YOUR ROADMAP FROM START TO STAGE

BY: LAYNE NORTON, PHD & PETER BAKER

THE COMPLETE CONTEST PREP GUIDE

The contents of this book should not be taken as medical advice. Always consult your physician or qualified health professional before beginning any type of diet or exercise plan.

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Layne is one of the most knowledgeable people when it comes to competition prep, nutrition, and training in the industry - and this contest prep bible is priceless.

Amanda Bucci, Fitness Influencer

Just like his bodybuilding.com contest prep guide was the definitive resource for competitors in the mid 2000's, this is the current book every competitor should own.

Dr. Eric Helms, PhD & Contest Prep Coach

This e-book is filled to the brim with quality information that every competitor and contest prep coach should get their hands on. This is a must-have in the competition world.

Sohee Lee, Fitness Author

This is, by far, the most thorough book I've read on contest prep. If you want a "Go-To, One-Stop Shop" guide for navigating the challenges of contest prep, this book is it.

James Krieger, MS

INTRODUCTION: THE JOURNEY

The amount of information that's available today regarding contest prep is enormous compared to what was available 10 and 20 years ago. In fact, it's staggering. When I started competing in 2001, I had but a scant few articles in the magazines you find at the checkout aisles in grocery stores that formed the basis for the beginning of my first contest prep. Looking back, there wasn't much info available and much of what was available quite frankly wasn't good. "This worked for me, bro" from whatever enormous pro bodybuilder was considered gospel.

This is probably a major reason that up until that point, only the genetic elites dominated the bodybuilding scene. They were the only ones whose bodies could tolerate those insane recommendations and still look good.

I got pretty lucky. I met a great coach about a month before my first show and it changed my life. I met Dr. Joe Klemczewski. Joe had all these crazy ideas about not cutting water & sodium, and focusing on science-based techniques to get ready for the stage. I hired him (for a paltry amount, I think he may have felt sorry for me) to do my last 4 weeks of contest prep. Funny thing happened, I won the teen division and novice tall division at my show and I was hooked. As a kid that got picked on growing up and with most of my peers saying I would never amount to anything, winning that show felt like winning the super bowl. More than winning that show, seeing how Joe was able to guide me through emails really got my wheels turning.

I remember meeting with him a few weeks from the show and thinking "man, this guy coaches bodybuilders for a living, how cool is that!?" As I sat there and stewed about how amazing that was, I blurted out "I want to do what you do!" Joe said that at the time he chuckled to himself and thought "yeah, right, kid." After all, Joe had put in a decade of work with his doctorate and starting his business. Most people aren't willing to commit to something like that.

Fifteen years later, to say that experience changed my life would be an understatement. I changed my major from biology to biochemistry in order to understand metabolism better. While many people told me that no one in the fitness industry would ever listen to a science geek, I figured they would listen if that science geek also looked the part. I was convinced that learning as much about human nutrition and metabolism as possible was the key to becoming successful in the industry I fell in love with. So much so that I decided to pursue a PhD in Nutritional Sciences, with my thesis focusing on protein metabolism. I was fortunate enough to study under Dr. Donald Layman, one of the world's foremost experts in muscle protein metabolism, at the University of Illinois. What I learned in those six years stretched well beyond what could ever be encompassed from just the knowledge I obtained.

I learned tenacity, outside the box thinking, challenging the status quo, and grit. All of the things I would require for my business ventures later in life. During the later stages of undergrad and the early stages of graduate school, I had begun writing for bodybuilding.com and posting on their message board. To say there was an appetite for good information was putting things lightly. People devoured my articles. I had dozens of people emailing, instant messaging (yes, I'm dating myself), and direct messaging me on various forums asking me to help them. I loved it. I was probably helping/coaching around 20 people for free when I got to graduate school. However, as graduate school picked up, I realized that I could not commit to that level of assisting others, without compensation. In 2005, I took on my first paid clients. Another life-changing decision.

Two years later, I formerly incorporated my coaching business, BioLayne LLC. I worked that as a full-time job as well as doing a full-time PhD. Many times, I would be in the lab late at night running a western blot or some other assay and during the incubation periods, I was answering emails or formulating client

plans. At the time, few people did online physique coaching, and no one really talked about it. It was great because there was no competition, but it was also hard to convince people that I could prep them for shows without being with them in person.

I don't want to say I was the first person to do online coaching because I wasn't, but I think it's relatively safe to say I played a big role in popularizing it over the next few years. In fact, I would estimate that I've worked with over 50 people who have gone on to become successful online coaches themselves. A short list of those people would be Dr. Peter Fitschen, Dr. Eric Helms, Alberto Nunez, Paul Revelia, Laurin Conlin, Ben Esgro, Ryan Doris, Steve Cook, John Gorman, Jessi Jean Cowan, Evan Shy, Bryce Lewis, Sohee Lee, Jessie Hilgenberg, Jamie DeBernard, Danielle Ruban-Martin, Brian Melancon, Joey Zinghini, William Grazione, Chris and Eric Martinez, and many others. I'm not trying to take credit for their success in any way, but rather highlight how popular the coaching industry has become.

Now, the issue isn't if people believe someone can coach them online, but rather that the market is flooded with coaches. There are absolutely no credentials needed to be an online coach. So many times, I've seen competitors get REALLY bad advice and at worse get screwed up from working with a random person from their gym or off social media just because they claimed to be "a coach." Most of these predatory coaches recycle the same plans over and over to different people with small changes. It's likely that it was simply a plan that was given to them by a former coach who likely also had no idea what they are doing.

> *As I always tell people, "if you think it's expensive to hire a professional, then just wait until you hire an amateur."*

I've had to find this out the hard way in other areas of my life. Just because someone got really lean and looks good on Instagram in no way qualifies them to coach you. Would you rather get heart surgery done by a cardiac surgeon who went to med school and years of residency after that or by some dude who is healthy and has never shown signs of heart problems even though they have bad habits?

Of course you want the educated person who takes their craft seriously. So why in the world

do people hire someone with no background, education, or knowledge in nutrition other than “here’s your meal plan”? One barrier for hiring good coaches is price, good help usually isn’t cheap.

That was one of the major reasons for writing this book, to provide a cost affordable way for competitors to get GOOD help and take them to stage without screwing them up.

The same can be said for information. There’s more information available about getting ready for a physique contest than ever before, but most of it’s terrible. So how do you sift through all the noise? How do you know who to trust? I hate saying “trust me” because at the end of the day, it’s not about trust. It’s about consistent results as well as information backed by evidence. I would like to think I can provide both of those.

As I write this today, I have 1749 client folders on my computer. It’s a staggering amount of people. Probably 40-50% of them were contest prep clients. That’s somewhere probably in the ballpark of 600-800 athletes that I’ve helped prep. Over 70 of which went on to win pro cards and of those, 15 snagged pro victories. Most of my clients were not genetic elites, though I did have some. I think the fact that I chose to work with everyone and not just genetic freaks actually was a good thing. I had to get in tune with people who didn’t respond well to normal adjustments. It made me think outside the box and ultimately made me a better coach.

Do you need a PhD in Nutrition to be a great contest prep coach? ***Certainly not.***

Do I think it helped me? ***Absolutely.***

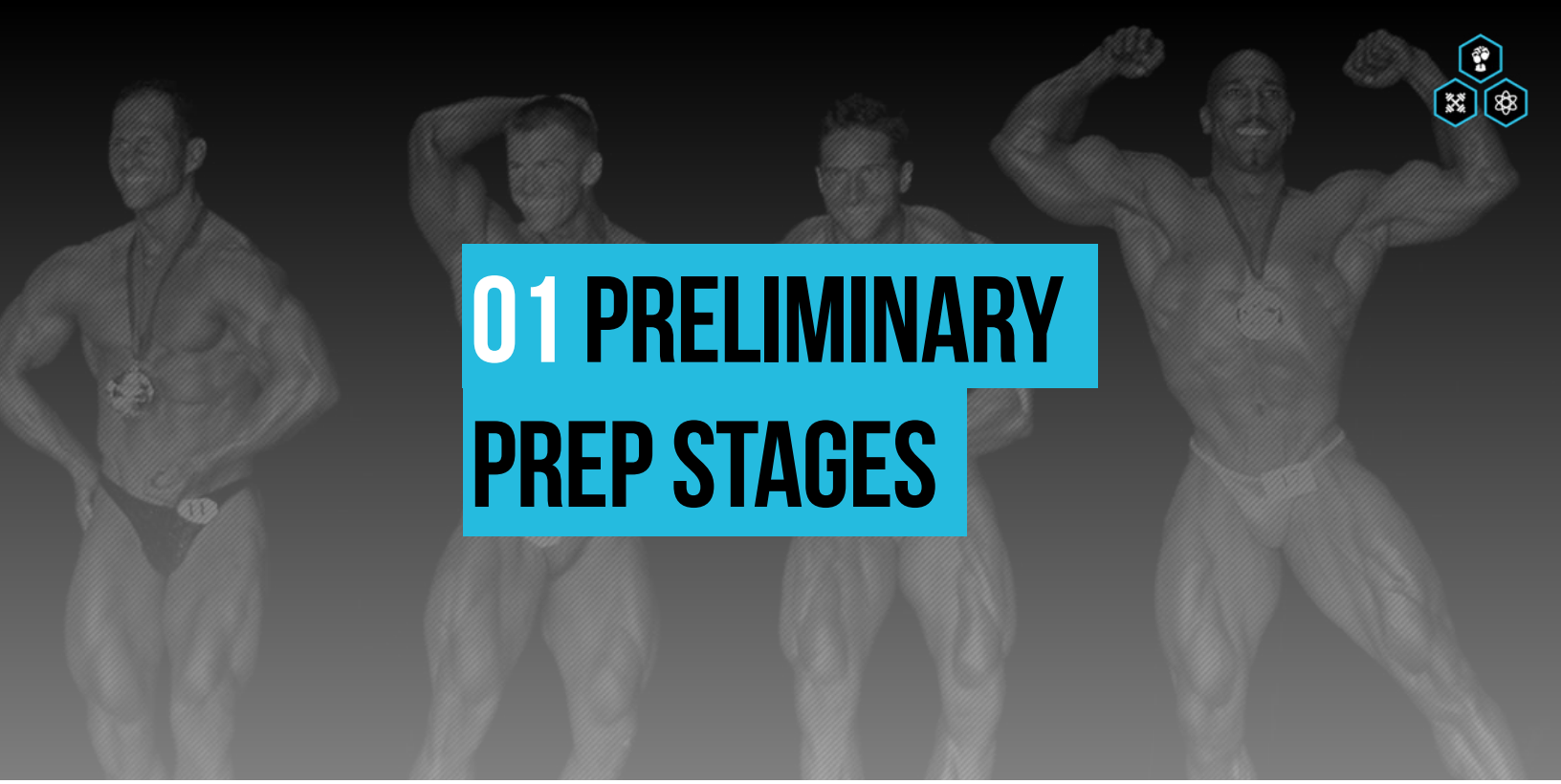
Do you need to have a pro card to be a great contest prep coach? ***Certainly not.***

Do I think that experience of competing at a high level helped me? ***Absolutely.***

The one thing someone must absolutely have to be a great coach however, is a willingness to learn from their clients. I can tell you that just by simply listening to my clients and paying attention to how their bodies responded to various nutritional strategies taught me more than I could have ever learned in any book or classroom.
The one other thing that I believe gave me an advantage is that I was never one to get stuck in a certain way of doing something. I tried various things and if it didn’t work, I

discarded it or modified it. I didn't keep hammering away at something that was a dead end. This meant that my coaching style, nutritional philosophies, and mindset all evolved over time. I'm not a great businessman, and I would consider myself a good, but not great scientist. I would however, consider myself a very outside the box thinker who isn't afraid to challenge the status quo. Flexible dieting, metabolic adaptation, reverse dieting, not cutting sodium and fluid, not taking diuretics, were ideas that I either helped pioneer or promoted. Trust me when I say, most of them went against the status quo and upset quite a few people. Currently, many of these concepts are widely accepted in the fitness community. Those of you who grew up competing in the 90s, could you have imagined a concept like flexible dieting gaining traction at that time? Hell no! Fortunately, the information age has made questioning dogma more acceptable. Sadly, there's still a lot of bad information out there.

What I've attempted to do in this book is put in everything I could think of to help you on your contest prep journey. This is information I never had available to me when I started competing. My goal with this book is to give you the guidebook to take you from point A to point Z of stepping on stage looking your best. I want to make this journey a little less stressful for you by taking a lot of the guesswork out of it for you. Consider this book your map and I'm your guide. I'm very much looking forward to working on this journey with you.



01 PRELIMINARY PREP STAGES

Congratulations. At this point, you've made the decision to compete and you've said to yourself "I'm doing it." As easy as it is to say the words, I want to caution you against jumping into this endeavor without thinking it through. Physique competition isn't like other sports where you can perform the activity and then leave it separate from the rest of your life. Prep will affect every area of your life, right down to your sex life. As crazy as it sounds, that's the truth. You need to ask yourself the following questions:

- Am I ready to meticulously track my food intake for several months?
- Am I ready to train harder than I've ever trained before?
- Am I ready to be hungry for short and long periods of time?
- Am I ready to have periods of very low energy and motivation?
- Am I prepared to deal with perturbations in mood including sadness, irritability, and malaise?
- Am I okay with not spending as much time with friends and family eating out?
- And yes, am I ok with having sex less often?

This is just a short list of things you will experience, and you *need* to ask yourself if you're ready. Competing can be one of the most rewarding experiences you'll ever go through, but only because of how difficult it is. For many, it will be one of the most difficult things you've ever done and doing it incorrectly can have serious repercussions. Bad coaches and bad advice have both negatively impacted people's health, relationships, and even cost some people their lives.

My goal for this book is to help you get on stage, looking your best ever, while minimizing any deleterious health effects and prevent you from making the same mistakes that so many others make. I've done that by placing the path before you.

So at the very beginning, let's start with something simple. You. Your history. Your training and your diet, specifically.

What Does It Take to Compete?

Ideally, you want to be a seasoned lifter. I don't mean you have to be some hardened, grizzled 40-year-old gym rat, though if you are, you can still compete. What this means is that you need to have been training for a year, minimum. Preferably, two years, to be honest. During that time, you need to familiarize yourself with proper form, the basic exercises, and develop a decent strength base.

Not only that, if you're the type of person who gets wrapped up in the minutia, at some point you have to let it go and *actually start*. You'll never feel ready. That's the way it is. If you're starting out, you shouldn't expect to be a big-league player. After you compete, you'll know what to improve. Once you realize you want to do it and you've been training consistently, pick out a show for the goal.

> *To simplify it all, get lean enough and you won't make a fool out of yourself.*

Don't fall into the trap of wanting to compete all the time. You won't make progress. You'll constantly starve, deal with negative metabolic adaptation, you won't have enough time to build quality muscle, and you won't have the time to make the improvements. Pick out a block of shows, maybe two to four shows over the course of a few months, then call it a season. Take the feedback—which will vary from show to show—and go with it.

Keep in mind, you're going to feel tired, hungry, run down, and you'll constantly think about food. If you aren't in the right mental place or position in your life, don't do it. If you just got fired or had a child, you might not want to compete. At the same time, there's also never a "perfect" situation. You have to go with the best you can at a given point in time. That time is purely something you have to judge for yourself. It's a mentally, physically, emotionally, challenging endeavor, but that's part of the reward

How Do I Get Shredded for Stage?

This isn't an easy or simple question to answer due to the nuances of fat loss. The short answer is, in order to get shredded for stage, you have to reduce your body fat percentage to an extraordinarily low level while maintaining as much muscle mass as possible. Bodybuilders will have to lose more body fat compared to, say, a bikini competitor, but in order to be successful, even non-bodybuilding physique competitors will need to be very, very lean. In order to achieve the desired level of leanness and lose sufficient body fat, it will take proper nutrition, training, and in some cases, cardio. It will also take time. For most of you, it will take a lot of time. More time than you would likely want to admit to yourself. One of my favorite bodybuilders of all time, Brian Whitacre, once said:

> *"Get to the point where you feel like you're ready for stage, then lose 10 more pounds and you're probably there."*

Some of you may scoff at this, but I've found his statement to be true more often than not. What people think "shredded" is and what it *really* takes to be at the top of the conditioning game is a whole other ballgame.

BRIAN WHITACRE
IFPA & WNBF WORLD CHAMPION

How long to diet is a question that will require a better understanding of your own individual metabolism and situation. The first thing we need to do in order to answer this question is figure out approximately how much body fat you will need to lose in order to be shredded. We can get an approximation of this by determining your current body fat percentage.

The Best Way to Measure Body Fat

Now, let's talk about measuring body fat. This measurement is going to come in handy later on when it's time to calculate your calories before you partition them into determined macronutrients. For measuring body fat, there are a myriad of different ways to do so:

- **Skin calipers**, which measure the folds of the skin
- **BIA**, which is a handheld device (there are also body weight scales that now have this as well) that sends an imperceptible electric current through your body to measure body fat
- **DXA scans**, which use low energy X-rays to determine body fat
- **Underwater weighing**, since muscle is denser than fat (muscle sinks, fat floats) they can use this to approximate the percentage of body fat
- **Bod Pod** is an air displacement plethysmograph which uses whole-body densitometry to determine your body fat
- **Navy body fat measurement**, which is an old school method based on your age and sex, as well as your waist, hip, and neck measurement

While some of these methods are more accurate than others, NONE of them are perfect. All of them use assumptions, imperfect estimations, and data calculations. They are also all subject to manipulation. It's less important what method you choose, it's more important that you're *consistent* with it and *always use that method*. I personally use calipers for my body fat, mainly because it's easy for me, and it's something I can reliably do on a consistent basis. Just because I use calipers doesn't mean you have to use them. The most important thing for you to do is make that measurement consistent.

For example, if you use the handheld Omron, you want to do it as soon as you wake up after you go to the bathroom, just like when you take your scale weight. After that, take your body fat measurement. As an experiment, go drink a huge glass of water and/or eat something. Go back to the Omron and take

your body fat again. You will get a different result.

Lean body mass (LBM) is all non-fat tissues, so if you drink a gallon of water and take a body fat test again, you will register as having eight pounds more lean body mass, since a gallon of water is eight pounds. I've had clients get upset that they took a DXA and it registered as them having lost one pound of lean body mass over the course of a month. The reality is they took this measurement at a different time of day, after eating different foods, after drinking a different amount of water, under different circumstances. This is why I hammer home consistency. If you can get a DXA scan every week but you can't do it under the same conditions, then the DXA might not be for you.

Why do I choose the calipers? Mainly because I feel like it measures what matters—the skin fold. The lower your skinfold is, the better you will look onstage. We don't care about body fat that isn't under the skin (there's some fat stored other places). If it isn't under the skin, it's not going to make you look less lean. Are all of these measurements accurate? To an extent. But none of them are 100% accurate. The consistent inaccuracies of a particular measurement are important for noting *your* trends. That's the key word. ***Your* trends.**

For example, if your caliper measurements predict a body fat of 10% and you're really 13%, they aren't that accurate. If you drop from 10% to 7% using the same measurements, you can be pretty confident that the RELATIVE drop in body fat was accurate. Keep in mind that even week to week body fat measurements can fluctuate and cause you to go up and down slightly in body fat, it's the overall trend over the course of several weeks that's most important, but more about this in Chapter 8.

Other Factors

As you keep going through your prep, you're going to notice something. Perhaps you've noticed it now, but if not, you will. I always have everyone take a daily measurement of body weight. If you've done this, you will notice that it isn't the same from day to day. If you're a woman, your menstrual cycle can yield different weights. The amount of salt you eat in comparison to the amount of water you drank can affect the next day's weigh in. Even the amount of sleep you get can yield a different result. It's for that reason I advocate daily weigh-ins and taking the average of the week. It gives you a reference to the bigger picture of how your body is changing.

Every now and then, people will also ask if you have to measure your body fat percentage every day and take the average of that. You certainly can. If you use an Omron, the process will be easy. However, if you use a DXA scan, or calipers, or something of that sort, you might find it to be a bit of a pain doing it every single day, which is why I always recommend once a week. Personally, I use a three-fold caliper test, and I do each one in triplicate to ensure accuracy. Then, I take the average of those measurements and use that as my weekly body fat percentage.

Finally, let's talk about Lean Body Mass (LBM). This goes hand in hand with body fat measurements, so it's something to keep an eye on. However, please avoid this one mistake everyone makes when they first start out. That is, don't make the mistake in assuming that LBM is solely your muscle mass. Muscle mass is indeed a part of your LBM. The weight of your organs, hair, fluids, bones, connective tissues, and anything else you can think of that isn't composed of fat, also comprises your LBM. So later, when I go over the potential losses in LBM, don't freak out and assume it's all muscle. It definitely isn't. Moreover, don't sweat the fact that this number will fluctuate like your scale weight will. It's all a part of the process.

Summary:

- Be consistent with your measurements
- On that note, pick one type of measurement that you can easily do and stick with it
- Be aware that your scale weight and your LBM will fluctuate
- Remember that 100% accuracy in the measurement is impossible, but spotting your trends is guaranteed if you measure it

Go ahead and get yourself measured and ready, because it's time to dive in.

02 WHERE TO START: DETERMINING CALORIE INTAKE

Getting ready for a physique competition largely comes down to conditioning. Unless you're taking exogenous drugs, it's unlikely that you're going to build muscle while dieting, so the muscle you start the prep with is what you have to work with. Your genetics and aesthetics are what they are, and they aren't going to be modified through fat loss. So muscle mass and muscle shape of your body are largely out of your control during contest prep, but the one thing you can control is how lean you get.

Getting lean enough boils down to one thing, and that's losing maximal amounts of body fat. For the record, if you compete in the bodybuilding divisions, prepare to lose a lot of body fat. As such, your nutrition strategy becomes absolutely paramount. Not only do you need to lose maximum body fat, but you don't want to do that at the expense of losing large amounts of muscle mass. This means that you will be walking a very fine line. Fortunately, I'm going to help you navigate that tightrope of fat loss vs. muscle loss.

Before we begin discussing where to start with your nutrition plan, we need to define a few terms.

Calorie - A calorie is simply a unit of energy. One thousand calories yield a kilocalorie, also called a food calorie. If you've ever watched my videos and you've heard me talk about kilocalories (kcals), just know that those are the same units you see on the back of your food labels, the food calories. So if something says 20 calories, it's actually 20,000 calories or 20 kilocalories. Somewhere along the line, some smartass decided it would be fun to confuse everyone by mixing all these up. But for our purposes, when I discuss "calories," I'm referring to kilocalories.

Maintenance Calories - Maintenance calories are exactly like they sound. The number of calories you must consume on a given day to maintain your weight.

Calorie Deficit - Simply stated, a calorie deficit is when you consume fewer calories than is required to maintain your bodyweight. This will, by definition, produce weight loss and (hopefully) body fat loss. It means you're using more energy than you're taking in via food calories. I'll get into more of the details later, but in the vast majority of cases, in order to lose fat, you need a calorie deficit.

Calorie Surplus - The exact opposite of the deficit, a surplus is when you consume more calories than your maintenance, resulting in weight gain. The usual goal in a surplus is to make sure that weight gain is mostly muscle tissue and not fat tissue.

Metabolism - The entirety of your body's chemical processes. Typically, the two big processes involve breaking down or building up the matter inside of us. Catabolism is the breaking down of large molecules into smaller molecules, and anabolism is the building of large molecules from smaller molecules.

Metabolic Adaptation - This is a change in metabolic rate as an adjustment to your dietary intake. For instance, if you were losing weight for a while, and you stalled, you've witnessed metabolic adaptation, you consumed fewer calories than your maintenance, so your metabolism adapted by slowing down in order to prevent too much weight loss. While the individual nuances of metabolic adaptation can get drastic, that's a simple way of looking at the process for our purposes, right now.

There we have some basic definitions. Now, what do we actually do with this information?

How Much Do I Eat to Get Shredded?

This is the golden question, and like all great questions, the simple answer is "it depends." Any diet can "work" so long as it creates a calorie deficit. However, as we will discuss later, our goal isn't just weight loss, it's fat loss with maximal retention of lean mass. What will determine overall weight loss is something we call energy balance or "calories in" vs. "calories out." That is, in order to lose weight, the amount of energy you expend every day will need to exceed the amount of energy—the calories—you consume.

Keep in mind a calorie isn't a molecule or a nutrient, rather it's a unit of measurement of a compound's energy content. So when we say fat has nine calories per gram, we are referring to how much energy can be produced from a gram of fat.

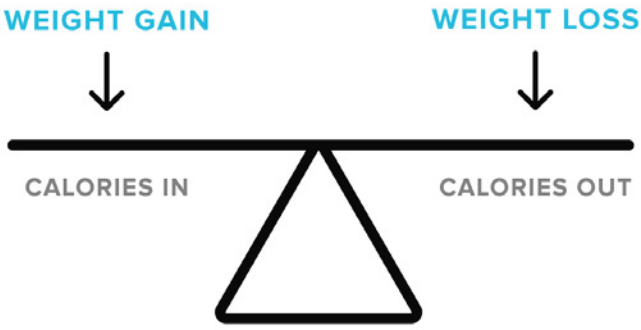


Figure 1. Simplified energy balance equation.

While there are some dietary zealots in today's world who have convinced themselves that calories don't matter, or that you can consume as many calories from "good" foods as you want and still lose weight, this is a complete and utter fallacy, and numerous research studies have shown it as such.[1][2][3]

Don't get me wrong, certain changes in macronutrient composition and food choices can change the "calories out" component of the equation and lead to more weight loss. Just know that the increased weight loss isn't due to some mystical inherent property of the food. Rather, it's that particular food's macronutrient composition.

1. Energy expenditure and body composition changes after an isocaloric ketogenic diet in overweight and obese men. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/27385608
2. Ketogenic low-carbohydrate diets have no metabolic advantage over nonketogenic low-carbohydrate diets. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/16685046
3. Effects of 4 weight-loss diets differing in fat, protein, and carbohydrate on fat mass, lean mass, visceral adipose tissue, and hepatic fat: results from the Pounds Lost trial. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/22258266

Protein is a good example in that it has a higher thermic effect of food (aka TEF, we will discuss below) than carbohydrate or fat, which is why diets higher in protein tend to produce better fat loss.[4] However, what I want to emphasize is that there is NO energy containing compound I'm aware of that's somehow energy negative. That is, eating said food actually causes you to burn (expend) more calories than the food itself contains.

Many people refer to things like vegetables and in some cases even proteins, as "free" foods because they cause greater caloric expenditure than other foods. While it's true that these foods cause greater "calories out" response, it does not make them free, it just means that they increase caloric expenditure modestly. To put it in even more simple terms, they *still* have calories.

The comparable example is eating 5000 calories per day of mostly fiber and protein because they cause a greater TEF. Sure, you burned more total calories due to TEF, but you still created a caloric surplus and made it impossible to lose weight. If you have to consume 2200 calories per day to lose fat, then it makes total sense to consume foods high in protein and fiber because you were targeting that calorie intake anyway, why not consume foods that give you a better TEF?

> *There are NO free foods, period.*

Now that we've talked about the concept of energy balance and calories in vs. calories out, we can discuss how to determine choosing the appropriate energy intake to get you shredded. It's not as straightforward as you might think. Before we can determine how many calories you need to eat to create a caloric deficit and lose fat, we first need to determine something called your "maintenance calories."

Determining Your Maintenance Calories

Keeping in mind that in order to lose fat we will need to create a caloric deficit, that is, eat less than our maintenance calories, we need to determine approximately what your maintenance calorie intake is. In order to determine that, we need to consider what

4. Moderate carbohydrate, moderate protein weight loss diet reduces cardiovascular disease risk compared to high carbohydrate, low protein diet in obese adults: A randomized clinical trial. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/18990242

components make up your total daily energy expenditure (TDEE).

Basal Metabolic Rate (BMR) -The major component of your TDEE is your basal metabolic rate (BMR). Your BMR accounts for approximately 60% of your TDEE and is the amount of energy your body requires to run basic processes and "keep the lights on" so to speak. Still, even though this is a baseline level to keep you alive, for most people it still is the major determinant of your TDEE.

Non-Exercise Activity Thermogenesis (NEAT) - NEAT is the amount of energy you spend doing little movements throughout the day that aren't actually exercise. Typing on the keyboard, talking, fidgeting, wiggling your toes, etc. NEAT also refers to walking, standing, and any non-exercise activity. This is actually the MOST adaptive component of metabolism because it increases significantly during a caloric surplus and decreases significantly during a deficit. NEAT is often used interchangeably with NEPA (non-exercise physical activity), though the main difference is whether we are conscious of the activity or not. For our purposes—and in the interest of not being pedantic—we will just refer to it as NEAT.

Thermic Effect of Food (TEF) - As weird as it sounds, there's also a thermic effect of food, meaning that it costs you energy in order to extract energy from the food that you eat every day. Think of it as a combustion engine. The conversion of gasoline to energy isn't perfect, in fact, a lot of the energy is wasted and your car has to put energy into the system in order to extract energy from the gasoline.

Exercise Activity - This is exactly what it sounds like. When you exercise, you expend calories. How many you expend depends upon the duration and intensity of the exercise performed.

So when we get to the point where it's time to calculate these equations, you have to take all of these into account.

If all this looked like an equation, that equation would be:

BMR + NEAT + Exercise + TEF = TDEE

Simple, right? In order to figure out all of this, you have to calculate it, and there are several calculators out there to help you do just that. Keep in mind that these are simply estimates, however. Most of them will get you in the same basic range. I tend to prefer the

Müller equation since it was done mostly on a homogeneous, modern population and uses lean body mass and body fat as its primary inputs. Any of them can work, but keep in mind that they will only work well for about 60% of people. The 40% who lie outside the mean and especially the 5% of outliers will either be well below or well above these calorie estimates and we will need to make some accommodations to them, that we will discuss later.

Mifflin-St. Jeor Calculator

This is a classic formula and on any given website, it's likely the one used to determine your caloric needs. This is going to require you to do a little math, but it's not too complex.

First, you have to know your weight in kilograms. If you have a digital scale (or even some analog scales have kilograms listed) this is pretty easy. You select the metric measurement and hop on. If you don't have that option, all you need to do is divide your weight in pounds by 2.2. So if you weigh 132 lbs, your equation would look like this:

132 ÷ 2.2 = 60kg

Your weight would be 60kg in that case.

Next, you have to figure out your height in centimeters. One inch equals 2.54 centimeters. So if you're five feet tall, your equation to figure out your height in centimeters would be as follows:

(12in × 5ft) × 2.54 = 152.4cm

So we figured out our height in inches and from there, centimeters.

Now, we can figure out your BMR according to the Mifflin St. Jeor equation. We'll use a 100kg man for our first equation. And let's say he is 25 years old and 182cm.

10 × 100 + 6.25 × 182 - 5 × 25 + 5 = 2017.5

(Round up to 2018)

There's our man's BMR now let's figure it out for a 60kg woman, aged 25, five feet tall--the equation is slightly different.

10 × 60 + 6.25 × 152.4 - 5 × 25 - 161 = 1266.5

(Round up to 1267)

So to plug your own numbers in, here's the equation:

For Men:

(10 × Weight in kg) + (6.25 × Height in cm) - (5 × Age in Years) + 5 = BMR

For Women:

(10 × Weight in kg) + (6.25 × Height in cm) - (5 × Age in Years) - 161 = BMR

Katch-McArdle

Here's another equation for you. For this one, you need to know your LBM, and that includes not only your muscle tissue, but your bones, connective tissue, organs, the water you just drank, or anything else in your body that isn't body fat tissue. We talked about it in the last chapter, but it bears repeating.

So let's figure out your LBM in kilograms, accept that it's still a guess (like these equations are in the first place) and then make the calculation.

Once you have your body fat percentage like we went over in Chapter 1, you make the following simple calculation to figure out your LBM:

LBM = Body Weight - (Body Fat Percentage × Body Weight)

So using our 60kg, 25-year-old woman, we will calculate her BMR with this equation. Let's say she uses calipers and determines she has 15% body fat. The equation will start with this:

60kg - (.15 × 60) = 51kg

Now that you know that, the full Katch-McArdle equation is as follows:

21.6 × LBM + 370 = BMR

So for our woman, she has a BMR that comes out to:

21.6 × 51kg + 370 = 1471.6

(Round up to 1472)

One thing I want to point out is that you'll notice there's no distinction between men or women with this particular equation. Not only that, there are fewer variables to contend with overall. On the plus side, it does take lean body mass into account which many of these equations don't.

Harris-Benedict

Here's another popular calculator that you can find. Like the Mifflin St. Jeor calculator, this one has a different equation for men and women, and takes into account your height and age, as well. It is as follows:

For Men:

66.5 + (13.75 × body weight) + (5.003 × height) - (6.775 × age) = BMR

For Women:

655.1 + (9.563 × body weight) + (1.85 × height) - (4.676 × age) = BMR

As is the standard, body weight is in kilograms and height is in centimeters, so for our 25-year-old, 100kg, 182cm tall man, the Harris Benedict equations looks like this:

66.5 + (13.75 × 100) + (5.003 × 182) - (6.775 × 25) = 2182.671

(Round up to 2183)

And for our hypothetical woman:

655.1 + (9.563 × 60) + (1.85 × 152.4) - (4.676 × 25) = 1393.92

(Round up to 1394)

In addition to the original Harris-Benedict equation, there's a revised version, which I will go over next.

Revised Harris-Benedict (Roza)

This is similar to the equation above, some of the numbers are a bit different, as you will see. Again, there's a biological sex distinction and the revised version also relies on your height and age, as well. This was found to be a bit more accurate for obese populations than the other equations, now since you're looking to do a contest prep that probably doesn't apply to you. Unless of course you had the dreamer bulk from hell this past offseason.

For Men:

88.362 + (13.397 × body weight) + (4.799 × height) - (5.677 × age) = BMR

Where if we plug in our example, we get:

88.362 + (13.397 × 100) + (4.799 × 182) - (5.677 × 25) = 2159.555

(Round up to 2160)

For Women:

447.593 + (9.247 × body weight) + (3.098 × height) - (4.330 × age) = BMR

Which yields:

447.593 + (9.247 × 60) + (3.098 × 152.4) - (4.330 × 25) = 1366.29

(Round down to 1366)

Finally, we have one more equation to go over.

Müller Equation

Finally, we come to the Müller equation. Briefly, Müller et al. noted the flaws of the World Health Organization's calorimetry and they came up with their own calculations based on a homogeneous modern population.

In this one, we have a few more variables to take into account. We have age and LBM again, but we also have to account for fat mass (FM), and biological sex, which is represented by a 0 if you're a woman, or a 1 if you're a man. This equation is one of my preferred ones because it accounts for most of the variables that have the biggest impact on metabolic rate (LBM, FM, Sex, and Age).

So all that yields this:

(13.587 × LBM) + (9.613 × FM) + (198 × sex) – (3.351 × age) + 674 = BMR

For our hypothetical man, let's say he also had 15% body fat, we would plug the numbers in as follows:

For Our Man:

(13.587 × 85) + (9.613 × 15) + (198 × 1) - (3.351 × 25) + 674 = 2087.315

(Round down to 2087)

For Our Woman:

(13.587 × 51) + (9.613 × 9) + (198 × 0) - (3.351 × 25) + 674 = 1369.679

(Round up to 1370)

All or any of these equations will likely get you in the ballpark for your BMR, but keep in mind they aren't perfect. All of them are the results of regressions based on data averages. That means these equations will probably work quite well for about 60% of people, they will work ok for 20-30% of people, and they won't work well for about 10-20% of people.

That's why it's important to understand that these equations are only estimates. Paying attention to how you respond to manipulations in your daily calories over a long period of time is always going to be the most accurate way of assessing your maintenance calories. In fact, my preference for determining maintenance calories is to simply track what you consume every day for a long period of time and note how your body weight responds over that time period as I will discuss later.

My personal favorites are the Müller and Katch-McArdle equation since they use lean body mass as an input which is the major contributor to metabolic rate. That doesn't mean the others are garbage. I recommend trying out each and see what you think is most accurate for you.

Activity Factor

All right, you've now established your BMR. Now it's time to figure out your maintenance calories. In order to do that, you take your BMR and add in the calories you burn when you exercise or play sports. This figure is always going to be higher than your BMR and is based on a range starting at 1.2 all the way up to 1.9.

Activity Factor Guide:

1.2 - Sedentary: You work a desk job and don't exercise (probably not many of you).

1.375 - Light activity: You work a desk job but do a bit of regular exercise. Or you do little exercise, but you work a job that's pretty active (i.e. a nurse, teacher, etc.) where you're on your feet most of the day. Most of you reading train hard and are decently active.

1.55 - Moderate Activity: Most of you will probably fall in this category. Maybe you work a sedentary job but train like a madman. Or maybe you train moderately but also have a job where you stand on your feet all the time. Someone who doesn't train but works a hard labor job would fall into this category as well.

1.725 - Very Active: You train most days of the week really hard and you also work a job where you're on your feet quite a bit. Overall, you're active throughout most of the day.

1.9 - Extra Active: You train hard and work a job that's also intense in nature. As an example, maybe you're a roofer, but you also go to the gym five days a week.

If you have a desk job, don't do anything on the weekends, come home from work and sit around and watch TV, you're going to be closer to the 1.2 range. If you time traveled back to Soviet Russia and joined their weightlifting team (where it was your job to lift and nothing else) you would be closer to a 1.9. For most people, they will probably select 1.55 as most competitive physique athletes train very hard but typically work somewhat sedentary jobs.

Once you select the appropriate activity factor, multiply it by your BMR that you established above, and there you have your estimated maintenance calories. For our 60kg woman who used the Müller equation. Her maintenance calories would look like this:

1370 × 1.55 = 2123.5

(Round up to 2124)

I can't emphasize this enough: *all* of these are estimates with varying degrees of precision. Some of these equations reflect the time periods in which they originated, like the Harris-Benedict equation. Newer ones, like the Mifflin St. Jeor and Müller calculator are more modern and generally considered more accurate.

Whichever calculator you use, be prepared to make adjustments, and stick with it. I've seen many people think of these equations as the word of god and think that they are magical. I've heard people exclaim "I ate 500 calories below my maintenance and I didn't lose weight!" Let me be **perfectly clear** on this. If you ate 500 calories below your *estimated* maintenance and didn't lose weight then by **definition,** that calorie level was **not** your maintenance. Period. Our maintenance calories are the amount of calories you consume to maintain your weight. So if you eat at maintenance and your weight increases or decreases (in the long term, not talking daily fluctuations) then it simply wasn't your maintenance regardless of what any calculation says.

The Best Method: Trial and Error

Ideally, you would spend several weeks at your maintenance calories to see if you actually do maintain. If your goal is to compete, then you want to tighten up that margin of variance every time you weigh in. Something like ± 1.0% body weight should be good to start out to account for normal weight fluctuations due to water retention, food volume, or hormonal cycles. I recommend weighing in the morning upon waking after

using the bathroom every single day and then taking the average of those weights for the week. Based on how much you gain or lose on a certain calorie amount, you can get a pretty good idea of what your maintenance is.

For example, if you were consuming 2400 calories per day for four weeks and you lost 1kg of fat in that time period you can use that data to calculate your approximate maintenance calories. It's not a perfect method keep in mind, but it will get you close.

Determining Changes in Body Fat vs. Lean Body Mass

Now you might think that since the example above lost pure body fat that means they lost 100% lipid, but body fat isn't 100% lipid. It's around 87% lipid and 13% made up of other components like protein, water, etc. So if we take 1000g/kg (1000g = 1kg) × 0.87 we get 870g of actual lipid/fat lost. We know that 1g of fat/lipid equals 9 calories. So 870 × 9 = 7830 calories per kg body fat lost. Since that was lost over 28 days if you divide 7830 ÷ 28 = 280 calories/day. Adding that back to 2400 + 280 = 2680 is approximately the caloric intake required to maintain that individual's body weight.

For the sake of completion, let's say you were in a gaining phase and in the same 28 days someone eating 3600 calories put on 2.5kg. But ¼ of it was lean body mass (LBM) and ¾ of it was body fat. Unless you're a raw beginner, fresh into the land of "newbie gains," this is likely the most realistic representation of what you're *actually* gaining in a building phase. If it isn't, it's pretty close.

2.5kg × 0.25 = 0.625kg lean body mass and
2.5kg × 0.75 = 1.875kg body fat

But lean mass isn't 100% protein. In fact, it's mostly fluid. Almost 70% of lean body mass is fluid, the other 30% (approximately) is lean tissue, most of which is made of proteins.

So if we take 0.625kg LBM × 0.3 = 0.1875kg of protein.

0.1875kg × 1000g/kg = 187.5g protein × 4 calories/g protein = 750 calories from LBM

Circling back to calories from body fat, 1.875kg body fat × 0.87 = 1.63125kg fat/lipid.

1.875kg × 1000g /1kg fat = 1631.25g fat × 9 calories/g fat = 14681 calories from body fat

Total approximate calories in the mass you gained = (calories from body fat + calories from LBM).

Total calorie surplus = 14681 + 750 = 15431

Divide 15431 ÷ 28 days = 551 calories/day surplus

Take their calorie intake minus the daily surplus to determine their approximate maintenance calories.

3600 - 551 = 3049 is their approximate maintenance calorie level

Obviously, this method is more involved than using an equation and simply plugging in the numbers. It requires you to track your weight, body fat, lean body mass, and caloric intake, but it will be by far the most accurate way of assessing your maintenance calories. Alternatively, if you wanted to track but not go to this length, you could just assume that there are approximately 7000 calories in each kg of mass or 3500 calories in each lb of mass and make your calculations based on that.

At the end of the day, whether you use one of the equations from above, track and calculate in super fine detail yourself, or a

Figure 2. Calculating maintenance calories based on the amount of weight gained over period of time.

rough estimate, it's all just a starting point. Wherever you start, you will likely have to make adjustments at some point. If you get your calories closer to the proper starting point, you may not have to adjust as early on, but you will still have to adjust at some point. While it's an important step, errors here are by no means fatal. Just focus on being consistent with whatever method you choose.

How Much Weight Do I Need to Lose?

Now that we have valuable data about your maintenance calories, we can start to look at determining how long you should prep for and what kind of caloric deficit you will require. Keep in mind the deficit that you require will depend upon the amount of body fat you need to lose. This is where it's EXTREMELY important to be honest with yourself and how much body fat you need to lose. If you're estimating or calculating that you're 10% body fat, but you can't see your abs at all, then you're only lying to yourself and impeding your ability to get lean enough. Luckily, I already went over how to calculate how much total body fat you have. In general, it's very difficult to know what your body fat needs to 'measure' in order for you to 'look' competition lean. Some people may measure relatively high, like Alberto Nunez (he measured around 6% body fat when he looked insanely shredded), where some people may measure extremely low at 3% and not look as lean.

A man who stands about 165cm (about 5'5") with a legitimate body fat of 6% will also look different than a man standing at 182.9cm (about 6'0"). The important thing is to keep in mind it's not an exact science and at the end of the day, no judge is going to get onstage with calipers or a DXA and ask what your body fat is. They only care about how you look. Therefore, body fat measurements should only be used as a rough estimate of how much total weight you need to lose so you can estimate what kind of deficit you require.

> *However, as prep starts to get down to the nitty gritty, paying attention to how you LOOK vs. the absolute measurement of body fat will become far more important.*

In general, if you're using calipers, DXA, or BIA to measure body fat, here's what I recommend targeting for the different divisions:

Division	Caliper	DXA	BIA (Inaccurate)
Men's Bodybuilding	2-4%	4-6%	6-9%
Women's Bodybuilding	6-8%	8-11%	10-13%
Men's Classic Physique	3-5%	5-7%	7-10%
Women's Physique	7-9%	9-12%	11-15%
Men's Physique	4-6%	6-8%	8-11%
Women's Figure	8-10%	10-13%	10-15%
Women's Fitness	8-10%	10-13%	10-15%
Women's Bikini	9-12%	11-14%	12-15%

Table 1. Approximate competition body fat levels for different physique competition categories.

I REALLY want to firmly emphasize that these are NOT hard numbers. These are just my data from working with clients. You may be a male bodybuilder and find that unless you caliper at a 2.5%, your glutes and hamstrings just aren't lean enough. Conversely, you may be a bikini competitor who finds that you look your best at 12% body fat. These ranges are only meant to serve as general guides. Also, take note of BIA. I've found that it typically measures lean people way too high. It's not a very accurate method of calculating absolute body fat for lean individuals. However, the relative changes in body fat are probably fine to use as a reference regarding whether or not you're getting leaner.

For example, if BIA calculates you at 22% body fat, you may really be much leaner than that. However, if four weeks later you're measuring at 17%, even though the absolute number may not reflect your real body fat, you can be

relatively confident that the relative reduction in the body fat value is useful data for assessing progress. In that case, the trending at large is the more important factor than the literal number.

Now that we have ideas about what body fat level is required for each division, let's discuss prep duration. If we know our target body fat, and we know our current body fat, we can get a good idea of how much body fat we need to lose. For example, if we have a male bodybuilder who is currently at 12% body fat and weighs 100kg, that means he has 12kg body fat. Theoretically, if he needs to lose 10% of his body fat, that will require a body fat loss of approximately 10kg. So he just needs to lose a total of 10kg right? Well, not quite. You have to account for the lean body mass that will be lost during dieting when assessing how much total body weight you need to lose.

