"A cookbook of minimalist methods for rapid body transformation—a practical crash course in how to reinvent yourself."
—KEVIN KELLY, *WIRED* MAGAZINE

# The 4-Hour BODY

AN UNCOMMON GUIDE
TO RAPID FAT-LOSS, INCREDIBLE SEX,
AND BECOMING SUPERHUMAN


TIMOTHY FERRISS

AUTHOR OF THE
#1 *NEW YORK TIMES* BESTSELLER
The 4-Hour Workweek

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# The 4-Hour Body

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RAPID FAT-LOSS, INCREDIBLE SEX,
AND BECOMING SUPERHUMAN

Timothy Ferriss

CROWN ARCHETYPE
NEW YORK

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# THINNER, BIGGER, FASTER, STRONGER?

# How to Use This Book

**Does history record any case in which the majority was right?**
—Robert Heinlein

**I love fools' experiments.**
**I'm always making them.**
—Charles Darwin

MOUNTAIN VIEW, CALIFORNIA, 10 P.M., FRIDAY

Shoreline Amphitheater was rocking.

More than 20,000 people had turned out at northern California's largest music venue to hear Nine Inch Nails loud and in charge, on what was expected to be their last tour.

Backstage, there was more unusual entertainment.

"Dude, I go into the stall to take care of business, and I look over and see the top of Tim's head popping above the divider. He was doing f*cking air squats in the men's room in complete silence."

Glenn, a videographer and friend, burst out laughing as he reenacted my technique. To be honest, he needed to get his thighs closer to parallel.

"Forty air squats, to be exact," I offered.

Kevin Rose, founder of Digg, one of the top-500 most popular websites in the world, joined in the laughter and raised a beer to toast the incident. I, on the other hand, was eager to move on to the main event.

In the next 45 minutes, I consumed almost two full-size barbecue chicken pizzas and three handfuls of mixed nuts, for a cumulative total of about 4,400 calories. It was my fourth meal of the day, breakfast having consisted of two glasses of grapefruit juice, a large cup of coffee with cinnamon, two chocolate croissants, and two bear claws.

The more interesting portion of the story started well after Trent Reznor left the stage.

Roughly 72 hours later, I tested my bodyfat percentage with an ultrasound analyzer designed by a physicist out of Lawrence Livermore National Laboratory.

Charting the progress on my latest experiment, I'd dropped from 11.9% to 10.2% bodyfat, a 14% reduction of the total fat on my body, in 14 days.

How? Timed doses of garlic, sugar cane, and tea extracts, among other things.

The process wasn't punishing. It wasn't hard. Tiny changes were all it took. Tiny changes that, while small in isolation, produced enormous changes when used in combination.

Want to extend the fat-burning half-life of caffeine? Naringenin, a useful little molecule in grapefruit juice, does just the trick.

Need to increase insulin sensitivity before bingeing once per week? Just add some cinnamon to your pastries on Saturday morning, and you can get the job done.

Want to blunt your blood glucose for 60 minutes while you eat a high-carb meal guilt-free? There are a half-dozen options.

But 2% bodyfat in two weeks? How can that be possible if many general practitioners claim that it's *impossible* to lose more than two pounds of fat per week? Here's the sad truth: most of the one-size-fits-all rules, this being one example, haven't been field-tested for exceptions.

You can't change your muscle fiber type? Sure you can. Genetics be damned.

Calories in and calories out? It's incomplete at best. I've lost fat while grossly overfeeding. Cheesecake be

praised.

The list goes on and on.

It's obvious that the rules require some rewriting.

That's what this book is for.

## Diary of a Madman

The spring of 2007 was an exciting time for me.

My first book, after being turned down by 26 out of 27 publishers, had just hit the *New York Times* bestseller list and seemed headed for #1 on the business list, where it landed several months later. No one was more dumbfounded than me.

One particularly beautiful morning in San Jose, I had my first major media phone interview with Clive Thompson of *Wired* magazine. During our pre-interview small chat, I apologized if I sounded buzzed. I was. I had just finished a 10-minute workout following a double espresso on an empty stomach. It was a new experiment that would take me to single-digit bodyfat with two such sessions per week.

Clive wanted to talk to me about e-mail and websites like Twitter. Before we got started, and as a segue from the workout comment, I joked that the major fears of modern man could be boiled down to two things: too much e-mail and getting fat. Clive laughed and agreed. Then we moved on.

The interview went well, but it was this offhand joke that stuck with me. I retold it to dozens of people over the subsequent month, and the response was always the same: agreement and nodding.

This book, it seemed, had to be written.

The wider world thinks I'm obsessed with time management, but they haven't seen the other—much more legitimate, much more ridiculous—obsession.

I've recorded almost every workout I've done since age 18. I've had more than 1,000 blood tests[1] performed since 2004, sometimes as often as every two weeks, tracking everything from complete lipid panels, insulin, and hemoglobin A1c, to IGF-1 and free testosterone. I've had stem cell growth factors imported from Israel to reverse "permanent" injuries, and I've flown to rural tea farmers in China to discuss Pu-Erh tea's effects on fat-loss. All said and done, I've spent more than $250,000 on testing and tweaking over the last decade.

Just as some people have avant-garde furniture or artwork to decorate their homes, I have pulse oximeters, ultrasound machines, and medical devices for measuring everything from galvanic skin response to REM sleep. The kitchen and bathroom look like an ER.

If you think that's craziness, you're right. Fortunately, you don't need to be a guinea pig to benefit from one.

Hundreds of men and women have tested the techniques in *The 4-Hour Body* (4HB) over the last two years, and I've tracked and graphed hundreds of their results (194 people in this book). Many have lost more than 20 pounds of fat in the first month of experimentation, and for the vast majority, it's the first time they've ever been able to do so.

Why do 4HB approaches work where others fail?

Because the changes are either small or simple, and often both. There is zero room for misunderstanding, and visible results compel you to continue. If results are fast and measurable,[2] self-discipline isn't needed.

I can give you every popular diet in four lines. Ready?

- Eat more greens.
- Eat less saturated fat.
- Exercise more and burn more calories.

- Eat more omega-3 fatty acids.

We won't be covering any of this. Not because it doesn't work—it does … up to a point. But it's not the type of advice that will make friends greet you with "What the #$%& have you been doing?!", whether in the dressing room or on the playing field.

That requires an altogether different approach.

## The Unintentional Dark Horse

Let's be clear: I'm neither a doctor nor a PhD. I am a meticulous data cruncher with access to many of the world's best athletes and scientists.

This puts me in a rather unusual position.

I'm able to pull from disciplines and subcultures that rarely touch one another, and I'm able to test hypotheses using the kind of self-experimentation mainstream practitioners can't condone (though their help behind the scenes is critical). By challenging basic assumptions, it's possible to stumble upon simple and unusual solutions to long-standing problems.

Overfat? Try timed protein and pre-meal lemon juice.

Undermuscled? Try ginger and sauerkraut.

Can't sleep? Try upping your saturated fat or using cold exposure.

This book includes the findings of more than 100 PhDs, NASA scientists, medical doctors, Olympic athletes professional sports trainers (from the NFL to MLB), world-record holders, Super Bowl rehabilitation specialists and even former Eastern Bloc coaches. You'll meet some of the most incredible specimens, including before-and-after transformations, you've ever seen.

I don't have a publish-or-perish academic career to preserve, and this is a good thing. As one MD from a well-known Ivy League university said to me over lunch:

> *We're trained for 20 years to be risk-averse. I'd like to do the experimentation, but I'd risk everything I've built over two decades of schooling and training by doing so. I'd need an immunity necklace. The university would never tolerate it.*

He then added: "You can be the dark horse."

It's a strange label, but he was right. Not just because I have no prestige to lose. I'm also a former industry insider.

From 2001 to 2009, I was CEO of a sports nutrition company with distribution in more than a dozen countries, and while we followed the rules, it became clear that many others didn't. It wasn't the most profitable option. I have witnessed blatant lies on nutritional fact panels, marketing executives budgeting for FTC fines in anticipation of lawsuits, and much worse from some of the best-known brands in the business.[3] I understand how and where consumers are deceived. The darker tricks of the trade in supplements and sports nutrition—clouding results of "clinical trials" and creative labeling as just two examples—are nearly the same as in biotech and Big Pharma.

I will teach you to spot bad science, and therefore bad advice and bad products.[4]

Late one evening in the fall of 2009, I sat eating cassoulet and duck legs with Dr. Lee Wolfer in the clouds of fog known as San Francisco. The wine was flowing, and I told her of my fantasies to return to a Berkeley or Stanford and pursue a doctorate in the biological sciences. I was briefly a neuroscience major at Princeton University and dreamed of a PhD at the end of my name. Lee is regularly published in peer-reviewed journals and has been trained at some of the finest programs in the world, including the University of California at San Francisco (UCSF) (MD), Berkeley (MS), Harvard Medical School (residency), the Rehabilitation Institute of Chicago (fellowship), and

Spinal Diagnostics in Daly City, California (fellowship).

She just smiled and raised a glass of wine before responding:

"You—Tim Ferriss—can do more outside the system than inside it."

## A Laboratory of One

> Many of these theories have been killed off only when some decisive experiment exposed their incorrectness … thus the yeoman work in any science … is done by the experimentalist, who must keep the theoreticians honest.
>
> *—Michio Kaku (Hyperspace), theoretical physicist and co-creator of string field theory*

Most breakthroughs in performance (and appearance) enhancement start with animals and go through the following adoption curve:

> *Racehorses → AIDS patients (because of muscle wasting) and bodybuilders → elite athletes → rich people → the rest of us*

The last jump from the rich to the general public can take 10–20 years, if it happens at all. It often doesn't.

I'm *not* suggesting that you start injecting yourself with odd substances never before tested on humans. I *am* suggesting, however, that government agencies (the U.S. Department of Agriculture, the Food and Drug Administration) are at least 10 years behind current research, and at least 20 years behind compelling evidence in the field.

More than a decade ago, a close friend named Paul was in a car accident and suffered brain damage that lowered his testosterone production. Even with supplemental testosterone treatments (creams, gels, short-acting injectables) and after visiting scores of top endocrinologists, he still suffered from the symptoms of low testosterone. Everything changed—literally overnight—once he switched to testosterone enanthate, a variation seldom seen in the medical profession in the United States. Who made the suggestion? An advanced bodybuilder who knew his biochemistry. It shouldn't have made a difference, yet it did.

Do doctors normally take advantage of the 50+ years of experience that professional bodybuilders have testing, even synthesizing, esters of testosterone? No. Most doctors view bodybuilders as cavalier amateurs, and bodybuilders view doctors as too risk-averse to do anything innovative.

This separation of the expertise means both sides suffer suboptimal results.

Handing your medical care over to the biggest man-gorilla in your gym is a bad idea, but it's important to look for discoveries outside of the usual suspects. Those closest to a problem are often the least capable of seeing it with fresh eyes.

Despite the incredible progress in some areas of medicine in the last 100 years, a 60-year-old in 2009 can expect to live an average of only 6 years longer than a 60-year-old in 1900.

Me? I plan on living to 120 while eating the best rib- eye cuts I can find. More on that later.

Suffice to say: for uncommon solutions, you have to look in uncommon places.

## The Future's Already Here

In our current world, even if proper trials are funded for obesity studies as just one example, it might take 10–20 years for the results. Are you prepared to wait?

I hope not.

"Kaiser can't talk to UCSF, who can't talk to Blue Shield.*You* are the arbiter of your health information." Those are the words of a leading surgeon at UCSF, who encouraged me to take my papers with me before hospital records claimed them as their property.

Now the good news: with a little help, it's never been easier to collect a few data points (at little cost), track them (without training), and make small changes that produce incredible results.

Type 2 diabetics going off of medication 48 hours after starting a dietary intervention? Wheelchair-bound seniors walking again after 14 weeks of training? This is not science fiction. It's being done today. As William Gibson, who coined the term "cyberspace," has said:

"The future is already here—it is just unevenly distributed."

## The 80/20 Principle: From Wall Street to the Human Machine

This book is designed to give you the most important 2.5% of the tools you need for body recomposition and increased performance. Some short history can explain this odd 2.5%.

Vilfredo Pareto was a controversial economist-cum-sociologist who lived from 1848 to 1923. His seminal work, *Cours d'économie politique*, included a then little explored "law" of income distribution that would later bear his name: "Pareto's Law," or "the Pareto Distribution." It is more popularly known as "the 80/20 Principle."

Pareto demonstrated a grossly uneven but predictable distribution of wealth in society—80 percent of the wealth and income is produced and possessed by 20 percent of the population. He also showed that this 80/20 principle could be found almost everywhere, not just in economics. Eighty percent of Pareto's garden peas were produced by 20% of the peapods he had planted, for example.

In practice, the 80/20 principle is often much more disproportionate.

To be perceived as fluent in conversational Spanish, for example, you need an active vocabulary of approximately 2,500 high-frequency words. This will allow you to comprehend more than 95% of all conversation. To get to 98% comprehension would require at least five years of practice instead of five months. Doing the math, 2,500 words is a mere 2.5% of the estimated 100,000 words in the Spanish language.

This means:

1. 2.5% of the total subject matter provides 95% of the desired results.
2. This same 2.5% provides just 3% less benefit than putting in 12 times as much effort.

This incredibly valuable 2.5% is the key, the Archimedes lever, for those who want the best results in the least time. The trick is finding that 2.5%.[5]

This book is not intended as a comprehensive treatise on all things related to the human body. My goal is to share what I have found to be the 2.5% that delivers 95% of the results in rapid body redesign and performance enhancement. If you are already at 5% bodyfat or bench-pressing 400 pounds, you are in the top 1% of humans and now in the world of incremental gains. This book is for the other 99% who can experience near-unbelievable gains in short periods of time.

## How to Use This Book—Five Rules

It is important that you follow five rules with this book. Ignore them at your peril.

#### RULE #1. THINK OF THIS BOOK AS A BUFFET.

Do *not* read this book from start to finish.

Most people won't need more than 150 pages to reinvent themselves. Browse the table of contents, pick the chapters that are most relevant, and discard the rest … for now. Pick one appearance goal and one performance goal to start.

The only mandatory sections are "Fundamentals" and "Ground Zero." Here are some popular goals, along with the corresponding chapters to read in the order listed:

#### RAPID FAT-LOSS

All chapters in "Fundamentals"

All chapters in "Ground Zero"

"The Slow-Carb Diet I and II"

"Building the Perfect Posterior"

Total page count: 98

#### RAPID MUSCLE GAIN

All chapters in "Fundamentals"

All chapters in "Ground Zero"

"From Geek to Freak"

"Occam's Protocol I and II"

Total page count: 97

#### RAPID STRENGTH GAIN

All chapters in "Fundamentals"

All chapters in "Ground Zero"

"Effortless Superhuman" (pure strength, little mass gain)

"Pre-Hab: Injury-Proofing the Body"

Total page count: 92

#### RAPID SENSE OF TOTAL WELL-BEING

All chapters in "Fundamentals"

All chapters in "Ground Zero"

All chapters in "Improving Sex"

All chapters in "Perfecting Sleep"

"Reversing 'Permanent' Injuries"

Total page count: 143

Once you've selected the bare minimum to get started, get started.

Then, once you've committed to a plan of action, dip back into the book at your leisure and explore. Immediately practical advice is contained in every chapter, so don't discount something based on the title. Even if

you are a meat-eater (as I am), for example, you will benefit from “The Meatless Machine.”

Just don’t read it all at once.

#### RULE #2. SKIP THE SCIENCE IF IT’S TOO DENSE.

You do not need to be a scientist to read this book.

For the geeks and the curious, however, I’ve included a lot of cool details. These details can often enhance your results but are not required reading. Such sections are boxed and labeled “Geek’s Advantage” with a “GA” symbol.

Even if you’ve been intimidated by science in the past, I encourage you to browse some of these GA sections—at least a few will offer some fun “holy sh*t!” moments and improve results 10% or so.

If you ever feel overwhelmed, though, skip them, as they’re not mandatory for the results you’re after.

#### RULE #3. PLEASE BE SKEPTICAL.

Don’t assume something is true because I say it is.

As the legendary Timothy Noakes PhD, author or co-author of more than 400 published research papers, is fond of saying: “Fifty percent of what we know is wrong. The problem is that we do not know which 50% it is.” Everything in this book works, but I have surely gotten some of the mechanisms completely wrong. In other words, I believe the how-to is 100% reliable, but some of the why-to will end up on the chopping block as we learn more.

#### RULE #4. DON’T USE SKEPTICISM AS AN EXCUSE FOR INACTION.

As the good Dr. Noakes also said to me about one Olympic training regimen: “This [approach] could be totally wrong, but it’s a hypothesis worth disproving.”

It’s important to look for hypotheses worth disproving.

Science starts with educated (read: wild-ass) guesses. Then it’s all trial and error. Sometimes you predict correctly from the outset. More often, you make mistakes and stumble across unexpected findings, which lead to new questions. If you want to sit on the sidelines and play full-time skeptic, suspending action until a scientific consensus is reached, that’s your choice. Just realize that science is, alas, often as political as a dinner party with die- hard Democrats and Republicans. Consensus comes late at best.

Don’t use skepticism as a thinly veiled excuse for inaction or remaining in your comfort zone. Be skeptical, but for the right reason: because you’re looking for the most promising option to test in real life.

Be *proactively* skeptical, not defensively skeptical.

Let me know if you make a cool discovery or prove me wrong. This book will evolve through your feedback and help.

#### RULE #5. ENJOY IT.

I’ve included a lot of odd experiences and screwups just for simple entertainment value. All fact and no play makes Jack a dull boy.

Much of the content is intended to be read as the diary of a madman. Enjoy it. More than anything, I’d like to impart the joy of exploration and discovery. Remember: this isn’t a homework assignment. Take it at your own pace.

## The Billionaire Productivity Secret and the Experimental Lifestyle

“How do you become more productive?”

Richard Branson leaned back and thought for a second. The tropical sounds of his private oasis, Necker Island murmured in the background. Twenty people sat around him at rapt attention, wondering what a billionaire’s

answer would be to one of the big questions—perhaps *the* biggest question—of business. The group had been assembled by marketing impresario Joe Polish to brainstorm growth options for Richard's philanthropic Virgin Unite. It was one of his many new ambitious projects. Virgin Group already had more than 300 companies, more than 50,000 employees, and $25 billion per year in revenue. In other words, Branson had personally built an empire larger than the GDP of some developing countries. Then he broke the silence:

"Work out."

He was serious and elaborated: working out gave him at least four additional hours of productive time every day.

The cool breeze punctuated his answer like an exclamation point.

4HB is intended to be much more than a book.

I view 4HB as a manifesto, a call to arms for a new mental model of living: the experimental lifestyle. It's up to you—not your doctor, not the newspaper—to learn what you best respond to. The benefits go far beyond the physical.

If you understand politics well enough to vote for a president, or if you have ever filed taxes, you can learn the few most important scientific rules for redesigning your body. These rules will become your friends, 100% reliable and trusted.

This changes everything.

It is my sincere hope, if you've suffered from dissatisfaction with your body, or confusion regarding diet and exercise, that your life will be divided into before-4HB and after-4HB. It can help you do what most people would consider superhuman, whether losing 100 pounds of fat or holding your breath for five minutes. It all works.

There is no high priesthood—there is cause and effect.

Welcome to the director's chair.

Alles mit Maß und Ziel,

Timothy Ferriss
San Francisco, California
June 10, 2010

## FOR YOUR READING PLEASURE

### Getting Tested

There are dozens of tests mentioned throughout this book. If you ever ask yourself "How do I get that tested?" or wonder where to start, the "Getting Tested" list on this page is your step-by-step guide.

### Quick Reference

Not sure how much a gram is, or what the hell 4 ounces is? Just flip to the common measurements on this page and unleash your inner Julia Child.

### Endnotes and Citations

This book is very well researched.

It's also big enough to club a baby seal. If you really want to make your eyes glaze over, more than 500 scientific citations can be found at www.fourhourbody.com/endnotes, divided by chapter and with relevant sentences included.

## Resources

To spare you the headache of typing out paragraph-long URLs, all long website addresses have been replaced with a short www.fourhourbody.com address that will send you to the right place.

Got it? Good. Let's move on to the mischief.

End of Chapter Notes

1. Multiple tests are often performed from single blood draws of 10–12 vials.

2. Not just noticeable.

3. There are, of course, some outstanding companies with solid R&D and uncompromising ethics, but they are few and far between.

4. I have absolutely no financial interest in any of the supplements I recommend in this book. If you purchase any supplement from a link in this book, an affiliate commission is sent directly to the nonprofit DonorsChoose.org, which helps public schools in the United States.

5. Philosopher Nassim N. Taleb noted an important difference between language and biology that I'd like to underscore: the former is largely known and the latter is largely unknown. Thus, our 2.5% is not 2.5% of a perfect finite body of knowledge, but the most empirically valuable 2.5% of what we know now.

# FUNDAMENTALS—
# FIRST AND FOREMOST

# THE MINIMUM EFFECTIVE DOSE

## From Microwaves to Fat-Loss

**Perfection is achieved, not when there is nothing more to add, but when there is nothing left to take away.**
—Antoine de Saint-Exupéry

Arthur Jones was a precocious young child and particularly fond of crocodiles.

He read his father's entire medical library before he was 12. The home environment might have had something to do with it, seeing as his parents, grandfather, great-grandfather, half-brother, and half-sister were all doctors.

From humble beginnings in Oklahoma, he would mature into one of the most influential figures in the exercise science world. He would also become, in the words of more than a few, a particularly "angry genius."

One of Jones's protégés, Ellington Darden PhD, shares a prototypical Jones anecdote:

> *In 1970, Arthur invited Arnold [Schwarzenegger] and Franco Colombu to visit him in Lake Helen, Florida right after the 1970 Mr. Olympia. Arthur picked them up at the airport in his Cadillac, with Arnold in the passenger seat and Franco in the back. There are probably 12 stoplights in between the airport and the Interstate, so it was a lot of stop-and-go driving.*
>
> *Now, you have to know that Arthur was a man who talked loud and dominated every conversation. But he couldn't get Arnold to shut up. He was just blabbing in his German or whatever and Arthur was having a hard time understanding what he was saying. So Arthur was getting annoyed and told him to quiet down, but Arnold just kept talking and talking.*
>
> *By the time they got onto the Interstate, Arthur had had enough. So he pulled over to the side of the road, got out, walked around, opened Arnold's door, grabbed him by the shirt collar, yanked him out, and said something to the effect of, "Listen here, you son of a bitch. If you don't shut the hell up, a man twice your age is going to whip your ass right out here in front of I-4 traffic. Just dare me."*
>
> *Within five seconds Arnold had apologized, got back in the car, and was a perfect gentlemen for the next three or four days.*

Jones was more frequently pissed off than anything else.

He was infuriated by what he considered stupidity in every corner of the exercise science world, and he channeled this anger into defying the odds. This included putting 63.21 pounds on champion bodybuilder Casey Viator in 28 days and putting himself on the Forbes 400 list by founding and selling exercise equipment manufacturer Nautilus, which was estimated to have grossed $300 million per year at its zenith.

He had no patience for fuzzy thinking in fields that depended on scientific clarity. In response to researchers who drew conclusions about muscular function using electromyography (EMG), Arthur attached their machines to a cadaver and moved its limbs to record similar "activity." Internal friction, that is.

Jones lamented his fleeting time: "My age being what it is, universal acceptance of what we are now doing may not come within my lifetime; but it will come, because what we are doing is clearly established by simple laws of basic physics that cannot be denied forever." He passed away on August 28, 2007, of natural causes, 80 years old and as ornery as ever.

Jones left a number of important legacies, one of which will be the cornerstone of everything we'll discuss: the minimum effective dose.

### The Minimum Effective Dose

The minimum effective dose (MED) is defined simply: the smallest dose that will produce a desired outcome.

Jones referred to this critical point as the "minimum effective load," as he was concerned exclusively with

weight-bearing exercise, but we will look at precise "dosing" of both exercise and anything you ingest.[1]

Anything beyond the MED is wasteful.

To boil water, the MED is 212°F (100°C) at standard air pressure. Boiled is boiled. Higher temperatures will not make it "more boiled." Higher temperatures just consume more resources that could be used for something else more productive.

If you need 15 minutes in the sun to trigger a melanin response, 15 minutes is your MED for tanning. More than 15 minutes is redundant and will just result in burning and a forced break from the beach. During this forced break from the beach, let's assume one week, someone else who heeded his natural 15-minute MED will be able to fit in four more tanning sessions. He is four shades darker, whereas you have returned to your pale pre-beach self. Sad little manatee. In biological systems, exceeding your MED can freeze progress for weeks, even months.

In the context of body redesign, there are two fundamental MEDs to keep in mind:

*To remove stored fat → do the least necessary to trigger a fat-loss cascade of specific hormones.*

*To add muscle in small or large quantities → do the least necessary to trigger local (specific muscles) and systemic (hormonal[2]) growth mechanisms.*

Knocking over the dominos that trigger both of these events takes surprisingly little. Don't complicate them.

For a given muscle group like the shoulders, activating the local growth mechanism might require just 80 seconds of tension using 50 pounds once every seven days, for example. That stimulus, just like the 212°F for boiling water, is enough to trigger certain prostaglandins, transcription factors, and all manner of complicated biological reactions. What are "transcription factors"? You don't need to know. In fact, you don't need to understand any of the biology, just as you don't need to understand radiation to use a microwave oven. Press a few buttons in the right order and you're done.

In our context: 80 seconds as a target is all you need to understand. That is the button.

If, instead of 80 seconds, you mimic a glossy magazine routine—say, an arbitrary 5 sets of 10 repetitions—it is the muscular equivalent of sitting in the sun for an hour with a 15-minute MED. Not only is this wasteful, it is a predictable path for preventing and reversing gains. The organs and glands that help repair damaged tissue have more limitations than your enthusiasm. The kidneys, as one example, can clear the blood of a finite maximum waste concentration each day (approximately 450 mmol, or millimoles per liter). If you do a marathon three-hour workout and make your bloodstream look like an LA traffic jam, you stand the real chance of hitting a biochemical bottleneck.

Again: the good news is that you don't need to know anything about your kidneys to use this information. All you need to know is:

*80 seconds is the dose prescription.*

More is not better. Indeed, your greatest challenge will be resisting the temptation to do more.

The MED not only delivers the most dramatic results, but it does so in the least time possible. Jones's words should echo in your head: "REMEMBER: it is impossible to evaluate, or even understand, anything that you cannot measure."

80 secs. of 20 lbs.

10:00 mins. of 54°F water

200 mg of allicin extract before bed

These are the types of prescriptions you should seek, and these are the types of prescriptions I will offer.

End of Chapter Notes

1. Credit is due to Dr. Doug McGuff, who's written extensively on this and who will reappear later.

2. In fancier and more accurate terms, *neuroendocrine*.

# RULES THAT CHANGE THE RULES

## Everything Popular Is Wrong

**Everything popular is wrong.**
—Oscar Wilde, *The Importance of Being Earnest*

**Know the rules well, so you can break them effectively.**
—Dalai Lama XIV

"This is clearly a lie. Gaining 34 lb in 28 days requires a caloric surplus of 4300 calories per day, so for a guy his size, he must have eaten 7000 calories a day. He expects me to believe that he dropped 4% in bodyfat as a result of eating 7000 calories? …"

I took a big swig of Malbec and read the blog comment again. Ah, the Internet. How far we haven't come.

It was amusing, and one of hundreds of similar comments on this particular blog post, but the fact remained: I had gained 34 pounds of muscle, lost 4 pounds of fat, and decreased my total cholesterol from 222 to 147, all in 28 days, without anabolics or statins like Lipitor.

The entire experiment had been recorded by Dr. Peggy Plato, director of the Sport and Fitness Evaluation Program at San Jose State University, who used hydrostatic weighing tanks, medical scales, and a tape measure to track everything from waist circumference to bodyfat percentage. My total time in the gym over four weeks?

Four hours.[3] Eight 30-minute workouts.

The data didn't lie.

But isn't weight loss or gain as simple as calories in and calories out?

It's attractive in its simplicity, yes, but so is cold fusion. It doesn't work quite as advertised.

German poet Johann Wolfgang Goethe had the right perspective: "Mysteries are not necessarily miracles." To do the impossible (sail around the world, break the four-minute mile, reach the moon), you need to ignore the popular.

Charles Munger, right-hand adviser to Warren Buffett, the richest man on the planet, is known for his unparalleled clear thinking and near-failure-proof track record. How did he refine his thinking to help build a $3 trillion business in Berkshire Hathaway?

The answer is "mental models," or analytical rules-of-thumb[4] pulled from disciplines outside of investing, ranging from physics to evolutionary biology.

Eighty to 90 models have helped Charles Munger develop, in Warren Buffett's words, "the best 30-second mind in the world. He goes from A to Z in one move. He sees the essence of everything before you even finish the sentence."

Charles Munger likes to quote Charles Darwin:

*Even people who aren't geniuses can outthink the rest of mankind if they develop certain thinking habits.*

In the 4HB, the following mental models, pulled from a variety of disciplines, are what will separate your results from the rest of mankind.

### New Rules for Rapid Redesign

**NO EXERCISE BURNS MANY CALORIES.**

Did you eat half an Oreo cookie? No problem. If you're a 220-pound male, you just need to climb 27 flights of stairs to burn it off.

**(Remember: skip the "GA" boxes if you don't like the dense stuff.)**

Put another way, moving 100 kilograms (220 pounds) 100 meters (about 27 flights of stairs) requires 100 kilojoules of energy, or 23.9 calories (known to scientists as kilocalories [kcal]). A pound of fat contains 4,082 calories. How many calories might running a marathon burn? 2,600 or so.

The caloric argument for exercise gets even more depressing. Remember those 107 calories you burned during that kick-ass hour-long Stairmaster™ session? Don't forget to subtract your basal metabolic rate (BMR), what you would have burned had you been sitting on the couch watching *The Simpsons* instead. For most people, that's about 100 calories per hour given off as heat (BTU).

That hour on the Stairmaster was worth seven calories.

As luck would have it, three small stalks of celery are six calories, so you have one calorie left to spare. But wait a minute: how many calories did that sports drink and big post-workout meal have? Don't forget that you have to burn more calories than you later ingest in larger meals due to increased appetite.

F*cking hell, right? It's enough to make a lumberjack cry. Confused and angry? You should be.

As usual, the focus is on the least important piece of the puzzle.

But why do scientists harp on the calorie? Simple. It's cheap to estimate, and it is a popular variable for publication in journals. This, dear friends, is referred to as "parking lot" science, so-called after a joke about a poor drunk man who loses his keys during a night on the town.

His friends find him on his hands and knees looking for his keys under a streetlight, even though he knows he lost them somewhere else. "Why are you looking for your keys under the streetlight?" they ask. He responds confidently, "Because there's more light over here. I can see better."

For the researcher seeking tenure, grant money, or lucrative corporate consulting contracts, the maxim "publish or perish" applies. If you need to include 100 or 1,000 test subjects and can only afford to measure a few simple things, you need to paint those measurements as tremendously important.

Alas, mentally on your hands and knees is no way to spend life, nor is chafing your ass on a stationary bike.

Instead of focusing on calories-out as exercise-dependent, we will look at two underexploited paths: heat and hormones.

So relax. You'll be able to eat as much as you want, and then some. New exhaust pipes will solve the problem.

#### A DRUG IS A DRUG IS A DRUG

Calling something a "drug," a "dietary supplement," "over-the-counter," or a "nutriceutical" is a legal distinction, not a biochemical one.

None of these labels mean that something is safe or effective. Legal herbs can kill you just as dead as illegal narcotics. Supplements, often unpatentable molecules and therefore unappealing for drug development, can decrease cholesterol from 222 to 147 in four weeks, as I have done, or they can be inert and do absolutely nothing.

Think "all-natural" is safer than synthetic? Split peas are all-natural, but so is arsenic. Human growth hormone (HGH) can be extracted from the brains of all-natural cadavers, but unfortunately it often brings Creutzfeldt-Jakob disease with it, which is why HGH is now manufactured using recombinant DNA.

Besides whole foods (which we'll treat separately as "food"), anything you put in your mouth or your bloodstream that has an effect—whether it's a cream, injection, pill, or powder—is a *drug*. Treat them all as such. Don't distract yourself with labels that are meaningless to us.

### THE 20-POUND RECOMP GOAL

For the vast majority of you reading this book who weigh more than 120 pounds, 20 pounds of *recomposition* (which I'll define below) will make you look and feel like a new person, so I suggest this as a goal. If you weigh less than 120 pounds, aim for 10 pounds; otherwise, 20 pounds is your new, specific goal.

