Reverse Engineering Your Diet (Parts 1, 2 & 3)

Part 1

What diet is best?

That depends. On a lot, actually. But you're not asking the right question.

By asking that question, you're effectively trying to start at the end of a process involving many considerations, your current constraints and context.

So let's hash that out.

#1) Choosing Your Overarching Goal

Dr. Layne Norton often uses the analogy of bodily processes being akin to dimmer switches instead of On-Off switches, and that definitely applies here.

While you can gain muscle and lose fat at the same time (1), your energy intake is going to dictate which side of the switch you're going to be on.

It's exponentially easier to gain muscle in an energy surplus; it's all but a necessity to create an energy deficit in order to lose fat. This is nothing new.

But how do you decide which goal is the one you want to push your dial towards? It goes beyond the conventional wisdom that you “bulk” in the winter and try to get shredded for beach season.

The choice largely depends on your current body composition; namely your body fat percentage.

Research shows that it's much easier to gain lean mass while overeating when you are already lean to begin with (2) (3).

In short, males should be below ~15% body fat and females should be below ~25% before even considering trying to bulk.

A lower BF% is going to be permissive to greater gains in lean mass while in a surplus. You're going to gain muscle and fat when overeating; your body fat percentage is going to dictate the ratio in which you do so.

A lower BF% is much more favorable for nutrient partitioning, as explained in the citations above. If you start eating a hypercaloric (more calories than you expend) diet at a higher body fat percentage, a higher proportion of those calories will end up being stored as body fat.

At this point, this will basically exclude a large portion of the population from trying to gain mass right away. Bummer, I know. But this knowledge will prevent you from wasting your efforts and digging yourself further into that hole.

So now we have the vast majority of the population in the lose fat camp, and the lucky few who can afford the extra calories.

How do we go about deciding how many calories to eat in either scenario?

#2A) Determining Your Caloric Intake

Surprise! That also depends.

There is a concept known as “training status” that will dictate how aggressively you should try to gain or lose weight. It ties back to the idea that you have a genetic limit of how much muscle your frame can hold. Let's face it, we all can't grow forever.

Rank beginners can afford to push the pedal to the metal in either direction. There is a whole lot of untapped potential to access in terms of new muscle mass, and newbies generally have quite a bit more body fat to get rid of.

The longer you've “been in the game,” the more meticulous you have to be in order to A) preserve the mass you've already built while cutting, and B) respect the shorter gap you have between your current physique and your “genetic ceiling.”

This is a 3,000 foot view of this issue, the finer points of which go beyond the scope of this article. But at this point, you should be able to correctly assess where you may fall on this spectrum.

#2B) Understanding Your Maintenance

In order to determine your desired energy intake, you also must know the amount of calories you have to take in order to simply stay weight stable.

This is an often disregarded component of constructing a diet. Consider your knowledge of this the “secret” to lasting progress.

Understanding human metabolism may seem like a daunting task, but the scientific community has teased out a few key factors that impact how much energy you expend on a daily basis.

The vast majority of this number will come from your resting metabolic rate; the amount of calories your body would burn if you just laid around in bed all day long (and we've all been there). This number is largely tied to your current body weight and energy intake. Contrary to popular belief, the more you weigh, the higher your RMR. So the idea that larger people “have a slow metabolism” doesn't hold weight (pardon the pun).

But it doesn't end there: energy expended during exercise, non-exercise energy expenditure (also known as NEAT) and the thermic effect of food all play a role in your total daily energy expenditure.

It's also worth noting that all of these values generally decrease during periods of prolonged dieting (4). Your body has various systems in place to conserve energy when your body

perceives that food is scarce, so it's not surprising to find that all facets of energy expenditure trend downwards in that scenario.

This is a word to the wise: it's never a good idea to aggressively under eat for a prolonged period of time if you want your metabolism to operate at an optimal rate.

You can find this maintenance intake two ways: mathematically (with tweaks, which is where a coach comes in), or through trial and error (more on that later).

Various calculations can be used to determine each of these factors. The base of this calculation comes from the Katch-McArdle Equation (5), which uses your lean bodyweight (in Kg) to figure your resting energy expenditure.

Next, you can utilize a multiplier to estimate your activity level across the day. This multiplier varies slightly across genders, but in general, a 1.0 multiplier could be used for very little activity outside of the gym, 1.2 could represent moderate activity such as standing all day at your job, and 1.4 could be used for a highly intensive job where you're moving all day long.