There are only a handful of studies looking at bodybuilders during contest prep as it stands. The majority of them were done in natural bodybuilders, so these are the studies I'll discuss. Whatever the results are for these, I think it's fair to say that an exogenously enhanced competitor won't lose as much LBM compared to a natural competitor. No matter where you fall, plan accordingly. As of the writing of this book, there were 8 studies directly examining LBM before and after contest prep.[5] [6] [7] [8] [9] [10] [11] [12]

5. Case study: Natural bodybuilding contest preparation. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/24901578
6. Natural bodybuilding competition preparation and recovery: a 12-month case study. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/23412685
7. A nutrition and conditioning intervention for natural bodybuilding contest preparation: case study. Retrieved January 2, 2018, from https://jissn.biomedcentral.com/articles/10.1186/s12970-015-0083-x
8. Female Natural Bodybuilding Competition Preparation: A 6-Week Case Study. Retrieved January 2, 2018, from https://digitalcommons.georgiasouthern.edu/cgi/viewcontent.cgi?article=2553&context=etd
9. Case Study: Unfavorable But Transient Physiological Changes During Contest Preparation in a Drug-Free Male Bodybuilder. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/28770669
10. Physiological Changes Following Competition in Male and Female Physique Athletes: A Pilot Study. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/28422530
11. Psychophysiological Tracking of a Female Physique Competitor through Competition Preparation. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/28344742
12. Body composition changes in female bodybuilders during preparation for competition. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/11360131

The average LBM lost (as a percentage of total weight lost) was 24.4%. However, that number is likely a bit low. Every single study except one showed significant losses of LBM.[11] When I ran statistics on the compiled data, the results of this study were an outlier compared to the rest as the subject in this case study actually gained 13.3% LBM during the prep. In the seven other studies, the *minimum* LBM lost was 9.9%.

Study	Weight Begin	Weight End	LBM Begin	LBM End	LBM % Lost	BF Begin	BF End	Subject Number
Fitschen	88.60	73.30	73.10	67.88	-34.11%	17.50%	7.40%	1
Rohrig	67.40	57.30	46.84	48.19	13.33%	30.50%	15.90%	1
Bannock	86.00	74.30	73.96	68.95	-42.82%	14.00%	7.20%	1
Loenneke	59.40	49.80	50.43	45.52	-51.18%	15.10%	8.60%	1
Rossow	102.85	88.87	87.63	84.87	-19.72%	14.80%	4.50%	1
Pardue	85.00	76.30	73.27	72.41	-9.90%	13.80%	5.10%	1
Van Der Ploeg	66.38	60.58	56.22	54.70	-26.21%	18.30%	12.70%	5
Too	76.30	63.40	64.09	60.61	-26.99%	16.00%	4.40%	1
Study Averages	80.79	69.04	67.05	64.06	-24.70%	17.13%	7.85%	
Weighted Averages	80.79	69.04	67.05	64.06	-25.20%	16.52%	8.47%	
Outlier Removed	83.03	71.00	70.41	66.71	-30.13%	15.21%	6.70%	
Outlier Removed Weighted	**83.03**	**71.00**	**70.41**	**66.71**	**-28.71%**	**15.25%**	**7.79%**	

Table 2. Compilation of studies examining natural physique competition prep. Displayed are total weight, LBM, and body fat changes and the proportions of each.

If we remove that outlier from the other studies, the average LBM lost was actually 29.8%. However, this number is also not quite accurate. Of the seven studies, six were case studies of individuals and one was an observational study of five subjects. If we view that as 11 data points—six individual case studies, and five individuals in another observational study—and weight the study with the five people appropriately, we arrive at a number of 28.7% LBM lost as a percentage of total weight lost (see table above).

Now, you might be thinking "they must have been on some terrible diets to lose that much lean body mass. I literally can't even." I can tell you that for several of them that was simply not the case. The Fitschen, Russow, and Pardue studies I can personally vouch for. The subjects in these studies were being prepped by very competent coaches who knew what they were doing.

What does this mean? For drug-free competitors, some LBM loss is probably inevitable. This is where I think it's important to differentiate between LBM and MUSCLE. Most people equate the two as the same thing, but they are NOT the same thing. I went over it before, but like all important truths, it bears repeating. Lean body mass encompasses all non-fat tissues including skeletal muscle. LBM also includes organs, bone, skin, connective tissue, hair, nails, and body water. In fact, it's likely that much of the losses of LBM are not skeletal muscle tissue at all, but rather body water, liver, and intestinal mass. Remember that for lean tissues like muscle, almost 70% of their mass is fluid. Therefore, if you consider that the average loss of weight is 28.7% LBM, it's likely reasonable to assume that less than 10% of weight lost was actual muscle tissue. However, we still need to account for this weight.

If we take our example from above that a 100kg male at 12% body fat needs to lose approximately 10kg of body fat in order to be stage ready, we can calculate how much lean body mass he will likely lose based on the averages as well. Since the average is approximately 28.7% lean body mass lost during dieting for a show, this means that 71.3% is fat. Thus, we can divide the body fat he needs to lose by this number in order to determine total weight loss required. That equation is as follows: 10kg ÷ 0.713 = 14.0kg total weight loss required.

That is, total weight loss required = body fat loss required ÷ % of weight from body fat lost.

So if we had a bikini competitor who was 60kg and needed to lose 10% body fat, that is 6kg. If we divide 6kg ÷ 0.713 we get 8.4kg total weight loss required. Now that we can determine with relative accuracy the total amount of weight loss required, we can then calculate our starting deficit after we determine how long we wish to prep for.

How Long to Prep

The old school bodybuilding lore suggests that this is an easy answer of 12 weeks. Indeed, my first contest prep was 12 weeks for no other reason other than that was the time period everyone in the magazines used. 12 weeks may be appropriate for some, but I've found that it's probably too short for most people. While a short 12-week prep may seem enticing compared to a 24-30 week slow grind, keep in mind that the faster you need to lose weight, the greater the daily deficit required, and the more likely you are to lose lean body mass.

I recommend losing no more than 1% of total body weight per week. That might not sound like much but in fact that's still an aggressive prep. In fact, in Bannock et al.'s natural bodybuilding contest prep case study, they saw significant reductions in lean body mass (42.8% of weight lost from lean body mass) even at 1% of body weight lost per week.

In general, I think the slower you can go, the better off you will be. This does have its realistic limits. Most people will reach their limit of being about to mentally grind after around 30-40 weeks of prepping in my experience. For a frame of references, that's over half a calendar year. So while it might seem enticing to try to diet 60 weeks and lose 0.2% body weight per week in order to maximize muscle retention, it's probably not practical. In general, I recommend losing an average of 0.4-0.8% of body weight per week.

So if we take our above example of a bodybuilder who weighs 100kg and decide that we are going to target a conservative weight loss of 0.6% body weight per week. That puts us at 0.6kg body weight loss per week. How many weeks of dieting does this equate to? Remember above we calculated that he had 10kg body fat and 4kg LBM that will likely be lost for a total of 14kg. If we divide that by 0.6kg weight loss per week, that puts us at 23.5 weeks which we can round up to 24 weeks to be safe.

We can also determine how this would look if we did a more aggressive fat loss regiment of

0.8% of body weight per week. That would be 14.0kg ÷ 0.8kg per week = 17.5 rounded up to 18 weeks of dieting. If we went to the absolute upper end of what I recommend for weight loss at 1% of body weight per week, then he would be targeting 1kg weight loss per week, placing his prep at around 14 weeks of dieting.

For another example, let's look at our bikini competitor from earlier. Recall that she was 60kg with 6kg body fat to lose and 2.4kg of LBM to potentially lose as well. With 8.4kg of total weight to lose, if she chose to lose at a rate of 1.0% body weight per week (the maximum upper end of what I recommend) that puts her prep time at 14 weeks (8.4kg ÷ 0.6 = 14.0), If she were to play it safer, she would opt to lose 0.6% of that body weight (0.36kg) per week which is more in line with what I would recommend, that would yield 23.3 weeks (8.4 ÷ 0.36 = 23.3) of dieting. Of course, I would round up to 24 weeks.

So to summarize, choosing prep duration should look something like this:

1. **Determine fat mass and lean mass**
   - Fat mass = total body weight × body fat %
   - Lean body mass = total body weight - fat mass (calculated above)
2. **Determine approximately how much body fat will need to be lost**
   - Body fat % loss required = Current body fat % - target body fat %
3. **Determine fat mass loss required**
   - Fat mass loss required = total body weight × body fat % loss required
4. **Determine approximate total body weight loss required**
   - Total body weight loss = fat mass loss required ÷ 0.713
5. **Choose rate of loss** (I recommend 0.4-0.8%/week with 1%/week maximum)
6. **Determine weight loss per week**
   - Weight loss per week = Total body weight × rate of loss % from step 5
7. **Determine required deficit duration**
   - Deficit duration = Total body weight loss (step 3) ÷ Weight loss per week (step 6)

Make Room for Life

These equations and steps are great starting points for determining how long you should diet, but they shouldn't be viewed as the holy grail. Even our best plans are subject to the chaos of life. You WILL have life happen to you during prep. Unless you're a pro bodybuilder with a massive sponsorship contract that allows you to do nothing except focus on eating, sleeping, and training, it's not a reasonable expectation to think that you will just be able to completely focus on your prep.

During my last prep, I was dealing with finishing my PhD, while running my full-time coaching business, and moving over 1000 miles from Illinois to Florida. I knew this going in, so I gave myself 24 weeks to get ready for my first show. Looking back, it went pretty smoothly all things considered. But life does happen.

In 2006, I was prepping for pro qualifiers (I would go on to win my pro card that year), but two weeks before my first show, my grandmother passed away and her funeral was one week out from my show and it required a four-hour drive to get there. So I cooked up a bunch of food, packed it into a big cooler, and drove down to say my goodbyes. I'm not telling you these stories to make myself appear any more dedicated than anyone else, I'm telling you them so that you understand that there's a high probability that something stressful will happen to you, completely unrelated to the contest prep.

Over the years, I've seen everything from clients who lost jobs, went through divorces, lost pets, were victims of violent crime, lost friends, family, and loved ones, and other assorted tragedies. While you may never incur a very stressful event during prep, it can't hurt to hope for the best and prepare for the worst. That's why I always emphasize that if you're in doubt, give yourself more time.

> *You can always hold steady if you're ready early or even start adding more calories in, but it's way more difficult to play catch up if you get behind.*

Determining Your Daily Starting Calories

Before we get down into the nitty gritty of determining your macronutrient intake, we first need to determine what your daily caloric intake will need to be based on the percentage of your total body weight that you

wish to lose per week. As I stated previously, my preference is to target 0.4-0.8% per week, with an absolute maximum being 1% per week.

For our 100kg male example from earlier targeting 0.6% of weight loss per week (100kg × 0.6 = 0.6kg or 600g per week) we can use this information to determine what his starting deficit will need to be. Recall that based on our scientific data from the studies examining contest prep, he will lose about 71.3% of his weight from fat and 28.7% from lean body mass. On a per week basis that equates to approximately 428 g of fat (600g × 0.713 = 428g) and 172 g LBM (600g × 0.287 = 172g).

Based on our previous discussion we can determine how many calories equate to the weight of each tissue type (adipose vs. lean body mass). First, we can calculate how many calories would come from the body fat lost.

Calories from fat loss would equal 428g body fat × 0.87% lipid in body fat = 372g of fat

372g fat × 9 calories/g fat = 3348 calories from body fat

Then to determine how many calories would come from LBM.

172g LBM × 0.3 = 52g of protein

52g protein × 4 calories/g protein = 208 calories from LBM

Therefore, the approximate total amount of caloric deficit required to lose 0.6kg per week is:

3348 + 208 = 3556 calories

If we divide that by 7, we get our daily caloric deficit required.

3556 ÷ 7 = 508 calorie per day deficit

Now if we wanted to run the same calculation on our 60kg woman with 6kg body fat to lose targeting 0.6% body weight loss per week, it would look like this:

Total body weight loss target per week = 0.6% of 60kg = 0.36kg × 1000g/kg = 360g

360g weight loss per week × 0.713 = 257g fat loss per week

360g weight loss per week × 0.287 = 103g LBM loss per week

Now we can calculate how many calories would come from the body fat lost. Calories from fat loss would equal:

257g body fat × 0.87% lipid in body fat = 224g of fat

224g fat × 9 calories/g fat = 2016 calorie from body fat

Then to determine how many calories would come from LBM.

103g LBM × 0.3 = 31g of protein

31g protein × 4 calorie/g protein = 124 calories from LBM

Therefore, the approximate total amount of caloric deficit required to lose 0.36kg per week is:

2016 + 124 = 2140 calories

If we divide that by 7, we get our daily caloric deficit required.

2140 ÷ 7 = 306 calorie daily average deficit required

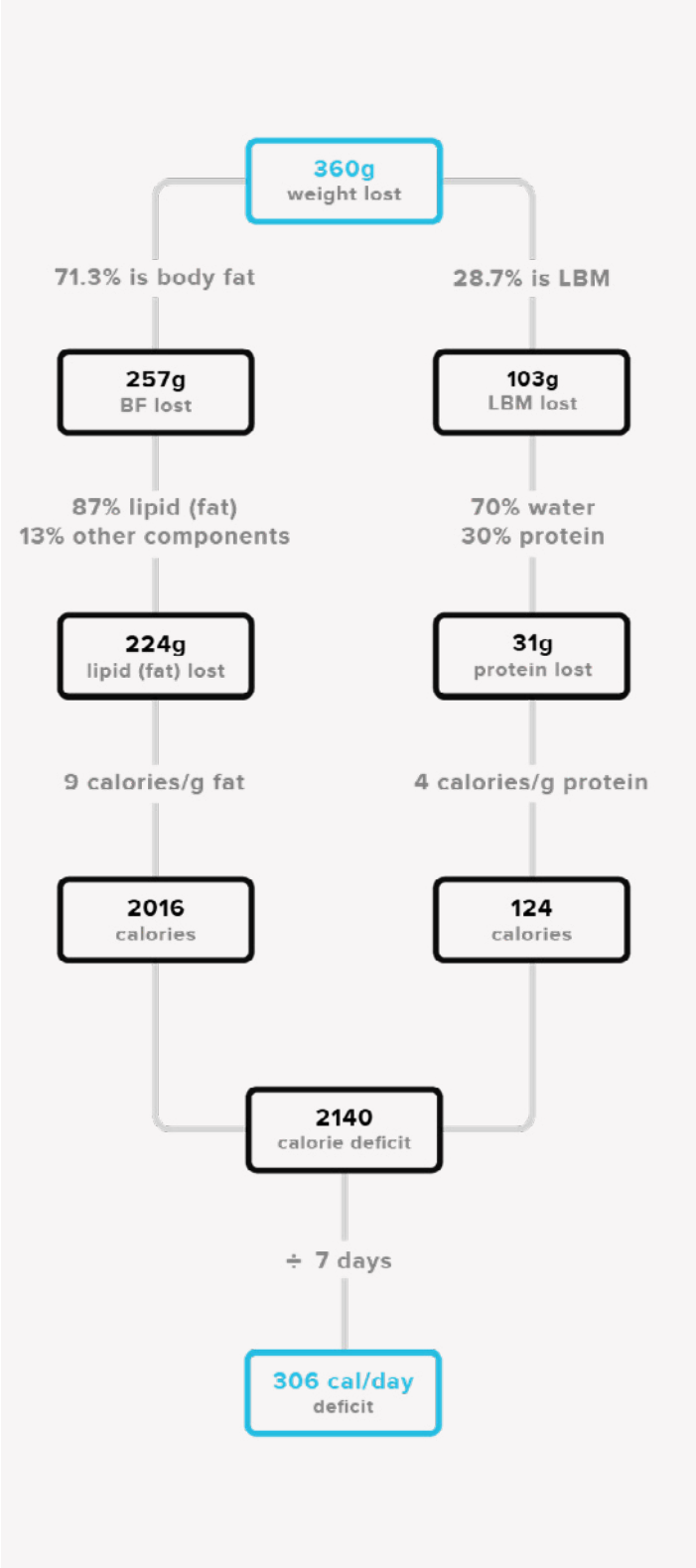


Figure 3. Calculating the deficit need to lose weight at the correct rate.

To simplify and save time for those of you who hate math, I've created a table on the next page that lays out the approximate amount of calories contained in various amounts of body weight based on these calculations. Please note that some numbers in the table come up slightly different from our calculations above due to the rounding done in the previous examples.

If you want to be more specific but don't want to waste time going through all these calculations you can simply multiply the amount of body weight per week that you want to lose by 847 and that will yield your average daily deficit calories. So if you want to lose 0.6 kg per week (as we discussed earlier) take 0.6 × 847 = 508 calorie deficit per day. If you look at table 3, you can see this matches it. Let's say for example you wanted to lose 0.43 kg per week. You would simply take 0.43 × 847 = 364 calorie deficit per day.

I want to emphasize AGAIN that metabolism isn't as clean cut as this sort of math makes it out to be. We are just taking our best estimates. If we put a kilo of body fat into a bomb calorimeter it would likely give a different reading than 7830 calories and if we put a kilo of lean body mass into a bomb calorimeter it would likely give us a different reading than 340 calories. These are just estimates to get us close, they aren't meant to be taken as 100% gospel.

Further, this assumes we are dealing with a closed system, but the human metabolism is quite frankly, messy. In fact, if you reduce your calorie intake by 40 calories per day below your maintenance, theoretically you would lose 2.46kg in a year. I promise you that if you reduce your calorie intake by 40 calories per day, absolutely nothing will happen. If you do lose any weight it will be completely short term and more likely the result of a short-term fluctuation that will simply re-fluctuate upward in time. You certainly wouldn't lose 2.46kg. So the purpose of these equations isn't to exactly predict how much weight you're going to lose down to the gram. The purpose of these equations is simply to provide us reasonable estimates so that we can make our best guess on what our starting calories and macronutrient intake should be.

I will likely emphasize this point a lot, but it's important to know that the human body is more complex than a series of equations. If it behaves as such, don't be alarmed. Further, your starting calories and macros are only where you will start and there's a 99.9% chance you will need to change them at

Weekly Weight Loss	Total Calories	Calories From BF	Calories From LBM	Daily Calorie Deficit
1.2kg	7113	6699	413	1016
1.1kg	6520	6141	379	931
1.0kg	5927	5583	344	847
0.9kg	5334	5025	310	762
0.8kg	4742	4466	276	677
0.7kg	4149	3908	241	593
0.6kg	3556	3350	207	508
0.5kg	2964	2791	172	423
0.4kg	2371	2233	138	339
0.3kg	1778	1675	103	254
0.2kg	1185	1117	69	169
0.1kg	593	558	34	85

Table 3. Approximate calculations for calories to lose weight. Furthest column left shows weight loss target per week. Second column from left shows total weekly calorie deficit required to lose target weight. Third and fourth columns show the approximate breakdown of calories that will come from fat loss and lean body mass loss respectively. Fourth column is daily calorie deficit required to lose weekly target of weight (far left **column)**

least once, and more likely multiple times in order to achieve a stage ready physique. So try not to get too obsessed with where you start and trying to make that number perfect. Rather, use this data to make your best educated guess and then make the necessary adjustments based on how you respond, but more on this later.

The final step now is to determine our daily caloric intake for starting prep. In order to do that, we simply subtract the daily caloric deficit we calculated above from our maintenance calories that we calculated earlier. In the case of our 100kg male, let's say his maintenance was 3300 calories per day. His starting average daily calories in order to lose 0.6% of his body weight per week would be 3300 - 510 = 2790 calories/day.

For our 60kg woman let's say her maintenance was determined to be approximately 1985 calories/day. Her starting average daily calories to lose 0.6% of her body weight per week would be 1985 - 308 = 1677 calories/day.

To summarize our calculations for determining average daily deficit calories:

1. **Determine approximate calories from body fat to achieve target rate of loss**
   - Weekly target body weight loss (kg) × 0.713 = weekly loss from body fat
   - Weekly loss from body fat × 1000g/kg × 9 calorie/g fat = weekly calorie deficit from body fat

2. **Determine approximate calorie deficit from LBM**
   - Weekly target body weight loss (kg) × 0.287 = weekly loss from LBM
   - Weekly loss from LBM × 0.3 (protein/LBM) × 1000g/kg × 4 calorie/g protein = weekly calorie deficit from LBM

3. **Determine weekly calorie deficit**
   - Weekly calorie deficit required = Weekly calorie deficit from body fat + weekly calorie deficit from LBM

4. **Determine average daily calorie deficit**
   - Average daily calorie deficit = Weekly calorie deficit required ÷ 7

5. **Determine average daily calories**
   - Average daily calories = Maintenance calories - average daily deficit calories

Summary

- Always take life into account
- Don’t be alarmed when your body acts like something other than a math equation
- Figure out your maintenance calories using one of the many equations
- Be consistent with your equations
- Figure out roughly how long your prep needs to be
- Figure out how aggressive you need to go
- Start

03 WHERE TO START: MACROS

While the reduction of body fat and body weight is solely dependent on your energy intake, you want to make the most out of your dieting experience. The goal is to keep your body composition optimized and limit the loss of LBM. For that, you have to know how to partition your calories into the three macronutrient groups. While energy balance will drive overall weight loss, how your energy is distributed into your macronutrient breakdown can affect how much weight you will lose from body fat vs. lean body mass, and it can also affect the "calories out" side of the calories in vs. calories out equation.

That is, while weight loss is indeed a function of calories in (energy consumed) vs calories out (TDEE or total daily energy expenditure), the components of the equation are rather complex and their distribution can affect the balance of this equation.

Each macronutrient has a different calorie/energy value. Briefly, protein, carbohydrate, and fat are the big three macronutrients and they each have a numerical energy value that you, and everyone else, refer to as calories.

The calorie content of your protein and carbohydrate is four calories per gram. The caloric value of one gram of fat is nine calories. There are other energy containing nutrients like glycerol, alcohol, fiber, and we will briefly discuss some of these but for the sake of not turning this into a thesis on every energy containing compound in existence, we will limit the discussion to things people might normally consume. Suffice it to say, not only do they provide you with energy, but each macronutrient has an important function within your body.

Protein - This is a big one, and it happens to be what I wrote my thesis on. Protein is essential in tissue turnover. Ingestion of sufficient dietary protein stimulates muscle protein synthesis, improves recovery, can increase lean body mass when combined with resistance training, and strength training.[1,2] But protein isn't just for muscle heads. High protein diets have also been demonstrated to be superior to isocaloric low protein diets with regards to fat loss. This is likely because the thermogenic effect of protein is about 30% more than carbohydrate at 6-8% and or fat at 2-3%.[3] This increased TEF is likely due to the high protein meals increasing protein turnover and energy expenditure. Protein turnover is an energy dependent process that requires ATP and thus increases caloric expenditure.[4] Further, high protein diets have also been shown to have a greater satiating effect than isocaloric lower protein diets.[5] Finally, when calories are equated, high protein diets (>1.6g/kg LBM) have typically been shown to be superior for fat loss and LBM retention.[6] So as you go further in your deficit during your prep, protein will be instrumental in keeping you

1. Higher compared with lower dietary protein during an energy deficit combined with intense exercise promotes greater lean mass gain and fat mass loss: a randomized trial. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/26817506
2. An isoenergetic high-protein, moderate-fat diet does not compromise strength and fatigue during resistance exercise in women. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/18618943
3. Pathways to obesity. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/12174324
4. The Energy Costs of Protein Metabolism: Lean and Mean on Uncle Sam's Team. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/books/NBK224633/
5. Protein, weight management, and satiety. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/18469287
6. Dietary protein and exercise have additive effects on body composition during weight loss in adult women. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/16046715

sane. Not only that, it's going to help preserve the majority of your muscle mass as you continue through the stages of the deficit.

Carbohydrates - While carbohydrates aren't what you would call an essential macronutrient—meaning that you don't need them to survive—they will, without a doubt, help you out both during your prep *and* when you step on stage. Do I also need to mention they taste good, too? When you eat carbohydrates, a few different things can happen. You can use them as fuel to get you through the workouts you will be doing, they can also convert to glycogen which will help your muscles look full when you step on stage, or if you're in a caloric surplus, they can add to your fat stores and make you gain weight. Carbohydrates are a large source of calories in the western diet. They're easy to over eat late at night standing over your kitchen sink and as such will need to be limited enough to create a caloric deficit, so that you can lose the requisite amount of fat required to be stage lean.

Fat - Keeping your fats at an optimal level is important for your hormonal balance. There's research showing that if you lower your fat such that it counts for less than 20% of your daily caloric intake, your testosterone may drop, which isn't beneficial for keeping muscle mass and strength.[7] Don't get the wrong idea, though. Some people might read this and think that more fat equals more testosterone, but this isn't the case. As long as you're eating a non-deficient level of fat, your testosterone levels won't decrease, but increasing fat further than that won't further increase testosterone in a linear fashion. Furthermore, it will be difficult to create a caloric deficit if your fat intake is too high as fats are nine calories per gram, over double the calories of protein or carbohydrate.

Fiber - This is an important one and one you will want to pay special attention to. For your purposes, it's best to track fiber as a carbohydrate. Don't worry about "net carbs" in relation to "total carbs." You'll go crazy trying to separate the two, and when you're in prep, the last thing you need is *another* variable to constantly monitor. So while the energy value of dietary fiber might not necessarily be four calories per gram like another carbohydrate, for our purposes, we will count it that way.

7. Decrease of serum total and free testosterone during a low-fat high-fibre diet. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/6298507

Further, even though fiber isn't digested like a typical carbohydrate, the bacteria in your gastrointestinal tract ferment a large amount of the fiber you eat to form short chain fatty acids which are then absorbed, and you still get a good amount of calories from them.

In addition to the energy value, fiber is also going to be instrumental for you in terms of your satiety, much like protein. Fiber is also very important for gut motility and regularity. In simple terms, you'll have better poops. Not only that, fiber is going to bind to your cholesterol and remove it, thereby helping you lower your serum cholesterol levels. So fiber is also good for your heart health.[8] You've also heard the old myth that meat rots in your colon, right? Well, that's not quite true. Fiber, since you can't digest most of it, does sit in your intestines. In order to break it down, your gut bacteria have to multiply to help with that process, which means fiber also increases your healthy gut bacteria. So fiber is definitely not a "free" nutrient, and you have to track it, but at the end of the day, it can be useful as it helps increase satiety, thermogenesis, and optimize bowel regularity.[9]

Alcohol - Ah yes, the 4th macronutrient. We would be remiss if we didn't discuss alcohol. While it's highly unlikely that many of you will be boozing it up during prep, it's still worth discussing alcohol and its impact on metabolism, and how to track it. In general, small or modest amounts of alcohol aren't going to have a negative impact on body composition so long as you account for the calories in the alcoholic beverage you consume.[10] Consuming large amounts of alcohol has been shown to inhibit protein synthesis and fat oxidation, however.[11] [12] Additionally, high intakes of alcohol can

8. Cholesterol-lowering effects of dietary fiber: a meta-analysis. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/9925120
9. Effect of dietary fibre on postprandial thermogenesis. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/3032832
10. The effect of moderate alcohol consumption on fat distribution and adipocytokines. Retrieved January 18, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/16493123
11. Alcohol impairs skeletal muscle protein synthesis and mTOR signaling in a time-dependent manner following electrically stimulated muscle contraction. Retrieved January 18, 2018, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4233249/
12. Alcohol and lipid metabolism. Retrieved January 18, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/16958674

suppress testosterone, but low doses of alcohol may actually increase testosterone, slightly.[13] [14] Just how much is considered moderate? No negative effects of alcohol were observed up to the equivalent of three to four drinks. In fact, the increase of testosterone was seen at just three drinks. Keep in mind that this is an increase in testosterone that's small and will have zero long-term effect on muscle mass. You won't get jacked by way of your drinking. The point is that it didn't inhibit your gain or maintenance of muscle mass in any way. So how much is too much? In general, if you're drinking enough to get drunk, you're drinking enough to start having negative body composition side effects.

The other downside to alcohol is that it's not filling and very calorie dense. At seven calories per gram of alcohol, it's only behind fat as the most calorie dense nutrient we consume. The question becomes, "how do we track it?" You could make a separate category for alcohol, but that's a real pain in the ass. Because what happens if you consume different amounts of alcohol every day or none at all? Or what if you drink a mixed drink? Now you're going to have to recalculate your carb and fat numbers every time you drink. Instead, what I recommend doing is tracking alcohol as either carbohydrate, or fat, or both. For example, if a drink like a Yuengling Light, which happens to be my favorite, contains 99 calories per serving, I can track it the following ways:

Carbohydrate:

99 calories ÷ 4 calories/g carbohydrate = 24.75g carbohydrate, rounded to 25g.

Fat:

99 calories ÷ 9 calories/g fat = 11g fat.

Combination:

44 calories from carbs ÷ 4 calories/g carbohydrate = 11g carbohydrate
45 calories from fat ÷ 9 calories/g fat = 5g fat

While this is a good strategy, you will probably not be drinking much, if at all, during your

13. Alcohol effects on luteinizing hormone and testosterone in male macaque monkeys. Retrieved January 18, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/4009484

14. Testosterone increases in men after a low dose of alcohol. Retrieved January 18, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/12711931

prep. I know I mentioned that already, but it bears repeating. But, you can take this information with you into your off season, and from here on out and make the process a bit easier.

Partitioning the individual Macronutrients

This is the part where we figure out exactly how many grams of protein, fat, and carbohydrates you get to eat daily. These numbers are based on a few different pieces of data, namely your daily calorie intake as calculated from above, and in the case of protein, your LBM.

> *Of the three macronutrients, protein is the most important because it improves retention of LBM, satiety, and fat loss. Because of these factors, we set the protein amount first.*

Protein

Old school bro wisdom—which isn't bad for some people in this particular case—dictates that you should get about 2g/1kg of body mass. You might remember this as 1g/1lb from all the magazines. This actually isn't terrible advice, but if you're going *solely* based on body mass, protein number can actually wind up skewing on the higher side if a person is obese.

As an example, if a person weighs 136kg and is obese at 30% body fat, their protein count would be roughly 272 grams of protein a day even though their lean body mass is only 95.2 kg (protein intake of almost 2.9g/kg).

Recently, there have been better developments for protein intake. The simple option is to take that LBM you figured out earlier and base your protein number off that. So with that in mind, you can derive a more accurate—and to be honest, a more sustainable—protein target for the day. Since it's the LBM component of your body mass that requires the majority of tissue turnover, it would make sense that protein intake should be based on your LBM rather than just total body mass, especially for people who may have more body fat than the average person.

In cases of a caloric deficit, or even advancing age, that number will actually go up in order to preserve the LBM that you might lose due to the catabolic nature of age (sarcopenia)

and a caloric deficit.[15] While it's difficult to determine hard numbers from current data, based on my best interpretations of current data, it appears that adding 1.5% protein each year after age 30 is probably a safe bet.[16] During a caloric deficit, it may be wise to also increase protein by 10-20% above surplus calorie levels of protein (assuming that protein was at the lower end of what is "optimal"). If you're someone who chooses to eat more protein than you "need" to maximize muscle protein anabolism, that is, you choose to eat 3g/kg LBM in the offseason when the reality is you could get just as much anabolic response from around 2.4g/kg LBM, then it's unlikely you need to further pump up your protein during a deficit as it's already quite higher than you require to maximize anabolism.

To make things easier, here's a table compiling some of these parameters:

	0-30 Years	30-40 Years	40-50 Years	50-60 Years	60-70 Years
No Deficit	1.8-2.0g/kg LBM	2.0-2.3g/kg LBM	2.3g-2.6g/kg LBM	2.6-2.9g/kg LBM	2.9-3.2g/kg LBM
Deficit	2.2-2.4g/kg LBM	2.4-2.8g/kg LBM	2.8-3.1g/kg LBM	3.1-3.5g/kg LBM	3.5-3.8g/kg LBM

Table 1. Protein recommendations based on lean body mass, age, and whether an individual is in a deficit.

Now, this may seem like a small amount of protein to some and a LARGE amount to others. Well first, for my American friends, remember you're

15. A systematic review of dietary protein during caloric restriction in resistance trained lean athletes: a case for higher intakes. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/24092765

16. A high proportion of leucine is required for optimal stimulation of the rate of muscle protein synthesis by essential amino acids in the elderly. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/16507602

looking at kgs of lean body mass. So let's take a different hypothetical person into account for this next example. A person who is 90kg at 10% body fat that is 9kg of body fat and 81kg of lean body mass. If they were 40 years old in a deficit we could target 2.8g/kg which would equate to approximately 227g protein. That's not a crazy amount of protein or out of line with what many bodybuilders already consume. In fact, some of you protein junkies may feel that these numbers are too small, but keep in mind that most bodybuilders OVER CONSUME protein and more protein isn't better. In fact, you may actually be triggering a suboptimal response called the "muscle full effect" or "refractory response" which is something I studied during my PhD research.[17]

> *Remember that MORE is NOT better, optimal is better.*

These ranges appear to be optimal and if anything, are on the high side of optimal, so by consuming these ranges of protein you can be confident that you're getting more than your fair share of protein to maximize your muscle building endeavors.

Now some of you don't compete in natural bodybuilding and may fall on the 'enhanced' side of things. I know conventional wisdom in the fitness industry dictates that you need way more protein than people who aren't on steroids. The idea being that if you're on steroids you're building muscle so much faster that you require more amino acids as building blocks to form the new tissue. That may be true, but the idea that you need insane amounts of protein like 4g/kg or the doses typically consumed by many pro bodybuilders is simply not true.

Let's say that someone on steroids could pack on 20 kg of lean body mass in a year. Is that possible? Maybe, but very unlikely for most people and it certainly wouldn't occur year over year. But for the sake of argument let's say it did. 40 kg of LBM is around 70% water. So if we remove that we are left with 12 kg actual tissue. Divide that over 365 days it works out to around 33g amino acids deposited in lean tissue per day. So if you're on the sauce and concerned you're not getting enough protein in to support your enhanced gains, simply add around 30g protein to the calculated amount from above

17. Leucine or carbohydrate supplementation reduces AMPK and eEF2 phosphorylation and extends postprandial muscle protein synthesis in rats. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4395871/

and you can be more than assured that you're getting what you require to maximize the enhancement.

Let's take this knowledge and practically apply it by using our examples from earlier, a 100kg male bodybuilder at 12% body fat and a 60kg bikini competitor at 20% body fat.

Let's say the man is 30 years old and the woman is 45 years old. For him, his lean body mass is 88 kg and if we multiply that by the amount in the table above (0-30 years old and in a deficit since he's prepping) we get a multiplier range of 2.2-2.4 g/kg LBM. Since more protein isn't going to hurt him or be dangerous let's go ahead and err on the high end of that range and take 88 kg LBM × 2.4 g/kg LBM = 211g protein per day. We can round that to 210g.

In the case of our bikini competitor, she has a LBM of 48 kg. If we look at our table for her age and deficit, we get a range of 2.8-3.1 g/kg. Since she's in the middle of the age bracket, let's just pick a simple number of 3g/kg. 48 kg LBM × 3.0g/kg LBM = 144g protein per day and we can round that up to 145g protein per day. Some of you might think that's way too low based on what your bro at the gym told you, but I can assure you that at this level of protein, you're getting all the anabolic benefits of protein intake That said, if you're a hardcore bro and just don't feel right unless you're stuffing a metric ton of chicken breasts down your throat every day, there probably is nothing wrong with eating more protein in that it's unlikely to harm you, but keep in mind that:

- Intakes over 2.8g/kg per day really haven't been assessed for long-term safety
- By consuming more protein, you're taking calories away from other macronutrients (carbs and fats) that also have specific valuable attributes and
- You're creating a more extreme diet that's going to be difficult to stick to

Now that we've come up with a protein amount, we need to deduct that amount from our overall calories.

So for our 100 kg male bodybuilder, if we look back we can see that we calculated his daily calories to lose approximately 0.6 kg (0.6% of his body weight) per week was determined to be 2790 calories per day. We calculated his protein at 210g per day. As protein is 4 calories/gram, calories from protein per day = 210g protein/day × 4 calories/g = 840 calories from protein per day. If we subtract

this number from his daily calorie intake 2790 calories - 840 calories we get 1950 calories left to allot for carbohydrates and fats.

To further carry out our example of our bikini competitor from earlier, her daily calorie intake for a deficit to lose approximately 0.36 kg (0.6% of her body weight) per week was determined to be 1677 calories per day. We calculated her protein at 145g per day. 145g protein/day × 4 calories/g = 580 calories from protein per day. If we subtract this from her daily calorie intake of 1677 we get 1097 calories left to allot for carbohydrates and fats.

Carbohydrates and Fats

I debated on how to present carbs and fats in this book for several days, hands hovering on my keyboard, but unable to make strokes. From an organizational standpoint, it makes sense to discuss them separately, however from a scientific perspective, it doesn't, since they will be intrinsically tied together. Let me explain what I mean. If we know our total calories and we know how much protein we are meant to consume per day, the calories leftover can only be allocated to carbohydrate and fats. Thus, if you consume higher carbohydrate, you will consume lower fat by default. If you consume higher fat, you will consume lower carbohydrate by default since the overall calorie amount is fixed. This concept is lost on about 95% of the public, but more on that later. It's like a sliding scale. As one goes up, the other goes down so that your remaining calories are still the same.

Without getting into a huge breakdown of carbohydrate and fat metabolism, as it's beyond the scope of this book, I want to break down the practical applications of the research that exists comparing high carb low fat diets vs. low carb high fat diets. Much of what you hear in the media is at best ignorant, and at worst purposefully misrepresented to drive an agenda. In the 70s and 80s it was the anti-fat crusade, now it's anti-carb and anti-sugar crusade, meanwhile obesity is still climbing regardless. At best, the people presenting the research are too ignorant to understand what the data is actually telling them. The vast majority of these studies are free-living subjects and the comparison diets are NOT calorie controlled. That is, they just instruct them on a certain way of eating and let them go.

In these types of studies, it does appear that reduced carbohydrate diets do have an advantage in fat loss, but that advantage is completely explained by the fact that people

eating a reduced carb diet simply tend to eat less overall calories and more protein.[18]

> *When overall calories and protein are controlled, the studies examining reduced carb diets vs. diets higher in carbohydrate show absolutely zero difference in weight and fat loss.*[19]

That being said, it may be that reduced carbohydrate diets have a greater satiating effect for many people and thus it's a benefit that should be considered. It's important to note however, that a recent study demonstrated that competitors who placed better at natural bodybuilding shows tended to consume higher levels of carbohydrates in their diet.[20]

Despite this data, anti-carb zealots will claim that carbs cause insulin release which completely blocks fat burning and induces insulin resistance. On the other end of the spectrum, anti-fat zealots will claim that fat causes insulin resistance and heart disease and is so calorically dense that it's the cause of the obesity crisis. The fact of the matter is that while overeating both of these macronutrients can lead to insulin resistance, heart disease, and obesity—due to overall excessive calorie consumption—when protein and calories are controlled, your distribution of carbohydrates and fats don't seem to matter for fat loss.

I think that my experience in coaching has shown me that typically the best diet for the individual is the diet that they find the most sustainable, even during contest prep. If a diet isn't sustainable for YOU, then even a short 12-week prep can become a monstrous grind. And if you have to go 20 or 30 weeks? Forget it. Most people fail on diets, including contest prep diets, not because they didn't have a perfect macronutrient breakdown, but because they simply weren't able to adhere. Adherence is the number one predictor of diet success in general population clients, and I've found the same to be true with contest prep clients. Additionally, clients who used more

18. Ketogenic low-carbohydrate diets have no metabolic advantage over nonketogenic low-carbohydrate diets. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/16685046
19. Energy expenditure and body composition changes after an isocaloric ketogenic diet in overweight and obese men. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/27385608
20. Nutritional strategies of high level natural bodybuilders during competition preparation. Retrieved January 16, 2018, from https://jissn.biomedcentral.com/articles/10.1186/s12970-018-0209-z

sustainable methods of prep also tended not to rebound as often as clients who were using more unsustainable methods. That may not be something you care about now but trust me on this. When the show is over and you put on 10+kg in a week of body fat, you *will* care. It sounds extreme but believe me when I say I've seen it.

So what to do with your distribution of carbohydrate and fat calories? Well, it's up to you. The research pretty clearly demonstrates that fat loss and muscle retention won't be different when calories and protein are equated, so you should use a breakdown that you find easiest to adhere to. Now some people will say that since carb/fat breakdown doesn't matter, why not just track total calories and protein? That's certainly an option, however, I don't believe it's the best option. Even though your breakdown of carbs and fats may not affect fat loss, I think it's important to pick a breakdown of carbs and fats and be consistent with it. The body likes and strives to maintain homeostasis and it likes being in a "groove" so to speak. Think about when you typically have your best workouts. It's usually when you're in a normal place in your life, you're in a regular schedule, eating mostly the same things, at the same times consistently. Now think about the worst training you've had in your life. It was probably during times of stress when your schedule was irregular and your eating was all over the place. It's for this reason that I think picking a carb/fat distribution and sticking to it is important.

Your metabolism upregulates and downregulates certain areas based on your nutrient intake. If we take an extreme example like a ketogenic diet, which is a diet very low in carbohydrate and very high in fat, your body can't produce glucose quickly enough to maintain blood glucose levels and run your body's processes. In response, it increases the rate of glucose production (called gluconeogenesis) and the rate of ketone production in the liver. These ketones then can be used by most tissues in the body for energy, sparing glucose for the absolutely essential processes.[21] It also drastically down regulates areas of metabolism that deal with glucose disposal since glucose intake is very low. So what happens if you get used to this and then throw high carbohydrate into the

21. Ketosis proportionately spares glucose utilization in brain. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3734783/

mix? The research shows that you aren't able to dispose of glucose well. The ketogenic diet didn't turn you into a type II diabetic, but rather you just didn't use those processes associated with glucose disposal during that time.

Think about metabolism like a military factory. Let's say it makes planes and ships. Like all factories, let's also assume this factory has a certain number of employees. If a huge contract came in for planes one day that they had to fill, they would have to shift the majority of their focus onto manufacturing planes and they wouldn't use the machinery specifically for ships nearly as much during that time. As that contract was winding down, if they immediately got a huge contract for ships they would then have to go back to using the machinery for building ships, only now that machinery hasn't been used in a while, will likely need some maintenance, tune-ups, and the employees will have to re-familiarize themselves to a certain degree with it. So they will be able to make ships again, but there will be a bit of a lag time while they re-acclimate to this process.

Metabolism isn't exactly the same, but the comparison is pretty accurate.

With all that said, my recommendations for carb and fat distribution are as follows:

- Pick something that you enjoy and perform well on
- Pick something that you can adhere to
- Pick something that minimizes your daily hunger
- Make sure, at bare minimum, to hit your fiber target
- Be consistent with that breakdown

I'm sure you're thinking "all this science is great Layne but give me some practical info." You got it. While the distribution of carbohydrate and fat is your call, I can tell you where I typically start with clients. More often than not, I take the calories remaining after the protein calories have been subtracted and I distribute them 60% to carbohydrate and 40% to fat.

For our male bodybuilder example, remember his calculated daily calories were 2790 and he was consuming 210g protein per day (210g protein × 4 calories/g protein = 840 calories from protein) so if we subtract his protein calories from his daily calories, we will be left with carb/fat calories. 2790 - 840 = 1950 calories from carb/fat. If 60% gets allocated to carbs and 40% to fat that comes to 1170

calories from carbs and 780 from fat. Since carbohydrate is four calories per gram and fat is nine calories per gram we are left with:

Daily Carbohydrate intake = 1170 kcal ÷ 4 kcal/g = 292.5g carbs
(rounded to 295g)

Daily Fat intake = 780 ÷ 9 kcal/g = 86.7g fat
(rounded to 85g)

So his total average daily macros end up being 210g protein, 295g carbohydrate, and 85g fat. This is a pretty reasonable and balanced intake and sustainable for most people. However, this individual has a pretty fast metabolism.

Let's look at our bikini competitor who isn't quite on the "macronator" level. Her average daily total calories were 1677 which we can round to 1680. We calculated a protein intake of 145g per day (145 g protein × 4 kcal/g protein = 580) so if we subtract her protein calories from her daily 1680 calories, we are left with 1100 calories for carbs and fats. If we distribute 60% of that to carbohydrate and 40% to fat we are left with 660 calories from carbs and 440 from fats. If we divide carbohydrate calories by four and fat calories by nine we are left with 165g of carbs and 48.9g (round up to 50g) of fat. So her average daily macros end up like this: 145g protein, 165g carbohydrate, and 50g fat. Once again, a very balanced, sustainable approach.

To summarize calculating macros:

- Determine total average daily calories as specified previously
- Determine protein intake as specified previously
- Subtract calories from protein from total daily average calories
- Distribute remaining calories to carbs and fats as per your preference
- Divide carb calories by 4 and fat calories by 9 to determine daily carb and fat gram intakes

For those of you who hate math, I've come up with a quick and easy table on the next page based on various average daily calorie intakes and different remaining carb/fat calorie amounts and how they would be distributed based on your preference.