Even if you have 100+ pounds to lose, start with 20.

On a 1–10 attractiveness scale, 20 pounds appears to be the critical threshold for going from a 6 to a 9 or 10, at least as tested with male perception of females.

The term "recomposition" is important. It does *not* mean a 20-pound reduction in weight. It's a 20-pound change in appearance. A 20-pound "recomp" could entail losing 20 pounds of fat or gaining 20 pounds of muscle, but it most often involves losing 15 pounds of fat and gaining 5 pounds of muscle, or some blend in between.

Designing the best physique includes both subtraction and addition.

### THE 100-UNIT SLIDER: DIET, DRUGS, AND EXERCISE

How, then, do we get to 20 pounds?

Imagine a ruler with 100 lines on it, representing 100 total units, and two sliders. This allows us to split the 100 units into three areas that total 100. These three areas represent diet, drugs, and exercise.

An equal split would look like this:

_____/_____/_____ (33% diet, 33% drugs, 33% exercise)

It is possible to reach your 20-pound recomp goal with any combination of the three, but some combinations are better than others. One hundred percent drugs can get you there, for example, but it will produce the most long-term side effects. One hundred percent exercise can get you there, but if injuries or circumstances interfere, the return to baseline is fast.

/_____/ (100% drugs) = side effects

//_____ (100% exercise) = easy to derail

Here is the ratio of most of the fat-loss case studies in this book:

_____/_/___ (60% diet, 10% drugs, 30% exercise)

If you're unable to follow a prescribed diet, as is sometimes the case with travel or vegetarianism, you'll need to move the sliders to increase the % attention paid to exercise and drugs. For example:

_/____/_____ (10% diet, 45% drugs, 45% exercise)

The numbers need not be measured, but this concept is critical to keep in mind as the world interferes with plans. Learning diet and exercise principles is priority #1, as these are the bedrock elements. Relying too much on drugs makes your liver and kidneys unhappy.

The percentages will also depend on your personal preferences and "adherence," which we cover next.

### THE DUCT TAPE TEST: WILL IT STICK?

Eating at least one head of lettuce per day works well for losing fat and controlling insulin levels.

That is, if you're a critical intervention patient, such as a morbidly obese type 1 diabetic. The options for such people, as explained by their doctors, are (1) change your diet with this prescription, or (2) die. Not surprisingly, adherence is often incredible. For someone who would like to lose 20 pounds but is more interested in how their ass looks in a pair of jeans, the adherence will be abysmal. Chopping vegetables and cleaning the Cuisinart three times per day will lead to one place: abandonment of the method. Does that mean it won't work for some people? No. It just means that it will fail for *most* people. We want to avoid all methods with a high failure rate, even if you believe you are in the diligent minority. In the beginning, everyone who starts a program believes they're in this minority.

Take adherence seriously: will you actually stick with this change until you hit your goal?

If not, find another method, even if it's less effective and less efficient. The decent method you follow is better than the perfect method you quit.

#### DON'T CONFUSE PHYSICAL RECREATION WITH EXERCISE

Physical recreation can be many things: baseball, swimming, yoga, rock- climbing, tipping cows … the list is endless. Exercise, on the other hand, means performing an MED of precise movements that will produce a target change. That's it. It's next to impossible to draw cause-and-effect relationships with recreation. There are too many variables. Effective exercise is simple and trackable.

Physical recreation is great. I love chasing dogs at the dog park as much as the next person. Exercise in our context, however, is the application of measurable stimuli to decrease fat, increase muscle, or increase performance.

Recreation is for fun. Exercise is for producing changes. Don't confuse the two.

#### DON'T CONFUSE CORRELATION WITH CAUSE AND EFFECT

Want to look like a marathon runner, thin and sleek? Train like a marathoner.

Want to look like a sprinter, ripped and muscular? Train like a sprinter.

Want to look like a basketball player, 68? Train like a basketball player.

Hold on now. That last one doesn't work. Nor does it work for the first two examples. It's flawed logic, once again appealing and tempting in its simplicity. Here are three simple questions we can ask to avoid similar mistakes:

1. Is it possible that the arrow of causality is reversed? Example: do people who are naturally ripped and muscular often choose to be sprinters? Yep.

2. Are we mixing up absence and presence? Example: if the claim is that a no-meat diet extends average lifespan 5–15%, is it possible that it is the presence of more vegetables, not the absence of meat, that extends lifespan? It most certainly is.

3. Is it possible that you tested a specific demographic and that other variables are responsible for the difference? Example: if the claim is that yoga improves cardiac health, and the experimental group comprises upper-class folk, is it possible that they are therefore more likely than a control group to eat better food? You bet your downward-dog-posing ass.

The point isn't to speculate about hundreds of possible explanations.

The point is to be skeptical, especially of sensationalist headlines. Most "new studies" in the media are observational studies that can, at best, establish correlation (A happens while B happens), but not causality (A causes B to happen).

If I pick my nose when the Super Bowl cuts to a commercial, did I cause that? This isn't a haiku. It's a summary correlation doesn't prove causation. Be skeptical when people tell you that A causes B.

They're wrong much more than 50% of the time.

#### USE THE YO-YO: EMBRACE CYCLING

Yo-yo dieting gets a bad rap.

Instead of beating yourself up, going to the shrink, or eating an entire cheesecake because you ruined your diet with one cookie, allow me to deliver a message: it's normal.

Eating more, then less, then more, and so on in a continuous sine wave is an impulse we can leverage to reach goals faster. Trying to prevent it—attempting to sustain a reduced-calorie diet, for example—is when yo-yoing becomes pathological and uncontrollable. Scheduling overeating at specific times, on the other hand, fixes problems instead of creating them.

The top bodybuilders in the world understand this and, even when in a pre-contest dieting phase, will cycle calories to prevent hormonal downregulation.[5] The daily average might be 4,000 calories per day, but it would be cycled as follows: Monday, 4,000; Tuesday, 4,500; Wednesday, 3,500, etc.

Ed Coan, described as the Michael Jordan of powerlifting, set more than 70 world records in his sport. Among other things, he deadlifted an unbelievable 901 pounds at 220 pounds bodyweight, beating even super-heavyweights. His trainer at the time, Marty Gallagher, has stated matter-of-factly that "maintaining peak condition year-round is a ticket to the mental ward."

You can have your cheesecake and eat it too, as long as you get the timing right. The best part is that these planned ups and downs accelerate, rather than reverse, progress.

Forget balance and embrace cycling. It's a key ingredient in rapid body redesign.

#### PREDISPOSITION VS. PREDESTINATION: DON'T BLAME YOUR GENES

The marathoners of Kenya are legendary.

Kenyan men have won all but one of the last 12 Boston Marathons. In the 1988 Olympics, Kenyan men won gold in the 800-meter, 1,500-meter, and 5,000-meter races, as well as the 3,000-meter steeplechase. Factoring in their population of approximately 30 million, the statistical likelihood of this happening at an international competition with the scope of the Olympics is about one in 1.6 billion.

If you've been in the world of exercise science for any period of time, you can guess their muscle fiber composition, which is an inherited trait: slow-twitch. Slow-twitch muscle fibers are suited to endurance work. Lucky bastards!

But here's the problem: it doesn't appear to be totally true. To the surprise of researchers who conducted muscle biopsies on Kenyan runners, there was a high proportion of fast-twitch muscle fibers, the type you'd expect to find in shot-putters and sprinters. Why? Because, as it turns out, they often train using low mileage and high intensity.

If you are overweight and your parents are overweight, the inclination is to blame genetics, but this is only one possible explanation.

Did fatness genes get passed on, or was it overeating behavior? After all, fat people tend to have fat pets.

Even if you are *predisposed* to being overweight, you're not *predestined* to be fat.

Eric Lander, leader of the Human Genome Project, has emphasized repeatedly the folly of learned helplessness through genetic determinism:

> *People will think that because genes play a role in something, they determine everything. We see, again and again, people saying, "It's all genetic. I can't do anything about it." That's nonsense. To say that*

*something has a genetic component does not make it unchangeable.*

Don't accept predisposition. You don't have to, and we can feed and train you toward a different physical future.[6] Nearly all of my personal experiments involve improving something that should be genetically fixed.

It is possible to redirect your natural-born genetic profile. From now on, "bad genetics" can't be your go-to excuse.

#### ELIMINATE PROPAGANDA AND NEBULOUS TERMS

> The word ***aerobics*** came about when the gym instructors got together and said, "If we're going to charge $10 an hour, we can't call it jumping up and down."
>
> *—Rita Rudner*

One question you must learn to ask when faced with advice or sales pitches is: "If this [method/product/diet/etc.] didn't work as advertised, what might their other incentives be for selling it?"

Aerobics classes? The reason you're sold: aerobics is more effective than alternative X. The real reason it's promoted: there's no equipment investment and the gym can maximize students per square foot per class. Many "new and improved" recommendations are based on calculating profit first and then working backward to justify the method.

Marketer-speak and ambiguous words have no place in 4HB or your efforts. Both will surface in conversations with friends who, in their best effort to help, will do more harm than good. If unprepared, one such conversation can single-handedly derail an entire program.

These are two categories of words that you should neither use nor listen to. The first, **marketer-speak,** includes all terms used to scare or sell that have no physiological basis:

Toning

Cellulite

Firming

Shaping

Aerobics

The word *cellulite*, for example, first appeared in the April 15, 1968, issue of *Vogue* magazine, and this invented disease soon had a believer base worldwide:

> Vogue *began to focus on the body as much as on the clothes, in part because there was little they could dictate with the anarchic styles…. In a stunning move, an entire replacement culture was developed by naming a "problem" where it had scarcely existed before, centering it on the women's natural state, and elevating it to the existential female dilemma… . The number of diet- related articles rose 70 percent from 1968 to 1972.*

Cellulite is fat. Nothing special, neither a disease nor a unique female problem without solutions. It can be removed.

Less obvious, but often more damaging than marketer-speak, are **scientific-*sounding* words** that are so overused as to have no agreed-upon meaning:

Health

Fitness

Optimal

To eliminate words you shouldn't use in body redesign, the question to ask is: **can I measure it?**

"I just want to be healthy" is not actionable. "I want to increase my HDL cholesterol and improve my time for a one-mile jog (or walk)" is actionable. "Healthy" is subject to the fads and regime du jour. Useless.

The word *optimal* is also bandied about with much fanfare. "Your progesterone might fall within the normal range, but it's not optimal." The question here, seldom asked, should be: optimal for what? Triathlon training? Extending lifespan 40%? Increasing bone density 20%? Having sex three times a day?

"Optimal" depends entirely on what your goal is, and that goal should be numerically precise. "Optimal" is usable, but only when the "for what" is clear.

If it isn't, treat *optimal* as Wikipedia would: a weasel word.

## WHY A CALORIE ISN'T A CALORIE

> Calories are all alike, whether they come from beef or bourbon, from sugar or starch, or from cheese and crackers. Too many calories are just too many calories.
>
> *—Fred Stare, founder and former chair of the Harvard University Nutrition Department*

The above statement is so ridiculous as to defy belief, but let's take a look at the issue through a more rational lens: hypothetical scenarios.

Scenario #1: Two male identical twins eat the exact same meals for 30 days. The only difference: one of the subjects just finished a strong course of antibiotics and now lacks sufficient good bacteria for full digestion.

Will the body composition outcomes be the same?

Of course not. **Rule #1: It's not what you put in your mouth that matters, it's what makes it to your bloodstream. If it passes through, it doesn't count.**

The creator of the "calorie" as we know it, 19th-century chemist Wilbur Olin Atwater, did not have the technology that we have today. He incinerated foods. Incineration does not equal human digestion; eating a fireplace log will not store the same number of calories as burning one will produce. Tummies have trouble with bark, as they do with many things.

Scenario #2: Three females of the same race, age, and body composition each consume 2,000 calories daily for 30 days. Subject 1 consumes nothing but table sugar, subject 2 consumes nothing but lean chicken breast, and subject 3 consumes nothing but mayonnaise (2,000 calories is just 19.4 tablespoons, if you'd care to indulge).

Will the body composition outcomes be the same?

Of course not. **Rule #2: The hormonal responses to carbohydrates (CHO), protein, and fat are different.**

There is no shortage of clinical studies to prove that beef calories[7] do not equal bourbon calories.

One such study, conducted by Kekwick and Pawan, compared three groups put on calorically equal (isocaloric) semistarvation diets of 90% fat, 90% protein, or 90% carbohydrate. Though ensuring compliance was a challenge, the outcomes were clearly not at all the same:

1,000 cals. at 90% fat = weight loss of 0.9 lbs. per day

1,000 cals. at 90% protein = weight loss of 0.6 lbs. per day

1,000 cals. at 90% carbohydrate = weight *gain* of 0.24 lbs. per day

Different sources of calories = different results.

Things that affect calorie allocation—and that can be modified for fat-loss and muscle gain—include digestion, the ratio of protein-to-carbohydrates-to-fat, and timing.

We'll address all three.

## MARKETING 101: SEXISM SELLS

Marilyn Monroe building her world-famous sex appeal.

More than 50% of the examples in this book are of women.

Marketers have conditioned women to believe that they need specific programs and diets "for women." This is an example of capitalism at its worst: creating false need and confusion.

Does this mean I'm going to recommend that a woman do exactly the same thing as a 250-pound meathead who wants 20-inch arms? Of course not. The two have different goals. But 99% of the time both genders want exactly the same thing: less fat and a bit more muscle in the right places. Guess what? In these 99 cases out of 100, men and women should therefore do *exactly* the same thing.

On average, women have less than one-tenth (often less than one-fortieth) the testosterone of men. This biochemical recipe just doesn't support rapid muscular growth unless you're an outlier, so, for the duration of this book, please suspend any fear of "getting bulky."

Even if you are a fast-responder, as you observe changes, you can omit pieces or reduce frequency. Don't worry about waking up looking like the Hulk the morning after a single workout. It won't happen, as much as men wish it did. There will be plenty of time to tweak and fine-tune, to cut back or shift gears, as you go.

One potential objection from the scientists in the group: *But don't women have more slow-twitch muscle fibers? Doesn't that mean women should train differently?* I propose not, and I'm not the first. Based on the data in this book and in the literature, you'll see that (1) muscle fiber composition can be changed, and (2) you should eat and train for your desired outcome, not to accommodate your current condition.

Don't fall victim to sexism in exercise. It's almost always a fraud or a sales pitch.

**TOOLS AND TRICKS**

***Seeking Wisdom: From Darwin to Munger*** **(www.fourhourbody.com/wisdom)** This is one of the best books on mental models, how to use them, and how not to make a fool of yourself. I was introduced to this manual for critical thinking by Derek Sivers, who sold his company CD Baby for $22 million.

***Poor Charlie's Almanack: The Wit and Wisdom of Charles T. Munger*** **(www.fourhourbody.com/almanac)** This

book contains most of the talks and lectures of Charlie Munger, the vice chairman of Berkshire Hathaway. It has sold nearly 50,000 copies without any advertising or bookstore placement.

**Munger's Worldly Wisdom (www.fourhourbody.com/munger)** This transcribed speech, given by Charlie Munger at USC Business School, discusses the 80–90 important mental models that cover 90% of the decisions he makes.

3. In this case, the “4-Hour Body” is quite literal.

4. These “mental models” are often referred to as *heuristics* or *analytical frameworks*.

5. For example, proper conversion of T4 thyroid hormone to the more thermogenically active T3.

6. Genes alone cannot account for the diversity of characteristics we see around us. Messenger RNA (mRNA) is now thought to be responsibl for much of the diversity, and there is good news: just as you can turn genes on and off, you can influence mRNA dramatically with environment—even shut down certain processes entirely through interference.

7. Protein, for one, provokes a greater thermic effect of food (TEF) than either carbohydrate or fat—in simple terms, in digestion a higher percentage of protein calories are “lost” as heat vs. carbohydrates or fat. This has led some scientists to suggest that the 4 calories per gram assumed for protein should be downgraded 20% to 3.2 calories per gram.

# GROUND ZERO—

Getting Started and Swaraj

**At the individual level Swaraj is vitally connected with the capacity for dispassionate self-assessment, ceaseless self-purification and growing self-reliance…. It is Swaraj when we learn to rule ourselves.**

—Mahatma Gandhi, ***Young India,*** June 28, 1928, p. 772

# THE HARAJUKU MOMENT

## The Decision to Become a Complete Human

**I must not fear. Fear is the mind-killer. Fear is the little-death that brings total obliteration. I will face my fear. I will permit it to pass over me and through me. And when it has gone past I will turn the inner eye to see its path. Where the fear has gone there will be nothing. Only I will remain.**

—Bene Gesserit "Litany Against Fear," from Frank Herbert's *Dune*

For most of us, the how-to books on our shelves represent a growing to-do list, not advice we've followed.

Several of the better-known tech CEOs in San Francisco have asked me at different times for an identical favor: an index card with bullet-point instructions for losing abdominal fat. Each of them made it clear: "Just tell me exactly what to do and I'll do it."

I gave them all of the necessary tactical advice on one 3×5 card, knowing in advance what the outcome would be. The success rate was impressive … 0%.

People suck at following advice. Even the most effective people in the world are terrible at it. There are two reasons:

1. Most people have an insufficient reason for action. The pain isn't painful enough. It's a *nice-to-have*, not a *must-have*. There has been no "Harajuku Moment."

2. There are no reminders. No consistent tracking = no awareness = no behavioral change. Consistent tracking, even if you have no knowledge of fat-loss or exercise, will often beat advice from world-class trainers.

But what is this all-important "Harajuku Moment"?

It's an epiphany that turns a nice-to-have into a must-have. There is no point in getting started until it happens. It applies to fat-loss as much as strength gain, to endurance as much as sex. No matter how many bullet points and recipes I provide, you will need a Harajuku Moment to fuel the change itself.

Chad Fowler knows this.

Chad, CTO of InfoEther, Inc., spends much of his time solving hard problems for customers in the Ruby computer language. He is also co-organizer of the annual RubyConf and RailsConf conferences, where I first met him. Our second meeting was in Boulder, Colorado, where he used his natural language experience with Hindi to teach a knuckle-dragger (me) the primitive basics of Ruby.

Chad is an incredible teacher, gifted with analogies, but I was distracted in our session by something he mentioned in passing. He'd recently lost 70+ pounds in less than 12 months.

It wasn't the amount of weight that I found fascinating. It was the timing. He'd been obese for more than a decade, and the change seemed to come out of nowhere. Upon landing back in San Francisco, I sent him one question via e-mail:

*What were the tipping points, the moments and insights that led you to lose the 70 lbs.?*

I wanted to know what the defining moment was, the conversation or realization that made him pull the trigger after 10 years of business as usual.

His answer is contained in this chapter.

Even if you have no interest in fat-loss, the key insights (partial completeness, data, and oversimplification among them) will help you lift 500 pounds, run 50 kilometers, gain 50 pounds, or do anything else in this book.

But let's talk about one oddity upfront: calorie counting. I just got done thrashing calorie counting, and I'm including Chad's calorie-based approach to prove a point.

This book didn't exist when Chad lost his weight, and there are far better things to track than calories. But … would I recommend tracking calories as an alternative to tracking nothing? You bet. Tracking anything is better than tracking nothing.

If you are very overweight, very weak, very inflexible, or *very* anything negative, tracking even a mediocre variable will help you develop awareness that leads to the right behavioral changes.

This underscores an encouraging lesson: you don't have to get it all right. You just have to be crystal clear on a few concepts.

Results will follow.

Enter Chad Fowler.

## The Harajuku Moment

"Why had I gone 10 years getting more and more out of shape (starting off pretty unhealthy in the first place) only to finally fix it now?

"I actually remember the exact moment I decided to do something.

"I was in Tokyo with a group of friends. We all went down to Harajuku to see if we could see some artistically dressed youngsters and also to shop for fabulous clothing, which the area is famous for. A couple of the people with us were pretty fashionable dressers and had some specific things in mind they wanted to buy. After walking into shops several times and leaving without seriously considering buying anything, one of my friends and I gave up and just waited outside while the others continued shopping.

"We both lamented how unfashionable we were.

"I then found myself saying the following to him: 'For me, it doesn't even matter what I wear; I'm not going to look good anyway.'

"I think he agreed with me. I can't remember, but that's not the point. The point was that, as I said those words, they hung in the air like when you say something super-embarrassing in a loud room but happen to catch the one randomly occurring slice of silence that happens all night long. Everyone looks at you like you're an idiot. But this time, it was me looking at myself critically. I heard myself say those words and I recognized them not for their content, but for their tone of helplessness. I am, in most of my endeavors, a solidly successful person. I decide I want things to be a certain way, and I make it happen. I've done it with my career, my learning of music, understanding of foreign languages, and basically everything I've tried to do.

"For a long time, I've known that the key to getting started down the path of being remarkable in anything is to simply act with the intention of being remarkable.

"If I want a better-than-average career, I can't simply 'go with the flow' and get it. Most people do just that: they wish for an outcome but make no intention-driven actions toward that outcome. If they would just do *something* most people would find that they get some version of the outcome they're looking for. That's been my secret. Stop wishing and start doing.

"Yet here I was, talking about arguably the most important part of my life—my health—as if it was something I had no control over. I had been going with the flow for years. Wishing for an outcome and waiting to see if it would come. I was the limp, powerless ego I detest in other people.

"But somehow, as the school nerd who always got picked last for everything, I had allowed 'not being good at sports' or 'not being fit' to enter what I considered to be inherent attributes of myself. The net result is that I was left with an understanding of myself as an *incomplete* person. And though I had (perhaps) overcompensated for

that incompleteness by kicking ass in every other way I could, I was still carrying this powerlessness around with me and it was very slowly and subtly gnawing away at me from the inside.

"So, while it's true that I wouldn't have looked great in the fancy clothes, the seemingly superficial catalyst that drove me to finally do something wasn't at all superficial. It actually pulled out a deep root that had been, I think, driving an important part of me for basically my entire life.

"And now I recognize that this is a pattern. In the culture I run in (computer programmers and tech people), this partial-completeness is not just common but maybe even the norm. My life lately has taken on a new focus: digging up those bad roots; the holes I don't notice in myself. And now I'm filling them one at a time.

"Once I started the weight loss, the entire process was not only easy but enjoyable.

"I started out easy. Just paying attention to food and doing relaxed cardio three to four times a week. This is when I started thinking in terms of making every day just slightly better than the day before. On day 1 it was easy. Any exercise was better than what I'd been doing.

"If you ask the average obese person: 'If you could work out for ONE year and be considered "in shape," would you do it?' I'd guess that just about every single one would emphatically say, 'Hell, yes!' The problem is that for most normal people, there is no clear path from fat to okay in a year. For almost everyone, the path is there and obvious if you know what you're doing, but it's almost impossible to imagine an outcome like that so far in the distance.

"The number-one realization that led me to be able to keep doing it and make the right decisions was to **use data**.

"I learned about the basal metabolic rate (BMR), also called resting metabolic rate, and was amazed at how many calories I would have to eat in order to stay the same weight. It was huge. As I started looking at calorie content for food that wasn't obviously bad, I felt like I'd have to just gluttonously eat all day long if I wanted to stay fat. The BMR showed me that (1) it wasn't going to be hard to cut calories, and (2) I must have been making BIG mistakes before in order to consume those calories—not small ones. That's good news. Big mistakes mean lots of low-hanging fruit.[1]

"Next was learning that 4,000 calories equals about a pound of fat. I know that's an oversimplification, but that's okay. **Oversimplifying is one of the next things I'll mention as a tool.** But if 4,000 is roughly a pound of fat, and my BMR makes it pretty easy to shave off some huge number of calories per day, it suddenly becomes very clear how to lose lots of weight without even doing any exercise. Add in some calculations on how many calories you burn doing, say, 30 minutes of exercise and you can pretty quickly come up with a formula that looks something like:

BMR = 2,900

Actual intake = 1,800

Deficit from diet = BMR – actual intake = 1,100

Burned from 30 minutes cardio = 500

Total deficit = deficit from diet – burned from 30 minutes cardio = 1,600

"So that's 1,600 calories saved in a day, or almost half a pound of bad weight I could lose in a single day. So for a big round number, I can lose 5 pounds in a week and a half without even working too hard. When you're 50 pounds overweight, getting to 10% of your goal that fast is **real**.

"**An important thing I alluded to earlier is that all of these numbers are in some ways bullshit.** That's okay, and realizing that it was okay was one of the biggest shifts I had to make. When you're 50–70 pounds overweight (or I'd say whenever you have a BIG change to make), worrying about counting calories consumed or burned slightly inaccurately is going to kill you. The fact of the matter is, there are no tools available to normal people

which will tell us exactly how much energy we're burning or consuming. But if you're just *kinda* right and, more important, the numbers are *directionally* right, you can make a big difference with them.

"Here's another helpful pseudo-science number: apparently, 10 pounds of weight loss is roughly a clothing size [XL → L → M]. That was a HUGE motivator. I loved donating clothes all year and doing guilt-free shopping.

"As a nerd, I find myself too easily discouraged by data collection projects where it's difficult or impossible to collect accurate data. Training myself to forget that made all the difference.

"Added to this knowledge was a basic understanding of how metabolism works. Here are the main things I changed: breakfast within 30 minutes of waking and five to six meals a day of roughly 200 calories each. How did I measure the calories? I didn't. I put together an exact meal plan for just ONE week, bought all the ingredients stuck to it religiously. From that point on, I didn't have to do the hard work anymore. I became aware after just one week of *roughly* how many calories were in a portion of different types of food and just guessed. Again, trying to literally *count* calories sucks and is demotivating. Setting up a rigid template for a week and then using it as a basic guide is sustainable and fun.

"Just a few more disconnected tips:

"I set up a workstation where I could pedal on a recumbent bike while working. I did real work, wrote parts of *The Passionate Programmer*, played video games, chatted with friends, and watched ridiculous television shows I'd normally be ashamed to be wasting my time on all while staying in my aerobic zone. I know a lot of creative people who hate exercise because it's boring. I was in that camp too (I'm not anymore … it changes once you get into it). The bike/desk was my savior. That mixed with a measurement system:

"I got a heart rate monitor (HRM) and started using it for EVERYTHING. I used it while pedaling to make sur that even when I was having fun playing a game I was doing myself some good. If you know your heart rate zones (easy to find on the Internet), the ambiguity non-fitness-experts feel with respect to exercise is removed. Thirty minutes in your aerobic zone is good exercise and burns fat. Calculate how many calories you burn (a good HRM will do it for you), and the experience is fun and motivating. I started wearing my HRM when I was doing things like annoying chores around the house. You can clean house fast and burn serious fat. That's not some Montel Williams BS. It's real. Because of the constant use of an HRM I was able to combine fun and exercise or annoyin chores and exercise, making all of it more rewarding and way less likely I'd get lazy and decide not to do it.

"Building muscle is, as you know, one of the best ways to burn fat. But geeks don't know how to build muscle. And as I've mentioned, geeks don't like to do things they don't *know* are going to work. We like data. We value expertise. So I hired a trainer to teach me what to do. I think I could have let go of the trainer after a few sessions, since I had learned the 'right' exercises, but I've stayed with her for the past year.

"Finally, as a friend said of my difficulty in writing about my insights for weight loss, a key insight is my lack of specific insights.

"To some extent, the answer is just 'diet and exercise.' There were no gimmicks. **I used data we all have access to** and just trusted biology to work its magic. I gave it a trial of 20 days or so and lost a significant amount of weight. Even better, I started waking up thinking about exercising because I felt good.

"It was easy."

It was easy for Chad because of his Harajuku Moment. It worked because he used numbers.

In the next chapter, you'll get your numbers.

That's when the fun begins.

Chad Fowler, before and after his Harajuku Moment. (Photos: James Duncan Davidson)

**TOOLS AND TRICKS**

**"Practical Pessimism: Stoicism as Productivity System," Google Ignite (www.fourhourbody.com/stoicism)** This is a five-minute presentation I gave in 2009 on my personal Harajuku Moment. This video will show you how to inoculate your fears while leveraging them to accomplish what you want.

**Clive Thompson, "Are Your Friends Making You Fat?"** ***New York Times*****, September 10, 2009 (www.fourhourbody.com/friends)** Reaching your physical goals is a product, in part, of sheer proximity to people who exhibit what you're targeting. This article explains the importance, and implications, of choosing your peer group.

End of Chapter Notes

1. Tim: This type of low-hanging fruit is also commonly found by would-be weight gainers when they record protein intake for the first time. Many are only consuming 40–50 grams of protein per day.

# ELUSIVE BODYFAT

## Where Are You Really?

**The first principle is that you must not fool yourself, and you are the easiest person to fool.**
—Richard P. Feynman, Nobel Prize–winning physicist

**γνωθι σεαΥτόυ ["Know Thyself"]**
—Inscription at Temple of Apollo at Adelphi

**Think fat is just under the skin? Think again. The above MRI of a 250-pound woman, compared to a 120-pound woman, shows the large fat deposits around internal organs. The undigested food is a reader-gagging bonus.**

Update E-Mail from Subject X, Male:

12/27/08

Beginning weight 245 lbs.

1/30/09

End of month #1 228 lbs.

3/1/09

End of month #2 222 1/2 lbs.

[Too little protein in the morning for the past 4 weeks; added 30 grams within 30 minutes of waking to restart fat-loss]

4/2/09

End of month #3 203 3/4 lbs.

[90 day weight loss = 41 1/4 lbs.]

5/1/09

End of month #4 200 lbs.

6/1/09

End of month #5 193 lbs.

7/1/09

End of month #6 186 3/4 lbs.

7/31/09

End of month #7 ————————185 lbs.

It's somewhat demoralizing to only lose eight pounds in the last two months.

As far as my lifting exercises are concerned, there are five basic lifts.[2] The two weights I am giving you are the poundage when I started and my present poundage.

1. Shoulder Press—10 slow reps[3]

Starting weight—15 lbs. Present weight—75 lbs.

2. Pulldown—8 slow reps

Starting weight—50 lbs. Present weight—135 lbs.

3. Bench Press—8 slow reps

Starting weight—30 lbs. Present weight—90 lbs.

4. Row—8 slow reps

Starting weight—50 lbs. Present weight—120 lbs.

5. Curl—12 slow reps

Starting weight—15 lbs. Present weight—50 lbs.

Subject X, aged 65, was depressed by his slowing rate of weight loss. The real question was: should he have been?

## The Deceptive Scale

Looking at his exercise logs, he showed massive strength gains in the three months where he showed the least *weight* loss.

I didn't think this was a coincidence. He had almost tripled his strength in all movements, and to estimate 10 pounds of lean muscle gain over those three months would be conservative. This would make his actual fat-loss closer to 18 pounds, not the scale's 8.

His muscle gains slowed after this update e-mail, and the fat-loss once again began to show on the scale. He dropped from 185 to 173. Total *weight* lost: 72 pounds.

But total *fat* lost? It's impossible to tell. In a rush to get started, I hadn't insisted on getting his bodyfat percentage measured.

Not that I cared much. For the first time in my life, I saw my father weighing less than me. During his annual checkup four months later, his doctor remarked: "You realize you're younger now than you were a year ago. You may just live forever." It was a stark contrast to his 245 pounds at 56 just a year earlier. My dad had gone from risk of sudden heart attack to looking and feeling 10 years younger in 12 months.

Regardless, he had become depressed about his results precisely when he should have been giving people high-fives. It takes just one such incident to ruin an entire program and months of progress.

How can *you* prevent unnecessary moments of doubt?

It just takes a few simple numbers to steer the ship—to know, without fail, when something is working and

when it is not.

Until you finish this chapter, do not pass go.

**If you want to skip directly to the actions, jump to "Starting Your Physical GPS" on this page. In fact, I suggest this for the first read through.**

## Choosing the Right Tools

I used to have a signature move while driving.

About a quarter-mile or so before arriving at my hard-fought destination, often within 200 feet, I would come to the unwavering conclusion that I'd gone too far. Then I would U-turn and drive in the opposite direction, only to repeat the drill like a dog tethered to a clothesline. Best-case scenario, this shuttle run doubled my travel time. Worst-case scenario, I got so frustrated that I abandoned the trip altogether.

This is exactly what most people do with fat-loss and exercise.

Using a blunt instrument like a scale (the equivalent of the odometer in my example) people often conclude they're not making progress when, in fact, they are making tremendous progress. This leads to a musical chairs of fad diets and demoralizing last-ditch efforts that do more harm than good. To hit your target 20-pound recomposition, you'll need to track the right numbers.

