From the Author who brought you
MACROS EXPLAINED

MACROS APPLIED

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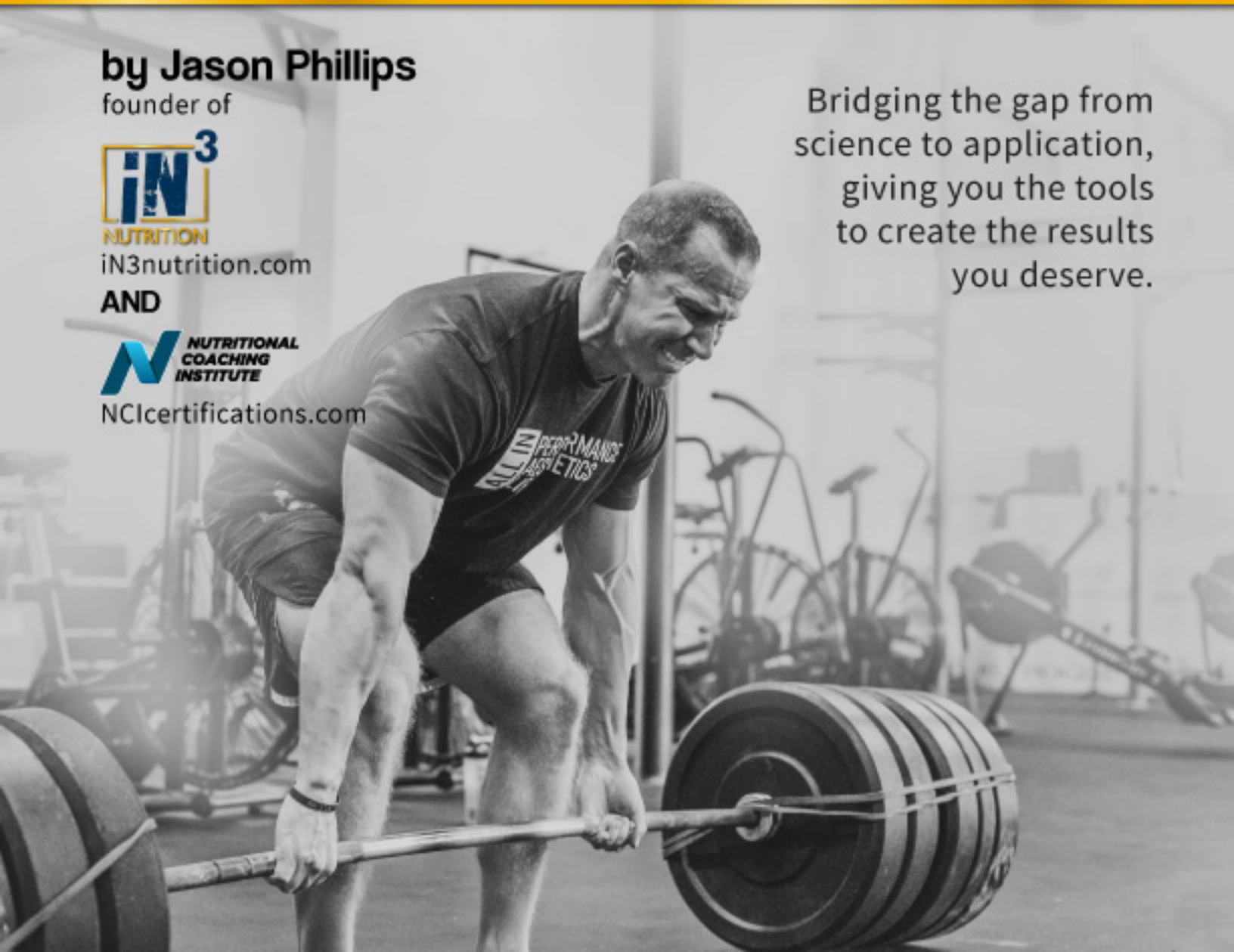
Bridging the gap from science to application, giving you the tools to create the results you deserve.



A Note From Jason: How to Use This Book

As any responsible professional will do, we must remind you that this information is simply that—INFORMATION. Your application of this information will be individual in nature, and can be distinct from what is considered to be "normal."

All content found in this eBook, was created for informational purposes only. The Content is not intended to be a substitute for professional medical advice, diagnosis, or treatment. Always seek the advice of your physician or other qualified health provider with any questions you may have regarding a medical condition. Never disregard professional medical advice or delay in seeking it because of something you have read in this book.

If you think you may have a medical emergency, call your doctor, go to the emergency department, or call 911 immediately. Reliance on any information provided by this book, iN^3 employees, or contracted writers is solely at your own risk.

Over the last two years, the iN^3 Dream Team has completely changed the game in nutritional consulting. We have done this by instituting frequent interaction with our clients, so as to ensure that we always know what is going on with them, their body, and their lifestyles. Biofeedback or physiological feedback is constantly assessed, so we can make sure the implemented dietary strategy is working.

Even if you're not working with us (if you're interested, you can contact us directly at admin@in3nutrition.com OR by visiting www.iN3nutrition.com), you need to do the same for yourself.

To do this, we recommend that you record several pieces of information daily.

When you are accurately hitting your macros daily, you can test your body's reaction on a physical and physiological level.

If you like the results, keep going. Why fix what isn't broke?

However, if you are unhappy with the results, or you find yourself at a plateau, then it is time to make a change and re-test.

While dietary prescription is not overly difficult (and will be even easier after reading this book), it does need to be monitored carefully. Be sure to keep

accurate information about how you feel, look and perform. This will leave you with the REAL feedback necessary to determine how your diet is affecting you.

When in doubt, contact us! You can contact us directly at admin@in3nutrition.com OR visit our website at www.iN3nutrition.com and get in touch with us there.

We truly hope you find this book helpful, and we look forward to seeing all of the amazing results that we KNOW it will create!

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Introduction

We are currently living in what I believe to be an era of education. The level of nutritional knowledge in our society is at an all time high, but unfortunately so is the level of confusion around the application! From keto to carb cycling, and from fasting to carnivore, the number of dietary protocols in existence is at an all time high. Yet the simple question remains - which "diet" is best for YOU, the reader of this book???

First and foremost, it is important to clearly state that it is our opinion that there is no such thing as "good" or "bad" dietary protocols. Instead of glorifying or demonizing a given approach, we find it more prudent to simply identify the facts and then create a decision to implement or not to implement accordingly.

As you will learn in this book, you must begin with YOU - your goals, your dietary history, and who you are as a dieter (your lifestyle preferences, etc..). There are several ways we can apply physiology and biology properly inside of a dietary setup, but without emphasis on an individual, the application will never be accurate.

Our goal with this book is simple - give you the tools that you need to set up your dietary intake in accordance with your goals. Simple, right? Not so fast! As you will learn, each set of goals also comes with a set of sacrifices - these MUST be understood.

The information contained in the pages that follow is a collection of APPLICATION based principles that created successful transformations over the last 15 years. It is important to note that while we aim to back everything with science, we will dip into some empirical data and evidence to help with practical application.

As always, thank you for your time and commitment to becoming the best version of yourself. Some of you are coaches, and others are just looking for self-improvement, but no matter who you are we are extremely confident that ***MACROS APPLIED*** will help you on your journey!