I want to emphasize that these calorie amounts listed in the column furthest to the left are NOT total calorie intakes. These are the remaining calories from carbs and fats after protein calories have been subtracted.

CHO/ Fat %	10/90	20/80	30/70	40/60	50/50	60/40	70/30	80/20
2200	55/220	110/196	165/171	220/147	275/122	330/98	385/73	440/49
2100	53/210	105/187	158/163	210/140	263/117	315/93	368/70	420/47
2000	50/200	100/178	150/156	200/133	250/111	300/89	350/67	400/44
1900	48/190	95/169	143/148	190/127	238/106	285/84	333/63	380/42
1800	45/180	90/160	135/140	180/120	225/100	270/80	315/60	360/40
1700	43/170	85/151	128/132	170/113	213/94	255/76	298/57	340/38
1600	40/160	80/142	120/124	160/107	200/89	240/71	280/53	320/36
1500	38/150	75/133	113/117	150/100	188/83	225/67	263/50	300/33
1400	35/140	70/124	105/109	140/93	175/78	210/62	245/47	280/31
1300	33/130	65/116	98/101	130/87	163/72	195/58	228/43	260/29
1200	30/120	60/107	90/93	120/80	150/67	180/53	210/40	240/27
1100	28/110	55/98	83/86	110/73	138/61	165/49	193/37	220/24
1000	25/100	50/89	75/78	100/67	125/56	150/44	175/33	200/22
900	23/90	45/80	68/70	90/60	113/50	135/40	158/30	180/20
800	20/80	40/71	60/62	80/53	100/44	120/36	140/27	160/18
700	18/70	35/62	53/54	70/47	88/39	105/31	123/23	140/16

Table 2. Distribution of remaining calories from carbohydrate and fat after protein calories have been subtracted. The column on the far left is the calories remaining to distribute to carbohydrate and fat. Each column thereafter shows the breakdown of grams of carbohydrate/fat each particular breakdown at each remaining calorie level would provide.

Further, the macro breakdowns listed are carbs/fats, so you see the carb value first then the fat value. I omitted the 90/10 column Carb/Fat that I had in my original table for two reasons. For one, it wouldn't fit on the page if I kept it. Two, the fat intakes were way too low. If you'll recall the section earlier where I mentioned the possible hormonal repercussions of not getting enough fat, it's pretty important. You could argue that the fat intakes in the 80/20 column are too low, they are certainly borderline especially when you get lower than 1300 calories remaining from carbs and fats.

There's evidence that if fats get too low on a diet it may impede hormone production.[22] It's debatable whether this is actually a function of low dietary fat relative to carb or just a function of low total calories overall (testosterone drops on caloric restriction regardless), but since there are essential fatty acids that your body can't make, I don't recommend going much below 30% of total calories remaining for carbs and fats.

For the most part, I would try to stay away from the far left and far right ends of this table. The far-left column and even the column second from left would be largely considered ketogenic. While it may be attractive to go ketogenic due to all the current hype, if you're going to do it I do NOT recommend using a cyclical ketogenic approach that many advocate.

> *The benefits of a ketogenic diet are not an increase in fat loss. Remember, fat loss is no different when calories and protein are equated between diets.*

The benefits are that some people feel better on a ketogenic diet and prefer that way of eating and find it more satiating and better energy. These benefits are due to becoming keto adapted. If you're constantly breaking up your adaptation with high carb days, you aren't going to be getting those benefits because you never have sustained adaptation.

Even if you're keto adapted, there are downsides to a ketogenic diet. First, it's difficult to stick to a ketogenic diet over a long period of time. Ketogenic warrior

22. Diet and serum sex hormones in healthy men. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/6538617

zealots will argue this point, but the fact is that most people can't completely omit carbohydrate from their diet for long periods of time and adhere to it. Next, a lot of the weight training you're likely to do will be anaerobic. Ketones can't be used for anaerobic energy production. That type of energy production requires glucose and with a very low carbohydrate intake, it's likely that you will have reduced muscle glycogen and not perform quite as well in the gym.[23] Third, unless you plan to eat ketogenic for the rest of your life, it's more likely you're going to experience some pretty bad body fat regain post diet as you begin eating carbohydrates again because all the systems dealing with disposing glucose aren't put to use on a ketogenic diet.

However, if you personally find that you enjoy the ketogenic diet, have good energy on it, and can adhere to it, then by all means go for it. It certainly doesn't seem to impede fat loss in any way, however you will likely need to use a multi-vitamin and fiber supplement as it may be difficult to meet requirements while on a ketogenic diet. Also, people with certain diseases and illnesses may be advised against using a ketogenic approach. I suggest consulting with your physician if you're considering a ketogenic diet or any diet at all. You may look at these previous calculations and say "why not just use percentages for protein, carbohydrate, and fat breakdown" since the way I do it is more involved. That's a good question, but keep in mind that while the most important thing is overall calorie intake, that the next most important thing is protein intake for muscle retention and thermogenesis/fat loss. If we use a strict percentage-based program, let's look at how that affects our protein, carbohydrate, and fat intakes.

If we have our 100kg bodybuilder example whose maintenance calories are 3300 calories and he's consuming 3600 calories in a surplus to build muscle and following a 25/50/35 pro/carb/fat breakdown his intake looks like this: 225g protein, 450g carbohydrate, and 140g fat. If we look at his intake using the daily average calories for dieting that we calculated previously for him of 2790 that same 25/50/35 breakdown now looks like this (numbers rounded to nearest 5 increment): 175g protein, 350g

23. Low carbohydrate, high fat diet impairs exercise economy and negates the performance benefit from intensified training in elite race walkers. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5407976/

carbohydrate, and 110g fat. His protein went down by 50 grams. But as we discussed, protein needs don't go down during dieting. They increase. For that reason, I don't like percentages because they simply don't hold up as you adjust total calories. It's much more accurate to calculate your daily calories, then determine protein based on the formulas we used earlier, and then determine carbohydrate and fat distribution from the remaining calories.

Fiber

I would be remiss if I didn't discuss fiber more in depth. Fiber is one of your most helpful friends during a contest prep. Not only is it thermogenic to about the same degree as protein, but it helps add bulk to your food, aids in digestion, and improves satiety in some cases.[24] Not many people have come up with precise calculations for fiber targets, but in general I think that targeting 10-15g fiber per 1000 calorie intake per day is a good starting point. If you're consuming a diet that's too low in fiber, it's probably not going to be satiating and you're going to have issues with bowel movement regularity. Further, you won't be optimizing your opportunity to lose body fat as you won't be getting the most thermogenic effect of fiber. As discussed earlier in the book, even though fiber is thermogenic, the calories count.

Much of the fiber you eat, while not digested like a typical carbohydrate, is fermented by the bacteria in your digestive tract and re-absorbed as short chain fatty acids which you still get a good amount of calories from. Not really. But it's so variable depending upon the specific source of fiber that trying to track each individual source would be almost impossibly difficult, not to mention it can change from individual to individual based on their specific gut microflora. It's for this reason that I recommend tracking fiber just like you'd track any other source of carbohydrate, at four calories per gram. Better to be safe than sorry, as well as consistent, in my opinion. That said, if you want to track it as 3 calories per gram, that's probably fine so long as you're consistent with it. Personally, I don't want to worry about it for the reasons stated earlier.

Many people will read about the benefits of fiber and do what they would normally do with

24. The effect of fiber on satiety and food intake: a systematic review. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/23885994

protein, over consume it. Remember though, more isn't better with regards to pretty much everything. Too much of a good thing is still a bad thing. In fact, too much fiber can actually cause gastrointestinal distress, constipation, and malabsorption of some vitamins and minerals. You might also feel bloated. I had one particular client who was not tracking his vegetable intake and was literally eating a kilogram of broccoli per day. He told me he was always feeling bloated and sluggish. I had him trim his broccoli intake back to 3-4 servings per day instead of his usual 10-12 and within 48 hours he was exclaiming that he couldn't believe how much better he felt and all his bloat went away.

Keep in mind that vegetables/fiber add bulk which is great, but that fiber will pull water into the GI tract, which is great for improving feelings of fullness but can also make you feel very bloated by virtue of having too much. This is one of the reasons I recommend limiting fiber when you're very close to a show, but we will discuss this in detail later.

Food Choices

Some of you (probably those that haven't followed me long) may be wondering "all of this is great, but where is the part where he

Summary

I know I've thrown a lot of calculations at you, but the take home is this:

- Determine your maintenance calories either by your food intake and weight changes or by one of the equations provided
- Determine your required daily deficit in order to lose the required amount of weight to be stage lean for your category based on a rate of loss that you choose
- Subtract the daily deficit from your maintenance calories to get your daily average deficit calories
- Determine protein intake
- Subtract protein calories from overall calories to get your carb/fat calories
- Choose carb/fat distribution based on your preferences
- Consume 10-15g fiber/1000 calories of intake

tells us what foods to eat?" Well, I'll save you time, that section doesn't exist. Why, you ask? Quite simply, there are no magic foods.

> *This may come as a shock to many of you, but the types of foods you eat affect fat loss FAR LESS than the amount of the foods you eat.*

There's no such thing as "clean" foods, as clean has no objective definition. Certain foods may have more benefits vs. others because they may have more protein and fiber and thus more thermogenic and filling, but even overeating on these foods can cause you to consume too many total calories for the requisite weight loss to occur. You may be able to eat more of these foods relative to foods containing mostly fat and refined sugars, but it doesn't make them a free food, and it doesn't make foods high in carbohydrate/fat/sugar necessarily "bad." It's just about how you choose to allocate your macronutrient "budget."

Let's take our two examples from above and examine the same food. If we have our male bodybuilder consuming 2790 calories per day, 210g protein, 295g carbohydrate, and 85g fat, can he afford to consume a Snickers bar each day? A Snickers bar is low in protein and fiber, high in carbohydrate and fat, and calorically dense (meaning a small amount has a lot of calories). One normal-sized Snickers bar (53g) contains 256 calories, 4g protein, 33g carbs (27g sugar), 12g fat, and 1g fiber. Not exactly filling and very high in calories, carbs, fats, and sugar considering you could eat a bowl of oatmeal with a tablespoon of peanut butter and get approximately the same macros and have it be much more filling, with more fiber.

For someone like our bodybuilder with a pretty fast metabolism, if we subtract this from his daily macros he still has 2536 calories, 206g protein, 262g carbohydrate, and 73g fat. Are those numbers difficult to achieve and still consume enough 35-45g of fiber? It's actually not difficult at all, with that much leeway. But let's look at our bikini competitor consuming 1690 calories per day, 145g protein, 165 carbohydrate, and 50g fat. If she consumes a Snickers bar, now she has 141g protein, 132g carbohydrate, and 38g fat. It's going to be much more difficult for her to hit her fiber target of 20-25g fiber than our male bodybuilder with a faster metabolism.

Think of your daily macronutrient intake like a budget. If you have a big budget (macro-millionaire) then you can "afford" to have some "junk" or "treats." The same way that a

150k sports car is a TERRIBLE investment if you're pulling $30k a year. That same sports car would be doable for someone who has $10 million in the bank because they can buy that sports car and still make their mortgage payments, health insurance, etc. In this way, things like candy, treats, and other "bad" foods are like the sports car. They are a really bad idea for people with a low budget because consuming them makes it really hard to hit your target and be satiated, but for someone with a BIG macro budget they can be totally fine so long as they can take care of their other responsibilities, in this case nutritionally, vs financially.

> *No foods are inherently "bad" or inherently "good" or imbued with special properties. It simply depends on your individual metabolism, goals, and macro "budget" as to whether or not it makes sense for you to include them.*

Now I know someone out there will say, "WHAT ABOUT INSULIN BRO? YOU CAN'T LOSE FAT IF YOU ARE EATING HIGH GLYCEMIC CARBOHYDRATE BECAUSE OF THE INSULIN SPIKE!" I typed it in all caps because it accurately reflects what people on the internet—so heavily steeped in their opinions and delusions—do when they try to argue a point. Allow me to address this by stating simple facts. Fat loss or gain is driven by energy balance.

Can hormones make a difference in energy balance? ***Yes.***

Will a hormonal response ever supersede an energy deficit? ***No.***

While high glycemic carbohydrate consumption may cause a bigger "spike" in insulin, the insulin response will also be of shorter duration compared to a lower GI carbohydrate which will have a lower peak insulin response, but longer in duration due to the rate at which glucose appears.

But honestly, who cares about all this hormonal mumbo jumbo? The question should be, does it actually affect fat loss?

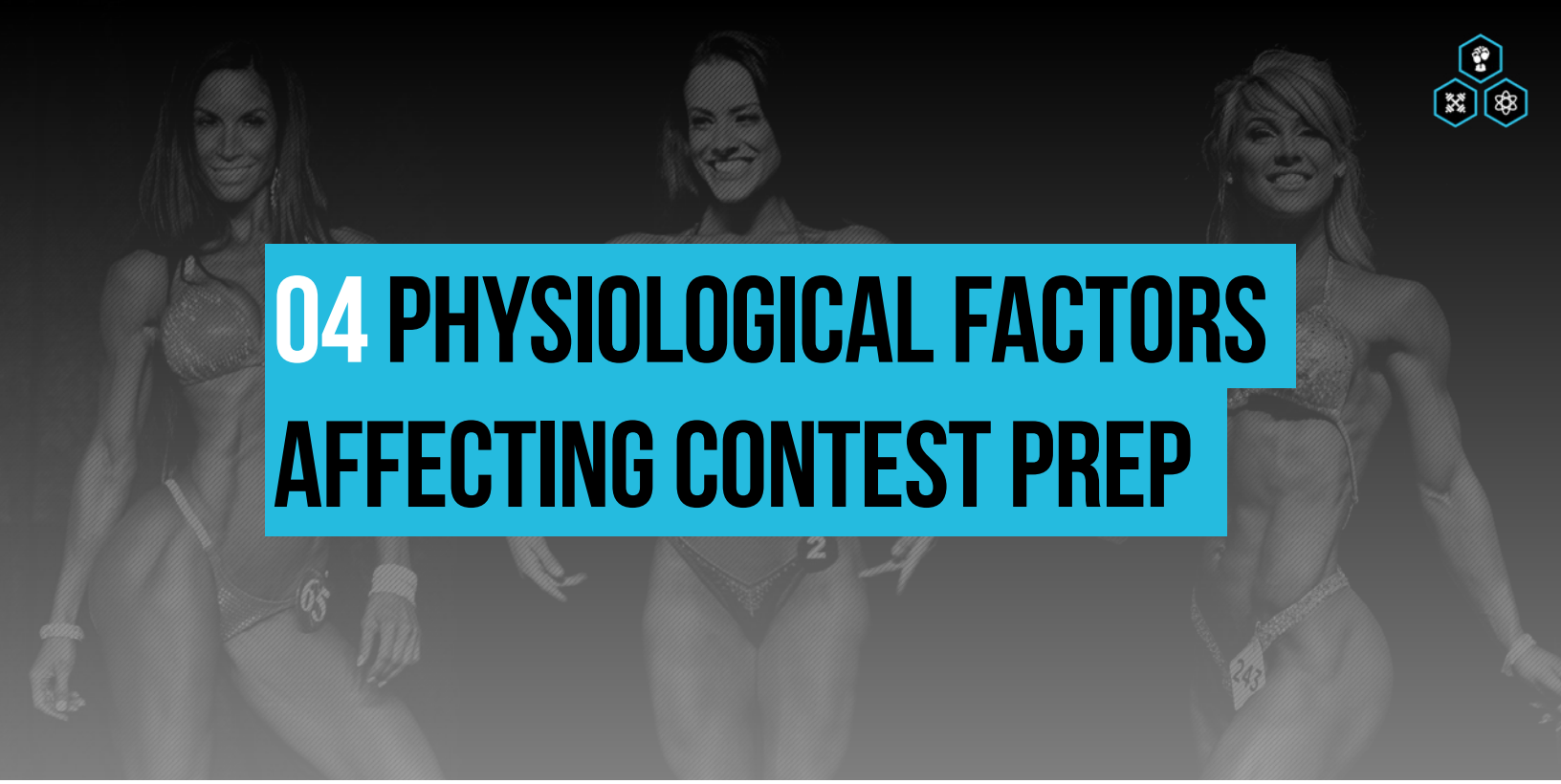
A study performed by Surwit et al. answered this quite convincingly in my opinion. They put subjects on a weight loss diet that consisted of less than 4% of calories from sugar (around 11g sugar/day) or 43% of calories from sugar (around 118g sugar per day) while keeping

total caloric intake the same.[25] They found that BOTH groups lost the same amount of weight and body fat. While this book focuses on body composition, there may be people out there who worry about overall health. Understand that the majority of the health benefits from dieting come from the weight loss, and the type of diet used to achieve that weight loss is secondary to the caloric restriction. That said, the high sugar diet showed no differences in most of the health markers (inflammation, glucose, etc.) assessed during this study when calories were equated. The only difference was in cholesterol. Both groups lowered their blood cholesterol, but the low sugar group had a slightly better response, but the difference was very small and likely accounted for by the reduced fiber intake in the high sugar group. Fiber binds to cholesterol and increases cholesterol excretion, so it would make sense that the high sugar group wouldn't lower cholesterol quite as much since fiber was also lower than in the low sugar group.

I don't want to continue into a lengthy diatribe about flexible dieting vs. restrictive dieting and why food choices matter much less than your daily macronutrient intake. It's beyond the scope of this book, and it's been done on Facebook and various forums ad nauseam for years. What I will tell you is that if you enjoy eating some sugar and "junk" food, you can do so without it derailing your ability to get lean, but you must understand that it comes at a cost. Eating a Snickers may taste great, but it's not very filling and takes up a large amount of macro budget for the amount of food volume you get. As you get lower and lower in calorie intake through the prep (discussed later) you will likely want to select foods that are more voluminous to help keep you full. In fact, many flexible dieters end up eating pretty "clean" by the end of a contest prep because it's the only way you can really get a large food volume in while calories are low.

> *The point I want to make is that you should give yourself the flexibility to consume foods you enjoy, you will still have to control portion size, but flexibility will improve adherence and help prevent post contest body fat regain.*

25. Metabolic and behavioral effects of a high-sucrose diet during weight loss. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/9094871



04 PHYSIOLOGICAL FACTORS AFFECTING CONTEST PREP

In addition to everything listed thus far, there are still more factors that affect your nutrition. Dietary History, age, sex, the category in which you want to compete, medical issues if you have them, your job, your overall lifestyle, are all going to affect the rate at which you lose fat and will affect your ideal prep time. Before we begin here, it's important to note that neither one of us are physicians and if you have any medical issues, it's imperative that you discuss it with your physician prior to starting any sort of nutrition or training regimen. It's also never a bad idea to discuss starting a nutrition or training regimen with your physician, even if you're healthy with no medical conditions.

Dietary History

Dietary history is one of the most important aspects of your choice to compete. This will be one of the major determinants of whether or not you should compete now, or whether you should wait. Much of the time, when you meet someone in your day to day life, they're almost always "on a diet" or "trying to lose weight" or any iteration of that. Some of these diets have

catchy names, like ketogenic dieting, Atkins, South Beach, The Zone, Paleo, HCG Diet, The Snake Diet, The Lunar Diet (I wish I was kidding), Intermittent Fasting, and many more to come undoubtedly.

> *Despite the fancy hand waving and misdirection, if you've ever had success with any of these diets, there's one thing they all have in common. They allowed you to create a caloric deficit.*

As we will discuss later in Chapter 6, sustained caloric deficits reduce metabolic rate through loss of overall body mass as well as metabolic adaptation (body becomes more efficient at producing energy). Unfortunately, many people aren't even in a good place to begin a contest prep because of the toll they have put on their metabolic rate through yo-yo dieting. This is normally prevalent amongst women compared to men, probably due to the societal pressures placed on them from a young age to be skinny.

Hormonal Roller Coaster

There's a lot to this, so I don't want to take up too much space on it, but it's worth talking about so you can understand the gravity of the "diet" business and the toll it can take on your body. A look at the word "diet" itself indicates a few things (first off, notice that the word contains the word 'die' in it, so there's that). The main thing it denotes is a starting point and an ending point. Every headline in the checkout line at the grocery store can clue you into that. Not only that, but there's almost always an element of semi-elimination involved in a given diet. A popular example right now is the ketogenic diet, which basically *eliminates* carbohydrate (less than 10% of calories from carbohydrate). Others, like Whole 30 or the Paleo diet suggest eliminating processed foods, dairy, legumes, or added sugars as well (don't worry, apparently tequila is still paleo though).

Many people go through their life jumping from one of these fad diets to another. They use the fad diet for a few weeks or months, lose a bit of weight, but invariably are unable to maintain it and then regain all of it, or worse... more.

In fact, the research on dieting is really morbid. Most overweight people are able to lose a significant amount of body weight during their lives. The problem is they can't

keep it off. Within 1 year of weight loss, over 80% will relapse to their pre-diet weight.[1] At 2 years that number jumps to 85%, and at 3 years that number is 95%.[2] [3] Think about this for a minute, that means in the long run, diets have a less than 5% success rate. Not only that, but 1/3-2/3 of these people will re-gain MORE weight than they lost on the diet, putting them in a WORSE position than they were previously.[4]

Think about how most people diet, or maybe even how you've dieted. You went on some fad diet, lost some weight until you could no longer sustain the diet and then you started eating all the things you had previously eliminated and saw your weight shoot back up, maybe even higher than you were before you started the diet. So what do you do? You immediately tried dieting back down maybe using the same diet, or maybe using a different fad diet, and repeated the process over again. If this sounds like you then it probably also seemed like it got harder and harder to lose weight with each subsequent diet attempt. This is likely due to the way you're dieting and regaining the weight. When you diet, you lose fat and lean body mass, but if you regain it quickly post-diet, you regain almost 100% body fat and since fat is much less metabolically active than muscle, this lowers your metabolic rate.[5] Further, because of the fad dieting, it's likely your metabolism slowed way down due to metabolic adaptation but when you regained the weight, you did not give it enough time of eating in a surplus to "catch back up." Thus, when you tried to diet again, it was not as successful (see figure 1 on the next page).

With that in mind, imagine the havoc you can wreak on yourself by repeating this extreme diet process ad infinitum. To that point, the other main failings I've seen in the industry are

1. Biology's response to dieting: the impetus for weight regain. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/21677272
2. Long-term efficacy of dietary treatment of obesity: a systematic review of studies published between 1931 and 1999. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/12119984
3. The mediocre results of dieting. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/23859104
4. How dieting makes some fatter: from a perspective of human body composition autoregulation. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/22475574
5. Metabolic slowing with massive weight loss despite preservation of fat-free mass. Retrieved January 2, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/22535969

Figure 1. Typical yo-yo dieting cycle causing negative metabolic adaptations. A dieter uses a fad diet to lose weight which causes decreases in body fat, lean body mass, and metabolic rate. If weight is regained quickly post-diet, it's mostly body fat and metabolic rate is still suppressed. This can make future dieting less successful.

due to the lack of a post-diet game plan. Sure, you just spent this specific amount of time on the diet, but how often do you feel confident in what to do next? You don't want to gain the weight back. You *definitely* don't want to gain even more of it back.

This is why we address the post-diet period in Chapter 13, however, it's also important to consider how you've been dieting leading up to the initial decision to prep. You need an honest self-assessment of where you are. If you've been training for a while, and counting your calories, you haven't been yo-yo dieting, you've been eating in a controlled surplus with a few successful diet bouts, and you're familiar with some of these concepts, you have a good start. If you actually have periods where you're in maintenance or even a surplus, you're ahead of the game, both in terms of when you can start competing and your overall health.

However, if you've been a chronic yo-yo dieter or a competitor who competes in spring and fall shows, ballooning up post-show only to have to starve yourself to make the next show, you will have a harder road ahead. If this applies to you, going into a deficit is most likely not the best idea, especially the type of rigid deficit you need to compete in a show. I've worked with over 1000 people over the last 13 years and I can tell you that the people who struggled to get in contest shape were overwhelmingly the people who spent too much time dieting and then ballooning back up, with not nearly enough time spent in a controlled, consistent calorie surplus to increase their metabolic rate and put them in a more optimal metabolic position for contest prep. Remember, you can't afford much leeway in your diet as you prep for a show. No missed meals, little wiggle room for fun foods as the line between Point A (where you are now) draws closer to Point B (game day). So if you're someone who can't seem to lose weight no matter what you do, have spent a lot of time yo-yo dieting, or requires extremely low calories to make any progress whatsoever, then you might need to consider giving yourself a much longer prep time than you would calculate based on Chapters 2 & 3.

A better option is running a reverse diet to increase your metabolic rate, but limit fat gain for several months or even a year or more (in the case of people who have completely tanked their metabolic rate through chronic dieting) so that you can put yourself in a more optimal place to start prep. Keep in mind that if you've been engaged in these yo-yo dieting practices and now your maintenance calories

are 1500 per day, think about what it's going to take for you to actually lose weight!

If your hormone levels are good, and you feel great, you've been spending more time in a controlled surplus, and you're still getting your period (unless you have methods of birth control that negate it or you're a male in which case if you're having a period you've probably got bigger problems then figuring out how long to prep), you have enough muscle mass, and you're maintaining your body weight on a healthy amount of calories, then your chances of succeeding during the contest prep phase are exponentially higher. With all that out of the way, let's discuss other factors that may affect your prep.

Sex

In addition to age, sex is an important factor. If you're a woman, the process is even less of a linear process than it is for men. So with that in mind, let's go through the menstrual cycle in a little more detail. If you're a woman, this won't be new to you, but if anyone else missed this part in middle school science, you're welcome.

First, we have menstruation. This is what everyone knows and typically refers to as the period. During this portion of the menstrual cycle, the uterus sheds its lining, along with blood and mucus, and discharges from the vagina. Typically, this portion of the cycle lasts as little as two days and as many as eight, barring any complications. The onset of menstruations marks the beginning of one of two phases; this particular phase is called the follicular phase. The follicular phase lasts until ovulation and is marked by the following:

- Ovarian follicle development
- Bleeding in the aforementioned time frame
- Higher estrogen compared to progesterone

In a perfect world, the follicular phase would last 14 days, and then comes the next phase, the luteal phase. The luteal phase is kicked off with ovulation after the follicle turns into the corpus luteum. The corpus luteum is a structure that releases progesterone, and this helps alter the uterine lining so that a fertilized egg can open up shop there and become a newborn baby at some point. However, if the egg isn't fertilized, the corpus luteum, a temporary structure, degrades and estrogen and progesterone levels tank, and you get your period, thus starting the cycle again. Prior to the beginning of the follicular phase,

women sometimes get symptoms which are commonly referred to as premenstrual syndrome (PMS). Symptoms can include but aren't limited to:

- Tender breasts
- Acne
- Bloating
- Lethargy
- Irritability

Looking at the low hormone levels before the follicular phase makes sense when you account for these changes in your body. The key points to look for as it relates to your dieting and training are being mindful of how you feel regarding the stressors you've been putting on your body (the dieting and training) and how you can work around your bodily sensations or if you should rest at all during a given phase of your cycle.

Something else to keep in mind is where your hormone levels are at any given point in your cycle. That said, here's an abridged version of a table that I pulled from this study (which also has an in-depth account of the nuances of the menstrual cycle if you're interested).[6]

With that in mind, it might not be a bad idea if you put some extra effort into your training right around the time you ovulate, since your testosterone is highest at that point and recovery may be improved. During the early follicular phase, you could focus on volume and dial back the intensity as much as you're comfortable with and right before menstruation, you could potentially dial back

Sex Steroids	Early Follicular	Pre-Ovulatory	Mid-Luteal
Progesterone (mg)	1	4	25
Testosterone (µg)	144	171	126
Estradiol (µg)	36	380	250

Table 1. Abridged version of normal hormone levels during various phases of the menstrual cycle.

6. The Normal Menstrual Cycle and the Control of Ovulation. Retrieved December 21, 2017, from https://www.ncbi.nlm.nih.gov/books/NBK279054/

both volume and intensity. Keep in mind these aren't clear-cut "rules" but rather suggestions if you're someone who finds your energy and strength are severely affected by where in your cycle you are.

Though this is an abridged overview of the menstrual cycle, it's something worth keeping track of in terms of how you feel and perform. With this type of knowledge, you'll know best how to proceed in terms of your training. For example, during PMS many women find that they retain quite a bit of water. Fluctuations of 2% body weight are quite normal for most women, even up to 4%. So keep this in mind when reading Chapter 8's section on breaking plateaus. Don't mistake an increase in weight or lack of weight loss during PMS for lack of progress. It's probably best if you wait until your period passes to determine whether or not progress is truly stalled or if it was simply short-term water retention.

Contraceptives

While "contraceptives" are broadly defined, as they can range from anything to abstinence, vasectomies, tubal ligations, condoms, and sterilization, for our purposes, I'm going with combination contraceptives.

According to a meta-analysis by Gallo et al., weight gain is typically associated with taking combination contraceptives. Further, women and clinicians often make this assumption regarding said associations between the two. According to the authors:

> *Almost three-quarters of women in a random survey conducted in the United Kingdom reported believing that weight gain was related to oral contraceptive use (Turner 1994). In a Canadian survey of women filling an oral contraceptive (OC) prescription (Gaudet 2004), 68% had counseling from their physician on weight gain and the pill. Of those who had counseling, 36% said their weight would stay the same while on the pill compared to 50% of those who had no counseling. In the United States, 45% of adolescents starting OC use believed that oral contraceptive use increased the risk of weight gain (Emans 1987).*[7]

7. Combination contraceptives: effects on weight. Retrieved December 21, 2017, from https://www.ncbi.nlm.nih.gov/pubmed/24477630

If you look further, the World Health Organization talks at length about combination contraceptives in their book, *Family Planning: A Global Handbook for Providers*. In one section they have two columns. On the left, they list the benefits and on the right, they list the side effects of combination contraceptives.

Among the negative side effects are deep vein thrombosis and pulmonary embolism, which the WHO list as very rare, and heart attacks and strokes which they list as extremely rare. Weight gain isn't mentioned at all.[8]

As for the benefits, they list that combination contraceptives can help protect against pregnancy, uterine cancer, ovarian cancer, and pelvic inflammatory disease. They go on to discuss that they may help protect against ovarian cysts and anemia, and could possibly reduce symptoms of PCOS, such as irregular bleeding, excess hair, and acne. In addition to that, they can potentially reduce ovulation pain, problems with menstrual bleeding, or symptoms of endometriosis.[8]

So based on the WHO's research, along with the above-mentioned meta-study, it's safe to say that there appear to be no associations with combination contraceptives and weight gain.

Medical Issues

Another aspect of your prep that you might face will be any potential medical issues you might have. That said, I'm going to cover a few of the ones I've run into over the years and with various clients. Keep in mind, too, that some of these are exclusive to either men or women, but other issues can have an effect on both sexes. The purpose is to go over some common ones and talk about them as they relate to *your* contest prep. Finally, none of this is medical advice. This is just a relay of research with some interpretive commentary.

It's not intended to diagnose or treat anything in any way shape or form. It's imperative that you talk to your doctor about any and all medical conditions that you have or think you have to get the proper diagnosis and medical treatment.

8. Emergency contraceptive Pills - Family Planning: A Global Handbook for Providers. Retrieved December 21, 2017, from https://www.fphandbook.org/sites/default/files/hb_english_2012.pdf

Polycystic Ovarian Syndrome (PCOS)

For roughly 10% of women who can bear children, they will have symptoms of PCOS. Briefly, PCOS is a hormonal condition that manifests around the age a woman can menstruate. While the exact causes are unknown, symptoms include but aren't limited to:

- Hirsutism, or excessive amounts of hair where you typically don't have hair
- Potentially elevated testosterone levels
- Type 2 Diabetes (though this is only an association, which I will speak more of soon)
- Actual cysts on your ovaries[9]

One of the other symptoms of PCOS is menstrual irregularities. For the women with PCOS, there's no uniform irregularity. So one woman with PCOS might have her period every 14 days. Others might have a prolonged cycle that stretches beyond 28 days up to 32, 33, 34, or even 35 days. Moreover, bleeding can be heavier than normal on top of some (or all) of the above-listed symptoms, or the heavier menstrual bleeding can be just another symptom that you get without any of the others.

Now, bear in mind that I don't want to seem like I'm making light of this. However, if you're reading this, you likely have a handle of how to handle your PCOS. But, a meta-analysis from Domecq et al. concluded the following:

> *This systematic review and meta-analysis demonstrates that LSM (lifestyle management) programs decrease the levels of fasting glucose and insulin, suggesting that these programs will be beneficial in overweight or obese women with PCOS. Changes in BMI were associated with changes in FBG (fasting blood glucose). Clinicians prescribing LSM interventions must consider the patient's capacity to sustain diet and exercise adherence and weight maintenance over time for the clinical benefits on PCOS to continue. Longer and larger trials at low risk of bias are needed to draw stronger conclusions about the effects*

9. Lifestyle Modification Programs in Polycystic Ovary Syndrome: Systematic Review and Meta-Analysis. Retrieved December 21, 2017, from https://academic.oup.com/jcem/article/98/12/4655/2834112

> *of LSM on outcomes more important to women with PCOS and not only surrogates. It's likely that the current evidence is underestimating the real effects of these interventions.*[9]

So for a woman in contest prep—provided you're on point with a hypocaloric diet, which by virtue of you being in contest prep *you are*—PCOS isn't the most disadvantageous thing that can happen to you, especially in terms of keeping LBM and your overall training. Keep in mind, it varies from woman to woman, so you might experience some or even more of the above-listed symptoms if you have PCOS, but the fact that you do engage in lifestyle management—controlling your diet and exercise—means that your contest prep won't be too adversely affected. All in all, the lifestyle management described in the meta-study suggests that it will help counteract some of the adverse effects of PCOS in addition to not being a detriment to your contest prep.

Celiac Disease and Thyroid Disease

These days, it seems like everyone *thinks* they have celiac disease based on how many people are trying to limit or eliminate gluten, but it's usually not the case unless you've been legitimately diagnosed with it. Before I go over Celiac proper, it's important to know what gluten *actually* is. Gluten is actually a Latin word that means glue. In vegan recipes, gluten is primarily a binding agent, but it also functions as the main source of protein in bread. Specifically, it's a type of storage protein which contains metal ions *and* some amino acids. In the muscle magazine world, it would be correctly called an incomplete protein due to low levels of the essential amino acid lysine.

Celiac disease is basically inflammation of the small intestine lining and leads to malabsorption of the nutrients within the food you eat. In people who suffer from celiac, wheat gluten triggers this, and the only effective treatment is a legitimate gluten-free diet. While a gluten-free diet is an easy treatment for the approximately 1% of the Western population dealing with it, it isn't quite so simple (and I'm not talking about actual knowledge of gluten-containing foods or anything like that). According to Sun et al.:

> *The associations of CD (Celiac Disease) with ulcerative colitis, Crohn's disease, microscopic colitis, autoimmune liver diseases, and several other immune- and non-immune-based diseases in the*

> *digestive system are well recognized. However, many diseases outside the digestive system, such as autoimmune thyroid disease, Sjögren's syndrome, type 1 diabetes mellitus, and Addison's disease, are associated with CD, in both its overt and silent forms. For example, a meta-analysis based on 26605 patients with type 1 diabetes mellitus revealed a 6.0% prevalence of biopsy-confirmed CD, which was increased compared with the prevalence among healthy controls.*[10]

Before going over the conclusion of this particular meta-analysis, some clarification is in order. Of all the thyroid complications mentioned, the authors concluded that if you have celiac disease then you ought to get your thyroid checked. If you get regular blood work done, make sure your panel includes a test for your thyroid hormones and that you're familiar with what they mean. We can start with an easy one. The above meta-analysis looked at euthyroidism, which is a fancy way of saying your thyroid is functioning like it should, meaning that your thyroid stimulating hormone (TSH) levels, which come from your pituitary gland, are in order, along with your T3 (thyroid hormone) and T4 (precursor to T3) levels.

In addition to euthyroidism, there's something called hypothyroidism, which is best described as an underactive thyroid, meaning your thyroid hormones are low. Common symptoms include fatigue, trouble concentrating, heavy bleeding in women, and others. At the opposite end of hypothyroidism, there's hyperthyroidism. The prefix "hyper" is the direct opposite of "hypo" so as regards your thyroid, hyperthyroidism is an overactive thyroid. Instead of general lethargy and your metabolic processes slowing, hyperthyroidism can cause sudden weight loss, faster heartbeat, and nervousness among other things.

Now with both hypo and hyperthyroidism, they can modulate your metabolic rate. We can quite plainly see that someone with hypothyroidism is going to have a more difficult time losing body fat than someone with a normal thyroid or someone who has hyperthyroidism. If you have hypothyroidism (because you went to a

10. Increased Incidence of Thyroid Disease in Patients with Celiac Disease: A Systematic Review and Meta-Analysis. Retrieved December 21, 2017, from https://www.ncbi.nlm.nih.gov/pubmed/28030626

doctor and they diagnosed you with it) and you take your medication (possibly something like levothyroxine or another hormone replacement) then your time in the deficit won't be nearly as bad as it could be due to having a continually level amount of thyroid hormones. However, something to potentially look for if you do have hypothyroidism is that the hormone replacement for it could *potentially* put you into a state of hyperthyroidism. All of this will be monitored by your doctor visits of course because you'll let them know if you feel or see any red flags.

For hyperthyroidism, some of the symptoms include, but aren't limited to:

- Irregular heartbeat
- Sudden weight loss
- Increased appetite
- Anxiety
- Heat sensitivity

One potential problem is that the symptoms are similar to other medical conditions which could lead to misdiagnosis amongst doctors. Again, consulting with your doctor and having the appropriate blood work done is important. If you have hyperthyroidism that will likely increase metabolic rate and increase the rate of weight loss. So if you have hyperthyroidism and you experience sudden weight loss *and* increased appetite, eating more will help you. And by virtue of your faster metabolic rate, you can increase your energy intake and still be in a deficit and lose weight. While this likely sounds like a good thing, keep in mind that if you don't eat more to compensate for the increased caloric output, you could be in danger of losing more lean body mass.

Beta Blockers

These drugs slow down your adrenaline (epinephrine) in an effort to lower your blood pressure. Not only that, they can also regulate your heartbeat as well as mitigate the physical manifestations of anxiety. As such, doctors may sometimes prescribe them for off-label anxiety use. Additionally, that type of off-label use sometimes makes its way into the performance-enhancing realm, mostly for musicians and actors, so that they don't suffer from poor performance due to said physical symptoms, which we don't recommend for physique sports.

In a meta-analysis, Sharma et al. noted that the introduction of beta blockers for the treatment of hypertension yielded a reduction five to ten percent reduction in TDEE (which was about 100-200 calories, according to the

authors). That 100-200 calories accounted for about 1kg-3.5kg of weight gain in clinical studies, as well. Moreover, because of metabolic adaptation, the weight gain you observe when taking beta blockers stops after a period of six months to a year, provided you made no change to your diet.

Based on what I've written so far, and in accordance with Sharma et al., the weight gain is the result of a decrease in your energy metabolism. They note that some of the potential mechanisms for this weight gain has to do with our old friend NEAT (see Chapter 2). Refer back to some of the symptoms beta blockers can treat, and you can note why there could be a decrease in your NEAT, which would account for the 100-200 calories decrease in TDEE.[11] Now that you're aware of that, if you take beta blockers, just be mindful of your actual activity level while at the same time being mindful of your deficit.

Corticosteroids

Corticosteroids are a type of steroid hormone but aren't like anabolic steroids other than the general chemical structure. The former are produced by your adrenal cortex and the latter come from either the ovaries or the testes. Hormones like cortisone, cortisol, and aldosterone, and their synthetic counterparts fall into the corticosteroid category.

Aldosterone regulates your electrolyte balance and will be discussed at length in Chapter 9, but the other two are involved in response to stress. Cortisone helps to reduce inflammation. If you've ever needed a shot of cortisone as an immediate injury treatment, this was the reason why. By way of gluconeogenesis (endogenous production of glucose from various substrates, mainly amino acids), cortisol regulates your blood sugar. In its synthetic form, it's known as hydrocortisone and is used in asthmatic inhalers and also to treat adrenal insufficiency, among other things.

According to Liu et al., a survey of 2167 long-term corticosteroid users found weight gain to be the most common *self-reported* (emphasis mine) side effect. They also noted that in an analysis of four prospective trials of people with rheumatoid arthritis found a 4 to 8% increase in mean body weight

11. Hypothesis: Beta-adrenergic receptor blockers and weight gain: A systematic analysis. Retrieved December 21, 2017, from https://www.ncbi.nlm.nih.gov/pubmed/11230280

with the use of 5–10 mg/day of prednisone (another type of synthetic corticosteroid derived from cortisone).[12] The same study they cited looking at that data also noted that the patients reported an increase in appetite.

The fact that the data is self-reported and that there was a noted increase in appetite shows the association of corticosteroid intake with weight gain. However, in the previously mentioned meta-analysis, it seems that the corticosteroids aren't the *direct* cause of weight gain, barring exceedingly high doses over a long period of time. Prolonged use coupled with higher doses can result in the redistribution of adipose tissue as well as cushingoid (Cushing's disease is an illness where cortisol is over secreted) features. But, Liu et al. noted that "patients should also be advised to carry a steroid treatment card and wear a medical identification tag, and to adopt lifestyle habits that may help minimize the risk of excessive weight gain with corticosteroid use, such as participation in regular physical activity and following a healthy, low-calorie diet."[12]

What is the practical application of this? Probably that if you need to use corticosteroids that it's possible you will experience an increase in hunger. Thus, it's a good idea to focus on eating foods that are high fiber and high volume in order to maximize satiety and avoid overeating which would impair fat loss.

Antidepressants

These are a bit more "gray" in terms of their effect on weight loss or weight gain. If you've ever gone through a horrible break up, a death, or any other tragedy life can throw at you, you might have succumbed to the "depression diet." Not to make light of anyone's mental health status, but essentially you don't eat during these times, and you lose weight. So if you get diagnosed as clinically depressed, you might also not eat enough. Then, if you start taking SSRIs or any other of the various antidepressants, you might start eating again. If your activity level is static, then it's likely you will gain weight.

At the same time, if you're depressed and use food as a way to "self-medicate," and you start taking antidepressants to correct your

12. A practical guide to the monitoring and management of the complications of systemic corticosteroid therapy. Retrieved December 21, 2017, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3765115/

chemical balance, then you might actually might notice some weight loss, since you may not resort to that type of behavior anymore. If you feel like you might be depressed, seek help from a licensed counselor and/or psychiatrist and speak with your physician.

Lucky for us, Drs. Serretti and Mandelli conducted a meta-analysis that looked at various forms of antidepressants as well as their effect on weight loss, weight gain, and maintenance. They looked at both acute intervals as well long-term intervals and concluded the following:

> *In conclusion, the results obtained in the present meta-analysis confirm that antidepressants markedly differ in their ability to induce changes of body weight. Overall, the impact is of mild significance, except in cases of mirtazapine and amitriptyline, which were the most potent weight gain promoters. Some reduction of body weight can result from treatment with fluoxetine and bupropion, although for fluoxetine the effect may be only transient. To our knowledge, this is the first systematic and comprehensive review of the effect of antidepressants on body weight. However, further studies taking into account other important variables such as depressive severity, loss of appetite, atypical features, premorbid weight, and sex are warranted to better understand the impact of antidepressants on weight gain.*[13]

So while there's more research needed, the most you can do, it seems, is to track your caloric intake diligently, and see what happens when or if you happen to start taking antidepressants.

Obligatory Disclaimer

None of this is to be taken as medical advice. We aren't physicians, we can't diagnose nor can we prescribe any kind of condition or medication. You should always seek out the care of a physician as it concerns any matter of your mental and/or physical health and wellbeing. All we wanted to do was go over a few bits of research in hopes that you better understand what's out there. This list is also

13. Antidepressants and body weight: a comprehensive review and meta-analysis. Retrieved December 21, 2017, from https://www.ncbi.nlm.nih.gov/pubmed/21062615

not meant to be exhaustive in any way, shape, or form. There are hundreds of thousands, if not millions, of medical conditions. We tried to focus on the conditions that might most affect a contest prep. Again, we implore you to speak with your physician and get regular checkups to ensure the best health possible. If you have a severe medical condition, we also recommend that it's probably best to NOT prep during that time. Prep is very stressful on the mind and body. If you're going through a difficult medical condition, it's most important that you focus on your overall health and wellbeing. Shows will always be there.

05 NUTRIENT TIMING AND DISTRIBUTION

Nutrient timing is something that got a ton of emphasis back around ten years ago. Some experts even went as far to suggest that *when* you ate certain nutrients was more important than your overall daily intake. I can tell you that's unequivocally false and has been shown to be false in various research studies.[1] These results have led many people to overreact and claim that nutrient timing doesn't matter at all. The reality is somewhere in between.

Total daily macronutrient intake is by far more important than nutrient timing. Not only that, distributing your nutrients in a way that fuels your workouts and allows you to optimize your adherence to your diet can be beneficial compared to just distributing them however you want.

So what do I recommend for nutrient timing? I have a few basic suggestions for each macronutrient.