The scale is one tool, and you should use it, but it is not king. It can mislead. Take this unedited feedback from Angel, who was two weeks into the Slow-Carb Diet at the time (see "The Slow-Carb Diet I and II" chapters):

> *After my cheat day on Saturday, I gained 1 pound which is normal for me … week two, I lost that 1 pound. I didn't lose any [additional] weight on week two, but I'm not discouraged. I did manage to lose in inches. I lost ½ an inch off my hips which is absolutely great. I lost a total of 1 inch off my thighs. Not so shabby either. So that's a total of 1.5 inches for the week. I'll take the inches. The grand total of inches lost from Day One: 5 inches … Yippee! No exercise either.*

My driving issues ended when I bought a GPS device.

The GPS fixed my problem because it could answer the simple question: was I getting*closer* to my destination?

In body redesign, our "destination" is a better ratio of body *composition*, not weight.

How much of you is useful muscle and how much of you is useless fat? Our constant companions will be circumference and bodyfat measurements. By the end of this chapter, you will have a starting point for your own physical GPS. This will guide you to your 20-pound recomposition goal.

Circumference is easy enough: use a tape measure. We'll cover the details at the end of this chapter.

But how do we actually measure bodyfat percentage?

It turns out, there are a lot of options, and the most common are the worst.

## Skinning the Cat

In one 24-hour period,[4] I took more than a dozen bodyfat measurements using the easiest-to-find, as well as the most sophisticated, equipment available.

Here are some of the results, from lowest to highest:

7%—3-point with SlimGuide calipers

7.1–9.4%—Accu-measure

9.5%—BodyMetrix ultrasound

11.3%—DEXA

13.3%—BodPod

14.7–15.4%—Omron hand-held bio-impedance (second value after drinking two liters of water in five minutes)

15.46–16.51%—4-site SlimGuide calipers

The range is 7% to 16.51%. So then, which of these bad boys is accurate?

The truth is, none of them are accurate. Moreover, this doesn't matter. We just need to make sure that the method we choose is consistent.

The following table shows the various techniques I considered, ordered from most to least error-prone.[5]

COMPARISON OF METHODS FOR ESTIMATING % BODYFAT

| METHOD | Cost of Procedure | Time (minutes) | Technician Skill | Subject Comfort | Error in %BF | Comments |
|---|---|---|---|---|---|---|
| Circumference | Low | ~5 | Low to moderate | High | ~3.0% – 3.6% | |
| Bio Electrical Impedance | Low | ~5 | Low | High | ~2.5% – 4.0% | Sensitive to subject hydration |
| Skinfold | Low | ~5 | High | Low | ~2.0% – 3.5% | Dependent on formula |
| Ultrasound | Low | ~5 | Moderate | High | ~2.3% – 3.0% | Only low-cost method that can also measure muscle thickness |
| BodPod | High | ~30 | High | Moderate | ~2.3% – 2.8% | |
| Underwater Weighing | High | ~30 – 60 | High | Low | ~2.3% – 2.8% | Needs careful measurement and can be affected by subject |
| DEXA | High | ~15 – 30 | High | High | ~1.2% – 2.5% | Can measure lean mass and bone |
| X-ray CT | High | ~10 – 15 | High | High | ~1.0% – 2.0% | Significant radiation |
| MRI | High | ~30 – 45 | High | High | ~1.0% – 2.0% | |

Provided by Luiz Da Silva, PhD., scientific advisory board, UC Davis National Science Foundation Center for Biophotonics Science and Technology.

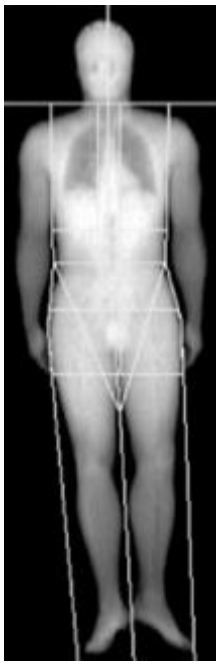
After dozens of trials with multiple subjects, and taking into account both constancy and convenience (including cost), there were three clear winners:[6]

1. DEXA
2. BodPod
3. Ultrasound (BodyMetrix)

## The Top 3

### DEXA

Dual energy X-ray absorptiometry (DEXA), which costs $50–100 per session, ended up my favorite, as it is repeatable and offers valuable information besides bodyfat percentage. The GE Lunar Prodigy, the machine used, is designed for bone density testing and splits the body into different zones:



My DEXA scan image.

If you're not concerned about osteoporosis, why is this interesting?

Because it highlights muscular imbalances between the left and right sides. In my case:

- Left arm—4.6 kg
- Right arm—4.7 kg (I'm right-handed, so not surprising)
- Left leg—12.4 kg
- Right leg—12.8 kg
- Left trunk—18.9 kg
- Right trunk—17.9 kg

As we'll see in "Pre-hab," making yourself injury-proof requires, above all, correcting left-right imbalances. In five to ten minutes, DEXA gives a crystal-clear picture of mass imbalances that even outstanding physica therapists can miss after hours of observation.

#### BODPOD

Costing just $25–50, BodPod uses air displacement and is comparable to the clinical "gold standard" of hydrostatic underwater weighing. The subject (you) sits inside a sealed capsule, and alternating air pressures determine body composition. Infinitely faster and more comfortable than underwater weighing, the BodPod is the official bodyfat measurement device of the NFL Combine, where the 330 best college football players are analyzed by NFL coaches and scouts to determine their worth.

Unlike calipers and some other methods, BodPod can accommodate obese subjects of 500+ pounds.

#### BODYMETRIX

BodyMetrix is a hand-held ultrasound device that tells you the exact thickness of fat (in millimeters) wherever you place it. It ended up being the tool I used most often and still use most often.

Ultrasound has been used for more than a decade to determine the fat and muscular characteristics of livestock. Want to see how that intramuscular marbling is coming along on your living Kobe beef? Pull out the pregnancy cam!

It's amazing that it took so long to reach athletics. The next-generation BodyMetrix wand, small enough to fit in a jacket pocket, connects to any PC with a USB cable and is now used by world-famous teams like the New

York Yankees and AC Milan football. It is the picture of simplicity: I was able to take frequent readings in less than two minutes, and both data and images were automatically uploaded to my Mac. (The PC software actually runs faster on a Mac using Parallels®, a program that allows you to use PC software on Macs.)

Rather than attempt to find a gym that offered this for per-session fees, I decided to own a unit. At $2,000 for the professional unit, it was worth the convenience. There is a personal version in development that will cost less than $500.

## Can't Find the Fancy Stuff?

If you choose to use calipers or bio-impedance (any tool you hold or stand on) out of convenience, or if you use them for more frequent measurement alongside one of the Top Three, here are critical points to consider:

#### 1. NEVER COMPARE BEFORE-AND-AFTER RESULTS FROM DIFFERENT TOOLS.[7]

Results from different tools cannot be compared. In my 24-hour measurement marathon, I tested 13.3% with BodPod and 11.3% with DEXA. Let's say I had tested using only DEXA at 11.3% and then tested on BodPod for m follow-up, which resulted in 12.3%. I would wrongly conclude that I'd gained 1% bodyfat, whereas I would have seen a more accurate 1% loss had I used BodPod for both.

#### 2. IF YOU CHOOSE TO USE BIO-ELECTRICAL IMPEDANCE (BEI),[8] YOU NEED CONSISTENT HYDRATION.

Using bio-impedance devices, I have been able to make my bodyfat percentage jump almost 1% in five minutes by drinking two liters of water in between measurements. Here's a simple approach that largely fixes hydration issues:

Immediately upon waking, drink 1.5 liters (about 50 fluid ounces) of cold water[9]—ensure that water temperature is the same day to day—and wait 30 minutes. Urinate and then test bodyfat using bio-impedance. Do not eat or drink anything else before testing. I use two empty Bulleit bourbon bottles (750 milliliters × 2 = 1.5 liters) because I love the old-school bottles, but Nalgene bottles are generally one liter each and have line measurements on the side. Wine and most liquor is also standardized for a 750-milliliter bottle size.

#### 3. IF YOU CHOOSE TO USE CALIPERS, YOU NEED A CONSISTENT ALGORITHM.

Even with the same calipers, using different math = different results. I suggest asking the gym or trainer to use a 3-point or 7-point Jackson-Pollock algorithm, which I have found gives the most consistent results compared to the Top Three.[10] This should be as simple as selecting from a drop-down menu in their software.

## Starting Your Physical GPS—The Steps

Starting a body recomposition program without measurements is like planning a trip without a start address. I *guarantee* you will regret it later. Don't fly blind.

My father, who lost more than 70 pounds and more than tripled his strength, is still kicking himself for not having bodyfat numbers.

Drop a dime or two and get your data. If need be, skip a few lattes and a dinner out.

Next steps:

1. Take your "before" circumference measurements. Get a simple tape measure and measure four locations: both upper arms (mid-bicep), waist (horizontal at navel), hips (at widest point below waist), and both legs (mid-thigh). Total these numbers to arrive at your **Total Inches (TI)**. Changes in this total will be meaningful enough to track.

2. Estimate your bodyfat (BF%) based on the "Eyeballing It" sidebar on this page.

3. Choose the best tool and schedule a session.

If you're over 30% bodyfat, avoid calipers and use DEXA, BodPod, or ultrasound, in that order. If you canno

find these, opt for bio-impedance and follow the hydration rules mentioned earlier.

If you are under 25%, still aim for DEXA, BodPod, or ultrasound. If you cannot find these, opt for calipers with a qualified professional (use the same person for all follow-up visits) and request the 3-point or 7-point Jackson-Pollock algorithm. If neither is available, use another algorithm that includes a leg measurement and at least three points total. Leg fat is tricky and needs to be included. Record the name of the algorithm used for future reference.

**TOOLS AND TRICKS**

**OrbiTape One-handed Tape Measure (www.fourhourbody.com/orbitape)** Measure any body part with military precision using this tape measure, the armed services' choice for physical examinations.

**Finding DEXA** DEXA must be administered by licensed medical staff and so eliminates most gyms and health clubs. First, Google your city, plus "DEXA body fat." If that fails, search "DEXA," "osteoporosis testing," or "bone density testing" for your zip code or city. Add "facility" if the search returns too many results. I spent $49 on the test in Redwood City, California, at the Body Composition Center **(www.bodycompositioncenter.com).**

**BodPod Locators (www.lifemeasurement.com/clients/locator)** The BodPod is used to test athletes at the NFL Combine for fat and fat-free mass, as well as respiratory volume. Use this site to find BodPod assessment centers, which are located in almost all 50 states.

**BodyMetrix (www.fourhourbody.com/bodymetrix)** The hand-held BodyMetrix device uses ultrasound to measure body composition down to the millimeter. For those with the means, it is an outstanding option and my default choice.

**Escali Bio-impedance Scale (www.fourhourbody.com/escalibio)** Escali's bio-impedance scale measures weight and percentage of bodyfat for up to 10 users.

**Slim Guide Skinfold Calipers (www.fourhourbody.com/slimguide)** These are the most widely used calipers in the world. They're low-cost, but accurate enough for professional use. Be sure to include at least one leg measurement in all calculations.

**Cosmetic Fat vs. Evil Fat—How to Measure Visceral Fat (www.fourhourbody.com/evil)** Ever wonder how some people, especially older men, can have beer bellies that seem as tight as a drum? Distended abdomens that seem like muscle if you poke them? The answer is unpleasant: rather than fat under the skin, it's fat around internal organs that presses the abdominal wall out.

One weakness of calipers and ultrasound is that they can only directly measure subcutaneous fat (under the skin) and not what's called visceral fat (around the organs).

This article, authored by Michael Eades MD and Mary Dan Eades MD, explains a low-tech method for estimating the latter, which is particularly important for those over 25% bodyfat or of middle-age and older.

## EYEBALLING IT: A VISUAL GUIDE TO BODYFAT

What should your bodyfat goals be? For most people, I suggest the following as a starting point:

For men:

If obese, aim for 20%.

If you have just a bit of extra padding, aim for 12%.

For women:

If obese, aim for 25%.

If you have just a bit of extra padding, aim for 18%.

If you (male or female) want to get to 5%, we'll help you later.

Use the pictures on this page or this page and descriptions (whatever is most helpful) to estimate your current bodyfat percentage. Where are you really? Look at the pics before reading the rest, as you might be able to skip the text.

The following percentages and descriptions are intended to reflect high-end caliper readings on males, but the guidelines are still helpful for women. Keep in mind that since calipers measure a skinfold, both subcutaneous fat and subcutaneous water are reflected in the numbers. Special credit to Surferph34 for the guidelines and photo links:[11]

**20% Bodyfat**

There is *no* visible muscle definition and only a hint of separation between major muscle groups if those groups are large and well developed. For examples, see:

www.fourhourbody.com/20a

www.fourhourbody.com/20b

www.fourhourbody.com/20c

**15% Bodyfat**

Some muscle separation appears between the shoulders (deltoids) and upper arms. Abs are not visible. For an example, see:

www.fourhourbody.com/15a

www.fourhourbody.com/bodyfat-examples

**12% Bodyfat**

More muscle separation appears, particularly in the chest and back, and an outline of the abs begins to appear. Standing under a ceiling light with favorable shadows, a pending four-pack might be visible. For examples, see:

www.fourhourbody.com/12a

www.fourhourbody.com/12b

**10% Bodyfat**

Muscle separations get deeper in the arms, chest, legs, and back, and six-pack abs are visible when flexed. For an example, see:

www.fourhourbody.com/10a

**7–9% Bodyfat**

Abs are clearly visible all the time, vascularity in arms is prominent, chest and back separation is obvious, and the face starts to appear more angular. For examples, see:

www.fourhourbody.com/7a

www.fourhourbody.com/7b

## 5–7% Bodyfat

Striations appear in large muscle groups when they are flexed. Vascularity appears in lower abdomen and in the legs. Competitive bodybuilders often aim for this state for competition day. For an example, see:

[www.fourhourbody.com/5a](http://www.fourhourbody.com/5a)

MALE EXAMPLES

Trevor Newell
33% bodyfat, 19% bodyfat, 9% bodyfat

Trevor Newell
33% bodyfat, 19% bodyfat, 9% bodyfat

Ray Cronise
31.56% bodyfat, 24.7% bodyfat, 12.65% bodyfat

Nic Irwin
22% bodyfat, 5% bodyfat

Nathan Zaru: 8% bodyfat. Despite the Incredible Hulk lighting, I believe this to be (among these photos) the best representative picture of what 8% bodyfat looks like for males with decent muscle tone. People dramatically underestimate bodyfat percentage. If you have a bit of muscle and are sub-10%, you should have definition similar to this.

**Individual images to follow.**

**Trevor Newell 33% bodyfat, 19% bodyfat, 9% bodyfat**

**Trevor Newell 33% bodyfat, 19% bodyfat, 9% bodyfat**

**Ray Cronise 31.56% bodyfat, 24.7% bodyfat, 12.65% bodyfat**

**Nic Irwin 22% bodyfat, 5% bodyfat**

**Nathan Zaru: 8% bodyfat. Despite the Incredible Hulk lighting, I believe this to be (among these photos) the best representative picture of what 8% bodyfat looks like for males with decent muscle tone. People dramatically underestimate bodyfat percentage. If you have a bit of muscle and are sub-10%, you should have definition similar to this.**

# FEMALE EXAMPLES

227 lbs., 39.8% bodyfat

Erin Rhoades
30% bodyfat, 25% bodyfat, 12% bodyfat

Julee
22% bodyfat (compare to Trevor or Nic in their 19–22% pics—the smooth appearance is similar)

Andrea Bell
13.4% bodyfat

**Individual images to follow.**

**227 lbs., 39.8% bodyfat**

**Erin Rhoades 30% bodyfat, 25% bodyfat, 12% bodyfat**

**Julee 22% bodyfat (compare to Trevor or Nic in their 19–22% pics—the smooth appearance is similar)**

**Andrea Bell 13.4% bodyfat**

2. This subject had more than 10 fractures in his knees and could not perform lower-body exercises.

3. For those unfamiliar with lifting parlance, “reps” are repetitions of a movement. If you do 20 push-ups, you’ve done 20 reps of the push-up.

4. From noon on October 3, 2009, to noon on October 4, 2009.

5. These error ranges assume trained professionals and optimum conditions for measurements (e.g., good hydration for body-impedance). The order was determined using the median of their lower and upper error percentages.

6. In an ideal world, X-ray CT and MRI would be used, but I omitted them due to radiation and cost, respectively.

7. Nor should you compare different algorithms on the same equipment. This most frequently causes confusion when you get caliper readings from different trainers. Use the same person and same algorithm (e.g., 3-point Jackson-Pollock).

8. Also referred to as bio-impedance, or BI.

9. The coldness of the water will also help fat-loss.

10. There are population-specific formulas that give better numbers, but they are not commonly used since most fitness clubs and personal trainers deal with the broad population.

11. www.fourhourbody.com/bodyfat-examples

# FROM PHOTOS TO FEAR

## Making Failure Impossible

**I have a great diet. You're allowed to eat anything you want, but you must eat it with naked fat people.**
—Ed Bluestone

**What gets measured gets managed.**
—Peter Drucker, recipient of Presidential Medal of Freedom

199.2 …

Trevor stared at the LCD as it delivered the news. He blinked a few times. 199.2. Then he blinked a few more times.

"Holy crap!"

He'd put on about 10 pounds a year after sophomore year in high school, tipping the scales at 240 pounds at college graduation. Now, for the first time since his teens, Trevor weighed less than 200 pounds.

That had been the goal since stepping on a treadmill almost two years earlier, but a distant goal. Breaking the 200 barrier had seemed unattainable. Now he'd done it. The question wasn't so much how he did it. The real question was: *why* did it work?

Simple. He'd made an agreement with a coworker: they would go to the gym together three times per week, and if either of them missed a session, that person had to pay the other $1.

In his first gym visit, Trevor walked for four minutes on the treadmill.

Not long thereafter, he ran a mile for the first time since fourth grade.

Now he has run two half-marathons.

It's not the $1 that matters (Trevor does quite well), it's the underlying psychology.

Whether it's one dollar or one inch, there are ways to ensure that the first step takes you to where you want to go.

### Cheap Insurance—<br>Four Principles of Failure-Proofing

I love SkyMall magazines. But one fateful Tuesday, despite my best efforts to read about poolside hammocks and wall-sized maps, I couldn't concentrate. There was a battle being waged across the aisle on Frontier Airlines, and I had a front-row seat.

In stunned silence, I watched a man, so obese that he needed a belt extension to buckle himself in, eat a full bag of Twizzlers prior to takeoff. He then proceeded to eat a full bag of Oreos, which he polished off before we had reached cruising altitude. It was an impressive display.

I recall asking myself: *How can he rationalize eating so much?* He had a cane, for God's sake. The answer was, of course, that he couldn't. I doubt he'd even tried. There was no logical justification for his behavior, but then again, there is no logical justification for how I hit the snooze button every 10 minutes for an hour or two every Saturday.

We break commitments to ourselves with embarrassing regularity. How can someone trying to lose weight binge on an entire pint of ice cream before bed? How can even the most disciplined of executives fail to make 30 minutes of time per week for exercise? How can someone whose marriage depends on quitting smoking pick up a cigarette?

Simple: logic fails. If you were to summarize the last 100 years of behavioral psychology in two words, that would be the takeaway.

Fortunately, knowing this, it is possible to engineer compliance. Pulling from both new and often-neglected data, including photographic research and auctions, there are four principles of failure-proofing behavior.

Think of them as insurance against the weaknesses of human nature—your weaknesses, my weaknesses, *our* weaknesses:

1. Make it conscious.
2. Make it a game.
3. Make it competitive.
4. Make it small and temporary.

#### 1. MAKE IT CONSCIOUS: FLASHING AND "BEFORE" PHOTOS

The fastest way to correct a behavior is to be aware of it in real time, not after-the-fact.

The curious case of the so-called "flash diet" is a prime example of the difference. Dr. Lydia Zepeda and David Deal of the University of Wisconsin–Madison enlisted 43 subjects to photograph all of their meals or snacks prior to eating. Unlike food diaries, which require time- consuming entries often written long after eating, the photographs acted as an instantaneous intervention and forced people to consider their choices *before* the damage was done. In the words of one participant: "I was less likely to have a jumbo bag of M&Ms. It curbed my choices. It didn't alter them completely, but who wants to take a photo of a jumbo bag of M&Ms?"

The researchers concluded that photographs are more effective than written food diaries. This is saying something, as prior studies had confirmed that subjects who use food diaries lose *three times* as much weight as those who don't. The upshot: use your camera phone to take a snapshot before opening your mouth. Even without a prescribed diet, this awareness alone will result in fat-loss.

The camera can also be used to accentuate your flaws … to your benefit.

If we analyze the post-contest submissions of the winners of the Body- for- Life Challenge, the largest physique transformation contest in the last 50 years of publishing, we can isolate one common understated element: "before" photographs. The training methods and diet varied, but those who experienced the most dramatic changes credited the "before" photographs with adherence to the program. The pictures were placed in an unavoidable spot, often on the refrigerator, and served as inoculation against self-sabotage.

Get an accurate picture of your baseline. It will look worse than you expect. This need not be bad news. Ignoring it won't fix it, so capture it and use it.

#### 2. MAKE IT A GAME: JACK STACK AND THE STICKINESS OF FIVE SESSIONS

Jack Stack was nervous. It was 1983, and he had just joined his employees to purchase SRC, a near-bankrupt engine remanufacturer, from their parent company, International Harvester. It was done in remarkable fashion, with $100,000 applied to a loan of $9 million, for a debt ratio of 89-to-1. The bank officer who handled the loan was fired within hours of approving it.

The 13 managers who contributed their life savings to make it possible were also nervous, but they needn't have been. That $100,000 would be worth $23 million in 1993, just 10 years later. By 2008, sales had increased from $16 million to more than $400 million, and stock value had risen from 10¢ per share to $234 per share.

What was to thank?

Games. Frequent games.

Jack Stack taught all of his employees how to read the financial statements, opened the books, and put numerical goals alongside individual performance numbers on grease boards around the plant. Daily goals and

public accountability were combined with daily rewards and public recognition.

The Hawthorne plant of the Western Electric Company in Cicero, Illinois, also figured this out, albei accidentally. The year was 1955, and their finding was significant: increasing lighting in the plant made workers more productive. Then someone pointed out (I have to imagine a sweaty- palmed intern) a confusing detail. Productivity also improved when they dimmed the lighting! In fact, making any change at all seemed to result in increased productivity.

It turned out that, with each change, the workers suspected they were being observed and therefore worked harder. This phenomenon—also called the "observer effect"—came to be known as "the Hawthorne Effect."

Reinforced by research in game design, Jack Stack and Western Electric's results can be condensed into a simple equation: **measurement = motivation**.

Seeing progress in changing numbers makes the repetitive fascinating and creates a positive feedback loop. Once again, the act of measuring is often more important than what you measure. To quote the industrial statistician George Box: "Every model is wrong, but some are useful."

It's critical that you measure something. But that begets the question: to replace self-discipline, how often do you need to record things?

That is, how many times do you need to log data to get hooked and never stop? In the experience of the brilliant Nike+ team, and in the experience of their users, more than 1.2 million runners who have tracked more than 130 million miles, that magic number is five:

> *If someone uploads only a couple of runs to the site, they might just be trying it out. But once they hit five runs, they're massively more likely to keep running and uploading data. At five runs, they've gotten hooked on what their data tells them about themselves.*

Aristotle had it right, but he was missing a number: "We are what we do repeatedly." A mere five times (five workouts, five meals, five of whatever we want) will be our goal.

When in doubt, "take five" is the rule.

### 3. MAKE IT COMPETITIVE: FEAR OF LOSS AND THE BENEFITS OF COMPARISON

Would you work harder to earn $100 or to avoid losing $100? If research from the Center for Experimental Socia Science at New York University is any indication, fear of loss is the winner.

Their three-group experiment looked like this: the first group received $15 and was told the $15 would be taken back if they lost a subsequent auction; the second group was told they'd be given $15 if they won the auction; and the third group was a control with no incentive. The first group routinely overbid the most.

Participating economist Eric Schotter explained the results:

> *Economists typically attribute excessive bidding to risk aversion, or the joy of winning. What we found is that the actual cause of overbidding is a fear of losing, a completely new theory from past investigations.*

This is not a depressing realization. It's a useful one. Knowing that potential loss is a greater motivator than potential reward, we can set you up for success by including a tangible risk of public failure. Real weight-loss numbers support this. Examining random 500-person samples from the 500,000+ users of DailyBurn, a diet and exercise tracking website, those who compete against their peers in "challenges" lose an average of 5.9 pounds more than those who do not compete.

There is another phenomenon that makes groups an ideal environment for change: social comparison theory. In plain English, it means that, in a group, some people will do worse than you ("Sarah lost only one pound—

good for me!") and others will do better ("Mike's nothing special. If he can do it, so can I."). Seeing inferior performers makes you proud of even minor progress, and superior performers in your peer group make greater results seem achievable.

Looking at DailyBurn's data set, those who have three or more "motivators" in their peer group lose an average of 5.8 pounds more than those with fewer.

Embrace peer pressure. It's not just for kids.

#### 4. MAKE IT SMALL AND TEMPORARY

That brings us to your most important next steps, detailed below.

## Questions and Actions

Before you move on to another chapter, take (or in the case of #2, *start*) at least two of the following four actions. Your choice:

**1. Do I really look like that in underwear?** Take digital photos of yourself from the front, back, and side. Wear either underwear or a bathing suit. Not eager to ask a neighbor for a favor? Use a camera with a timer or a computer webcam like the Mac iSight. Put the least flattering "before" photo somewhere you will see it often: the refrigerator, bathroom mirror, dog's forehead, etc.

**2. Do I really eat that?** Use a digital camera or camera phone to take photographs of everything you eat for 3–5 days, preferably including at least one weekend day. For sizing, put your hand next to each item or plate in the photographs. For maximum effect, put these photos online for others to see.

**3. Who can I get to do this with me?** Find at least one person to engage in a friendly competition using either total inches (TI) or bodyfat percentage. Weight is a poor substitute but another option. Use competitive drive, guilt, and fear of humiliation to your advantage. Embrace the stick. The carrot is overrated.

**4. How do I measure up?** Get a simple tape measure and measure five locations: both upper arms (mid-bicep), waist (horizontal at navel), hips (widest point between navel and legs), and both legs (mid-thigh). Total these numbers to arrive at your **total inches (TI)**. I'm telling you again because I know you didn't do it after the last chapter. Get off your ass and get 'er done. It takes five minutes.

**5. What is the smallest meaningful change I can make?** Make it small. Small is achievable. For now, this means getting started on at least two of the above four steps before moving on. The rest and best is yet to come.

### TOOLS AND TRICKS

**Grossly Dramatic and Realistic Fat Replicas (www.fourhourbody.com/fatreplica)** These are disgusting but effective motivators. I keep a one-pound fat replica in the drawer of my refrigerator. The five-pound replica is the most effective visual aid I've ever seen for getting otherwise resistant people to lose fat. One biotech CEO I know goes so far as to carry one in his briefcase to show people who might benefit. If you want to thank yourself, be thanked, or perhaps be punched in the face, order one of these.

**Services for Posting "Before" (and "After") Pictures**

Posterous (www.posterous.com)
Evernote (www.evernote.com)[12]
Flickr (www.flickr.com)

**PBworks Personal Wiki Pages (www.fourhourbody.com/pbworks)** Ramit Sethi (in the next sidebar) set up a free PBworks page (a simple wiki page like those found on Wikipedia) and invited all his bettors to be notified when he updated his weight. He also used his PBworks page to talk a ridiculous amount of trash.

**Eat.ly (http://eat.ly)** Eat.ly is one of the easiest ways to start a photo-food journal. This site lets you track and keep a visual record of meals you've eaten.

**Habit Forge (www.habitforge.com)** Habit Forge is an e-mail check-in tool for instilling new habits into your daily routine. Decide on the habit you want to form, and Habit Forge will e-mail you for 21 days straight. If you don't follow through, the e-mail cycle will start all over again.

**stickK (www.stickk.com)** stickK was founded on the principle that creating incentives and assigning accountability are the two most important keys to achieving a goal. Cofounder Dean Karlan, an economics professor at Yale, came up with the idea of opening an online "Commitment Store," which eventually became stickK. If you don't fulfill your commitment with stickK, it automatically tells your friends and opens you up to endless mockery and derision.

**BodySpace (www.bodybuilding.com/superhuman) or DailyBurn (www.dailyburn.com/superhuman)** Need to find someone to keep you accountable? To encourage or harass you when needed? Join more than 600,000 members on BodySpace, or 500,000 on DailyBurn who are tracking the results of their diet and exercise regimens. The URLs above will link you to 4HB communities on these sites.

## RAMIT THE GREAT TRASH-TALKER— HOW TO GAIN FIVE POUNDS A WEEK

Ramit Sethi has always joked about his "Indian frailty."

He had wanted to add muscle to his 127-pound frame for years, but it didn't happen until he made one simple addition to his life: another bet. Ramit has an entire folder in his Gmail dedicated to bets against friends, all adding up to about $8,000 in prize money.

This time, he bet them all that he could gain 15 pounds of muscle in three months.

In the first seven days alone, he gained five pounds and was the heaviest he'd ever been. In the end, he added 20% to his bodyweight—surpassing 15 pounds—while keeping his bodyfat low. Now, three years later, he's maintained his new muscular weight almost to the exact pound.

There were three reasons it worked after years of failing to gain weight.

### 1. He used a bet and tracked results publicly

Ramit set up a free PBworks wiki page (like the pages found on Wikipedia) and invited all the bettors to receive notifications when he updated his weight. He then proceeded to talk an ungodly amount of trash.

Needless to say, smack-talking would make him look doubly stupid if he didn't win the bet. Ramit elaborates on the accountability:

"Use psychology to help; don't just 'try harder.' If you've repeatedly tried (or committed to do) something and it hasn't worked, consider public compliance or a bet."

| CHANGE | COMMENT (FEEL FREE TO ADD YOUR OWN) |
|---|---|
| STARTING WEIGHT | • The beginning of the end for my bettors. –Ramit |
| +3.2 | • Be afraid. –Ramit |
| +2.2 | • Almost near my highest weight ever. Women and children are beginning to be frightened of me. –Ramit |
| +2.2 | • A new weight record for me, and more to come. I have not felt hunger since 9/29. –Ramit |
| –1.4 | • A pall is cast over this challenger as i encounter my first–ever week of losing weight. I will recover. –Ramit |
| +1.4 | • Back on the right track. –Ramit |
| –2.0 | • Have i plateaued? –Ramit |
| +3.8 | • I AM A HUGE MAN, THE LARGEST I HAVE EVER BEEN. I WON'T WALK ON BRIDGES BECAUSE I'M AFRAID THEY WILL TOPPLE OVER. I AM ALSO AVOIDING PICKING UP BABIES BECAUSE I AM AFRAID OF ACCIDENTALLY THROWING THEM INTO THE STRATOSPHERE. IT'S ON!!!!!!!!!!!!!!!! –Ramit |

**2. He ignored almost everyone**

From Ramit:

"Everyone has a damn opinion. Some people told me I would get fat, as if I would let that happen for a few hundred bucks. And of course, everyone had theories about what to eat, drink, and even what combination of weights to lift.

"More than a few people shrieked upon finding out my strategy (working out, running, and eating more): 'What!? You can't run! You'll lose too much weight!' All I could do was point out that it seemed to be working: I'd already completed one-third of the bet in the first seven days. There wasn't much they could say to that.

"Everyone's got an opinion about what you 'should' do. But the truth is, most of them are full of hot air and you can get it done using a few simple steps.

"I ignored every one of them."

**3. He focused on the method, not the mechanism**

"People warned me that I had to understand how lipids and carbs and fatty acids worked before I started. That's such nonsense. What if I just started working out and ate more? Could I learn all that fancy stuff later? You don't have to be a genius to gain or lose weight."

**4. Make it small and temporary: the immense practicality of baby steps**

"Take the pressure off."

Michael Levin has made a career of taking the pressure off, and it has worked. Sixty literary works later, from national nonfiction bestsellers to screenplays, he was suggesting that I (Tim) do the same: set a meager goal of two pages of writing per day. I had made a mental monster of the book in your hands, and setting the bar low allowed me to do what mattered most: get started each morning.