CHAPTER 1

Introducing the Triangle of Awareness

Later in this book you will learn how to create prescriptions for any goal. In the next chapter you will learn how to properly structure your year to ensure you not only achieve your results, but potentially "recover" from these pursuits as well. But before we get to any of that, we need to ensure that you truly know what your goals are….and more importantly, what they are NOT! Allow me to introduce to you **The Triangle Of Awareness**.

The Triangle Of Awareness is a model that I built a few years ago when I began realizing that people truly do not understand their goals. Sure, you can likely identify what you "want." But are you aware of the fact that every set of goals also comes with a list of sacrifices?

This is why the illustration of the triangle is a perfect representation of a set of goals. If you look at the top corner of the triangle labeled as PERFORMANCE, you will note that it is a maximal distance from the other corners - AESTHETICS and LONGEVITY. This means that the methods used to pursue your performance based endeavor will not in any way take into account the other subsets of goals, aesthetics and longevity.

Have you ever heard someone say, "I want to perform better and lose fat?"

Be honest with yourself, you have likely made this statement too.

But considering that adequately fueling performance will likely come with a requirement of at minimum, caloric maintenance (more likely, a caloric surplus), and fueling fat loss will require a caloric deficit, the direct pursuit of both goals concurrently is not possible.

NOTE - This is not to say that small amount of fat loss will not be achieved during the pursuit of increased performance, but it can not be the direct GOAL of a protocol.

(You will learn how to ultimately achieve multiple sets of goals using the periodized approach that is outlined in the next chapter)

To help us better understand our goals, let's examine the three categories of goals, and how to properly fuel them.

PERFORMANCE

Performance can be defined as "the action or process of carrying out or accomplishing an action, task, or function." Nutritionally speaking, we tend to view performance through the lens of athletics, or athletic type endeavors like CrossFit, Olympic Lifting, Powerlifting, or other various forms of racing (sprinting or distance). All of these endeavors have clearly defined metrics relative to "improvement" - whether it be faster times or increased load, there is always an objective measure to discern whether performance is increasing or decreasing.

While it is important to understand what defines "performance" inside of nutrition, it is equally as important to NOTE what is not included when having this discussion:

No one has ever received a gold medal in the Olympics for having "the best abs."

No one has won the CrossFit Games for having "the best physique."

The world record IronMan Time was not awarded for "fittest physique."

The World's Strongest Man was not won based on the premise of "man likely to live the longest."

And the Super Bowl was not won by the team that collectively had the healthiest biomarkers in their blood work.

While each of the athletes in these respective endeavors likely did have some level of caring for their aesthetics and/or long term health, it was NOT the primary goal nor could their dietary protocol be built around the secondary sets of goals.

Instead, let's take a view of the factors that will affect a nutrition plan that will maximally fuel performance.

***NOTE - the list that follows assumes all things to be "normal"...i.e. There are no preexisting metabolic adaptations or hormonal imbalances that need to be addressed in addition to the fuel/recovery demands of a given activity.*

Adequate Intake Relative to Fuel and Recovery - While it may seem obvious, the first thing that must be included in a performance based protocol is adequate caloric intake.

While there are certain situations where a small caloric deficit will yield an athletic advantage, these are the exceptions and not the rules.

Instead, an emphasis on performance will require at minimum caloric maintenance and in most cases a small surplus of calories.

The composition of these calories (macro breakdown) will vary greatly based on the individual and the nature of the activity, but regardless of the protein, carbohydrate, and fat distribution, high quality, micronutrient dense foods should compose the majority of what is consumed.

Physical Demands of Activity - As you will recall from *Macros Explained*, once calories are determined inside of a prescription the next piece that needs to be determined is the protein intake.

The range for determining intake that was discussed in that book was .7g/lb - 1.2g/lb of bodyweight. This still holds true in the performance continuum with activities that require more relative body strength (CrossFit, football, etc.) necessitating more protein intake (closer to the 1.2g/lb) and activities that require less relative body strength (distance running, etc.) necessitating less protein intake (closer to and sometimes below .7g/lb).

Energy System Demands of Activity - From an aesthetic point of view, research indicates that if calories and protein are properly accounted for, then the ratio of carbohydrates to fats will not matter when it comes to fat loss. While empirically I have not always seen this to hold up, the truth is that it is completely irrelevant when it comes to performance. Instead, the quantity of fats and carbohydrates included in a prescription should be predicated on the energy system demands of the activity. Clearly a powerlifter and an IronMan athlete will need different sources and quantities of fuel, but so will an off-season and in-season CrossFitter. What is important to note is that this fuel source may NOT be what is optimal for "ideal body composition." As stated, this is perfectly acceptable as optimal performance and optimal aesthetics are never going to be created via the same prescription.

For athletes performing activities primarily in the ATP-PC energy system (short sprint, 3RM lift, etc.), stored fuel is going to be the primary fuel source. Logically we can conclude that routinely consuming a minimum of caloric maintenance and in many cases a small surplus would be advisable. The ratio of carbohydrates to fats will largely be dependent on the individual in these sports.

For athletes performing activities primarily in the glycolytic pathway (traditional strength training, CrossFit, 400m sprint, etc.), carbohydrate is going to be the primary fuel source. Assuming adequate calorie intake, timing of these carbs is far less important than current media suggests it to be. However, if trying to maximize performance while in a caloric deficit, carbohydrate timing around training can be very beneficial.

For athletes performing activities primarily in the oxidative pathway (jogging, long and slow distance efforts, etc.), fats will be the primary fuel source. However, it is very important to note that as you approach aerobic threshold, carbohydrates become the primary fuel source. Thus, activities such as marathons and IronMans, will undoubtedly be fueled (at some point) by carbohydrate. For this reason, endurance athletes should not only aim to consume adequate fats, but also to maximize their metabolic flexibility.

AESTHETICS

Aesthetics inside of physical pursuits is usually referenced in terms of achieving the "ideal physique." This is obviously a very relative term, but typically involves some amount of fat loss and/or some amount of muscle gain. Not once in my 15+ years in this industry have I had anyone come to me reporting the desire to lose muscle and gain fat….but I suppose we should never say never.

From a competitive standpoint, aesthetics are usually referenced in terms of bodybuilding (physique, figure, bikini, etc.) competitions. While extremely subjective in nature, the winner in these competitions is rewarded for having achieved low levels of body fat while simultaneously achieving and maintaining the appropriate amount of muscle. There are other variables that are judged (symmetry, presentation, etc.) but for the purposes of this book we will simply look at this endeavor relative to its need for fat loss and muscle gain/retention.

While bodybuilding stages are the pinnacle of aesthetics in terms of competition, the average person that is reading this book or being coached by a coach implementing these principles is simply looking to improve their cosmetics for a variety of other vanity based reasons. For some it is

vacation, for others it is to look better while pursuing dates, and of course there are plenty that are desiring to look their best for specific events like weddings or birthdays.

Regardless of whether the goal is to be competitive, or simply to "look better," the pursuit of improved aesthetics WILL NOT be achieved with a protocol that yields maximal performance or maximal longevity.

This is not to say that initially there won't be crossover, because in lots of cases there will be.

Weight loss is actually the number 1 thing usually needed for improvement in most health related issues. It can also help some performance based athletes, especially if relative body strength is important.

But we must note, weight loss and optimal fat loss relative to physique enhancement are often very different.

