The Ultimate Diet 2.0

by

Lyle McDonald

This book is not intended for the treatment or prevention of disease, nor as a substitute for medical treatment, nor as an alternative to medical advice. It is a review of scientific evidence presented for information purposes only. Recommendations outlined herein should not be adopted without a full review of the scientific references provided and consultation with a physician. Use of the guidelines herein is at the sole choice and risk of the reader.

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Foreword

After my last little drug book on Bromocriptine, I wanted to get back to my main area of interest and real area of expertise: integrated methods of training and nutrition. I will be mentioning some drugs that might be useful along the way, but that's not the main focus of this book. Actually, the best way for me to introduce this book is with a story/history lesson.

The story of this book begins just over twenty years ago in 1982. That year, Dan Duchaine and Michael Zumpano introduced the Ultimate Diet to the world of bodybuilding. In a nutshell, the Ultimate Diet was a 10 day cyclical diet and training plan, incorporating three different training and eating approaches in a coordinated fashion. Drug options were suggested since the laws were less stringent then. It was radical and revolutionary for its time combining cutting edge science with good old intuition (and maybe a little lucky guesswork) to create a complete plan for generating extraordinary results in ordinary people. It achieved something few plans could claim: fat loss with muscle gain or at the very least fat loss with no muscle loss. With slight adjustments in calorie intake it could be used for muscle gain with minimal fat gain.

Fifteen years later, the same Dan Duchaine released an "updated" version of that diet in his seminal book Underground Bodyopus: Militant Body Recomposition. Now a 7 day plan, without nearly the complexity as the original Ultimate Diet, Bodyopus kicked off an entirely new interest in the bodybuilding subculture regarding cyclical diets and cyclical ketogenic diets in particular. This is where I enter the story.

In 1997, I was terribly bored with my life, looking for something to do. I latched onto the Bodyopus diet like a drowning man grabbing a life preserver and never looked back. In one sense, it mirrored Duchaine's original interaction with Zumpano and the Ultimate diet back in the 80's. At that time, Zumpano was the guru and Duchaine was the bored detail man looking for something new to do with his life. In 1997, Dan was the guru and I was the bored detail man. That's how I like to think of it anyhow; I don't know if Dan saw it like that or not.

In any event, what started as a whim, writing a weekly diary of my experiences on the diet turned into something far more. A couple of years later, I wrote the be-all, end-all book on ketogenic dieting. Even Dan admitted I knew more about "his" diet than he did which was as great an honor as I could receive. I became the keto-guy (a nickname I still can't shake no matter how hard I try) even though I never really advocated them in the sense that you'd think. Against all odds, considering how badly it was written and how boring it was to read, the keto book actually sold decently. If nothing else, it established me as a "name" in the industry. A detail-obsessed geek, mind you, but a "name" nonetheless.

In the 6 years since that book, research into human physiology, nutrition, biochemistry, etc. has advanced at an amazing and exponential pace. Science is finally getting to the mechanistic reasons that things happen in the body. Knowing how things happen in the body allows for a certain measure of control. This book represents an integrated approach to all of it.

A note on the title of this book

In case you didn't look at the cover, the title of this book is The Ultimate Diet 2.0. Before I go any further, I want to explain the reasoning behind the name. The first reason, mind you, is that I suck at coming up with creative names (the titles of my last two books prove that). At least I'm honest. But even if I were creative, I still would have chosen to call it The Ultimate Diet 2.0, so that's actually not the main reason this time.

If there's a primary reason I chose the title I did, it's out of tribute. As above, this book is basically an update and revision to the dietary approach that helped me gain whatever amount of respect and importance I hold in the bodybuilding or sports nutrition world. From the Ultimate Diet came Bodyopus. From Bodyopus came my first book. From my first book came my career.

Now, since I got involved with this whole mess at the Bodyopus stage of things, you may be wondering why I didn't call this Bodyopus 2.0 instead. There are a few reasons. First, it just seemed a bit inappropriate. Bodyopus was Dan's brainchild and the name held a very specific meaning to him. The Ultimate Diet 2.0 is a little more generic of a title and just seems a little less pretentious in that respect. Or not.

Also, Dan passed away three years ago (2000), and it just seemed disrespectful to confuse people with two books called Bodyopus. Even though it's a few years out of date and had a minor number of technical mistakes, I still think everyone should own a copy of Bodyopus. Having two books with that title would have confused the average person. Finally, I didn't know who legally owned the rights to the Bodyopus name and didn't want to get my ass sued.

Perhaps more importantly, this book doesn't really revise the seven day Bodyopus plan, with its two types of weight training (tension and depletion) and two distinct dietary periods (low- and high-carb). My first book was closer to that, more of a detail/technical manual for keto/cyclical keto diets. If anything, that first book should have been called The Bodyopus Companion or something equally silly.

Rather, what I'm going to describe here comes directly out of the original Ultimate Diet plan from 1982, which had three types of weight training, three types of eating, and a lot more complexity (and potential sources of confusion). On various levels, including the most fundamental ones, the original Ultimate Diet was the impetus for this book; as a tribute/revision to that diet, I think the names should be the same.

The title of this book, The Ultimate Diet 2.0, has several meanings. The first is simply one of tribute to Duchaine and Zumpano's original Ultimate Diet, released all the way back in 1982. It's fascinating reading now and they were ahead of their time by many years. This book is also an update to that same diet integrating findings about metabolism, fat loss and muscle gain to optimize it. Anyone involved with computers knows that new versions of stuff get a new number. Hence 2.0. Finally (hopefully), it will be the last diet you need. Hence the word "ultimate."

Introduction

Face it, you're normal. Well, more normal than you like. Even though you've trained like an animal, taken all the supplements and done everything you're supposed to, you're still closer to normal than not. Sure, you carry more muscle than the average person on the street (which isn't saying much) and you're leaner too (which is saying even less). You're as healthy as it gets (physically anyhow) and your doctor is thrilled.