1. Nutrient timing revisited: is there a post-exercise anabolic window? Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3577439/

Protein

Previous bodybuilding lore suggested that protein timing post workout was absolutely critical. If you didn't get in 50g of super hydrolyzed ultra-fast digesting whey within one hour of finishing your workout, all your gains were for naught, and you will be catabolic for the rest of your days. The idea behind this "anabolic window" was that training was so catabolic that you simply stay in that catabolic state until you consume sufficient protein.[2] While that's true for endurance training, that doesn't seem to be the case for resistance training as weight training actually causes its own anabolic response independent of nutrition.[3] This purported "anabolic window" has been shown to be more like a large barn door. While research has shown that protein ingestion post training does augment anabolism, the most important thing is to get enough total protein in throughout the day and make one of your protein containing meals fall within a few hours of finishing your training session.[1]

Research has also shown that protein ingestion with your pre-workout meal elicits about the same anabolic response as post-training.[4] This suggests that post-training probably isn't a magic time, but rather that it makes sense to have multiple high protein meals throughout the day to maximize the anabolic response.

Likely, the more important factor regarding protein "timing" is more so how you distribute your daily protein intake. Protein metabolism is regulated meal to meal and there's no way to "store" excess protein. Protein is either used for protein synthesis or gluconeogenesis (or some ketogenesis but that's beyond the scope of what we are discussing). Thus, one question I proposed during my PhD research was the following: if someone consumed 145g protein per day, but ate 100g of it in 1 meal and then 15g in three other meals, would that be as good as consuming 4 meals of 35-40g protein in a balanced distribution pattern vs. an unbalanced distribution pattern?

2. Human muscle protein synthesis and breakdown during and after exercise. Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/19164770

3. Fasted-state skeletal muscle protein synthesis after resistance exercise is altered with training. Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1474760/

4. Pre- versus post-exercise protein intake has similar effects on muscular adaptations. Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5214805/

Previous studies have shown that there's a minimum "threshold" amount of protein (mostly dependent on the protein sources' leucine content) that's required to stimulate muscle protein synthesis. If you don't reach that threshold amount, the increase in synthesis doesn't occur. So it stands to reason that consuming multiple meals per day that reach this threshold and stimulate anabolism would be superior to only stimulating it one time with a massive protein meal.

Why? Because doubling protein intake above the threshold intake doesn't lead to a doubling of the rate of anabolism.[5]

Figure 1. Comparing two protein distribution methods and their ability to stimulate muscle protein synthesis.

The research from my thesis supported this notion when comparing unbalanced distribution of protein vs. a balanced distribution. The group eating a balanced distribution of protein over 3 meals gained more muscle

5. The leucine content of a complete meal directs peak activation but not duration of skeletal muscle protein synthesis and mammalian target of rapamycin signaling in rats. Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/19403715

size than the group that consumed 70% of their daily protein in one meal and 15% in the other two meals.[6]

> *So while the post-workout "anabolic window" is likely overblown, it seems that a balanced protein distribution is probably important.*

Carbohydrate

Carbohydrate is the macronutrient that seems to be most variable in terms of anecdotal reports from competitors and how they like to distribute them. From a purely physiological standpoint, it would seem reasonable that a disproportionate amount of carbohydrate should be ingested both pre- and post-workout for a number of reasons.

- Pre-workout carbohydrate consumption to ensure sufficient energy for training and to top off muscle glycogen stores
- Post-workout carbohydrate to facilitate amino acid uptake into muscle cells after training and replenish muscle glycogen
- Training increases the translocation of the muscle glucose transporter called GLUT-4, which should increase insulin sensitivity in muscle cells post workout
- Carbohydrate consumption will increase insulin levels and insulin is anti-catabolic

While all these points are true, I think the data has shown their importance to be of minimal significance. For example, regarding point one, if you're consuming enough total carbohydrate throughout the day, your muscle glycogen stores should be sufficient. Muscle glycogen is very precious and is typically spared exclusively for when it's needed. So if your daily carbohydrate intake was 300g, even if you ate all of that 300g in the morning and trained in the evening, it's likely that the muscle glycogen you stored from that morning meal wouldn't be going anywhere. Further to that point, much has been made by many "experts" (most of whom are trying to sell you their ultra-fast carb post workout supplement) about the importance of consuming high GI carbohydrate post-workout due to the "need" for replenishing muscle glycogen rapidly.

6. Meal Distribution of Dietary Protein and Leucine Influences Long-Term Muscle Mass and Body Composition in Adult Rats. Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/27903833

The true irony is many of these "experts" are low carbohydrate zealots, except when it comes to buying their super important post-workout supplement, which, by the way, is high in carbohydrates. For a bodybuilder, quickly replenishing muscle glycogen is likely not a big issue. Replenishing glycogen isn't required to initiate the anabolic process and tissue turnover, and most bodybuilders aren't training multiple times per day. So as discussed previously, as long as you consume sufficient carbohydrate over a 24-hour period, you will recover the muscle glycogen regardless of whether or not you consume a high glycemic carbohydrate source post workout or not.

I personally don't recommend, nor do I like using a high glycemic carbohydrate drink post workout. If someone's daily carb intake is 160g for example, I wouldn't want them to consume 50 of that in drink form where it has very minimal impact on satiety.

One other aspect of this to keep in mind is that your carb intake may get very low as a function of having to reduce calories during the contest prep and if that's the case, you won't fully replenish your muscle glycogen stores, but that doesn't change regardless of how you time your carbohydrate intake.

Many people also love to hone in on insulin. Insulin is largely portrayed as an anabolic hormone, but that isn't really true. Insulin has a permissive effect on anabolism in adults. That is, if you're deficient in insulin—think type 1 diabetic—you will have decreased levels of muscle protein synthesis. Normalizing your insulin will bring anabolism levels back to normal, but then further increasing insulin within the physiological range doesn't further augment anabolism. Research in adults has confirmed that giving carbohydrate alone doesn't stimulate muscle protein synthesis. However, giving carbohydrate plus protein may cause a greater anabolic response than providing protein alone.[7] Thus, it's probably a wise idea to consume several protein-containing meals each day with carbohydrate.

How you distribute your carbohydrate intake doesn't seem to impact body composition, but consuming carbohydrate with protein may lead to a slightly better anabolic response, therefore I typically recommend people

7. Dietary Protein and Resistance Exercise. Retrieved January 3, 2018, from https://books.google.com/books?id=LyHOBQAAQBAJ&pg=PA26#v=onepage&q&f=false

spread out carbohydrates as they please. Personally, I train best when I've had plenty to eat and I'd rather consume carbohydrate during the time of the day where I can best dispose of them, which is around training time. Typically, I train in the afternoon, so I consume a low carb breakfast (<5% of daily carb intake at breakfast) then a large pre-training meal containing about 20-30% of my daily carbohydrate intake. Post workout I will consume about 30-40% of my daily carbohydrate intake, and the other 35-45% I will spread out however I choose to.

This works for me because I like to train in the late afternoon or evening and I'm hungriest in the evenings. However, on occasion I do train in the morning, I don't consume such a large carbohydrate amount before training. Not because I don't like a big meal in the morning, but because if I eat over half my daily carb intake in my first two meals, I would be very hungry by night time and it would be difficult to hit my total daily macronutrient intake.

But this is why it's very important to choose a distribution that works for you as an individual. Some people hate eating breakfast before they train in the morning. They don't train well if they have food on their stomach. Now, whether that's a physiological response or more psychological we can debate, but the fact of the matter is that they don't personally like it. Therefore, I'm going to recommend that they distribute their food in such a manner that it works best for how they train and for their hunger levels. You'll see this over and over, but 95% of the battle during prep is consistency and adherence.

It would be silly to recommend someone consume a large amount of carbohydrate pre-workout if it:

- Makes them feel worse
- Have less effective training sessions
- Makes it harder for them to stick to their daily macronutrient numbers later in the day because they ate so much earlier in the day

That being said, if you train in the morning and that's when you find yourself most hungry, by all means, have more carbs during that time frame.

Fats

People often ignore fat intake when it comes to nutrient timing in comparison to protein and carbohydrate. Most of the bodybuilding lore surrounding fat timing suggests minimizing

fat consumption when you eat a meal high in carbohydrate. The idea being that if carbohydrates are high, insulin will be high, and this will drive fatty acids into adipose tissue. While this is true, we need to keep things in the context of a 24-hour day.

For example, if someone consumed a large amount of carbohydrate and fat in a meal, let's say half their daily intake of both, is it likely they will store more fat in adipose than if they just had carbohydrate in that meal and no fat? Of course. But remember, since they ate such a large amount of carbohydrate and fat at one time, that means they will be consuming much lower amounts of carbs and fats throughout the rest of the day. This means that they will be burning more fat throughout the rest of the day as their intake during that time will be reduced compared to someone who separated their carbohydrate and fat intake.

The net effect on fat loss will likely be very minimal, if not zero. Further, fat doesn't require insulin to be stored in adipose tissue, so eating a high fat meal can still result in fat gain. Again, remember that it's total energy balance that makes the biggest difference. In general, I suggest distributing fats however you enjoy. Perhaps eating slightly lower fat than other meals with your higher carb meals may result in a tiny amount less fat being deposited, but there's no direct scientific evidence I've seen to support it and I honestly doubt if it makes a difference.

Meal Frequency

I can remember the old infomercials from back around the 2002-2003 era touting the benefits of meal frequency. "Eat smaller more frequent meals to 'boost metabolism' and keep yourself constantly anabolic," they bellowed. Some even suggested that meal frequency was more important than overall caloric intake. Alas, as you're probably now well aware, there are no magic tricks when it comes to metabolism.

> *Research has conclusively demonstrated that it does not matter how many meals per day are consumed, it's total energy balance that drives fat loss.*

To my knowledge, there are no studies that exist showing differences in fat loss due to meal frequency when calories are

equated.[8] [9] Indeed, we currently are experiencing the opposite trend of fasting for fat loss and anabolism. While I don't think eating small frequent meals is superior for fat loss, I also don't think consuming a single huge meal is superior either. Let's look at an example of two meals per day vs. eight meals per day with calories equated.

Figure 2. Comparing two meals vs. eight meals and their overall effect on fat loss when calories are equated.

At each of those small eight meals, there will likely be less fat deposited in adipose due to the meals being smaller. The two big meals would likely have a large amount of fat deposited into adipose tissue for the first few hours post meal. After that, however, the body would then burn quite a bit of body fat since no other meals would be consumed.

8. Increased meal frequency does not promote greater weight loss in subjects who were prescribed an 8-week equi-energetic energy-restricted diet. Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/19943985
9. Effects of Increased Meal Frequency on Fat Oxidation and Perceived Hunger. Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4391809/

And while the smaller meal group is storing less body fat at each small meal compared to the big meal, they are still storing some at each small meal, or if they are in a caloric deficit, they are spending less time in a post-absorptive state and not getting a big increase in fat burning. Once again, the net overall difference is zero with regards to fat loss.

What about muscle building? Do smaller more frequent meals produce better gains? Or is fasting anabolic? Well as per usual, the answer is in the middle. While fasting isn't anabolic, and one or two protein containing meals per day is probably not sufficient to maximize anabolism, eating too frequently can trigger a "muscle full" effect and actually have a negative impact on anabolism as well.[10]

> *Therefore, based on most current data, I suggest a meal frequency of approximately three to five meals per day, containing sufficient protein at each in a balanced distribution for maximizing muscle building.*

Summary

- Meal frequency does not affect fat loss when calories are equated
- It's recommended to consume 3-5 protein rich meals per day in a balanced distribution pattern
- It may be beneficial to have carbohydrate at some of these meals to optimize the anabolic response
- Consume carbohydrate intake around training as preferred by the individual to optimize training performance and recovery
- Distribute fat intake as per the individual's preference

10. Muscle full effect after oral protein: time-dependent concordance and discordance between human muscle protein synthesis and mTORC1 signaling. Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/20844073

06 REFEEDING AND DIET BREAKS

The Metabolic Process

We use the term “metabolism” a lot in this book and it sure sounds fancy. But what exactly is metabolism? Webster’s dictionary defines metabolism as “the chemical changes in living cells by which energy is provided for vital processes and activities and new material is assimilated.” On a basic level it’s the process of extracting energy from the food you eat and producing energy to power your cell’s biological processes. The molecules, like amino acids, sugars, fats, and others contained in food, all contain energy that can be extracted through the process of metabolism. The end product of macronutrient metabolism is the molecule adenosine triphosphate (ATP) as well as water and carbon dioxide.

ATP is essentially the energy currency of the cell. The process of hydrolyzing ATP is used to drive many cellular reactions. If we eat an excess amount of energy compared to the ATP we use (burn), then we store this energy in adipose tissue (and to a lesser extent lean mass and glycogen).

If we eat fewer calories than required to produce the ATP needed to run these chemical processes, then that energy must be liberated from storage in the form of adipose tissue—the body fat and to a lesser extent lean body mass and glycogen.
When someone has a "fast metabolism" what we mean on a cellular level is that their body is *inefficient* in production and usage of ATP. If we refer to someone as having a slow metabolism then that person is likely very *efficient* at ATP production and usage. Someone with an efficient (slow) metabolism is able to waste less ATP and produce more ATP from less energy intake, meaning fat storage is easier for this person.

This may all seem confusing, but it's the crux of the age old idea of "calories in vs. calories out" or as we have referred to previously, energy balance. There are groups of people today—here's looking at you, keto zealots—who insist that calories in vs. calories out is just a myth and it's hormones that drive weight loss. This is certainly not true and even if it was, hormones would only drive weight loss by affecting the calories out side of the equation. Weight loss absolutely boils down to calories in vs. calories out, but what makes up the calories out side of the equation is pretty complex and we don't fully understand it.

> *The facts, however are simple. If you aren't losing weight, you aren't in a caloric deficit.*

The term "metabolic rate" that we have used previously refers to the '"calories out" portion of the equation. As we are going to see, "calories out" or metabolic rate can fluctuate pretty substantially and we have to account for this in our prep.

The Metabolic Consequence of Prep

Most people don't truly appreciate what dieting to very low body fat percentages does to the body's metabolic rate. There's no easy way to put this. It tanks it for most people. In fact, the drop in metabolic rate is almost always greater than you would predict based on the person's lean body mass and activity level. Many people find it pretty easy to lose initially during a contest preparation diet, when metabolic rate is still elevated from overfeeding during the offseason (assuming you've had a proper offseason) but over time, your metabolic rate slows to adapt to the calorie deficit for one simple reason. The reason? To keep you alive. Our bodies have been forged in the fires of evolution with one primary goal: STAY ALIVE long enough to

pass on our genetic material. You can't do this if you starve to death. Thus, when the body senses a caloric deficit, there's a large scale mobilization of various systems that all have one primary outcome, lower the amount of energy you expend. This means that you will find it harder and harder to lose body fat as your metabolism adapts further to reductions in calories.

The decrease in metabolic rate is largely accomplished by making energy production more efficient and less wasteful. Typically, we think about efficiency as a good thing, but for fat loss, it's anathema. Consider this for the sake of argument: two people are completely physiologically identical (muscle mass, fat mass, age, genetics, etc. are all the same), but one is able to maintain their body weight on 1200 calories while the other is able to maintain it on 1800 calories per day.
The person who can maintain their body weight on 1200 calories per day is 50% more efficient than the person who requires 1800 calories per day to maintain their body weight. A great comparison is fuel efficiency in cars. If your gas tank (the fuel storage) is your body's energy source (mostly fat stores) and your fuel efficiency (miles per gallon, or kilometers per liter depending upon where you're from) is your body's metabolic rate, then the most efficient car is the one that can go the furthest on the smallest amount of fuel. It will take longer to deplete its fuel reserves because it's more efficient and has a slower "burn rate."

Figure 1. Two genetically identical individuals who undergo the same amount of metabolic adaptation during a prep (30%).

In this way, we want to be the inefficient car that burns through fuel very quickly because it means we will shed fat more rapidly.

But what if your car could sense that you weren't putting enough gas in it and could make itself more efficient despite having less gas so that you don't run out of fuel? Well, for one, you have a car way ahead of the times. But also, this is akin to metabolic adaptation.

A great example of this is the natural bodybuilding case study by Russow et al. where their subject's BMR plummeted from 2424 calories/day to a meager 1283 calories/day. Keep in mind this subject was not some 50kg bikini competitor, this was a 100kg male bodybuilder with about 85kg of lean body mass.[1] In fact, if we plugged his data into one of our body composition equations like the Müller equation, we would get the following predicted BMR data:

Pre-Diet:

(13.587 x 87.65) + (9.613 x 15.2) + (198 x 1) – (3.351 x 27) + 674 = 2118 calories/day

Post-Diet:

(13.587 x 84.87) + (9.613 x 4.0) + (198 x 1) – (3.351 x 27) + 674 = 1973 calories/day

Check out the difference in predicted metabolic rate vs. actual metabolic rate by the end of their study. Let it sink in. He got way more efficient during the 24 week caloric restriction. His metabolic rate was almost cut in HALF. The predicted starting metabolic rate was actually a bit low compared to the actual metabolic rate—that is his metabolism was faster than normal—but look at the difference in his actual BMR by the end of contest prep vs. what his predicted BMR was. It's an astonishing 700 calories/day difference and about 35% lower than predicted. This massive difference is what's known as metabolic adaptation and the determinant involved in this drastic difference is probably something you've heard me talk about before if you've followed me for any reasonable duration of time.

What is metabolic adaptation? It's really a catch all for various metabolic changes in the body that work to slow down your overall

1. Natural bodybuilding competition preparation and recovery: a 12-month case study. Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/23412685

metabolism. Let's discuss the major factors of metabolic adaptation.

BMR

During caloric restriction the body's basal metabolic rate adapts to the decrease in energy intake by dropping significantly. Most research that's available suggest it's about a 15% decline on average.[2] Much of this decline in BMR is due to the reduction in weight and lean mass while you diet. Since lean mass (and to a much lesser extent, fat mass) are metabolically active tissues, as you lose weight, you will have a reduction in BMR just due to less overall tissue and less energy needed to carry around the reduced body mass. This change in body mass however isn't nearly enough to account for the total decrease in energy expenditure though.[3] There are a few things to consider with this 15% metabolic adaptation number:

- It's just an average and some people will drop more and some will drop less
- That number is based off of normal people dieting, and not physique competitors trying to get crazy lean
- It's likely that the level of adaptation is proportionate to the level and duration of restriction

As we saw above, the Russow case study saw *a 35% BMR reduction* during that individual's contest prep.

NEAT

NEAT is probably the component of your total daily energy expenditure that has the biggest relative adaptation during caloric restriction. Indeed, research has shown NEAT to be reduced by a massive 400 calories per day in people who lost at least 10% of their body weight.[4]

TEF

TEF seems to be largely unaffected by dieting. However, since you're eating less

2. Metabolic adaptation to weight loss: implications for the athlete. Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3943438/
3. Metabolic slowing with massive weight loss despite preservation of fat-free mass. Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/22535969
4. Long-term persistence of adaptive thermogenesis in subjects who have maintained a reduced body weight. Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/18842775

food, the absolute amount of calories burned from TEF will be lower while the rate may be unchanged.[5] Keep in mind TEF is a very small proportion of your daily calorie output so even if it's not changed, it doesn't seem to have a huge impact one way or the other.

EA

Dieting reduces the amount of energy you expend during exercise.[6] Ever hear someone say something to the effect of "I don't understand why I can't lose weight, the cardio machine says I'm burning 1000 calories!" The hard truth is, you're most likely burning far less than that during exercise. Just think about times in your life when you've been overfeeding for long periods of time, you might have broken a sweat just standing up and moving around, whereas when you're dieting you find yourself constantly cold. This is another example of reduced thermogenesis.

Other Metabolic Adaptations

While adaptations to weight loss and low calorie dieting happen on a grand scale, they also occur on the smallest cellular level. Your cells contain mitochondria which is the organelle of the cell that produces ATP, your body's energy currency. During low calorie dieting and weight loss, the body adapts by increasing mitochondrial efficiency.[2] Like I said before, efficiency is the bane of fat loss. Your cells' mitochondria are able to pump out more ATP energy with less input. Part of this may be explained by the reduction in uncoupling protein from weight loss.[7] Uncoupling proteins reduce the efficiency of ATP production in the mitochondria and cause extra energy to be given off as heat. Thus these uncoupling proteins are very thermogenic.

Hormonal Adaptations

The endocrine system is also a target for metabolic adaptation. Most scientists agree that fat loss occurs not through a reduction

5. Effect of weight reduction on resting energy expenditure, substrate utilization, and the thermic effect of food in moderately obese women. Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/1570799
6. Greater than predicted decrease in energy expenditure during exercise after body weight loss in obese men. Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/12617720
7. Decreased mitochondrial proton leak and reduced expression of uncoupling protein 3 in skeletal muscle of obese diet-resistant women. Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/12145158

in fat cell number, but in *fat cell size*. As fat cells shrink from weight loss, they reduce their secretion of a hormone called leptin.[8] Leptin is a major control hormone for hunger, metabolic rate, and many other metabolic outcomes. It's often viewed as a central control hormone for fat loss and fat gain. When you reduce your calories and drop your body fat levels, the shrinking fat cells reduce their leptin output.

Interestingly, several studies have demonstrated that leptin levels are reduced to a greater extent than would be predicted for the amount of fat loss that occurs even after weight has stabilized.[9] This means low calorie dieting may suppress metabolic rate to a greater proportion than the amount of fat that's lost. Not only that, eating at a deficit and losing fat lowers the output of thyroid hormone T3, which also contributes to a lower metabolic rate.[10] Furthermore, energy restricted weight-loss is also accompanied by reduced sympathetic nervous system tone.[11] While the previously mentioned hormones fall, the hormone ghrelin is increased as a result of the deficit and weight loss.[12] Increased ghrelin contributes to an increase in appetite with weight loss. There's a reason it has the nickname "the hunger hormone." The increase in ghrelin and decrease in leptin could explain why dieting becomes progressively more difficult. Together they cause hunger levels to rise and make it more difficult to feel satiated.

These aren't the only hormones that change during caloric restriction and affects metabolic rate. Other hormones that have less of an effect on metabolic rate like testosterone, estrogen, and other sex hormones also change during a caloric deficit.[13] Interestingly,

8. Biology's response to dieting: the impetus for weight regain. Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/21677272
9. Persistent metabolic adaptation 6 years after "The Biggest Loser" competition. Retrieved January 3, 2018, from http://onlinelibrary.wiley.com/doi/10.1002/oby.21538/full
10. Moderate weight loss is sufficient to affect thyroid hormone homeostasis and inhibit its peripheral conversion. Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/23902316
11. Baseline sympathetic nervous system activity predicts dietary weight loss in obese metabolic syndrome subjects. Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/22090279
12. Weight loss increases circulating levels of ghrelin in human obesity. Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/11874411
13. Sex hormone changes during weight loss and maintenance in overweight and obese postmenopausal African-American and non-African-American women. Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3635052/

cortisol concentrations have been observed to significantly increase during contest preparation.[14]

Adipose Tissue Adaptations

Perhaps even more interesting is the notion that massive refeeding in the post-diet period may increase in the production of small fat cells.[8] Eating in a deficit, along with the subsequent weight loss, makes fat cells more insulin sensitive, and this may promote more nutrient storage in adipose tissue.[8] As you regain fat after your deficit period, these cells would normally enlarge, but since there are now a greater number of total fat cells, one may reach their previous body fat setpoint, but each individual fat cell may now be smaller than at the previously established setpoint.

Figure 2. Body fat adaptations resulting from excessive post-diet refeeding. As you refeed and pass your pre-diet weight, your body fat increases in both cell number and size, which is termed body fat overshooting. Adapted from MacLean et al.

14. Case Study: Unfavorable But Transient Physiological Changes During Contest Preparation in a Drug-Free Male Bodybuilder. Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/28770669

Thus, even though one may have regained the total amount of fat back after prolonged refeeding post diet, their individual fat cells may now be smaller due to an increase in overall fat cell number and this may signal to the body that setpoint has not been met since each individual cell is still smaller. As a result, leptin levels may not be as high as they were previously at the same body fat level. I'll discuss this more in the afterward, but keep it in mind. These adipose tissue adaptations could be a major factor influencing "body fat overshooting" phenomenon that so many competitors experience post contest.

Body Fat Setpoint and Fat Loss

Your body has what's known as a body fat setpoint as we touched on earlier. In short, it's a level of body fat you're accustomed to that your body will try to maintain. Everyone has a different set point, as well. If you're a 90kg man and have weighed the same for over a decade, and your body fat has been sitting at 16% for that decade, it's safe to say your body might be a fan of that. Factor in genetics, nutritional habits spanning a lifetime, activity, and everything else you've done, it makes for a distinct variable for us all. We believe that this setpoint is largely controlled by the hormone leptin. Think of leptin as your body's adipose tissue thermostat. A thermostat controls the temperature of the room and keeps it at a set point. If the temperature drops below the set point, the heater kicks on and raises it back up. When the temperature rises above the set point, the air conditioning turns on and brings the temperature back down. Leptin is like that thermostat.

The body fat setpoint is sensed by the size of the individual fat cells. As the cells start to shrink during a deficit, the adipose tissue cells reduce their secretion of leptin. This reduces metabolic rate (calories out), increases hunger (calories in), and tries to drive the body back towards the setpoint by swinging the body's caloric balance to a positive direction. During a caloric surplus, fat cells expand and leptin secretion increases which increases metabolic rate, decreases hunger, and drives calorie balance in a negative direction to bring the body back down towards your body fat setpoint.

I'm sure by now you've heard of your bodybuilding competitors or friends who go out after their shows and photo shoots and have a food orgy, right? They wind up gaining about seven or eight kilograms by morning. Sure, it's a cliché, but there's actually some validity to it. If you've been in a prolonged

calorie deficit, your metabolic rate slows, hunger elevates, and your ability for fat cells to assimilate nutrients will be enhanced. This is improving your body's efficiency to store energy (fat). So when you consume a lot of energy, you're better able to capture it and store it as body fat.

Think about it from an evolutionary perspective, the prolonged caloric deficit is signaling to your body that food is scarce. So when you come across food your body wouldn't want to waste that energy, it would want to store it as efficiently as possible. This is how cheat meals or days can pack on way more body fat than you would have believed. You might not have even went crazy, but maybe you had a couple slices of pizza and you ended up adding a kilogram (some of it water yes, but some body fat) whereas in the offseason, you probably wouldn't have added much weight, if any at all. This is because your body has become much more efficient at storage in response to the prolonged caloric deficit. It's also why fat loss becomes harder and harder the further below your body fat set point that you go.

So how do we deal with all this? Is dieting hopeless? Take heart, friends, while there's no way to completely eliminate metabolic adaptation, we do have a few tools that we can use to mitigate the effects.

1. **Do NOT crash diet.** The more slowly you lose the weight, the more lean body mass you will retain. Maximizing your retention of lean body mass will help attenuate the slowing of your metabolic rate because you'll have more metabolically active tissue.

2. **Attempt to diet on as many calories as you can.** The more calories you can consume and still lose weight, the more calories your body will burn. Now you can't say "I wanna lose weight on 8000 calories per day" and make it come true. The minimum caloric deficit weight loss threshold will be different for everyone, but this is why it's so important to go slow.

3. **Keep training hard.** We will discuss this more in the chapter on training, but the harder you train (when programmed correctly) the more muscle you're likely to maintain, which benefits your metabolism as discussed previously. Finally, we can incorporate things like refeeds and diet breaks.

Refeeds

The concept of a refeed is that you engage in a controlled overfeed, in an attempt to raise leptin and metabolic rate which will hopefully have a "slingshot" effect on metabolism to help attenuate some of the metabolic adaptation induced by dieting. There's plenty of data to show that short term refeeding does increase leptin.[15] Typically this is done mostly through increasing carbohydrate intake, as carbohydrates, specifically glucose, have a much greater impact on leptin production than fats or protein.[16] Wow, sign me up, right? Eat more and raise metabolic rate? Who doesn't like that idea? Well, it's not that clear cut.

> *While refeeds have been shown to increase metabolic rate in the short term, there's no data showing they improve fat loss during a diet.*[17] [18] [19]

Say what? Didn't I just say that they increased metabolic rate and leptin? Yes I did, but these changes are all very transient. The rise in metabolic rate and leptin is short lived and quickly returns to baseline once the calories come back down. In fact, of the studies examining diets that utilized higher calorie days, thus far none have demonstrated superior fat loss compared to diets that were continuously the same amount of calories each day. While an increase in metabolic rate is great, you have to keep in mind that you can still store body fat during a refeed.

Consider this, if a refeed boosted your metabolic rate by 1000 calories for the day, but you had to eat an extra 2000 calories to get that boost, then that means you actually stored 1000 calories and it was a net negative on your progress. Based on the research it appears that it's the weekly caloric deficit that

15. Effects of short-term carbohydrate or fat overfeeding on energy expenditure and plasma leptin concentrations in healthy female subjects. Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/11126336
16. Dietary intakes and leptin concentrations. Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4251481/
17. Intermittent versus daily calorie restriction: which diet regimen is more effective for weight loss? Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/21410865
18. The effects of intermittent or continuous energy restriction on weight loss and metabolic disease risk markers: a randomized trial in young overweight women. Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/20921964
19. Effects of intermittent compared to continuous energy restriction on short-term weight loss and long-term weight loss maintenance. Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/25826770

makes the difference, not varying the high and low calorie days.

Now, you may think that I'm bagging on refeeds, but I'm not. I'm just laying out the data. I still use refeeds for a few reasons. First and foremost, many people just prefer to diet that way. Some people, myself included, would rather eat 2000 calories 5 days per week, so that we can have 2 days per week at 3750 calories and enjoy some tastier treats and bigger meals rather than eat 7 days per week at 2500 calories. Based on current data, you should do whatever you personally prefer. I know higher calorie days for some can break up the monotony of dieting and also allow more flexibility for a meal out with friends or family, or some nice dessert. Others may prefer the same intake per day. This gives them a higher daily calorie intake everyday than they would get on their "low" days every single day.

That's all the scientific talk, but I can tell you anecdotally as a coach, I've observed differential reactions to high calorie days. Some people respond very poorly and soak every calorie up and retain it. Yet I've had others who seemed to be at a standstill with their fat loss and had a very, very high calorie day or two and then all of a sudden a few days later they start losing again. Further, some individuals report ravenous hunger on refeed days while others feel quite satiated. I don't have any peer review studies to give you on this, but I know I've definitely observed it. It's also important to point out that thus far, the vast majority of data on refeeds has looked at isolated high calorie days and not consecutive days.

Several highly regarded contest prep coaches I trust as well as a few scientists who work in experiments with people have told me that they have had quite a bit of success with consecutive day refeeding. That is, at least two consecutive days of increased calories. Perhaps one day isn't sufficient for anything more than a transient boost in metabolic rate and something about multiple days of refeeding is enough to actually make a difference. At this point, we simply don't know. What we do know is that refeeds don't seem to offer too much magic, but they are a tool some people like to use.

A novice will erroneously equate refeeds with cheat meals, but there are some differences. Refeeds are more structured and planned. Like a cheat meal, refeed days are going to have you go over your normal daily calories, but it's going to be targeted. Typically, refeed

days have an increase in carbohydrate intake and a decrease or maintenance of protein and fats. The caloric increase will raise your leptin levels and reduce ghrelin levels, both of which may help improve your satiation.

To structure a refeed, here's a brief guide:

- Reduce your protein intake to non-deficit levels based on Table 1 in Chapter 3
- Fats are usually maintained or reduced by 10-20%
- Typically calories are raised to maintenance if not, slightly more
- Increase carbohydrate intake to fill in remaining calories
- Have your refeed days on your hardest of training days since the caloric increase is going to help you train harder and in a more anabolic environment

So what would this actually look like? Let's take our bodybuilder example from earlier. His average daily deficit calories were calculated to be 2790 calories per day. This translates to 19530 calories per week. If he wanted to do two high calorie days at his maintenance calories that would put him at 3300 calories on those two days. That's 6600 calories total for refeed days. We then subtract that from his weekly calorie intake 19530 - 6600 = 12930. We then divide that by the remaining 5 days 12930 ÷ 5 = 2586 calories per day on his low days.

Then we can determine his macros by the same formulas as earlier. Briefly, his protein was calculated at 210g per day. 210g protein is 840 calories, if we subtract this from 2586 we are left with 1746 calories for carbs and fats. His carbs and fats were then placed in a 60/40 ratio (personal preference). 1746 × 0.6 = 1047.6 calories from carbs, rounded to 1048 calories. Divide by 4 to get 262g carbohydrate per day, rounded to 260g. To then get fat numbers we take 1746 × 0.4 = 698 calories from fat. 698 ÷ 9 = 77.6g fat, which then we can round to 75g or 80g, let's say 75g. So with this his low day numbers look like 210g protein, 260g carbohydrate, and 75g fat.

His high day numbers can be determined the same way. If we drop his protein to 2g/kg (See Table 1 in Chapter 3) lean body mass (keep in mind if he is older than 30 we should add 1.5% protein intake per year) that is 88kg × 2 = 176g protein, rounded to 175g protein. 175g protein is equal to 700 calories. 3300 - 700 = 2600. If we keep fats at 75g per day, that's 675 calories from fats. 2600 - 675 = 1925 calories

left for carbohydrate. If we then divide this number by 4 we get 481.25, rounded to 480g carbohydrate. So his high day numbers end up at 175g protein, 480g carbohydrate, and 75g fat.

Diet Breaks

The research on diet breaks is relatively new, but the idea of diet breaks have been around for five or more years. Eric Helms, Leigh Peele, and several others have written about them over the years, but now we have it in a formal research setting from the University of Tasmania.[20]

I would like to note, though, that the other strategies listed above are a diet break of sorts as well, but what the MATADOR study describes is intermittent periods of caloric deficits and maintenance periods. Briefly, 51 obese men were divided into two groups. One group restricted caloric intake for 16 consecutive weeks, or they alternated a caloric deficit with maintenance eating for two periods totaling 30 weeks. For the latter group, they still had 16 weeks of a caloric deficit like the former group, but they

Setting it Up

1. Determine weekly calorie intake.
2. Choose number of high calorie days.
3. Choose how high calorie you would like your high calorie days (the higher the calories on high days, the lower the calories will be on low days). Typically, this number is around maintenance or greater.
4. Multiply the number of high calorie days by the calorie amount of those days. This will give you total calories consumed on high calorie days.
5. Subtract total calories consumed on high days from weekly calorie intake, this leaves you with the calories from your low calorie days.
6. Divide your total low day calories by the number of low calorie days to get your daily low calorie day intake.
7. Determine macronutrients for each day as described previously.

20. Intermittent energy restriction improves weight loss efficiency in obese men: the MATADOR study. Retrieved January 3, 2018, from https://www.nature.com/articles/ijo2017206

alternated it with two week periods of maintenance eating. So for this group, their participation looked like this: Two weeks deficit, two weeks maintenance, and so on until they reached 30 weeks total.
Prior to any caloric restriction, 47 of the participants established a baseline and from there, while in the caloric deficit ate at 67% of their maintenance calories. At the end, the group with intermittent caloric restriction had lost more weight per weeks dieting than the group at the consistent deficit. Not only that, when they adjusted for changes in body composition, the intermittent group was found to have maintained a higher BMR than the group who had a continual deficit. The upside to this is that the intermittent maintenance period seems to suggest that it's possible to successfully diet while staving off too many of the negative metabolic adaptations.

I'm sure many people will be very excited to implement this. Only 2 weeks of dieting at a time and I will lose more fat you say? I'm in. Well, before you go too crazy, keep in mind there are some drawbacks to this method. While the diet breaks group lost more weight compared to the continuous group per 16 weeks of dieting, remember that it took the diet breaks group 30 weeks to get 16 weeks of actual dieting (caloric deficit). While they lost more weight on an absolute scale, it did actually take them longer in total because of the diet breaks because they basically just maintained their weight during the diet breaks. So this may be a great strategy to implement if you're at least 20+ weeks out from a show, but if you need to lose quite a bit of fat and you only have 12 weeks (you probably haven't read this book to begin with) then you probably will want to opt for a more traditional approach.

Another drawback for this approach is that eating 67% of maintenance calories during the diet period, while it's only 14 days, it is aggressive. And by that, I mean *highly* aggressive. If we take our bodybuilder whose maintenance was 3300 and have him eat at 67% of that intake, that's only 2211 calories. That's not a lot of food for a guy his size. And if we look at our bikini competitor, it's much less. For her, 67% of maintenance calories of 1985 would equal approximately 1330 calories. Not exactly a lot of calories. So many people may find it difficult to stick with this as it will be very restrictive. Additionally, the MATADOR study also adjusted the "maintenance calories" used in the diet break period to account for any metabolic adaptation. That is, every two week period, they recalculated the subjects maintenance calories using the

Müller equation by entering the subjects new data (changes in lean body mass and fat mass). So if you're performing this sort of dieting, keep in mind that your maintenance calories will change and you have to recalculate them using one of the equations we discussed in Chapter 2 (the MATADOR study used the Müller) or recalculate your maintenance calories using the trial and error method as described in Chapter 2.

Keep in mind there are no rules that say you have to eat at 67% of maintenance calories for two weeks. This is just what was done in the experiment. We know it works, but we don't know if that's necessarily optimal. Why couldn't you do a three week diet at 78% of maintenance calories rather than 67% for two weeks. The reason I say 78% is that's what it would be if you spread the same deficit they crammed in two weeks over three weeks instead. Further, there's nothing that says you need to be so aggressive so long as you can lose the appropriate amount of body fat in the appropriate amount of time.

Let's take our bodybuilder example again. Earlier we gave the example of the calories and macros he would need to consume as a daily average for a 24 week prep. His average daily calories would start at 2790, protein at 210, carbs at 295, and fats at 85g. But let's say we wanted to institute two week diet breaks intermittently after two weeks of dieting and we would do it as they did in the experiment with 30 total weeks, 16 weeks in a deficit and 14 weeks of diet break at maintenance. Recall that we estimated he had 14.0kg to lose in total body weight to be stage ready. Previously we had discussed him doing a traditional diet for 24 weeks to get there, which would make his rate of loss approximately 0.6kg per week. If we decided to do 30 weeks total dieting with 16 of those weeks being restriction and 14 weeks being at maintenance, that means he would likely not be losing weight during his 14 weeks of maintenance periods, and thus he would only have 16 weeks to lose the 14.0kg. This would put his total rate of loss at 0.9kg per week of deficit. That's 0.9% body weight loss per week, which as I said earlier is near the upper limit of what I recommend, however recall that this won't be a sustained deficit as he will be instituting diet breaks which will help keep his metabolism from slowing down and retain lean body mass.

Since we know he needs to lose 0.9kg per week, we can determine what kind of daily average deficit he will need. If we refer to Table 3 from Chapter 2, we can see that

0.9kg of weight loss per week will require approximately a 765 calories deficit per day, we can calculate his starting macros for dieting weeks and maintenance weeks.

Recall that his maintenance calories are 3300. Daily deficit required during diet weeks = 3300 - 765 = 2535. Protein intake is the same as before (calculated from Table 1 in Chapter 2) of 210g/day. Subtract protein calories from daily calories 2535 - 840 = 1695 calories remaining. Distribute remaining calories between carbs and fats (calculate free hand or use Table 2 in Chapter 3). In our example bodybuilder, he chose a 60/40 (carb/fat) breakdown which leaves us with 1695 × 0.6 = 1017 calories from carbohydrate and 1695 × 0.4 = 678 calories from fat. 1017 ÷ 4 calories/gram carbohydrate = approximately 255g carbohydrate. 678 ÷ 9 calories/gram fat = approximately 75g fat.

His diet break numbers would be 3300 calories per day (maintenance) with protein at a 'non-deficit' level (Chapter 3, Table 1) of 175g per day (also calculated previously in the refeed example). 175 x 4 = 700 calories from protein. 3300 - 700 = 2600 calories remaining for carbohydrate and fat. As shown previously, he was on a 60/40 breakdown of carbs/fats. 2600 x 0.6 = 1560 calories from carbohydrate. 1560 ÷ 4 = 390g carbohydrate per day. 2600 x 0.4 = 1040 calories from fat. 1040 ÷ 9 = 115.6g fat per day (round to 115g fat). This would put his macros during the diet break at 175g protein, 390g carbohydrate, and 115g fat per day. What's important to note is that the "maintenance calories" should NOT be the same for each diet break period. Recall that as you diet, you lose fat mass and lean body mass, and while diet breaks will help prevent metabolism slowing from metabolic adaptation, metabolism will still slow down during dieting due to loss of overall body mass. Thus we need to recalculate our maintenance calories during each diet break. In the MATADOR study referenced here, they used the Müller equation to calculate maintenance calories during each diet break period. You could recalculate your diet breaks in this way or you could determine maintenance calories manually using the trial and error method described in Chapter 2 maintenance calories section. Remember that whatever method you use, always use that method and stay consistent with it.

Keep in mind not to get stuck with the idea that the only way a diet break can work is by doing 2 weeks deficit and 2 week break with the deficit at 67% of your maintenance. You can adapt it and customize it to your needs.

For example, how would it look if we did the same thing with our bikini competitor? Recall that she needed to lose 6kg total based on our earlier calculations. If we spread that over 16 weeks of dieting that would be 0.375kg per week, which is very similar to what we calculated previously (0.36kg per week). For the sake of changing up our example, let's say that she didn't want to have to do 30 total weeks of dieting. So instead of doing two weeks dieting followed by a two week diet break, she decided to do three weeks of dieting followed by a two week diet break. For the sake of ease, we will say that she's only going to spend 15 weeks in a deficit. That's five periods of three weeks spent in a deficit, with two week diet breaks in between. That's a total of 23 weeks of dieting with 15 weeks in a deficit and 8 weeks in a break.

Figure 3. Diet example that includes five periods of 3 weeks spent in a deficit, with 2 week diet breaks in between. There is a total of 23 weeks dieting with 15 weeks in a deficit.

We can then easily calculate her starting daily average deficit calories during the diet weeks using the information from above. She needs to lose 6kg and plans to spend 15 weeks in a deficit. 6 ÷ 15 = 0.4kg per

week of dieting. We then need to determine what caloric value is equivalent of 0.4kg of body weight. If we reference Table 3 from Chapter 2, we see that 0.4kg is equivalent to approximately 2381 calories per week and 340 calories per day deficit. Her maintenance is 1985 so 1985 - 340 = 1645 calories per day. We can then calculate her macros as demonstrated previously.

Briefly, we first calculate protein from Table 1 in Chapter 3. Her protein intake was determined to be 145g protein per day (3.0 g/kg LBM). 145 × 4 = 580 calories from protein. 1645 - 580 = 1065 calories left to distribute to carbs and fats. Using Table 2 from Chapter 3 we can select a carb/fat breakdown based on preference. Previously we used 60/40 carb/fat so we will apply it here for consistency. This leaves us with 1065 × 0.6 = 639 calories from carbohydrate and 1065 × 0.4 = 426 calories from fat. 639 calories ÷ 4 calories/g carbohydrate = approximately 160g carbohydrate and 426 ÷ 9 = approximately 45g fat per day.

Her starting maintenance macros can be calculated as well for her first diet break numbers (understanding each diet break will require a re-calculation of maintenance calories). Her protein intake can be determined from Table 1 in Chapter 3 as described earlier. This would equate to 120g protein (2.5g/kg LBM) which is 480 calories. 1985 calories (initial maintenance calories) - 480 = 1505 left to distribute to carbs and fats. Using Table 2 from Chapter 3 we can select the carb/fat breakdown as described previously. We used 60/40 fat which is 1505 × 0.6 = 903 calories from carbohydrate and 1505 × 0.4 = 602 calories from fat. 903 calories ÷ 4 = approximately 225g carbohydrate and 602 ÷ 9 = approximately 65g fat.

Another thing to consider is there's no reason you can't combine diet breaks with refeeds. In the case of our bikini competitor, 3 weeks is a long time to go on a deficit with no break. So let's say she also wanted to have 1 day per week at maintenance during her 3 week dieting phase. As we already know her starting maintenance calories and macros from what we just calculated (1985 calories, 120g protein, 225g carbs, and 65g fat or if we want to keep fat low as per traditional refeeds we could do 120g protein, 270g carbs, and 45g fat) we can determine what her 6 low days would look like if we put in one high day at maintenance. Since she needs to lose 0.4kg body weight per week we can reference we know her average calorie

intake during her initial dieting phase is 1645. Multiplied by 7 her weekly calories are 11515 calories. 11515 - 1985 = 9580 calories. 9580 calories ÷ 6 = approximately 1588 calories for her 6 low days during the initial diet phase. Calculating her macros from this is simple as we have described it many times now. Briefly, we know that protein is 145g during the deficit. This equated to 580 calories as we've shown previously. 1588 - 580 = 1008. Using the 60/40 carb/fat breakdown as described earlier leaves us with approximately 150g carbs and 45g fat on her low days. If she wanted 2 days at maintenance she could also do this as calculated previously. Alternatively, high calorie days don't have to just go to maintenance, they could be greater than maintenance, it simply means your low calorie days will be even lower. Try to find what you prefer and what is most sustainable and tolerable to you.