As you will learn shortly, a physique related fat loss protocol and optimal longevity protocol are also very different. The retention of lean tissue requires a relatively high protein intake, which while not "unhealthy," is also not OPTIMAL for longevity.

More simply stated:

Mr Olympia (the biggest bodybuilding competition in the world) is not awarded to the person with the biggest back squat or the healthiest blood work.

Progress relative to achieving an individual's "beach body" is not measured by strength of a deadlift or weekly check ups with the doctor.

And unless you are at a meathead convention, pick up lines to get dates rarely involve athletic performance or life expectancy.

As with performance, and as we previously stated, there will absolutely be crossover. But an ABSOLUTE AESTHETIC prescription will not be optimal for the other two segments of the Triangle of Awareness.

Let's look at what an ABSOLUTE AESTHETIC protocol will entail.

***NOTE - As with the performance protocol section, the list that follows assumes all things to be "normal"...i.e. There are no pre-existing metabolic adaptations or hormonal imbalances that need to be addressed.*

As noted earlier, absolute aesthetics are typically achieved with some sort of combination of fat loss and/or muscle gain. For this reason, we will examine what is needed for each.

Fat Loss

While there are many methods that can be used, achieving fat loss is actually quite simple. As you learned in *Macros Explained*, calories are king! Rule number 1 of any fat loss endeavor is simply to create an energy deficit (this can be done via diet or exercise, or a combination of both).

Later in Chapter 4 we will break down exactly how to do this for maximal results, but once a caloric deficit is established it is time to ensure you have created the proper composition of those calories (macro breakdown.) This will be ensure that we are creating FAT loss, and not simply WEIGHT loss.

While there are lots of factors that we will discuss later in this book, science is relatively clear when it comes to macronutrient composition for fat loss: Assuming that caloric intake and protein intake have been properly accounted for, the quantity/ratio of carbohydrate relative to fats is insignificant. This is to say that if a calorie deficit has been established, and protein intake is adequate, you (the individual pursuing fat loss) get to choose whether you consume more carbs or more fats.

Periodization will be the next major component of fat loss.

While a calorie deficit is absolutely necessary to achieve fat loss goals, a sustained calorie deficit WILL yield metabolic adaptations. For this reason, later in this book you will learn about things like diet breaks and maintenance phases, and how they are best used to facilitate success inside of fat loss efforts.

Recovery is the final, and most overlooked factor when it comes to fat loss. While this is not necessarily DIRECTLY a dietary prescription, varying degrees of recovery or lifestyle factors affecting recovery will absolutely need to be considered when creating a fat loss protocol.

Muscle Gain

Muscle gain is an important part of achieving the cosmetic goals that most individuals desire. Unfortunately, it is often one of the most misunderstood processes - especially relative to the amount of time required to achieve it.

First and foremost, it is important to understand WHY we should even pursue any amount of muscle gain to begin with.

Muscle gain is not just for bodybuilders - it is for EVERYONE. Science tells us that the greater amount of lean tissue we have, the faster our metabolic rate. In theory (not always direct application), this will allow you to consume more calories in any subsequent fat loss phase.

Additionally, it will allow for most people to optimize their aesthetics.

No amount of direct stimulation to a muscle while in a calorie deficit will create hypertrophy. This is to say that as you are "dieting down," you will not be able to create new lean tissue where you desire it. For this reason, if you never go through a muscle building phase, you will never truly be happy with your aesthetics at the end of a fat loss phase.

In Chapter 4, we will provide a more in-depth look at muscle gaining protocols, but from a principle standpoint, one thing MUST be present - a minimum of caloric maintenance, and in most cases a small caloric surplus.

NOTE - *this subheading is called MUSCLE gain, not FAT gain, so composition of these calories WILL matter.*

Recent research tells us that protein is king! However, while protein is an absolutely important part of the muscle building process, it is not necessary to over consume protein either. Remember, caloric intake will be at a minimum of maintenance level, so protein sparing nutrients (carbs and fats) will be adequate.

Similar to fat loss, periodization will also be necessary within muscle gaining.

Clearly eating in a small calorie surplus will yield some body fat gain in conjunction with the desired muscle gain. While this is totally normal, and absolutely expected, there are some negative consequences that can happen if you this process is prolonged.

It goes without saying that carrying excessive bodyfat is not healthy, but it will also reduce insulin sensitivity and can reduce performance in the gym which are not optimal for gaining new lean tissue.

For these reasons, periodic "mini cuts" or brief periods spent in a caloric deficit will ultimately lead to enhanced, LONG TERM results.

Finally, recovery is the final component of a muscle gain protocol. You can eat all of the food and perform all of the workouts that you want, but if you aren't getting adequate sleep and controlling stressors, your pursuit of muscle gain WILL NOT be optimal - period.

NOTE - I recognize that maximizing hormonal output is another component of muscle gain that should be addressed, but this is a topic not suited for this book.

LONGEVITY

Longevity based prescriptions are relatively new to the nutrition space, but are becoming increasingly more popular.

Before we dive directly into this topic, let's be clear that in several cases simply losing weight or performing marginally better (not an absolute emphasis) will yield a much better health profile.

With that said being said, it is very rare that we see a client come to us with a goal singularly rooted in their desire to live longer. Instead, we typically see "health increase" (i.e. quality of life, feeling better, etc..) as a secondary goal inside of other objectives. For this reason, we will examine longevity protocols in two different ways:

1 - Absolute longevity

2 - Relative longevity within other protocols

Absolute longevity

If you are reading this book for yourself or you have a client that simply wants to live a longer life, research tells us that the key is to control inflammation. We are beginning to see the examination of things like telomere length in predicting longevity, but all of these measures come back to inflammatory markers.

Physically this happens with a reduction in stress, and complete recovery.

In simple terms - this does NOT come from frequent, INTENSE exercise. It does not come from excessive caloric intake in pursuit of muscle gain. And it most certainly does not come from inadequate sleep or a lack of parasympathetic inputs.

Instead, those seeking to "live forever" will opt for very low intensity, cardiorespiratory and cardiovascular training and a very low stress lifestyle that does not include pressure at work or an inability to sleep adequately.

Dietarily, we know that a minor caloric deficit and primarily plant focussed diet are going to optimize longevity. While the aesthetic and performance

protocols had a heavy emphasis on protein intake, the longevity based protocol will not require nearly as much. Due to a lack of high volume resistance training, the need simply doesn't exist. Instead, those seeking longevity will opt for less protein and more high quality fats. Carbs, especially refined carbs, will also be minimized, and sometimes even completely eliminated. Research heavily supports the ketogenic diet - a diet composed of 70% fats, 25% protein, and 5% carbs - relative to improving longevity!

However, there are very few individuals in this world that get to sleep in a cold, dark room, walk on the beach for their exercise, remove themselves from the stressors of life, and consume perfectly prepared, micronutrient dense foods.

For this reason, we will now examine longevity relative to other protocols.

Longevity with Performance and Aesthetics

As we mentioned earlier - optimal performance will not come from optimizing health, and "the perfect physique" does not come with an optimized life expectancy - but very few people reading this right now will be seeking absolutes in their endeavors.

Instead, most sets of goals come with an undertone of longevity relative to the primary goal of either performance or aesthetics.

The single biggest way to ensure that longevity and health are accounted for in any prescription is to ensure that the plan is periodized. This is to say that any intensive phase where stressors are intentionally imposed to a large degree, is followed by a recovery phase that allows the body to return to a homeostatic balance or setpoint.