But we both know that there's that nagging voice that isn't satisfied: normal isn't the same as content. Either you don't have as much muscle as you'd like or you can't get rid of the last little bit of fat. How do I know this? Am I psychic? Have I been watching you through your window? No. I know this because folks who have optimized metabolisms and good genetics don't buy books like these in the first place. We always notice them in the gym, the folks who seem to break all the rules of training and diet and still look better than we can hope to. They do nothing but bench and curls, eat a junk food diet and just get big, symmetrical and ripped. We can, and should, hate them. No, it's the folks who are looking for salvation who keep me in business.

In buying this book, you're continuing a long-held tradition of grasping at anything that might offer a solution. If at all possible, it should be simple and unobtrusive. Maybe a pill. Well, I hate to burst your bubble but this is the truth: if it were simple and easy to become supranormal, everyone would do it and you'd see a lot more examples walking around.

What I'm going to describe in this book isn't easy and it isn't simple. It's also not magic. I have some physiological tricks that may look like magic, but they're not. Since my biggest bodypart is my brain, I've used it to (re)develop an integrated system of training and nutrition (and some supplements and drugs) that let you sidestep some of the problems inherent in achieving a supranormal body.

In redeveloping the original Ultimate Diet, I've applied the most cutting edge research available, discussed various elements of the diet with many other smart folks, and done cycle after cycle testing the diet both in myself and in my multiple guinea pigs. After many years of testing, design and redesign, I give you the Ultimate Diet 2.0 (UD2 from here on out).

Chapter 1: What this book is and who it's for

So here we are again, another book, another chapter on defining the problems. If you read my last book, you already probably have some idea what I'm going to say. In short, dieting to low bodyfat levels sucks. Actually, dieting sucks across the board but the real problems start when you start to get far below normal. So what's normal?

In modern times, an average male may be carrying 18-25% bodyfat, an average female 21-28%. Many, many (too many) people are much fatter than that.

Healthy bodyfat levels are considered to be 11-18% for men and 18-25% for women. To the body-obsessed, except maybe at the lower levels, that's still fat. Male bodybuilders (and other athletes) think in terms of sub-10% bodyfat levels, females typically in the low to mid teens. Researchers would probably debate the validity of such beliefs but who cares; if you believe it, it's true to you. Perhaps more important is that it is your goal.

Most diets or diet books are aimed at the folks who are trying to get somewhere in the realm of average. There are tons to choose from out there. Any discovery or piece of research that might affect these folks can be turned into a quick fix diet book. One of these days, I'm going to write my own, make a zillion dollars and retire.

For obese folks just trying to lose weight, pretty much any non-retarded diet will work. The main issues to deal with there have more to do with anxiety and the issues involved in changing long-term eating and activity patterns. And even though some readers might disagree, getting a male to 12-15% bodyfat or a female into the 18-22% range usually isn't that difficult. Basic food control, adequate protein and exercise will usually get it done without too much trouble. This book isn't aimed at either group.

By the time folks get to the 12-15% (18-22% for women) range, anxiety, food control and changing habits usually aren't the problem. For bodybuilders and athletes meticulous food control and training is part of the lifestyle. It's when folks start trying to achieve the lower extremes of bodyfat percentage that other problems start to occur. Ravenous hunger, severe muscle loss, metabolic slowdown and screwed up hormones are a few of the usual problems. Women and some men have an additional problem mobilizing and getting rid of stubborn fat (hip/thigh area for women, ab/low-back fat for men).

In presenting the UD2, I'm going to assume that you already have the discipline and anxiety issues well under control. While they are less of a problem on this diet than on many others, it's the real physiological problems I'm setting out to address and fix.

Who am I?

I imagine most readers know me as the author of The Ketogenic Diet, which is more or less considered to be the be-all, end-all book on low-carbohydrate dieting. Fewer readers seem to be aware of my second book, which dealt with the drug Bromocriptine. If you've read either book, you'll have a better background to understand the information in this book. If not, don't worry, I'll try to give you enough background to understand the UD2. To be honest, to give the rationale for everything in detail would take more pages than I want to take. I'm going to cover the basics and you'll just have to take my word for the rest.

Who are you?

So who are you, the ideal UD2 candidate? Actually, let me backpedal a bit and talk about who this diet isn't for. It's not for rank beginners. The training and dietary recommendations simply aren't appropriate for someone just starting out. Get 3-6 months of basic training under your belt and get your basic diet dealt with first before even considering the system described in this book. As above, it's not for the general fat folks out there. In general, until males hit 12-15% bodyfat and females 20-22% bodyfat, a more standard approach is probably fine (and desirable). I recommend folks use the simplest approaches they can until those approaches stop working.

First and foremost, if you're a male, you should have no more than 15% bodyfat, female no more than 22% bodyfat. Most likely you want to get leaner while maintaining or even increasing muscle mass. This could be for a bodybuilding contest, for some special event, or simply because you want to see where the body has veins. Alternately, you may want to gain muscle without the accompanying fat gain (or even slight fat loss). Perhaps you're a performance athlete like a powerlifter or an endurance athlete who needs to lean out while maintaining performance. The UD2 can be used for all those goals.

It should go without saying that you have to be exercising for the diet to work. By exercise, that means weight training (I'll talk about endurance athletes separately). Again, if you're new to weight training, the UD2 isn't appropriate; get 3-6 months of training under your belt first. If you're not planning on exercising, this diet will not do you any good. In fact, it'll probably just make you fatter.

You'll need a reasonable (but not insane) amount of diet discipline and you should have a basic understanding of nutrition and diet setup. If you don't know what a protein or carbohydrate is, or how to set up a diet, you're going to be totally lost reading this. I've tried my best to provide all the information you need but I'm going to make some assumptions about basic knowledge. If you meet this rather narrow set of criteria, read on.