Now the fun begins.

On days you train, you can specifically target the amount of extra calories you utilize. The literature shows that typical resistance training burns roughly .048 calories per pound per minute spent training (6). This doesn't necessarily reflect rest periods, but time spent actually doing work.

So no, your 3 hour training marathon won't literally cost you hundreds of calories. You should actually be conservative in estimating your training time to reflect the actual amount of time you spend under the bar.

On top of all of this, we use a TEF multiplier to estimate the amount of calories you burn from your body utilizing the food you give it.

Here is what many people fail to realize: TEF can vary widely depending on the composition of your diet (7). We'll dig into this more in future installments, but a whole-food diet is going to give you the most bang for your buck here. Your body has a much easier time utilizing the energy from food that's already highly processed as opposed to how it deals with whole foods full of fiber and protein. There's also reason to believe whole foods can stimulate protein synthesis more effectively than processed foods (8).

This TEF multiplier can range from 1.10, reflecting poor nutrient partitioning thanks to a highly-processed diet, all the way up to 1.25. In the context of a 1000 calorie meal, that can be the difference of nearly 150 calories. Over time, that can be the difference from staying "fluffy" or having the physique of your dreams.

#KnowledgeIsPower

You can also take a more practical approach by tracking your calorie intake and scale weight to see what level of intake keeps you at the same weight over time. Or, you can combine these

approaches, use the calculations to set a baseline, and tinker from there to see what keeps to weight stable.

After tracking and finding this level of intake, you can apply an energy deficit or surplus to push you toward your goal.

By now, you should see how much of an art form constructing an effective diet truly is. And we're just scratching the surface.

In the following installments of this series, I'll use a few example scenarios to show how to go about setting your macronutrients targets, and how to properly distribute those macros over the course of the week to best spur you towards your goals.

In-Text Citations

(1) http://bayesianbodybuilding.com/gain-muscle-and-lose-fat-at-the-same-time/
(2) http://www.nature.com/ijo/journal/v38/n2/abs/ijo201377a.html
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Part 2

In Part 1 of this series, we dove into what considerations you have to make in order to start creating a diet that's best suited for your current goals.

In this installment, I'll utilize a pair of common examples to illustrate how this might look in practice.

Scenario 1) A Lean, Newbie Lifter

I know, I know: in Part 1, I said most newbie lifters have a bit more body fat to shed than your average gym goer. But I wanted to illustrate a scenario where “bulking” would be feasible, and I've personally seen my fair share of people who would fit in this category.

Just imagine it: taking your first step into a gym again, all those newbie gains just waiting to explode onto your frame in record time… if we could only turn back the clock.

The lucky demographic that comprise this scenario will be represented by our new fictional friend Jay. Jay is 18 years old, 130 lbs soaking wet, and wants to add some mass so that everyone in college will “put some respeck on his name.”

Luckily, being this skinny (let’s ballpark his body fat at around 10%) will allow Jay to pursue his goal of mass gain right off the bat.

We know already that Jay will be eating in a surplus, but just how much of an excess in energy will he be consuming? As I mentioned in the last installment, newbies can afford to be more aggressive in either direction, when trying to either gain muscle or lose fat.

Compared to an advanced lifter who can only afford a small 2-5% surplus in order to minimize fat gain (1), a rank beginner can push the envelope and get all the way up to a 15-20% surplus.

Not only is Jay's starting body fat percentage working in our favor here, but remember: he's never touched a weight before in his life. All of the newfound growth that he will experience here in the early part of his training career will, by comparison, come on exponentially faster than any other gains he will experience over the course of his training timeline.

A simple analogy here would be gaining experience and knowledge at a new job: when you start fresh with no background, it feels like you're learning 1000 new things a day. When you've had years of experience under your belt, it's less about learning a ton of new things (or gaining heaps of new muscle), and it becomes more about refining what you already know (or improving your conditioning while maintaining more of that hard earned muscle).

Back to our friend: For the sake of this example, let's assume Jay is a college student, and let's also assume he doesn't get much more activity outside of the gym than simply going from class to class.

Now would be a good time to flesh out where training comes into the mix. For any trainee, weight training is going to be the driver of proper utilization of the nutrition you are putting into your body. Training can be seen as a hormetic stress, meaning at the proper "dose," the body responds in accordance with General Adaptation Syndrome and makes you better able to handle that stress again in the future. Your diet (among other things) is going to dictate how much of that process you are going to complete between training bouts.