Once again, please keep in mind I'm not saying this is the absolute best way to do things. I don't think 3 weeks deficit and 2 weeks at maintenance is magic. Neither is 2 weeks deficit and 2 weeks break. There probably is an optimal breakdown of diet weeks vs. break weeks but we don't have enough data to determine what that is, and it's likely variable from person to person.

There's some data suggesting that the majority of metabolic adaptation occurs within the first few weeks of dieting, so if you're going to utilize the diet breaks approach it's probably best to do so using 2-4 week diet periods interspersed with 1-2 week diet breaks. In this case we are using 3 weeks diet followed by 2 weeks break.

Personally, if you were going to use diet breaks I wouldn't do more than a 4 week diet without a 2 week break, I would make sure that you don't spend less than 1/3 of total prep time at maintenance. So if you're in a deficit for 2 weeks, no less than 1 week at maintenance. If you're spending 4 weeks in a deficit, no less than 2 weeks at maintenance. Once again, this method of dieting has some great benefits but it also has some downsides, namely that it will likely take more time overall.

Now you may be thinking "that's ok, because I get to spend a lot of that time eating at maintenance." Keep in mind that eating at maintenance isn't exactly pigging out for most people, and you will still have to be diligently tracking, measuring your food, weighing yourself, taking body fat measurements, and will still contribute to the overall "grind" of prep.

> *Self control is fatiguing, and while a 40+ week prep using diet breaks may not sound bad, it would still be a hell of a grind.*

Cheating

I tend to draw a pretty thick and noticeable line in the sand about this topic. To start with, notice that I referred to it as a cheat *day.* The original idea was for it to be a cheat *meal.* That's it. One meal of the dirty, unclean, least "bro" foods you can imagine. Then, you go back on your merry way on the diet train. Problem solved. Except, not really.

One of the problems with cheat meals is that for many people they can trigger what's called a "disinhibition reflex" they become binges that turn into a **cheat day or days.**

So instead of having a controlled, reasonable amount of food at one meal, you wake up and have a thick stack of pancakes for breakfast (with some Bloody Marys if you're going to do it right), a bag or two of tortilla chips during the football game, *and* the pizza at night.

Next thing you know is you've derailed your progress and turned it into a binge where you suck down so much food that a black hole would be jealous. Those types of setbacks are never good. Not only that, this type of behavior also comes from the same crowd of "hardcore" people who live by the mantra "food is fuel, nothing more." If that were *truly* the case, they wouldn't let these binges happen.

So let's get one thing out of the way, first. Food definitely is fuel. All the math equations you've read up until this point talking about energy expenditure are indicative of that. On a broader level, food is more than that. You have various cultural, religious, and personal affiliations with food. You restrict food for Ramadan, and feast on Eid al-Fitr. You feast on Christmas, you have totem restaurants for anniversaries or special occasions, you have the ritual of wedding cake when you get married. Food is fuel and more.

> *To look at any food as "cheating" takes the joy out of your life. It also tends to create a poor relationship with food where guilt enters the picture and this can create more problems.*

I've seen more people enter what I call "fuck it mode" because they restricted themselves

to only “bro” foods so that when they ate *anything* off plan, they felt guilty and just said “fuck it.” Try to be reasonable. One slice of pizza is hardly going to derail your progress if you account for it in your macros. But a whole large pizza, breadsticks, ice cream, and donuts, washed down with a sixer of beer is going to set you back pretty damn far.

That’s not to say some foods aren’t problematic for you. If that’s the case, limiting them might be the best way to go about it in order to avoid binging. In and of themselves (allergies you may have not withstanding) foods are neither good nor bad and you want the least amount of restriction you can afford. Not only that, having some “bad” foods during your prep is going to be tough simply because the best foods are calorically dense. If you’re monitoring your protein and fiber intake like you should, the easiest route might be to either limit or eliminate some of your favorites. That’s just how the process goes, and the simple name for it is “self regulating.”

Lastly, cheat meals (or heaven forbid, cheat days) are typically not tracked. So you might go over on your net deficit for the week. You also don’t want that. It defeats the purpose of tracking your macros to lose body fat entirely. So the basic philosophy is this: it’s not a test, don’t cheat. There are better ways. High calorie days are fine. Refeeds are fine. Diet breaks are fine. There’s no reason to ‘cheat’ on your diet as you can have any foods you like if you account for them in your macro budget.

Summary

In summary, refeeding, calorie cycling, and diet breaks have very little hard data at this point in time. Diet breaks do seem to have some reasonably good data supporting their implementation but this research is in its infancy. I think what’s the most important thing to take away is these methods should only be implemented if they maintain or improve adherence and they need to be tailored to the needs of the individual rather than just applied in a blanket matter where everyone does the same thing.

I encourage anyone looking into these methods to try out a few different ways of doing things and see what you like best and what is the most sustainable for you during a prep.

07 WHERE TO START: TRAINING

In addition to your body adapting to your caloric intake in the form of metabolic adaptation, your body also adapts to any type of training stimulus you give it. For instance, when you first started lifting, you kept getting solid results month after month. We like to call these "newbie gains." When a muscle hasn't been exposed to a stimulus, it's going to respond by adapting very quickly to that stimulus to prevent continuous damage to the tissue.[1]

After a while, you might have noticed those results stopped, or at the very least, they slowed down. This isn't a bad thing. In fact, if this didn't happen, you'd be a superhuman. It just means that your body is doing what it needs to do so that it can be more efficient. The process of remodeling tissue is very energy consuming, so the body will want to "protect" the tissue from suffering as much damage from each subsequent training session so that the remodeling process doesn't have to be quite as energetically expensive.

1. Skeletal Muscle Structure, Function, and Plasticity. Retrieved January 3, 2018, from https://books.google.com/books/about/Skeletal_Muscle_Structure_Function_and_P.html?id=T0fbq_b89cAC

You probably noticed that the longer you trained, the less sore you got after your training sessions. That's part of the adaptive process. Be careful however, because soreness isn't a cause of muscle growth, but the reduction in soreness is an example of adapting.[2] When that happens, it's time to add in some new training stimuli. To do so, you have three basic ways to make that happen.

Progressive Overload

This is the only way to reshape your body and keep making gains in both strength, and hypertrophy.[3] While it covers a lot of variables, there are three main ones you need to focus on for your contest prep. It's also worth noting that it applies to all physical activity beyond lifting weights. For our purposes, we'll keep the focus narrow.

Intensity - The first metric of progressive overload is the intensity. Intensity refers to what percentage of your max strength for a specific exercise that you're working with. This is usually expressed as the absolute load or as a percentage of your one rep max for that exercise. For example, if your max deadlift is 300lbs (~136kg), and if you're using 300 lbs, the intensity is 100%. This means that it took the most concerted effort you could give to make that lift happen and that you could not complete a second rep. If you were using 240 lbs (109 kg) then that would be 80% of your one rep max.

Volume - Volume is simply the amount of weight lifted (or the distance you traversed). So back to our deadlift example, if you were to deadlift 205 lbs (~93 kg) for three sets of ten repetitions, you would equate your volume like this:

Weight × (Reps × Sets) = Volume or in our case, **93 kg × (10 × 3) = 2790 kg or ~6150 lbs**

Density - This one is related to volume. Density is simply the amount of volume you do in time. So if that deadlift workout that yielded you 2790 kg of volume took you 15 minutes, you would express it as follows:

2790 ÷ 15 = 186 kg/min for your density

2. Muscle damage and muscle remodeling: no pain, no gain? Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/21270317
3. Essentials of Strength Training and Conditioning. Retrieved January 3, 2018, from https://books.google.com/books/about/Essentials_of_Strength_Training_and_Cond.html?id=rk3SX8G5Qp0C

Figure 1. Progressive overload through intensity, volume, and density leading to long-term adaptations in muscle hypertrophy and strength.

One of the ways to increase your results is to have more workout density, so if that same workout took you 12 minutes, it would be as follows:

2790 ÷ 12 = 232.5 kg/min

The second figure is the more dense figure. And it works the same for distance, as well.

In summary, you can make progress by lifting more weight on your lifts (intensity), lifting more *total* weight (volume), and lifting more total weight in a shorter amount of time. While there are more tenets to progressive overload (tempo, metabolic stress, etc.), those are the basic three you want to focus on.

With that in mind, the first steps are to take an accurate look at what your training looks like now. Easiest way to do it is to take a pen and a notebook. No changes yet. Just track whatever you're doing. What you're doing is establishing a baseline activity level so you know where you're currently at.

Physique Assessment

Now, you're at the point where you have to evaluate your physique so you know how to structure your training. Not only that, you have to assess your body shape to know what attributes you can bring out more for greater emphasis when you practice your posing, which I will go over later.

However, there are some general rules you can follow to ensure success. In bikini and figure competitions, if you don't have well defined glutes and shoulders, it can be the difference between a top three finish and a fourth, fifth, or sixth place finish.

For men, you want to make sure that your shoulders and lats present an aesthetic picture by not being too big in comparison to the lower portion of your physique. In short, at the top, you need to be wide, and converge to a narrow waist, and then swell in size to a big set of legs. You want to create a really nice "X" frame. Since you can't shave inches off your hips and make your waist more narrow, the best way to make your waist look a small as possible is to lose as much fat as possible and get your legs, lats, and shoulders bigger.

Adapting to Training Volume

Like I mentioned, your training has some similarities to your diet. Whenever you adapt to the current stimuli—commonly called a plateau—you have to change something.

Contrary to what late night TV will tell you, you don't have to "confuse" your muscles or any nonsense like that. All you have to do is keep up with your progressive overload.

For your overall training volume, you want to start on the conservative side. The reason for being conservative at first is because volume is easy to add to your workouts. You can do that in a few different ways for a given muscle group, like adding more reps, more sets, more density, or even more accessory exercises. You can also do a combination of the three.

For example, if it's your chest day, and your day looks like this:

Flat Bench Press: 4x4-6
Incline Dumbbell Bench: 3x8-10
Incline Dumbbell Flies: 3x12-15

You have some leeway for the future. The easiest option is to systematically increase the given rep range on every exercise, starting with the flat bench. Then on your next chest day, you increase the reps on your incline dumbbell bench, and so on.

After that, or even before you opt to increase the rep ranges, you can simply add another exercise to your chest day. Perhaps after you flat bench press you can perform a few sets of dumbbell flat bench presses to increase the volume.

Still, there are other ways to add in more volume. Some of these methods are impractical, but for the sake of completion, it's worth it to include them, so here they are:

1. The first method is to go six days a week with a split that looks something like this: Upper Body, Upper Body (antagonists from the first day), and Lower Body. Then you would repeat that process again the next three days. This yields you with four upper body days and two lower body days.

2. This particular style is good if you have a lagging body part and you want to bring it up, but it also has a few time components that might not agree with your life, namely more laundry, and even more time at the gym. For this, you add another training session for a body part on a given day. To increase that further, opt for that twice a week. Again, it's impractical for many, but it does work.

However, you don't want to add too much volume, too quickly because at some point you will also adapt to that volume level, and when you adapt to too large of a training stimulus, it will be tough to manipulate as your prep goes on.

For example, if your squat has plateaued and you decide to start squatting everyday, sure your squat will get much better (provided you don't get injured) but once you plateau, how are you going to make progress? Squat 2x/day, everyday? So for this reason I recommend increasing volume and overload progressively and slowly, just like I recommend decreasing calories during prep (more on this in the next chapter).

After you increase the volume, you can then increase the density of your workouts. The simplest way to do this is to lower your rest periods. So if your accessory work has you resting for two minutes, you can bump those rest periods down shorter and shorter over time (while maintaining volume) to increase your workout density.

Finally, you can increase the intensity in the form of the load you use for your workouts, once you've exhausted all these options. I wait to mention this method last, because heavier weights are hard on the body in terms of systemic stress and your ability to recover. However, if you're working toward the same rep schemes, you won't be close to 100% of your one rep max, so the increases in intensity aren't as drastic as they could be, but enough to stimulate new growth, which is exactly what you want.

Training During Prep

I mentioned the three big metrics of progressive overload, and those are going to be key for your training during the contest prep. While most of us won't be building muscle during prep (unless you were really obese to start, a beginner, or on steroids, the first 2 being quite unlikely), you still want to focus on maintaining it to the best of your ability as it's likely you will lose some lean body mass during prep (see our conversation in Chapter 2). Additionally, training adds to your activity factor and overall systemic stress, which is what you want so that you can keep seeing the results you want.

To that end, you want to induce the most systemic stress that yields the change you want *as well as* that from which you can recover. In addition to that criteria, any injuries, or other limitations must be taken into account

along with your overall lifestyle. For instance, if you have an office job with minimal stress, and no lingering, lifelong injuries, you could get away with having a few days of compound movements in your training program. This means you could squat, deadlift, or even overhead press at a higher frequency.

However, if you're a roofer, working every day, sometimes putting in hours of overtime so that your 40 hour week turns into a 60 hour week, your training options are going to be a bit more limited. In this case, you might not be able to train for five or six days a week, like the office worker can. You might not even be able to get four days a week as often as you'd like.

Not only do you have to figure your job into this, but there's also everything else going on in your life.

Do you have children?

Do you sleep enough?

Do you travel a lot for any reason?

These are all factors that are going to eat into your recovery. You're not Superman or Wonder Woman as much as you'd like to think it, so make sure you plan your training to acknowledge for outside stressors and accommodate for those accordingly. For example, if you have 3 kids, work a stressful job, and are a single parent, it's probably not reasonable to expect to train 7 days per week with the latest awesome DUP squat 4x/week program.

> *Focus on something that will work for you and allow you sufficient recovery for your lifestyle.*

How to Train During Prep

Going into a full on discussion on how to train' is beyond the scope of this book as I could write an entire book just based on proper training.

In general, there are a few things to keep in mind:

1. Many people completely change the way they train during prep, whether it's doing less volume, changing exercises, or changing rep schemes. While programmed changes are fine, there's no reason to completely overhaul your programming during prep. In general, what builds muscle best will

also maintain it best. If you're used to doing a certain amount of volume and then you cut it in half because you're prepping, you're drastically reducing the signal for adaptation and telling your body "hey we don't need all this energetically expensive tissue because the stimulus is reduced, let's shed some of it."

2. You'll want to train in a properly periodized format. Again, there's too much to go into on this topic but in general, data seems to indicated that training in a daily undulating pattern seems to elicit greater adaptation long term and muscle growth than linear periodized or non-periodized training programs.[4] [5]

3. Training a body part multiple times per week seems to be superior to a single time per week based on the latest meta-analysis.[6] The optimal frequency is probably different from person to person but it seems to be 2-3x per week for each body part

4. Multiple sets per body part seem to be superior to a single set.[7] For upper body it looks like 8-10 sets per week per body part may be best and for lower body it looks like more than 10 sets per week. Keep in mind this research is in its infancy though, so it's difficult to put a hard number on it.

5. You SHOULD train to failure at some points and near failure often, but you should not train to failure too frequently and definitely not on every set. Training to failure is a huge burden on your recovery and too much of it will reduce your performance and impede your progression. I recommend 1-2 sets to absolute failure per week per body part. Make sure your failure sets are at the end of the workout and not

4. A comparison of linear and daily undulating periodized programs with equated volume and intensity for strength. Retrieved January 26, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/11991778
5. Effects of linear vs. daily undulatory periodized resistance training on maximal and submaximal strength gains. Retrieved January 26, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/21499134
6. Effects of Resistance Training Frequency on Measures of Muscle Hypertrophy: A Systematic Review and Meta-Analysis. Retrieved January 26, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/27102172
7. Effect of resistance training set volume on upper body muscle hypertrophy: are more sets really better than less? Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/29024332

the beginning. This way you won't negatively impact your performance on your other sets. For sets not taken to failure keeping them around an RIR (repetitions in reserve) of 1-2 (1-2 reps left in the tank) is probably best.

6. You will want to make changes in exercise selection as prep progresses. Heavy back squatting is awesome but by the end of your prep you're probably going to suck at it because your levers will be so different, you will have very little energy, and your core stabilization will be worse due to such a small waist. Therefore, it may be helpful to change to something like a hack squat. This goes for other exercises as well that might become very difficult to execute safely near the end of prep.

7. Train based on the category you plan to compete in. If you're a bikini competitor, it's not a good idea to bust out the most intense chest training protocol 3x/week and only train your glutes 1x/week. You should probably be training glutes at least 2x/week and possibly more. If you're competing in men's physique it's probably best not to train legs as much as you train your upper body. You may love training legs, but the fact is you're robbing your body's overall recovery capability from other body parts that are more important because they are actually displayed onstage while legs are not.

8. You should prioritize your weak points. If your back is a weak point, don't put it as your last muscle group to train on a day. Train it first. Also, if you're doing refeeds (Chapter 6) then make sure you train a weak point on a day you're having higher calories to take advantage of the improved recovery.

Based on the principles above, I recommend training 4-6 days per week if your schedule can accommodate it. Split your body parts up in a way that's easiest for you. An easy example might be:

4 Day (2x/week frequency per body part):

Monday: Upper body
Tuesday: Lower body
Wednesday: Rest
Thursday: Rest
Friday: Upper body
Saturday: Lower body
Sunday: Rest

5 Day (2x/week frequency per body part):

Monday: Upper body
Tuesday: Lower Body
Wednesday: Rest
Thursday: Chest and Back
Friday: Lower Body
Saturday: Shoulders and Arms
Sunday: Rest

6 Day (3x/week frequency per body part):

Monday: Upper Body
Tuesday: Lower Body
Wednesday: Upper Body
Thursday: Lower Body
Friday: Upper Body
Saturday: Lower Body
Sunday: Rest

Cardio

You might find that cardio is suspiciously absent during this discussion of starting prep. I tend to be a cardio minimalist only because most people have very busy schedules and I'd rather have them spend their free time that they can devote to the gym by lifting weights. I've seen many people abuse cardio. Yes it is a tool and can be helpful, but you do not want to over do it.

> *If you're a bodybuilder and you're spending more time doing cardio than you do lifting weights, something is wrong.*

Sport specificity is important, the goal is to be as muscular and lean onstage as possible. Both lifting weights and cardio burn calories, but only one will get you more muscle mass or help maintain that muscle mass.

Consider if the shoe was on the other foot. A bodybuilder spending more time doing cardio than lifting weights is like a distance runner spending more time lifting weights than running. Sure lifting weights is helpful for a runner, but not nearly as helpful as actually running, which is specific to their sport. Proportionately more cardio compared to lifting is ok when dealing with a physique sport like bikini since bikini competitors don't need to be insanely jacked, but keep in mind however, a bikini competitor still has way more muscle than your average woman.

Cardio Dosage

So how much cardio should you start with? It boils down to personal preference. You don't have to do any. In fact I've had people go entire preps with ZERO dedicated cardio.

What do you prefer? If you do less cardio you have more free time and you won't be so fatigued for your lifting sessions. If you do more cardio you will be able to eat more, but you will have less free time and possibly deal with more fatigue.

There's no right or wrong answer here. It simply depends on your preference. For people with slow metabolisms, they may prefer starting with some cardio so they can eat more. How can you decide on how to track and incorporate cardio? There are several ways you could do it but the most straightforward way would be to look at your weekly average deficit calories and decide how much you'd want to get from cardio and add it back in.

For example, if we take our bikini competitor example at 1680 calories per day intake or 11760 per week, if we started with a HIIT session of 8 intervals and a steady state session of 20 minutes and we calculate based on the machines she used for cardio, or online calculators, or FitBit (insert whatever calorie monitor you like) and we determined that those two sessions burned approximately 420 calories, we can then add that back in for the week. 11760 + 420 = 12180. Divide that by 7 days in a week and you get 1740. If we subtract her calories from protein (145g/day × 4 calories/g = 580 calories) 1740 - 580 = 1160 calories to distribute to carbs and fat.

Previously, we used a 60/40 CHO/Fat breakdown so if we stick with that example we end up with 1160 × 0.6 = 696 calories from carbohydrate. 696 ÷ 4 = approximately 175g carbohydrate. 1160 × 0.4 = 464 calories from fat. 464 ÷ 9 = approximately 50g fat. So by doing these two cardio sessions she has been able to give herself a bit more food each day. Keep in mind that NO estimations of caloric output are really that accurate, what's most important is sticking with ONE way of measuring output and ALWAYS use that. So if you're using a certain type of treadmill or elliptical and basing your caloric output off the reading on the machine, then try to ensure you only use that type of machine at your gym because if you use another, they may estimate caloric expenditure differently.

Another option is one that's getting more and more popular is to wear a step monitor and regulate your cardio that way.

For example, if you know that in the offseason you were taking 10000 steps per day on average, then you could simply try to maintain that. Remember that one of the reasons

our metabolic rate drops during prep is the reduction in NEAT. We simply move less and most times we aren't even aware that we are moving less. Someone who decided they wanted to do no cardio to start could simply focus on maintaining their average daily step output. Then could increase their steps based on their progress (we will continue this discussion of adding cardio in the next chapter). There's no right or wrong way to do this, but whatever method you choose, the key is CONSISTENCY, as I'm sure you've noticed by now.

What Type of Cardio?

The next logical question is, which sort of cardio should you do? The debate as it tends to make its rounds in the fitness circles is always between Low Intensity Steady State Cardio (LISS) versus High Intensity Interval Training (HIIT). Recall that when I talked about intensity, it was in terms of your raw strength. However, delving too far into this is beyond the scope, intensity also refers to all out effort. So if we were to make an easy comparison, a leisurely stroll for one kilometer might take you 15 minutes whereas a sprint of one kilometer might take you four minutes. Same distance, but different levels of effort involved. So for HIIT, you would alternate periods of high effort work—sprints, cycling, battling ropes, swinging kettlebells—with periods of lower effort work or even rest. LISS is exactly like it sounds. You're moving at a steady pace, and it's at a low intensity. So if you have ever seen the most bro bodybuilder plodding along on the treadmill, that is LISS.

> *With that out of the way, I'm going to say something that every scientist should say in their career at some point, "I changed my mind."*

Many "gurus" can never acknowledge that they have possibly been wrong on a subject. I change my mind on the subject of LISS cardio. When I started, I was very much against HIIT and for LISS. Then I switched to advocating for HIIT and spurned LISS. The reasoning was that LISS wasn't good for muscle retention because it was so non-specific towards weight training whereas higher intensity sprints were a little bit more similar to weight training. Newer research shows this statement to be false, it doesn't seem that HIIT cardio is better for retaining muscle than LISS cardio. However, per time, HIIT still wins. If you perform a half hour of HIIT you'll do more work than a half hour of LISS, which will yield

more fat loss.[8] Additionally, HIIT may increase 24 hour energy consumption even after the HIIT bout is done. Per unit time HIIT is king, in fact research has shown that HIIT can produce almost 50% more fat loss using less than a tenth of the time LISS.[9]

Should be a no-brainer right? But, there are a few downsides to HIIT:

- HIIT can impede recovery and increase risk of injury while you're in a deficit, which can lead to additional muscle soreness, and impeding subsequent weight training sessions.
- It's more psychologically taxing. I used to have to get psyched up just to do my HIIT sessions and you can only 'go to the well' so many times.
- Not everyone likes it.

Now what do you do? If you have the time, and hate HIIT, do some LISS. If you *love* HIIT, then do it. Either one will benefit you, and LISS won't make you more catabolic than HIIT.
If you need to jumpstart your creative process, here are some examples of each. We will go with HIIT, first.

Your intervals are as follows and they are written as work/rest and will take you 15 minutes to complete (they are listed seconds of high intensity/low intensity):

- 60/20
- 60/20
- 60/20
- 90/30
- 30/30
- 30/30
- 120/45
- 90/15
- 60/60
- 30/10

I would consider this a VERY challenging, advanced, HIIT workout, and I recommend doing this after a good 10-15 minute warm up at a moderate pace.

Let's say for the example you chose cycling, which for all intents and purposes, isn't a bad

8. The effects of high-intensity interval training vs. moderate-intensity continuous training on body composition in overweight and obese adults: a systematic review and meta-analysis. Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/28401638
9. Run sprint interval training improves aerobic performance but not maximal cardiac output. Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/20473222

choice as it has a low skill level which means form degradation will be less likely to yield injury. Hop on the bike, put the pedal(s) to the metal for 60 seconds. Then pedal lightly for 20 seconds. Repeat this process with intervals listed until the time is up. Go hard. Every time you perform HIIT, remember that the operative words are *High Intensity*.

If you don't like having so much variation in your HIIT intervals and want something easy for the sake of not having to think about it, you could just do:

- 45/15 or
- 40/20 or
- 90/30

There are infinite number of ways to program it. But it's important that you base it off your cardiovascular fitness. If you try to do intervals at 60/60 and are puffing wind after the first ten seconds and slowed to a crawl by 20 seconds, then going at a walking pace for 40 seconds because you're gassed is pretty pointless. Use an interval breakdown that's challenging but allows you to complete it without gassing after the first few intervals. For LISS, it's a bit more straightforward. It should be a bit of work, but not leave you feeling wrecked. My own personal favorite LISS workout is on the treadmill. I set it to 5.63 km/hour (3.4 mph) at an incline of six and walk for 35 minutes. I also manage to listen to a lot of podcasts and audio books during that time because it's not as taxing as a HIIT or weight training. This doesn't mean you have to limit it to a treadmill, either. You can use a bike, or if you live in an area where you like to walk briskly, go for it. It's also nice if you have elevations in those outdoor areas to traverse as well. I recommend finding a form of LISS that you enjoy and look forward to. You might even use it as time to walk your dog, mow the lawn, get the groceries, or do some other task.

> *Ultimately, your cardio choice boils down to this: what won't leave you wrecked, and what do you have time to do? Make your informed choice based on that.*

Now as for how much to do, it depends. If you started prep doing no cardio, add it in on an off day. If you followed the example template, you have four training days, and the addition of cardio would make for a fifth training day. Once you've added that extra day in, check to see if you're moving where you need to be in another seven days. It might be just enough to spur your forward momentum.

When Should I Do Cardio?

This is a topic I see a lot of people get wrong. How often do you see a competitor walk into the gym and hop on the cardio equipment and immediately do 30-60 minutes of cardio and then train? Chances are very often. Many competitors will say that they do this to 'warm up' and get the 'fat burning process moving' so that they burn more fat during their workout. Not only is there no evidence that doing cardio before weight training causes more fat loss, there's evidence that performing cardio before weight training actually can inhibit resistance training adaptations.[10] [11]

We don't know when exactly the best time to do cardio is, but based on the current research it's probably best if you do cardio on your off days from resistance training if possible. If this isn't an option due to schedule, then it's probably best if you try to separate cardio and weight training as much as possible during the day. Research shows it's slightly better to train in the afternoon compared to mornings for maximizing strength and hypertrophy.[8] So if you can't do cardio on a separate day, ideally you'd weight train in the afternoon, wait several hours and then do cardio before bed. If this isn't an option you could weight train in the morning and do cardio later in the day. If this isn't an option then I would recommend doing a lifting session whenever you can, then do your cardio after, this way it minimizes the negative effect of cardio on the lifting adaptations.

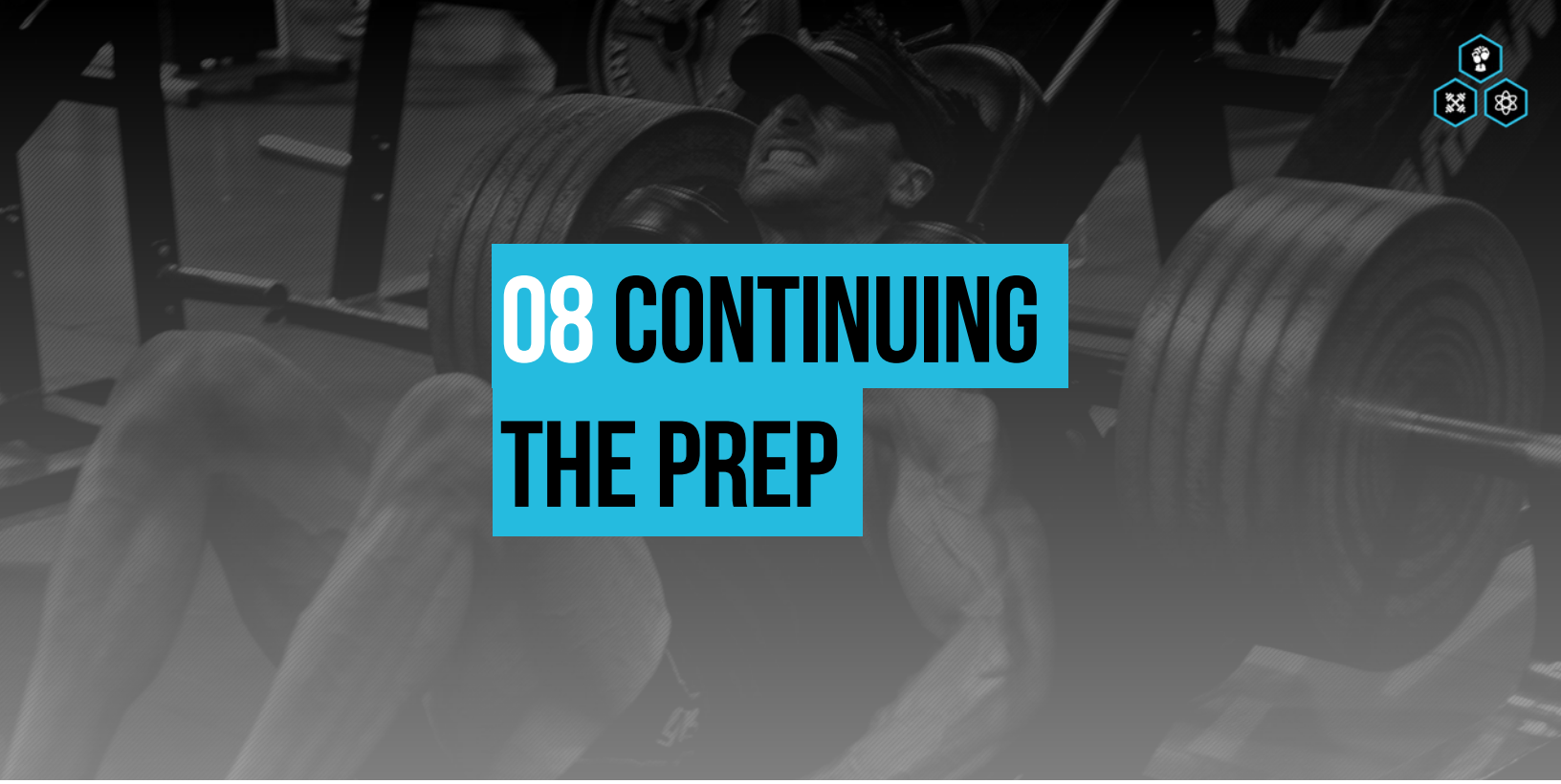
If none of these are an option, then you may have to do cardio in the morning and resistance train in the afternoon/evening. This would be one of the worst options, but the worst option seems to be doing cardio right before you resistance train if the goal is maximizing muscle mass.

10. Effects of morning versus evening combined strength and endurance training on physical performance, muscle hypertrophy, and serum hormone concentrations. Retrieved January 3, 2018, from http://www.nrcresearchpress.com/doi/abs/10.1139/apnm-2016-0271

11. Neuromuscular Adaptations to Combined Strength and Endurance Training: Order and Time-of-Day. Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pubmed/28704882

Summary

- You will adapt to training, too. This is ok.
- It's not about *overhauling* your training, it's about making smart additions and tweaks to it.
- The three listed metrics of progressive overload are key factors in making these adjustments.
- You don't *have* to do cardio, but it can be a good way to get over a plateau.
- HIIT is better if you're short on time.
- LISS might be better for your recover as you're deep in prep.
- Both can work, do what you like the best and add it in as needed.
- I would be foolish not to mention that you can go to **https://www.biolayne.com/members/workout-builder/** and sign up for our workout builder and get a custom program for your needs, right down to the type of competition you want to do. However, if you want some free workouts, we have included my PHAT program, and we will also link out to some other free sources at the end of the book.



08 CONTINUING THE PREP

Monitoring Your Progress

Data is king and the more data you have the better decisions you can make regarding your progress. In general, I don't like to rely too much on one method of monitoring progress as each method is subject to daily fluctuations that can skew our view of the data. Ideally, we would only use pictures to assess progress since the judges judge on aesthetics. Unfortunately, no one is objective enough to simply look at pictures and know if they are on track. Not even me. Especially not me.

Here's the thing, we can be objective with other people, but when it comes to ourselves and people we care about? Good luck. If I only went based off how I looked, I would be all over the place. One day I might be retaining a bit more water and look a bit softer and panic and drop my calories low because I feel like I won't be ready. Two days later I look amazing and am worried I will get too flat, so I raise my calories. Then a few days go by and the cycle continues. Many of you who have tried to prep yourselves before

are likely nodding your heads as you read this. Knowing that we aren't very objective ourselves means we need objective data in addition to subjective data. We use both in order to determine if we are on track and can continue our current course, or to see if we are getting behind in our prep and need to make adjustments with calories and/or activity.

So what do I recommend monitoring for progress? In general, there are 3 pillars of progress that I use.

Body Weight

Body weight is about as objective as it gets. Step on the scale and see where you're at. Simple right? Well, kind of. Body weight can fluctuate. Let me state that again; body weight can fluctuate. A lot. Those of you who've ever weighed in everyday know what I mean. If I look at data from my own last prep, I had a week where I weighed in the following weights, which I did in pounds because 'Murica. So every weigh in is as follows: 216.9, 216.5, 214.1, 214.5, 217.5, 215.9, and 215.3. In the following week it was 215.1, 214.7, 213.1, 214.0, 213.5, 214.1 and 216.8. Now if I weighed in on day 7 of each week on that day alone, I would think that I was in big trouble. After all, I gained 1.5 lbs in a week. If we look at the averages from the weeks we get a very different story. The first week average was 215.8 and the average for the second week was 214.5. On average, I lost 1.3 lbs, but if I only weighed in once per week, I would have registered as a 1.5 lb gain. That's a 2.8lb swing. This is why I prefer weighing in daily and taking the average for the week and comparing it to the average from the previous weeks. Day to day fluctuations may occur, but typically the weekly average will tell the true tale.

Not only do I recommend taking averages, I also want to minimize any variations in weigh in variables from day to day. That's why I recommend taking weight the same way, on the same scale, in the same place on the floor (yes this can make a difference), at the same time, under the same conditions. For ease, I recommend weighing in first thing in the morning, naked, after you wake up, and after you use the bathroom. Weighing in using this method will help minimize day to day fluctuations, though they will still occur.

Body Fat Measurement

I'm going to beat this topic to death since it was covered in depth in Chapter 1, but it's worth talking about how I recommend using

body fat measurements. As I discussed in Chapter 1, body fat measurements are highly volatile, so I tend to put less emphasis on them week to week and look more so at the trends over time. Body fat and lean body mass can fluctuate so much based on fluid retention that it's difficult to draw meaningful data in the short term. This is why it's critical to take these measurements the same way, under the same conditions each week to minimize fluctuations. As I discussed earlier, I recommend using a method of body fat assessment that you can do at home. By doing it at home, you can take the measurement before you eat or drink and meddle with the reading.

Ideally, when using calipers you would have someone else do it, but it's still possible to do it yourself. Whether you do it yourself or not, make sure you try to do it the exact same way every time. Your exact measurement may not be completely accurate, but it's likely that the relative change may be different. That is, you may measure at 11% when in reality you're 13%, but if you drop to 9%, that 2% change is probably relatively accurate, even if the absolute number isn't accurate. I like to take body fat measures in triplicate to minimize variability week to week. Usually I will measure my body fat 3 times and take the average of those measurements.

Pictures

While objective measurements are nice, at the end of the day, we are competing in a physique competition. No judge will get onstage with a scale and calipers and declare someone the winner. It's about what you look like. I don't recommend taking pictures every day. You'll just end up driving yourself crazy and you likely won't be able to determine progress from one day to the next. While pictures are subjective, I do recommend treating them as objectively as possible.

Just like weighing in, we want to do them under the same conditions to minimize any day to day fluctuations. This means we ideally take pictures on the same day of the week, the same time of day, in the same room, under the same lighting, wearing the same outfit (preferably our posing suit), using the same camera, on the same settings, *every single time*.

I recommend taking pictures on the day of the week you will end up competing (for people in the US this is usually Saturday, overseas it's Saturday or Sunday). I recommend taking them after you weigh in that morning before you eat anything. Whatever room you choose to take them in, turn all the lights on, and

use the flash on your camera. This is going to make for very harsh lighting and wash out a lot of definition, but that's exactly what's going to happen on stage. Stage lights are incredibly unforgiving. I've seen people take their update pictures in perfect lighting after they've carbed up and look like Greek gods only to get their clocks cleaned onstage because they thought they were leaner than they really were.

Here's my rule. Pay attention to it.

> *When you look GOOD in BAD lighting, then you know you're ready.*

I'm not saying you can't take some pictures after you carb up, in awesome lighting to post on Instagram (#gains #teamnorton #teambiolayne #contestprepguide). Nothing wrong with that. What I'm saying is don't use those pictures to assess progress. Post the awesome pictures online, but use your boring progress pictures when you're assessing whether or not adjustments are needed.

PROGRESS PICTURE EXAMPLE - 1 WEEK OUT

How to Assess Progress

Most physique coaches do some sort of check in with their clients to assess progress. Since you're reading this book, it's likely that you aren't hiring a coach or if you've hired one, you may not be confident in them. Either way, even if you're coaching yourself, you will need to do check ins to assess your progress just like any coach would. So let's put together our check ins. I suggest checking in with yourself a minimum of once per week. In being as specific as possible, I would also suggest you designate your check in day on the day of your competition.

You will want to check in with the following info:

1. **Body Weight:** Weigh yourself in the morning, naked, after using the bathroom, on the exact same scale, in the exact same place, and as close to the same time as you can, every morning. Average the weights for your check in for the week and then compare this average to the previous week's average. Taking the average helps ensure that you will minimize the impact any random fluctuations have on your body weight progress.
2. **Body Fat:** Once per week take a body fat measurement the exact same way, using the exact same apparatus. If you're doing it at home make sure to do it fasted, right after you weigh in. If you're using calipers, you can use 3 or 7 site calculations, just make sure you do it the same way EVERY SINGLE TIME. If you use calipers I recommend taking the measurements 3 times and taking the average of the 3 measurements.
3. **Pictures:** Take pictures once per week, in the exact same room, in the exact same spot, with the exact same lighting, using the same camera, wearing the same clothing (preferably your posing suit, if not then use underwear), and same settings. Take the pictures after you weigh in and take body fat measurements.
4. **Subject Feedback:** Answer the following questions (rank 1-10, 10 being best, 1 being terrible):

- Did I adhere properly to my macronutrient targets, training, and cardio? (1-10)
- How is my energy? (1-10)
- How is my strength? (1-10)

- How are my hunger levels? (1-10)
- How is my mood? (1-10)
- How is my stress? (1-10)
- How am I sleeping? (1-10)
- Am I on my period? (guys, you don't need to worry about this one)

This data you collect will help you determine if you're progressing at an appropriate rate. Since prep is a bit of a time crunch by definition (you don't have forever to get to your goal, there is a set date) I like to do two check ins per week. My big check in on the weekend with all the data above and a mini check in on a Wednesday where I look at my weight averages for the last week. I don't typically make adjustments due to data from this mini- check in, but it can influence whether or not I make a check in when the weekend comes.

For example, if my weight has been trending up during the week and stays up but slightly dips back down at the end of the week, I might be more inclined to make a change than if I'd only checked in on the weekend and saw that might weight had slightly dropped. If I was only taking the weekend data, I might decide to wait a week before pulling the trigger on any changes. But seeing that my weight had been consistently up during the week and had only slightly dipped back down on the weekend may sway me especially if my body fat had not gone down and my pictures didn't look any different. Alternatively, I might decide to wait to make changes but then I see on the next mini check in that I still wasn't dropping weight, that might make me pull the trigger on making changes mid-week instead of waiting until the next weekend.

Interpreting Check In Results

The main driver of my adjustments is typically body weight, only because it's a completely objective measurement and less subject to screw ups. Body fat should be objective in theory, but the means of measuring it are so volatile that it's difficult to really be super confident in the measurements. So how do we know if we are making appropriate progress? We look at the data and make a judgment call. In terms of body weight, we have a weekly target based on how much we have to lose all together. If we use the example of our male bodybuilder from Chapter 2 who needs to lose 14.1 kg in about 24 weeks of dieting, then we are looking for about 0.6 kg of loss per week of dieting. I say "per week of dieting" because if you're instituting diet breaks, then you will be doing a longer prep and you will have periods of 1-4 weeks (depending upon

your diet break duration) where you likely won't' be losing weight.. So if our target is 0.6 kg per week, if we don't lose that much then we need to make changes right?

Not necessarily. Remember that body weight can still fluctuate a lot. Even without anything weird going on (periods, binges, stress, etc) fluctuations of 1% are normal and even 2-3%. This is why I highly recommend taking the average weight from the week, but even with that, there can be week to week fluctuations. So if your target is 0.6 kg per week lose and you only hit 0.4 or 0.5 is it time to panic and drop 500 calories or add 3 hours of cardio? Probably not. In fact, it's probably not time to do anything yet. By the same token if you lose 1.1 kg in a week, is it time to add a bunch of calories back in? Probably not. In fact, in the first week of dieting, it's very common for many people to drop a lot of weight, some from fat, but quite a bit from total body water as well. Once fluid levels stabilize, then weight loss tends to continue at a more steady pace.

As we discussed in depth in Chapter 6, your metabolic rate is going to slow during prep. How quickly that occurs is quite variable from individual from individual. Typically, it's between 2-4 weeks for a noticeable difference to occur. But how can we tell the difference between a real reduction in metabolic rate, vs. a week where your weight trended upward a bit? This is why we have markers other than body weight to go by. I require 2 of our big 3 metrics not progressing before I'll make a change. For example if body weight didn't drop as much as we'd like or stayed steady, but body fat dropped and you look visually leaner in pictures, then I wouldn't make any change. But if body weight did not change, body fat did not change, and you can't see much difference in leanness, then it's probably time to make a change.
If you're in doubt and you think you look leaner and body fat dropped slightly but your weight stayed the same or went up slightly, then I would hold steady, provided you have sufficient time.

However, if your rate of loss required to make your goal ever begins to approach or exceed 1% body weight per week, then it may be time to get more aggressive. However, if you have 2 check ins in a row where weight loss did not achieve at least 50% of the target goal (ie 0.6 kg per week but for the last 2 check ins you've been averaging less than 0.3 kg per week) then you're likely starting to plateau it's time to make a change regardless of body fat measurements.

Plateaus

Everyone hates a plateau. The general consensus is that they are these insurmountable obstacles that royally hinder you in every way. Yes, they are a hindrance, but the important thing to remember, like I've mentioned before, is that you *will* plateau. I've only come across ONE client who never plateaued their entire prep. In 13 years of doing this. A plateau is just your body's way of adapting to the stimuli it's receiving. In an effort to reach homeostasis, your metabolic adaptation occurs along with a decrease in NEAT, and you stopped losing fat, even though you're eating a level of calories that was allowing you to lose fat previous to the plateau.

> *All of this is normal. Typically, most people will encounter plateaus once every 2-4 weeks.*

When a plateau occurs, you simply need to tweak the stimuli. These changes to your whole entire prep can come in various forms, some of which are easier than others, the "others" being the ones you will likely hate the most.

Options for adding stimuli include:

- Decreasing calories
- Adding in some cardio
- Adding in more training volume
- Increasing the training density
- Increasing training intensity
- Reconfiguring your training split, which can also be a form of adding volume

Nutritional Adjustments

If you're no longer losing weight/body fat at the appropriate rate, or likely, not at all, then that means your metabolic rate has lowered to the point where your current intake is either now your new maintenance or getting close to it. I've had many people exclaim "I don't understand, I'm in a caloric deficit, why am I not losing weight." Well quite simply, "maintenance calories" are a moving target. The longer you diet, the more your metabolism adapts, and the lower your TDEE/ maintenance calories becomes.

If you aren't losing weight or body fat, then by definition you are NOT in a deficit.

In order to continue to progress, you must re-establish the deficit. Keep in mind however, there are a few things that can cause a "false positive" that you're at a plateau.

Figure 1. Metabolic adaptation during a dieting phase. Over time, your BMR and NEAT will drop and you will burn less total calories. This can cause plateaus in fat loss as you're prepping and in order to get fat loss going again, you will need to reduce calories or increase activity.

- Menstrual cycle for women (most stop losing or gain some weight)
- Excessive stress (I've seen people under enormous amounts of stress retain quite a bit of fluid)
- Consistent lack of sleep. Believe it or not, sleeping metabolic rate is important for fat loss and I've seen people's progress grind to a halt with prolonged lack of sleep
- Illness can cause a large immune response that increases total body inflammation causing greater water retention and increased body weight
- Injury also causes acute increase in inflammation which may increase water retention and body weight
- Lack of adherence. As much as this sounds like an obvious slap in the face of a bullet point, it's the biggest cause of lack of progress. If you aren't consistently hitting your targets your progress will be staggered or non existent

If your progress stops but you're experiencing one or more of these problems then it may be best to err on the side of caution and wait one extra check in (if you can afford to) in order to see if progress will continue. However, if you're nailing your nutrition targets, hitting your training program hard, and nailing your cardio recommendations, and still find your progress grinding to a halt, then it's time to make some adjustments.