Why not just use standard dieting approaches?

You may be wondering why you shouldn't just use one of the myriad standard dieting programs out there. I mean, pick up any bodybuilding magazine, and there are tons of plans that claim to let you achieve everything the UD2 does without all of the hassle. Why is the UD2 superior?

The main problem I have with the standard advice is that it's just so standard. High protein, low to moderate fat, low to moderate carbohydrates, weight training and aerobics is the standard prescription for getting ripped up. If all of the magazines are writing it, it must work, right? Well, yes, up to a point.

Frankly, I have no problem with the standard advice as long as it's producing results. As I said above, I actually prefer simpler approaches as long as they work. In many people, who frequently have genetic advantages that they might not even be aware of, they work just fine. But based on observations at the gym and the feedback I get, not everybody is so lucky (I'll talk about some of the reasons the genetically lucky are lucky next chapter). The reality is, only a small portion of the people who try actually achieve their goals using the standard advice. That tells me that, standard or not, it's not effective.

And don't get me started on the advice given by pro bodybuilders. It shouldn't even be taken into consideration unless you've got the array of steroids, thyroid medications, thermogenics and appetite suppressants that they use to get ready for a contest. A current pro is reported to have said the following about contest dieting "There is no magic diet, buy as many drugs as you can afford and starve yourself for as long as you can stand it."

For the majority, the genetically average (or disadvantaged), any number of problems can stop the diet in its tracks. A metabolically average dieter may lose 1 lb of muscle for every 3 lbs of fat lost trying to get to single digit bodyfat levels. Women have even more problems with muscle loss, not to mention issues with lower bodyfat mobilization. For some, metabolic adaptation causes fat loss to slow or stop completely long before goals are reached. There are all kinds of reasons these problems occur, most of which can be traced to the body's many annoying ways of adapting to a diet. Those same individuals have an equally hard time adding muscle without gaining too much bodyfat at the same time. Fundamentally, this is an issue of partitioning, where the calories are going (or coming from) when you eat (or diet).

What you should expect during the diet

I'll say up front that the UD2 is not an easy diet. You'll have to count/decrease calories and carbohydrates 3-5 days out of every 7. While you don't get to eat everything in sight on the other days, it'll sure seem like it. On some days you can even eat some junk food.

If you use the fat loss variant, you should be losing a pound or more of fat per week, while

gaining some muscle. At the very least you'll maintain muscle without loss which can be an improvement for most people. Performance athletes can lean out while maintaining or even increasing performance as well. For the muscle gain variant, it's a little harder to predict. Women, of course, will have slightly smaller changes overall for what should be obvious reasons.

Despite what you may be used to, you'll only be lifting 4 days per week. Each workout should take about an hour or so, with one running maybe an hour and a half. If you can't find 4 hours per week to train consistently, this diet won't do you much good. Cardio is optional for men, but generally necessary for women to lose their lower bodyfat at any decent rate. Still, you shouldn't need a ton of cardio with this diet, not nearly as much as you think anyhow.

There are only one or two required supplements, although there are some that can be genuinely helpful. Beyond that, the diet revolves around basic foods that you can get at any supermarket (I assume that bodybuilders and athletes have no problem with protein powder). While I'll mention drug options to further optimize the diet, they are by no means required.

Chapter 2: Your body hates you

As I'm fond of saying, your body hates you. Actually, that's backwards, your body loves you. It loves you so much that it will do everything in its power to keep you alive even if that means keeping you small(er) and fat(ter). Because to your body, that gives you a better chance of survival. That you want to do something different doesn't matter as far as your body is concerned.

I want you to put this book down and go look in the mirror for a second. Don't get so caught up in throwing most muscular poses that you forget to come back. What you just saw is perhaps the most complicated machine in existence. Over millions of years (or 7 days, depending on your personal cosmology), it has developed ways of adapting to just about anything that you can throw at it.

This most complicated machine, your body, the one that hates you (but really loves you) still thinks that you're living the rather plebeian existence of our ancestors. Our modern lifestyle has only been around for the last couple of thousand years or so, far too short a time for our bodies to adapt. As far as your body is concerned, you might as well be a paleolithic man named Og (no jokes about the mental capacities of athletes, please) living on the plains.

Let's look at the implications of this by trying to see things from your body's perspective. For the most part, your body has one overwhelming goal which is to keep you alive long enough to have children and ensure the survival of your genes. Everything else is pretty secondary to that goal. So what does that mean? Again, a few things.

First it means that your body needs a nice space-efficient way to store scads of energy. That's to get you through the times when there isn't food available (as it frequently wasn't prior to the advent of 7-11). That energy store exists, it's called bodyfat, and your body thinks it's great. Fat is space efficient, easy to store, doesn't take much energy to sustain, and can hold an unlimited number of calories. If your fat cells get full, your body can even make new ones to store more incoming calories. The new fat cells are a lot harder to get rid of then they were to gain, by the way, which is a very good reason not to get too fat in the first place. Bodyfat is truly an ideal way to store energy.

From your body's perspective it looks like this: If food becomes unavailable, the more fat you have, the more likely you are to survive long enough until food becomes available again. In societies with seasonal food availability, being able to store a lot of fat when food was plentiful was the only way to get through the times when it wasn't. The extra fat also helped keep folks warm during the winter. No central heat or Gortex parkas back then.

In many societies people would fatten up in the summer so that they could survive through the winter and repeat for as long as they lived. Now, we just stay in one long fattening cycle (if you're a powerlifter, you can call this a bulking cycle and not feel guilty) without a break.

That's at the root of the modern problem of obesity: constant availability of high calorie, high-sugar, high-fat foods. Decreases in daily activity is the other big part. Though our genetics are the same as they were 10,000+ years ago, our environment has changed drastically.