You may have heard the term "protein synthesis" before, and this is what we're trying to take advantage of. After training, your body's ability to synthesize new protein (a.k.a. build new lean tissue) dramatically increases. Some research suggests that you have the potential to double your protein synthesis within this window after training (2). This is a rough explanation of the phenomena you may know as the "anabolic window" that you've probably seen plastered across magazines and message boards. While it seems cliche and gimmicky at this point, that term actually has merit to it.

As with most of the other concepts we've covered so far, the anabolic window is something that differs with training status. Newbies haven't put themselves through many (or any) workouts before, so the stimulus from resistance training will be harder for their body to overcome. As a result, protein synthesis will be elevated for a much longer amount of time after training as opposed to someone who is very experienced in the gym.

In the latter scenario, the body literally has no need to elevate its ability to build new tissue that high or that long, simply because there's not that much new tissue left to be built. Your body also becomes much more efficient at recovering from a bout of exercise after doing so in a routine fashion for years on end. As with most things, whatever you repeatedly expose yourself to, your body will become better at dealing with.

At a certain point, trainees will approach their genetic limit; while this point will occur much later in a training career than some people expect, it will still happen. Unfortunately, we all can't continue gaining muscle (naturally, of course) forever.

So what's the takeaway here? For our buddy Jay, his ability to synthesize new protein will be markedly higher and last markedly longer following a single training bout, up to 72 hours (yes, that's 3 full days, not a typo). Contrast that number with a much more modest 12-18 hours spike in protein synthesis for an experienced lifter.

This has two implications:

1) Since protein synthesis will be elevated for longer, a newbie like Jay can afford to train much less frequently and still reap all of the rewards of eating within the anabolic window. With a rank beginner, as little as two full-body workouts per week will keep protein synthesis elevated for nearly the entire week.
2) Again, since protein synthesis will be elevated for much longer, less of an importance will be placed on nutrition specifically in the post-workout time zone. Unlike an experienced lifter, who needs to place a hefty chunk of their nutrition in that post-workout window to take advantage of that much shorter spike in their body's growth potential, there isn't exactly the same urgency for a newbie. In fact, they can afford to each in a much more "iso-caloric" (same calorie amount in each meal) fashion, since basically all of their meals will come in this anabolic window.

Alright, we've covered quite a bit here. What does everything I said here look like in number form? Here's a pretty table to help with that:

Jay	Training Day (2 days/wk)	Rest Day (5 days/wk)
Bodyweight	130 lbs (59.1 kg)	130 lbs (59.1 kg)
Bodyfat %	10%	10%
BMR (Katch-McArdle)	1519 kcal	1519 kcal
Activity Factor	1	1
TEF (low BF%, whole-food diet)	1.25	1.25
Training Expenditure (60 min)	355 kcal	0 kcal
Energy Balance	120%	120%
Energy Intake	2810 kcal	2278 kcal

All things considered, this would be a great foundation to an approach for a beginner. As I mentioned above, calorie cycling won't matter as much to someone in this position as opposed

to someone more experienced, so eating a diet with a daily energy balance of 120% would work very well. However, we can take this example a step further to really fine-tune things. And you're going to have to wait until Part 3 to figure out what that is ;)

Scenario 2) Your Typical "Gym Bro"

Luckily for you, since we fleshed out most of the background concepts in the example above, this section will go much quicker.

Experienced; strong; a little "puffy." This encapsulates a HUGE part of the current gym-going demographic. They have the will and the work ethic, they just put their faith in the wrong information and end up with sub-par physiques as a result.

Meet Brodie, another fictional character with a very applicable gym-bro name. 22 years old, 190 lbs, strong as a bull, but 20% bodyfat. He recently graduated and is one of the proud few who was able to secure a 9-5 job straight out of college. However, just like our friend Jay, this means Brodie doesn't get much activity outside of the gym.

At his age and strength level, Brodie simply needs to shed some bodyfat in order to attain an impressive physique. It's fair to tab him as a high-intermediate in the training game, which means his protein synthesis peak after training won't be nearly as long as Jay's. This also means that Brodie will employee an energy deficit instead of a surplus.