Logic dictates that simply math will tell us how to progress. If someone was consuming 2790 calories per day to lose a targeted 0.6 kg per week like our bodybuilder example, but stops losing weight that SHOULD equate to a further 510 calorie per day reduction (see Chapter 2, table 3) in calories in order to resume normal progress. That means we would need to reduce calories to 2280 in order to continue progress at 0.6 kg per week of body weight loss right? Not necessarily. Now you won't find this information in any text book or pubmed citation (no hate, I love pubmed) but after working with over a thousand people in my career, I can tell you with 100% certainty that there are thresholds in metabolism.

I've had people stuck at a weight for weeks and by simply reducing their carbohydrate intake by 10-15g per day and fat by 2-3g per day, it suddenly gets them to drop a kg within a week. It doesn't make sense, but I'm sure many coaches reading this book will nod their heads in agreement. This was something I discovered through sheer mass effect of working with so many people. I used to make

really aggressive drops in calories, but over time I found I really did not need to make them. In fact, typically a 5-10% reduction in carbohydrate and fat intake will be enough to do the job and resume progress. Occasionally, I've had people who needed to approach 15% reductions in carbohydrates and fats in order to keep progressing, but those were pretty rare. How much should you choose? That depends on the individual. The best advice I can give is to start conservatively with a 5% reduction in carbohydrate and fat intake and document how your body responds. If you find that's insufficient to jump start progress after a few adjustments, then try 10%. If that doesn't do the trick then try 15%. I've met very few people who did not respond to a 15% reduction adjustment.

If we take our bodybuilder example who was consuming a daily average of 210g protein, 295g carbs, and 85g fat, if we dropped carbs and fats by 5% we'd be looking at dropping approximately 15g from carbohydrate and 4g fat. If we did a 10% drop we'd be looking at approximately 30g carbohydrates and 8g fat reduction.

What if someone is doing high calorie days and low calorie days? Typically I will drop from both days in proportion. So if we look back at Chapter 6, we gave the example of our bodybuilder having a five lower calorie days of 210g protein, 260g carbohydrate, and 75g fats and two high calorie days of 175g protein, 480g carbs, and 75g fat. If we hit a plateau and decided to drop 7% from carbs and fats, that would mean a reduction of 18.2g carbs (rounded up to 20g for sake of easy numbers) and 5.25g fat (rounded to 5g) on lower calorie days. On his two higher calorie days per week this would be a reduction of 33.6g carbs (rounded to 35g) and 5.25g fat (rounded to 5g).

This isn't a set in stone rule however. You could always keep your higher calorie days at the same carb and fat intake and only reduce your lower calorie days, the downside to this is that it means you will have a much bigger drop on your low days.

If we use our previous example but decide that we aren't going to reduce the carbs and fats on his high days we need to figure out how much lower to drop them on his low days. We calculated a reduction of 20g carbs and 5g fats. This equates to 125 calories. Since he has two high days this means the total reduction that *should* have come from his high days is 250 calories. Since his distribution of calories is 60/40

between carbohydrate and fats (see Chapter 3 discussion on carb/fat distribution) that equates to 150g calories from carbohydrate and 100 calories from fat. Since there are five low days remaining in the week to distribute these calories over, this equates to 30 calories per day from carbohydrate and 20 calories from fat which corresponds to a further low day reduction of 7.5g carbohydrate and 2.2g fat per day. Remember that previously we reduced his low day numbers by 20g carbohydrate and 5g fat. If we add 7.5 and 2.2 we get 27.5 and 7.2g which we can round to 30g carbohydrate and 7g fat. This leaves us with 260 - 30 = 230g carbohydrate and 75 - 7g = 68g fat. Therefore, his new low day numbers would be 210g protein, 230g carbohydrate, and 68g fat if he wanted his higher calorie days to remain the same.

I've seen some people abuse this methodology where they are essentially starving themselves on low days only so they can gorge themselves on their high days. I've found that this typically doesn't work well for most people. This sort of dieting on extremely low calories for most days so you can have a few controlled binges usually leaves you feeling extremely weak, tired, grouchy, and hungry on your lower calorie days whereas on your high calorie days you may have slightly more energy from food but your body feels sluggish because you're so bloated from eating so much food.

My recommendation is to not let high calorie days exceed low calorie days by more than 2x difference. So if you're eating 2000 calories on your low days, the max I'd want to see on your high days is 4000 calories.

Understand that some people have more adaptive metabolisms than others and will adapt faster to the caloric deficit adjustments than those less adaptive. I've had people who I had to drop calories almost every week, while others needed only one or two adjustments their entire prep. This is where the individuality of prep comes in and understanding how your body is likely to respond to these adjustments is crucial.

Make sure you keep track of every time you adjust your intake and how your body responds. This will give you a more accurate idea of how your body is likely to respond in the future and you can adjust accordingly. That is, if you know you only require a 5% adjustment to continue progress, then there's no need to do 15%. However, if you know that 5% typically won't give you an adequate "jump start" then you will want to use a higher

number. If you know that 5% isn't enough but 10% definitely works, try a 7.5% drop next time and see if that does it. In this way you can titrate out the minimum adjustment required in order to continue progression. The first time you're making an adjustment, I'd try a 5% drop in carbs and fats and a 10% increase in cardio activity. If you don't wish to increase cardio activity then try a 10% drop in carbs and fats. If it works and you lose the weight you intend or more, then next time try a 5% reduction in carbs and fats and a 5% increase in cardio activity. If that produces results then maybe just try a 5% reduction with no increase in cardio the next time.

On the flip side, if a 5% reduction in carbs and fats and a 10% increase in activity doesn't produce results, try a 10% drop in carbs and fat and a 10% increase in activity. If that doesn't do it, then try a 15% drop. Once you hit an adjustment that works, the next time you plateau, try a slightly lower drop by 2.5%. So if it took a 15% drop to work, the next time drop back to a 12.5% drop and see if it still works. If you can't get results on a 15% drop in carbs and fats and a 10-20% increase in cardio activity then that's likely a good indicator that your metabolism isn't in a good place to prep for a show.

> *In general, be conservative if you can, but if you're starting to lag way behind (approaching requiring 1% drop of body weight per week to be ready) don't be afraid to drop the hammer.*

Cardio Adjustments

Our next item on the list is adding in some cardio. I approach cardio like I approach calories, I don't go crazy. I typically add 10-20% increase in cardio work. So if someone is currently doing 60 minutes of low intensity work and 10 intervals per week, I may go with a 10% increase which would add approximately 5 min of low intensity and 1 extra interval per week. Or, if you've been using the method of "step counting" and you're normally getting 10,000 steps per day, aim for 11,000.

I often like to reduce calories and add cardio together because this means I can make a smaller adjustment of both instead of using large reductions of one or the other such as a 5% reduction in carbs and fats and a 10% increase in cardio activity. *However*, please keep in mind that this is completely malleable. Want to eat more? That's totally fine, add more cardio and don't reduce calories or make a

smaller reduction. It has to be in proportion however. If you only plan to reduce carbs and fats by 5% but know that it typically requires a 10% reduction to see progress, then add an extra 5% of cardio activity above what you would normally do.

So if we plateau, we might be at minimum looking at a 5% decrease in carbs and fats and a 10% increase in cardio activity to continue progress. However, I've seen some people who could overcome their plateaus with a simple 5% reduction in carbs and fats and no increase in cardio activity or vice versa. This is where self-experimentation is crucial. Observe how you respond to various manipulations and adjust from there. It's not an exact science, but if you're paying attention and give yourself enough time, you'll start to notice trends.

What should we do if we haven't been doing any dedicated cardio but we want to add it in?

Typically, I would add a minimum of 20 minutes of LISS or a HIIT day of 4 intervals to start. This should produce around 100-200 calorie 'burn' depending upon your individual metabolic response to cardio. This is pretty conservative, but remember if you're also making a 5-10% (maybe 15%) drop in carbohydrate and fat, it's likely these small adjustments will be enough to get you past the plateau. Alternatively, if you haven't been doing dedicated cardio activity and wish to add it in during a plateau but not decrease your food intake you could just add a greater amount of cardio activity such as 3-4 sessions of a mix of HIIT and LISS. I don't have any scientific data to back up these recommendations, this is only going off of my observations with clients. I wish I had a magic blueprint to give you to say 'here, do X, Y, and Z, but I don't. The best I can do is educate you on your options and try to encourage you to monitor how you respond so you can make the best decisions over time.

Training Adjustments

Once you've added in the cardio, and increased your forward momentum, there will come a point where you still stall. Again. Fear not, you know enough about progressive overload to know that it isn't the end of the world, so you're just going to add in some more volume. Not only that, you aren't going to go crazy with the volume. Approach it like you did adding in cardio. Instead of adding 100 rep sets or crazy supersets, let's take a look at two easy options to start with.

The first option is something I do a lot of. They are called AMRAP sets. AMRAP stands for "as many reps as possible" and is self explanatory. To make sure the volume isn't junk volume, AMRAP sets work well when you incorporate them with large muscle groups, ideally on compound movements like squats, deadlifts, or even leg presses and pull-ups.

Let's say your max squat is 200kg, and you're doing some working sets of 140kg on your leg day. After your initial work sets, drop the weight to 130kg and see how many reps you can get in a set. Go for as many reps as possible. If you were doing four sets of 6 with 140kg, expect to push up at least six, maybe more. Let's say for the example, you achieve ten reps with 130kg for your AMRAP set. You've just added another 1300kg of volume to your workout. If you do the same for your deadlift, that's more volume. This way, at the end of the week, total work done is more than it was last week and you've increased your activity factor.

In addition to or possibly in lieu of the AMRAP, you can simply add more work sets to your big lifts and/or accessories. The easiest way to do this is to take some of your big lifts, like pull-ups, squats, overhead press, bench press, dips, hip thrusts, and the like, and tack on an extra work set to some of them.

On days you squat, for example, if your workout has you squatting four sets of six reps, knock it up to five sets of six. If you squat 100kg, that's an extra 600kg of volume in the workout, with more systemic stress on your entire body. And you could apply the same idea to all of the other big lifts listed above, as well, though the math will be different depending on the weights that you use for each one.

Up next, you can make your workouts more dense. If you recall, density is the volume you do in time. So if your 100kg squat workout for five sets of six takes you half an hour, and the next time it takes 20 minutes, your workout is more dense. At first glance, most simply assume that you just shorten the rest intervals in between sets. This is a good strategy, but it's only *part of the picture*. Indeed, shorter rest intervals will yield more density, but there are any number of ways to do more work in less time.

> *One of my favorite ways to go about this is super setting. While supersets sound like the most bro concept ever, they are great at both adding volume and condensing work.*

The latter reason is why I've done supersets consistently over the year. I just never talked about it due to a dearth of research on the subject.

Now, that has changed.[1] There's new research out that actually shows that supersetting antagonist muscle groups can not only save time, and add volume, but can also improve your potential for hypertrophy.[2]

For instance, if you do an incline dumbbell bench press, immediately followed by a chest supported dumbbell row on the same incline bench, you've worked your antagonist groups, and you've done it in a short amount of time.

If you were to implement super setting into your training, it wouldn't be too difficult. You can start with your upper body training days, and look at all of your pushing and pulling movements, first.

Next, take stock of your vertical pushing and vertical pulling movements, and subsequently pair them.

One example might look like this:

A1: Pull-up
A2: Barbell overhead press

B1: Barbell bench press
B2: Barbell bent over rows

C1: Incline dumbbell flies
C2: Chest supported rear delt flies

In sum, you perform A1 followed by A2, for the prescribed rep count, then you rest. After you do that about three or four times, you move on to the next superset and repeat.

For the sake of completion, it's important to note the other set of superset combinations. In the above cited study they make mention of A-A pairings (agonist and antagonist pairings like biceps and triceps).

In addition to A-A pairings, there are also A-P pairings of exercises (alternate peripheral exercises) which include completely different muscle groups. Squats and Bicep curls would

1. The effects of traditional, superset, and tri-set resistance training structures on perceived intensity and physiological responses. Retrieved December 28, 2017, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5556132/
2. The effects of superset configuration on kinetic, kinematic, and perceived exertion in the barbell bench press. Retrieved December 28, 2017, from https://www.ncbi.nlm.nih.gov/pubmed/28796130

be a good example of an A-P pairing, as well as a lunge and overhead press. I like to divide A-P pairings up into top and bottom groupings because it's easy that way, and it's also easier to combine compound movements.

Finally, there are the S-B pairings. These are what are known as similar biomechanical pairings. Examples of these could be preacher curls and incline dumbbell curls, deadlifts and Romanian deadlifts, bench press and dumbbell flies, and so on. Basically, the same muscle groups with different ranges of motion and leverages constitute a typical S-B pairing. As for these types of pairings, it appears that S-B pairings yield a higher rate of perceived exertion than the others, and it makes sense, intuitively, since you're taxing the same muscle groups, albeit a bit differently. With that in mind, you will have to pay extra attention to recovery during your contest prep, should you go the S-B route.

One final note about the S-B pairings, if you do opt for them, keep in mind the word "similar." As an example, if you opt for a S-B bicep pair, you wouldn't want to work them the same way. What this means is that you would be better off choosing something like a preacher curl, which has the highest activation during the first third of the movement, and a dumbbell incline curl where the activation is best during the last third of the movement.[3] Or, you could choose a neutral grip (hammer) curl which uses both the biceps *and* the brachialis, and pair it with a barbell bicep curl. Different emphases for a similar exercise.

Finally, in terms of making adjustments via progressive overload, you can raise the intensity. While intensity is measured in the terms of all out effort, the increases in load don't have to be directly correlated to your one rep max. In fact, it's more advantageous to look at it in terms of your rate of perceived exertion (RPE). As an example, if you've been typically taking an exercise to an RPE of 8 (see Table 1 on the next page), that means you could potentially squeeze out one or maybe two more reps in your set.

As you adapt to this stimulus, your RPE is going to lessen. You're going to become efficient because your body is saying "I can do this, better keep making it easier because I'm going to have to keep doing it." When that

3. Effect of the shoulder position on the biceps brachii emg in different dumbbell curls. Retrieved January 6, 2018, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3737788/

RPE eight finally becomes an RPE of six, you simply increase the weight. Once you increase the weight, you aim to hit your rep targets, ideally within a rep range. When you do that, own the weight. When it gets easier, increase the weight. As for my preferred hierarchy of progressive overload, I usually opt for increasing the volume, then the density, and finally, the intensity, and repeat that process. That's a bit of an oversimplification, but it's the general idea of how it works.

1-5 RPE	6 RPE	7 RPE	8 RPE	9 RPE	10 RPE
Very low effort. Like a warm up. You could have completed at least five more reps.	Easy effort. You could have completed at least four more reps.	Somewhat challenging. You could have completed about three more reps.	Reasonably challenging. You could have done two more reps. Most sets should be here.	Very challenging. You could have only done one more rep with good form.	Extremely challenging. You couldn't have done another rep without failing or bad form.

Table 1. Rate of perceived exertion (RPE) description.

One final option you have for tweaking all these training variables is to completely reconfigure your split. In the examples above, there were two upper and two lower body days. An easy way to add volume in on top of what you're already doing is to add in more work days. So the first sample split looked like this:

Monday: Upper Body
Tuesday: Lower Body
Wednesday: Off
Thursday: Upper Body
Friday: Lower Body
Saturday: Off
Sunday: Off

You had two upper and two lower body days a week and three off days. To add more volume, you could try something like this:

Monday: Upper Body Pulling
Tuesday: Upper Body Pushing
Wednesday: Lower Body
Thursday: Upper Body Pulling
Friday: Upper Body Pushing
Saturday: Lower Body

Obviously, six days a week is a lot to take in. If you don't go conservatively with the volumetric increases, six day splits can leave you feeling wrecked, especially if you're in the throes of months of dieting. If you're doing cardio on top of that, you then have to factor in even more time and more recovery. So use the six day split judiciously.

In between the four and six day split, you can also try a five day split, which could look something like this:

Monday: Upper Body Pushing and Pulling
Tuesday: Lower Body (More Quad Focus)
Wednesday: Upper Body Pushing and Pulling
Thursday: Lower Body (Posterior Chain Focus)
Friday: Low Volume, Low Intensity Total Body Workout
Saturday: Off
Sunday: Off

Obviously, these are just examples. The best way to figure out *how* to add more to your split is to keep an accurate training log that details all the sets, reps, and amount of time each workout took. Once you start keeping the log, you can figure out your volume, density, and intensity and make the appropriate changes to your program at any given time. Not only that, but keeping an accurate log makes going down the above bullet points a far easier task than simply winging it.

> *Remember, you can improve things if you measure them.*

Oops, I Screwed Up

So you went out and had a girls' night and wound up back at your BFF's apartment drinking wine and watching true crime shows on Netflix. And not only that, you all were just out at the food truck, and you might have had one or three too many tacos, and ice cream, and Reese cups. Then maybe washed it down

with some milkshakes. Oh, and the biggest horror of all? You're too hungover to go the gym the next day.

Is all hope lost? Is your prep doomed to fail? ***Most likely, no.***

This whole scenario is an amalgam of typical occurrences that we all go through, lumped into one horror story. What it comes down to is that you can break your adherence by either missing your training days, or overshooting (or undershooting) your calories for the day. Further, a lot of the fall out depends on where you are in your prep. If you're at the beginning of a 30 week prep, then this won't set you back too far, if you do it the day before your show, then you're probably in a good bit of trouble.

If you're fortunate enough to know how many calories you overate on a night out, this is a good thing. If it was the product of you simply having a good time and not a stress induced binge, you can take those calories, and deduct it from your subsequent days. For instance, if you overate 1000 calories, deduct 500 from the next two days, 250 calories for four days, or 200 calories for five days after. If the calories you overate are close to your high carb (if you're having them) day numbers then you could just take a high carb day for that day and not have it on your normal day. The point is not to panic if you simply overate. You will be ok.

Now, and I'm speaking not as a counselor because neither of us are counselors or physicians, but if you have an emotional binge, then you need to take a different course of action to avoid the cycle of binging and subsequently punishing yourself. This simply means to get back on the wagon the next day and move on. More importantly, work on the triggers that caused you to binge eat in the first place. I would highly suggest finding a counselor or therapist who is familiar working with physique athletes. This may sound like something that isn't a huge deal, but I would say more than 50% of the athletes I worked with at some point had a disordered relationship with food. Not all of them received or need counseling, but many did. I found that those people who got help typically had better long term outcomes than those who did not.

What about missed training days? Luckily, you have a lot of leeway here. If you're on a four day split and you train Monday, Tuesday, Thursday, and Saturday, for example, and you miss Saturday, you can easily bump it over to

Sunday. After Sunday, start fresh on Monday with your normal split. If you're on a more frequent training split, like five or six days a week, you would simply shift everything a day. If you, like 99.9999% of the gym population, work your chest out on Monday, you would move it over to Tuesday. That type of shift isn't going to make or break your prep.

Alternatively, you can treat a missed training day similar to how you would treat a day of overeating. If you missed day five of your five day split, you can allocate a lift or two from that day onto each subsequent day of the week to accumulate the volume you would have otherwise missed. Not only that, you won't throw your schedule off by having to shift everything.

Summary

In sum, we have a hierarchical list of variables to manipulate in order to break through a plateau. Typically, I find it easiest on competitors to make small adjustments from each so that it doesn't seem like such a huge "hit." For example, instead of making big 15% carb and fat drop, perhaps you can only drop 5% and increase your activity by 10% and increase the density of your training and that will help you get through the plateaus.

Whatever changes you make, be sure that you give them at least a week to work. Don't make a 10% drop in carbs and fats along with a 20% increase in cardio activity and then make another change 24 hours later because you had another bad weigh in. Try to be patient and document your responses.

After a few plateaus you should get an idea of how much of a carb/fat drop and/or cardio activity increase is required to continue progression. Remember there's no set rule that says you have to do a 5, 10, or 15% drop. You can do anywhere between those. Maybe 7% is your threshold. Maybe 12%. That's why it's so important to monitor your progress and see what you respond to. Further, you have to take into account the nature of your life, as well. For instance, for some people who work demanding jobs, adding in more training volume might not be a realistic option. Adding more training DAYS would be even less realistic. For that person, the only optimal course would be to add a cardio session where convenient and/or decrease food intake. The main takeaway is to have a list of all possible options, and take an inventory of your life and how you respond to various stressors. From there, make the best decision you can and dominate. Then, repeat the process. Make sure you're constantly looking

at pictures of some of the best competitors in your division. If you aren't at their level of leanness (be honest with yourself) then you still have work to do. So regardless of the scale and what progress it says you're making, if you're 4 weeks out and aren't seeing the definition you need, then you should make adjustments. Peaking early isn't a big deal. It means you can add calories back in. It's a lot easier to slow down fat loss than it is to speed it up, trust me on this. So while I always say err on the side of being conservative, it's also important to know when to drop the hammer, if you see yourself getting too far behind, remember that there's nothing wrong with being ready early.

This is why it's so imperative to give yourself sufficient time to prep. The more work you do in the offseason and on the front end of planning your prep and priming your metabolism, the less you will be likely to have to panic and get really aggressive during prep.

09 PEAK WEEK: THE FINAL COUNTDOWN

This is it. Everything that goes into what you present on stage at your show can either be flawless or broken during this week. Not only that, this is where you will see the difference between a novice's approach, as opposed to a more refined, experienced, and scientific approach. Believe it or not, over 95% of the popular BROtocols aren't based on anything remotely scientific. Quite the opposite, in fact. Most of these methods leave you looking worse, feeling like death, unable to properly focus and execute poses and are even quite dangerous. More than a few competitors have DIED following some of these ridiculous peak week protocols. All of these peak week protocols are in search of the elusive "dry" look and they all fall short in the science department and in the results department.

Oftentimes, when a competitor gets their scorecard back from the panel, they're greeted with the timely advice that next time, they need to be "drier."

I hate to break it to you, but 999 times out of 1000 it has nothing to do with a competitor holding water. It has to do with the fact that they still have a significant amount of body fat to lose.

Most people have no concept of what it takes to truly be shredded. Take my friend Brian Whitacre here. Look at how shredded he is in this first picture.

Would you believe that he's 7 weeks out there, and almost 10 lbs away from his final stage weight? Then check out his picture at 1 week out. Most people would look at his 7 week out picture and say he's ready. But most people have no idea how harsh stage lighting can be. You must be absolutely peeled, especially if you are competing in bodybuilding. Now check out Brian's stage picture. There may be people who have gotten leaner but I haven't met them yet. Also, would you believe that Brian didn't cut sodium or water at all? Not even on show day. The funny thing about getting lean enough is that you look 'dry' by default.

7 WEEKS OUT 1 WEEK OUT STAGE

Sadly, many coaches have convinced competitors that they can work peak week magic to make the competitor look way better simply by manipulating a bunch of variables during the final week. I've got news for you, if you're not lean enough by the time peak week comes, nothing you do during that final week is going to make a huge difference, in fact, most changes you make will do more harm than good. If you aren't looking 'dry' the best thing you can do is try to lose as much body fat as you can during the last week and fill out a bit on show day. But there are NO, I repeat NO crazy peak week magic tricks that will turn everything around. I've yet to hear a competitor say "man, I looked like garbage a week out, but that peak week voodoo I did fixed everything and I looked amazing."

What I do hear a lot goes something like this "I looked so good one week out and then so terrible on show day. I have no idea what happened." So if your feedback is that you need to be 'drier' the reality is you need to get leaner. It's not easy, but it is as simple as that. Not only do you need to be leaner to look drier, you also don't need to manipulate sodium and water as much as you think you do. Let me repeat that. *You don't need to manipulate sodium and water as much as you think you do.* Got it?

You're no doubt familiar with the bro science water loading protocols. Most of them go something like this:

7-10 days out to 2-3 days out:

Load sodium and water while depleting carbohydrates and engaging in high volume depletion workouts.

2-3 days out up until show day:

Cut sodium and water, take a diuretic, ingest large amounts of potassium, stop training, and load carbohydrates like crazy.

These protocols typically result in people looking softer, flatter, less vascular, and the icing on your crappy protein powder cake is that many can't even get a pump on show day.

When the show is over, many competitors notice that they actually look better late at night, or the following day. This is after they've had a few massive meals. So the assumption they make is that they didn't carb up enough. But that assumption is erroneous. Most of these competitors were already loading large amounts of carbohydrate. They looked better because they finally ate sodium and drank water. You will learn the very same thing,

shortly. So why do people do some of these crazy peak week protocols?

The goal of any peak week protocol is to get as much water into the muscle cells and leave as little water in the subcutaneous layer (between the muscle and the skin) as possible. In your body's natural state, you hold about 70% of the water inside your cells and about 30% outside your cells. That's a pretty favorable ratio to start with. Unfortunately, when we start trying to tweak too many things, it can get messy. Whether we like it or not, the body is always fighting to maintain homeostasis. You're body's fluid and electrolyte balance is extremely important. Fluid balance controls blood volume and affects blood pressure, a pretty big deal. Electrolyte balance can change electrochemical gradients which can affect every cell in your body, including your cardiac cells. We'll get to it shortly, but some of the "bro" protocols can actually put you in significant danger.

Enter Henry Louis Le Chatelier

Even though most of our water is held inside the cell in our natural state, competitors and coaches are always trying to tweak things to make massive changes in peak week. Typically by cutting sodium, water, and taking a diuretic. "Common sense" dictates that we should do that because we want to get as much water out of the subcutaneous layer as possible. But physiological processes aren't governed by surface level common sense. If you cut sodium and water, your body is going to fight for equilibrium. Your aldosterone (the water retention hormone) will increase, and it will cause water to be reabsorbed from the nephrons in your kidneys and fill in that interstitial space. And like I mentioned, you can't guide water excretion/absorption like a crossing guard (but more on this later).
This is where our French scientist, Henry Louis Le Chatelier, can lend us a hand with "Le Chatelier's Principle." It can be summarized as follows: "If a chemical system at equilibrium experiences a change in concentration, temperature, volume, or pressure; the equilibrium will shift in order to partially counteract the imposed change." In simpler terms, if you're dealing with a chemical system under equilibrium, any change to that system will then be met with a shift in the overall system to counteract the change and maintain equilibrium.[1]

1. Chemistry/Sixth Edition: e-Text by Raymond Chang. Retrieved January 3, 2018, from https://www.pdfdrive.net/chemistrysixth-edition-e-text-e19616505.html

So, let's take a look at how this applies to you and your prep. In a simple demonstration, let's look at it like this:

Figure 1. A. Water inside muscle cells B. Subcutaneous water (under the skin) C. Water being excreted in the kidneys.

For our purposes, A is the water in our muscles. B is the interstitial water (water that fills the subcutaneous layer under the skin), and C is water in the kidneys being excreted. If you were to take a diuretic to increase water excretion, that is, increasing the removal C, the system will shift and increase the removal of B, *and also accelerate removal of A*. This happens because of the body(system)'s need to maintain equilibrium. So while you have reduced total body water volume, the ratios between the different compartments will stay the same. The outcome is you simply look flatter. If you cut water, the end result is the same as taking a diuretic. You're taking in less water, which means less A moving into B, and into C. In the example of cutting water, the kidney has to hold back its excretion and increase reabsorption of water.

So, what about the hypothetical competitor in our example? Well, let's say he actually was holding water. In fact, let's say I knew beyond a shadow of a doubt that he was in shape. This in mind, the best thing to do is to increase A, the water in our muscles. How do you do that? You simply increase your blood flow, and blood pressure by getting a pump. This is NOT the time to go heavy. So in our example, let's say he was legitimately holding water the night before the show. By holding water I mean you could see swollen fingers and ankles, trademarks of edema. I would recommend some light circuit training the night before and the day of the show (early morning) to get a good pump. This will help shift water back into the muscle cells as fluid and nutrients are driven in by the cellular swelling driven by the training. Don't get too carried away. Think about when you got an insane pump during a workout, it probably also blurred out some definition, especially in the case of the lower body. So don't push too hard, but a light workout just enough to get a good pump can be beneficial towards slightly shifting your fluid dynamics in your favor and is a big reason I do NOT recommend stopping training during peak week. Think about it, you're going to not train for 5-6 days when the most time you took off during prep was probably 2-3 days max and now you're going to expect to get a pump after a 5-10 minute warm up backstage under high stress and after not training for almost a week? Good luck.

The Old Peak Week Games - Water

Every "super secret" peak week plan offers a high pay off. Based on what I mentioned so far, you know enough to know that the "secret" is a money making plot by bad coaches. Keep in mind that many coaches try to manipulate as many variables as possible so that:

1. You feel like you couldn't do it by yourself, so you 'need' that coach.

2. If you don't look your best, they can quiz you and easily figure out something small you did 'wrong' and blame it on that.

That being said, stop me if you heard this:

Starting on Sunday (six days out from the Saturday show) you're taking in low or even zero carbohydrates. In addition to that, you're increasing the salt intake, and you're drinking upwards of three times the amount of water you were taking in prior to peak week. Along

with all that, your training consists of high rep, depleting workouts. You continue this process until around Tuesday.

On Wednesday, or even Thursday, you start the hyper aggressive carbohydrate loading. Wednesday also marks the cessation of workouts and your cardio. Finally, Thursday typically marks a big drop in your sodium and water while simultaneously taking a diuretic and loading potassium.

When Friday rolls around, you're still pumping up the carbohydrates and you're cutting sodium and water still. Depending on how much of "the secret" you have, your water intake is, at best, less than half of your normal intake, or at worse, no water. Sodium is also very low, potassium is high, along with your diuretic.

On Saturday, you keep this process up--the potassium, diuretic(s), carbohydrates. Later, you come in looking less than your best because the entirety of these "secrets" didn't make up for that fact that your glutes weren't striated in the first place and in reality these "secret" protocols left you looking flat, less vascular, and soft.

At the end of the day, it all circles back to Le Chatelier's principle of equilibrium. In an effort to push water out of the subcutaneous layer, you simply reduced total body water. But water is not our enemy. Water is our ally. What do you think gives muscle tissue a 'hard' look? It isn't the tissue. Muscle tissue is a soft and squishy tissue. It isn't until those cells are volumized with fluid that they appear "hard." When muscle cells are volumized with fluid they occupy more space and press against the skin. This has a dual effect of making the muscle look 'harder' and stretching the skin to make it look "thinner" and you look "drier." Think about a water balloon. If you suck a bunch of water out of a water balloon does it look tight? No. Fill it up to the max just before it bursts and it looks very tight and "thin."

> *We should be aiming to maximize water in the cell and you simply are NOT going to accomplish that by reducing total body water.*

With that in mind, it's time to move on to why sodium depletion isn't much of a "secret" either.

The Old Peak Week Games - Sodium Depletion

I'm not sure where the notion that cutting

sodium was a good idea came from. In some ways it's worse than cutting water. Sodium balance is tightly regulated. Your body's equilibrium for blood sodium levels is right around 135-145 mEq/L. If you get very far away from these at all you could die. For that reason, it is *tightly* regulated. So much so that if you drastically increase sodium intake, your body responds by proportionately increasing sodium excretion. Remember Le Chatelier's principle; you're increasing the input, so to maintain equilibrium output is increased. If you consume less sodium, sodium excretion is decreased.

A popular saying in physiology is "today's sodium input is tomorrow's sodium output." That is, any water you retain from increased sodium ingestion is very short term, typically 24-48 hours and if you maintain that increased sodium output, the body will re-establish equilibrium by increasing sodium excretion This process is regulated in large part by a hormone called aldosterone. When sodium intake decreases aldosterone increases in order to increase sodium reabsorption by the kidneys. But in order to reabsorb sodium, you must also reabsorb water.[2]

A 1990 study from Harvard illustrates this point. Rogacz et al. reduced dietary sodium intake in a group of men to almost nothing for a six day period and examined the results on blood sodium levels. They also looked at aldosterone and urinary sodium, too.[3] Check out the results:

	Initial Levels	1 Day	2 Days	6 Days
Urinary Sodium	217 (mmol/day)	105	59	9.9
Aldosterone	10.4 (ng/100ml)	11.7	22.5	37
Serum Sodium	139 (mEq/L)	139	139	138

Table 1. Results of a reduced dietary sodium intake. Table adapted from Rogacz et al.

2. Human Physiology, 8th by Fox, Stuart Ira: McGraw-Hill Companies. Retrieved January 3, 2018, from https://www.abebooks.com/Human-Physiology-8th-Fox-Stuart-Ira/934500007/bd
3. Time Course of Enhanced Adrenal Responsiveness to Angiotensin on a Low Salt Diet. Retrieved December 28, 2017, from http://hyper.ahajournals.org/content/hypertensionaha/15/4/376.full.pdf

Blood sodium levels were almost PERFECTLY conserved. But in order to do so, aldosterone increased. In fact, aldosterone had doubled within 2 days of depleting sodium. Think about the normal peak week "brotocols," where sodium depletion started two days before the show. This means by following these protocols your aldosterone levels will be DOUBLED on show day. We are talking about a hormone that makes you retain water being doubled on show day. In addition to that, the sodium depletion will lower your blood pressure. Lower blood pressure means you won't succeed in getting a pump like you normally would. Lower blood pressure also means that the reabsorbed water from the kidneys won't have the pressure to remain in the vascular system and will leak into the subcutaneous layer. This is one potential end result of following a brotocol like this.

That's not the end of the problems with brotocols, either. That extra potassium loading isn't going to help *at all*. If the ratio of potassium to sodium is too high, your aldosterone will increase even more on top of what happened by depleting your sodium. And then comes *even more* subcutaneous water.[2] If only this were the last of the problems with these methods.

You learned depleting sodium can actually make you look softer. However, depleting sodium will impede your ability to achieve fullness, as well. In your small intestine you have what's called a sodium-dependent glucose cotransporter called SGLT-1 and it's responsible for glucose absorption. It's called a cotransporter because it uses a sodium gradient to drive glucose from the intestine to be absorbed. Research demonstrates that sodium restriction will actually reduce the expression and activity of this transporter.[4] In turn, this limits your ability to absorb glucose and prevents you from achieving the great fullness you desire. Further, think about the timing of these brotocols because you will be cutting sodium at the same time that you're loading a lot of carbohydrate (often in excess of 500g per day for 2-3 days).

All that undigested glucose is going to remain in the small intestine and pull water into that area in order to maintain proper osmolarity and it will cause bloating in the small intestine.

4. ACSM's Advanced Exercise Physiology. Retrieved January 3, 2018, from https://books.google.com/books?id=YAAT1-hebMgC&pg=PA365&lpg=PA365&dq=ACSM's+advanced+exercise+physiology+slgt1+charles+tipton&source=bl&ots=lSD5iITFuZ&sig=ZmUaK5Jk8WNU-GqVxN7m9h4qi3k&hl=en

Figure 2. The physiological changes that happen when you cut sodium in your diet. Your body will fight to maintain homeostasis by secreting aldosterone from your adrenal glands. This hormone causes your body to reabsorb sodium and water in the kidneys.

So now you've managed to put water *everywhere* but where you need it. It's just sitting there in the subcutaneous layer and the gut. Now you look softer.

I haven't even mentioned sodium depletion effects on vascularity. Sodium is one of the most powerful volumizers of the plasma there is. If you deplete sodium, you lower the volume and pressure of the vascular system. And one of the reasons sodium depletion stimulates aldosterone is to prevent blood pressure from falling too low. So remember all those people we talked about earlier who complained about looking bad onstage but had a cheat meal afterwards and looked shredded, full, and vascular? It wasn't the carbs they ate that filled them out, they were eating plenty of carbs, it was the fact that they *finally* ate sodium and drank water, which filled them out. If you've ever done one of these brotocols before and ended up very frustrated, I'm hoping that you're having a "eureka" moment right now.

The Old Peak Week Games - Training

This time, I'm going to talk training. One of the prevailing ideas is that you need to do crazy high volume workouts to deplete your glycogen stores early in the week followed by completely staying out of the gym to super compensate your glycogen stores. There's a few issues with this. The main one being that you're totally ending your training while you load up on carbohydrates. While you will get a lot of glucose going into the muscle cell you will also likely get quite a bit in the subcutaneous layer because you're no longer training during this time and providing less incentive for the body to keep stuffing glucose into the muscles. Now we do want to increase muscle glycogen before we step onstage because every gram of glycogen draws around 2.7g of water into the muscle with it. More water inside the muscle is awesome, we just have to be very cautious with how many carbs we put in to ensure we don't spill over.

Another big issue with these depletion workouts is that they are likely to be very different from what you're used to doing. Since your body isn't adapted to this stimulus, it increases the likelihood that you will experience a stress response to it which means increased inflammation, localized swelling, and soreness in the muscles you train. Changing your stimulus up as a part of a regularly periodized training program is a great idea. It's a terrible idea one week before your show when it could cause you to have

edema and hold water where you don't want it as well as be sore on stage, and screw up your ability to hit the poses. If you've ever noticed less leg definition after a grueling leg workout and had difficulty flexing and posing them you've seen this effect happen.

Probably one of the biggest problems with these peak week training brotocols is that they have you completely stopped training 2-4 days before the show. When you're used to training 5 to 6 days out of the week and suddenly you don't train for three or four days it's not going to work well. After that kind of layoff, can you honestly expect to get the best pump of your life in 15 minutes backstage while you're under high stress? Good luck with that. As has been repeatedly emphasized, if you're looking great one week out, why make a bunch of drastic changes?

The Old Peak Week Games - Carbohydrate Loading

Finally, everyone's favorite subject after many weeks of grueling prep. If you remember the voodoo method of carb loading, most competitors will load towards the very end and on the day of. They start back loading 600, 700, or even 800 carbs over three days. The problem with this method is that it leaves less variability in what you can tweak to look your best on stage. Instead of looking like a well oiled machine, you have better odds of looking like a train wreck.

Instead, I prefer a sensible approach. Instead of back loading the carbs, I like to front load them. The difference between back and front loading is all about *when* you load. Front loading just means that you start loading them earlier in the week. I'm a fan of front loads for several reasons:

1. You're still training early on in the week, so they will be useful and tolerable.

2. If you do happen to take into many carbohydrates and spillover you have several days to reduce them and tighten back up rather than a few hours.

3. If you take in too few, you can increase them.

So exactly how many carbohydrates should you consume? My general rule of thumb is no more than 3x your average daily carbohydrate intake for your highest loading day. There are exceptions but I've found this to be a relatively good rule over time.

Other Old Peak Week Myths

Most of these old brotocols could not exist without promoting myths and lore almost like a bedtime fairy tale to physique athletes. For example, many competitors will cut out protein shakes during the final week. The rationale? They cause water retention. Well, if you've been having shakes through your entire prep, and they didn't affect you negatively, it's not going to start now. If it were true, you'd be perpetually bloated and retaining water (as we discussed, swollen fingers, ankles, etc). However, the only reason not to have them is if you have any sort of allergy. Some people are allergic to proteins, like the beta-lactalbumins found in whey protein. If you're one of those people, then don't drink shakes, but if you're allergic then you probably weren't drinking them to begin with.

Another popular peak week myth revolves around creatine. This one states that you need to cut out creatine because of water retention. Now, this is partially well informed. Creatine DOES cause you to retain water. In fact, it causes water retention in the muscle cells, which is *exactly* where you want it. On the flip side, this can give you the idea that it's ok to load up on creatine to enhance the effect of cellular water retention. This is also not a good idea. If you aren't used to taking creatine and you decide to load up, there's a good chance you'll end up feeling bloated. Moreover, you won't be able to get rid of all the extra creatine, so you'll end up taking in water via the creatine that remains in the GI tract. Just continue taking creatine at your normal dose.

Many brotocols have people cut out tons of different foods during peak week like dairy, wheat, sugar, artificial sweeteners, coffee, vegetables, and pretty much any food you can think of. The fact is, until you reach the final 24 hours, there really isn't much reason to change the food choices you make, just simply hit your macronutrient targets. However, in the last 24 hours, there may be some wise food changes, we will discuss those a bit more later. But the fact of the matter is that if these products were making you retain water chronically, you would know it. Many people wake up looking leaner in the morning and then throughout the day don't look as tight and mistake this for them having ingested something that's making them retain water. Everyone looks tighter in the morning, it probably has to do with being horizontal for 6-8 hours. This is much different than being upright and subject to the effects of gravity much more. This gives your blood

flow a chance to 'even out' a bit and your fluid balance to really equilibrate. Ever notice that your feet and legs can feel swollen at the end of a day? Also you probably notice that when you don't get much sleep you may wake up not looking as tight. All this has less to do with food choices and more to do with the effect being horizontal has on your fluid distribution.

The Old Peak Week Games - WTF?

Where did these peak week brotocols evolve from and why? It's something I've asked myself many times when I didn't understand why anyone who ever studied basic physiology made these recommendations, but I have a few theories. I think the sodium and water depletion protocols came from wrestling. If you think back to high school you might remember wrestlers doing absurd cutting rituals to make a weight class. This is a good example of people not understanding correlation vs. causation.

Bodybuilding was really born in the 40s and 50s in terms of true competition. Before that, if you were a muscular, strong, athlete you probably played football or wrestled. Wrestlers often had to make lower weight classes and would cut water and sodium intake to do so and lose a lot of water. Now these wrestlers were often the most ripped and muscular people around, but that wasn't from them cutting water and sodium, it was because they had very low body fat and engaged in resistance training (of sorts, throwing another human around definitely is a lot of resistance), so I think it's possible that some early bodybuilders copied what wrestlers did and it simply became bodybuilding dogma. Funny enough, when I got into coaching, I had other coaches tell me, "your methods will never work, you can't do them. This is the way it's always been done." Pure dogma.

I also think that many people cut sodium and load potassium because of what they learned about the sodium potassium pump (also called the Na+/K+-ATPase) in basic biology class in high school. The sodium potassium pump exists in every cell and is used to maintain an electrochemical gradient across the cells. It's an ATP driven pump that pumps two potassiums into the cell and three sodiums out of the cell with each "pump" against both of their concentration gradients (hence the reason it requires ATP, as it wouldn't occur without energy input).[5]

5. By Reginald H. Garrett - Biochemistry: 2nd (second) Edition. Retrieved January 3, 2018, from https://www.amazon.com/Reginald-H-Garrett-Biochemistry-second/dp/B008WDGB1E

Figure 3. Sodium potassium pump (Na+/K+-ATPase). This is an ATP driven pump that pumps three sodiums out of the cell and two potassiums into the cell with each "pump" against both of their concentration gradients.

The body does this to maintain the cells "resting potential" as well as assist in cotransport (transport of sodium back into the cell is energetically "favorable" and can be used to "drive" other "unfavorable" reactions) and other cellular functions. People looked at the diagram in their high school science books and said "Oh, it's pumping sodium outside the cell and potassium inside the cell so if we load potassium and deplete sodium it will get us more volume inside the cells."

Remember where I said it was energetically unfavorable? Sodium WANTS to go inside the cell. So much so that the pump is working to pump it back OUT, but the concentration gradient makes it favorable for sodium to go in. In reality it really doesn't have much to do at all with how much sodium or potassium you take in because the pump will control the levels of sodium & potassium in the cell regardless. The only thing you're doing by following a peak week brotocol is putting fluid where you don't want it, flattening yourself out, and risking killing yourself. Yes, I said that. **Killing yourself.**

If you're cutting sodium and water you will

be dehydrated. Loading potassium won't make up for the massive sodium depletion and while it's difficult to do, if you get enough potassium in your system you can hyperpolarize your cardiac cells and STOP YOUR HEART. This has happened to several competitors, some survived thankfully, but some didn't. They were following these brotocols and in many cases they were getting bad muscle cramps. Rather than giving their body what it really needed, like sodium and water, they loaded even more potassium in, and since their total body fluid volume was way lower from dehydration, this raised their potassium concentrations even more, coupled with the loading. The end result was deadly.

Please, not only are these brotocols terribly ineffective, they are also dangerous. Heed my warnings.

> *I've seen bikini competitors literally pass out backstage at major shows because they hadn't drank water in days. Nothing is worth your life. Especially when it doesn't work.*

I think many of the recommendations above likely emerged from protocols used by competitive runners, as well. Runners will often do depletion workouts (high volume) and deplete carbohydrate intake in order to attempt to deplete muscle glycogen stores so that they can then super compensate glycogen levels by loading carbohydrate and not train. There's some evidence that you can cause a supercompensation effect by following these protocols, however the problem is what it does to fluid balance. Water follows glucose into the cell and other places.

If you load too much glucose/carbohydrate you can very easily put water where you don't want it in addition to where you want it. Finally, in my experience I've found that while some competitors respond well to very aggressive carb ups, most do better and remain tighter by using a more measured approach.

Further, when you're loading carbohydrate so aggressively near the show, if you spill over (a term we use where a competitor has over filled their capacity to store glucose and it has "spilled" over into the plasma and subcutaneous layer) now you only have a day or maybe hours to fix it. It's basically like NASA starting the countdown to launch a shuttle, igniting the engines, only to find out that there's a problem they need to fix. You will have a hard time fixing that spill over in less than 24 hours.