Dr. B. J. Fogg, founder of the Persuasive Technology Lab at Stanford University, wrote his graduate dissertation

with a far less aggressive commitment. Even if he came home from a party at 3:00 A.M., he had to write one sentence per day. He finished in record time while classmates languished for years, overwhelmed by the enormity of the task.

Understanding this principle, IBM led the computing world in sales for decades. The quotas for its salespeople were the lowest in the industry because management wanted the reps to be unintimidated to do one thing: pick up the phone. Momentum took care of the rest, and quotas were exceeded quarter after quarter.

Taking off the pressure in 4HB means doing experiments that are short in duration and not overly inconvenient.

Don't look at a diet change or a new exercise as something you need to commit to for six months, much less the rest of your life. Look at it as a test drive of one to two weeks.

If you want to walk an hour a day, don't start with one hour. Choosing one hour is automatically building in the excuse of not having enough time. Commit to a fail-proof five minutes instead. This is exactly what Dr. Fogg suggested to his sister, and that one change (the smallest meaningful change that created momentum) led her to buy running shoes and stop eating dessert, neither of which he suggested. These subsequent decisions are referred to in the literature as "consonant decisions," decisions we make to be aligned with a prior decision.

Take the pressure off and do something small.

Remember our target to log five sessions of new behaviors? It's the five sessions that are important, not the duration of those sessions. Rig the game so you can win. Do what's needed to make those first five sessions as painless as possible. Five snowflakes are all you need to start the snowball effect of consonant decisions.

Take the pressure off and put in your five easy sessions, whether meals or workouts. The rest will take care of itself.

# PRAGMATIC LAZINESS: HOW ONE GRAPH BEATS EXPERT ADVICE

In 2008, a 258-pound Phil Libin decided to experiment with laziness.

He wanted to lose weight. This is common. As is also common, he wasn't particularly keen on diet or exercise. He'd tried both off and on for years. The intermittent four- to eight-week programs helped him drop pounds—and then his other behaviors helped him gain them back even faster.

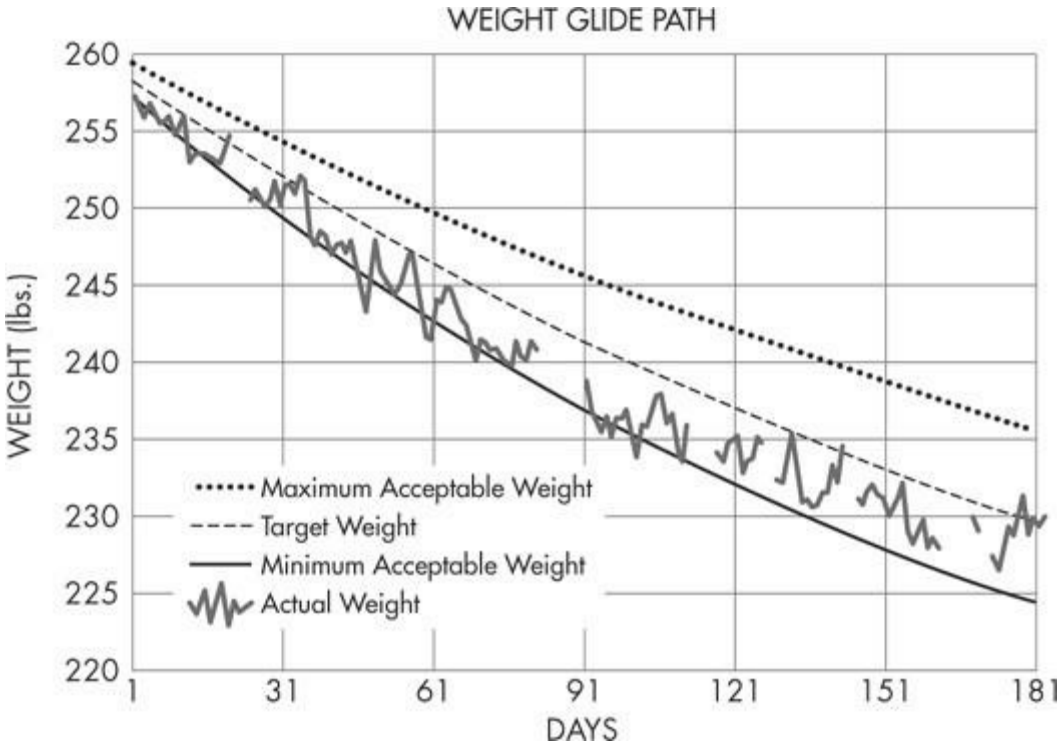
He began to suspect there might be an easier way: doing nothing.

Phil had a simple method in mind: "I wanted to see what effect being precisely aware of my weight would have on my weight."

This is where we depart from the common. Phil lost 28 pounds in six months without making the slightest attempt to change his behavior.

First, having arbitrarily decided that 230 pounds was his ideal weight, Phil drew a blue line in an Excel spreadsheet. The downward slope represented his weight decreasing from 258 to 230 over two years. Every day's target weight, which sat on the blue line, was just 0.1% (approximately) lower than the previous day's. Easy peasy. See his graph on the next page, where the "blue" line is the middle dashed line.

He then added in two important lines below and above his "target" blue line: his minimum-allowable weight (green line) and his maximum-allowable weight (red line) for each day. He had no plan to hit his exact target weight each day, as that would be too stressful. He just had to keep between the lines.




**Interested in Phil's Excel spreadsheet? Download a blank version at www.fourhourbody.com/phil. Just input your starting weight and desired ending weight, and you can duplicate his experiment.**

How?

He weighed himself naked every morning at the same time before eating breakfast. He stepped on the scale a few times and put the average of the results in his Excel spreadsheet. The jagged line above shows his actual weight changes. Gaps represent periods of travel when he didn't have access to a scale.

Phil kept the spreadsheet in the program he helped pioneer, Evernote.com, so that he could see it from any computer or phone. It was always at his fingertips.

It was pure 100% awareness training, nothing but tracking.

In fact, Phil made a concerted effort *not* to change:

"I actually made a conscious effort not to deviate from my diet or exercise routine during this experiment. That is, I continued to eat whatever I wanted and got absolutely no exercise. The goal was to see how just the situational awareness of where I was each day would affect my weight. I suspect it affected thousands of minute decisions that I made over the time period, even though I couldn't tell you which."

Oddly, he treated excessive drift upward (gaining) or downward (losing) as equally bad:

"The only times I sprang into deliberate action were the few times (seen on the graph) where my weight dipped below the minimum acceptable level. Then I would eat doughnuts or gorge myself to make sure I was back in the 'safe zone' the next day. That was a lot of fun. I suppose I would have done the opposite and eaten less had I ever gone over the maximum weight line, but that never happened. The whole point was not to lose weight *quickly.* It was to see if I could lose weight *slowly* and *without any effort*."

Awareness, even at a subconscious level, beats fancy checklists without it.

Track or you will fail.

12. Full disclosure: I am now an adviser to both Posterous and Evernote because I believe in the services.

# SUBTRACTING FAT

## Basics

# THE SLOW-CARB DIET I

## How to Lose 20 Pounds in 30 Days Without Exercise

**Out of clutter, find simplicity.**
—Albert Einstein

11:34 A.M. SATURDAY, JUNE 20, 2009,
SAN FRANCISCO

Text message from London, eight hours ahead, meant to impress:

*This is my dinner. Happy times!*

The accompanying photo: a pepperoni and sausage pizza so large it doesn't fit on the screen.

Chris A., a fellow experimenter, and I were having our weekly virtual date.

Text response from me:

*This is my breakfast. BREAKFAST. Can you hear the insulin pouring out of my eyes? Woohoo! Ante up, fa boy.*

My accompanying photo: two bear claws, two chocolate croissants, grapefruit juice, and a large coffee.

Response from Chris:

*LOL … please don't make me do this …*

And so it continued, a text-message eating contest. The truth is, I do some version of this every Saturday, and thousands of people over the last four years have joined me in doing the same. In between pizzas and bear claws, the net result is that the average follower has lost 19 pounds of fat, and a surprising number have lost more than 100 pounds total.

This odd approach has produced something of a small revolution.

Let me explain exactly how Chris and I reach and maintain sub-12% bodyfat, often sub-10%, by strategically eating like pigs.

### The Slow-Carb Diet—
### Better Fat-Loss Through Simplicity

It is possible to lose 20 pounds of bodyfat in 30 days by optimizing any of three factors: exercise, diet, or a drug/supplement regimen. Twenty pounds for most people means moving down at least two clothing sizes, whether that's going from a size 14 dress to a size 10 or from an XXL shirt to a large. The waist and hips show ar even more dramatic reduction in circumference.

By April 6, 2007, as an example, I had cut from nearly 180 pounds to 165 pounds in six weeks, while adding about 10 pounds of muscle, which means I lost approximately 25 pounds of fat. The changes aren't subtle.

The diet that I'll introduce in this chapter—the Slow-Carb Diet—is the only diet besides the rather extreme Cyclical Ketogenic Diet (CKD) that has produced veins across my abdomen, which is the last place I lose fat.

There are just five simple rules to follow:

#### RULE #1: AVOID "WHITE" CARBOHYDRATES.

Avoid any carbohydrate that is, or can be, white. The following foods are prohibited, except for within 30 minutes of finishing a *resistance-training* workout like those described in the "From Geek to Freak" or "Occam's Protocol" chapters: all bread, rice (including brown), cereal, potatoes, pasta, tortillas, and fried food with breading. If you avoid eating the aforementioned foods and anything else white, you'll be safe.

Just for fun, another reason to avoid the whities: chlorine dioxide, one of the chemicals used to bleach flour (even if later made brown again, a common trick), combines with residual protein in most of these foods to form alloxan. Researchers use alloxan in lab rats to induce diabetes. That's right—it's used to *produce* diabetes. This is bad news if you eat anything white or "enriched."

Don't eat white stuff unless you want to get fatter.

#### RULE #2: EAT THE SAME FEW MEALS OVER AND OVER AGAIN.

The most successful dieters, regardless of whether their goal is muscle gain or fat-loss, eat the same few meals over and over again. There are 47,000 products in the average U.S. grocery store, but only a handful of them won't make you fat.

Mix and match from the following list, constructing each meal with one pick from each of the three groups. I've starred the choices that produce the fastest fat-loss for me:

**Proteins**

*Egg whites with 1–2 whole eggs for flavor (or, if organic, 2–5 whole eggs, including yolks)

*Chicken breast or thigh

*Beef (preferably grass-fed)

*Fish

Pork

**Legumes**

*Lentils (also called "dal" or "daal")

*Black beans

Pinto beans

Red beans

Soybeans

**Vegetables**

*Spinach

*Mixed vegetables (including broccoli, cauliflower, or any other cruciferous vegetables)

*Sauerkraut, kimchee (full explanation of these later in "Damage Control")

Asparagus

Peas

Broccoli

Green beans

Eat as much as you like of the above food items, but keep it simple.

Pick three or four meals and repeat them. Almost all restaurants can give you a salad or vegetables in place of french fries, potatoes, or rice. Surprisingly, I have found Mexican food (after swapping out rice for vegetables) to be one of the cuisines most conducive to the Slow-Carb Diet. If you have to pay an extra $1–3 to substitute at a restaurant, consider it your six-pack tax, the nominal fee you pay to be lean.

Most people who go on "low"-carbohydrate diets complain of low energy and quit because they consume insufficient calories. A half-cup of rice is 300 calories, whereas a half-cup of spinach is 15 calories! Vegetables are not calorically dense, so it is critical that you add legumes for caloric load.

Eating more frequently than four times per day might be helpful on higher-carb diets to prevent gorging, but it's not necessary with the ingredients we're using. Eating more frequent meals also appears to have no enhancing effect on resting metabolic rate, despite claims to the contrary. Frequent meals can be used in some circumstances (see "The Last Mile"), but not for this reason.

The following meal schedule is based on a late sleep schedule, as I'm a night owl who gives up the ghost at 2:00 A.M. at the earliest, usually with wineglass or book still in hand, à la heroin addict. Adjust your meals to fit your schedule, but make sure to have your first meal within an hour of waking.

Meals are approximately four hours apart.

10:00 A.M.—Breakfast

2:00 P.M.—Lunch

6:30 P.M.—Smaller second lunch

8:00–9:00 P.M.—Recreation or sports training, if scheduled.

10:00 P.M.—Dinner

12:00 A.M.—Glass of red wine and Discovery Channel before bed

Here are some of my meals that recur again and again:

• Breakfast (home): Scrambled Eggology® pourable egg whites with one whole egg, black beans, and mixed vegetables warmed up or cooked in a microwave using Pyrex® containers.

• Lunch (Mexican restaurant): Grass-fed organic beef, pinto beans, mixed vegetables, and extra guacamole.

• Dinner (home): Grass-fed organic beef (from Trader Joe's), lentils, and mixed vegetables.

Just remember: this diet is, first and foremost, intended to be effective, not fun. It *can* be fun with a few tweaks (the next chapter covers this), but that's not the goal.

### RULE #3: DON'T DRINK CALORIES.

Drink massive quantities of water and as much unsweetened tea, coffee (with no more than two tablespoons of cream; I suggest using cinnamon instead), or other no-calorie/low-calorie beverages as you like. Do not drink milk (including soy milk), normal soft drinks, or fruit juice. Limit diet soft drinks to no more than 16 ounces per day if you can, as the aspartame can stimulate weight gain.

I'm a wine fanatic and have one to two glasses of red wine almost every evening. It doesn't appear to have any negative impact on my rate of fat-loss. Red wine is by no means required for this diet to work, but it's 100% allowed (unlike white wines and beer, both of which should be avoided).

Up to two glasses of red per night, no more.

### RULE #4: DON'T EAT FRUIT.

Humans don't need fruit six days a week, and they certainly don't need it year-round.

If your ancestors were from Europe, for example, how much fruit did they eat in the winter 500 years ago? Think they had Florida oranges in December? Not a chance. But you're still here, so the lineage somehow survived.

The only exceptions to the no-fruit rule are tomatoes and avocadoes, and the latter should be eaten in moderation (no more than one cup or one meal per day). Otherwise, just say no to fruit and its principal sugar, fructose, which is converted to glycerol phosphate more efficiently than almost all other carbohydrates. Glycerol phosphate → triglycerides (via the liver) → fat storage. There are a few biochemical exceptions to this, but avoiding fruit six days per week is the most reliable policy.

But what's this "six days a week" business?

It's the seventh day that allows you, if you so desire, to eat peach crepes and banana bread until you go into a coma.

#### RULE #5: TAKE ONE DAY OFF PER WEEK.

I recommend Saturdays as your Dieters Gone Wild (DGW) day. I am allowed to eat whatever I want on Saturdays and I go out of my way to eat ice cream, Snickers, Take 5, and all of my other vices in excess. If I drank beer, I'd have a few pints of Paulaner Hefe-Weizen.[1]

I make myself a little sick each Saturday and don't want to look at any junk for the rest of the week. Paradoxically, dramatically spiking caloric intake in this way once per week increases fat-loss by ensuring that your metabolic rate (thyroid function and conversion of T4 to T3, etc.) doesn't downshift from extended caloric restriction.

That's right: eating pure crap can help you lose fat. Welcome to Utopia.

There are no limits or boundaries during this day of gluttonous enjoyment. There is absolutely **no calorie counting** on this diet, on this day or any other.

Start the diet at least five days before your designated cheat day. If you choose Saturday, for example, I would suggest starting your diet on a Monday.

## That's All, Folks!

If the founding fathers could sum up our government in a six-page constitution, the above is all we need to summarize rapid fat-loss for 99.99% of the population. Followed *to the letter*, I've never seen it fail. Never.

When you feel mired in details or confused by the latest-and-greatest contradictory advice, return to this short chapter. All you need to remember is:

**Rule #1: Avoid "white" carbohydrates (or anything that can be white).**

**Rule #2: Eat the same few meals over and over again.**

**Rule #3: Don't drink calories.**

**Rule #4: Don't eat fruit.**

**Rule #5: Take one day off per week and go nuts.**

For the finer points, we have the next chapter.

## $1.34 PER MEAL?

Andrew Hyde is community director at TechStars, a well-known start-up incubator in Boulder, Colorado. He is also an Internet-famous big bargain hunter. I use "big" in both the figurative and literal senses: Andrew is 6'5" and 245 pounds.

I should say that he *was* 245 pounds. In his first two weeks on the Slow-Carb Diet, he lost 10 pounds and

perhaps more impressive, racked up incredibly *un*impressive costs:

Total per-week food cost: $37.70

Average per-meal cost: $1.34

And this was including organic grass-fed beef! If he'd eaten a big salad three times a week instead of a few proteins, his weekly cost would have been $31.70.

He repeated four meals:

BREAKFAST: Egg whites, one whole egg, mixed vegetables, chicken breast

LUNCH: Mixed vegetables, peas, spinach (salad)

SECOND LUNCH: Chicken thigh, black beans, mixed vegtables

DINNER: Beef (or pork), asparagus, pinto beans

His exact shopping list was simplicity itself. The prices are the per line totals:

1x Eggs (12 pack) $1.20

2x Grass-fed organic beef (0.5-lb cuts) $4

4x Mixed vegetables (1-lb bags) $6

2x Pork (1-lb cuts) $3

1x Chicken breast $2

2x Asparagus bundles $2

1x Organic peas (2-lb bag) $2

1x Pinto beans (1-lb bag) $1.50

2x Spinach (3-lb bags) $6

1x Black beans (1-lb bag) $1

3x Chicken thigh $9

Getting these prices didn't require a degree in negotiation or dozens of hours of searching. Andrew looked for discounted items near expiration date and shopped at smaller stores, including a Mexican grocery store, where he bought all of his dried beans.

Just to restate an important point: Andrew is an active 6'5", 245-pound, 26-year-old male, and he exercised three times a week during his Slow-Carb Diet experiment. He's not a small organism to feed.

He's also not unique in his experience.

Though you might not get to $1.34 per meal, his two-week experiment shows what thousands of others have been surprised to learn about the Slow-Carb Diet: it's damn cheap.

The myth that eating right is expensive is exactly that: a myth.

## THE FORBIDDEN FRUIT: FRUCTOSE

Can fruit juice really screw up fat-loss?

Oh, yes. And it screws up much more.

Not to speculate, I tested the effect of fructose in two tests, the first during a no-fructose diet (no juice, no fruit) and the second after one week of consuming 14 ounces—about 1.5 large glasses—of pulp-free orange juice upon waking and before bed. The orange juice was the only thing distinguishing diets A and B.

The changes were incredible.

**Before (10/16, no fructose) and after (10/23, orange juice):**

Cholesterol: 203 → 243 (out of "healthy" range)

LDL: 127 → 165 (also out of range)

There were two other values that shot up unexpectedly:

Albumin: 4.3 → 4.9 (out of range)

Iron: 71 → 191 (!) (out of range aka into the stratosphere)

Albumin binds to testosterone and renders it inert, much like SHBG (discussed in "Sex Machine") but weaker. don't want either to be out-of-range high. Bad for the manly arts.

If you said "Holy sh*t!" when you saw the iron jump, we're in the same boat. This result was completely out of the blue and is not good, especially in men. It might come as a surprise, but men don't menstruate. This means that men lack a good method for clearing out excessive iron, which can be toxic.[2] The increase in iron was far more alarming to me than the changes in cholesterol.

Here is just one of several explanations from the research literature:

> *In addition to contributing to metabolic abnormalities, the consumption of fructose has been reported to affect homeostasis of numerous trace elements. Fructose has been shown to increase iron absorption in humans and experimental animals. Fructose intake [also] decreases the activity of the copper enzyme superoxide dismutase (SOD) and reduces the concentration of serum and hepatic copper.*

The moral of the story? Don't drink fruit juice, and absolutely avoid a high-fructose diet.

It doesn't do the body good.

**TOOLS AND TRICKS**

**The Three-Minute Slow-Carb Breakfast (www.fourhourbody.com/breakfast)** Breakfast is a hassle. In this video, I'll show you how to make a high-protein slow-carb breakfast in three minutes that is perfect for fat-loss and starting the day at a sprint.

**Still Tasty (www.stilltasty.com)** Not sure if it's safe to eat those eggs or those Thai leftovers? Tired of calling your mom to ask? This site allows you to search the shelf life of thousands of cooked and uncooked foods.

**Food Porn Daily (http://www.foodporndaily.com)** Need some inspiration for your cheat day? Food Porn Daily provides a delicious and artery-blocking cornucopia of bad (but tasty) eating. Save it for Saturday.

**Gout: The Missing Chapter (http://www.fourhourbody.com/gout)** Concerned about protein intake and gout? Read this missing chapter from *Good Calories, Bad Calories*, graciously provided by stunning science writer Gary

Taubes. It might change your mind.

End of Chapter Notes

1. Okay, I did have a few cold ones in Munich. It was one-third the cost of bottled water.

2. See the “Living Forever” chapter for more on this.

# THE SLOW-CARB DIET II

## The Finer Points and Common Questions

**As to methods, there may be a million and then some, but principles are few. The man who grasps principles can successfully select his own methods.**
—Ralph Waldo Emerson

**The system is the solution.**
—AT&T

This chapter answers the most common questions related to the Slow-Carb Diet, shares real-world lessons learned, and pinpoints the most common mistakes.

I designate Saturday as "cheat day" in all of my answers, but, in practice, you can substitute any day of the week.

Chances are good that at least 50% of the questions in this chapter will come up for you at some point. If you're serious about achieving the fastest fat-loss possible, read it all.

### Common Questions and Concerns

#### HOW CAN I POSSIBLY FOLLOW THIS DIET? IT'S TOO STRICT!

Just start with changing your breakfast. You will lose noticeable fat. Be sure to see Fleur B. in "Perfect Posterior," who lost about 3% bodyfat in four to five weeks with this one substitution. Once you see the results, suck it up and move to 100% slow-carb for six days, after which you can indulge yourself for 24 hours.

Then again, would doing a one-week test from the get-go really be too much? I doubt it. "Pritibrowneyes" developed a simple method for extending self-control:

> *One thing that worked well for me was keeping a little notepad with me. Everytime I got a craving for something (sweet stuff or just regular food) I added it to the list of things I was going to feast on during my cheat day. This was my way of acknowledging my craving and reminding myself that I could have it, but just not right now. It's like deferred eating.*

If that's not enough, don't forget sugar-free Jell-O. When you are on the verge of self-control breakdown, usually late at night, a few bites will put the demons back in their cages.

#### BUT EATING THE SAME STUFF IS SO BORING!

Most people vastly overestimate the variety of their meals.

Assuming you're not traveling, what have you had to eat for breakfast for the last week? Lunch? Chances are good that, especially for breakfast, you've repeated one to three meals.

Rotating five or six meals for a few weeks is not hard at all, even though you might imagine otherwise. Feeling awesome and looking better each successive week easily justifies having familiar (tasty) food from Sunday to Friday. Saturday is no-holds-barred. Here's one of hundreds of examples of results trumping variety, this one from Jeff:

> *I've been going 2 weeks strong, and am down almost 15 lbs! I have this "lose 30 before I'm 30 years old" plan and I'm now halfway there with 4 months to go.*
>
> *I do egg-whites, Lentils, and broccoli in the A.M., a burrito bowl (chicken, black beans, veggies) for lunch, then*

*chicken, lentils and assorted veggies for dinner. All followed with some delicious red wine before bed.*

*I admit I'm already bored with the meals, but the results I'm seeing so far make it a minimal concern. I add some different seasonings or light sauces to the chicken to mix it up… .*

*I've only had one cheat day so far, but am looking forward to my second one tomorrow. I may have overdid it last week, as I consumed almost 5,000 calories, where normally I'm coming in around 1,200–1,300:); Surprisingly, that huge cheat day last week didn't set me back too far, as I was back to my pre-cheat weight by Monday morning.*

*I don't like exercise, and haven't committed to it as part of my weight loss plan, but some folks at work get me to do 30–45 minutes on a elliptical or bike a couple times a week. Not sure if that's enough that it really has an impact or not, but at least it gets me off my butt.*

*I'm interested to see how the next 2 weeks go. I'm under 200 lbs for the first time in years, and my goal is 185.*

#### SHOULD I TAKE ANY SUPPLEMENTS?

I suggest potassium, magnesium, and calcium. This diet will cause you to lose excess water, and electrolytes can go along with it.

Potassium can be consumed during meals by using a potassium- enriched salt like "Lite Salt" or, my preference, eating extra guacamole with Mexican meals. Avocadoes, the main ingredient in guacamole, contain 60% more potassium than bananas. Avocadoes also contain 75% insoluble fiber, which will help keep you regular. If you prefer pills, 99-milligram tablets with meals will do the trick.

Magnesium and calcium are easiest to consume in pill form, and 500 milligrams of magnesium taken prior to bed will also improve sleep.

If you prefer to get your electrolytes through whole foods, here are good slow-carb options, in descending order of concentration. Notice that spinach is the only item on all three lists:

**Potassium** (4,700 mg per day recommended for an average, healthy 25-year-old male)

1. Lima beans, cooked, 4.9 cups (1 cup = 969 mg)
2. Chard, cooked, 4.9 cups (1 cup = 961 mg)
3. Halibut, cooked, 2.6 fillets (half a fillet = 916 mg)
4. Spinach, cooked, 5.6 cups (1 cup = 839 mg)
5. Pinto beans, cooked, 6.3 cups (1 cup = 746 mg)
6. Lentils, cooked, 6.4 cups (1 cup = 731 mg)
7. Salmon, cooked, 3.4 fillets (half a fillet = 683 mg)
8. Black beans, cooked, 7.7 cups (1 cup = 611 mg)
9. Sardines, 7.9 cups (1 cup = 592 mg)
10. Mushrooms, cooked, 8.5 cups (1 cup = 555 mg)

**Calcium** (1,000 mg per day recommended for an average, healthy 25-year-old male)

1. Salmon with bones, 1.1 cups (1 cup = 919 mg) (great-tasting if you're a cat)
2. Sardines with bones, 1.8 cups (1 cup = 569 mg)
3. Mackerel, canned, 2.2 cups (1 cup = 458 mg)

4. Tofu, firm, 3.6 cups (1 cup = 280 mg)
5. Collards, cooked, 3.8 cups (1 cup = 266 mg)
6. Spinach, cooked, 4.1 cups (1 cup = 245 mg)
7. Black-eyed peas, cooked, 4.7 cups (1 cup = 211 mg)
8. Turnip greens, cooked, 5.1 cups (1 cup = 197 mg)
9. Tempeh, 5.4 cups (1 cup = 184 mg)
10. Agar, dried, 5.7 cups (1 oz = 175 mg)

**Magnesium** (400 mg per day recommended for an average, healthy 25-year-old male)

1. Pumpkin seeds (pepitas), 2.6 oz (2 oz = 300 mg)
2. Watermelon seeds, dried, 2.8 oz (2 oz = 288 mg)
3. Peanuts, 1.6 cups (1 cup = 245 mg)
4. Halibut, cooked, 1.2 fillets (half a fillet = 170 mg)
5. Almonds, 5 oz (2 oz = 160 mg)
6. Spinach, 2.5 cups (1 cup = 157 mg)
7. Soybeans, cooked, 2.7 cups (1 cup = 148 mg)
8. Cashews, 5.5 oz (2 oz = 146 mg)
9. Pine nuts, 5.7 oz (2 oz = 140 mg)
10. Brazil nuts, 6.3 tbsp (2 tbsp = 128 mg)

#### NO DAIRY? REALLY? DOESN'T MILK HAVE A LOW GLYCEMIC INDEX?

It's true that milk has a low glycemic index (GI) and a low glycemic load (GL). For the latter, whole milk clocks in at an attractive 27. Unfortunately, dairy products paradoxically have a high *insulinemic response* on the insulinemic index (II or InIn) scale. Researchers from Lund University in Sweden have examined this surprising finding:

> *Despite low glycemic indexes of 15–30, all of the milk products produced high insulinemic indexes of 90–98, which were not significantly different from the insulinemic index of the reference bread [generally white bread]…. Conclusions: Milk products appear insulinotropic as judged from 3-fold to 6-fold higher insulinemic indexes than expected from the corresponding glycemic indexes.*

Removing even a little dairy can dramatically accelerate fat-loss, as Murph noticed:

> *OK, it's been a week since taking Tim's advice and cutting the dairy. I'm down 6 more pounds. And what's unbelievable to me is that I wasn't even consuming that much beforehand. Maybe a handful of cheese on my breakfast eggs, and a glass of milk per day.*

Need something to flavor your coffee? If you must, use cream (not milk), but no more than two tablespoons. I opt for a few dashes of cinnamon and the occasional drops of vanilla extract.

#### NO FRUIT? DON'T I NEED A "BALANCED DIET"?

No.

To begin with, there is no consensus on what a "balanced diet" is. My researchers and I tried to find an official

definition from the U.S. Department of Agriculture or other federal agencies, and we could not. I have not seen any evidence to suggest that fruits are necessary more than once a week on cheat day.

See "The Forbidden Fruit" sidebar in the last chapter for more.

#### GOD, I F*ING HATE BEANS. CAN I SUBSTITUTE SOMETHING ELSE?

Perhaps you just hate farting and not beans.

First, let's fix that bean issue, then I'll talk about how and when you can omit them.

Lentils seldom cause the gas problem and are my default in the legume category. For beans, purchasing organic will often fix the rumbling pants effect, and if that doesn't work, soaking the beans in water for a few hours will help break down the offending cause: oligosaccharides. This is one of many reasons I eat canned beans and lentils, disposing of the murky juice in the can and rinsing, instead of purchasing either dry. If all else fails, add some Beano (Bean-zyme for you vegans) or epazote (available at Mexican grocery stores or online) to the beans and you're golden.

Is it the blandness that's the problem? That's even easier to fix: add a little balsamic vinegar and garlic powder. I personally love hot sauce (www.cholula.com is my current favorite). Try red beans instead of black or pinto.

Perhaps it's the beany mouth feel and texture? Try fake mashed potatoes, which slow-carber Dana explains:

> *Put a little olive oil in a pan … add a can of white kidney beans (or some cauliflower), mash them with a spoon or whatever you choose, add a bit of water to get the consistency you want, season with a little bit of salt, pepper, garlic powder, and some parmesan cheese if you wish … tastes awesome and cooks in no time at all!*

The fake mashed potato approach also works well with simple refried beans … and don't forget to mix the beans with something else. My breakfast is often a concoction of mixed veggies with lentils and store-bought, mayonnaise-minimal coleslaw. It's 100 times better-tasting than the three eaten separately.

Do you really have to eat beans every meal? No. Which leads up to the rules of omission.

I do not eat beans with every meal because I eat out almost every lunch and dinner. If I'm cooking, lentils and black beans are my defaults. Outside, I'll order extra protein and vegetables for the entrée and supplement with one or two slow-carb appetizers, such as unbreaded calamari and a salad with olive oil and vinegar. If you omit legumes in a meal, **you must absolutely** make a concerted effort to eat larger portions than your former higher-carb self. Remember that you're getting fewer calories per cubic inch. Eat more than you are accustomed to.

#### HOLY FESTIVUS, I GAINED EIGHT POUNDS AFTER MY CHEAT DAY! DID I UNDO ALL OF MY PROGRESS?

No, not at all. It's common for even a 120-pound female to gain up to eight pounds of water weight after 24 hours of increased carbohydrate intake. Larger males can gain 10–20 pounds. Expect MASSIVE weigh fluctuations after cheat day. Relax. It will disappear over the next 48 hours.

Mark's experience is typical:

> *I have been doing this now for about 10 weeks and I have weighed myself daily during the process. I put on up to 2 kg (4.4 lbs) every cheat day, return to my pre cheat weight by Wednesday at latest, and have been averaging a further 1 Kg (2.2 lbs) per week loss by the next cheat day.*
>
> *To date I have lost 12 kgs / 26.5 lbs. I am fairly strict during the week (protein + beans + veg and thats about it), and I do circuit training and Brazilian Jiu Jitsu 3–4 times per week. The only variation I have from Tims guide is a whey protein shake after every hour of training.*

Weigh yourself before your first meal on cheat day and ignore the short- term fluctuations, which do not

reflect fat-loss or gain. *Remember to take circumference measurements on your weigh-in days,* as it is typical to gain some lean muscle while on this diet.

The mitochondria in muscle increase your ability to oxidize fat, so we want to encourage this, but the muscle gain can keep you at the same weight for one to two weeks.

Pounds can lie, but measurements don't.