Caveat Alert: Deficits and surpluses are just tools to try to maintain desired rates of weight gain and weight loss that have been shown in research to be the most sustainable and effective. Even with an "aggressive" 20% surplus, in Jay's scenario, that should theoretically lead to about a 1% increase in bodyweight over the course of a single week.

Double Caveat Alert: The adaptive nature of your metabolism is going to play a huge role here. While the entirety of this principle is beyond the scope of this article, it ties into the notion that we are working towards rates of weight loss or gain instead of blindly following set surpluses or deficits. Someone like Jay may very well have an adaptive metabolism, and they may come to find that even with a 20% surplus, they aren't gaining 1% of bodyweight per week. Or, on the flip side, he may find a 20% surplus is causing him to gain weight way too fast, and this is almost never a good problem. Consider the intensity of the surplus or deficit to be a means to an end, with the rate of weight gain/loss being the deciding factor.

Back to the original caveat… Knowing that Jay weighs 130 lbs at the start of the program, this amounts to 1.3 lbs in the first week. This 1% per week value will effectively limit fat gain and ensure that the majority of the new weight will end up being lean mass. On the flip side, a it could take a 40% deficit to encourage a 1% rate of weight loss across a single week. That's doubling the intensity, relatively speaking, for an identical rate of progress in the opposite direction. Since Brodie is more advanced, losing bodyweight at 1% a week will put his muscle mass at risk, and we want to do all we can in order to maintain what he's already got.

A 20% deficit should theoretically lead to a loss of .7% of bodyweight per week, or roughly 1.33 lbs. Yes, less than 1%! This should be sounding all types of alarms in your head to signal that either route, muscle gain or fat loss, is a multi-week process that will be much more successful

when taken slow. You will be much better able to mitigate fat gain in a bulking phase, or to mitigate muscle loss in a cut, when you exert a little patience, grasshopper.

And now, finally, back to Brodie… he will also have an anabolic window that will be closer to 18-hours (less than a full day), with the peak coming in the early hours post-training. Knowing this, Brodie can afford to train much more often if he wants to consistently reap the benefits of elevating protein synthesis. And let's not beat around the bush here: training more means more food. And more food is good.

If you manipulate training volume correctly (beyond the scope of this series), someone like Brodie can still afford to train at a high frequency while cutting. Somewhere between 4 and 6 training sessions per week, coupled with an energy deficit, should put our man on the right track to losing fat while maintaining all of that strength and muscle he spent so much time slaving away in the gym with his fraternity brothers for.

Brodie	Training Day (6 days/wk)	Rest Day (1 days/wk)
Bodyweight	190 lbs (86.4 kg)	190 lbs (86.4 kg)
Bodyfat %	20%	20%
BMR (Katch-McArdle)	1862 kcal	1862 kcal
Activity Factor	1	1
TEF (not ideal BF%, whole-food diet)	1.2	1.2
Training Expenditure (60 min)	518 kcal	0 kcal
Energy Balance	80%	80%
Energy Intake	2285 kcal	1788 kcal

Something that may strike you right away is the energy intake values, compared to the first example. In short, someone 60 lbs heavier will be consuming over 500 calories less on training days to start with. These values will surely change over time, but this sheds light on the more aggressive nature you have to take while cutting weight vs gaining weight.

But just as in our first example, there is a way to fine tune this approach even further. Oh, not to mention we haven't even touched on macros, meal frequency, calorie cycling, and much more.

In Part 3, we'll get to the nitty-gritty details.

In-Text Citations

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Part 3

Alright, we've been through quite a bit in the first two parts of this series. We discussed goals, training status, how those factors impact energy intake, how to set that energy intake… But it doesn't stop there. We have a little more work to do to figure out how to best distribute that energy, time-wise and macro-wise, to streamline your progress.

Remember our new friends, Jay and Brodie? We found their desirable energy balance based on their goals, but that's not the whole picture. Let's use another pretty little table to illustrate what we know about them so far:

Jay	**Goal: Gainz**
Bodyweight	130 lbs
Energy Balance	120%
Rest Day Expenditure (5 days)	1899 kcal
Rest Day Intake	2278 kcal
Training Day Expenditure (2 days)	2342 kcal
Training Day Intake	2810 kcal
Expected Weight Gain	1% BW/week
Brodie	**Goal: Fat Loss**
Bodyweight	190 lbs
Energy Balance	80%
Rest Day Expenditure (1 day)	2234 kcal
Rest Day Intake	1788 kcal
Training Day Expenditure (6 days)	1828 kcal
Training Day Intake	2285 kcal
Expected Weight Loss	.7% BW/week

So now we know how much energy they will be eating; now, we're going to find out what that will be comprised of and when they'll be eating that energy.