Lean individuals would have been at a big disadvantage hundreds of thousands of years ago when getting your next meal wasn't as simple as driving down to the local fast-food restaurant. Folks who didn't fatten up wouldn't have survived the food shortages, for the most part, so their genetics usually got weeded out of the pool. This probably isn't true for ethnic groups that lived in areas of the world where food was available year round: those are the ethnic groups that tend to stay lean pretty naturally.

The people who could store fat the best, who were most likely to survive the famines, were the ones who survived and passed on their genetic code down the line to us. In our current society, bodyfat is just a health-risk, not a necessary element to keep us alive for the most part. This fact is clearly shown in the survival times of lean versus obese folks during total starvation. A lean individual may die after 60 days of total starvation while an obese individual may make it for six months or longer. Extreme leanness is generally incompatible with survival if food becomes unavailable. I'll come back to this in a bit.

But what about muscle, that's useful right? You've got to be able to kill stuff to survive and that means muscle. Yes and no. Although it's wonderful to imagine Paleolithic man taking down wild animals with his bare hands like in all the "Tarzan" movies, it's more likely that man used his bigger brain to outfox animals when it came to hunting. Our brains are staggeringly large (relative to our bodyweight) than those of other animals; most likely we used our brains to compensate for relatively less muscle mass.

So while a modicum of muscle was necessary for survival, and our ancestors are thought to have had more muscle than the average American couch potato (which isn't really saying much), excessive muscle mass was probably a liability. Sure, you need enough to get around and get food but anything more than that is basically dead weight. In the wild, with the possible exception of impressing a potential mate, an 18 inch arm wouldn't have been much of a benefit. If anything, it might have slowed down your spear-throwing a bit.

In contrast to fat, muscle requires a lot of energy to build, requires a lot of energy to sustain, and doesn't provide much energy when it is broken down. Even then, your body will happily break it down when you diet. My point is that you run into an equally difficult set of adaptations occurring when you try to push your muscle mass beyond a certain point.

The end result of all of this is that, to your body, which thinks it's still on the plains eking out an existence, being fat and small are beneficial, because they meant greater survivability. Our physiology reflects this which makes things really suck for folks who want to be bigger and leaner. In short, we're fighting against millions of years of evolution and adaptation to reach our goals of bigger and leaner. Usually, the body wins.

Now, you may be thinking that I'm full of it already, because you can look at any magazine

and find many sterling examples of individuals who are both huge and lean. They are called pro bodybuilders. There are a few reasons why the images in the majority of the magazines aren't very relevant to the rest of us. First and foremost, pro bodybuilders (or athletes in general) have better genetics than the rest of us. They are the genetic elite. This isn't some type of personal grouse or whine, simply a statement of fact and reality. If you had their genetics, you wouldn't be reading this book.

If you look at pro bodybuilders in their early stages, they are still typically leaner and bigger than the normal individual. From a physiological standpoint, they probably have higher than average testosterone levels and don't overproduce cortisol. Thyroid levels are probably optimal or close to it, helping to naturally optimize metabolic rate, fat burning and protein synthesis.

They have good skeletal muscle insulin sensitivity and tend to put calories into muscle more effectively (i.e. they partition calories towards muscle instead of fat). They probably have fewer fat cells than most people and that fat is evenly distributed (although even female pros have problems with lower bodyfat). When they diet, they don't have as many problems with metabolic slowdown. Their evenly distributed fat comes off easily and, since they can use fatty acids easily for fuel, they don't lose as much muscle when they diet. All of these factors contribute to their success.

We can contrast that to the average individual who could have any number of potential metabolic defects that prevents them from reaching their desired goals. Testosterone might be on the low side of normal, cortisol production is elevated, thyroid or nervous system output may be low (meaning a lower than optimal metabolic rate). Skeletal muscle insulin sensitivity is low which means that excess calories get pushed towards fat cells more effectively. When these folks diet, the brain tends to overreact, lowering metabolic rate (which probably wasn't optimal to begin with). Fat loss slows to a crawl. Difficulties mobilizing bodyfat, along with problems with testosterone and cortisol, lead to increased muscle loss. I could keep going but you get the idea.

I'm not just telling you this to depress you; consider it more of a reality check to make you aware of what is and isn't possible. My point is that pro bodybuilders (hell, pro athletes of any sort) are the genetic elite. You are not like them and they have advantages naturally that you don't. Most importantly, trying to mimic what they do, or expecting their results, can only lead you down an endless path of frustration.

And then there are drugs

All professional bodybuilders (and most athletes) use drugs. Anyone who says differently is lying or trying to sell you something. Again, this isn't a grouse or whine, but rather a statement of fact. When you introduce the myriad anabolic drugs into the equation, it becomes possible to

not only side-step but almost ignore "normal" human physiology. Couple better than average genetics with enough drugs and you get professional bodybuilders. You are not one of them, you will not be one of them. No amount of wishful thinking can change that. Even if you had access to all of their drugs, there's no guarantee you'd get as big; it's likely that one of the genetic advantages that professional bodybuilders have is a high sensitivity to the drugs that they do take.

Anyone who tells you that the various bodybuilding drugs (anabolic steroids, insulin, clenbuterol, etc.) don't work, or aren't necessary to reach a monstrous level of development, is bullshitting you. Usually they have an all-natural supplement or steroid replacement to sell you in the first place (I just have a book). I'd be lying if I told you that anything you'll read in this book could take you to the development level of even the worst pro. It can't. Without both their genetics and their drugs, it simply can't be done. At best proper/meticulous/crafty nutrition and training will let your maximize your own potential and move beyond ordinary. To go above your genetic potential requires drugs. The sooner you come to terms with this, the better off you'll be.

The fact is that drugs, even the relatively simple testosterone, can take you to a level of development otherwise unachievable by any natural training, diet and supplement methods. At even moderate doses, testosterone allows you to sidestep your normal physiology and reach a higher level. It raises the "setpoint" of how much muscle you can carry; it reduces your fat mass at the same time. Once you introduce all the other drugs endemic to pro-bodybuilding, you get a physiology that is unattainable in non-drug using individuals.