Don't Fix What Isn't Broken

We can look at this process with a bit of *informed* common sense now. Think about it like this: If you're looking great a week out from the show, that means you've done everything well so far. You haven't messed with diuretics, sodium, or anything. Following that line of thinking, why would you go in and undo what you worked so hard to achieve by "tweaking" all these new variables? A novice summary of peak week usually reads "I fell short on stage after my carb load and sodium depletion, but I looked great the day after."

This is not good. The summary should be "I looked pretty good a week out. I made some minor tweaks and looked great on stage." That's what it's about. Not the day after. The moments you spend on stage are where you need to look your best. The bottom line is you need to look awesome a week out to look awesome on stage. If your glutes aren't striated a week out, they likely won't be on stage day (referring to bodybuilding division, bikini ladies please don't show up with striated glutes). With that in mind, if you look shredded a week out, you don't want to screw up the process with these bro science voodoo secrets.

I tell my clients that my goal as a coach is to not screw them up. I'd rather be sure that someone is 95% on every time and then make some minor adjustments to attempt to get the last 5%, but if we don't get it at least we are sure they are hitting that 95% potential. Going in at 95% is better than trying to get that 5% and losing 25% of your progress because you went nuts changing too many variables.

Further, to hammer in this point, let's look back to 2006. I was moments away from winning my natural pro card. I was backstage, getting pumped up to go on and pose. Just across from me was one of my competitors. He was shoving fistfuls of Lucky Charms into his mouth, silently praying the carb loading magic would happen before he took the stage. I want to make it clear, I'm not knocking the guy. He looked good, by all accounts. Easily he was beach or photo shoot ready. But if I had to estimate, he was about 9% body fat, and despite that, he did wind up placing in the top five. So he wasn't a slouch. It was what he said to another competitor that piqued my interest. You would think watching a grown man eat fistfuls of a kid's cereal would do that, but the fitness industry is weird. He said "I mistimed my carb load." The truth is he mistimed it by eight weeks. He just wasn't lean enough.

Part of this is on the judges, in my opinion. It sounds more pleasing and less hurtful to tell someone "you were holding water" rather than say "you were not lean enough, you need to lose more body fat." It makes sense. At this point in the process, you've invested so much time, emotion, and energy into the process, and getting rid of extra water is something that you can fix. So you try the voodoo magic for your next show. The reality is that sometimes you NEED to hear the truth, no matter how much it hurts.

Now that you know what NOT to do, the question remains what to do? I want to emphasize that peaking is just like any other aspect of prep, much of it depends on the individual. I can give you templates, recommendations, and general ideas but part of this is an art more so than a science.

> *What I can tell you is when you're in doubt, don't change it and just keep it steady. If you need to make adjustments, error on the more conservative side.*

As the old sports adage goes "dance with the one that brought ya."

The New Peak Week Games - Water

I do not recommend cutting water during peak week. I recommend keeping it at a steady level every single day. If you've been taking in 6 liters per day, keep taking in 6 liters per day. If you've been taking in 4 liters per day, keep taking in 4 liters per day. 10 liters per day? Keep it at 10 liters per day. That's what your kidneys are used to and that's what they regulate at normally.

One question I get is what is the minimum amount of water I should be taking in? As a general rule I think 10ml per kg of body weight is a decent start. The other question I often get is whether or not someone should count other fluids like coffee, diet soda, protein shakes, and the like. The bros will argue with me but the answer is yes, count it. It's still fluid. Even if it was something like coffee, about 99% of it's still water. Someone may argue this, pointing out that caffeine is a diuretic and could actually dehydrate you. **Not true.**

Yes, caffeine is a mild diuretic (very mild) but it won't dehydrate you. Drinking coffee still hydrates you more than if you didn't drink it. In fact, it's such a mild effect that studies have

actually shown no difference in hydration with drinking coffee vs. drinking water.[6]

So you can continue to drink your coffee with confidence during peak week. In fact, if you're someone who has trouble defecating on show day, a nice black coffee in the morning can help with this. The only time I recommend reducing fluid during competition prep is 2 hours out from going on stage. I recommend that people just sip fluid. Why? Is there some super magical effect that reducing water intake has? Am I going back on my claims about not making changes to water? No. I recommend reducing water about 2 hours out from stage for two very simple reasons:

1. You don't want to feel like you have to pee when you're onstage, especially for the ladies who have already been "glued in" to their suits.

2. You don't want to have a belly full of water when you step on stage because you just got done chugging a liter of water. So keep drinking water as per normal on show day, but when you get to 2 hours out, just take sips.

The New Peak Week Games - Sodium

While cutting sodium isn't a good idea, modest tweaks to sodium intake can actually be beneficial. In general, I lower sodium intake slightly as carbohydrate goes up and raise it as carbohydrate goes down. The logic in this is to keep the overall solute load somewhat level, though it would be nearly impossible to keep it completely level. I'm not talking about huge fluctuations. I'm talking about 30% changes or so at most. The only time I reduce sodium regardless is when a woman gets her period near the show. This actually happens more often than you might think and the stress associated with a show can cause an early onset period. When this happens I usually drop sodium by 30% off of what I had scheduled for them to intake. I only do this if they get their period closer than three days out. Further out than that and the body tends to level itself out. Why do I decrease sodium levels with a period? The hormonal flux during a period causes an increase in sodium retention and so we are simply adjusting for that. But there's no need to cut it out, just a modest 30% drop should do the trick.

6. No Evidence of Dehydration with Moderate Daily Coffee Intake: A Counterbalanced Cross-Over Study in a Free-Living Population. Retrieved January 3, 2018, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3886980/

As I said, overall I keep sodium right around the normal intake that the individual is used to consuming. If they normally keep it at 1000mg, then the highest I'm going to take them is around 1300mg and the lowest I'm going to take them is around 700mg (and I may not even take them there). If they are taking in 10,000mg I may take them up to 13,000mg and down to 7,000mg. This might seem insane but remember the kidneys will accommodate for any sodium intake so long as it's regular. If you're used to eating for example 5000mg of sodium per day and suddenly you jump it up to 10000mg, you'll actually probably get really vascular for about 2-10 hours after that, then around 18-24 hours after you've had that jump you will start looking very watery. Most of the competitors I coach look their best on show day and look very watery the day after.

I actually had one client call me to complain about it. Keep in mind this client looked awesome onstage and won their show and their pro card at this show. They said "Layne, I don't understand. Everyone is posting photos of themselves looking so much better the day after the show and I look like crap!"

"So you would have rather looked worse on show day and better the day after the show?" I asked. Then the message stuck. In this case, even he had gotten roped into bodybuilding dogma. It's so generally and widely accepted that you will look better the day *after* your show that people come to expect it. For myself and my clients, I would rather have them spot on the day of their show but then look worse the day after, but that's just me. They can keep posting pictures looking awesome the day after the show, we will keep taking the wins.

One of the reasons people look so much BETTER after the show is that they go out after finals are over and have a really big meal with a lot of sodium and water. They are shocked at how hard, vascular, and tight they look. You would think that they would use this knowledge to try to replicate it onstage, but instead they keep going back and doing the same dumb shit they did before. Those who don't learn from history are doomed to repeat it. Why not use all this to your advantage? I'm not talking going on a food bender before stage, but why not have a good amount of water, carbohydrates, fats, and sodium a few hours before stage? The only thing stopping most people is their fear of breaking bodybuilding dogma. The dogma and fear of missing out is so strong, I actually had one client tell me that they didn't want

to keep water in. They also wanted to cut sodium because they would be the only one at the show not cutting water and sodium and it made them feel like the other competitors would make fun of them. I facepalmed so hard it about hit the back of my skull. Indeed, I have my clients consume more sodium than usual on show day.

This means they wake up the next day looking pretty watery but on show day they look very tight and full and are able to get an awesome pump. Don't believe me? If you're dieting, go out and get yourself a Chipotle burrito on your high calorie day, then train 2 hours later. Tell me that you don't get a sick pump. So that's exactly what I have people do on show day. Not necessarily a burrito, but about 2 hours before the show (especially for bodybuilders) I have my competitors consume a high carb, high fat, high sodium meal with water of course. For bikini and figure/fitness competitors, I may have to tweak this a bit. You don't want a bikini competitor looking too vascular, but you also don't want her too flat. I've seen bikini competitors who are known for their glutes on Instagram look flat as a pancake onstage because they depleted themselves too hard. Even as a bikini competitor, you still want a good amount of fullness, just not as much as bodybuilding, but I will show you examples of each later.

> *Typically I will have people consume a meal containing about 40-50% of their normal daily sodium intake about 2 hours before they step onstage (at prejudging and finals).*

Sodium can be our biggest ally if we use it right and I will spell it out for you step by step in the tables a few pages below.

The New Peak Week Games - Training

As stated previously, there isn't any reason to make drastic changes to your training until a few days before the show. In fact, I would say it's imperative that you keep your training as normal as possible with a few minor exceptions.

1. Do not train to failure during peak week even if you're accustomed to it, stay 2 reps shy.

2. Do not use drop sets, giant sets, or any kind of advanced techniques during peak week.

3. Make your leg training early in the week

so they have plenty of time to recover.

4. 1 day and 2 days out from the show just do light full body circuits for 30-40 minutes to get a pump but stay WELL SHORT of failure. At least 5 reps shy and use machines only. This should be a very easy session, just break a light sweat and get a pump, that's it. This session is to keep your muscles "primed" and to drive nutrients into the muscle cell and keep the fluid where we want it, which is inside the muscle cell.

5. Don't do anything that has the potential of making you overly sore

Other than that, do what you normally do. If you normally squat, feel free to do so early in the week. Bench press? Go for it. Just heed my warnings on everything else.

The New Peak Week Games - Carbohydrate Loading

As I stated above, I don't really care for super aggressive carb loading really close to the show. It makes it very difficult to adjust if you over carb and with very little time to fix it. I much prefer a process I call "front loading."

I glossed over it earlier, but basically I load carbs earlier in the week. Why do I do this? A few major reasons that I touched on earlier but to recap:

1. It gives us time to assess how your body is responding and make adjustments.

2. If we need to make adjustments we have days as opposed to hours to fine tune things.

3. You're loading carbohydrate when you're still training relatively hard, giving your body a better reason to push them into muscle cells.

I'm not saying back loading doesn't work. It can and I've seen it work well with some people. What I'm saying is that it's a bit more high risk than front loading.

Typically I don't load carbohydrates greater than 3x more than their average daily carb intake over the last month. If someone has been consuming 100g of carbs per day, I'm not going to load them on 500g of carbohydrate. I always get a good chuckle when people who have been doing very low carbohydrate diets or keto load hundreds of

grams of carbohydrates a few days out from their show and then can't figure out why their body didn't respond well to it. The lower your carbohydrate intake, the less your body will use the systems that deal with carbohydrate disposal and so if you load an insane amount of carbohydrates after being on low carbs for a long time don't be surprised that you look worse. If you're very low carb or keto dieting I would recommend modestly raising carbohydrates and protein (probably by 50% carbs and 25% protein) and loading fat (increase by 100-200%).

Keep in mind I'm also NOT saying you should load 3x carbohydrate intake over your average daily intake. I tend to stay closer to 2x normal average carb intake for most clients' carb loads. When would I go 3x? Most likely when I have someone who I know tolerates carbohydrates well and has a lot of muscle mass, but we had to diet them aggressively at the end of their prep so their carb intake was pretty low for that specific reason. So if you have a lot of muscle mass (>85 kg LBM for example) and you normally eat a decent amount of carbs but fell behind in prep for whatever reason and had to get aggressive and cut down to say 100g carbs, it probably wouldn't make sense to load you on 200g. So for larger guys who may have had to get aggressive right at the end, err on the higher end.

I typically will do a mild carb depletion starting about ten days out followed by a load starting about five days out from show. This load tapers to what you would consume on a normal or a bit less than normal day two days out from the show. Then, the day before the show is a "swing day." This means it can either be another low day if the person isn't tight enough, or if they aren't full enough it can be a load day, or if they are on the money it can be a normal or semi-normal day. More on that in the tables below.

> *When in doubt, be conservative. Better to be too tight and a bit flat than really full but spilled over and soft.*

The New Peak Week Games - Example Tables

Here's where we get down to the nitty gritty. I'm going to provide some templates. Keep in mind these are NOT set in stone and not the end all be all, but they should be really helpful for many of you.

Normal = your average daily intake (including

high and low days in the case of carbs or fats). This may or may not include a multiplier. For example if your normal average daily carb intake is 120 and you see “Normal × 1.5” then 120 × 1.5 = 180g carbs on that day and so on and so forth. I will give a table below using the multiplier system and then I will show an example of what the corresponding numbers would look like using example macros, sodium, fluid, etc.

Days Out	PRO	Carbs	Fats	Sodium	Fluid	Training	Cardio
8-10	Normal	Normal × 0.7	Normal × 0.7	Normal × 1.3	Normal	Normal	Normal
6-7	Normal × 0.9	Normal	Normal	Normal × 1.2	Normal	Normal	Normal
5	Normal × 0.8	Normal × 2.5	Normal × 1.6	Normal	Normal	Legs	Normal
4	Normal × 0.85	Normal × 1.9	Normal × 1.3	Normal	Normal	Normal	Normal
3	Normal × 0.90	Normal × 1.3	Normal	Normal*	Normal	Normal	Normal
2	Normal × 0.95	Normal × 0.7	Normal × 0.7	Normal*	Normal	30-40 min circuit	No HIIT
1	Normal	Normal × 0.7-2.0	Normal × 0.7-1.3	Normal*	Normal	30-40 min circuit	No Cardio
Show Day	Normal × 0.7	Normal × 2-2.5	Normal × 1.3-1.6	Normal*+ × 1.3	Normal¥	Pump up	No Cardio

Table 2. Template for Bodybuilding, Men’s Physique, Men’s Classic Physique, Women’s Bodybuilding, and Women’s Physique.

* *Decrease sodium by factor of 0.7 if you have your period within 3 days of show. On show day this would mean Normal × 1.3 × 0.7 = Normal × 0.91, you can round it to Normal × 0.9.*

+ *Consume approximately 40-50% of normal daily sodium intake (0.4 - 0.5 multiplier) 2 hours before prejudging and finals.*

ɣ *Reduce water to sips 2 hours out from prejudging and finals, then resume normal water intake after prejudging/finals.*

It may seem strange that I've lumped bodybuilding, men's physique, men's classic physique, women's bodybuilding, and women's physique all in one table, but in reality the difference between men's bodybuilding, men's physique, and men's classic physique largely comes down to genetics vs. what you want to do in peak week. If you look at the top men's physique athletes, many of them would make awesome local or regional level bodybuilders but just don't have the overall size to cut it at the highest levels. But they still are typically rewarded for being muscular, hard, vascular (though there are limits to this), and very low body fat.

Now let's look at what happens if we take someone with an average daily macronutrient intake, sodium, and fluid intake of 200g protein, 150g carbs, 60g fat, 4000mg sodium, and 4 liters of water. Let's also assume they do 1 HIIT cardio session and 2 low intensity cardio session per week.

Cardio doesn't need to be placed where it is, that's just an example, it can be tweaked to the users preferences so long as HIIT cardio isn't performed within 3 days of the show and there's no cardio performed the day before the show.

Days Out	PRO	Carbs	Fats	Sodium	Fluid	Training	Cardio
8-10	200g	105g	42g	5200mg	4L	Normal	1 LISS
6-7	180g	150g	60g	4800mg	4L	Normal	No Cardio
5	160g	375g	96g	4000mg	4L	Legs	1 HIIT
4	170g	285g	78g	4000mg	4L	Normal	No Cardio
3	180g	195g	60g	4000mg*	4L	Normal	1 LISS
2	190g	105g	42g	4000mg*	4L	30-40 min circuit	No Cardio
1	200g	105-300g	42-78g	4000mg*	4L	30-40 min circuit	No Cardio
Show Day	140g	300-375g	78-96g	5200mg*+	4L¥	Pump up	No Cardio

Table 3. Sample Bodybuilding/Physique/Men's Classic Physique peak week based on normal intake of 200/150/60 protein/carb/fat, 4000mg sodium, and 4L water.

* *Decrease sodium by factor of 0.7 if you have your period within 3 days of show. On show day this would mean Normal × 1.3 × 0.7 = Normal × 0.91, you can round it to Normal × 0.9.*

\+ *Consume approximately 40-50% of normal daily sodium intake (0.4 - 0.5 multiplier) 2 hours before prejudging and finals.*

¥ *Reduce water to sips 2 hours out from prejudging and finals, then resume normal water intake after prejudging/finals.*

Days Out	PRO	Carbs	Fats	Sodium	Fluid	Training	Cardio
8-10	Normal	Normal × 0.7	Normal × 0.7	Normal × 1.3	Normal	Normal	Normal
6-7	Normal × 0.9	Normal	Normal	Normal × 1.2	Normal	Normal	Normal
5	Normal × 0.8	Normal × 1.9	Normal × 1.4	Normal	Normal	Legs	Normal
4	Normal × 0.85	Normal × 1.5	Normal × 1.2	Normal	Normal	Normal	Normal
3	Normal × 0.90	Normal × 1.1	Normal	Normal*	Normal	Normal	Normal
2	Normal × 0.95	Normal × 0.7	Normal × 0.8	Normal*	Normal	30-40 min circuit	No HIIT
1	Normal	Normal × 0.7-1.9	Normal × 0.8-1.2	Normal*	Normal	30-40 min circuit	No Cardio
Show Day	Normal × 0.7	Normal × 1.2-1.9	Normal × 1.1-1.3	Normal*+ × 1.3	Normal¥	Pump up	No Cardio

Table 4. Template for Women's Bikini, Figure, and Fitness.

* *Decrease sodium by factor of 0.7 if you have your period within 3 days of show. On show day this would mean Normal × 1.3 × 0.7 = Normal × 0.91, you can round it to Normal × 0.9.*

\+ *Consume approximately 40-50% of normal daily sodium intake (0.4 - 0.5 multiplier) 2 hours before prejudging and finals.*

¥ *Reduce water to sips 2 hours out from prejudging and finals, then resume normal water intake after prejudging/finals.*

Note that the carb loading isn't nearly as aggressive for bikini/figure/fitness. In figure and fitness it may be ok to go up to a multiplier of 2.2, but for bikini being super full simply isn't that much of a priority and being tight is the more important thing.

Let's look at this as a sample for a bikini/figure/fitness competitor with a normal average daily intake of 150g protein, 100g carbohydrate, 40g fat, 2000mg sodium, and 3L fluid. Let's assume they were doing 2 HIIT sessions and 4 steady state sessions per week.

Cardio doesn't need to be placed where it is, that's just an example, it can be tweaked to the users preferences so long as HIIT cardio isn't performed within 3 days of the show and there's no cardio performed the day before the show.

Days Out	PRO	Carbs	Fats	Sodium	Fluid	Training	Cardio
8-10	150g	70g	28g	2600mg	3L	Normal	1LISS/1 HIIT/1 off
6-7	135g	100g	40g	2400mg	3L	Normal	1LISS/1HIIT
5	120g	190g	56g	2000mg	3L	Legs	HIIT
4	128g	150g	48g	2000mg	3L	Normal	LISS
3	135g	110g	40g	2000mg*	3L	Normal	LISS
2	143g	70g	32g	2000mg*	3L	30-40 min circuit	LISS
1	150g	70-190g	32-52g	2000mg*	3L	30-40 min circuit	No Cardio
Show Day	105g	120-190g	44-52g	2600mg*+	3L¥	Pump up	No Cardio

Table 5. Sample Women's Bikini, Figure, and Fitness peak week based on normal intake of 150/100/40 protein/carb/fat, 2000mg sodium, and 3L water.

* *Decrease sodium by factor of 0.7 if you have your period within 3 days of show. On show day this would mean Normal × 1.3 × 0.7 = Normal × 0.91, you can round it to Normal × 0.9.*

+ *Consume approximately 40-50% of normal daily sodium intake (0.4 - 0.5 multiplier) 2 hours before prejudging and finals.*

ɣ *Reduce water to sips 2 hours out from prejudging and finals, then resume normal water intake after prejudging/finals.*

In the case of someone doing very high amounts of cardio, it's ok to miss a few sessions of LISS in peak week, but if things have been done correctly, cardio probably shouldn't be that high.

Miscellaneous Peak Week Recommendations

If it's not discussed above, it should be kept the same during peak week with the exception of fiber and high fiber foods like vegetables, whose intake should be ceased 18 hours before prejudging and total fiber intake should be limited as much as possible. Fiber is awesome. It's thermogenic, it's filling, but it's not good to have a ton of close to your show. Fiber is filling because it draws water into the GI tract making you feel full. While that's great for satiety, you don't want that bulk sitting in your GI on show day. Eighteen hours is enough to 'vacate' excessive bulk from your GI. For the last 18 hours before stage and on the day of the show you want to focus on low fiber sources of food aka a "low residue diet."

Examples of low residue foods:

- White breads with no nuts or seeds
- White rice
- Potatoes without skin
- Rice cakes
- Candies
- Fresh fruit like bananas, cantaloupe, honeydew, and watermelon
- Eggs
- Fish
- Poultry
- Dairy products (limit to 2 servings/day)

For fats on show day, I generally recommend getting them from what you've typically used during prep. However, if you need extra fat, peanut butter, almond butter, butter, avocado, cheese (don't exceed 2 servings) are all reasonable sources of fat.

Other things I recommend eliminating 18 hours out include artificial sweeteners. Don't get me wrong, I love my sweeteners, but some of them work by not being absorbed through the GI and in some people this may cause a bit of gastric distress. Leave them out the day before the show and show day. I also recommend not taking ibuprofen within 48 hours of a show as it affects the kidneys and causes some water retention.

I also recommend that people who typically have trouble defecating the day before or on show day take a mild laxative. I do NOT recommend taking laxatives that work by pulling water into the GI tract as this will dehydrate you. I recommend using something like a stool softener or sennosides (aka Ex-lax). This will stimulate your GI to evacuate without dehydrating you. You can also try black coffee as part of your show day fluid intake to help you go.

Not only that, I also recommend taking an antihistamine like Benadryl or Claritin at night two days out from the show and the day before the show. This will help prevent any excess water retention from an infection that you may get. Some people think I'm goofy for this, but by the end of prep, you're stressed, your calories are low, and your immune system is likely a bit compromised. Better safe than sorry.

Show Day Peaking

You have your numbers for show day, now what? In reality you should eat at about your normal meal frequency and distribute your macros, fluid, and sodium accordingly with the one exception of the meal I recommend eating two hours out from prejudging and

then finals. A quick note, if you think that you may be in the overall posedown at finals then I recommend consuming your two hour out meal two hours before you think you will go onstage for the overall posedown and NOT from when you will go on to do your routine. If you don't think you'll be in the overall, then you can eat that meal two hours before your routine. In each of these two hour out meals I'm targeting about 40-50% of your normal daily sodium intake as I said earlier, but also about 30% of your show day carbohydrate and fat intake (60% in total between the two meals). The other 40% should be spread relatively evenly over your other meals. Your fluid intake should be consumed as per normal but try to keep it pretty even throughout the day and then just take sips two hours out from prejudging and finals. I also recommend taking some salt packets and quick sources of carbs and fats with you. I'll typically have a Gatorade as well as some Reese pieces or something of that nature. If you find you're low on energy or just not filling out, you can use this to make a difference in about 20-30 minutes. Spread protein out pretty evenly over all your meals.

This is where it get tricky. It's often difficult to tell the difference between being flat and being spilled over. That may sound really dumb, but often if you're very flat, you look softer because less water inside the muscle means less muscle volume pressing against the skin. In general if you're too flat and need more carbs/fats/sodium you will notice the following:

- Less vascularity
- Less hardness to the muscle
- Difficulty getting a pump
- Muscles look smaller
- You still 'feel' tight

In contrast, if you're beginning to spill over (which is less likely because we front loaded and were conservative) you will notice the following:

- Vascularity present but blurred
- Muscle feels full and volumized but not as sharp
- Little difficulty getting a pump
- Muscles look normal/big
- You feel a bit bloated in your GI
- You have a bit of swelling in the hands, feet, and or ankles

It's much easier to fix being too flat vs. being too full when it comes to the day before show and show day. If you're too flat, adding more carbs and fats the day before (aim for the

higher end of the given range) you will notice a difference quickly. Even the day of the show if you're flat a few hours before, consuming adequate carbs/fats/sodium/fluid you will notice an increase in fullness within a few hours.

By contrast, if you're spilled over, it generally takes days to tighten back down. This is why I really emphasize erring on the side of too little vs. too much. If you find yourself spilling over during peak week that's ok if it's happening 3-4 days out because that's relatively normal. But if by 2 days out you aren't starting to trend towards getting tighter, you may want to drop carbs and fats down to the 0.7 multiplier. If you still aren't tightened back down the night before then I recommend going and doing an extra full body circuit for 30-60 minutes. That will help, but the best advice is to be conservative and not let it come to that in the first place.

A note, some shows do prejudging and finals continuously with no break in between. If that's the case you may only have 30-120 minutes before you go back out onstage. I'd recommend getting 50-60% of your show day sodium intake at the 2 hour out meal and 30-40% of your show day carb and fat intake. If it's 30-60 minutes pound some Gatorade or quick sources of carbs and fats for about another 15-20% of show day intake. Try to get down another 20-30% of your sodium if you can.

Two Day Peaking

This can be REALLY tricky. Remember I said most my competitors look worse the day after the show. But no big deal. We can still work with this. Since we are only doing one round of judging, we aren't going to need as many calories at prejudging on day one. So I recommend reducing the carb and fat recommendations by a factor of 0.8. So if you were at 2.5x multiplier for show day carbs you would do 2.0. I would keep sodium at what was recommended previously. If prejudging is in the morning you can still have some carbs and fats after but I'd try to get 70-80% of your carbs and fats in before stage, then have mostly protein only the rest of the day. Your two hour out meal will need to be more aggressive too at about 50-60% of your show day intake. If you're competing at night for prejudging, then get almost 100% of your carbs and fats in before prejudging and just have protein only before sleeping. If you wake up feeling a bit spilled over, I would recommend a 30 minute full body circuit.

Summary

You aren't smarter than your body's mechanisms to maintain homeostasis.

That's the takeaway. However, you need to go back and read this chapter. Then read it again, and again.

10 POSING

One of the first things I read about posing was from Arnold. I remember in his encyclopedia he said to always keep your calves flexed, even if you aren't directly showing them off. Obviously, I'm paraphrasing, but he does bring up a good point. Always show off what you're not showing off. Whether valid or not, judges have peripheral vision, and everything could potentially be taken into account, though it might not be a focal point. So keep that in mind as we go over posing. Since we started by talking about Arnold, it's only proper to go over the poses for men's bodybuilding first.

One thing I should note is that you should practice these poses well in advance of your show. When you watch the pros pose, it looks effortless. They're doing it right. It should look effortless. But the reality is that even poses with the word "relax" in them require high levels of muscular tension. Not only that, you have to smile and look like you're having a good time while you're under constant pressure from the judges and audience. Factor that in with the stage lights and the intense heat coming from them (maybe even as high as 100 degrees), along with oil possibly dripping in your eye, posing on stage is far less exciting than it sounds. That doesn't make it any less crucial. So let's start.

MEN'S BODYBUILDING POSES

(WOMEN'S BODYBUILDING IS THE SAME EXCEPT THERE'S NO MOST MUSCULAR)

FRONT RELAXED POSE

- Turn your feet out and jam them into the ground to keep the quads tight
- Pull up the lats
- Flare the lats as wide as you can
- Don't flex your abs, flexing them will diminish the aesthetic you're going for
- Keep the arms in a relaxed flare

LAYNE NORTON, NATURAL PRO

SIDE RELAXED POSE

- To start, place the toes on the back foot right in between the heel and toe of the foot facing the front
- Keep a small bend in the knees to flex the hamstrings
- Keep your glutes tight
- Twist the torso to display your obliques and intercostals
- Pull the arm farthest away from the judges across your body to flex your pec
- Practice it facing both directions, as you will have to perform it that way

LAYNE NORTON, NATURAL PRO

BACK RELAXED POSE

- Make sure your glutes and hamstrings are tight by pulling back against the floor with your feet, as if you were executing a stiff-legged deadlift

- Flare your lats and lean back slightly. This will catch the light and bring out your back detail

That wraps it up for the symmetry portion of the posing. Don't get too excited, there's more. Up next, we have the muscularity round.

LAYNE NORTON, NATURAL PRO

FRONT DOUBLE BICEPS POSE

- Slowly raise your arms until your upper arms are parallel with the floor
- You can either flex your abs or pull them up
- From there, transition back into your front relaxed pose

LAYNE NORTON, NATURAL PRO

FRONT LAT SPREAD POSE

- Take your thumbs and place them on the spine in the lower back and drag them out to the sides as you flare your lats
- End with your fists against the widest part of your hips
- Keep your lats flared and lean back a bit
- Keep your arms flexed along with your pecs

LAYNE NORTON, NATURAL PRO

SIDE CHEST POSE

- Flex the calf closest to the judges. Place those toes in the middle of the rear foot in between the heels and toes
- Take the arm farthest from the judges and swing it to form a curl with the arm nearest the judges
- Flex the pec further away from the judges

LAYNE NORTON, NATURAL PRO

SIDE TRICEPS POSE

- Feet position is exactly the same as the side chest pose
- Reach behind your body to grab your hand and flex your triceps
- If you're not flexible enough, try grabbing your fingers instead of your wrists

LAYNE NORTON, NATURAL PRO

REAR DOUBLE BICEPS POSE

- Lift your heel to flex your calf. Despite the name, it's a full body pose
- You want to create a V taper from the top and bottom
- Turn out your leg and pull back
- Flex your biceps and lean back
- Don't squish your shoulder blades together; flare your lats as much as possible

LAYNE NORTON, NATURAL PRO

REAR LAT SPREAD POSE

- Feet are in the same position as the rear double biceps
- Take your thumbs and place them on the spine in the lower back and drag them out to the sides as you flare your lats
- End with your fists against the widest part of your hips
- Keep your lats flared and lean back a bit
- You aren't flexing as much as you're showing the thickness of your back

LAYNE NORTON, NATURAL PRO

HANDS OVER HEAD ABS POSE

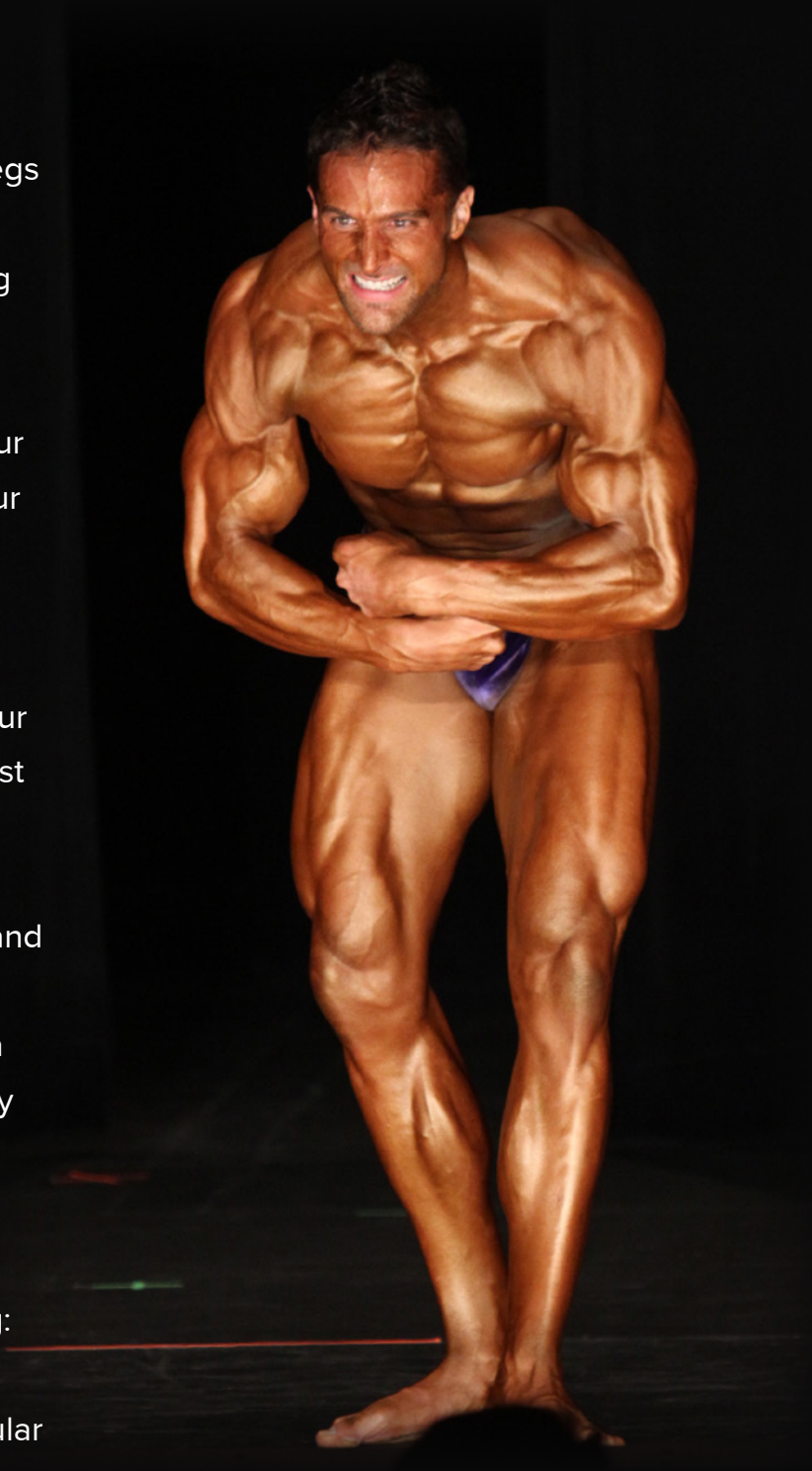
- Place your hands behind your head, extending one leg and flexing down on your abs
- Squeeze down on your quads to show striations, or push your foot against the floor
- Keep your upraised arms in close to your head
- Blow out your air while contracting your abs and pull your belly button in

LAYNE NORTON, NATURAL PRO

MOST MUSCULAR POSE

- Stagger your stance and flex both legs
- Flex your arms, pecs, and everything else
- One variation has your hands on your hips. If you choose that one, use your body as leverage to contract your upper body hard
- Another variant has you clasping your hands. For that one, do the same, just make sure not to shield your abs
- One final variant is called the crab, and you don't touch anything, and your hands are making fists. Keep them a bit separated so you don't shield any part of your physique

One final note, for the women competing in women's bodybuilding: these poses are the same for you, *except* you don't do the most muscular pose. Other than that, get to practicing these same ones.



LAYNE NORTON, NATURAL PRO

For the side poses, make sure you practice them on both sides. When the mandatory poses are done, you have some optional ones to work with that the judges may or may not ask for. Optional poses for bodybuilding include:

SIDE SERRATUS POSE

- This is one of my personal favorites, and it helps if you have those nice finger like serratus muscles standing out in bold relief. Like other side poses, practice both sides
- Foot position is just like a side chest or side triceps
- The arm closest to the judges goes behind your head like you're trying to scratch your back. The farther arm crosses in front to flex the pec
- Flex the exposed oblique
- Keep your legs tense and glutes tight

LAYNE NORTON, NATURAL PRO

HAMSTRING POSE

- Turn and face the rear of the stage, and rotate 45 degrees to one side
- Display your hamstrings by flexing the hamstrings on the leg that's furthest from the judges (you can typically choose either leg so pick your best one to display)
- Pick your foot up and down while tensing your hamstring and flexing it in order to display its muscularity
- Make sure you also keep your upper body tight and your lower back slightly arched. It's customary to also display the tricep on the side of the body of the plant leg

LAYNE NORTON, NATURAL PRO

CALF RAISE POSE

- Turn and face the rear of the stage, and slowly flex up and down to showcase your calves
- Keep the rest of your body tight, including your upper back and arms

LAYNE NORTON, NATURAL PRO

FIGURE POSES

FIGURE

Women's figure is pretty cut and dry in terms of the posing. There's no routine you have to perform, you simply go out, and do your quarter turn. One thing to keep in mind for these poses is that the judge's view matters the most. With that, the figure poses are as follows:

FRONT POSE

- Stand facing the judges with your legs together and quads flexed
- Flare the lats as wide as you can
- Don't flex your abs, flexing them will diminish the aesthetic you're going for, instead pull them in a bit
- Keep the arms in a relaxed flare with your hands open
- Arch the back and keep your chest high

HOLLY BAXTER, PNBA PRO,
2X WORLD CHAMPION FITNESS MODEL

SIDE POSE

- Make your quarter turn to the right
- Stand with your legs together and quads flexed
- Flare the lats
- Again, don't flex your abs
- Arms are still in the relaxed flare and your hands are open
- With your back arched, chest up high, twist your torso to the left

HOLLY BAXTER, PNBA PRO,
2X WORLD CHAMPION FITNESS MODEL

BACK POSE

- Perform your quarter turn to the right
- Stand facing away from the judges with your legs together and quads flexed
- Flare the lats as wide as you can
- Pop your glutes and hamstrings
- Keep the arms in a relaxed flare with your hands open
- Arch the back and keep your chest high and point your upper back slightly downward by bending your lower back a little

HOLLY BAXTER, PNBA PRO,
2X WORLD CHAMPION FITNESS MODEL

SIDE POSE

- Make your quarter turn to the right
- Stand with your legs together and quads flexed
- Flare the lats
- Again, don't flex your abs
- Arms are still in the relaxed flare and your hands are open
- With your back arched, chest up high, twist your torso to the right

One final but important note, when you perform your second quarter turn to right, move your hair so that it doesn't cover your upper back. It's not mandatory, but you see it a lot, and like I've said before, it's better to err on the side of caution.

HOLLY BAXTER, PNBA PRO,
2X WORLD CHAMPION FITNESS MODEL

BIKINI POSES

BIKINI

For the bikini competition, you have two main poses. A front facing pose, and a back facing pose. In addition to that, you "model walk" your way to center stage right before you hit your poses.

FRONT POSE

Once you arrive at center stage, hit your front pose:

- Feet slightly wider than shoulder width apart
- Weight on left leg with your left hip cocked to that side
- Right leg extended out
- Right hand hanging in a relaxed position
- Left hand goes on your hip
- Unlike before, you won't be tensing and flexing all that much here

ARIA ADAMY, IFBB BIKINI PRO

BACK POSE

After you hit the front pose, it's time to hit the back pose:

- Turn around so your back faces the judges
- Feet slightly wider than shoulder width apart, weight distributed evenly, legs are straight, keep a hard arch in your back
- Glutes are pushed out (this goes hand in hand with arching your lower back) and hands are lightly resting on your quads
- Your feet also have a slight turnout to show the full shape of your legs
- Alternatively, you can do the back pose the exact same way except with your heels touching. Whichever style you choose will depend on your body type and which looks best

ARIA ADAMY, IFBB BIKINI PRO

MEN'S PHYSIQUE POSES

MEN'S PHYSIQUE

For men's physique, you have to get your footwork down, first. The footwork is instrumental in you nailing your poses.

FRONT RELAXED POSE

Your first position is facing the judges head on as you're lined up with the other men. In this front relaxed pose, one foot remains flat, and you're going to move the other foot out to the side, a bit beyond shoulder width, and stand on your toes. For the purpose of explaining this, I'll assume the left foot is flat and the right foot is elevated.

COLBY SMITH

MEN'S PHYSIQUE

From there, the judges will ask you to do your quarter turn to the right. When they direct you to do so, perform the following sequence:

- Shift your weight on to your right foot
- Step forward with your left leg
- Pivot on the left leg as you drag the right leg behind you while you turn and face the right
- Your right foot ends up further behind your left, still on your toes with your calf flexed

If you've done it correctly, your left side will face the judges, and your back leg (the right leg) will be further back on its toes.

Next, the judges will ask you to perform another quarter turn to the right. For this quarter turn, you will pivot on both feet and orient yourself the exact same way you started with your left leg planted and your right foot flexed so that you're on the ball of your foot.

COLBY SMITH

For the next turn, they will ask you to turn to the right again. This time around, you're going to perform another twist to the right and you'll end up with the left leg back and on its toes, and the right leg up front with the foot flat.

In the last turn, you will wind up back where you started. To get there, bring your left foot even with the right foot and keep your weight on it. Next, pivot on the left foot as you sweep the right foot to the side so that you end up in your starting position facing the judges.

So now that the footwork is out of the way, that leaves the upper body.

For the upper body posing, you have one main position with some slight modifications. The front relaxed pose is similar to the same pose for men's bodybuilding. The main difference is that for men's physique you're going to have one hand off your hip, and one hand on your hip. If it helps, think of it as a cross between a front lat spread and a front relaxed pose.

In this demonstration, based on how I went over the footwork, start with your left hand on your hip and your right hand off the hip. Spread the lats, and flex the abs.

When you perform your quarter turn to the right, twist your torso to the right and extend your left arm. By doing this, the judges will see your back and tricep and you will shield your chest and abs temporarily.

For the reveal, roll your left shoulder back, place your left hand on your hip and your right arm will slightly cross in front to flex your pec, as you twist your torso to the left, showing the judges your side profile. Again, flex your abs and obliques.

BACK RELAXED POSE

Next, you'll do the back relaxed pose. It's the same as the front, except this time, as you transition, flex your back *then* spread it. End with one hand on the hip, one off the hip, and your calf flexed. Last, lean back slightly to catch the light.

COLBY SMITH

MEN'S PHYSIQUE

When you do your next quarter turn, you want to mirror what you did before. This time, your right hand goes on the hip, and your left arm slightly crosses to flex the pec. Before the reveal, twist your torso to the left and extend your right arm. By doing this, the judges will see your back and tricep and you will shield your chest and abs temporarily.

As before, roll your right shoulder back, place your right hand on your hip and your left arm will slightly cross in front to flex your pec, as you twist your torso to the right, showing the judges your side profile. After this, you maintain your relaxed pose as you wait in line with the group of your competitors.

COLBY SMITH

WOMEN'S PHYSIQUE POSES

WOMEN'S PHYSIQUE

Women's physique posing has a lot of overlap with women's bodybuilding when it comes to the mandatory poses, however there are some key differences that differentiate them.

FRONT DOUBLE BICEPS POSE (OPEN HANDS)

- Slowly raise your arms until your upper arms are parallel with the floor
- You can either flex your abs or pull them up
- Keep the hands open and not balled into fists
- From there, transition back into your front relaxed pose
- For this one instead of facing directly to the front flat footed, spike one foot and transfer the weight to your other leg

JEN TAYLOR, IFBB PRO, RUNNER UP 2017
WOMEN'S PHYSIQUE OLYMPIA

Photo Credit: Dan Ray

SIDE CHEST POSE (EXTENDED ARMS)

- Flex the calf closest to the judges. Place those toes in the middle of the rear foot in between the heels and toes
- Take the arm farthest from the judges and extend it cross it over to flex the chest and grab the hand closest to the judges
- Flex the pec closest to the judges

JEN TAYLOR, IFBB PRO, RUNNER UP 2017
WOMEN'S PHYSIQUE OLYMPIA

Photo Credit: Dan Ray

REAR DOUBLE BICEPS POSE (OPEN HANDS)

- Lift your heel to flex your calf. Despite the name, it's a full body pose
- You want to create a V taper from the top and bottom
- Turn out your leg and pull back
- Flex your biceps and lean back
- Don't squish your shoulder blades together; flare your lats as much as possible, and keep your hands open

JEN TAYLOR, IFBB PRO, RUNNER UP 2017
WOMEN'S PHYSIQUE OLYMPIA

Photo Credit: Dan Ray

ABDOMINALS AND THIGHS

- Place your hands behind your head, extending one leg and flexing down on your abs
- Squeeze down on your quads to show striations, or push your foot against the floor
- Keep your upraised arms in close to your head

JEN TAYLOR, IFBB PRO, RUNNER UP 2017
WOMEN'S PHYSIQUE OLYMPIA

Photo Credit: Dan Ray

SIDE TRICEPS POSE

- Feet position is exactly the same as the side chest pose except from there, you bend the back leg more and extend the front leg closest to the judges out further to flex your quad
- Reach behind your body to grab your hand and flex your triceps
- If you're not flexible enough, try grabbing your fingers instead of your wrists

JEN TAYLOR, IFBB PRO, RUNNER UP 2017
WOMEN'S PHYSIQUE OLYMPIA

Photo Credit: Dan Ray

MEN'S CLASSIC PHYSIQUE POSES

This division, much like men's physique, is a newcomer. Like men's physique, it's a division for guys who don't want to attain superhuman size. The goal for classic physique is pure aesthetics over size, with an emphasis on the classic V taper going from the lats to the narrow waist.

Ideally, this image should conjure up the *Pumping Iron* era. Guys like Arnold, Frank Zane, and Franco Columbu are thought to embody what this current division seeks to showcase.

Like men's bodybuilding, you have mandatory poses. Five of them, to be exact. Four of these poses are the same as in men's bodybuilding. The fifth one is your choice of a classic pose from the *Pumping Iron* era of bodybuilding, and we will list a few of those for you to choose from.