Setting Macros

For those of you who are unaware with what macronutrients are, they are the three main energy-giving components of the diet: fats, carbohydrates and protein. Technically, alcohol also provides calories, but if you're this far into the discussion, that probably means you don't have a diet and lifestyle predicated around alcohol delivering the majority of your calories (...right?).

Fats deliver 9 calories per gram, while carbs and protein deliver roughly 4 calories per gram a piece. On its surface, it appears that fat would inherently be more "fattening." While this would technically be true if we were simply doling out food on a gram-to-gram basis, nobody actually operates that way. At least I hope not. Plus, in the context of body composition, the fat to carb ratio of your diet doesn't matter all that drastically, provided that you have a few other major points in check [1]. That first major point being…

Protein

You guessed it. By now, the term "high-protein diet" is thrown around as liberally as politicians throw around insults at their opponents. But this isn't without good reason: protein is the only macronutrient that is able to stimulate the Mammalian Target of Rapamycin, or mTOR, on its own. Aside from sounding long and complicated, mTOR plays a vital role in muscle growth and protein synthesis. Thanks to protein's unique makeup and constituent amino acids, this is the macronutrient that is most crucial to the process of protein synthesis and maintaining/gaining lean muscle mass.

To make a long story (kind of) short, an amino acid found in protein named leucine has the ability to signal mTOR all by itself, kick-starting the process of synthesizing new lean mass. This is important for obvious reasons.

But impact of dietary protein on protein synthesis doesn't stop there, so don't go out buying leucine supplements and chugging them down thinking that a single amino acid is all you need. The remaining amino acids found in protein are vital in that they provide the building blocks for the new tissue that you are trying to signal your body to build with each training session. Look at it this way: leucine raises the flag and opens the gates, the other amino acids must be ready, in abundance, to get through that gate and construct themselves.

So how much leucine do you need to send this signal? Good question.

There is a common theory discussed called the "leucine threshold," meaning that there appears to be a certain amount of leucine that will successfully trigger the start of this process [2].

A study has been done where daily protein intake was distributed across the day over three meals in different fashions: one with the majority of the daily protein at one meal, and another with the protein spread more evenly through each of the three [3]. Researchers found that protein synthesis was elevated over the course of the day to a higher extent in the even

distribution group as opposed to the skewed distribution, which could very well mean that the smaller meals in the skew group didn't provide enough leucine to start the protein synthesis process.

For the physique-minded athlete, our goal is to maximally stimulate protein synthesis with each meal in order to save or gain lean mass, depending on your goal. The major takeaway here would be to ensure that each meal you eat surpasses that leucine threshold, which appears to be around the 3-4 gram mark.

Alternately, it has been described as the amount of leucine that can stimulate protein synthesis above the 50% mark. Menno Henselmans recommends never having a meal with less than 0.3 g/kg of protein included, and I'm comfortable with sharing that recommendation. Let's be real, I'm comfortable sharing anything he says.

In practice, when using high-leucine protein sources such as meat, dairy and protein powders, this could be as little as 18 g of protein for our friend Jay and 26 g for Brodie.

Sidebar: these values may seem low on the outset, as you may have fallen into the bodybuilding magazine dogma of "more protein = better." As with many things in nutrition, and life in general, more does not always mean better. Be aware that magazines, supplement companies and Instagram celebrities peddling products have an agenda and they want to paint the picture that you need to be chugging down whatever protein shake they're selling as often as possible. You don't need to buy into this when you know some of the finer points, such as the leucine threshold that I just presented.

So now that we've established effective minimums on a per-meal basis, we can see how this translates to a daily protein intake goal. As Menno and Eric Helms have discussed at length in their protein debate (Google it), this target range of protein intake is likely less than what you've been lead to believe by the bodybuilding/supplement industry.

An effective daily protein intake can be represented by the range of 1.8 grams/kg to 2.7 grams/kg. Here's how that plays out for our two subjects:

Jay: 130 lbs (59.1 kg), 106 - 160 grams per day
Brodie: 190 lbs (86.4 kg), 156 - 233 grams per day

Any value within these ranges will suffice, but special consideration should be taken in either circumstance. Other than personal preference (sometimes people just really like eating protein), training status and goals should factor into where you may fall into the range.