Still not convinced? A single example should help to make my point. In natural (read: non drug using) individuals who have dieted down to extremely low bodyfat levels, say 5%, you see a common hormonal pattern. Testosterone levels are typically bottomed out (some studies even find castrate levels, which is why a lot of natural contest bodybuilders can't get their dick hard, not that they have a sex drive in the first place), thyroid levels are bottomed out, IGF-1 levels are bottomed out, sympathetic nervous system output is way down meaning decreased caloric and fat burning, appetite is through the roof, cortisol is through the roof, on and on it goes. This makes good evolutionary sense: at 5% bodyfat, you are starving to death. Your body is turning off every system (metabolic, reproductive, immune, etc.) that it can to keep you alive until you get some food.

Contrast that to a dieting professional bodybuilder. With the choice of the right drugs, he can eliminate pretty much all of the above problems. Anabolic steroids replace natural testosterone, synthetic thyroid replaces what the body is no longer making, injectable insulin, GH, and IGF-1 fix the insulin, GH and IGF-1 problem, clenbuterol replaces sympathetic nervous system output, appetite suppressants can deal with appetite and anti-cortisol drugs deal with the cortisol problem. That's only a partial drug list, by the way.

Getting to the point

The drug using bodybuilder has completely shut the door in the face of his normal physiology while the natural bodybuilder is basically fucked (physiologically speaking). Again, my point in explaining this isn't so much to give you a metaphorical kick in the nuts before we get started; it's to explain the basic realities of the situation. One of the worst things that a natural athlete or bodybuilder can hope to do is to emulate the pros in terms of their results, training or diet. Pro athletes and bodybuilders have at least two major advantages that you don't have: genetic and drugs. Hoping that you can achieve what they achieve or, even worse, trying to use their approach to do it, is destined for failure.

But all is not lost. One of the goals of the UD2 is to mimic, to as great a degree as possible, some of the processes that occur normally in the genetic elite. We may not be able to do it 100%, but we can get in the ballpark and this will improve results. By using specific nutritional and training practices, the occasional supraphysiological level of supplements and even the occasional drug, we can duplicate some of what's going on.

Chapter 3: Why is it so hard (Part 1)

After last chapter, you're thinking one of two things. Either you can't wait to get into the nuts and bolts of this diet, or you're still not convinced. I mean, you can open any of the muscle magazines (or should we call them supplement catalogs?) and see any number of diet plans, training programs, or nutritional supplements all of which promise everything I told you this diet could accomplish. So how come I'm right and they're wrong?

As I said in chapter 1, the biggest problem with the standard advice is simply that it is generally **so** standard. Most bodybuilding writers, nutritionists and gurus are more concerned with maintaining the status quo, maybe refining it a bit, than going out on a limb and suggesting something new and radical. So let's look at the status quo and see why it won't ultimately let you achieve your goal (again, if it did, you wouldn't have gotten or even needed this book).

The standard prescription to do what I've described (more muscle, less bodyfat) is usually a fairly standard moderate to high carb, moderate to high protein, and low to moderate fat diet (depending on the personal philosophy of the magazine and the writer in question). High fiber, clean carbs, lots of quality protein, fats seem to be the most variable although everyone is finally getting onto the healthy fat bandwagon like they should have done years ago. Couple that with weight training and cardio and magic will happen, right? Well, sort of.

Most people remember those wonderful beginner days, when muscle gain and fat loss come without too much effort. It's true, beginners can pull off what seems like a magical body composition transformation without much difficulty. Folks coming back from a layoff or injury, where they typically gain fat and lose muscle, can do this too. Muscle memory allows the muscle to be regained while the fat is coming back off. As people become more advanced, gaining more muscle, or reaching lower bodyfat levels, this trick becomes more and more difficult until the point that it is more or less impossible. You usually end up either having to focus purely on muscle gain (accepting that some fat will come with it) or fat loss (accepting that you'll lose some muscle). Bulking and cutting phases, basically.

I say more or less impossible because there are a lot of inefficient ways of accomplishing it usually involving months and months of teeny-tiny caloric deficits(like 200 calories/day under maintenance) coupled with intensive training to achieve fairly small changes. Personally, I don't have that kind of patience. I've always wanted a faster solution even if it was more complicated.

Even without trying to gain muscle while you're losing fat, simply losing fat without losing muscle is problematic. This is especially true once you try to push the boundaries of normalcy (again, about 12-15% bodyfat in men and 20-22% bodyfat in women). Getting to those levels without muscle loss isn't too much of a problem but getting leaner tends to cause muscle loss at faster and faster rates. The usual advice is to up protein (which only works up to a point) or lose fat so abysmally slowly (0.5 pounds per week) that you go nuts dieting for months on end.

Gaining muscle without putting on too much fat is another, somewhat different problem,

although the same advice is usually given. Maybe with less cardio, or slightly different training, but the same nonetheless. Once again, past the beginner stage, lifters find that putting on muscle at any sort of appreciable rate (without drugs anyhow) usually means gaining some bodyfat as well. The ones who don't want to gain any fat are the ones who will tell you that 3-5 lbs of muscle/year is the most you can gain past the beginner stage.

Then there's the folks who want to lean out significantly while gaining muscle (or strength) at the same time. As I said above, this is pretty easy in beginners, folks who are very fat, or those coming back from a layoff. For everybody else, it's more difficult, approaching impossible. For short periods, the UD2 will let you do it.

Defining the problem again

If you go around into any commercial gym, you typically see folks in a lot of different conditions. There are typically some big but fat guys, some small but lean guys, some small and fat guys, and a few big and lean guys. But, unless you belong to a gym with a large bodybuilder contingent, the last group tend to be few and far between. The question is why?