- Every "physique prep" (stage or beach) should be followed by quickly returning to caloric maintenance... and even gaining body fat.
- Every "season" for an athlete needs to be followed by a post season phase of emphasis on physical and physiological recovery.

These are non negotiables if you want long term success - PERIOD!

The second way to ensure that long term health is a component of a protocol is to look at food selection inside of caloric and macronutrient consumption.

While "high carbohydrate" is typically essential for performance, but not ideal for longevity, an athlete that desires to stay as healthy as possible will not immediately look to refine sugars as the source of these carbs. At some

point, simpler carbs will likely be unavoidable, but to maximize longevity relative to intention, the foundation of the protocol can not be built with an emphasis on micronutrient-void foods.

Additionally, “higher protein” and insufficient recovery will be necessary for most individuals seeking to achieve peak cosmetics. We also know that these same individuals can achieve any level of cosmetics desired regardless of micronutrient content of their foods (other than fiber.) With that understanding, it is critical to understand that if there is any desire for an emphasis on longevity, controlling food selection and maximizing recovery are the best ways to accomplish this.

Finally, the most overlooked variable in understanding longevity relative to other sets of goals is customization. While this may seem insignificant for “health,” I can assure you that it has extreme relevance. One of the worst things we see in the industry today is “diet hopping.” Jumping from diet to diet, fad to fad, and unhealthy practice to unhealthy practice, yet never seeing the physical results desired. What is not typically observed is the level of frustration and self doubt that is occurring. This leads to high levels of stress, a loss of sleep, and overall diminished feeling of well being. And as discussed earlier, stress and a lack of sleep are in complete contrast to a longevity based protocol.

CHAPTER 2

The Periodized Approach

In Chapter 1, you learned the necessary components for a prescription relative to each individual set of goals. What was not discussed, was how to recover from each of these dietary endeavors. And while the information contained above is absolutely correct when it comes to pursuing said goals, subsequent attempts at achieving similar goals without having first created an environment of recovery will not yield adequate results. For this reason, we MUST periodize and implement a multi-phasic approach when creating nutritional protocols.

While periodization is most commonly thought of in the athletic arena, the periodized approach has application in every dietary set up.

Re-read the above sentence, and let it sink in - it truly is the foundation upon which LONG TERM successful programs are built.

The pursuit of dietary goals typically comes with a relatively high amount of stress on the body. Whether the desired result is improved cosmetics or improved performance, achieving this goal IS a navigation away from set point or homeostatic balance. Anytime this occurs, there MUST be a recovery phase that allows for a restoration of homeostasis which will include restoring proper hormonal function. Without this phase, any subsequent dietary attempts WILL NOT yield optimal results, and in several cases can become the root cause of hormonal impairments.

Finally, while stress and recovery are the foundation of change, there must also be dedicated periods of change.

To quickly review, we have not identified the fact that dietary pursuits involve the following:

- Active pursuit of goals
- Recovery from active pursuit of goals
- Time allotted for physical change/improvement

The final piece that must be considered is a transition from the "improvement" period to the active pursuit of goals. This component has a physical requirement, but even more importantly will have a mental aspect as well!

When we put it all together, we have the following:

- **SEASON** - Active pursuit of intentional change
- **POST SEASON** - Active recovery from demands of "season"
- **OFF SEASON** - Strength/skill acquisition
- ***PRE SEASON*** - Transition physically/mentally towards the demands of "season"

As stated earlier, these "seasons" are not just for athletes, but rather for anyone seeking results. Let's now review periodization in both athletic and aesthetic populations.

PERIODIZATION FOR ATHLETES

Fueling the performance of an athlete has become far too myopic in the scope in which we view it. Simply put, the general emphasis of "nutrition for athletes" has solely been focused on fuel and recovery. While this is exactly what is needed, you know by now that this clearly misses accounting for the big picture. In Chapter 3 you will learn more about specific performance applications, but for now let's examine the fuel/recovery/lifestyle demands of each "season."

SEASON

Defining nutritional intake during a season is relatively simple and can be defined in three words: FUEL AND RECOVERY. This is not to say that other variables can't help, but this MUST be the emphasis. Once again….it MUST be the emphasis.

Creating and SUSTAINING maximal performance will only come from adequate fuel and recovery - period!

As you learned in Chapter 1, adequate fuel and recovery may not always yield optimal aesthetics and/or biomarkers relative to longevity, but those are not going to help you "win" your athletic endeavor.

Instead, understanding the energy system of your sport, and consuming enough specific fuel is the ONLY focus of this phase.

For most, this will come from carbohydrate, but as always there will be exceptions.

As a season progresses, additional considerations may need to be made to account for any recovery debt that has been created. Remember, season

schedules are built for competition, not around an ideal training/recovery schedule. Rarely will complete recovery occur, so increasing macronutrient intake will likely be necessary to offset this.

POST-SEASON

Earlier we discussed that every dose of stress should be followed by an equal dose of recovery. This holds especially true in athletics!

As a whole, the "season" phase can be viewed as a significant stressor leaving a significant effect on an individual - specifically in terms of injuries and hormonal balance.

For this reason, every "season" MUST be followed by a "post-season" phase.

While the singular goal of "season" is to ensure adequate fuel and recovery, the singular goal of "post season" is to ensure a return physically and physiologically to a homeostatic balance. This is defined by recovering from injuries and restoring proper hormonal function.

When we defined the typical fuel source for "season," we mentioned that the majority of sports are fueled by carbohydrate. While this does not always mean that "in season" protocols will be "low fat," it does indicate that most often the protocols during the season will not be adequate in terms of fat intake - especially to support the maintenance/rebuilding of the effects on the hormonal profile.

This is why as we restore caloric maintenance in the "post-season" phase, the emphasis of this caloric increase will be dietary fat intake. As you know from *Macros Explained*, it is dietary fat intake that can support proper hormonal function and support soft tissue health - not carbohydrate.

As with during "season," it must be remembered that this is NOT a period of time to emphasize aesthetics. In fact, activity in this phase will likely be reduced yet calories will not leaving a slight energy surplus - not an environment for fat loss. However, if future fat loss is the goal, having a properly functioning hormonal profile will be optimal to ensure maximal results. Additionally, having a slightly higher body fat level will also be a return to an approximate physical "setpoint," which will also help normal hormone and metabolic function.

OFF SEASON

Assuming that you have successfully completed a post season, the "off season" will be typified by strength and skill acquisition.

This period is NOT a time of competition, and assuming you are training appropriately (cough...crossfitters...cough) your fuel and recovery demands will not be nearly as high as "in season." Instead, individual skills that are needed to perform better in an individual's sport will be developed in this time.

This brings us back to the basic fundamental of change, stress imposition to facilitate an intended adaptation.

Increasing power output, increasing aerobic capacity, refining skills, increasing relative body strength, and even weight loss are all realistic goals that can be included in this season. Each will come with a different stressor, and must be followed by the appropriate recovery to ensure that the desired improvements are actually made.

Contrary to "season" and "post season," there are no general fuel requirements here. Speed and power will be calorie and carbohydrate specific, aerobic capacity may include more fats, and weight loss will have a variety of macro compositions all within a caloric deficit. Instead, this phase will require that you identify a goal, understand the energy systems involved, and implement accordingly.

Also in contrast to the "season" and "post season" phases, this IS a time that body composition can be emphasized. In fact, fat loss may yield performance increases in many cases, especially a sport where relative body strength or speed is involved.