Remember, Jay is just starting his strength training journey, and he likely has a lot of new mass to build. In order to accommodate that higher-than-normal rate of growth we expect in this scenario, he should steer towards the higher end of the range.

For Brodie, we could steer towards the lower end. As an experienced lifter, he is closer to his "genetic ceiling," and his body has become much more efficient at metabolizing protein thanks to the numerous training sessions he already has under his belt [4]. An energy deficit also makes you body more efficient at metabolizing protein [5].

And if that wasn't enough, steering towards the low end of the range could theoretically make a diet much more sustainable for someone in a deficit. Yes, protein is more satiating (to a point) than other macronutrients in isolation, but if you have more calories to allocate toward carbs and fat, you can construct a much more enjoyable diet that you will more likely stick to in the long run.

I'll wrap up this protein topic by stating that these values should be considered stable across all days. Jay will be eating 160 grams of protein on training days and rest days; Brodie will be eating 156 grams across all days as well. For Jay, that amounts to 640 calories per day from protein. For Brodie, it's a roughly equivalent 624 calories.

Calorie Cycling/Nutrient Timing Part 1

Before we fill in the rest of the energy intake with calories from carbs and fat, we can fine-tune either scenario to better fit both trainee's anabolic windows. Think back to when we set energy balance percentages for both of these guys. As discussed, they can get by just fine by maintaining a 20% surplus (or deficit) across all days. But monotony can easily set in in either scenario, especially when cutting.

Research shows that it's can be easier to adhere to a diet with varying calorie intakes across days instead of maintaining the same level of intake for the long haul [6]. This makes sense from an evolutionary perspective, as the same amount of food surely wasn't available across all days for our distant ancestors. It also makes intuitive sense, as these days typically provide acute, tangible results, at least on the scale.

And now that we know about the increased ability to synthesize new protein within the anabolic window, we can tailor our dietary prescriptions to allow for the majority of calorie intake at those specific times and minimize our intake when it is unreasonable to expect your body to be building any new tissue (a.k.a. outside of the window).

Think of it this way: Jay eating at a 20% surplus across all days is the same as him eating at a 20% surplus across an entire week. When we take a step back and look at the bigger picture, we are accomplishing the same goal in either scenario; we are left with a lot more wiggle room in the latter scenario. More people need to start viewing energy balance this way.

Based on their energy output, this is how a week would look for both subjects in terms of caloric intake:

Jay (2 training days): 17,010 calories
Brodie (6 training days): 15,498 calories

It's important to note that with both training frequencies, both guys will spend roughly 6 days out of the week within the anabolic window. This leaves one day outside of that window. When your body has no signal to build new lean tissue (a.k.a. a training stimulus), it would make sense to limit the consumption of energy in order to mitigate fat gain.

It may sound a bit extreme, but I often employ Protein Sparing Modified Fasts (PSMF) on myself and recommend it to others on days where they won't spend any time within the anabolic window. This constitutes your desired protein intake… and little to nothing else.

It might seem a little insane to only eat lean protein and vegetables for all of your meals on a single day, but personally, I find it pretty easy.

Let's assume that both of our noble heroes abide by this and eat nothing but lean protein and vegetables in the single day (a.k.a. protein and trace other nutrients) spent outside of the anabolic window. Ready for more math?

Jay: 17,010 weekly calories - 640 calories on PSMF day = 16,370 remaining calories
Brodie: 15,498 weekly calories - 624 calories on PSMF day = 14,874 remaining calories

In essence, we're willingly taking on a sharper deficit on one day to create a higher reserve of calories on days where you can put them to good use. All of the sudden, Jay is eating more than a 20% surplus on days within the anabolic window; Brodie has less than a 20% deficit to deal with on training days. This strategy of rearranging calorie intake basically optimizes how you can put them to work for you.

Now, for the rest of the calories. Where will they come from?

Fats & Carbs

Please check your zealotry at the door: neither macronutrient is inherently harmful to your health. An optimal fat intake will maintain levels of vital hormones so that you can perform at an optimal rate [8]. Carbs provide energy, which matters in the anabolic window to spur new growth, and also contribute to glycogen stores. While traditional weight training doesn't deplete muscle glycogen to the extent that most people believe [9], it's still a factor to consider and be mindful of.