Why is it so difficult to get both big and lean at the same time? It's almost as if the body can do one or the other well, but not both, which really isn't far from the truth. Related to that, why is it so difficult to lose fat and gain muscle at the same time? Or to gain muscle without gaining fat at the same time? Hell, even losing fat without losing muscle is difficult enough. To answer the question of why things are so difficult, let's start simple and move towards more complex explanations, since that will lead us to an understanding of how to solve the problem.

The simplest answer I could give, I've already discussed in the last chapter and in my last book: evolution. To restate it all quickly and simply, 10 million+ years of evolution have left us with genetic propensities and physiologies that want us to stay smallish and fat, because that means better survival. On top of that, once you're past puberty, your body is far more concerned with homeostasis (remaining the same) than with anything else. To one degree or another, it tends to defend your bodyweight and bodyfat percentage at a certain level (which appears to be programmed in the brain). You can change that set point to some degree with training and diet, but your body always strives to maintain the status quo more than anything else.

But both of those are really just statements of the amazingly obvious, without really telling us much. So let's move a level deeper and start to get into the physiology of why accomplishing our goals is so difficult. That will lead us towards the solution.

Doing two things at once

One fundamental problem is that our bodies aren't typically good at doing two things at once, especially when those things are at odds with one another, or have different fundamental requirements.

For example, study after study has shown that combining heavy strength training with heavy endurance training compromises the overall results. Why? Strength training sends the muscle an adaptive signal to become bigger and stronger and more efficient at using glucose for fuel; endurance training send a signal to become more energy efficient (which typically means smaller because smaller muscle fibers can get energy more readily) and use more fat for fuel. End result is that the body can't do both optimally and you get less than stellar results when you try to do both.

How does this apply to losing fat and gaining muscle? In short, they have different (and, in fact, mutually exclusive) requirements. That is, gaining muscle and losing fat require different scenarios in terms of nutrition, hormones, etc. In fact, the specific requirements for gaining muscle are also the reason that you tend to gain fat at the same time. Similarly, the requirements for fat loss are part of the reason (along with your body's adaptations) that you will lose muscle at the same time. I'll discuss this in detail next chapter.

Synthesizing new tissue (whether muscle or fat) requires energy and that energy can't just magically appear. Synthesizing new muscle tissue is especially costly, at least when compared to synthesizing new fat. While it's wonderfully idyllic to think that the calories for muscle growth will magically be generated from burning fat, it rarely happens that way, at least not without powerful repartitioning drugs like clenbuterol. Which makes a rather nice segue into the next chapter.

Chapter 4: Why is it so hard (Part 2)
Partitioning

At a very fundamental level, the problem natural bodybuilders and athletes have is one of partitioning. At its simplest, partitioning refers to where the calories go (into muscle or fat cells) when you eat more of them or come from (from muscle or fat cells) when you eat less of them.

In an ideal universe, every calorie you ate would go to muscle tissue, with none going into fat cells; you'd gain 100% muscle and no fat. In that same ideal universe, every calorie used during dieting would come from fat stores; you'd lose 100% fat and no muscle. Unfortunately, we don't live in an ideal universe.

As I mentioned early in this book, some hapless individuals will lose as much as one pound of muscle for every 2-3 pounds of fat that they lose when they diet. Typically, those same individuals will put on about the same amount of fat and muscle when they gain weight. Thus is the balance of the universe maintained. More genetically advantaged individuals tend to put more calories into muscle (meaning less into fat) when they overeat and pull more calories out of fat cells (and less out of muscle) when they diet. They stay naturally lean and have few problems dieting. Once again, you aren't one of them, or you wouldn't be reading this book.

When talking about calorie partitioning, researchers refer to something called the P-ratio. Essentially, P-ratio represents the amount of protein that is either gained (or lost) during over (or under) feeding. So a low P-ratio when dieting would mean you used very little protein and a lot of fat. A high P-ratio would mean that you used a lot of protein and very little fat. It looks like, for the most part, P-ratio is more or less the same for a given individual: they will gain about same amount of muscle when they overfeed as they lose when they diet. P-ratio can vary between individuals, of course, but for any given person, it appears to be relatively constant.

So what controls P-ratio? As depressing as this is, the majority of of the P-ratio is out of our control; it's mostly genetic. We can control maybe 15-20% of it with how we eat or train. Supraphysiological amounts of certain compounds (supplements) and, of course, drugs, can also affect the P-ratio. Exercise is perhaps the most significant weapon we have in battling with our body and affecting P-ratio.

So what are the main determinants of calorie partitioning? Hormones are crucially important. High testosterone levels tend to have positive partitioning effects (more muscle, less fat) while chronically high levels of cortisol have the opposite effect (less muscle, more fat). Thyroid and nervous system activity affect not only metabolic rate but also fat burning. Thyroid also affects protein synthesis. Optimal levels of these hormones not only mean better fat loss (and less muscle loss) when you diet but better muscular gains (and less fat gain) when you gain weight. Unfortunately, levels of these hormones are basically "set" by our genetics; the only way to change them significantly is with supplements or drugs. Beyond that, there's not a whole lot

we can do to control them.

Another factor controlling P-ratio is insulin sensitivity which refers to how well or how poorly a given tissue responds to the hormone insulin. High insulin sensitivity means that a small amount of insulin will generate a large response; insulin resistance indicates that it takes more insulin to cause the same effects to occur.

Now, insulin is a storage hormone, affecting nutrient storage in tissues such as liver, muscle and fat cells. In that same ideal world, we'd have high insulin sensitivity in skeletal muscle (as this would tend to drive more calories into muscle) and poor insulin sensitivity in fat cells (making it harder to store calories there). This is especially true when you're trying to gain muscle.

When you diet, it's actually better to be insulin resistant (note that two of the most effective diet drugs, GH and clenbuterol/ephedrine cause insulin resistance). By limiting the muscle's use of glucose for fuel, insulin resistance not only spares glucose for use by the brain, but also increases the muscles use of fatty acids for fuel.