Some dieters needlessly fall off the train in frustration. Angel, whom we met once in earlier chapters, didn't. Why not? At the risk of sounding repetitive, let me reiterate, since I know most readers will ignore this:

> [*Week one*] *Hello all. I just wanted to share my first week with you. I have lost a total of 7 pounds…. Mondays are also the day that I take my measurements. I have lost 1 inch from each thigh, 1 inch from my waist, and 1/2 inch from my hips. I already noticed that my pants I haven't worn for a while fits perfect. This is the motivation I need to keep on going.*
>
> [*Week two*] *After my cheat day on Saturday, I gained 1 pound which is normal for me. The week before I gained pretty much that, but lost it. So week two, I lost that 1 pound. I didn't lose any weight on week two, but I'm not discouraged. I did manage to lose in inches. I lost ½ an inch off my hips which is absolutely great. I lost a total of 1 inch off my thighs. Not so shabby either. So that's a total of 1.5 inches for the week. I'll take the inches. The grand total of inches lost from Day One: 5 inches total. Yippee! No exercise either.*

Enjoy your cheat day guilt-free. Measure the right things at the right times.

#### CAN I USE SPICES, SALT, OR LIGHT SAUCES? WHAT CAN I USE FOR COOKING?

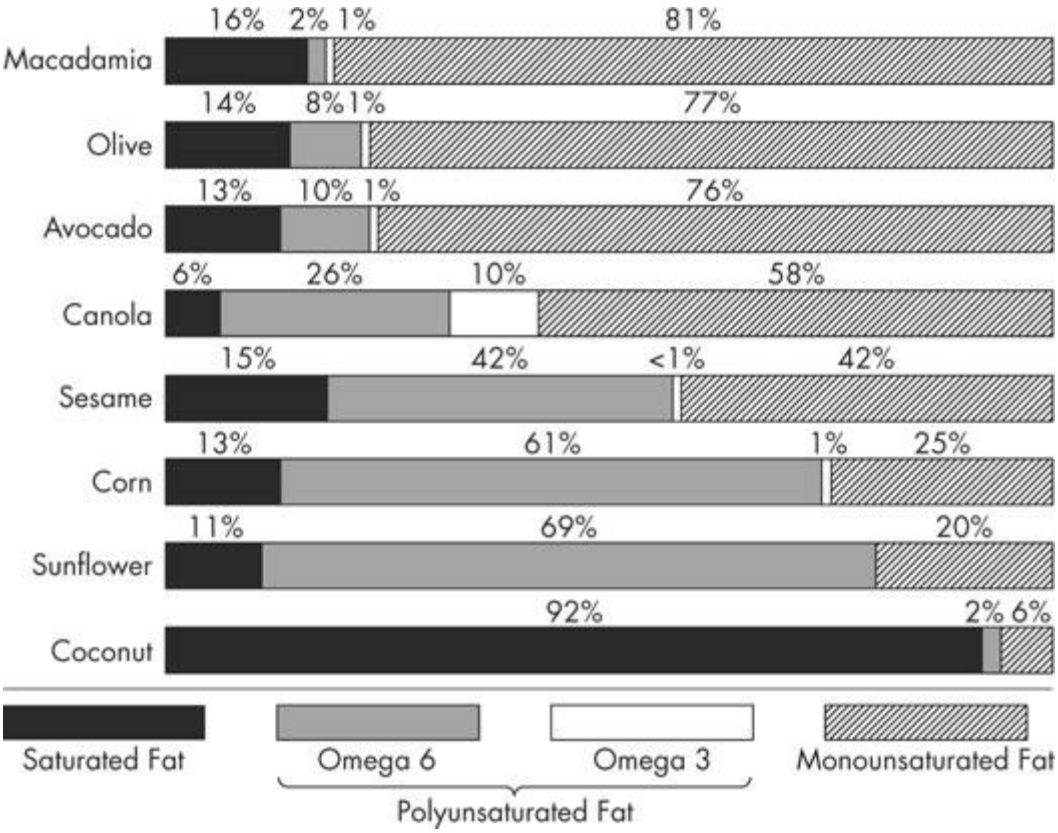
Spices and herbs, but not cream-based sauces, are your friends. Take a trip to Whole Foods with $50 and get educated. That $50 spree will last you at least a few months.

Montreal steak rub, thick salsa without sugar added, garlic salt, white truffle sea salt (combine this with tarragon on eggs), Thai chili paste (srichacha)—this is just about all you need to start. For salad dressing, a few drops of a nonsugar sweetener like stevia mixed with vinegar and mustard will give you a dressing to satisfy any sweet tooth. My preference, and my go-to restaurant salad dressing, is simply balsamic vinegar and olive oil.

Butter is fine, as long as the only ingredients are butter and salt.

For cooking, you can use olive oil for low heat and either grapeseed oil or macadamia oil for high-temperature cooking.

## THE NEW AND IMPROVED OLIVE OIL? INTRODUCING MACADAMIA OIL




"Comparison of Dietary Fats and Oils," from *Agricultural Handbook*, no. B-4, U.S. Human Nutritional Information Service, http://www.adoctorskitchen.com/about/about-fats. (Courtesy: Deborah Chud MD)

Macadamia oil is the new and improved olive oil. Since several high-level bodybuilding coaches introduced me to this new kid on the block, I've been hooked.

Consider the following:

• It tastes almost like butter. Extra-virgin olive oil is fine alone or on salad, but let's face it—it makes scrambled eggs taste like cat vomit.

• Unlike olive oil, it has a high smoking point (234°C) and is ideal for sautéeing and all manner of cooking. I now use butter from grass-fed cows, ghee, and macadamia oil exclusively for all stove-top action.

• It has a long shelf life and is more stable than olive oil when exposed to light. If you've ever consumed olive oil from a clear container, there is a good chance that you've downed rancid olive oil on at least one occasion. Some industry analysts estimate that more than 50% of all mass-produced olive oil is spoiled when consumed.

• It is the lowest of all cooking oils in omega-6 fatty acids but high in palmitoleic acid, which isn't found in any other plant oil. Because palmitoleic acid is found in the sebum of human skin, macadamia oil can also double as a potent skin moisturizer. Not suggested with olive oil unless you want the sex appeal of a Greek salad.

• The fat in macadamia oil is 80% monounsaturated, the highest percentage among cooking oils.

**Sources and Resources:** Species Nutrition (http://www.speciesnutrition.com)—President Dave Palumbo was the first to introduce me to macadamia oil and I get mine from his producers.

### CAN I DRINK ALCOHOL? WHAT TYPES OF WINE ARE BEST?

On cheat days, all is fair. Have a keg by yourself if the spirit moves you. On diet days, stick to dry wines, "dry" being defined as less than 1.4% residual sugar. The driest red varietals are Pinot Noir, Cabernet Sauvignon, and Merlot, whereas the driest whites are generally Sauvignon Blanc and Albariño. This certainly doesn't stop me from enjoying my favorite big reds: Malbec from Argentina and Zinfandel from California. I have found better fat-loss results with red wine compared to white.

Though there are exceptions, it is best to avoid Riesling, White Zinfandel, and Champagne.

#### WHAT SHOULD I EAT FOR SNACKS?

There should be no need, or real physical urge, to eat snacks. If you are hungry, you're not eating enough protein and legumes at each meal. This is an uber-common novice screwup. I've been there too. Eat more.

If you're eating enough and still feel the urge to snack, it's a psychological addiction, one that most often goes hand in hand with procrastination. Some of us go to the bathroom, others go to the water cooler, and others eat. I've done all three, so I know the drill.

If all else fails and you *must* have a snack, go for carrots, but a bag of carrots will hit you like a donkey kick in the stomach, so don't binge. If I snack, I'll most often make a small snack—200–300 calories—out of restaurant leftovers like Thai chicken basil with *no* rice. If you're really starving, just eat another slow-carb meal. It won't do any harm.

If you get headaches or have other symptoms of low blood sugar, 90% of the time it will be because you are not eating enough. First-time slow-carbers are accustomed to eating small portions of calorically dense carbohydrates (think bagels or pasta), and they duplicate the portion sizes with the calorically lighter slow-carb foods, resulting in insufficient calories. Expect that you can eat two to three times as much volume, and assume that you should.

Likewise, if you have trouble sleeping due to hunger, you're not eating enough. In these cases, consume a bit of protein prior to bed, which can be as simple as 1–2 tablespoons of almond butter (ideal) or peanut butter with no additives (the only ingredients should be peanuts and perhaps salt). Note to the ladies, for whom peanut butter seems to be like crack: the tablespoon scoop should be no more than a small mound, not half the jar balanced on a spoon.

#### DO I REALLY HAVE TO BINGE ONCE A WEEK?

It is important to spike caloric intake once per week.

This causes a host of hormonal changes that improve fat-loss, from increasing cAMP and GMP to improving conversion of the T4 thyroid hormone to the more active T3.

Everyone binges eventually on a diet, and it's better to schedule it ahead of time to limit the damage. The psychological benefits outweigh even the hormonal and metabolic benefits. I eat like this all the time and have for seven years. Few ways of eating (WOE) are this sustainable and beneficial.

#### CAN YOU GET AWAY WITH ONE CHEAT *MEAL* PER WEEK?

Most men can. Some women can't.[3]

Menstruation can stop if leptin levels get too low. This happened to one reader for seven months until she returned to "refeeding," as she called it (binge day), though she only did it once every two weeks. Forced overfeeding can temporarily increase circulating leptin 40%. I still suggest once per week as a default. Bumping up food intake for 12–24 hours, not necessarily to the point of sickness, is an important reset. If you gain too much or plateau and get nervous, eat a good high-protein meal for breakfast on your off day and then binge from lunch to dinner, which is what I now do most of the time.

I don't always splurge to the point of sickness. In a response to one slow-carber, I explained:

> *Yes, you can eat anything you want—in any quantity—on Saturdays. I tend to go nuts every 1 of 4 weeks and eat so much I get nearly sick, which makes me moderate the other 3. I love Snickers, TimTams, bear claws (and all pastries), and ice cream. Enjoy.*

One more tip: whenever possible, eat out for your cheat meals.

No matter what, throw out all bad food before the next morning. If there is bad food in your house, you will

eventually eat it before your “off” day, also called “reverse Lent” by some followers.

#### WHAT ABOUT BREAKFAST?

My most frequent breakfast consists of eggs, lentils, and spinach. I prefer lentils, straight out of the can, to black beans, and hard-boiling a dozen eggs beforehand makes this easy.

Breakfast is the hardest meal for most to modify, as we’re a country of toast- and cereal-eating junkies. Moving to slow carbs and protein requires a more lunchlike meal for breakfast. This is easier when you realize that breakfast can be a smaller meal when followed by a lunch three to five hours later. Try it for five days and you’ll see the difference. Not only will the increased protein intake decrease water retention, resting metabolism increases about 20% if your breakfast calories are at least 30% protein.

If you want a more typical breakfast, try eggs with turkey bacon (or organic normal bacon)[4] and sliced tomato. Delicious. Cottage cheese, my mother’s preference, is also a fine addition. Have you ever cooked eggs with ghee (clarified butter)? Try it and thank me.

Interested in why I specifically choose eggs, spinach, and lentils? For those who like to get deep in the weeds, your science fix is next.


In randomized and controlled trials, eating eggs results in more fat-loss and increased basal metabolism. In one such trial, overweight women who consumed a breakfast of two eggs a day for eight weeks (at least five days per week) instead of a bagel of equal weight and caloric value lost 65% more weight and—more importantly—had an 83% greater reduction in waist circumference. There were no significant differences between the plasma total-, HDL-, and LDL-cholesterol and triglyceride levels of either group.

Egg yolks also provide choline, which helps protect the liver and increases fat-loss as compared to a control. Choline metabolizes into betaine and offers methyl groups for methylation processes. Steven Zeisel from the University of North Carolina–Chapel Hill explains: “Exposure to oxidative stress is a potent trigger fo inflammation. Betaine is formed from choline within the mitochondria, and this oxidation contributes to mitochondrial redox status.” Guess what another primary source of betaine is? Spinach.

This is where credit is due: Popeye got it right. Spinach is incredible for body recomposition.

The phytoecdysteroids (20HE specifically) in spinach increase human muscle tissue growth rates 20% when applied in a culture (think petri dish). Even if you’re not interested in growth, it also increases glucose metabolism. Phytoecdysteroids are structurally similar to insect molting hormones—finally, an affordable way to eat insect molting hormones!—and both increase protein synthesis and muscular performance. Even little rats build stronger paw grips. In good news for women, the 20HE ecdysteroid tested demonstrates no androgenic properties. In other words, it won’t give you a hairy chest or an Adam’s apple.

The Rutgers University researchers responsible for the principal study emphasize, almost as a deterrent, that one would need to eat 1 kilogram (2.2 pounds) of spinach per day to mimic the administration used. In testing, I’ve found that it’s not hard at all to see a visible effect with smaller amounts. I routinely eat two to three cups of spinach per day, which is less than you think, and each cup is 81 grams. Two cups, at 162 grams, is about 16% of 1 kilogram. Three cups is almost 25% of 1 kilogram. If the results of the study are dose-dependent, one might expect an increase in muscle fiber synthesis of 3% from 2 cups and 5% from 3 cups, not to mention the effect of increased carbohydrate metabolism. Compounded over time, this is significant. If the effect is not dose-dependent but rather triggered at a dose less than 1 kilogram per day, it is possible that the 20% increase could be achieved with far less than 1 kilogram. I also believe that spinach increases cAMP, but that’s for the geeks to explore.

Lentils, last but not least, are a rich and cheap source of protein (amino acids), isoleucine and lysine in

particular. Both lysine and isoleucine, a branched-chain amino acid (BCAA), are noted for their roles in muscular repair, and the latter for its effect on glucose metabolism.

#### DO I HAVE TO LIMIT VEGGIES TO THOSE LISTED?

There's no need to limit veggies to those I listed, but I've found that the more variety you attempt, the more likely you are to quit, as everything from shopping to cleanup becomes more complicated.

As I've said before, this diet is not designed to be fun, even though most people end up enjoying it. It's designed to be effective. The vegetables I've listed are those I've found to be most tolerable when eating them again and again. Feel free to substitute whatever you want, but don't forget to include legumes for calories.

One veggie that often gets unnecessarily tossed due to rule #1 (no white foods) is cauliflower. Eat all the cauliflower you like. It's great for making faux mashed potatoes. Otherwise, stick to the no-white rule.

#### ARE CANNED FOODS ALL RIGHT?

Canned foods are absolutely fine. No problem. Almost all of my vegetables are either frozen (80%) or canned (20%). I'm a huge fan of canned tuna in water mixed with lentils and chopped onions.

#### CAN I EAT WHOLE GRAINS OR STEEL-CUT OATS?

No.

#### CAN I DO THIS IF I'M A LACTO-OVO VEGETARIAN?

Lacto-ovo is fine. Meat isn't necessary, but it does make the job easier. Eggs and beans are sufficient to lose weight, but I would avoid most milk products. Cottage cheese is an exception. It doesn't interrupt things, and the high casein content appears to facilitate fat-loss.

One reader used Yves veggie hot dogs and Instone high-protein pudding, in addition to eggs, to satisfy his protein requirements. Brown rice protein, as well as hemp or pea protein, will work if you can stomach it. If possible, I discourage consuming any refined soy products, including all soy milk and isolated soy protein supplements. See the "Meatless Machine" chapter for more warnings on soy and alternatives.

#### CAN I EAT SALSA?

Salsa is outstanding, especially chunky medium spicy salsa with corn, beans, etc. I can't stand egg whites by themselves, as they're too boring even for me. This is why I almost always eat whole eggs, but if you add a few spoonfuls of salsa on top of either option, it's a delicious little meal. Just don't put the salsa and lentils in the same bowl. The mixture will make you gag like a camel coughing up a hair ball.

#### CAN I EAT FRIED FOODS?

Stir-fry is ideal for this diet, as are most cuisines (like Thai) that depend on it. Deep-frying should be avoided because of the breading and poor nutrient density for the calories.

Refried beans work just fine, and more than 30 slow-carbers have lost up to one pound per day using them as a staple. Reader David C. lost 20 pounds in 30 days using almost exclusively canned refried beans. In his last update, he'd lost 42 pounds and his wife had lost 36 pounds.

Refried beans do, however, contain a boatload of sodium, approximately 45% of the daily allowance per cup. If you don't have hypertension, this probably won't kill you, but do your best to include other beans, or mix them together, on occasion. This will result in less water retention. Bloated ain't pretty, no matter how low your bodyfat.

I love refried beans, too, but try to diversify once you have the hang of the diet.

#### WHAT IF I'M TRAVELING AND EATING IN AIRPORTS?

If you're airport-hopping and cannot find a Mexican restaurant or grill, grab a bag of raw almonds or walnuts at a kiosk and commit to consuming no starch for the remainder of your travel time. There are enough calories in that

single bag to give you two to three small "meals" and get you through a full 12 hours. Most airports also have chicken salads (omit dressings besides olive oil or vinegar) that you can combine with the nuts.

If it comes down to it, choose mild hunger instead of deviation. If you always eat on the clock, perhaps it's been a few years since you've felt real hunger.

Having followed this diet in 30+ countries, I can state without exception that travel is not a legitimate excuse for breaking the rules.

## EATING OUT AND THE CHIPOTLE METHOD

Speaking as a cooking-inept bachelor, and as someone who has eaten out an average of twice a day for the last five years, the slow-carb solution in restaurants is eight words:

"I'll just have more vegetables instead of [starch]."

For most places, it's a simple matter of substituting more vegetables—spinach or whatever is available—for the standard rice, bread, or potato that comes with the meal. "No substitutions" on the menu? No problem. Add a few more words and it's abracadabra done:

"I'll just have more vegetables instead of the [starch]. If I have to pay a bit extra, that's fine."

If that fails, gird your loins and just order a separate veggie or legume side while omitting the starch. In total, this substituting will average out to less than $3 extra per meal, and it's often free. Consider this your nominal flat stomach tax. If you're eating out to begin with, you can afford an extra $3, so don't be penny-wise and pound-foolish. If you can't afford it, skip a latte or newspaper so you can.

The most cost-effective cuisines I've found for the Slow-Carb Diet are Thai[6] and Mexican, the latter of which leads us to the wonderfully simple example of Eric Foster and his Chipotle® Diet.

Eric lost 91 pounds and went from 44% to 23.8% bodyfat in less than 10 months adhering to the following menu:

> BREAKFAST: One cup of coffee and an egg (scrambled or hard-boiled) [I believe he would have los significantly more fat by adding even one extra egg each day.]
>
> LUNCH: Fajita bol (peppers, onions, steak, tomato salsa, green tomatillo salsa, cheese, sour cream, guacamole, romaine lettuce)
>
> DINNER: Fajita bol (peppers, onions, steak, tomato salsa, green tomatillo salsa, cheese, sour cream guacamole, romaine lettuce)

This diet totals about 1,480 calories and 29 grams of nonfiber carbohydrates daily. Brent, another follower of the Chipotle Diet, lost 120 pounds in 11 months, bringing him from 300 to 180 pounds bodyweight.

But doesn't it get boring? Eric suspected it would:

> *I honestly thought I might get bored of the burritos after a couple months, but it hasn't happened yet. Thank God! Before I started dieting, Chipotle was my favorite place to eat. I made adjustments to the menu items to make it low-carb, and it tasted just as good as if I hadn't made any changes at all.*

Losing fat doesn't need to be punishment. It doesn't even need to be inconvenient.

Go slow-carb for a week and you won't go back.

### WHAT ABOUT FAT-LOSS DRUGS?

I could recommend several hard-core thermogenics, but the potential for addiction, organ damage, and lesser-known chronic problems (sinusitis, for example) just isn't worth it.

The most effective, side-effect-minimal "stack" I've found is PAGG, and it's detailed in the chapter entitled "The Four Horsemen."

#### ISN'T HIGHER PROTEIN HARD ON THE KIDNEYS? WHAT IF I HAVE GOUT?

First, I am not a doctor, nor do I play one on the Internet. If you have medical conditions of any type, consult a physician. Now, on to my interpretation of the data:

If you don't have a serious preexisting medical condition, the amount of protein I prescribe should not hurt you. There is no compelling evidence to support the protein-hurts-your-kidneys claim. This is what Michael Eades MD calls a "vampire myth" because it just refuses to die, despite a lack of evidence.

Gout?

Gout is usually blamed on purines and therefore protein, so those diagnosed with it, like my mother, will be put on low-protein, low-legume diets. I ascribe to Gary Taubes's interpretation of the scientific literature, which indicates that fructose (and therefore sucrose, table sugar) and other factors are more likely to be causal agents of gout. Phosphoric acid in carbonated drinks is also to be avoided.

My mother's uric acid levels normalized on the Slow-Carb Diet, despite much higher protein intake. She continued to take low-dose allopurinol during the diet, and the food was the only variable that changed.

This said, no matter what you do with your diet or self-experimentation, do not stop or modify medication without consulting a medical professional.

#### I'M HITTING A PLATEAU—WHAT SHOULD I DO?

The first three mistakes discussed in the next few pages (eating too late, not eating enough protein, drinking too little water) are the three most common causes.

Nevertheless, the total percentage of bodyfat lost per month naturally decreases over time. The number of mitochondria in your muscle tissue largely determines your rate of sustained fat-loss. Targeted exercise, even just 20 minutes per week, will often double fat-loss that's plateaued, and should do so for at least two to four months. The best options are covered in the "Adding Muscle" chapters.

## Common Mistakes and Misunderstandings

The first three mistakes in this section cover 90%+ of stalling problems, but the rest are well worth reading. An ounce of prevention is worth a pound of cure, and a few minutes of education is worth many pounds of extra fat-loss.

#### MISTAKE #1: NOT EATING WITHIN ONE HOUR OF WAKING, PREFERABLY WITHIN 30 MINUTES

This was my dad's issue and is almost always a show-stopper. Look at what happened once we addressed it:

12/27/08
Beginning weight 245 lbs.
1/30/09
End of month #1 228 lbs.
3/1/09
End of month #2 222½ lbs. [Too little protein in morning for last 4 weeks—added 30 grams as a ready-to-drink Myoplex shake within 30 minutes of waking to restart fat-loss]
4/2/09
End of month #3 203¾ lbs.

90 day weight loss = 41¼ lbs.

The first month, his rate of loss was **17 pounds per month**. The second month, when he postponed breakfast,

his rate of loss dropped to **5.5 pounds per month**. The third month, after consuming 30 grams of protein within 30 minutes of waking, that rate more than tripled to **18.75 pounds per month**!

These numbers don't tell the whole story, of course, as he was adding muscle at the same time, but this type of dramatic acceleration is typical. Skipping breakfast is also closely associated with overeating in the evening. Don't skip. Have no appetite in the morning? No problem. Keep it small and protein-rich, then: two to three hard-boiled eggs sprinkled with white truffle sea salt.

Here's another case study, this time from JayC:

> *10/18/2008–2/14/2009: Starting weight: 260 lbs, Today's weight: 212 lbs*
>
> *Wow! This is the first time I've been less than 215 since my freshman year of college! I hit a bit of a plateau after getting down to 220 on Christmas. I was eating the same, drinking the same, etc and stayed at 220! So how did I get over this plateau?? By eating more! Can you believe the awesomeness of this lifestyle? Tim had posted … to eat at least 30g of protein upon waking, and to up the water even more so. Reluctantly I enlarged my breakfast and lunch portions and BAM!*

Skip breakfast, forget to eat within one hour of waking, and you will fail.

#### MISTAKE #2: NOT EATING ENOUGH PROTEIN

Get at least 20 grams of protein per meal.

This is absolutely most critical at breakfast. Eating at least 40% of your breakfast calories as protein will decrease carb impulses and promote a negative fat balance. Even 20% protein—more than most people consume—doesn't cut it. First choice: down two to three whole eggs at breakfast. Second choice: if that's impossible to stomach, add other protein-rich whole foods, such as turkey bacon, organic bacon, organic sausages, or cottage cheese. Third choice: have a 30-gram protein shake with ice and water, as my father did.

The first few days you'll feel like you're force-feeding yourself, and then it will all change and you'll feel incredible. Get at least 20 grams of protein per meal, no matter what.

Related problem: not eating enough food. Do NOT try to restrict portions or calories. Eat until you are full, and eat as much as you like of the approved foods. If you don't, you will either downshift your metabolism or cheat between meals with banned-food snacks.

Kristal wasn't losing weight and was irritable on the diet. Why? Because she was neglecting legumes and focusing on a higher volume of green vegetables, resulting in insufficient calories. There is no need to count calories if you follow the rules, and one of the rules is: get plenty of legumes. Her results multiplied after making one change:

> *I took your advice and made beans the #1 ingredient this week, and I have a lot more energy and am remarkably less cranky. The first couple weeks I made veggies #1 with a bit of beans and meat tossed in. This week it is beans, beans, beans … and I'm now down 10 pounds. Whoopee!*

#### MISTAKE #3: NOT DRINKING ENOUGH WATER

To ensure optimal liver function for fat-loss, increased hydration is a must.

Insufficient water intake ("I just don't like drinking much water") seems to be particularly common among women. My mother plateaued in fat loss and, looking at her water intake, I insisted she add a few more glasses. She immediately started losing fat again and lost 3 pounds in the subsequent week.

**Make a special effort to drink more water on your cheat day**, as the carbohydrate overload will pull water to your digestive tract and muscle glycogen. If you don't get enough water, headaches will be the result.

#### MISTAKE #4: BELIEVING THAT YOU'LL COOK, ESPECIALLY IF YOU'RE A BACHELOR

In a sentence: if you don't normally cook, get canned and frozen food for the first few weeks.

Don't buy a bunch of food that requires cooking skills if you don't have them. Don't buy foods that spoil if you've never prepared a proper meal. Unfounded optimism will just result in rotten food and frustration. Below is a telltale picture of what happens to most onions that live in my refrigerator.


Jack and the onion stalk

I have bags of dried lentils in my cabinet that are now six months old. Why? I'm too lazy to boil and strain them.

Keep it simple. Use frozen and canned stuff for at least the first two weeks. Change one habit at a time: food selection first, food preparation second.

#### MISTAKE #5: MISTIMING WEIGHINGS WITH YOUR MENSTRUAL CYCLE (NOT A PROBLEM FOR BACHELORS)

Women tend to retain much more water just before their periods. Be sure to take this into account when you start your diet and take measurements.

Ignore scale readings in the 10 days before menstruation. They're not at all a reflection of what's happening. If you are following the diet to the letter, you will lose fat. Treat your first weighing following your period (as soon as one day following is fine) as your "after" measurement.

Don't let short-term water fluctuations discourage you. Be aware of your menstrual timing so you don't mistakenly conclude the diet isn't working.

#### MISTAKE #6: OVEREATING "DOMINO FOODS": NUTS, CHICKPEAS (GARBANZO BEANS), HUMMUS, PEANUTS, MACADAMIAS

There are certain foods that, while technically fine to eat on the diet, are prone to portion abuse. I call these "domino foods," as eating one portion often creates a domino effect of oversnacking.

My fat-loss has plateaued three times due to almonds, which are easy to consume by the handful and simple to excuse as nutritious. Unfortunately, they also contain 824 calories per cup, 146 calories more than a Whopper from Burger King (678 kilocalories).

A few almonds is just fine (5–10), but no one eats just a few almonds.

Caro learned to avoid domino foods, but lost valuable time in the process, as have dozens of others:

> *I have re-started this eating plan. I started it but wasn't following it exactly how Tim laid it all out…. I added peanuts and I was eating chickpeas and no weight loss, so I thought it was time to get real. I re-started 5 days ago and I am happy to say I have lost 5lbs in 5 days by following the plan EXACTLY as Tim says making no adjustments or substitutes in any way, getting real and honest about what I can and can't eat.*

Think you'll just have one cookie or a couple of potato chips?

Not if there's a bag of either in the kitchen. Self-discipline is overrated and undependable. Don't eat anything that requires portion control. Get domino foods out of the house and out of reach.

#### MISTAKE #7: OVERCONSUMING ARTIFICIAL (OR "ALL-NATURAL") SWEETENERS, INCLUDING AGAVE NECTAR

Even with no calories, most artificial and natural sugar substitutes provoke increased insulin release, though aspartame (Nutrasweet®) shows surprisingly little effect on insulin. Not that this is a free license to overconsume Nutrasweet®: it's often paired with acesulfame-K, which has a host of negative health effects. Both low-calorie and no-calorie sweeteners have been associated with weight gain. I've seen just about all of them stall fat-loss.

Don't think I'm preaching. I'm a total Diet Coke whore. Can't help it.

Indulging my addiction up to 16 ounces a day doesn't seem to interfere with loss. I've found, as have other slow-carbers, that more than 16 ounces interrupts the process at least 75% of the time.

"All-natural" sweeteners are, based on the role of fructose in metabolic disorders, arguably worse for you than even high-fructose corn syrup (HFCS).

So-called "sugar-free" health foods are full of sweeteners such as "concentrated apple and pear juices," which are two-thirds fructose, and the latest and greatest saviors are even worse. Raw agave nectar, for example, is as high as 90% fructose and shows no better antioxidant content than refined sugar or HFCS.

Skip the sweeteners whenever possible. If it's really sweet, it probably spikes insulin or screws up your metabolism. Experiment with spices and extracts like cinnamon and vanilla instead.

#### MISTAKE #7: HITTING THE GYM TOO OFTEN

One female slow-carber wrote:

> *I have been going to the gym 5x/week, 2 hours on the treadmill plus a one hour spin class 2x a week…. I have been doing this for almost three months. In the first 3 weeks I lost almost 20 pounds but since have regained about 7 pounds. I also complete a variety of exercises targeting various muscles groups (2x/week for my legs, hips, arms, etc*)

The seven pounds could have been muscular gain, which is good, but she was spending more than 12 hours a week in the gym. I suspected her problem, which I'd seen in others, was unsustainable overtraining and related "reward" eating:

> *I suspect you are overtraining and actually losing muscle, given your description. This will lower your basal metabolic rate and then cause you [to] stall with fat loss. Try the diet with no more than 2–3 short weight training workouts per week [if you even choose to exercise; it's not mandatory] and remember to track bodyfat % and not just weight.*

Doing too much will not only *not* help, it will reverse your progress, as it also leads to overeating, sports drinks, and other assorted self- sabotage.

Remember the MED. Less is more.

3. Especially if consuming less than 30% of calories as fat.

4. Residual drugs and environmental toxins are often stored in fat, so you'll want to buy the good stuff when consuming animal fat from higher up the food chain, like pork or beef. Eating larger animals from factory farms is asking for trouble.

5. I suggest avoiding curries, which can cause intestinal upset without rice.

# DAMAGE CONTROL

## Preventing Fat Gain When You Binge

**Life itself is the proper binge.**
—Julia Child

**Doughnuts are a normal part of a healthy, balanced diet.**
—Brooke Smith, Krispy Kreme spokeswoman

I was on a first date at Samovar Tea House in San Francisco.

The incense, subdued global music, and meticulous track lighting made us feel like we were somewhere between a Buddhist-inspired Last Dragon and a Dutch coffee shop. Then, as if on cue, both of us ordered Schizandra berry tea. The description?

> *2000 years ago Shen Nong first identified this potent elixir as an "adaptogenic tonic" (i.e., it gives you whatever you need: energy, relaxation, beauty, sexual prowess).*

Things were off to a good start.

After some flirting and playful verbal sparring, I made my move.

"Don't let this weird you out."

I took an electronic food scale out of my man-purse,[6] which I use to carry odd items, and began separating all of my food so I could weigh the individual pieces. This was, of course, the beginning of the end.

Ah, l' amor … It is fickle and not fond of serial-killer-like behavior.

But love could wait. I had other things on my mind.

It was just the beginning of a 12-hour quest for fatness, and it was my second attempt. The first attempt, done with more than 10 pounds of fatty cuts of grass-fed beef, had failed. That is, I could consume only six pounds without vomiting, and I didn't gain one gram of fat.

Why the hell do a quest for fatness at all, you ask?

Because I wanted to prove, once and for all, that the calories-in-calories-out model was plain wrong, or at least incomplete. The easiest way I could do this was by consuming a disgusting number of calories in a short period of time and documenting the aftereffects.

This time, I had a different approach.

At 11:43 P.M. that evening, with two minutes remaining, I struggled to choke down a final package of Nutter Butters. I had polled my then 60,000 or so Twitter followers the previous night for their favorite calorically dense foods, and I had committed to consuming as many as possible. Everything I ate or drank would be photographed and either measured or weighed.

Here's how it added up, with non-eating but important events indicated with an asterisk:

11:45 A.M. start

- 1 cup steamed spinach (30 kcal)
- 3 tbsp almond butter on one large celery stalk (540 kcal)
- 2 heaping tbsp Athletic Greens in water (86 kcal)

- Chicken curry salad, 195 g (approximately 350 kcal)

Total = 1,006 kcal

12:45 P.M.