PRE SEASON

The final phase of a periodized athletic protocol that needs to be discussed is the "pre season" phase.

From an activity standpoint, this is the phase in which sport specific training and activity is added back into a training protocol. This should not be full blown competition, but more specific energy system work and small competitive pieces will be built into this phase.

Naturally, if we are departing a singular emphasis on specific aspects of a sport, and entering a phase where aspects of the actual sport are being performed, then it is logical that the quantity and specific type of fuel begin to be adjusted.

For this reason, we must take a look back at our "season" protocols and begin implementing accordingly.

As you will recall, understanding the energy systems involved in a given activity will yield the macronutrient source of fuel provided to ensure

adequate performance and recovery. In most cases, this source will be carbohydrate, but as with all things nutrition this is not a blanket statement nor should it be treated as one.

The closer and closer you get towards a season, the higher the volume of sport specific activity you will be performing. Logically this will come with an increase in calories as well as an increase in the macronutrient specific to fueling the activity.

While aesthetics are rarely negatively affected in this phase, it definitely is worth noting that as with "season" and "post season," this phase does not come with an emphasis on aesthetics. Attempting to maximize any physical appearance, or even pursuing fat loss in this phase can prematurely begin creating a recovery debt - the same recovery debt that will only be exacerbated during the upcoming season.

By now you know that this will only be detrimental to not only performance, but can also negatively affect an individual physically and hormonally.

However, if executed properly, the "pre season" phase will go a long way in creating an environment for maximal performance as well as providing the best starting point from which to perform.

PERIODIZATION FOR AESTHETICS

As we discussed early, the word "periodization" usually elicits thoughts purely of an athletic pursuit. However, a periodized approach also has application, and should absolutely be implemented with every client - especially those seeking aesthetic improvements.

In Chapter 4 you will learn about some specific aesthetic applications, but for now let's review the fuel/recovery/lifestyle demands of each phase.

SEASON

We reference "season" within an aesthetic periodization as the time in which you are actively pursuing the desired end goal physically. The pinnacle of this would be a bodybuilder dieting for a show, but for most of you reading this book it will be some sort endeavor leaving you on a beach in a bathing suit, fitting into a wedding dress, or some other setting where you are desiring to appear at your physical best.

As discussed previously, the pursuit of fat loss will require a calorie deficit. Creating and sustaining this calorie deficit is analogous to the "fuel and recovery" focus of athletic periodizations. This MUST be priority number 1, or optimal aesthetics (assuming fat loss is required) will never be achieved.

Also noted earlier is that if we have properly set up a dietary protocol accounting appropriately for calories and protein, the ratio of carbohydrates to fats will be 100% relative to the individual. This is to say that there are no specific fuel sources required for this phase other than ensuring appropriate caloric intake and adequate protein intake.

Previously when we discussed athletic periodization, we reviewed that in most cases pursuing absolute athletic performance will not yield optimal aesthetics or longevity. Now it is worth mentioning that as we pursue optimal aesthetics, performance output can not be an emphasis and neither can biomarkers for longevity.

POST SEASON

For a third time now in this book, we will reiterate that every dose of stress should have a dose of recovery.

In athletic periodizations, you learned that the entire "season" can be viewed as a stressor to the body, and therefore must be followed up by a "post season" dedicated to recovery and a return to homeostatic balance. This also holds true in aesthetics periodization.

Remember that as humans we have a natural set point, and any navigation away from that set point will yield adaptations. While these adaptations are a normal part of any process, allowing yourself to become "adapted" will hinder any future pursuits that you undertake.

The return to setpoint or homeostatic balance inside of an aesthetic periodization is performed by increasing calories steadily over time until a restoration of maintenance has been achieved. While current research only tells us that caloric maintenance is the true key here, several empirical observations have suggested that assuming protein to be adequate, carbohydrates will be the primary macronutrient emphasized in restoration of metabolic hormones.

However, just as with athletic periodizations there will be some recovery of sex hormones required. For this reason, ensuring optimal fat intake is also advised.

When we discussed "season" for those seeking aesthetic improvements, we made note of the fact that performance would likely not be optimal. In the "post season" phase, performance will have the potential to increase, but SHOULD NOT be the training emphasis of this phase. From a fuel standpoint you will be in a far better situation than you were as you were "dieting down," but remember that the true recovery is happening physiologically with the restoration of metabolic and sex hormones. If we push the limits of performance, we will not truly be executing a post season phase and we risk not maximizing the desired outcomes of future "seasons."

OFF SEASON

Off season is also referenced as “improvement season.” In athletics we referenced this as “strength and skill acquisition,” but in aesthetics this time of year can have multiple applications.

It is relatively simple to identify that the goal of an off season bodybuilder is likely to build more lean tissue, and address any symmetrical issues that they will need to present on stage...

But what about the average person that has no desire to compete?

As a culture, we must begin viewing the process beyond simply the end result. The word improvement relative to the off season in aesthetics can also reference improvement in metabolic capacity and finding balance with fitness and life.

Most often, this is a time when I will work with clients to ensure we are setting them up for long term success. From an education standpoint, clients will continue to learn how to incorporate their dietary protocols into “life.” While this may sound a bit ridiculous (and to some degree, it is), the truth is that dieters view their nutrition protocols and their “lives” to be completely separate. It is the role of a coach to ensure that we bridge this gap, and create long term sustainability for an individual.

Clearly the average person is not overly concerned with adding another 5-10lbs of muscle before their next “bikini season,” but they certainly would love to be in a position where they can diet on more calories and/or have a better mental outlook on the dieting process as a whole.

PRE SEASON

As you learned earlier, the “pre season” phase involves re-introducing “season specific” activities. In athletics, this is as simple as playing the actual more sport more frequently instead of just practicing the different pieces. But in aesthetics this can be far more difficult to define.

Consider this: “season” for someone pursuing maximal aesthetics will be defined by a calorie deficit, maximal compliance without deviation, and quite simply - a lot of hard work!

Based on this information, the pre season phase for most dieters is two fold:

1 - begin creating more precision within tracking protocols

2 - mentally prepare for the rigors ahead

If done properly, allowing for this phase will alleviate the difficulty usually associated with the first few weeks of dieting.

PUTTING IT ALL TOGETHER

When executed properly, the periodized approach allows for continuous expansion and growth. Season after season and year after year, an individual should be maximizing their abilities to achieve their goals and recover from these pursuits. But if we do not account properly for the demands (both fuel and recovery) of each season, the desired cycle of expansion can quickly become a cycle of regression.

(Side note - for coaches reading this book, a periodized approach is your best retention tool inside of your business.)

CHAPTER 3

Applications for Performance

As you know by now, performance nutrition is about fueling an individual to be their best - period. The subsequent aesthetic changes, or longevity related effects can not be the emphasis of this nutritional protocol.

In application, we typically see two types of individuals pursuing a performance increase:

1 - Recreational individuals that simply want to "be better" in their given activity (i.e. CrossFit Class or strength training)

2 - Athletes that will compete at specific events over the course of a year

Let's examine both, and how to properly apply a periodized nutrition program for each.

RECREATIONAL INDIVIDUALS

In chapter 2 you learned that regardless of the desired outcome, every individual should be following some sort of periodization.

For the recreational individual, this is not always easy to identify.

Let's use CrossFit as an example.