MEN'S CLASSIC PHYSIQUE

FRONT DOUBLE BICEPS POSE

- Slowly raise your arms until your upper arms are parallel with the floor
- You can either flex your abs or pull them up
- From there, transition back into your front relaxed pose

DANNY LIGHT

SIDE CHEST POSE

- Flex the calf closest to the judges. Place those toes in the middle of the rear foot in between the heels and toes
- Take the arm farthest from the judges and swing it to form a curl with the arm nearest the judges
- Flex the pec further away from the judges

DANNY LIGHT

REAR DOUBLE BICEPS POSE

- Lift your heel to flex your calf. Despite the name, it's a full body pose
- You want to create a V taper from the top and bottom
- Turn out your leg and pull back
- Flex your biceps and lean back
- Don't squish your shoulder blades together; flare your lats as much as possible

DANNY LIGHT

MEN'S CLASSIC PHYSIQUE

ABDOMINALS AND THIGHS

- Place your hands behind your head, extending one leg and flexing down on your abs
- Squeeze down on your quads to show striations, or push your foot against the floor
- Keep your upraised arms in close to your head

DANNY LIGHT

THE VACUUM POSE

If you search for pictures of Frank Zane posing, you'll be hard pressed not to run into this particular classic pose. The stance is like that of the previous abdominal and thigh pose. The differences are as follows:

- You want to exhale all the air from your lungs
- Puff out your chest
- And pull your belly button back like you're trying to touch it to your spine

This is the classic version of it that you see Zane do in many pictures, but it isn't the only version you can do. Arnold frequently vacuumed doing various single and double bicep poses, so it's really something you can incorporate into something else, if you see fit.

LAYNE NORTON, NATURAL PRO

THE ARCHER POSE

If you ever watched Hulk Hogan win a wrestling match, then you have seen his version of this. The short of it is that this pose shows off your tricep on one arm, and the bicep of the other arm. To perform:

- Flex the bicep of the right arm
- Extend the left arm and flex the tricep
- Make sure that your upper arms make a straight line
- Flex your obliques slightly to the right so that your left arm is point at an angle
- Look to where your left arm is pointing
- Flex the abs (or vacuum them)

And there you have it for the men's classic physique mandatory poses.

LAYNE NORTON, NATURAL PRO

WOMEN'S FITNESS MOVES

This one is the most straightforward, while also offering the chance to showcase the most personality as well as creativity. Further, as of 2018, the rules became even more straightforward, since the two-piece swimsuit judging isn't a part of the competition anymore. That said, you have four mandatory moves:

- A high kick
- Any kind of push-up
- A side split
- A straddle hold

You can complete these basic moves in any order during your competition routine. A fitness competition routine lasts for two minutes and consists of a choreographed sequence that showcases how fit you are.

WOMEN'S FITNESS

HIGH KICK

LEAH CHRISTIANA, IFBB PRO

WOMEN'S FITNESS

PUSH UP

LEAH CHRISTIANA, IFBB PRO

WOMEN'S FITNESS

SIDE SPLIT

LEAH CHRISTIANA, IFBB PRO

Photo Credit: Dan Ray

WOMEN'S FITNESS

STRADDLE HOLD

LEAH CHRISTIANA, IFBB PRO

Photo Credit: Dan Ray

Putting On a Show

If you've ever watched an old movie, like *The Wizard of Oz* or anything from that time period, you might notice the acting is a bit different than it is today. Everything the actors did they oversold. One reason is that cinema was a new medium and actors were used to performing on a stage. On a stage, you have a crowd of people looking at you. They have to see and hear everything. As a result, the movements were bigger than normal. Now that you're competing on a stage, I want you to think of it the same way. Your smile has to be bigger than you think it needs to me. Every step has to mean something. Finally, every time you hit a pose, you need to show yourself. Exaggerate it a little bit, but never hide what you worked so hard to achieve. You want the people in the very back to see what you have to offer. So oversell it, and show the world your body.

Posing Routines

For women's and men's bodybuilding, you have the posing rounds. You have the relaxed portion where you do your relaxed poses and turns, then you have your individual posing routines. For both, you get 60 seconds with a ten second warning, and you have the opportunity to perform a series of poses in a choreographed sequence.

In the men's classic physique, you also have the chance to do a posing routine, much like in the bodybuilding divisions. Like them, you get 60 seconds and the opportunity to showcase your creativity and personality.

Lastly, in women's physique you have the chance for two posing routines. The first one you perform during prejudging, and the rules are the same as listed above. If you make it to the finals, you have 90 seconds and you can set it to music.

Summary

- Be yourself to the highest extent you can
- Be bold and big on stage
- Read the rules of your division and federation
- For simplicity, I chose the NPC amateur rules, if I were to go through and go by organizations, it would be a whole other book
- Practice your posing long before you think you need to
- Men's and Women's Bodybuilding poses are the same, except women don't do a most muscular pose

11 MISC PREPARATIONS

Posing Suit and Trunks

Finding the right posing trunks or posing suit can be absolutely critical towards displaying your physique to its fullest potential. For bodybuilders it may seem pretty straight forward. I mean how much different can one pair of tiny posing trunks be compared to another? I can tell you that it's more than you might think.

For example, compare the cuts of the two posing trunks on the next page. One of them completely covers the upper side areas of my glute and makes them look not as developed as a properly cut pair would.

Then compare to when I switched to another pair that were cut properly. Unfortunately, on this pair I failed to take into account that I have really long legs. These posing trunks were very thin on the sides and made my legs look even longer.

For someone with short, big legs these would have been perfect, but for me they weren't showing my physique well. They made my legs look like they were about five feet long.

Now check out when I got a pair that were properly cut in the back but also were a bit thicker on the sides. I actually looked like I had legs that weren't meant for a flamingo. Again, this was just me, in my particular circumstance,

with my particular body. You might have a physique that looks great with posing trunks that have a thin side.

Alternatively, posing trunks that cover more of your glutes may look better on you compared to me. I recommend trying out different cuts of suits if you can. If there's someone local to your area that makes posing trunks who's well regarded, I recommend meeting with them to see what might look best.

For women, choosing a posing suit is an even bigger deal. It's more expensive, sometimes reaching into the thousands of dollars, and it's looked at more closely by the judges. Just like with bodybuilders, choosing a posing suit is going to be very individual in terms of what looks good on you. Don't just choose a suit because your favorite competitor wore it and looked great in it. What looks great on them may not be great for your body. As I said previously, if you have the opportunity to meet with the big suit maker in your area, I would highly recommend doing so, they can look at your physique, take your measurements, and come up with a suit that fits you best. If you're on a really tight budget, another good option may be to buy a used suit, and then tailor it. Most people only wear a suit once or twice and then get rid of it. You could probably save hundreds of dollars by buying a used suit. I recommend checking out **http://www.divaexchange.com** as they have a ton of options.

For men's physique competitors, they will use boards shorts. You want to make sure you choose shorts that fit well don't bunch up in places they aren't supposed to. Make sure they are fitted exactly for you. You don't want them too loose or bunching up in places. Fortunately, you can walk into any surf shop and find good board shorts to try on. Just be careful of suits with too many different lines and designs, they may change the way your body appears to the judges. Shorts with a darker waist band tend to make your waist look smaller. So you will have a lot of options, just make sure you try on many of them and pick the one that fits your physique best.

I haven't yet mentioned the color of suit that you should buy. This is also individual. However, there are some general guidelines. I typically don't care for colors like white, yellow, orange, light green, yellow, gray, or light pink. Some women can get away with light pink, but typically I still think they look better in other colors. It's too much of a contrast from the dark tan on the skin to something so lightly colored. Brown suits also typically don't look good either, as they tend to just match your tan and act as a camouflage. Additionally, if you're tan runs or smudges on to your suit, it's going to be much more apparent to the judges and the audience than someone who wore a darker suit. Most other colors are fine.

> *In my opinion, the colors that look best on stage are dark greens, red, dark reds, royal blue, navy blue, and purple.*

Overall, the suit is very important and shouldn't be neglected. Make sure you shop around and ask other competitors where they bought their suits. Find a suit maker or tailor who is willing to work with you to tailor the suit to your physique.

Tanning

Tanning is huge. If you're not dark enough onstage, you simply won't look good, period. You won't reveal enough definition and it will hurt you in the judging. You can't, unless you already have dark skin, get dark enough naturally. You will need to use some kind of stain, bronzer, or both. There are plenty of stains out there like Pro Tan, Dream Tan, Jan Tana, etc. They all work reasonably well. However, I've met few people who could get dark enough through self-application. If you're going to use these stains, I'd recommend visiting someone who does spray tanning in your area and ask them to use one of these stains in their machines as it will get darker and go on more evenly. The best thing about these stains is you see the color instantly and it stays on for several days. Additionally, the stains tend to dry out your skin and when they finally come off, it's usually a bit splotchy and looks weird. Typically this color isn't bronze enough on its own. You need some sort of bronzer to catch the light correctly.

I always used Dream Tan #2 which was amazing. I could be completely white as a ghost and after a coat or two of this, I would be the darkest one onstage. Dream Tan and other bronzers like it are also great because you don't need to stain your skin. Once it's off, it's off and you're done with it. However, many organizations have banned dream tan bronzer (not their stain though) because it's simply too messy and ruins venues. If you're competing in a show that hasn't banned it, I would strongly consider it if you're a bodybuilder. For all other divisions I'd forgo it. Especially for women, it's just too messy with your hair and makeup.

The best option in my opinion for organizations who have banned dream tan and similar bronzers is to find someone who does spray tanning and have them do several coats of one of the stains. At minimum, three coats. The other option is many of these shows have tanning services right there. The problem is that some of them can be pretty terrible. I'd recommend trying to find someone in your area who does the spray tanning. Get several coats of that and then you can do the service on the day of the show once you arrive, so that you can be as dark as possible.

When I say dark, I mean DARK. You should be black.

> *If you think you're dark enough, you're not, so when in doubt, go darker. I'm not kidding.*

You'd be shocked at how dark you need to get to look your best under stage lighting. In addition to being dark as night, you also need to be properly bronzed. Many of the tanning services at the show will offer bronzing. I would take that option. Or try to find a bronzer not banned by the show. Do NOT go with the old school option of doing a ton of coats of stain and then use cooking oil as a "bronzer" or baby oil. Oil should be used ever so sparingly. I've seen too many people come out looking like basted turkeys on Thanksgiving because they used too much oil.

For bodybuilders and physique athletes, I also recommend getting a product called "Hot Stuff" which is a spray that contains Methyl Nicotinate amongst other ingredients which increases blood flow to the skin and thus increases vascularity. It tends to be pretty effective. I recommend applying over the chest, shoulders, arms, back and quadriceps LIGHTLY. Don't get too aggressive with this stuff or it's going to feel like you're on fire.

Hair Removal

This is one area where it helps to not have much body hair. In order to show off your physique, you can't have any hair, except for whatever is growing out of your head.
To remove body hair, you have a lot of options out there, including:

- Laser hair removal
- Waxing
- Sugaring
- Shaving
- Hair removal lotions like Nair

With each option, there are a myriad of pros and cons, so it makes sense to go over a few of them.

Shaving is a tried and true classic. The upsides are that it's relatively inexpensive, and you get used to it over long periods of time. For the competition, you have to take into account what you're wearing. Or, what you're not wearing. Remember, you aren't wearing much. So areas that you normally overlook may well be exposed.

For instance, your glutes, the groin area, your feet, underarms. Everything. If you happen to be a man or woman with light blonde body

hair, shaving it off will be easy. If you happen to be more hairy than normal, shaving might be a time intensive endeavor for you. With that in mind, before you take the shaving cream and razor to your body, you might consider running the clippers over your body first to make the razoring a bit easier. If not, you're going to deal with a lot of caked up hair in the end of your razor. Also, don't be surprised if you get some red bumps your first few times shaving. It will take a while for your body to get used to it.

I strongly suggest, especially if you're a hairy behemoth, any of the other options besides shaving. I say this as a hairy person because having someone else take care of this is easier than you doing it. At the same time, it's costly. Waxing or sugaring can run you around $300, and laser removal can go higher than that depending on the area. But you won't have to do them as frequently as they last longer than shaving.

Lotions that remove hair can be decent options. They tend to be inexpensive and easy to do, we just cover the body with the lotion. Unfortunately, these tend to be quite variable in their effectiveness from person to person. Most people I've talked to were pretty underwhelmed with them. But perhaps for someone who has already undergone some other sort of hair removal process like shaving or waxing, using Nair to keep the hair off might be a decent option.

Whichever you decide to do, keep in mind that shaving is a better option if you don't have a lot of hair. Alternatively, if you're a walking fur coat, consider the other options.

***No matter what,* pay attention to the following:**

1. Make sure that you're removing the hair over every exposed area. This may even mean getting a manzilian/Brazilian if you get waxed.

2. Start early. All of these options can yield certain undesirable outcomes, like ingrown hairs, red skin, torn skin in the case of waxing. It's better to get that taken care of and adapt to it than wait until you're a week out.

3. Aside from shaving, these other processes will hurt. I really can't sugar coat it. It's painful. So prepare for that.

Travel

I'm very sensitive to this subject, because I travel every single month, and sometimes every single week. Many people don't plan adequately enough for travel and end up letting it throw them off during their prep. If you're someone who travels often you probably don't need the section as much because you probably already come up with some coping skills. The biggest thing is preparation. If you're traveling for business or personal, it's likely that there's going to be quite a few meals out either with colleagues or family depending on what you're traveling for. Since it's going to be more difficult to control the calories consumed during those meals, it's probably best to bring a lot of low calorie options with you. As well as handy high protein low carb, lower fat snacks like beef jerky, canned tuna, and canned chicken. This could help ensure that you're able to hit your protein requirement well on the go.

Additionally, protein powders and protein bars can also be very helpful. If you're traveling by car, I would pack meals into a cooler and take them with you. In this way, you can still control almost everything you eat. If you're staying in a hotel, try to make sure that you can get at least a small refrigerator and microwave, that way you have more options to take with you. In this day and age, I recommend using Airbnb, if you can. Having access to a full-size kitchen is invaluable when traveling during prep. Now you can pack some meals, but you can also cook some meals yourself like you would at home.

What if you were flying? There's a lot of debate online over what will fly at airports. In the United States, if its packaged food that is sealed, unopened, and not liquid then you should be safe. However, if it's food you cooked at home, packed into a Ziploc bag or other home container, then it's probably pretty dicey whether or not it will get through security. You don't want to have all your meals packed into your carry-on, and then have security confiscate all of them. I believe you can put almost any food in your checked luggage. The problem is if you're on a long flight it may get warm during that time. It also means that food is taking up space in your checked luggage, and most airlines charge for extra checked bags.

Another option for jetsetters is to use a meal delivery service. Twenty years ago, healthy meal delivery services didn't really exist. But now we have many at our disposal. There are dozens of national chains, and countless more

local meal delivery services. I've used many of them, and so far my favorite national chain is Icon Meals. Full disclosure, they currently sponsor me, so take my input for what it's worth. Their meals are tasty and relatively inexpensive at about $8-10 per meal. This might seem like a lot of money, but when you consider that you'll probably spend at least $20 every time you eat out, you realize it's much more manageable. Further, it takes away the hassle of having to cook, package, and travel with your own meals. They also do custom meals that you can make specifically tailored to you, in addition to their signature meals. They also deliver very quickly. If you were in the continental United States and place your order before 2 PM you will get it the next day. What I do if I'm flying, is I will order Icon Meals to be delivered where I'm staying. I will also take some protein snacks like beef jerky, protein bars, protein powders, and canned chicken with me just to be safe. Since I typically stay in Airbnbs, I'll also usually go to the grocery store when I get into town. This way, I have pre-made meals for me, but I can also cook some things I like, and have good snack options as well.

If you're someone who is on a tight budget, then I can't recommend Airbnb enough. For the same or less price than most hotels, you can have a full kitchen and simply go to the grocery store to get your food and cook everything you need. That's a heck of a lot easier than cooking everything at home, trying to lug it with you when you travel, and hope it doesn't spoil.

One other important thing, I also recommend scouting out gyms in the area ahead of time. If you can book a place to stay that's close to a good gym, that way in the best case scenario you can walk to the gym. Definitely don't rely on a hotel gym to have what you need. Try to find several options and make sure they're open at times. Don't wait until you're checking into the hotel or Airbnb to try to figure out a gym to go to. If you're on a tight budget, try to see if any of the gyms have free guest passes. Many gyms will actually let you train free for your first few times.

> *Overall, travel can be done and you can still make progress towards your goal of competing. Preparation is key. If you don't prepare adequately for the travel, you will end up setting yourself back.*

12 SHOW DAY

It all comes down to this. You've put in months of hard work. You've followed the nutritional and training advice in this book and you're ready. You followed the peaking advice so you're looking tight, full, and at your best ever. You've already got the game plan for the show day. Now it's time to execute. Let's discuss what to expect on show day and how you can prepare yourself to perform at your best.

Traveling to The Show

If you're lucky enough to have a show in your hometown, then you will be at a huge advantage in that you can sleep in your own bed, prepare food in your own kitchen, hop in your own car, and drive to prejudging and finals. For most people however, some sort of travel will be involved in competing. We touched on travel in the last chapter, but we should be more specific with travel as it relates to your show. The first thing I would recommend is get there early if you can. If you're competing on Saturday, the latest I would show up is Thursday. If you show up the day before, now you're getting into town (likely in the afternoon), checking into a hotel or Airbnb, then

you'll need to check into the show, get your competitor packet/info, train if you're doing a circuit like we recommend in this book, going to the store to get groceries, tanning, cooking, etc. It's too much. If you get in a day early, now you can get all that stuff done, except maybe tanning, so that you can actually relax and de-stress the day before the show. This is very important because the more stressed you are, the more likely you are to not look your best.

But if you're close enough to travel by car to the show, then I would recommend getting in early as stated previously and also packing some of your own food pre-cooked, if not all of it. It's just easier than getting somewhere and having to go to the grocery store and cook all this food in an Airbnb or worse, a hotel room.

> *My rule is, the more you can get done before you get to the actual show, the better off you're going to be.*

You want to take control of as many variables as you can. Never assume something will just go your way, will be taken care of for you. Assume everyone else is incompetent and you're the only one capable of doing this correctly. If you do that, you're going to be in good shape even if things go wrong. And if things go well, then you're even in better shape.

If you're flying to the show now there are more specific things and you need to consider. First off, assume that the airlines will lose your luggage. This has happened before. Fortunately, I had packed everything that I absolutely needed like my posing trunks, bronzer, and other essential show day things. Also assume everyone on the plane is sick. Be careful with who you sit next to, and if you feel like they are displaying symptoms of illness, do your best not to catch it from them. I would definitely travel with hand sanitizer. I would also assume that your flight will get delayed and your connections will get delayed, if you have them. So make sure you take extra food or snacks with you so that when this happens, so that you aren't completely at the mercy of the airport food.

I once had a client who was only supposed to have a one hour layover turn into a seven hour layover due to delays. They ended up having to get food at the airport and had no idea what was in it in terms of sodium protein carbs and fat. When he came to show day they didn't look their best and this probably had something to do with it. Preparation and

planning is key. Where are you staying? Is it close to the venue? Do you need a rental car? Can you find a direct flight so that you're less likely to have travel problems? These are all things you should think about.

Another question to consider is whether or not you should stay at the host hotel. This may seem obvious because why wouldn't you stay at the host hotel? Often times the host hotel is also the venue where the show is held, this makes it very convenient. Additionally, competitor check ins, polygraphs for some drug tested shows, and tanning are often done at the host hotel. Staying there ensures you're close to everything and it's convenient. But there are also downsides. Sometimes they aren't close to the venue. In fact, I've been to shows where the host hotel was 20 minutes away from the venue. Make sure you know how close it is to the venue as this can influence your decision. Another issue is that if you're staying at the host hotel, you won't have access to a kitchen to prepare food in most cases. Additionally, since the hotel will be filled with competitors it's likely that if the hotel doesn't provide microwaves and refrigerators as standard, they will be quickly gone because all the competitors will be putting in requests for them. So if you plan to stay at the host hotel make SURE to put in a request for a microwave and refrigerator early. Further, many of these hotels are very expensive even with "group discounts." I've had host hotels cost upwards of $250 per night even with the "discount." So consider all these variables when choosing where to stay.

While we are on the topic of hotels, here's something many people don't think of when they are staying at a hotel or Airbnb and competing. Bring your own sheets. It's very likely that the tanner you use will stain the sheets and then you will be buying them. You may also want to bring your own towels. I had a hotel once charge me an extra $150 for towels and sheets. Competing is expensive enough, you don't need to add that cost to it.

Tanning

Tanning was mostly covered in the previous chapter but show day tanning warrants some further clarification. I recommend tanning on show day be done EARLY. Right after you wake up if possible. You have a lot of things to think about on show day, get this out of the way so you can focus on important things and not have to worry about getting tanned an hour before the show. Additionally, if you tan early, after a few hours you'll be able to see if you need a touch up or fill in some spots.

Make sure if you're using a show tan service that you book your appointment EARLY.

Do NOT wait until the week before to do this, otherwise you will be stuck with a crappy time. If you fail to plan, then you plan to fail.

Make Up/Hair

This one is specifically for the women, unless you're a guy who has some super fabulous hair that needs extra attention. I would plan for this to take around 1-2 hours. Couple that with another hour for a show day tan and you need to really make sure you've given yourself enough time to get this done. If you can afford it, I recommend having someone else do your makeup. You don't need the stress of all the other things that happen on show day occupying your mind on top of having to make sure your makeup is on point. Ideally you would get your spray tan done, then get your makeup done. Makeup is very important for looking good onstage. But keep in mind, makeup that looks good in day to day life isn't sufficient for stage. Makeup that looks good on stage will be WAY over the top in real life. So don't freak out when your makeup gets done for the show and you look a bit intense, that's normal.

Competitor's Meeting

This is the most hated part of any show day and typically the most useless in my experience. The competitors meeting is often a meeting just so the promoter can hear themselves talk but there still are some vital pieces of info that do get conveyed at these times. It's usually held an hour before the show starts and the promoter will talk about the order of events, any specific rules you need to know, etc. The head judge may or may not talk as well and run through the poses for the different divisions.

My feeling has always been that if you need the competitors meeting to show you how you should be posing, you're probably doomed because you aren't prepared at all.

I usually use this time to clear my head and get the lay of the land regarding the stage, exit doors, and also where things are located. It's not a bad idea to go to the venue the day before the show to find where the backstage dressing rooms are, the pump up room, the stage entrance, the exits, and where the bathrooms are. That way you aren't scrambling on show day to find them. I also recommend bringing a pillow with you. Depending upon what division you're in, there

could be a lot of downtime and you need to rest so you're ready to go when it's stage time. I once was at a venue at 8:30 in the morning and did not get onstage until 3:30 pm.

Prejudging

Prejudging is also known as "the morning show" (though it's not always in the morning) and this is typically where almost all the scoring takes place in the amateur ranks (it can be different in the pros). This is where they will bring you out and compare you in quarter turns against the other people in your division and class.

We've already discussed how to eat on show day in the peak week chapter but I'll re-emphasized that you need to bring extra food just in case things run really long. Sometimes shows go really fast, but sometimes they go slow. You should have game plans for both. Ideally you will have someone with you who can watch the show and get an idea how fast the show is moving and how far out you might be. If you're on your own, don't hesitate to ask the expeditors where the show is at and how long it might be to your division. This will help you time your food and your pump up better.

The Pump Up

About 20 minutes before you're set to go onstage, I recommend to start pumping up.

For bikini competitors this is probably less important but you still should do some pumping of the arms, shoulders, and glutes. For other divisions, I recommend focusing your pump up efforts on chest (except for figure, fitness, and bikini), shoulders, arms, and some light body weight squats to get a bit of quad pump. I've seen pump up rooms that were extremely well equipped and I've seen others that were a joke. I recommend bringing your own resistance bands with you so you don't have to worry about jockeying for position for a decent set of dumbbells in the pump up room.

I wouldn't pump up too aggressively. Start early, when the class two before yours gets onstage. Go at a nice smooth pace and get a good pump. I don't recommend doing any exercises where your body touches the ground (if you do push ups don't touch your chest to the ground), or where you lay down even if there's a bench. You will lose some of your bronzer/tan by touching the ground or benches. Once the class before yours gets onstage they will likely start calling your class

to line up. There's no reason you can't keep pumping, I always do right up until I walk onstage.

On Stage

You're finally here. All the preparation comes down to this. When you come onto stage the expeditor will either show you where to stand or will have instructed you previously. If they haven't, make sure you ask them before you go out. The lights onstage will be bright and HOT, prepare yourself. You won't be able to see much of the audience. I recommend fixing your gaze at the judges. I wouldn't stare down the head judge, but just keep your focus on their general direction, thus you will be looking down slightly. Remember to smile and look confident. The deer in headlights look isn't a good look for anyone.

Many competitors labor through their time onstage, hating every minute of it. How silly, this is what you worked for. Enjoy it. This is your reward for months of work. Have fun, smile, and execute.

Finals

The finals are mostly for show and trophy presentations in the amateur ranks. In the pros it can be a different story. However, if you do happen to win your class, you need to make sure you stay focused because you will be in an overall. During my first show I never dreamed I would win the novice tall class. So after prejudging I went out and ate what I wanted. Then when I won the tall class I had already done myself in for the overall. I probably wouldn't have won anyway, but I would have had a better shot to be sure. So don't just go off the rails after prejudging, especially if you looked good and were in the mix for the win in your class. You'll need to be sharp so that if you happen to win your class, you can continue to execute in the overall and hopefully bring home one massive trophy. Before you get to awards presentations however, there will be your posing routine.

Note: before you go out to accept your awards for your class, have some water and quick carbs, fats, and sodium backstage with you so that if you win your class and quickly have to go back out for an overall, you have food and fluid on you to help you fill out and give you energy for the overall posedown.

Your Posing Routine

This ranges from a "stage walk" in bikini to an actual posing routine in bodybuilding. In

general, you'll get 30-60 seconds of either house music or your own custom music, depending up on the organization and show. This typically isn't judged although sometimes it can be. The most important part of this is to make sure you pick music (if you have a choice) that suits your physique. Please don't be a mass monster posing to R. Kelly or a really skinny guy posing to Metallica. Pick something that fits you. Pick poses that emphasize your strengths and figure out smooth transitions between them. Make sure you practice this frequently. If you happen to screw up onstage, don't freak, likely no one but you will know if you messed up. Just keep rolling. Also, if you're supposed to have custom music and the DJ screws up and plays the wrong song, don't make a scene. Just be classy and roll with it. I promise, being a good sport will go a long way.

Overall

If you made it this far then you're in the creme-dela-creme. Many competitors will never get into an overall. This means you're competing to win the entire show in your particular division and possibly a pro card.

I still remember when I was coaching now bikini pro Laurin Conlin. Laurin was 24 years old and I had coached her since she was 20. She was competing in NPC Nationals, the most competitive show in the NPC. There were over 50 women in her height class alone and over 250 bikini competitors in total. Laurin did the work. She was lean enough. Her peak week was absolutely flawless. Her posing was on point. Hair and makeup was perfect. But it was how she handled being onstage that really made her pop.

From the second she walked out onstage, she walked out like she had already won and she was just there to pick up the trophy. Not in a cocky way, but in a calm, confident way, that said "I know I'm good, and I know that you know that I'm good." She easily won her class. I was so ecstatic as she was one of my favorite clients who I'd seen come from a kid with big dreams finally to the big stage. I knew how hard she had worked. I was so nervous for her (even though her mom said from the beginning of the show she would win). When she won her class I turned to her mom and said "she did it, I can't believe it." To which her mom replied, "she ain't done yet." Her mom had seen her in every single show she had ever competed and knew she was going to win. Her mom isn't a cocky person but she knew that Laurin had put it all together that day and the way she carried herself on

stage was the icing on the cake. I rushed backstage to give her some quick advice before she went back out for the overall. I simply said “one more round, stay focused.” Many competitors win their classes and relax because they are so happy. Even if they don’t go crazy with food, just losing that little bit of killer instinct and mental sharpness can be the difference between winning and losing the overall. Laurin was laser focused. When she won the overall, she was excited but didn’t look shocked.

LAYNE WITH LAURIN CONLIN

If you find yourself in an overall or think you might win your class, make sure that you do the following things:

1. Take a bit of quick carbs/fats/sodium/water close to the stage with you so that you can easily grab it before going out for an overall.

2. If you're in the tallest or heaviest class tell the expeditor you need a second before you walk back out. Remember you will have likely just stepped offstage before they send you right back out.

3. Put some phrase, quote, or song in your head that focuses you and recite that to yourself over and over and over. In the case of Laurin's example "one more round."

4. Keep some workout bands close to the stage so that you can pump up a bit more before you go out for the overall.

The overall will be just like your posing in prejudging most likely although they may add specialty poses if it's very close. Keep in mind that in very close competitions judges are looking for ANYTHING to separate very close calls. I personally judged a show once where it was SO close that a few of the judges couldn't make a decision, so I just kept taking them through their mandatories and working the hell out of them until one of them started to fade. Again, this is why posing and the little things are SO important. They might not end up mattering, but you sure as hell don't want to lose because of them.

Stress Management

This is a big one. I've seen stress do crazy things to people and their physique. I had one client in particular who was looking awesome a few days out. He was so lean that he had visible veins in his glutes. But come show day he was a mess. He was so stressed about every little detail, he must have called or texted me a total of 40+ times. I had to tell him "Jim (not his real name), you've gotta chill out man. This little stuff you're worrying about isn't anything compared to the stress you're putting your body through." By the time he got to stage, he still was very lean but his abdominals were bloated and distended (he was not on any kind of drugs that I knew of and he had never displayed this before). In my opinion, the stress response really caused him to retain water badly.

Try to remember that almost anything that happens to you is probably happening to the other competitors. Show is running late? It's running late for everyone. Venue sucks? It sucks for everyone. Prejudging starts at 7 am? It started at 7 for everyone. Stop focusing on the negatives. Anything that causes adversity works to the ADVANTAGE of the person who is more prepared. Adversity punishes those who aren't prepared to the advantage of those who are. If you've done your homework and followed the advice in this book, if prejudging is running 3 hours late, great. They will be freaking out while you just keep doing what you do and crush it when it's time. So do what you need to do to de-stress. Listen to music, binge watch a TV series while you wait, read a book, play a video game, do something to take your mind off of it until it's go time.

Family and Friends

Few things can match the feeling of performing at your best and doing well at a show in front of your family and friends. The feeling is incredible. However, family and friends are another variable. If you're at a big show where good seats may be limited, it's probably the best idea to purchase tickets ahead of time. I would also make sure to give them recommendations for something to do between prejudging and finals. They may have 8 hours in between or even a full day if it's a two day show. I recommend coming up with some options for them, especially if they are traveling. Nothing is worse than sitting in a hotel room and watching hands on the clock.

I also recommend you talk to them about how to cheer for you. It's completely ok for them to go crazy over you and cheering you on, but I would encourage you to talk to them about not saying anything negative about the other competitors. I doubt anyone would say something truly mean, though I've seen it at shows. What I mean is, don't say something like "number 27 (your friend or family member) is way more ripped than number 24." Or "number 24 doesn't have legs." Instead something like "look at the legs on number 27, wow!" This goes along with sportsmanship. And under NO circumstances should they EVER boo another competitor. PERIOD.

If they disagree with a call then talk to the judges, the other competitor didn't hold a gun to the judges head, and it most likely wasn't "politics." I hear people claim "politics" all the time. Does it happen? Yes, but get over yourself. This isn't a sport where tens of millions are on the line. Most people spend way more money competing than they will

ever make. It's just not that big. Isn't it funny how everyone screams politics when they lose, but not when they win? When they win, it's all silence.

Sportsmanship

I've seen some pretty crappy stuff at shows over the years. I've seen a "pro" bodybuilder (I use "pro" because he didn't act like a professional) tell a trophy girl to take his medal back and not to put it around his neck. I've seen people wag their finger at the judges. I've seen people glare at judges. I've seen competitors refuse to shake other competitor's hands. I saw a competitor in my own class flip a table backstage after prejudging because he cramped onstage, even though he had obviously won the class. I've also seen people not show up for finals because they were upset about prejudging.

I can promise you that acting like a crybaby is never a good look on anyone. Not only that, but there's a reason I remember these incidents. They stuck out in my mind and they will stick out in the judges' minds in the future too. JUST DON'T DO IT. PERIOD. If you need to throw a hissy fit, wait until you get to your car, hotel, or home. Don't do it onstage or at the venue.

Post Show Festivities

The show is over, the work is done. Time to go enjoy yourself. For some people this means getting the hell home or back to the hotel, taking a nice shower (anyone who has been in tanner for any length of time knows how good this feels), and going to bed. For others this means going to the post show party. Most shows will have a post show party at either a bar, restaurant, or even dance club. I wouldn't say you need to go to this, I haven't gone several times at my own shows. However, if you want to work in the industry in addition to compete, or you want to make contacts in the industry, this is an excellent place to do so. You're going to meet other people who compete and share the same passion as you and you will almost certainly meet some friends and maybe business associates or training partners in the future. You never know.

Summary

To quote the great Dalton from the 1980s movie *Road House*, "Be nice." Be nice, have fun, and own it. You worked hard for this.

13 AFTERWORD

So, What's Next?

At this point, the competition is over and the crowds are gone. So what do you want to do next? You can keep competing and become a pro, or you can use this knowledge to hone in your physique for weddings, photo shoots, or whatever you want to do.

It's my goal that you now have a thorough understanding of not only what it takes, but what you have to go through in order to be a competitor in the physique world. So with that in mind, let's talk about how to leave your show and not have a bad rebound period.

Early on, during my first runs of competing, I would always binge after shows. Without fail. If you've ever done the same, you know the panic starts to set in when you see that scale rise. Then, over the course of a few months, you notice you've gained an unflattering 20, 30, 40, even 50 lbs. You don't want this to happen.

At the same time, you don't want to stay close to being stage ready all the time. I mentioned it before, but in regards to your hormones alone, it's not a good idea. Plus, if you intend to increase your metabolic rate, you will gain some fat. You just don't want to gain too much.

You Need to Plan

If you aren't planning your post contest diet, you're setting yourself up for a bad rebound. Now, when I say "plan" it doesn't need to be too strict. After all, you've been diligent in counting your macros and your training, so you don't need to take it that far. If you can't override the psychological feeling that you *have* to eat after you're *physically full*, then maybe a higher degree of rigidity is required.

During the last round of my bodybuilding shows, I was able to stop the post show binge eating, and I managed to do well at the after party by simply using the rule of eating until I was physically full (there's a difference between feeling physically full vs. being satisfied and any competitor will know what I'm talking about). This wasn't easy to do, but it set me up for success without putting on pound after pound in the following days. As an example, during my last show I had two slices of rich, calorically dense Chicago deep dish pizza, and a beer. That was it. I felt good. I overrode the psychological nagging that screamed at me to eat more. I woke up the next morning and gained maybe a half pound. More important than the lack of weight gain, I felt good and now I was set up to start my offseason appropriately with reasonable caloric increases and progressions.

It's a terrible feeling to go crazy eating for a few days and have put on 10-20 lbs (I've seen it happen so many times) and immediately feel like you need to diet back down, even though you were just on a diet for many months. So immediately post show, make sure you have a plan for the night after the show but I would also go ahead and calculate your macros where you will want to start your reverse diet/ recovery diet/lean bulk/bulk/dreamer bulk/etc. This will give you a much better way to move forward.

The Other Side of Metabolic Adaptation

After my last shows, I followed the plan to eat to satiety and in the following days, I was ready to start my reverse diet so that I could put myself back into a good metabolic position. To illustrate that point, let's look

at it using our previous example, the 60kg female bikini. Let's say her maintenance was roughly 1985 when she started her prep. Over the course of her prep, her final caloric intake was 1250, and she weighed 51kg by the end and was losing approximately 0.3kg per week for the last few weeks. Based on Table 3 in Chapter 2 that means she was in an approximate 250 calorie deficit. I recommend going back up to at LEAST maintenance after contest. In this competitor's case that would be 1500 calories (1250 + 250 = 1500). I would actually probably recommend adding 10-30% to that number but maintenance should be the minimum where someone starts. If you want to feel normal more quickly and have more energy, then add more calories to start, but realize that you will add more fat as well. If you want to stay leaner and don't mind feeling like hammered shit for a few more weeks, then starting at maintenance is probably fine.

There's no right or wrong way, all of them are fine, you just need to have an honest conversation with yourself about which goal is most important to you.

I don't want to get into the nuances of reverse dieting because it's beyond the scope of this book, but please heed my advice, don't spend more time dieting than you do in a surplus overall. A proper reverse diet, or controlled increases in calories, can make all the difference to prep getting easier and easier over time vs. more and more difficult. In the case of our bikini competitor example, with careful attention to her post-diet diet, let's say she ramps back to 60kg over the course of time, except *this time* her maintenance calories are at 2100. At this point, if she were to drop to 1900 calories, at her current weight, she'd start dropping body fat at a conservative rate. By virtue of this process, you're seeing the net positive effects of metabolic adaptation.

I see so many competitors, especially women who crash diet, eating around 1000 calories per day and doing hours of cardio only to put all the fat they lost back on in a few weeks. Then they feel bad about themselves for putting it all back on and try to diet again, only this time it's harder because their metabolism is still suppressed from dieting previously, so they have to diet even more aggressively. Then they blow back up again because their diet was so aggressive and this process repeats itself over and over until finally it's impossible to lose fat without very low calories and very high amounts of exercise. You don't want to find yourself in this mess as some of the awful damage I've seen to competitors

can take years to undo.

> *Do your prep RIGHT, reverse or recover diet appropriately, spend an appropriate amount of time out of a deficit, and then diet correctly again. Over time, prepping will get easier, not harder.*

How Quickly Should I Add Calories?

Some of my colleagues advocate going directly to maintenance calories straight away, right from the show. To be clear, I have no problem with that whatsoever and that's what I recommend. But I recommend your ACTUAL maintenance, not your predicted maintenance for offseason levels. If you jump up to your offseason maintenance, you're going to feel amazing, but you will pile on the pounds pretty quick.

There are some considerations you need to be aware of. Adaptation has no off switch. So that 1985 calorie maintenance our 60kg woman had at the start of her prep isn't her maintenance anymore. If she ended her prep at 1250 calories per day and was only losing 0.3 kg per day, that means she'd need to add 385 above her actual REAL maintenance to reach her predicted maintenance. Given her small frame, and drastically reduced metabolic rate, those 385 added calories are going to spurn unwanted weight gain.

Suffice it to say, your original maintenance calories aren't going to be your current maintenance calories. Your NEAT is down, along with your metabolic rate, so this is normal. If you do want to make that jump back into maintenance, you would do well to recalculate like you did at the very beginning.

In order to put yourself back into an optimal metabolic place, I've had my clients reverse diet their way back up. Initially, you bump the calories up to maintenance or up to 30% over their REAL maintenance. In our example, 10% of 1500 is 150. And 150 + 1500 is 1650. If she wanted to be more aggressive she could go up to a 30% bump which would be 1950 calories, but this would likely cause quite a bit of fat gain. Then she would increase her intake as dictated by reverse dieting logic that once again is subject for another book. In general, I recommend caloric increases of around 2-10% per week, but it really is very individual

The frequency of your increases depends on you. If you're ok with gaining a bit of fat quickly, you can increase right after the show,

and then make weekly jumps. The plus side to this is that you will feel better, quicker. After you make a few quick increases, you can lengthen the amount of time before the next one, provided you're at a point where you're feeling good.. Another plus side is that as you increase your calories, your NEAT increases, and you can increase your TDEE, too. Not only that, but with more food comes a faster metabolism. As you keep on increasing the food, you will eventually be in a surplus without gaining too much weight, and you're in a good spot to start building muscle. You can keep on going until you establish a new maintenance or you keep eating in a small surplus.

The main takeaway is that *you need to plan*. Even if it's a haphazard plan, it's better than attacking every day like it's time to hit the buffet, because the goal for your next prep is to be in a better place than when you started your last prep. This applies to your mentality, your metabolic rate, and your overall body composition.

You've come this far, and nothing would make me happier than seeing you beating your own personal and competitive bests. And if you make it to the pros? Awesome. And if you decide not to, at least you tested your resolve in a way that few people ever will.

Thank You

I would like to personally thank you for purchasing this book. It's the culmination of over a decade of work with clients, and months of writing with Peter, debating about what to put in vs. leave out (we put everything in), and countless late nights writing while I also still kept up with current clients. Speaking of which, I also want to thank all the clients I've worked with over my 12 years in the business. When I started, people doubted online prep was even possible and now it's a widely accepted business. While I loved doing my PhD, working with clients taught me more than anything I ever could have read on my own. I could go on thanking so many people who were influential in my life but I fear we wouldn't have the pages for it. One person I would like to single out is Dr. Joe Klemczewski. He prepared me for my first show and also was a bit of a mentor to me for coaching. Without Joe's influence, I know I wouldn't be where I am today. Thank you Joe for opening a door I didn't even know existed. Finally, thanks to Peter Baker for encouraging me to finally write a book when people have been asking me to do it for over a decade.

Dream BIG
Work Hard
Never Quit

Please keep me updated on how you all liked the book by leaving feedback on my social media platforms. Tag us in your progress photos on Instagram **#contestprepguide #teambiolayne #teamnorton #peterdbaker**. We look forward to seeing your transformations.

RESOURCES

As promised, we wanted to deliver some solid resources for your training. Most of these are basic, but don't let that stop you. If you stick with the basics, you'll get a lot of mileage, but if you go and start making your own personal tweaks, you're defeating the purpose of following a program. Since you're prepping, it's better to follow the program and focus on the other monumental stressors of your prep than worry about the minutiae of your program.

Without further ado, here's a list of some excellent resources:

1. **BioLayne Website -** We don't mean to toot our own horn... well yes we do. BioLayne.com has a plethora of free and premium content that will help educate you and give you great ideas for your nutrition and training.

2. **The BioLayne Workout Builder -** This is our workout builder. It's more customized than most anything you'll find on the internet, and it has templates for bodybuilding and bikini competitors, which fits right into the point of the book. This one isn't free, but as part of the BioLayne website Gold membership at $12.99 a month, it's a great deal. Plus you get premium articles, videos, Q&A, and webinars.

3. **StrongLifts 5 x 5 -** A very basic strength program, this free program focuses on several basic exercises and uses progressive overload so that you improve in those exercises. The downside to this is that it's basic, as well. Not that it's bad to focus on the basics and get better, but for the purposes of body composition, you will outgrow StrongLifts rather quickly.

4. **Madcow 5 x 5 -** Madcow is an extension of StrongLifts. When you attain a certain level of strength, in order to keep going you need to tweak the metrics of overload, as discussed earlier.

5. **Free PHAT Program -** You'll have to sign up for the BioLayne email list (don't worry, I promise I won't spam you) but you can get an awesome free PDF of Layne's PHAT program, one of the most popular training programs of the last 10 years.

6. **MASS Monthly Research Review -** If you want to learn about some of the most important research regarding training and nutrition it can be hard to keep up with all the new research. MASS is a monthly publication that takes care of all the hard work for you. Run by Greg Nuckols, Dr. Mike Zourdos, and Dr. Eric Helms, MASS finds the most relevant research regarding strength and hypertrophy each month, and breaks down the studies in a way that's easy for anyone to understand. It will cost you $30 per month but it's a great deal for the content you get.

7. **Foods that Fit your Macros -** This ebook will cost you $9.99 (Australian, so somewhere around $7-8 US) but you will get an awesome selection of easy to make meals that are low in calories but delicious. Holly has a Masters in Dietetics, a BS in Nutritional Sciences, is a 2x Natural World Champ in the Fitness Model category, and graces some of the covers of our ebook (for those of you who bought the book with the female cover).

8. **Greg Nuckols' Website -** Greg is a really smart guy who provides a ton of free content. He might be putting the most value out of anyone in the industry right now.

9. 1 Rep Max Calculator - This website isn't fancy but it has numerous coefficients to help you determine your 1 rep max based on what you can do for various rep schemes. This can be useful for people who want to find out their 1 rep max so that they can build out a program based around their 1 rep max.

10. Peter Baker's Website - Peter's website has a myriad of information on both training and nutrition and is easily digestible for people of all skill levels.

11. Leigh Peele's Website - Leigh, like Layne, is an OG in this game and wrote a magnum opus on the metabolism years back called "Starve Mode". It does cost, but it's an insightful read about the human metabolism chock full of scientific resources.

12. Alan Aragon's Website - Like Layne, Alan also helped pioneer the evidence based fitness movement and has taken arguing on the internet (and making a living doing so) to unprecedented levels.

13. Sohee Lee's Website - Sohee worked with Layne for several years and is a well known evidence based resource for women.

14. Bret Contreras' Website - Bret is a pioneer of butt research. So much so, he is referred to as "The Glute Guy" based on the volume of research he has conducted and extrapolated during his career.

15. James Krieger's Weightology - James is another evidence based fitness pioneer who has not only extrapolated many research studies, but also has conducted and authored his own research.

Conclusion

While this list isn't the end all be all, we wanted to give you something to go with so that you can keep up your lifting in addition to your prep dieting. If you noticed elsewhere, the theme is consistency. So with that in mind, pick the program you can stick with, and be consistent.