Both of our subjects are male, but the recommendations don't change too drastically across genders. For fats, males should steer towards getting at least 40% of their Resting Energy Expenditure (REE, comprised of BMR, Activity and TEF) in the form of fats; females can aim for 40% of total energy intake, since they have a glycogen-sparing metabolism compared to males and require less carbohydrate [10].

More math:

Jay: 16,370 calories * .40 = 6,548 calories from fat per week
  6,548/9 = 728 grams of fat per week
  728/6 = 121 grams of fat per non-PSMF day
Brodie: 14,874 calories * .40 = 5,950 calories from fat per week
  5,950/9 = 661 grams of fat per week
  661/6 = 110 grams of fat per non-PSMF day

Now the puzzle is starting to come together. Jay will be getting 160 grams of protein each and every day, and at least 121 grams of fat on the 6 days he'll be spending within the anabolic window. Brodie will be getting 156 grams of protein each day, and at least 110 grams of fat on his training days.

I say “at least” because these fat values are effective minimums. You could logically fill in the remaining amount of calories for both subjects with carbs, but some people tend to work better with a higher proportion of fat as fuel. These would be details that would be teased out of the course of weeks while accumulating data and seeing how different protocols affect performance.

But, for sake of simplicity, let’s go with filling the remainder with carbs. Almost done with math, I promise:

Jay: 17,010 weekly calories - 6,548 fat calories - 4,480 protein calories = 5,982 calories
5,982/4 = 1,496 grams of carbs per week
1,496/6 = 249 grams of carbs on non-PSMF days
Brodie: 15,498 calories - 5,950 fat calories - 4,368 protein calories = 5,180 calories
5,180/4 = 1,295 grams of carbs per week
1,295/6 = 216 grams of carbs per non-PSMF days

The picture is becoming much clearer now, so here’s another pretty little table to summarize what we have up to this point:

Jay	Training Day	PSMF Day	Brodie	Training Day	PSMF Day
Fat	121 g	Minimal	**Fat**	110 g	Minimal
Carbs	249 g	Minimal	**Carbs**	216 g	Minimal
Protein	160 g	160 g	**Protein**	156 g	156 g

Meal Frequency

Another hotly debated topic in the fitness industry. “Gotta keep the metabolic furnace stoked, bro.”

Sure, bro…

All told, meal frequency doesn’t have that much of an impact on metabolic rate within a reasonable range [11]. Sorry to take the wind out of everyone’s collective sails. Eating more often doesn’t give you any edge on someone eating a normal 3-4 meals.

Again, it comes down to personal preference and your ability to hit the leucine threshold with each meal. If you have so many meals that there won’t be enough protein in some of them, then they’re just not worth it.

Our friends Jay and Brodie abide by this mentality, and will be spreading their intake over 4 meals each day.

Calorie Cycling/Nutrient Timing Part 2

What we discussed in the first nutrient timing side bar may seem like nothing new to you. You may instinctively eat a little less on days where you do less and a little more on days where

you're active. But we can take this two steps further: by loading nutrients at certain times throughout the day, and by consistently hitting feeding windows across all days.

This is another blessing of eating relatively fewer meals; it turns out to be much easier to eat at similar times each and every day. And the impact of eating within the same windows of time each day actually has some pretty huge impacts on how your body utilizes the food you give it.

I recommend eating each meal within the same 2-hour window across all days. It's more simple than you may think, because you can simply prescribe a meal time and stretch it back an hour and forward and hour to construct a meal window. If both of our subjects eat their first meal at 9 AM, any time between 8 AM and 10 AM would suffice.

Why eat in specific windows? By eating at irregular times, you will experience:

- Higher fasting total and LDL ('bad') cholesterol, as well as increased insulin production in response to the meal. [12]
- A disruption in appetite. [13]
- A disruption in cortisol production throughout the day, along with higher blood pressure. [14]
- Reduced insulin sensitivity, resulting in a decreased thermic effect of food (TEF, the energy your body expends to break down the food you just ate). It can decrease by almost 50%. [15] That's bad.

Actually, it's all bad. So take as much care as you can to get as close to these windows as possible to amplify your efforts. Your body craves routine, so give it what it wants!

Let's take this example a step further and assume that all meals for both subjects will come at 4-hour intervals. So 9 AM - 1 PM - 5 PM - 9 PM. I recommend this amount of time be the minimum you spend between feedings, with longer periods being perfectly fine.