Every year "The Open" takes place in February/March. Logically, most will assume that this period of time would be the individual's "season," and in most cases this will hold true.

But what about the local throwdowns that occur every month?

Several recreational individuals will find themselves competing at events like this several times throughout the year, and obviously wanting to maximize their placing.

So is each event a "season?"

Do we complete a full periodization between each event?

The answer, as with all things nutrition related, is it depends.

While you CAN likely go through 2-3 relatively complete periodizations in a year, the biggest limiter here will be the duration of the "off season." While this

may not seem like a big deal, remember that this is the period in which true change, and true improvement is created. If we are limiting this period of time to a few short weeks, do we truly believe that improvement is being created? Most likely, not.

So if the goal is to improve performance and maximize an individual's ability to compete in a given environment, we highly recommend choosing one event to be the focus of the year.

NOTE - this is NOT saying you can only choose to compete once per year, this is to say that your performance nutrition protocol should be built to prioritize the competition that you deem to be the most important each year.

Continuing with the example of a CrossFitter, let's use "The Open" as the desired performance season, and create an application for the average individual.

Season

Recall that nutritional protocols "in season" are built around 2 things: FUEL and RECOVERY.

Regardless of the individual, the application here will be relatively straight forward. To ensure that an individual is fueled, we must ensure that overall caloric intake is adequate.

If this is your starting point as an individual or with a client, you can calculate your maintenance calories using the TDEE x Intensity Factor Formula outlined in *Macros Explained*.

If you or your client have been adhering to a nutritional protocol prior to this point, you will likely want to increase the overall intake. This increase can come in several ways, but will mostly be dependent on the training age and training ability of the individual:

Beginners - Because most beginners are still making neurological adaptations in the training environment, the degree of fuel and recovery required is relatively low. For this reason, simply ensuring that post workout carbohydrates are consumed to offset the potential CNS/Cortisol effects of training will be the emphasis.

Intermediate - Individuals with a moderate training age will begin pushing their limits in this period. For this reason, adding additional carbohydrates (high molecular weight carbs - cyclic dextrin) immediately after training will be advised. In addition to this, as the 5 week competition continues, consider adding additional calories to the overall intake as the accumulation of fatigue WILL occur.

Advanced - individuals that are looking to advance to the next level of competition will obviously require the most amount of fuel and recovery. For these athletes, we recommend increasing caloric intake slightly at the beginning of the season to ensure adequate fuel is available, and of course adding carbohydrates in the immediate post workout window to ensure recovery. As with intermediate trainees, accumulation of fatigue will absolutely occur within the five week window, so additional caloric increases over the course of the "season" will likely become necessary.

While this book is all about APPLICATION, and I would love to be able to quantify the amount of carbohydrate or amount of calories that should be given during the season, the truth is that this will come as a direct result of reading an individual's biofeedback.

Finally, it is important to note that weight gain during "season" is likely. Additional caloric intake combined with increased inflammation is not a recipe for seeing the scale drop. This is OK and NORMAL - do not freak out! Remember, this is a PERFORMANCE protocol, not an aesthetic protocol - DO NOT reduce calories!

Post Season

You know by now that the "post season" phase is defined by a return to a homeostatic balance or set point.

To begin understanding the post season better, we need to examine WHY we need recovery in the first place.

During the season, fuel and recovery are king. This means that food quality is sometimes lower as the need for simple carbs is increased. While this is totally normal, there are some GI ramifications that need to be addressed in the post season.

Additionally, "season" is not typically associated with high levels of fat intake. No, we are not saying that you will be "low fat" by any means, but relative to the physical and CNS demands you are placing on the body, your fat intake will likely not be optimal. This is important because dietary fat intake can be assist in maintaining proper hormonal balance.

Finally, "competing" is a different stimulus than "training." When truly maximizing output, the demands on the nervous system are far greater, and need to be considered from a recovery perspective.

These three things are the major components to the post season phase for recreational CrossFitters.

Unfortunately, most recreational individuals will immediately want to either start dieting for their "summer body" or they will want to jump right into training to "be better for next year."

While both are admirable, clearly neither are appropriate. Instead, consider the following:

Application 1 - Gut Health Protocol. This book would be entirely too long if we tried to outline every gut health protocol available, but the emphasis here is to create an understanding for YOU (reading this book) that gut health needs to be addressed in this time frame. If you choose to overlook or omit this, you will NOT create the desired adaptations (improvements) in the off season. As you will learn later, nutrient intake is only the first part of success, nutrient absorption is what really matters.

Application 2 - Increasing Fat Intake. While a reduction of dietary fat intake in season is not the only thing affecting hormonal status, and increasing dietary fat intake post season is not the only thing that will improve hormonal status, it absolutely WILL contribute positively to overall recovery in this phase. It is important to note that while this increase in fat intake can come with a slight decrease in either protein or carbohydrate intake, it should NOT yield an overall reduction of calories. Remember we are looking for RECOVERY, not fat loss.

Application 3 - Parasympathetic Activity. No, this is not a dietary protocol, but it needs to be understood. No matter how good your diet is, it will never account for a lifestyle or misapplied training program that does not yield the necessary recovery.

The duration of this phase will be variable, and as previously stated will be solely defined by a return to homeostatic balance.

Off Season

We know by now that "off season" is the period of time to create adaptations that will yield future performance increases. In most cases, this comes in the form of strength and skill acquisitions.

However, when discussing the recreational athlete, this doesn't always hold true.

Instead, most recreational athletes are usually trying to find balance in this phase. Very few will commit themselves to the training (and subsequent fuel requirements) necessary to create change for the long term, and quite frankly - that is totally OK!

Nutritional programming for the off season recreational athlete MUST start with a conversation.

What is the real goal of this time? What do you or your client want TODAY, TOMORROW, and FOREVER?

If the goal is future performance increase, then this season must be about fueling the necessary requirements that will make an individual better.

Conversely, if the goal is body composition improvement, this would be the season to do so. For some this body comp improvement will assist in performance (increase in relative body strength) and for others it will be pure vanity. Regardless, off season is the one time where body composition changes can be the primary emphasis.

The reason we can do this is because the off season is the one time that an individual can truly manipulate training volume and intensity without compromise.

In season, you MUST compete at your highest level.

Post season, you MUST reduce training volume and intensity to facilitate the restoration of set point.

Pre season, you MUST begin adding "sport specific" work.

But off season, there are no real requirements and the programming can be made to account for any set of goals.

APPLICATION POINT - Upon full recovery (completion of post season), the true application comes from goal setting. Without identifying the desired results, this phase will likely yield frustration before it yields results.

Pre Season

In athletic endeavors, "pre season" is typified from a training perspective by the introduction of sport specific or energy system specific work. Therefore, an athlete must fuel accordingly, most often with the introduction of more carbohydrates.

However, in the recreational individual the pre season is more closely associated with a recommitment to the process.

In the "off season" section above, we gave three scenarios:

- An individual that seeks the necessary changes to truly create a future performance increase.

- An individual that chooses to find “balance” in the off season.
- An individual that chooses to emphasize body composition in the off season.

Each of these scenarios will yield a different application for the pre season phase.

APPLICATION POINT - review what was accomplished (or not accomplished) in the off season

For the individual that prioritized athletic improvement in the offseason

This is the most straightforward application, and will simply consist of restructuring macro prescription to account for the increase in sport specific work. If body composition (most specifically weight and body fat loss) was an emphasis, an increase in calories in this phase will also become necessary.