- Grapefruit juice (90 kcal)
- Large coffee with 1 tbsp cinnamon (5 kcal)
- 2% milkfat milk, 315 ml (190 kcal)
- 2 large chocolate croissants, 168 g (638.4 kcal)

Total = 923.4 kcal

2:00 P.M.

- Citrus kombucha, 16 oz (60 kcal)

*2:15 P.M.

- Poo
- AGG (discussed later)
- Butter fat and fermented cod liver

*3:00–3:20 P.M.

- 15 repetitions x 3 sets each:
  1. Bent row
  2. Incline bench press
  3. Leg press

3:30 P.M.

- 1 qt Straus cream-top organic whole milk (600 kcal)

*4:00 P.M.

- Probiotics
- 20-min. ice bath

4:45 P.M.

- Quinoa, 230 g (859 kcal)

5:55 P.M.

- Zzang candy bar (216 kcal)
- Yerba mate (30 kcal)

Total = 246 kcal

*6:20 P.M.

- Poo

*6:45 P.M.

- 40 air squats and 30 wall tricep extensions

6:58 P.M.

- Assorted cheeses, 33 g (116 kcal)
- Honey, 30 g (90 kcal)
- Medium apple (71 kcal)
- Crackers, 8 g (30 kcal)
- Chai tea with soy milk (not my choice), 12 oz. (175 kcal)

Total = 482 kcal

*9:30 P.M.

- 40 air squats in men's room

9:36 P.M.

- Pizza (nettles, red onion, provolone, mushroom, pancetta, and olive oil with one whole egg), 8 pieces (64 g each) (1,249 kcal)
- 1 small glass red wine, Nero d'Avola, 5 fluid oz. (124 kcal)
- Bi-Rite vanilla ice cream, 59 g (140 kcal)
- Double espresso (0 kcal)

Total = 1,513 kcal

10:37 P.M.

- 2 heaping tbsp Athletic Greens in water (86 kcal)

*10:40 P.M.

- PAGG (discussed later)
- 60 standing band pulls

*11:10 P.M.

- Poo

11:37 P.M.

- Peanut cookie, 40 g (189 kcal)
- Nutter Butter package, small (250 kcal)

Total = 439 kcal

2:15 A.M.

- Bedtime/face plant

For a grand total of … drum roll, please … 6,214.4 calories in 12 hours.

Based on basal metabolic rate (BMR) calculations that took into account my lean mass vs. fat mass at the time, my BMR for 24 hours was approximately 1,764.87 calories, which would make my 12-hour BMR 882.4 calories.

There are two things we need to add to this: the 20-minute moderate-intensity weight lifting session (80 calories maximum, which we'll use here) and walking.

I walked approximately 16 flat blocks and one mild uphill block during that period of time, which adds no more than 110 calories in this case, given the 1.4-mile distance at 2 miles per hour speed and 168 pounds bodyweight. I otherwise avoided movement and standing whenever possible, with the exception of the brief air squats. Twenty minutes of lifting + walking = 190 calories. Let's call it 200.

Using this math, **I still consumed 6.8 times my resting metabolic rate in my 12-hour quest for fatness.**

So what happened? Let's look at my body fat and weight measurements, which were taken using the BodyMetrix ultrasound device, and the average of three separate weighings:

Saturday, August 29, 2009 (the morning of the binge): 9.9% bodyfat at 169 pounds

Monday, August 31, 2009 (48 hours later): 9.6% bodyfat at 165 pounds

WTF?

Now let's look at how I did it.

## The Lost Art of Bingeing

Sitting down for Thanksgiving dinner or butter cookies at Christmas?

Sounds like a binge. That, in and of itself, doesn't need to mean horrible guilt and extra fat rolls afterward. If you plan ahead of time and understand a little science, it's possible to minimize the damage. I eat whatever I want every Saturday, and I follow specific steps to minimize fat gain during this overfeeding.

**In basic terms our goal is simple: to have as much of the crap ingested either go into muscle tissue or out of the body unabsorbed.**

I do this by focusing on three principles:

### PRINCIPLE #1: MINIMIZE THE RELEASE OF INSULIN, A STORAGE HORMONE.

Insulin release is minimized by blunting sharp jumps in blood sugar:

1. Ensure that your first meal of the day is not a binge meal. Make it high in protein (at least 30 grams) and insoluble fiber (legumes will handle this). The protein will decrease your appetite for the remainder of the binge and prevent total self-destruction. The fiber will be important later to prevent diarrhea. In total, this can be a smallish meal of 300–500 calories.

2. Consume a small quantity of fructose, fruit sugar, in grapefruit juice before the second meal, which is the first crap meal. Even small fructose dosing has an impressive near-flat-lining effect on blood glucose.[7] I could consume this at the first meal, but I prefer to combine the naringin in grapefruit juice with coffee, as it extends the effects of caffeine.

3. Use supplements that increase insulin sensitivity: AGG (part of PAGG) and PAGG (covered in the next chapter). The example intake in this chapter is quite mild, so I dosed only twice. If I'm going whole hog, I will have another PAGG dose upon waking. This reduces the amount of insulin the pancreas releases in spite of mild or severe glucose surges. Think of it as insurance.

4. Consume citric juices, whether lime juice squeezed into water, lemon juice on food, or a beverage like the citrus kombucha I had.

#### PRINCIPLE #2: INCREASE THE SPEED OF GASTRIC EMPTYING, OR HOW QUICKLY FOOD EXITS THE STOMACH.

Bingeing is a rare circumstance where I want the food (or some of it) to pass through my gastrointestinal tract so quickly that its constituent parts aren't absorbed well.

I accomplish this primarily through caffeine and yerba mate tea, which includes the additional stimulants theobromine (found in dark chocolate) and theophylline (found in green tea). I consume 100–200 milligrams of caffeine, or 16 ounces of cooled yerba mate, at the most crap-laden meals. My favorite greens supplement, "Athletic Greens" (mentioned in the schedule) doesn't contain caffeine but will also help.

Does this really work? Taking the goodies from taste buds to toilet without much storage in between?[8]

More than a few people have told me it's pure science fiction.

***Too much information (TMI) warning:*** I disagree, and for good reason. Rather than debate meta-studies, I simply weighed my poo. Identical volumes of food on and off the protocol. On protocol = much more poo mass (same consistency, hence the importance of fiber) = less absorption = fewer chocolate croissants that take up residence on my abs. Simple but effective? Perhaps. Good to leave out of first-date conversation? Definitely.

On to one of the cooler aspects of this whole craziness: GLUT-4.

#### PRINCIPLE #3: ENGAGE IN BRIEF MUSCULAR CONTRACTION THROUGHOUT THE BINGE.

For muscular contractions, my default options are air squats, wall presses (tricep extensions against a wall), and chest pulls with an elastic band, as all three are portable and can be done without causing muscle trauma that screws up training. The latter two can be performed by anyone, even those who have difficulty walking.

But why the hell would you want to do 60–90 seconds of funny exercises a few minutes before you eat and, ideally, again about 90 minutes afterward?

Short answer: because it brings glucose transporter type 4 (GLUT-4) to the surface of muscle cells, opening more gates for the calories to flow into. The more muscular gates we have open before insulin triggers the same GLUT-4 on the surface of fat cells, the more we can put in muscle instead of fat.

Longer answer:


GLUT-4 has been studied most intensely for the last 15 years or so, as it became clear around 1995 that exercise and insulin appear to activate (translocate) GLUT-4 through different but overlapping signaling pathways. This was exciting to me, as it meant it might be possible to use exercise to beat meal-induced insulin release to the punch—to preemptively flip the switch on the biological train tracks so that food (glucose) is preferentially siphoned to muscle tissue.

But how much contraction is enough? It turns out, at least with animals, that much less is needed than was once thought. In one fascinating Japanese study with rats, high-intensity intermittent exercise (HIT) (20-second sprints × 14 sets, with 10 seconds of rest between sets) was compared to low-intensity prolonged exercise (LIT)

(six hours of extended exercise) over eight days.

The surprising result? Bolding is mine:

> *In conclusion, the present investigation demonstrated that 8 days of **HIT lasting only 280 seconds** elevated both GLUT-4 content and maximal glucose transport activity in rat skeletal muscle to a level **similar to that attained after LIT ["Low-Intensity Training" of six hours a session],** which has been considered a tool to increase GLUT-4 content maximally*.

Compared to a control, GLUT-4 content in the muscle was increased 83% with 280 seconds of HIT vs. 91% with six hours of LIT.

Now, of course, animal models don't always have a direct transfer to humans. But I wondered: what if 280 seconds was all it took? This thought produced even more questions:

Do we have to get the 280 seconds all at once, or can they be spread out?

Is 280 seconds really the magic number, or could even fewer seconds trigger the same effect?

Is it even plausible that 60–90 seconds of moderate contractions could have a meaningful impact?

To attempt to answer these questions, I contacted researcher after researcher on three continents, including GLUT-4 specialists at the Muscle Biology Laboratory at the University of Michigan at Ann Arbor.

The short answer was: it did appear plausible.

The most important research insight came from Dr. Gregory D. Cartee and Katsuhiko Funai:

> *The insulin-independent effect of exercise begins to reverse minutes after exercise cessation with most or all of the increase lost within 1–4 hours. A much more persistent effect is improved insulin sensitivity that is often found approximately 2–4 hours and as long as 1–2 days after acute exercise.*

I started with 60–120 seconds total of air squats and wall tricep extensions immediately prior to eating main courses. For additional effect, I later tested doing another 60–90 seconds approximately one and a half hours after finishing the main courses, when I expected blood glucose to be highest based on experiments with glucometers.[9]

Exercises are best done in a restroom stall and not at the table. If you can't leave the table, get good at isometric (without moving) contraction of your legs. Try to look casual instead of constipated.

It takes some practice.

In China, I was taught a rhyming proverb: *Fàn hòu bǎi bù zǒu, néng huó dào jiǔ shí jiǔ* [飯後百步走, 能活到九十九]. If you take 100 steps after each meal, you can live to be 99 years old.

Could it be that the Chinese identified the effect of GLUT-4 translocation hundreds, even thousands, of years before scientists formalized the mechanism? It's possible. More likely: they just liked rhyming.

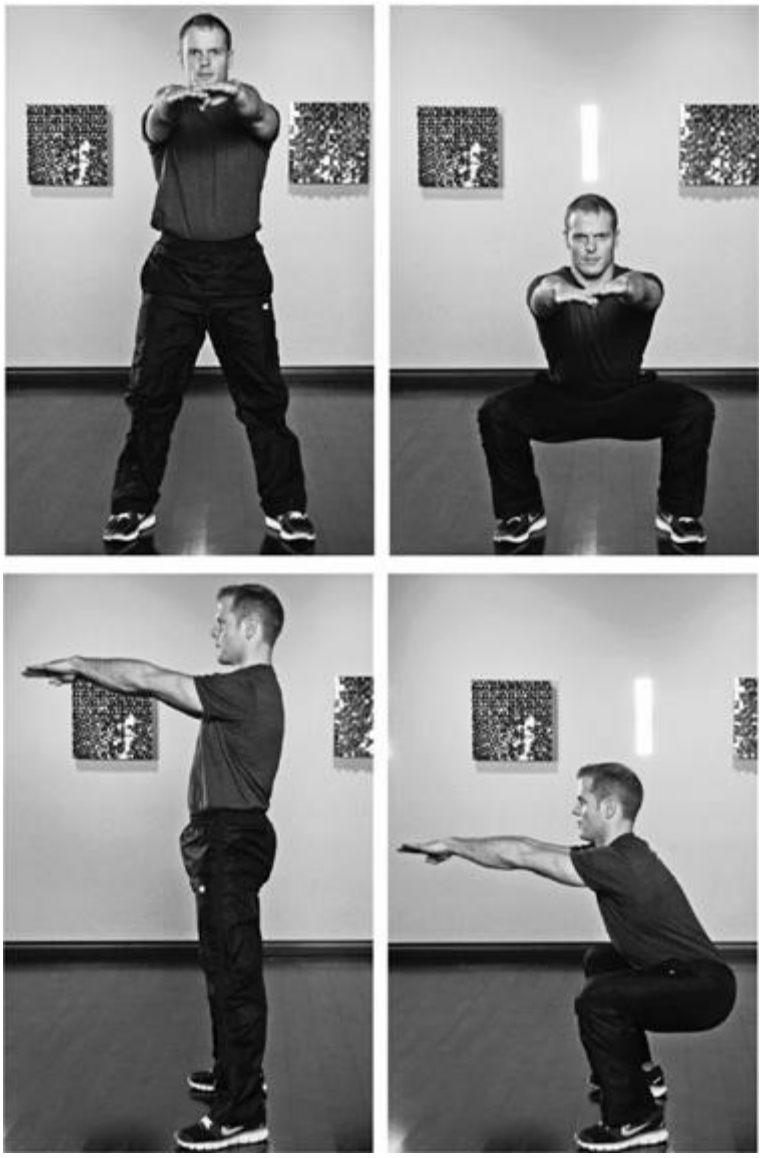
In all cases, if you do 60–90 seconds of contraction after each meal (and a bit before, ideally), you might live to see your abs.

Don't forget the air squats.

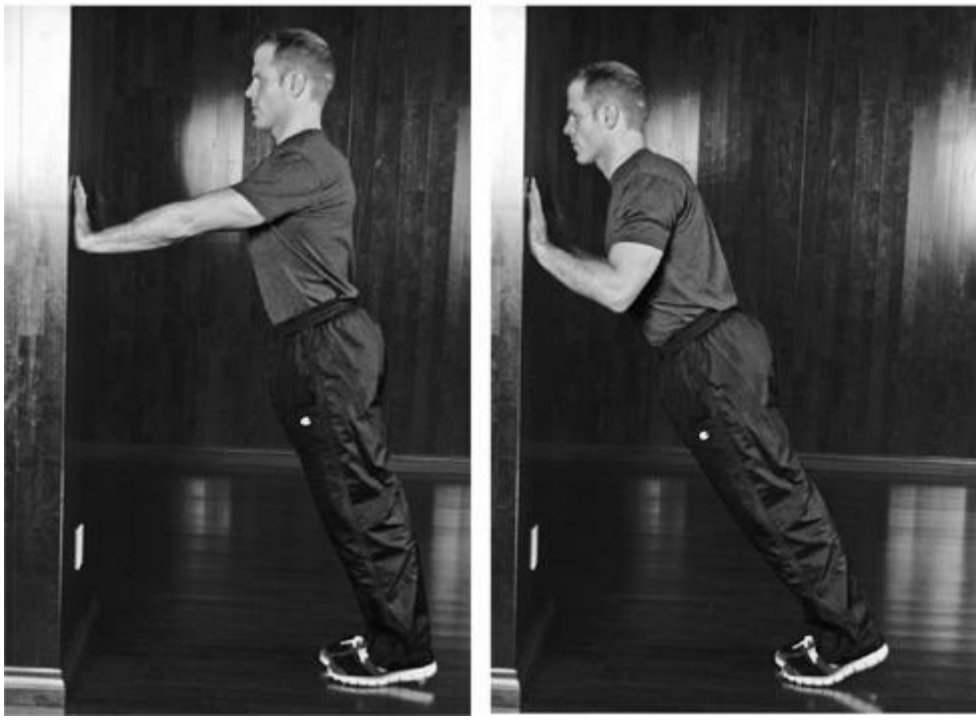
## STALLING MANEUVERS: AIR SQUATS, WALL PRESSES, AND CHEST PULLS

I aim for 30–50 repetitions of each of the following:

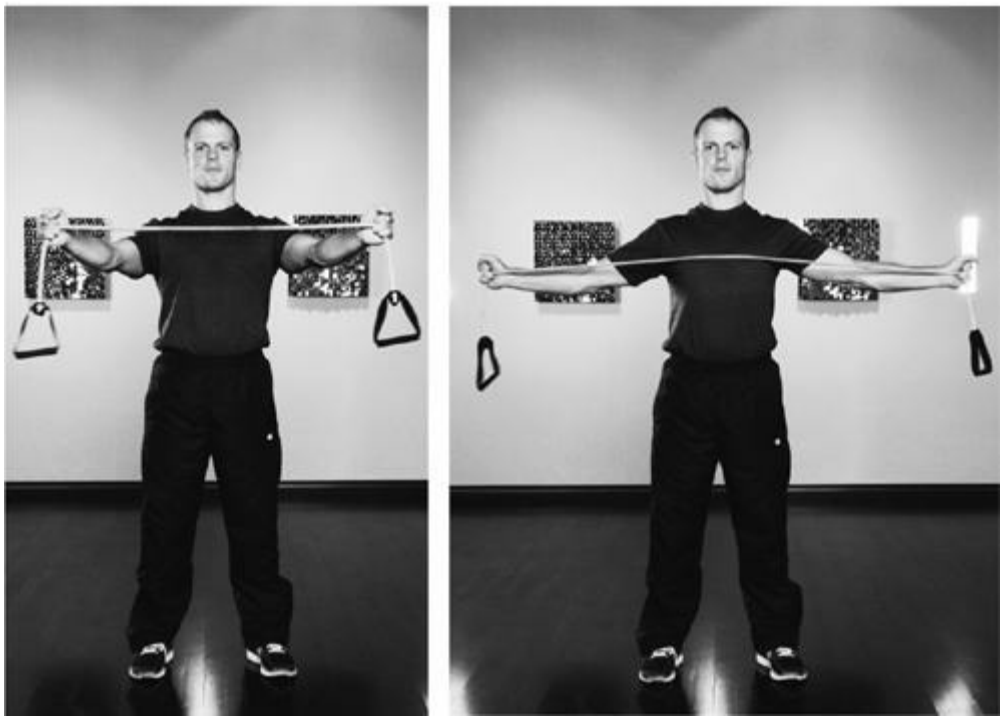
## Air Squats



## Wall Presses



**Chest Pulls**



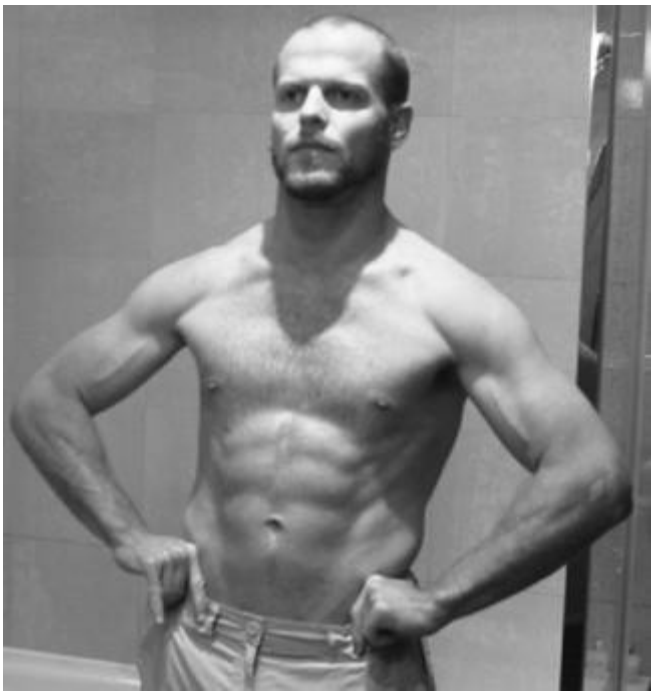
## X-FACTOR: CISSUS QUADRANGULARIS

Cissus quadrangularis (CQ) is an indigenous medicinal plant of India.

It is a newcomer in mainstream supplementation, usually prescribed for joint repair. In July 2009, I experimented with high-dose CQ following elbow surgery due to a staph infection. Unexpectedly, used in combination with PAGG, it seemed to have synergistic anti-obesity and anabolic (muscle growth) effects. Upon performing a second literature review of its use in Ayurvedic medicine and fracture repair, it became clear that there were implications for preventing fat gain during overfeeding.

Rural China, where I continued experimentation with CQ, provided high-volume rice meals combined with sweets at mandatory sit-down meals, 3–5 times per day. It was the perfect fat-gaining environment.

CQ preserved my abs. I saw measurable fat-loss and anabolic effects once I reached 2.4 grams (2,400 milligrams), three times per day 30 minutes prior to meals, for a total of 7.2 grams per day. Is that the magic dose? I had approximately 160 pounds (72.7 kilograms) of lean bodymass, so there might be a trigger at 45 milligrams per pound lean bodymass, or it could be an absolute effective dose regardless of bodyweight. Until long-term side-effect studies are done at these higher doses, I don't suggest exceeding 7.2 grams per day.



**In Beijing, after three weeks of eating like a Peking pig.**

For those who can afford it, I believe CQ is very effective for minimizing unwanted fat gain while overfeeding. Until more human studies are done, I don't plan on continuous use, but I will use it during 8–12 week growth cycles, on "off" days, or after joint sprains.

Kevin Rose, one of my traveling companions during our three-week trip, lamented, "Glenn and I were getting fatter and fatter, while this f*cker was getting ripped. What the hell?!"

One friend, a serial CTO, referred to cissus quadrangularis as the "morning-after pill" for diet after seeing me chase peanut butter ice cream and brownies with it.

CQ works.

## INSIDE THE MICROBIOME: BALANCING BACTERIA FOR FAT-LOSS

Why is obesity so much more common today than it was even a few decades ago?

Researchers are starting to find bacterial clues that may point to an answer. There has been a profound shift in our populations of gut bacteria—the little creatures that live in our digestive tracts—and studies show the changes as correlated with increased fatness.

There are actually 10 times more bacterial cells in your body than human cells: 100 trillion of them to 10 trillion of you. For the most part, these bugs help us, improving our immune system, providing vitamins, and preventing other harmful bacteria from infecting us. These bacteria also regulate how well we harvest energy from our food.

So far, two primary strains of bacteria have been found to influence fat absorption, almost regardless of diet: Bacteroidetes and Firmicutes. Lean people have more Bacteroidetes and fewer Firmicutes; obese people have more Firmicutes and fewer Bacteroidetes. As obese people lose weight, the ratio of bacteria in their gut swings confidently over to more Bacteroidetes.

This finding has significant enough implications for national health that the National Institutes of Health (NIH) launched the multi-year Human Microbiome Project in late 2007. It is like a Human Genome Project for bacteria and intended to explore how some of the 40,000+ species of micro-friends (and fiends) are affecting our health and how we might modify them to help us more.

This could take some time, but you don't need to wait to act. There are a few things you can do now to cultivate healthy and fat-reducing gut flora:

1. **Get off the Splenda.** A 2008 study at Duke University found that giving Splenda to rats significantly decreased the amount of helpful bacteria in the gut. Once again, the fake sugars turn out just as bad as, if not worse than, the real deal.
2. **Go fermented.** Dr. Weston Price is famous for his studies of 12 traditional diets of near-disease-free indigenous communities spread around the globe. He found that the one common element was fermented foods, which were consumed daily. Cultural mainstays varied but included cheese, Japanese natto, kefir, kimchi (also spelled "kimchee"), sauerkraut, and fermented fish. Unsweetened plain yogurt and fermented kombucha tea are two additional choices. Fermented foods contain high levels of healthy bacteria and should be viewed as a mandatory piece of your dietary puzzle. I consume five forkfuls of sauerkraut each morning before breakfast and also add kimchi to almost all home-cooked meals.
3. **Consider probiotics and prebiotics.** *Probiotics* are bacteria. I've used Sedona Labs iFlora probiotics both during training (to help accommodate overfeeding) and after antibiotics.

   *Prebiotics* are fermentable substrates that help bacteria grow and thrive. In this category, I've experimented with organic inulin and fructo-oligosaccharides, commonly referred to as FOS. For a host of reasons, I prefer inulin, which I get through the Athletic Greens mentioned previously. Inulin is about 10% the sweetness of sugar, but unlike fructose, it's not insulinemic. In the whole-foods realm, garlic, leeks, and chicory are all high in inulin or FOS content.

Though the research is preliminary, introducing pre- and probiotics together in the diet could have beneficial effects on allergies, aging, obesity, and a range of diseases from AIDS to type 2 diabetes. I found one potential benefit particularly fascinating, given our focus on GLUT-4: both inulin and FOS improve calcium absorption, and calcium absorption promotes the contraction-dependent GLUT-4 translocation!

If the anti-obesity effects weren't enough, consider bacterial balance a crucial step in supporting your "second

brain."

Most of us have heard of serotonin, a wide-acting neurotransmitter that, when deficient, is intimately linked to depression. Prozac and other selective serotonin reuptake inhibitors (SSRIs) act to increase the effects of serotonin. Despite the label "neurotransmitter," which leads most people to visualize the brain, only 5% of serotonin is found in your head. The remaining 95% is produced in the gut, sometimes referred to as "the second brain" for this reason.

In a randomized, double-blind, placebo-controlled study of 39 patients with chronic fatigue syndrome, *Lactobacillus casei* strain Shirota was found to significantly decrease anxiety symptoms. Probiotics (bifidobacteria is one example) have also been shown as an effective alternative treatment for depression because of their power to inhibit inflammatory molecules called cytokines, decrease oxidative stress, and correct the overgrowth of unwanted bacteria that prevents optimal nutrient absorption in the intestines.

Give your good bacteria an upgrade and get your microbiome in shape. Faster fat-loss and better mental health are just two of the benefits.

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**TOOLS AND TRICKS**

**Twelve Hours of Bingeing in Photos (www.fourhourbody.com/binge)** See the binge from this chapter as I captured it in real time and posted the photos on Flickr. It will give you an appreciation for the quantity.

**Super Cissus Rx (www.fourhourbody.com/cq)** This is the brand of CQ I used during the experimentation.

**Athletic Greens (www.athleticgreens.com)** This is my all-in-one greens insurance policy. It contains 76 ingredients, including inulin for improving bacterial balance.

**Escali Cesto Portable Nutritional Scale (www.fourhourbody.com/cesto)** This is the one-pound scale I carried around in my man-purse to measure the weight and nutritional composition of my meals. The Escali Cesto display shows calories, sodium, protein, fat, carbohydrates, cholesterol, and fiber for almost 1,000 different types of food. May the force be with you, fellow OCDers.

**Nutrition Data (www.nutritiondata.com)** Want to find out how many calories are in your favorite splurge meal or family recipe? Just use the "Analyze Recipe" Nutrition Management Tool on this site to calculate the nutritional value of the dish. You can also save your recipes and share them with others. I use this site often, including for the calculations in this chapter.

**Thera-Bands (www.fourhourbody.com/thera)** I started doing standing chest pulls with Thera-Bands (primarily gray), which are popular among physical therapists for rehab exercises. Once I got up to 75 reps per set without fatigue, I upgraded to the mini-bands below.

**Mini-bands (www.fourhourbody.com/minibands)** I now use these for standing band pulls. Made famous by Louie Simmons of the Westside Barbell gym, these bands are often used by powerlifters to add resistance to deadlifts, bench presses, and squats in the upper ranges of motion. On a related note, think age is an excuse? Tell Louie. He squatted 920 pounds at age 50.

6. Strange enough to begin with.

7. See “The Glucose Switch” for more on this.

8. It’s true that increasing the speed of gastric emptying can increase the glycemic index of meals; that makes it all the more important to blunt that response with a small dose of fructose.

9. Again, see “The Glucose Switch” for more tricks along these lines.

# THE FOUR HORSEMEN OF FAT-LOSS

## PAGG

**Without garlic, I simply would not care to live.**
—Louis Diat, First Chef de Cuisines of the New York Ritz-Carlton

SUMMER 2007, NORTHERN CALIFORNIA

The smoke wisped into the air amid the sounds of summer eating: laughter, beer bottles clinking, and the undeniable sizzle of tri-tip steak on three enormous outdoor grills. All was well in Willow Glen, San Jose, where my parents were visiting me. I was at home, but they had ventured out to explore downtown Lincoln Avenue on a beautiful afternoon, which led them to La Villa Italian restaurant.

My father was standing on the corner admiring the grill work when a thin homeless man sauntered up to his side. After a minute or two of silence and staring at meat and tongs, the homeless man made this opening:

"You know how I lost all my weight? More than 100 pounds?"

My dad was 5'6" and almost 250 pounds at the time. Silence followed for several seconds, and my father—amused by the approach and more than a bit curious—finally relented: "How?"

"Garlic. Clove after clove. It's that simple."

The homeless man didn't want anything and never asked for anything. He was earnest. After sharing his advice, he just walked away.

As unusual as this encounter was, I had, in fact, been looking at garlic for some time. This was just the final anecdotal push I needed to begin experimenting at much, much higher doses. The homeless man's contribution to my latest cocktail made it all come together.

The final feedback from one guinea pig, a semiprofessional athlete with approximately 9% bodyfat at 200 pounds, was representative: "I've lost 6 pounds of fat in the last week. This is un-freaking-believable."

Allicin, one component of garlic, appeared to be the missing fourth ingredient in a supplement stack I'd been refining for two years: PAGG.

### Before: ECA

From 1995 to 2000, I experimented with a fat-loss cocktail that comprised ephedrine hydrochloride, caffeine, and aspirin—the famed and research-proven "ECA" stack. This was the mixture I used three times per day when on the Cyclical Ketogenic Diet to produce veins on my abdomen for the first time in my life, all in less than eight weeks.

**E**phedrine hydrochloride: 20 mg

**C**affeine: 200 mg

**A**spirin: 85 mg

The biochemistry was spot-on, and dozens of studies supported the effects. If E = 1, C = 1, and A = 1, the three combined have a synergistic effect of 1 + 1 + 1 = 6–10.[10]

Sadly, the ECA stack is not a free ride. The effects are beautiful and predictable, but there are prices to be paid: side effects.

Tolerance to the upper-like effects[11] develops quickly and cessation can cause severe headaches. The withdrawal pains lead to a domino effect of stimulant use. Either people never stop taking ECA or they substitute in equally strong drugs to avoid chronic fatigue. I suspect there is an entire generation of strength and endurance athletes with ECA-induced adrenal fatigue who now depend on stimulants for normal everyday function. Some I

know opt for 6–10 double espressos per 24 hours. Used in high doses or in high-humidity/high-heat conditions, ephedrine and ephedra have also both been associated with heart attack and death.

I suffered so many sinus infections post-ECA that I visited a Stanford-trained specialist who, after reviewing a cranial MRI, asked without a second of hesitation: "Do you drink much caffeine or take other stimulants?" Almost all of my sinal cavities were completely blocked with compressed, dried matter. She was amazed that I was able to get out of bed in the morning.

From that point onward, I removed stimulants for brief but increasing periods, as painful as it was, until I had reestablished basic adrenal function. It was clear that another fat-loss approach was needed, something more sustainable.

I wanted to find a nonstimulant stack that used different pathways altogether.

## After: PAGG

The end result was PAGG.

**P**olicosanol: 20–25 mg

**A**lpha-lipoic acid: 100–300 mg (I take 300 mg with each meal, but some people experience acid reflux symptoms with more than 100 mg)

**G**reen tea flavanols (decaffeinated with at least 325 mg EGCG): 325 mg

**G**arlic extract: 200 mg

Daily PAGG intake is timed before meals and bed, which produces a schedule like this:

Prior to breakfast: AGG

Prior to lunch: AGG

Prior to dinner: AGG

Prior to bed: PAGG

AGG is simply PAGG minus policosanol.

This dosing schedule is followed six days a week. Take one day off each week and one week off every two months. This week off is critical.

Let's look at our new cast of characters.

### POLICOSANOL

Policosanol, an extract of plant waxes, often sugar cane, is the most controversial element in the PAGG stack. I originally experimented with policosanol at low and high doses to increase HDL cholesterol and decrease LDL cholesterol. Used in combination with time-release niacin, one orange before bed, and chromium polynicotinate (*not* picolinate) during the four-week "Geek to Freak" project detailed in later chapters, I lowered my total cholesterol from 222 to 147 while almost doubling HDL.

There was a pleasant side effect: an unintended but significant reduction in bodyfat. I isolated the policosanol over several weeks of further testing. The research studies are far from conclusive regarding policosanol's effects on cholesterol; most show no effect whatsoever. This could be due to not dosing policosanol before peak cholesterol production between midnight and 4:00 A.M. Regardless, the addition of policosanol (10–25 milligrams before bed) to the PAGG (then AGG) stack produces, in my experience and that of my guinea pigs, far superior effects for fat-loss vs. AGG alone. This was tested with three brands and three dosages (10, 23, and 40 milligrams per day). I found 23 milligrams per day to be optimal for fat-loss, with little additional benefit from higher doses.