No, your muscles won't shrivel up in front of your eyes. By spacing meals 4+ hours apart, you're respecting another theory known as "the refractory nature of protein synthesis." While it's still just a theory, research has shown that while amino acids levels in the blood and protein synthesis both rise immediately after the consumption of a meal, protein synthesis will decrease back to baseline about 2 hours after a meal and stay there even if amino acid levels are still elevated [16]. You can literally give someone an IV drip of amino acids, and protein synthesis will still return to baseline at some point.

The time period for this effect to wear off is roughly 4-5 hours, which is why I tend to plan meals accordingly (more insight on this theory from Dr. Layne Norton can be found here).

Speaking of planning meals, you definitely want one of your meals to fall within an hour or two of your training session in order to take advantage of your body's elevated ability to synthesize new tissue. This matters far more for Brodie, who gets more of a "peak and valley" effect on protein synthesis from a training bout as opposed to Jay, who can train once and seemingly make gains forever (I wish…).

Say our experienced lifter Brodie trains in the evening (hint: a great idea for any intermediate/advanced trainee), he'd a) want to keep that training time as consistent as possible in order to

give his body a routine to adapt to and b) would want to finish training at about 4 PM so that he can reap all the rewards of a high-energy meal after his workout.

For Jay, he can honestly train whenever, as long as it's not in the fasted state. Don't freak out, I'll touch on that in another article. But no matter when Jay trains, he'll enjoy a heightened rate of protein synthesis for hours, even days on end.

To differentiate this example from the other one, let's assume that Jay can only train in the afternoon due to his class schedule. Now, he can have 3 meals within the time frame where protein synthesis is at it's highest (MPS peaks a few hours immediately after training, and it gradually falls back to baseline. Training status impacts how long that return to baseline takes, but it's not consistently as high as it is immediately post training).

Putting it All Together

Let's put a nice bow on Jay's full picture.

Jay is trying to build mass, training twice a week, and spending nearly 6 days within the anabolic window thanks to his newbie training status. On PSMF days, it's pretty cut and dry: get 40 grams of protein in each sitting, and trace amounts of any other nutrient. Done.

On the rest of the days of the week, it would make sense to use an iso-caloric approach and ration out his nutrients equally across all meals. Remember, three of those meals will come while his ability to create new tissue is still high, so the need to specifically time nutrient intake isn't as crucial.

If I was coaching Jay, I'd recommend that 6 days of the week look something like this:

Meal (x4)	Grams
Fat	30
Carbs	62
Protein	40

Pretty simple, isn't it? We have all of our bases covered: every meal would hit the leucine threshold, he'd be eating enough across the day to hit all of his targets, and on training days, 3 of these meals would fall within the anabolic window. Actually, on all 6 days, basically all of his meals would fall in that window. Pretty sweet.

Brodie needs a little more TLC. Since his anabolic window period is much shorter, we have to respect that and realize that if he trains in the evening (around 3-4 PM), the elevated protein synthesis will disappear by the following morning.

His 6 days would look something like this:

	Fat	Carb	Protein
Meal 1 - 9 AM	20	26	26
Meal 2 - 1 PM	20	26	26
Meal 3 - 5 PM	50	108	52
Meal 4 - 9 PM	20	54	52
Totals	110	216	156

The meals within the anabolic window are highlighted, and the reduction of calories from meals 3 to 4 indicate the steady fall of protein synthesis through the rest of the day. But again, here we have all meals hitting the leucine threshold, and we've taken care to double the amount in the anabolic window because there's reason to believe we have double the growth potential at that time. All told, 1,694 calories out of 2,470 (or 69% of intake) is coming within that window for improved growth. Pretty smart move.

Again, these both represent starting points, and will be tinkered with on a week-to-week basis depending on scale weight, body composition changes and performance markers. And these examples also assume that both subjects are following a whole-foods based diet in order to boost TEF as high as possible in either scenario.

But if you've made it this long, congratulations. You hung with me through the dense info and hopefully came out better equipped to assess yourself in terms of how to construct a proper diet. Now the question of "which diet is best" doesn't seem so simple, now does it?

If this type of information interests you, I strongly encourage you to look into the Bayesian Bodybuilding PT Course. I credit most of my knowledge to Menno Henselmans and his outstanding, no-BS online course.

In-Text Citations

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