In addition to hormonal advantages, it's likely that the genetic elite have high skeletal muscle insulin sensitivity. They store tremendous amounts of calories in their muscles, which leaves less to go to fat cells. Their bodies also don't have to release as much insulin in response to food intake.

In contrast, individuals with poor skeletal muscle insulin sensitivity tend to overproduce insulin, don't store calories in muscle well (this is part of why they have trouble getting a pump: poor glycogen storage in muscle cells) and tend to spill calories over to fat cells more effectively.

So what controls insulin sensitivity? As always, there are a host of factors. One is simply genetic, folks can vary 10 fold in their sensitivity to insulin even if everything about them is the same. Another is diet. Diets high in carbohydrates (especially highly refined carbohydrates), saturated fats and low in fiber tend to impair insulin sensitivity. Diets with lowered carbohydrates (or less refined sources), healthier fats (fish oils and monounsaturated fats like olive oil) and higher fiber intakes tend to improve insulin sensitivity.

Another major factor is activity which influences insulin sensitivity in a number of ways. The first is that muscular contraction itself improves insulin sensitivity, facilitating glucose uptake into the cell. Glycogen depletion (remember this, it's important) improves insulin sensitivity as well.

So what else controls the P-ratio? As it turns out, the primary predictor of P-ratio during over- and underfeeding is bodyfat percentage. The more bodyfat you carry, the more fat you tend to lose when you diet (meaning less muscle) and the leaner you are, the less fat you tend to lose (meaning more muscle). The same goes in reverse: naturally lean (but **not** folks who have dieted down) individuals tend to gain more muscle and less fat when they overfeed and fatter individuals tend to gain more fat and less muscle when they overfeed.

The question is why, why does bodyfat percentage have such a profound impact on P-

ratio? There are a few easy answers. One is that bodyfat and insulin sensitivity tend to correlate: the fatter you get, the more insulin resistant you tend to get and the leaner you are the more insulin sensitive you tend to be.

A second is that, the fatter you are, the more fatty acids you have available for fuel. In general, when fatty acids are available in large amounts, they get used. This spares both glucose and protein. By extension, the leaner you get, the more problems you tend to have; as it gets harder to mobilize fatty acids, the body has less to use. Since there is less glucose available (because you're dieting) this increases the reliance on amino acids (protein) for fuel. The original Ultimate Diet advocated medium chain triglycerides (a special type of fatty acid that is used more easily for fuel than standard fats) and this can be a good strategy under certain circumstances. I'll mention some other options later on in the book.

But that's not all. It turns out that bodyfat percentage is controlling metabolism to a much greater degree than just by providing fatty acids. Research over the past 10 years or so has identified fat cells as an endocrine tissue in their own right, secreting numerous hormones and proteins that have major effects on other tissues. Perhaps the most important, and certainly the one most talked about is leptin, but that's far from the only one. Tumor necrosis factor-alpha, the various interleukins, adiponectin and other compounds released from fat cells are sending signals to other tissues in the body which affect metabolism.

Without getting into all of the nitpicky details (many of which haven't been worked out yet), I just want to talk a little about leptin (if you read my last book, this will all be familiar ground).

Leptin, the short course

Leptin is a protein released primarily from fat cells although other tissues such as muscle also contribute slightly. Leptin levels primarily correlate with bodyfat percentage, the more fat you have the more leptin you tend to have (note: different depots of fat, visceral versus subcutaneous, show different relationships with leptin). At any given bodyfat percentage, women typically produce 2-3 times as much leptin as men.

In addition to being related to the amount of bodyfat you have, leptin levels are also related to how much you're eating. For example, in response to dieting, leptin levels may drop by 50% within a week (or less) although you obviously haven't lost 50% of your bodyfat. After that initial rapid drop, there is a slower decrease in leptin related to the loss of bodyfat that is occurring. In response to overfeeding, leptin tends to rebound equally quickly (much faster than you're gaining bodyfat). In contrast to what you might think, it looks like leptin production by fat cells is mainly determined by **glucose** availability (you'd think it was fat intake). So whenever you start pulling glucose out of the fat cell (dieting), leptin levels go down; when you drive glucose into fat cells, it

goes up.

Basically, leptin represents two different variables: how much bodyfat you're carrying and how much you're eating. That is, it acts as a signal to the rest of your body about your energy stores. I'll come back to this in a second.

Like most hormones in the body, leptin has effects on most tissues in the body. Leptin receptors have been found all over the place, in the liver, skeletal muscle, in immune cells; you name a site in the body and there are probably leptin receptors there. There are also leptin receptors in the brain but I'll come back to that below. For now, let's look at a few of the effects that leptin has on other tissues in the body.

In the liver, leptin tends to reduce insulin secretion from the beta-cells. In skeletal muscle, leptin promotes fat burning and tends to spare glucose (and therefore amino acid use). In fat cells, leptin may promote fat oxidation as well as making the fat cell somewhat insulin resistant. Leptin also affects immune cell function, decreasing leptin impairs the body's ability to mount an immune response. Now you know at least part of the reason you tend to get sick more when you diet. On and on it goes. An entire book could and should be written about leptin.

Leptin and the brain

Now, I want you to think back to the first couple of chapters of this book, where I talked about the evolutionary reasons it's so hard to get extremely lean. To your body, becoming too lean is a very real threat to your survival. From a physiological standpoint, that means that your body needs a way to "know" how much energy you have stored.

As you may have guessed, or known from my last book, leptin is one of the primary signals (along with many others including ghrelin, insulin, peptide YY and other as of yet undiscovered compounds) that signals the brain about how much energy you have stored and how much you're eating.