### ALPHA-LIPOIC ACID (ALA)

Alpha-lipoic acid (ALA) is a potent antioxidant and free radical scavenger that has been proven to regenerate

vitamin C and vitamin E; restore levels of intracellular glutathione, an important antioxidant that declines with age; and increase excretion of toxic heavy metals such as mercury.

It was first synthesized and tested in the 1970s for the treatment of chronic liver diseases. The intravenous interventions reversed disease in 75 out of 79 subjects.

Given its impressive effects, the most remarkable feature of ALA is its apparent lack of toxicity in humans[12] It's NOAEL (No Observable Adverse Effect Level) is 60 milligrams per kilogram of bodyweight, which would mak up to 4,091 milligrams per day safe for a 150-pound person. Our dosing will be 300–900 milligrams total per day.

Though lipoic acid naturally occurs in some organ meats and vegetables, including spinach and broccoli, the amounts are trace. I didn't want to consume 10 tons of liver for 30 milligrams of lipoic acid, so I began using synthetic alpha-lipoic acid in 1995.


I began taking ALA for its impressive impact on glucose uptake and reduced triglyceride production.

First and foremost, I wanted to increase muscular absorption of the calories (and supplements) I consumed, and ALA turned out to be the perfect force multiplier. More calories absorbed into muscle meant fewer calories deposited as fat and faster strength gains.

ALA accomplishes this, in part, by recruiting GLUT-4 glucose transporters to the muscular cell membrane. This both mimics insulin and increases insulin sensitivity, and ALA is therefore being explored as an "insulino-mimetic" that can be used to treat type 2 diabetes and metabolic syndrome.

Not only does ALA increase glucose and nutrient absorption, but it also demonstrates triglyceride inhibition and—through extrapolation—fat storage. Here is an abstract from a 2009 article from the *Archives of Biochemistry and Biophysics* that drives the point home:

> *Livers from LA [lipoic acid]–treated rats exhibited elevated glycogen content, suggesting dietary carbohydrates were stored as glycogen rather than becoming lipogenic substrate.*

In one sentence, here is why alpha-lipoic acid is kick-ass for our purposes: **ALA helps you store the carbohydrates you eat in muscle or in your liver as opposed to in fat.**

#### GREEN TEA FLAVANOLS (EGCG)

Epigallocatechin gallate (EGCG) is a catechin and flavanol found in green teas.

It has been researched for a wide range of applications, including decreasing the risk of UV-induced skin damage, inhibiting cancer growth, and reducing mitochondrial oxidative stress (anti-aging).

I tested green tea and EGCG, once again, for the underreported "off-label" benefits. Specifically, two related to body recomposition:

• Much like ALA, EGCG increases GLUT-4 recruitment to the surface of skeletal muscle cells. Of equal interest*it inhibits GLUT-4 recruitment in fat cells*. In other words, it inhibits the storage of excess carbohydrates as bodyfat and preferentially diverts them to muscle cells.

• EGCG appears to increase programmed cell death (apoptosis) in mature fat cells. This means that these hard-to-kill bastards commit suicide. The ease with which people regain fat is due to a certain "fat memory" (the size of fat cells decreases, but not the number), which makes EGCG a fascinating candidate for preventing the horrible

rebounding most dieters experience. Super cool and important.

Human studies have shown some potential fat-loss with as little as a single dose of 150 milligrams of EGCG, but we will target 325 milligrams three to four times per day, as the fat-loss results seem to "hockey-stick"—go from a mild incline to a sharp rise—between 900 and 1,100 milligrams per day for the 150- to 200-pound subjects I've worked with. I suggest decaffeinated green tea extract pills as the source, unless you want to be stuck to the ceiling and feel ill. Using tea leaves and steeping cup after cup is too imprecise and too caffeinated.

If you are undergoing cancer treatment, please consult your doctor before using EGCG, as it can increase the effects of some drugs (the estrogen antagonist tamoxifen, for example) while decreasing the effects of others,[13] such as the drug Velcade®, to which it binds. If you are undergoing treatment for multiple myeloma or mantle cell lymphoma, likewise avoid EGCG.

#### GARLIC EXTRACT (ALLICIN POTENTIAL, S-ALLYL CYSTEINE)

Garlic extract and its constituent parts have been used for applications ranging from cholesterol management to inhibiting lethal MRSA staph infections.

Strangely, test subjects and I have had the best fat-loss results with extracts designed to deliver relatively high doses of allicin. Allicin, if delivered in a stable form, appears to have the ability to inhibit fat regain. The reason our results were "strange" relates to the "stable form" bit. Most research indicates that allicin should have almost zero bioavailability more than six days after extraction from garlic cloves, particularly after exposure to stomach acid. Our confounding results could be due to a combination of other organic components, most notably one precursor to allicin: S-Allyl cysteine (alliin). S-Allyl cysteine exhibits outstanding oral bioavailability, near 100% in large mammals.[14]

Until further research concludes otherwise, I suggest using an aged-garlic extract (AGE) with high allicin potential that includes all constituent parts, including S-Allyl cysteine.

I've tried consuming it fresh, chomping on cloves, and it isn't kind to your digestive tract. If you are going the whole-food route, use it in your cooking to prevent stomach self-destruction.

For precision and convenience, I use supplements to reach my target baseline in dosing, and I use extra garlic in food for delectable (but not necessary) insurance above that baseline.

## Warnings

Ensure adequate consumption of B-complex vitamins while using PAGG and consult your doctor before use if you have a medical condition (e.g., hypertension, hypoglycemia, diabetes) or are taking any medications. In particular, blood-thinning medications (e.g., warfarin, aspirin, etc.), thyroid medications, or anti-anxiety drugs like clozapine.

If you are pregnant or breastfeeding, do not use PAGG. Blood-thinning compounds ain't for babies.

### TOOLS AND TRICKS

I currently use the following products. I have no financial interest in any of them:

**Vitamin Shoppe**—Allicin 6000 Garlic, 650 mg, 100 caplets (www.fourhourbody.com/garlic)

**Mega Green Tea Extract (decaffeinated)**, 725 mg, 100 capsules (www.fourhourbody.com/greentea)

**Vitamin Shoppe**—Alpha-Lipoic Acid, 300 mg, 60 capsules (www.fourhourbody.com/ala)

**Nature's Life**—Policosanol, 60 tablets (www.fourhourbody.com/policosanol)

10. The ephedrine increases cAMP levels, the caffeine slows cAMP breakdown, and the aspirin further helps sustain increased cAMP levels b inhibiting prostagladin production.

11. In over-the-counter drugs, ephedrine is generally mixed with guafenesin (an expectorant), as it can otherwise be freebased with basic lab supplies into methamphetamine.

12. Except for those predisposed to Insulin Autoimmune Syndrome (IAS).

13. If you're a male bodybuilder, this effect on tamoxifen can be a good thing, but watch your HDL, which can drop like a stone.

14. Though S-Allyl cysteine (SAC) is an easier molecule to get into your bloodstream and has been implicated in minimizing the damage of glycation and free radicals in diabetes, it would be premature to label this the single component responsible for lipid changes or fat-loss. The fat-loss could well be due to several synergistic compounds in garlic that activate phase I and II detoxification enzymes.

# Advanced

# ICE AGE

## Mastering Temperature to Manipulate Weight

**Don't tell me it's impossible, tell me you can't do it. Tell me it's never been done … the only things we really know are Maxwell's equations, the three laws of Newton, the two postulates of relativity, and the periodic table. That's all we know that's true. All the rest are man's laws.**

—Dean Kamen, inventor of the Segway and recipient of the National Medal of Technology and Lemelson-MIT Prize

"Michael Phelps eats 12,000 calories a day …"

That was all Ray Cronise heard from across the room. He jerked his eyes up from the spreadsheet and reached for the TiVo to pause the television.

Twelve thousand calories.

Ray Cronise had been a high-ranking material scientist at NASA for almost 15 years, and his specialties included biophysics and analytical chemistry. He'd been in mission operations and seen—hell, helped *produce*—research the public wouldn't see for decades.

But spending half of his life behind a computer had taken its toll. The creeping two to four pounds per year had added up and left him weighing 230 pounds at 5'9".

It was now a much-improved 209-pound Ray Cronise who sat with a spreadsheet in front of him and his eyes on the paused television. He still had more than 30 pounds to lose. It would take at least 18–24 weeks at his current rate.

The spreadsheet was designed to fix this by comparing all the human activities he could isolate, each correlated to its caloric expenditure per hour for his weight. He was tired of being fat and hoped the numbers would provide a faster solution. Instead, they painted a futile picture: even if he ran a 26.2-mile marathon he would only burn around 2,600 calories, or approximately ¾ of a pound of fat.

How could Phelps eat an *extra* 9,000 calories per day? Ray scanned his finger through the columns, jotted down a few notes, and defaulted to the calculator. It made no sense.

"In order for Phelps to burn those kinds of calories above and beyond what his resting metabolic rate [RMR] was," Ray recalls, "keeping in mind that I had the calculations in front of me, and it's about 860 calories an hour at competitive swimming rates, he would have to sustain more than 10 hours of continuous butterfly every day. Not even he can do that."

So what was going on? Was Phelps misinforming journalists during his Olympic quest? Sabotaging competitors foolish enough to mimic him based on interviews?

The physics didn't work.

Then, in an instant, paused over the spreadsheet, after 15 years of frustration, it all became crystal clear:

"It was the thermal load of the water. Water is 24 times more thermally conductive than air. Phelps spends three or four hours a day in the water."

The effect was the same as pouring hot coffee into a metal cup instead of a ceramic mug; the former loses calories (heat) much faster. Ray did the math with this new variable, and, amazingly, it seemed to add up.

In the six weeks that followed, from the weekend of October 27 to December 5, he would lose 28.6 pounds of fat and never regain them.

The game had changed.


**The first 12 weeks *without* cold exposure vs. the second 6 weeks *with* cold exposure.**

## From NASA to Everest: Correcting the Metabolism Equation

It seemed too good to be true. So, as any good scientist would, Ray tried to disprove himself.

In the studies and science he reviewed, what struck him most was not evidence that contradicted his conclusions, but rather the near-complete omission of heat as a factor in fat-loss.

The common equation in the literature was simple: weight loss or gain = calories-in – calories-out. $\triangle$Wt = kcal in – kcal out.

This wasn't the problem.

The problem was that every table for calories-out (caloric expenditure) immediately fixated on activity level. Thermodynamics—*thermo*dynamics—had somehow been robbed of heat. In Ray's world of space shuttles and atmospheric reentry, heat was king. The laws of thermodynamics were being cited by people who didn't understand them. Take the first law as an example. In simple terms:

*Energy can neither be created nor destroyed. It can only change forms.*

The misquoters were limiting the ways ingested calories could change form. They treated exercise and storage as the only two options. In fact, the human body is an *open* thermodynamic system and has a number of other options. Ray's then-209-pound meat-frame could exchange energy with his environment in the form of work (exercise), heat, or matter (excretion).

Running a marathon might burn 2,600 calories, but working out in an 82°F pool for four hours could burn up to an *extra* 4,000 calories, if one considered thermal load.

How else could people like Scott Parazynski, a friend of Ray's, eat can after can of Spam and other high-fat foods? Scott was an MD and former astronaut who had attempted to summit Everest twice, losing about 25 pounds on each attempt. He was successful on his second ascent. His troupe ate lard and sticks of butter to prevent excessive weight loss. The workload of the climb alone could not account for the caloric expenditure, a 5,000-calorie deficit. It was the cold. Lots of cold.

So Ray began to treat himself like a human space heater.

He tried everything: he drank a gallon of ice water between waking and 11 A.M.; he slept with no covers; he took midwinter "shiver walks" of 20–30 minutes with nothing but a T-shirt, earmuffs, and gloves on his upper body.

He later found less painful options, but the results were undeniable. He lost almost six pounds in the first week.

## It Gets Better—The Devil's in the Details

This was not the first time Ray had tried to lose weight.

In 2006, he lost a respectable 20 pounds following the Body-for-Life (BFL) exercise and diet plan, designed by Bill Phillips. BFL performed as advertised, and Ray lost 17.8 pounds of fat in 12 weeks, for an average weekly fat loss of **1.48 pounds.** This was, by all conventional measures, a huge success. Unfortunately, in a pattern familiar to millions, he then gained it all back, plus interest.

In the second experiment, however, repeating BFL with intermittent cold exposure, Ray lost 28.6 pounds in six weeks, for an average weekly fat-loss of **4.77 pounds.** The addition of cold exposure alone increased fat-loss per week more than three times. This added up to 61% *more* total fat lost in *half* the time.

I found Ray's results both incredible and believable. But something seemed to be missing.

First of all, he had also gained more muscle with cold exposure. Losing more heat couldn't account for that. Though the muscle gain could have been accounted for by the slight inaccuracies of home-use calipers (plus or minus two pounds), I suspected there was more to the story.

Second, looking at the research, the math didn't add up quite as neatly as I'd hoped.

It's been shown that you can burn almost four times more fat than usual with two hours of cold exposure[15] (176.5 milligrams per minute instead of 46.9 milligrams per minute). This is great, but percentage changes can be deceptive. If there are nine calories in one gram of fat, and assuming the effect lasts for the time you are in the water, then this exposure would burn an extra 139 calories,[16] or *15.5 grams of fat*.

15.5 grams?! That's about 11 paper clips … for two hours of torture.

Ray was losing more than three additional pounds (approximately 1,350 grams) of fat per week with cold exposure. To achieve that with water immersion alone, looking at the same studies, he'd need to spend 174.2 hours per week in 50° water. It seems unlikely that Ray spent more than 24 hours per day in water. In fact, he didn't spend two hours per day swimming in, or consuming, 50° water.

| | BFL | | BFL + COLD | |
|---|---|---|---|---|
| | 7/10/2006 | 10/2/2006 | 10/27/2008 | 12/8/2008 |
| MEASUREMENT | START | WEEK 12 | START | WEEK 6 |
| Right Arm | 14.50 | 14.0 | 14.25 | 13.75 |
| Left Arm | 14.25 | 14.0 | 14.25 | 14.00 |
| 2" Above Navel | 39.00 | 34.0 | 39.00 | 33.25 |
| Navel | 40.00 | 36.0 | 40.50 | 36.00 |
| 2" Below Navel | 41.00 | 37.3 | 41.00 | 37.00 |
| Hips (Widest Point) | 42.25 | 40.0 | 42.25 | 39.50 |
| Right Thigh | 25.25 | 22.0 | 25.25 | 21.75 |
| Left Thigh | 24.75 | 22.3 | 24.75 | 21.75 |
| Total Inches | 241.00 | 219.50 | 241.25 | 217.00 |
| INCHES (LOSS) | NA | 21.50 | NA | 24.25 |
| Skinfold (mm) | 20.0 | 13.0 | 20.0 | 7-8 |
| **Bodyfat % (Accu-Measure)** | **24.70%** | **17.80%** | **24.70%** | **12.65%** |
| Total Bodyfat (lbs.) | 51.5 | 33.7 | 51.6 | 23.1 |
| Total Lean Mass | 156.9 | 155.6 | 157.4 | 159.2 |
| Weight | 208.4 | 189.3 | 209.0 | 182.3 |
| **Total Weight Loss** | NA | **19.1** | NA | **26.7** |
| **Total Fat Loss** | NA | **17.8** | NA | **28.6** |
| **Total Lean Mass Gain** | NA | **-1.3** | NA | **1.9** |

**Ray Cronise's fat-loss spreadsheet. 12 weeks without cold vs. 6 weeks with cold.**

Something else needed to be happening. It could have been the other thermic loads he experimented with: cold walks, sleeping without sheets, etc.

Digging deeper still, I now believe that the "something else" involves two players you'll hear much more about in the next few years: adiponectin and BAT.

Adiponectin is a cool little hormone, secreted by fat cells, that can both increase the oxidation ("burning") of fatty acids in mitochondria and increase uptake of glucose by muscle tissue. I believe adiponectin is largely to thank for Ray's muscle gain.[17] Speculation notwithstanding, the research is in its early stages, so I'll reserve adiponectin as an intellectual dessert for the geeks. My forays into its potential can be found in the online resources.

BAT and my related torture experiments, on the other hand, are worth taking a closer look at.

If the science gets too dense and you want the index card version, skip to "Ice Age Revisited—Four Places to Start" on this page. I won't be offended.


***Fat-Burning Fat***

Not all fat is equal. There are at least two distinct types: white adipose tissue (WAT) and brown adipose tissue (BAT).

WAT is what we usually think of as fat, like the marbling on a steak. A WAT cell—an adipocyte—is composed of a single large fat droplet with a single nucleus.

BAT, in contrast, is sometimes referred to as "fat-burning fat" and appears to be derived from the same stem cells as muscle tissue. A BAT cell is composed of multiple droplets that are brown in color because of a much higher volume of iron-containing mitochondria. Normally associated with muscle tissue, mitochondria are best known for producing ATP and oxidizing fat in muscle tissue. BAT helps dissipate excess calories as heat. These excess calories would otherwise be stored in the aforementioned WAT and end up in your beer gut or muffin top.[18]

In a nutshell: cold stimulates BAT to burn fat and glucose as heat. Cold, as well as drugs called beta-adrenergic agonists,[19] can also make BAT appear within WAT in mice and rats. In other words, cold might help you increase the amount of your "fat-burning" fat. This has tremendous implications.

## MY EXPERIENCE

In 1995, I began conducting experiments on myself using the powerful "ECA stack" discussed in the last chapter.

It was an effective thermogenic cocktail. So effective, in fact, that I suffered heat exhaustion three times and should have been hospitalized on two of those occasions. It doesn't matter how ripped you are if you're dead.

In 1999, four years of experimentation later and much the wiser, I had eliminated the contributing factors that led to heat stroke conditions (in my case, all exercise or sun exposure at 70%+ humidity) and began to combine ECA with timed cold exposure.

The outcome: in four weeks, I lost what usually took up to eight weeks with ECA alone, and I did it without the side effects. I used two different protocols, both of which worked:

**PROTOCOL A**

1. I consumed the ECA stack 45 minutes prior to cold-bath immersion on an empty stomach. Though the metabolism of caffeine (caffeine clearance) varies from person to person, I assumed that blood concentration would peak between 60 and 90 minutes post–oral consumption, which was based on the average *pharmacokinetics* of caffeine in white male subjects. Pharmacokinetics, usually in graph form, show the relative blood concentrations of a specific drug over time after administration. Caffeinated gum, for comparison with pills, shows peak levels at 15 minutes. Delivery mechanisms matter.

2. I placed two ten-pound bags of ice in a cold-water bath and submerged myself for a total of 20 minutes. Those 20 minutes were phased as follows:
00:00–10:00 minutes: Up to mid-waist, legs submerged, torso and arms not submerged.
10:00–15:00 minutes: Submerged up to neck with hands out of the water (sitting cross-legged then reclining makes this easier in a standard bathtub).
15:00–20:00 minutes: Submerged up to neck, hands underwater.

Sound painful? It is.

The second protocol, performed without ECA and tested separately, activated BAT and was far easier.

**PROTOCOL B**

1. I placed an ice pack on the back of my neck and upper trapezius area for 30 minutes, generally in the evening, when my insulin sensitivity is lower than in the morning.[20]

That's it.

I tested protocol A three times per week (on Monday, Wednesday, and Friday) and protocol B five times per week (Monday through Friday). The former caused grand mal–like shivering and the latter caused no shivering.

Nonetheless, looking at the bodyfat results, Protocol B appeared to be around 60% as effective as the torture baths in Protocol A.

Not a bad yield, considering that no convulsing is involved.

In 1999, amusingly, most researchers firmly believed that BAT, while abundant in infants, was nonexistent or negligible in adults. I was in the midst of my Guantanamo Bay baths[21] at this time, and these conclusions did not square with my experience. It wasn't until years later that better tools, most notably positron-emission topography (PET), became more widespread and were used to demonstrate that BAT is most certainly present in adults, particularly in the neck and upper chest areas.

That explains why the ice packs on my neck and upper trapezius worked.

In the May 2009 issue of *Obesity Review*, a paper was published titled "Have we entered the BAT renaissance?" I'd say the answer is yes. The abstract concludes: "These recent discoveries should revamp our effort to target the molecular development of brown adipogenesis in the treatment of obesity."

Let's start with cold. It isn't fancy, but it works well.

## Ice Age Revisited—Four Places to Start

If we combine the research with data from self-trackers like Ray and his 50+ informal test subjects, there are four simple options you can experiment with for fat-loss:

1. Place an ice pack on the back of the neck or upper trapezius area for 20–30 minutes, preferably in the evening, when insulin sensitivity is lowest. I place a towel on the couch while writing or watching a movie and simply lean back against the ice pack.

2. Consume, as Ray did, at least 500 milliliters of ice water on an empty stomach immediately upon waking. In at least two studies, this water consumption has been shown to increase resting metabolic rate 24–30%, peaking at 40–60 minutes post-consumption, though one study demonstrated a lower effect of 4.5%. Eat breakfast 20–30 minutes later à la the Slow-Carb Diet detailed in earlier chapters.

3. Take 5–10-minute cold showers before breakfast and/or before bed. Use hot water for 1–2 minutes over the entire body, then step out of water range and apply shampoo and soap to your hair and face. Turn the water to pure cold and rinse your head and face alone. Then turn around and back into the water, focusing the water on your lower neck and upper back. Maintain this position for 1–3 minutes as you acclimate and apply soap to all the necessary regions. Then turn around and rinse normally. Expect this to wake you up like a foghorn.

4. If you're impatient and can tolerate more, take 20-minute baths that induce shivering. See protocol A earlier in this chapter but omit the ECA. For extra thermogenic effect, consume 200–450 milligrams of cayenne (I use 40,000 BTU or thereabout) 30 minutes beforehand with 10–20 grams of protein (a chicken breast or protein shake will do). I do not suggest consuming cayenne or capsaicin on an empty stomach. Trust me, it's a bad idea.

## SIX REASONS TO TAKE A COLD SHOWER

1. Short-term cold exposure (30 minutes) in humans leads to fatty acid release to provide fuel for heat production through shivering. This same shivering could be sufficient to recruit GLUT-4 to the surface of muscle cells, contributing to increased lean muscle gain.

2. Even at shorter durations, cold exposure with shivering could increase adiponectin levels and glucose uptake by muscle tissue. This effect could persist long after the cold exposure ends.

3. In the absence of shivering, it is still possible to capitalize on "fat-burning fat" through the stimulation of BAT thermogenesis. Curiously, even without shivering, there are small but unaccounted increases in lean muscle tissue when comparing underwater (superior) vs. land-based exercise.

4. Cold water improves immunity. Acute cold exposure has immunostimulating effects, and preheating with physical exercise or a warm shower can enhance this response. Increases in levels of circulating norepinephrine may account for this.

5. Not germane to fat-loss, but another reason to use cold exposure: cold showers are an effective treatment for depression. One study used showers at 68°F for two to three minutes, preceded by a five-minute gradual adaptation to make the procedure less shocking.

6. The visible results, of course:

Before After

**TOOLS AND TRICKS**

**ColPaC Gel Wrap (www.fourhourbody.com/colpac)** These pliable wraps, used in physical therapy clinics, can be cooled quickly and applied to any body part, including the back of the neck, for BAT activation.

**"How to Make a Real Ice Pack for $0.30" (www.fourhourbody.com/diy-ice)** If you prefer the frugal approach, this article will show you how to quickly and easily make your own reusable ice packs at a fraction of the cost of store-bought packs.

**"TED Talks Lewis Pugh Swims the North Pole" (www.fourhourbody.com/pugh)** Lewis Pugh is known as the

human polar bear. Why? He swam across the icy waters of the North Pole in a Speedo and regularly swims in freezing cold water. Watch this TED speech for astonishing footage and blunt commentary on super-cold swims.

**Ray Cronise Cold Experiments (www.raycronise.com)** Explore Ray's experiments in cold exposure to find additional options for accelerating fat-loss. If he can keep NASA shuttles from incinerating, he can help you lose heat.

15. Men acutely exposed to cold for two hours (in a liquid-conditioned suit perfused with 10°C [50°F] water) have been observed to increase heat production by 2.6-fold and increase the oxidation rate of plasma glucose by 138%, of muscle glycogen by 109%, and of lipids by 376%. Raising the body's heat in response to cold exposure is done mostly by burning lipids (50%), then glycogen from muscles (30%), then blood glucose and proteins (10% each).

16. (176.5 – 46.9)/1,000 g/min * 120 min * 9 cal/g.

17. Shivering also contributes to increased muscular GLUT-4 activity, just like air squats.

18. This energy "wasting" is possible due to an uncoupling protein called UCP1, also known aptly as *thermogenin.*

19. Ephedrine and clenbuterol, neither of which I recommend, are two examples of b-agonists. According to reliable sources interviewed for this book, several infomercial fitness celebrities achieved their amazing transformations with abuse of clenbuterol, not the exercise they claim responsible. "Clen" works, but don't count on your endocrine system working properly after megadoses.

20. This evening decline is largely true only for non-obese people; obese individuals tend to have uniformly depressed insulin sensitivity at all times.

21. Nickname courtesy of one test subject in 2009.

# THE GLUCOSE SWITCH

## Beautiful Number 100

DISCLAIMER: **This chapter discusses the use of medical devices. Speak with your medical professional before jabbing such gadgets in your flesh.**

**Everything is a miracle. It is a miracle that one does not dissolve in one's bath like a lump of sugar.**
—Pablo Picasso

7:00 A.M. PST, SECURITY LINE, DELTA AIRLINES

My hands were sweating.

Rehearsing one-line explanations in my head was getting tiring, and the queue ahead of me wasn't getting shorter. I started shifting impatiently from foot to foot, like a boxer waiting for the bell, or a three-year old preparing to wee himself.

Understandably, this behavior made the older midwestern couple to my right nervous. I considered telling them, "Just be glad I didn't go with plan A," but I had a feeling this would make things worse.

Plan A, to be clear, was awesomely stupid.

Plan A was to wear a 50-pound weighted vest through security and onto the plane headed for Central America.

Two days earlier, I'd explained the rationale to a friend:

"I don't know if the gyms will have what we need, so I would at least have the vest."

"Hmmmm … okay."

"But it's too heavy to check as luggage, so I'll just wear it. The only downside is it might be impossible to get in the overhead bin, so I'd have to wear the damn thing for the whole flight. The two-pound bricks are clearly made of dense black plastic, though, so security shouldn't be an issue."

"Bricks? Ha ha ha … yes, a great idea. Well, give me a call once you have a security boot on your head and an assault rifle in your eye. Dude, that's a TERRIBLE idea."

"You think?"

"Suicide bomber jacket? Yes, I think."

So the vest remained at home.

But that was just one carry-on item. Fortunately, the metal detectors didn't pick up plan B, which wasn't *on* me but *in* me. This required some tact. I moved to a restaurant near to my gate to check on things. Something was wrong.

Sitting in the darkest corner I could find, I pulled up the side of my shirt and surveyed the damage. The sensor wasn't working.

"Motherf*cker," I muttered as I winced and slowly pulled it out of my abdomen. I held up the two metal prongs I'd inserted under my skin the night before and looked at them from all angles like a diamond. No visible problem. Perhaps the metal detectors screwed it up.

The Nicaraguans at the closest table had stopped eating and were all staring at me with mouths agape.

"No pasa nada. Soy diabético." *Nothing's wrong. I'm a diabetic.* That was the easiest explanation I could offer, even though I wasn't a diabetic. They nodded and went back to eating.

I ordered coffee and pulled out a notebook. Despite this minor glitch, I already had some fantastic data.

I would put in a new implant as soon as I landed in Managua.

**Two Months Earlier—Firefly Restaurant, San Francisco**

"Is this really interesting to you?"

It was a group dinner, and the man across from me thought I was just being polite. I'd asked what he did nine-to-five, and his answer was: medical device designer. In the span of "Oh, really?!" I was on him like a two-year-old Labrador on someone's leg. The 20 questions were just getting started, and the wine hadn't even arrived yet.

His cousin, a close friend of mine, chimed in, as I was already plotting experiments in my mind:

"Trust me. He's interested. This is all he thinks about. It's weird."

And that is how I first heard the name "DexCom." I jotted it down and did my best to act normal. It was hard to contain my excitement.

Soon thereafter, I knew all about DexCom. I called their headquarters, I called the head of marketing, I called the head of education, I spoke with the chief scientific officer, and I read about Charlie Kimball, over and over again.

Charlie Kimball is a type 1 diabetic. Unlike type 2 diabetics, he needs to inject insulin multiple times per day. He also happens to be a professional race car driver.

In 2006, Charlie became the first American to ever win an F3 Euroseries race. Then, in 2007, at age 22, he went to the doctor for a small skin irritation and left the office with a diagnosis of type 1 diabetes. Tragically, this meant he was forced to abandon racing altogether. Pricking your fingers to take blood sugar readings just isn't possible when flying around curves at 150 miles per hour.

In 2008, Charlie returned to the wheel and claimed a podium finish in his first race. How?

He was the first race car driver in the world to have a strange device strapped to his steering wheel: the DexCom SEVEN continuous glucose monitor (CGM).

> *I check it like it's one of my race car gauges as I'm driving around the track. It's my body's data. And it's not information overload. It's perfect.*

In more tangible form, it's a receiver that looks like this:


Charlie has an implant in his side (as I did) that samples his blood glucose levels[22] every five seconds. These data are then transmitted to the receiver, a palm-sized device with a screen, where Charlie can see his blood glucose levels in a graph. It displays updates every five minutes, shows his ups and downs, tells him when he's

falling too fast, and alerts him when he's at risk of hypoglycemia (low blood sugar).

So why on earth would I want to use this device as a nondiabetic? Why might you?

What if you could tell which meals were most likely to make you fat?

What if you could predict when food would hit your bloodstream and schedule exercise to optimize fat-loss or muscular gain?

What if, as an endurance athlete, you could eat carbs only when you most needed them instead of guessing with a timer?

The wish list went on and on. Now I just needed to check them off, one by one.

## Making a (Wish) List … And Checking It Twice

After my dinner at Firefly, I immediately started jotting down dream tests, as this little gizmo seemed capable of clearing up some long- standing theoretical bullsh*t.

I'd long been fascinated by the glycemic index (GI) and glycemic load (GL) index, both of which reflect how much certain foods raise blood sugar levels as compared to a control (usually white bread or glucose with a designated value of 100). The higher the GI or GL value (the latter takes into account portion size),[23] the more a food causes blood sugar to jump. The more a food causes blood sugar to jump, in general, the fatter you will get.

There are two problems with these indices. The first is that real- world meals seldom resemble laboratory meals. When's the last time you ate 100 grams of potato starch by itself? Second, the indices are one- size- fits- all.

Reality isn't one-size-fits-all. If someone of baguette-eating European descent eats white bread, will his blood response be the same as someone from a pastoral bloodline that historically fed off of livestock and little starch? Not likely, as members of the former group often have higher levels of amylase enzyme, which breaks starch down into sugar.

Blood sugar is a very personal thing.

There are some predictable results—eating doughnuts will spike blood sugar more than an equal volume of melon—but what of the more subtle choices? What of the old folk remedies and bodybuilding anecdotes? Here's a short list of questions the DexCom allows us to put to the test:

Does lemon or vinegar really decrease the GL of a meal?

Which lowers glucose response more, if either: protein or vegetables and fiber?

Does eating fat and protein *with* a high-carb meal lower GL more than eating either *before* the meal?

Does drinking water with a meal increase or decrease its GL?

## How I Used It and What I Learned

September 23 was one of the first test days with the implant.