An individual seeking “balance” in the off season

However, if “life balance” was the goal, then this phase will consist of simply rebuilding the habits necessary to be successful in the upcoming season. This will likely require a review of what was occurring during the previous pursuit of “balance,” and moving forward appropriately.

An individual that chose body composition

If body composition (most specifically weight and body fat loss) was an emphasis, an increase in calories in this phase will become necessary. Recall that we CAN control training intensity/volume in the off season, but as we move towards pre season there is a definitive type and volume of work that must be completed if we want to be successful moving forward. For this reason, we must begin departing a sole emphasis on body composition, and begin placing our focus into fuel and recovery.

PRE SEASON APPLICATION - Create an understanding of what was or was not accomplished in the off season. Determine what needs to be accomplished between today and the start of “season.” Plan accordingly to ensure that you are ready at the appropriate time.

Athlete’s that will compete at specific events over the course of the year

As mentioned earlier, the periodizations for recreational individuals and the periodizations for competitive athletes will vary, but not as much as you might think. Let’s examine what a periodized schedule might look like for a competitive athlete.

Season

As with any endeavor, season will remain to be about "fuel and recovery." This will never change, regardless of the application (even when you learn about this in aesthetic applications in the next chapter.)

For most sports this is very easy to identify - football runs from late summer to the end of the year/early following year, basketball runs from October to April/May, etc.. However, if we stay with the CrossFit example that we have been using, or even sports like Obstacle Course Racing, defining a "season" can be very difficult as there will likely be multiple events spread throughout the course of a year. Because the spacing of these events will not yield sufficient time to complete full periodizations between each one, a competitive athlete MUST begin to choose which event, or series of events, is most important.

This choice will provide a competitive advantage in the period of time that the athlete has deemed to be most important. We must note that this will also yield less than optimal performance in other times of the year. However it is our belief that that those attempting to be better at CrossFit should take notes from other sports - football players only peak for one competitive season, and the same with basketball, hockey, baseball, and pretty much every other professional sport. WHY do CrossFitters think they can compete all year? Quite simply - they can't if they expect to create long term improvement.

APPLICATION POINT - If your season is not clearly defined, define it! Prioritize what time or period of time will be most important. Once you have that time frame defined, the basic tenets of "in season" nutrition will apply.

Post Season

The "post season" phase for an athlete will have little variance from other post season prescriptions. It is important to reiterate, the key determinant for a successful post season is a return to homeostatic balance. This means full restoration of physically and physiologically from any of the effects of "season."

This phase is easy to identify in the mainstream sports like football, basketball, etc., but it is not so easily identified if we continue with the CrossFit example.

However, in the above section we identified that a mixed modal athlete will need to identify one specific period of time or event that they want to define as their season. Previously this would have been The Open - Regionals - The Games, but with the new format, we are currently unsure of how this will play out.

Once you have identified your season, more specifically the END of your season, you must be prepared to enter the post season phase.

Nutritionally speaking this is relatively straight forward - ensure adequate (note, not excessive) caloric consumption and increase dietary fat intake to help support hormone levels.

From a lifestyle perspective, this is not so easy. While this is not in any way a book about training, it must be understood that no nutritional protocol will work in the presence of improper training protocols. We mention this because the post season phase nutrition protocol MUST be accompanied by a reduction in training volume and intensity to facilitate a reduction of sympathetic inputs. This is easily understood in the mainstream sports like football, etc - as games simply stop being played. But in the CrossFit world, a return to "training" is just more CrossFit. In theory this CAN work, but in actual application we have seen very few individuals that can scale back the intensity and/or volume appropriately (yes, winning the workout is fun...we get it).

APPLICATION POINT - Determine the end of your "season" and begin post season protocols immediately. Consume approximately maintenance calories, adequate dietary fat, and ensure that lifestyle factors are appropriate relative to the desired recovery.

Off Season

As mentioned a few times before this, the off season phase should consist of strength and skill acquisition.

To continue with our example of more "mainstream sports" (football, basketball, etc..) vs "CrossFit", we notice that in "mainstream sports" the off season does not involve actual games. Instead there is a lot of a time in the weight room and doing skill specific drills relative to an athlete's position. From a nutrition standpoint, we simply choose to fuel and recover from these demands appropriately to ensure the desired adaptation is achieved.

However in CrossFit, the typical "training" is more of the "sport." While this is perfectly acceptable, a trainee must remember the desired outcome of this phase - ADAPTATION FOR FUTURE SUCCESS. Simply stated - TRAINING must not be confused with COMPETING.

APPLICATION POINT - At the beginning of an off season, determine the desired outcomes of this phase. Ensure that training has been set up appropriately, then fuel and recover from those specific training demands accordingly. There is no "general prescription" here, as each set of strength and skill acquisitions will vary in energy system use and subsequent fuel and recovery demands. Simply program accordingly.

Pre Season

The pre season phase for an athlete typically involves more sport specific work. In basketball, hockey, etc., this means actually beginning to play games. In CrossFit, this means doing more "competitive workouts" where the outcome is the emphasis, not the training adaptation.

For this reason, we must begin adding in specific fuel and recovery protocols to this phase.

We have outlined this several times prior, so refer back to previous if needed.

APPLICATION POINT - As we move towards actually playing a given sport, we must recognize the demands of this sport. Begin the pre season phase with an assessment of the fuel demands for the sport. Ensure that every dose of sport specific work is receiving an adequate dose of recovery nutritionally. Continue to scale appropriately as the volume of sport specific/number of games played increases.

CHAPTER 4
Applications for Aesthetics

When we think about creating a nutrition plan or hiring a nutrition coach, we almost always think about fat loss. And as you know by now, the media has picked up on this and has given you hundreds of different ways "guaranteed" to deliver the fat loss results you desire. Sadly these "guarantees" repeatedly fall short, leaving you frustrated and still without the results you originally wanted.

In full transparency, the conundrum of this book is that we guaranteed advice on APPLICATION. However, as you know there is no one size fits all prescription. With that said, we have chosen to outline the process and provided as much insight as possible as to what goes into each phase.

PRE-SEASON: THE PRE-DIET

As you learned earlier, periodization does not only apply to athletics. In fact, it may be the single most overlooked aspect of a nutritional protocol that yields aesthetic improvements.

Contrary to athletic prescriptions, the preseason here is not defined by an increase in activity and a subsequent increase in fuel requirements.

Instead, the PRE DIET has two major components:

1 - ensure that calories are adequate, and in a position in which a deficit CAN be created safely.

2 - mentally prepare for what lies ahead, and ensure that all lifestyle factors are planned and under control for the journey that lies ahead.

Let's examine both of these in greater detail.

Adequate Calories

As noted above, the media and internet gurus have preyed on the billion dollar fat loss industry only to leave unfilled promises. What is worse is that those unfulfilled promises have also left several individuals metabolically adapted, or in a position in which their hormone levels (sex hormones, thyroid, HPA axis, metabolic hormones, etc.) have adapted to a prolonged calorie deficit, resulting in an inability to lose fat or create any significant physical change for that matter.

Because this has become somewhat of an epidemic, the pre diet must ensure

that an individual is regularly consuming adequate calories and has not been in a position that will leave them entering the diet phase with pre existing metabolic adaptations.