All of these hormones send an integrated signal to a part of the brain called the hypothalamus that "tell" it what's going on elsewhere in your body. Changes in levels of these hormones causes other changes in various neurochemicals such as neuropeptide-Y (NPY), corticotrophin releasing hormone (CRH), pro-opiomelanocortin (POMC) and several others to occur. These neurochemicals regulate metabolic rate, hunger and appetite, hormones and a host of other processes.

So when you restrict calories, causing changes in all of the hormones and neurochemicals mentioned above, and a number of physiological processes change, mostly for the worse. Levels of thyroid stimulating hormone, leutinizing hormone and follicle stimulating hormone (TSH, LH and FSH respectively) go down. This results in lowered levels of thyroid and testosterone. Levels of growth hormone releasing hormone (GHRH) go down meaning GH output can be impaired.

Sympathetic nervous system activity goes down which, along with the drop in thyroid, has a huge impact on metabolic rate. Cortisol levels go up as does hunger and appetite. You get the idea. What you end up seeing is an all purposes systems crash when you try to take bodyfat to low levels. I should note that these processes are occurring to one degree or another during all diets, they simply become more pronounced at the extreme low levels of bodyfat.

Ideally, the opposite effects should occur when you raise calories. However, for reasons I detailed in my last book, the system is asymmetrical: falling leptin (and changes in all of the other hormones) has a much larger impact on the body's metabolism than raising leptin does (unless you're raising it back to normal). So the body ends up fighting weight loss to a far greater degree than weight gain. Generally speaking, people find that it a lot easier to get fat than to get lean. Of course, there are exceptions, folks who seem to resist obesity (or weight gain altogether). Research will probably find that they are extremely sensitive to the effects of leptin (and other hormones), so when calories go up, they simply burn off the excess calories without getting fat.

Most of us aren't that lucky. Rather, like insulin sensitivity discussed above, researchers will probably find that leptin sensitivity is a huge factor influencing how changes in caloric intake affect metabolism. Someone with good leptin sensitivity will tend to stay naturally lean and have an easy time dieting; folks with worse leptin sensitivity (leptin resistance) won't.

You might be thinking that the quick and dirty solution would be leptin injections. As I pointed out in my last book, injectable leptin is a pipe-dream at this point, an effective dose costing nearly $1000/day (not to mention requiring twice daily injections). Using bromocriptine or other dopamine agonists seem to fix at least part of the problem by sending a false signal to the brain by making it think leptin levels are normal.

Recent studies that have given injectable leptin to dieters show that the fall in leptin is one of the primary signals in initiating the adaptation to dieting. However, unlike in rats, injecting leptin into humans doesn't fix all of the problems.

This is because, in humans, there is more of an integrated response to both over and underfeeding. To understand this better, I want to take a snapshot of what happens when you either reduce or increase calories.

Dieting

So you decide to diet, reducing carbs, calories or both. Vary rapidly, blood glucose and insulin levels are going to be reduced. This is good as it releases the "block" on fat mobilization. Additionally, catecholamine release typically goes up (at least initially), further increasing fat mobilization from fat cells. This causes blood fatty acid levels to increase. This is also good, as it tends to promote fat burning in tissues such as liver and muscle. This effect is facilitated if you deplete liver and muscle glycogen, as glycogen depletion tends to increase the use of fatty acids

for fuel. The increase in blood fatty acid levels also has the short-term effect of causing insulin resistance. As I mentioned, this is a good thing on a diet since it spares glucose and helps promote fat oxidation. So far, so good, right?

Unfortunately, along with these good effects, a lot of bad things start to happen. I already described many of the central adaptations above: changes in leptin, ghrelin, Peptide YY (and certainly other hormones) "tell" your brain that you're not eating enough. This causes changes in the various neurochemicals stimulating a number of negative adaptations. I want to note that the response is not immediate, there is a lag time between the changes in all of these hormones and the body's response. But that's not all.

There are also many other adaptations which occur when you diet, so let's look at some of those. First and foremost, the drop in leptin directly affects liver, skeletal muscle and fat cell metabolism, mostly for the worse.

While the drop in insulin mentioned above causes better fat mobilization, it causes other problems. One is that testosterone will bind to sex-hormone binding globulin (SHBG) better, lowering free testosterone levels (this is in addition to the drop in total testosterone). As well, insulin is anti-catabolic to muscle, inhibiting muscle breakdown. The increase in cortisol that occurs with dieting enhances protein breakdown as well as stimulating the conversion of protein to glucose in the liver. Additionally, a fall in energy state of the muscle impairs protein synthesis (although it increases fatty acid oxidation). The mechanism behind this is more detail than I want to get into here. But the combined effect of these processes is that protein synthesis is decreased and breakdown is accelerated; this causes muscle loss.

On top of that, high blood fatty acid levels tend to impair the uptake of T4 (inactive thyroid) into the liver. There are also changes in liver metabolism that impair the conversion of T4 to T3 (active thyroid). Both of these processes cause decreased blood levels of T3. There is some evidence that high blood fatty acid levels causes tissues to become resistant to thyroid hormone itself (this is part of why just taking extra thyroid on a diet doesn't fix all of the problems). After the initial increase, there is also a drop in nervous system output (that can occur in as little as 3-4 days after you start a diet). Along with the drop in thyroid, insulin and leptin, this explains a majority of the metabolic slowdown that occurs. The change in liver metabolism (and the reduction in insulin) also impairs the production of IGF-1 from GH.

All of these adaptations serve two main purposes. The first is to slow the rate of fat loss, as this will ensure your survival as long as possible. Related to that, the body tends to shut down calorically costly activities. This includes protein synthesis, reproduction and immune function; there's little point keeping any of these functioning when you're starving to death. The drop in leptin, and the changes in hormones that occur are a huge part of why men tend to lose their sex drive (and ability) and women lose their period when they get lean/diet hard.

The second is to prime your body to put fat back on at an accelerated rate when calories become available again. Decreased metabolic rate and fat burning, along with improved caloric