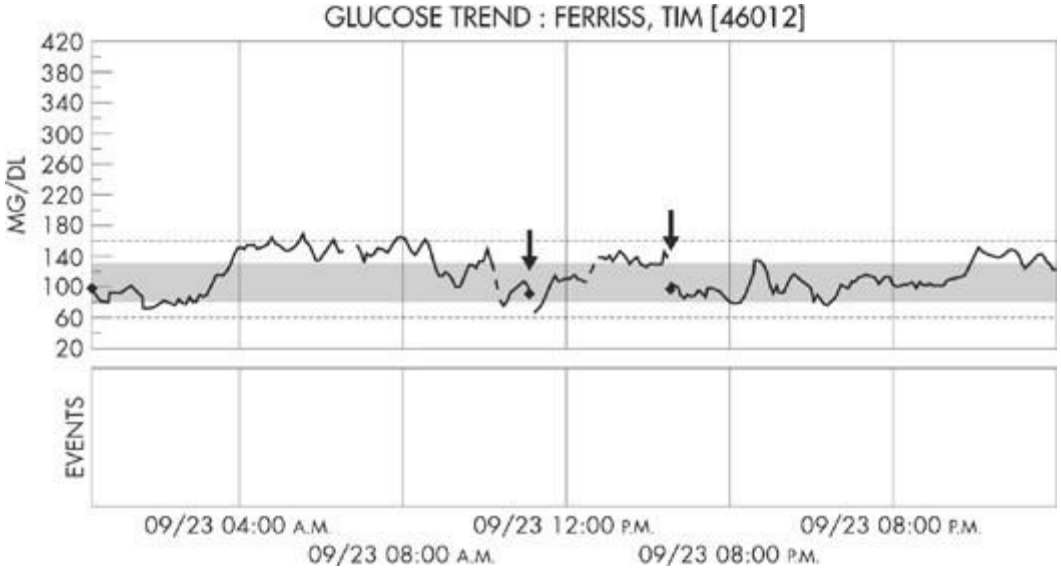
I tried everything, as I wanted to see highs and lows. The following graphs show my data for that 24-hour period, and the downward arrows in the first graph indicate where I inputted glucometer readings.

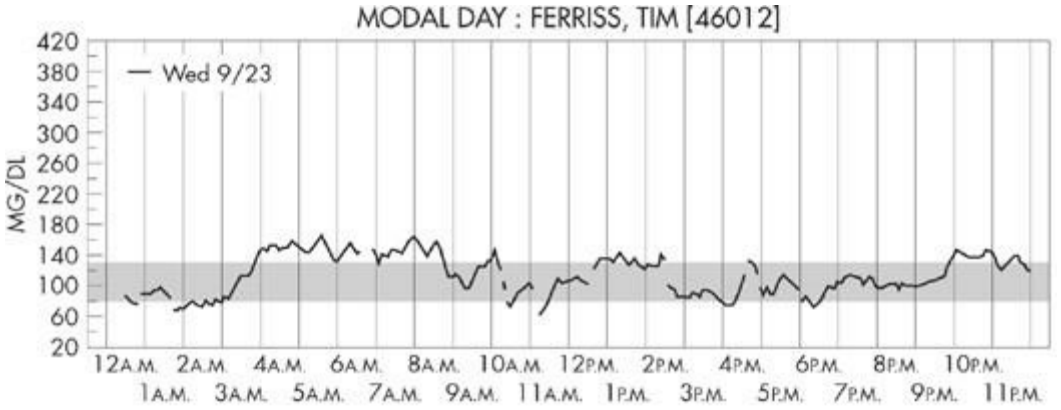
Taking the blood glucometer readings is the only pain-in-the-ass part.

The SEVEN is designed to show trends and alert you when the upward or downward changes are too dramatic To ensure that the displayed number is close to accurate, you need to calibrate with a glucometer at least twice a day.

Don't want to become diabetic? Want to curb things like eating sweets, which can lead to adult-onset diabetes? Try using a glucometer for 24 hours. For each glucometer calibration, you stick a lancet (needle) into

your finger and put a drop of blood on a test strip, which is read by a hand-held device (the glucometer) to display your number. Many type 1 diabetics prick their fingers more than four times per day.




| Stat | Totals | 12A.M. | 1A.M. | 2A.M. | 3A.M. | 4A.M. | 5A.M. | 6A.M. | 7A.M. | 8A.M. | 9A.M. | 10A.M. | 11A.M. | 12P.M. | 1P.M. | 2P.M. | 3P.M. | 4P.M. | 5P.M. | 6P.M. | 7P.M. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # Readings | 274 | 7 | 12 | 12 | 12 | 12 | 12 | 9 | 12 | 12 | 12 | 12 | 10 | 9 | 12 | 11 | 12 | 12 | 12 | 12 | |
| Average | 117 | 86 | 87 | 80 | 114 | 154 | 151 | 149 | 149 | 143 | 118 | 104 | 93 | 121 | 135 | 112 | 91 | 104 | 103 | 90 | |

I started off using a OneTouch UltraMini® glucometer, one of the most popular glucometers in the United States, but abandoned it after three weeks. It was so erratic as to be unbelievable. For each calibration, I wanted to get two readings within five points (milligrams per deciliter [mg/dL]) of each other, and then input the average in the DexCom device. This would minimize the likelihood of using an error for calibration. I expected this process to take two or three jabs, but it often took more than eight needle sticks. DexCom recommends calibrating twice daily, but I tended to do it at least three times daily (meaning up to 24 needle sticks). Not fun if you have to use your hands for anything.

Everything from humidity and sweat to temperature and air exposure can screw up readings. I ended up depending on the WaveSense® Jazz glucometer, the best device I could find that corrected for these variables. It brought the number of sticks per calibration from 8+ down to two to three sticks. I recommend this device.

But tracking glucose levels 24/7 was just one half of the puzzle.

I recorded everything I ate, and just about everything I did, in a Moleskine journal, which I then had transcribed.

Here is September 23, verbatim with comments in brackets, which corresponds to the graphs on the previous page. I used the OneTouch here, and finger names followed by numbers indicate repeated glucometer jabs:

Wednesday 9/23

12:22 am

Glucometer: [I would often swab multiple fingers with alcohol, wait 30 seconds, then go down the line with multiple lancets]

Middle 102

Ring 88

Pinky 94

Index 95

1:42 am rib-eye .5 lbs.

1:54 am 74 glucose (CGM)

1:40–2:30 am 3 glasses wine (Stag's Leap red)

2:13–2:30 am 200g steak

Sleep

10:57 am Er 5 [this was a glucometer error]

Pinky 90 (air exposed 5 sec.)

Index 96

Index 114 (same needle)

Mid 93 (new needle)

11:11 am 20 almonds

11:16 am 67 glucose

11:19 am 2 tbl athletic greens + 2g vit. C

Break: 11:37 am:

2 scrambled eggs

4 tblsp olive oil

hot sauce

11:56 am:

1 cup spinach

133g lentils (first legumes since 9/5, 18 days)[24]

12:10 pm: 2–2.5 tbs almond butter with celery

1:10 pm: 400 ml cold water

1:54 pm: 40 air squat

Out of range 10 mins [I left the receiver on a table and wandered off]

2:35 pm: 128 dexcom ——>94–96 glucose

2:37 pm: Lipo-6 1 pill [a thermogenic] + 2g vit. C

3:50 pm: Kombucha

Lunch: 4:06 pm: hot & sour beef with eggplant

4:46 pm: yerba mate (20g sugar)

7:09 pm: unsweetened yerba mate

7:25 pm: 15 almonds + 2g vit. C

9:00 pm: workout start

9:30 pm: workout end

9:35 pm: super monster protein (Odwalla)

10:00 pm: seaweed salad (huge)

10:15 pm:

12–15 pieces sashimi

1.75 bowl rice

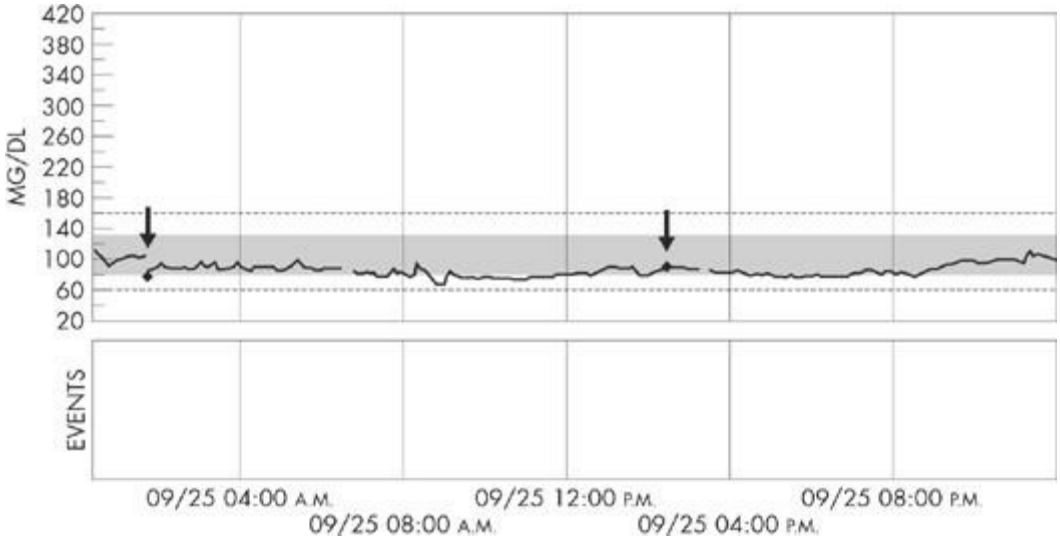
3 cups green tea

11:05 pm: 300 ALA

11:33 pm: 50 air squat

Compare the jagged graph for September 23 on this page with the following graph for September 25, which is a near flatline. On the 25th, I deliberately consumed high-fat meals and snacks for pre-sex testosterone (see "Sex Machine" for how to do this).

It's important to note that, at 10:15 P.M. the evening before (September 24), I also consumed two rib-eye steaks (200 grams each) with sides of broccoli and spinach, which explains the flatline even before breakfast.




Friday 9/25

11:50 am: 1 Lipo-6

12:10 pm: 91,86,95,108 glucose

12:30 pm: grass-fed Prather beef meatballs with walnut pesto + olive oil[25]

12:42 pm: cobb salad (huge)

5:20 pm: 25 almonds + 300mg ALA

6:39 pm:

4 brazil nuts[26]

Fish/cod oil

2 scoops athletic greens

8:26 pm: CRAZY LIBIDO

Americano restaurant

Hierloom tomato

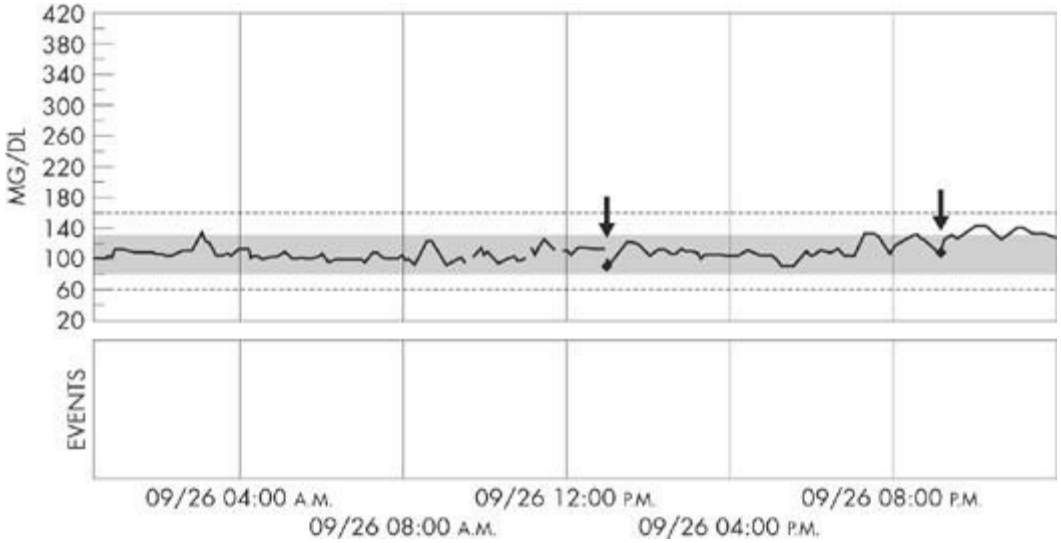
Antipasto mixed (olives, pork, meatballs)

9:29 pm: Pancetta wrapped chicken

11 pm–12 am: sex [You can see a small bump in blood glucose, which is partially due to glycogen being

released. I also observed this during anaerobic exercise like weight training.]

September 26, a Saturday, and my weekly binge day, produced a unusually flat graph considering the jamming of chocolate croissants and other goodies down the gullet:




Saturday 9/26

10:40–11:40 am: sex

12:40 pm:

4 brazil nuts

2 cod caps

1 adrenal recovery pills, 3 desiccated liver [“liver”]

12:50 pm: 1 cup orange juice

1:03 pm:

2 chocolate croissants (3)

Bearclaw (1)

Coffee with cinnamon (3)

1:13 pm: done [I sometimes noted when I finished meals for duration]

1:44 pm:

Carrot juice

Almond croissant

3:45 pm: Kombucha

4:08–4:35 pm:

Hot & sour beef + eggplant

3/4 cup brown rice

5:45 pm:

20 almonds

4 oz liver

6:45 pm: Odwalla protein monster vanilla

7:30 pm:

2 brazil nuts

.5 lb chicken curry salad

.4 lb quinoa

AGG

+ 40 mini-band chest pulls

10:04 pm: 1 glass red wine [started drinking here and sipped]

10:45 pm:

spinach salad + oyster appetizer

11pm: Hanger steak

How is such a flat graph on September 26 possible when I was consuming such obvious garbage? Several of the tricks were covered in "Damage Control," but there were other patterns that emerged over the weeks of testing with my implant. Patterns that you can use to your advantage.

## The Results

The data set, small as it was, allowed me to form some preliminary personal conclusions that others were able to replicate. Here are a few worth considering:

#### IT'S NOT WHEN YOU PUT IT IN YOUR MOUTH THAT COUNTS. IT'S WHEN IT GETS TO THE CELLS.

Food doesn't move to the bloodstream nearly as quickly as I thought.

When I first implanted the SEVEN sensor, I was as giddy as a 10-year-old birthday girl and compulsively checked the values every five minutes during meals. I ended up misattributing all over the place. My blood glucose hit 200 during sex, and I thought it was the horizontal gymnastics that caused it, not taking into account the enormous sushi plate I ate two and a half hours earlier. It was probably 80%+ due to the latter.

It turned out that food and liquids took much, much longer to get to my bloodstream than one would expect. In most cases, I peaked one and a half to two and a half hours after food consumption, even with yogurt. Orange juice peaked 40 minutes after drinking.

This has profound implications and made the entire experiment worth the hassle.

Think you'll have a quick bite for energy 20 minutes before going to the gym? It might not be available to your muscles until an hour after the gym. The solution: eat it an hour earlier.

Think that protein shake is getting to your muscles in the valuable 30-minute post-workout window? In my case, if I drank the "post-workout" shake post-workout, it didn't. I needed to have it before my workout and then sit down to a large meal almost immediately after the workout. Doing it one and a half hours after the workout, as commonly suggested, just wouldn't get the goods to my muscles in time.

#### INCREASING FAT CONTENT IN MEALS BLUNTS JUMPS IN GLUCOSE MUCH MORE THAN LEAN PROTEIN.

The more fat, and the earlier in the meal, the less the glycemic response. Eat good fat, preferably as an appetizer before the entrée. I now eat four Brazil nuts and one tablespoon of almond butter first thing upon waking.

#### FRUCTOSE HAS A LARGE AND VERY EXTENDED GLUCOSE-LOWERING EFFECT, BUT THIS DOESN'T MEAN YOU SHOULD CONSUME IT. LOW BLOOD GLUCOSE DOES NOT ALWAYS = MORE FAT-LOSS.

For one week of my testing of the SEVEN device, I drank 14 ounces of orange juice first thing in the morning as my benchmark instead of white bread or glucose. Once I'd established my typical response to 14 ounces of one brand of OJ, I could isolate one variable (like vinegar or lemon juice) and measure the deviation from my usual morning response.

OJ helped me to maintain much lower average glucose values throughout the day.

Does this mean you should eat more fructose? Not necessarily.

My fat-loss plateaued as soon as I introduced fructose (the 14 ounces of orange juice), even though it created a

pleasant flat line around the 100 mg/dL mark.[27] In future tests, I would like to see if a much smaller amount of fructose in whole fruit form, probably berries, could be used to blunt glucose response without stalling fat-loss or causing fat gain. I think this would ideally be limited to a 24-hour period like a binge day and consumed 30 minutes prior to the one or two highest-GL meals, similar to how I used a *small* amount of OJ before croissants on September 26.

It's easy to get fixated on one measurement, whether the number on a scale or the number on a glucometer. But, as Warren Buffett, the richest investor in the world, is fond of emphasizing: it's not enough to simply measure things—you have to measure what matters.

If your goal is fat-loss, before-and-after bodyfat percentages determine pass or fail, not glucose measurements alone. Keep your eye on the right ball.

#### VINEGAR, COUNTER TO EXPECTATIONS, DIDN'T LOWER GLYCEMIC RESPONSE. LEMON JUICE, ALSO COUNTER TO EXPECTATIONS, DID.

There's a great deal of evidence for vinegar lowering the glycemic index of a meal by more than 25%. It seems as reliable as any food "rule" could be.

Both white vinegar and apple cider vinegar were used in the literature. But acetic acid is acetic acid, so any kind of table vinegar that has at least 5% acetic acid should work[28] if you consume at least 20 milliliters (1.5 tablespoons).

In my trials, neither white vinegar nor balsamic vinegar had a lowering effect on blood sugar. I even drank 3 tbsp+ of vinegar before my meals as a last- ditch attempt. Unhappy times in stomach-ville and no discernible benefit.

Why no effect? There are a few possible explanations, but the most likely are: I need a higher dose, or vinegar doesn't affect fructose metabolism and showcases its effects in a high-starch meal. Recall that, owing to the problems of standardizing true real-life mixed meals, I used changes in responses to OJ as a benchmark.

Lemon, however, showed its merits without fail.

There are anecdotes and websites galore that claim lemon juice lowers glycemic index. Neither my researchers nor I could find any controlled studies showing evidence of a GI-lowering effect for lemon, lime, or citric acid. The closest was citrate, a salt or ester of citric acid in combination with other things like insoluble calcium. In my personal trials, three tablespoons of fresh-squeezed lemon juice just prior to eating (not store-bought with preservatives and artificial additives) appeared to lower blood sugar peaks by approximately 10%.

#### CINNAMON, EVEN IN SMALL DOSES, HAS A SUBSTANTIAL EFFECT ON GLUCOSE LEVELS.

There is ample evidence that cinnamon can be used to reduce the glycemic index of a meal up to 29%. At four grams per meal or even six grams per day, it can lower not only blood glucose but also LDL cholesterol and triglycerides. Cinnamon weighs in at 2.8 grams per teaspoon, **so four grams of cinnamon is about one and a half teaspoons.**

Cinnamon's effect on glucose levels seems partially due to the fact that it slows the rate at which food exits the stomach (gastric emptying), which means that you also feel full faster with cinnamon.

I tested three species of cinnamon: **Ceylon cinnamon** (*Cinnamomum verum* or *zeylanicum,* also referred to as "true cinnamon"), **Cassia cinnamon** (*Cinnamomum cassia* or *aromaticum*), and **Saigon cinnamon** (*Cinnamomum loureiroi,* also known as Vietnamese cinnamon).

Though Cassia is thought inferior to Ceylon or completely ineffective in some bodybuilding circles, it has lowered glycemic response in both published studies and in my experience. This is fortunate, since Cassia is what is most often found at coffee shops and restaurants if you ask for "cinnamon." I found Saigon cinnamon to be most effective, with Cassia in close second place and Ceylon in much further third place.

In terms of reducing glycemic response, I found the following, from largest to smallest effect, effective:

**1. Get freshly ground cinnamon or grind it yourself**. If you, like me, have a bachelor-special spice rack that's three years old, toss it and get new raw materials. The polyphenols and active ingredients degrade over time and with air exposure.

**2. Learn how to spot species.** Unfortunately, U.S. packagers are not legally required to specify the type of cinnamon species on the label. Not sure which raw "cinnamon" sticks are Cassia? They will roll up from both sides, like a scroll. Ceylon will roll up from one side, as if you had rolled up a bathroom towel. Distinguishing powder is harder, as age plays a part, but Cassia tends to be a darker reddish-brown and Ceylon a lighter tan color.

**3. Don't use too much.** It's easy to get overambitious with cinnamon, but there are active substances that can hurt you if consumed in excess. Coumarin, as just one example, is a potent blood-thinner and some cinnamon in Europe has a warning label for this reason. Use no more than four grams per day. I use a few dashes in coffee and limit myself to two to three cups of coffee throughout the day.

To reiterate, based on material bulk density reference charts, cinnamon weighs in at 0.56 grams per cubic centimeter, one cubic centimeter = 0.2 teaspoon, and so there are **2.8 grams of cinnamon per teaspoon.**

**So four grams of cinnamon = 4 divided by 2.8, or just about one and a half teaspoons. Don't consume more per day.**

#### MORE THAN QUALITY, IT'S THE SIZE AND SPEED OF MEALS THAT DETERMINED GLYCEMIC RESPONSE.

Even on protein and vegetables alone, I could bump glucose as high as 150 mg/dL without much effort. Granted, I eat like a starving dog. In Whym restaurant in Manhattan, one friend nicknamed me "Orca" after watching me nonchalantly swallow a piece of ahi-tuna the size of my fist. To him, this was unusual. To me, it was the only way I'd ever eaten: fast.

The easiest thing you can do to decrease glucose spikes is slow down. I had to methodically finish my plate in thirds and train myself to wait five minutes between thirds, usually with the help of iced tea and slices of lemon. It also helps to drink more water to dilute digestion (I'm fantastic at this), eat smaller portions (not so good at this), and chew more (Orca is *terrible* at this).

All four strategies serve to decrease the amount of food that gets digested per minute, which will determine the size of your glucose arc.

Two real-world examples:

1. Matt Mullenweg, lead developer of the WordPress blogging platform, lost 18 pounds with one change: chewing each mouthful of food 20 times. The exact number wasn't important. It was having a precise number that helped. Counting slowed him down and made him aware of portion size, which made him less likely to overeat. I don't have the patience for chewing like normal humans, but Matt did.

2. Argentine women are famous for being gorgeous and eating crap. In total, I've spent about two years in Buenos Aires, and the female Argie diet appears to consist of little more than cappuccino, cookies and biscuits, a super-sweet caramel called *dulce de leche*, ice cream, and—for dinner—meat and salad with a side of pasta. Is it just fantastic genetics? I don't think so. Several male friends have traveled with petite Argentine girlfriends, who, once in the United States or Europe, immediately put on 10–20

pounds. The reason? The girls themselves admitted it: increased portion size and increased speed of eating. The beautiful people of Buenos Aires might eat a wide spectrum of garbage calories, but they tend to do it in small bites and over a long period of time.

Slow down and smell the roses.

Make 30 minutes the minimum for a meal.

#### FOR FASTEST FAT-LOSS, MINIMIZE YOUR BLOOD SUGAR BUMPS ABOVE 100 TO NO MORE THAN TWO PER DAY.

I was able to sustain rapid fat-loss if I didn't jump above 100 mg/dL more than twice daily. Fat-loss was marginally greater when I remained under 90, but this was difficult to achieve without omitting legumes and following more of a ketogenic diet. For convenience and socializing, I prefer the slow-carb approach unless I'm dieting to below 8% bodyfat.

The 100-mg/dL rule excludes binge day, where all is allowed. On nonbinge days, using fructose or semistarvation to remain under 100 mg/dL is counterproductive and considered cheating.

But how to keep yourself under 100 mg/dL if you don't have an implant in your side?

Just follow a handful of simple rules based on the literature and my personal tracking, in addition to the basic tenets of the Slow-Carb Diet:

• Eat decent quantities of fat at each larger meal. Saturated fat is fine if meat is untreated with antibiotics and hormones.

• Spend at least 30 minutes eating lunch and dinner. Breakfasts can be smaller and thus consumed more quickly.

• Experiment with cinnamon and lemon juice just prior to or during meals.

• Use the techniques in "Damage Control" for accidental and planned binges. Keep in mind that the techniques in that chapter will help you minimize damage for about 24 hours, not much more.

**TOOLS AND TRICKS:**

**DexCom Seven Plus (www.dexcom.com)** The DexCom Seven Plus is the continuous glucose monitor I used and abused. It is an implant that gives you the approximate data of 288 fingertip blood samples per day. I found it invaluable, even as a non-diabetic.

**WaveSense Jazz Glucometer (www.fourhourbody.com/jazz)** This is, by orders of magnitude, the best glucometer I found. It's small, simple to use, and incredibly consistent, as it accounts and corrects for environmental factors. For those who don't want an implant but want an actionable glimpse of how they respond to foods, this is a great option.

**Glucose Buddy (www.fourhourbody.com/app-glucose)** Glucose Buddy is a free iPhone app for diabetics that allows you to manually enter and track glucose numbers, carbohydrate consumption, insulin dosages, and activities.

**Juliet Mae Fine Spices & Herbs (www.julietmae.foodzie.com)** This is where you can buy Juliet Mae's delicious cinnamon. I used her sampler for all testing, which includes Cassia, Ceylon, and Saigon cinnamon.

**MiR 50-Lb. Short Adjustable Weighted Vest (www.fourhourbody.com/vest)** The best weighted vests in the business. This is what I almost wore through airport security. If you want a rifle butt in the head at customs, it's the perfect choice.

22. Technically, interstitial fluid levels, from which the blood glucose is extrapolated.

23. GL = (GI x amount of carbohydrate in grams)/100.

24. I was looking at artificially creating food allergies and then removing them, an experiment that didn't make it into this book.

25. If you're ever in Mill Valley, California, go to Small Shed Flatbreads and get this dish.

26. Eaten for specific non-slow-carb reasons. See the "Sex Machine" chapter for more.

27. The reasons for this are explained in "The Slow-Carb Diet I."

28. Or a serving of any unsweetened table dressing that amounts to the equivalent of 20 milliliters of 5% acetic acid.

# THE LAST MILE

## Losing the Final 5–10 Pounds

**I saw an angel in the block of marble and I just chiseled until I set him free.**
—Michelangelo

I looked down at my pad of paper and read the first question: "What's the biggest mistake that drug-free 'natural' bodybuilders make?"

"Natural bodybuilders?" John Romano laughed. "The biggest mistake 'natural' bodybuilders make is thinking they're natural. Eating 20 chicken breasts a day isn't natural. The best I'll give them is 'over-the-counter.' "

And so our conversation began. It was going to be a fun interview.

Romano had his finger on the pulse of physique augmentation for more than two decades as the editor in chief of *Muscular Development* (*MD*) magazine. *MD* is the one mainstream magazine that serves as an intersection between published research and experimentation in the wild world of bodybuilding. *MD* wasn't enough for John, so he left to push the boundaries even further on a site called RX Muscle.

I reached out to him about specifics of drug- assisted and drug-free approaches for achieving sub-10% bodyfat, as he's observed thousands of guinea pigs and their results. John is a testament to his findings: he looks like he's in his thirties though he just turned 50, which he credits to infrequent HIT-style resistance training (see "From Geek to Freak"), a simple decision-free diet, and a "modicum of the right drugs."

The diet he follows for fat-loss, and the one he prescribes to competitors, is also that of his business partner, whom we'll meet later: Dave "Jumbo" Palumbo. It is an elegant and effective means for losing the last 5–10 pounds that seem resistant to everything else.

The following menu is for a 200-pound male at 10–12% bodyfat, and the ounces of protein (8 ounces for a 200-pound male) should be adjusted up or down 1 ounce per 10 pounds of *lean* bodyweight (e.g., 7 ounces for 190 pounds, 9 ounces for 210 pounds) with a minimum per-meal intake of 4 ounces. In other words, even if you weigh 100 pounds, you will not decrease the ounces of protein below four ounces.

For sizing: half a cup of almonds is about 60 almonds, and eight ounces of lean protein is approximately the size of your fist.

Here's the kicker: **One of these meals has to be eaten every three hours while you're awake, and you must eat within one hour of waking and one hour of bed.** Hunger is no longer the driver for food intake. Tupperware is your friend, and the clock is your drill sergeant. Skipping meals is not permitted, so purchase in bulk and prep food in advance if needed.

If you weigh less than 150 pounds, use the lower end of protein intake at four ounces protein (or 30 grams for protein shakes) and have smaller portions for the add-ons: a *quarter*-cup of nuts *or* one tablespoon of peanut butter *or* one tablespoon of extra-virgin olive oil (EVOO) or macadamia oil.

Eat one of these meals every three waking hours:

**Option 1:** 50 grams of whey protein isolate + half a cup of nuts or two tablespoons of peanut butter

**Option 2:** eight ounces of cooked, white, nonfatty fish (no salmon, mackerel, etc.) + half a cup of nuts or two tablespoons of peanut butter. Acceptable fish include, but are not limited to, lean tuna, white fish, bass, catfish, pike, whiting, and flounder.

**Option 3:** eight ounces of cooked turkey or chicken + half a cup of nuts or two tablespoons of peanut butter

**Option 4:** eight ounces of cooked fattier protein: red meat (à la flank), ground beef, fatty fish, or dark

poultry + one tablespoon of olive oil or macadamia oil

**Option 5:** five whole eggs (easiest if hard-boiled)

Unlimited quantities of the following are allowed at each meal:

Spinach

Asparagus

Brussels sprouts

Kale

Collard greens

Broccoli rabe

Broccoli and other cruciferous vegetables

One tablespoon of olive oil or macadamia nut oil can be included as dressing, as long as you have not included the half-cup of nuts or two tablespoons of peanut butter in that meal. In the lower-fat meal options, you may make a salad dressing using slightly more oil: two tablespoons olive oil or macadamia oil.

No corn, beans, tomatoes, or carrots are permitted, but one cheat *meal* is encouraged every seven to ten days.

Simple and effective.

## WHAT THE BODYBUILDERS ADD THAT YOU SHOULDN'T

The above diet can get you to 8% bodyfat or even less. Needless to say, there is a point of diminishing returns when each additional 1% drop is more difficult than the preceding 5%.

If training and diet hit a ceiling, how on earth do bodybuilders get to less than 4% subcutaneous bodyfat?

In a word: drugs.

Romano's pre-competition schedule on the following page assumes a well-trained 5'9", 200- to 220-pound bodybuilder at 10–12% bodyfat who gets down to 180–190 pounds at 6–8% bodyfat before implementing the drug regimen. On contest day, he should end up at 200–205 pounds at less than 4% bodyfat.

Almost all of the drugs listed can have serious side effects when misused. Google "Andreas Munzer autopsy' to see what can happen when you make mistakes.[29] Do not try this at home.

"This is really, in my opinion, the best way to prepare," Romano says, "but you need patience, and that is usually more difficult to build than the muscle. Train with super-high intensity (one body part per day, five days a week) and do cardio (30–40 minutes per day). Continue this regime during your 'pre-diet' phase. You will want to whittle your bodyfat down VERY low with a no-carb diet—under 8%. You have to keep up the intensity and the cardio. This is probably going to take 10–12 weeks. Crazy as it sounds, you want to break down some of the muscle you just built and deplete yourself as much as possible.

"Then you add the juice. One Sustanon every other day with 75 milligrams trenbolone (Tren) or 200 milligrams Deca-Durabolin (Deca). Two IU Growth Hormone (GH) every day. Add 75 grams of carbs to your first three meals Drink 40 grams of whey protein isolate before bed. Wake up four hours later and drink another 40 grams. Back the cardio off to 30 minutes, four times a week, and keep upping your training intensity.

"After eight weeks, switch from Sustanon and Tren to Equipoise (EQ)—150 milligrams every other day, and Primo Depot, 400 milligrams once a week. Up the GH to 4 IU every day. Back your carbs down gradually to zero by the end of the first week. Switch your training to lighter weights and higher reps, but still with high intensity. Bring your cardio up to 30 minutes a day, six days a week. Start practicing mandatory poses 30 minutes every night. Work up to holding each pose for one minute.

“After four weeks, add 100 milligrams of Masterone every other day, 100 milligrams of Winstrol (Winny) every day, two Clenbuterol (Clen) every four hours, 25 micrograms of T-3 every morning, and a cap of GHB before bed. Increase posing to 30 minutes in the morning and 30 minutes at night. You can stay on this for four to six additional weeks.

“Two weeks out: Stop Clen. Add 25 micrograms of T-3 before bed. Cut fat out of diet.

“One week out: Go back on Clen as before. Stop GH.

“Three days out: Cut sodium, add 50 grams of carbs to first meal, stop cardio, increase water consumption to at least two gallons a day.

“Two days out: Last training session—full body, high rep with super-high intensity. Add 50 grams of carbs to first two meals. Stop middle-of-the-night protein shake.

“One day out: Add 75 grams of carbs to last two meals. Stop drinking water at 8:00 P.M.—only little sips after that, as few as possible. Cut Clen. No shake before bed.

“There will be a few tweaks to this system during its progression, as every person will respond differently. But this should give you a good platform.”

Aesthetics are one thing, therapeutics are quite another. For a glimpse of the latter, we must learn from Nelson Vergel.