Mental Preparation

Assuming that physically you are prepared to undertake a fat loss, we must also ensure that you are mentally prepared for what is to come.

First and foremost, we should quickly review the Triangle of Awareness and state that FAT LOSS goals are NOT in any way PERFORMANCE or LONGEVITY goals. With this in mind, the first acknowledgement that anyone undertaking a fat loss pursuit must understand is that a performance decrement is very likely to occur. Additionally, the pursuit of an extreme aesthetic change will not in any way yield optimal longevity either.

Remember that fat loss is a navigation away from set point, and the body will do everything it can to restore that set point.

Physically this will include things like hunger, fatigue, mood changes, and decreases in sex drive. These are NORMAL parts of the process, but must be expected if success to be had.

Additionally, we know that as the dieting process continues, eating out becomes far more difficult while staying within a given macro allotment. If you are someone that is social, this must be understood and prepared for.

In the end, understanding what you are and are not willing to sacrifice and simply preparing yourself for the process is a necessity when it comes to having a successful process.

SEASON: THE DIET

A brief review from *Macros Explained* tells us that to begin a fat loss phase, we must know a person's Total Daily Energy Expenditure (TDEE). This is found by simply multiplying the individual's BMR with an intensity multiplier that is based on activity and lifestyle.

Once you know TDEE, you can now create a caloric deficit.

APPLICATION POINT - For those with more weight to lose, a larger deficit is advise (up to 30%). Conversely for leaner individuals looking to simply lose the "last few pounds," a smaller deficit is advised.

The caloric deficit can be achieved via purely caloric restriction, or in combination with caloric expenditure via exercise or increases in NEAT.

As a review, once you have created a calorie deficit, you will set up the macros in the following way:

1 - protein

2 - fat

3 - carb

The exact quantities can be found in the *Macros Explained* book.

In theory once this caloric deficit has been established, fat loss should begin.

Empirically we know that the rate at which an individual subsequently loses fat is extremely individual, but this SHOULD begin the process.

However, as with all processes, there will be plateaus.

We have made mention a few times that fat loss is a navigation away from set point and will undoubtedly yield some metabolic adaptations. Aside from creating a larger calorie deficit, small diet breaks or restorations of maintenance calories, also referred to as refeeds, are typically a great way to bust these plateaus.

Again, there are no blanket statements as to how to best use refeeds, but because this is an application based book, we will outline a few examples and allow you the opportunity to implement accordingly.

Single Day Refeeds - There is no scientific data to support the use of single day refeeds relative to their ability to restore any sort of metabolic function, but empirically we have seen efficacy.

APPLICATION POINT - While there is no research that says single day refeeds will ignite or reignite a fat loss process, trying one when progress stalls is not a bad idea as they can serve as a great litmus test of what is truly going on. Often times we will see biofeedback restored - most specifically a hunger response and/or increases in sleep quality following one day of higher calories/carbs.

Multiple day refeeds - Research currently suggests that 2-3 day refeeds can re-stimulate fat loss during a prolonged period of a calorie deficit. These 2-3 days are typically going to be composed of maintenance calories and higher in carbohydrates.

APPLICATION POINT - If you truly feel that fat loss has stalled, before simply dropping calories consider a multiple day refeed. Additionally, before seeing fat loss stall, consider 2-3 days at maintenance calories at strategic intervals throughout the dieting process to prevent adaptive thermogenesis.

Maintenance weeks and diet breaks - Another “refeed” method is to provide

weeks at maintenance calories or even complete diet breaks. If a diet is properly planned relative to duration, using this technique will not only maintain optimal metabolic function, but can also serve as a great mental relaxation period.

APPLICATION POINT - Diet breaks and maintenance weeks are best used in long term, properly planned diet setups. Unfortunately most people do not properly plan, and opt to attempt to expedite the fat loss process. While this isn't overly bad and can certainly yield results, using diet breaks will help to OPTIMIZE metabolic function and preserve lean tissue in the process. Consider a maintenance week after 3 weeks of a significant calorie deficit, or a diet break every 6-10 weeks of a prolonged diet phase.

Final takeaways for active dieters - The dieting process is the single most volatile and unpredictable process known to man. While there is plenty of "theory" around what SHOULD happen, the truth is that we can never predict how a fat loss phase is actually going to play out. The most successful diets will be achieved using a strategy that effectively creates a calorie deficit, does not create an overabundance of stress that the body can not recover from, and allows for an individual to not feel withdrawn from their "normal life."

POST-SEASON: THE AFTER DIET

As mentioned several times already in this book, every dose of stress requires an equal dose of recovery.

With this in mind, and with the understanding that the dieting process is a very stressful process on the body, every diet phase MUST include an "after diet" phase - or recovery phase.

Similar to the "post seasons" we have discussed previously, this phase will be defined as a restoration of maintenance - both in caloric consumption and hormonal balance.

NOTE - THIS IS NON NEGOTIABLE IF YOU WANT TO CREATE FUTURE SUCCESS

There are two popular methods used in this phase:

1 - Reverse Dieting

2 - The "recovery diet"

Reverse Dieting

We have previously written a full book on Reverse Dieting and its benefits, but there are also some things that an individual needs to be aware of when undertaking this process.

The positives of a reverse diet include minimizing post diet "rebound" or fat gain. A rapid increase in body fat can be difficult for an extremely lean individual to handle mentally, so this slower process seems to be advantageous for most. Finally, the reverse diet is a process that is an active pursuit of maintenance restoration. Even though the caloric increases are small, they do have a definitive target that will yield the recovery necessary for the body.

The potential pitfalls actually come in the prolonged nature of a reverse. Remember that at the end of a diet phase, metabolic and sex hormones are likely compromised. By avoiding bodyfat regain, and continuing to live in a caloric deficit (even a smaller one), an individual is also prolonging the presence of these existing adaptations. This means that hunger will remain present, lethargy will remain present, and sex drive will take longer than usual to completely return.

APPLICATION POINT - Reverse diets work are a great tool, but not the only tool when working with individuals that are coming out of a diet phase or that are experiencing metabolic adaptation. As with the "season" phase, understanding what you are about to experience can be critical. Reverse diets do to seem to be more advantageous for those individuals that have been diet hopping, or have only been in a calorie deficit for a relatively short period of time in which extreme results were not the goal.

The Recovery Diet

The recovery diet was popularized by the gentlemen at 3DMJ. This is a more rapid approach to maintenance restoration, more focussed on the amount of weight an individual will gain in an (expedited) period of time.

One of the main positives I have seen with this approach is that it accounts for mistakes made in a reverse diet. As mentioned above, reverse diets still involve a significant amount of hunger and/or lethargy which yields a large number of mistakes throughout the process. Because those mistakes will ultimately yield weight gain, this approach has already accounted for them based purely on the desired outcome.

Additionally this method restores maintenance much faster which provides relief from the previously described adaptations like hunger, lethargy, and reduced sex drive.

The negatives related to this approach are almost all directly related to the amount of weight and body fat that will be gained in a short amount of time. Even though it is a NORMAL and NECESSARY part of this phase, it certainly is not easy and can lead an individual to attempt to prematurely resume their previous caloric deficit.

APPLICATION POINT - The recovery diet seems to be more advantageous and lifestyle friendly than reverse diets for "post season" after a diet that yielded extreme fat loss. With that said, be sure that you are ready for the physical results that will accompany this dietary protocol.

OFFSEASON: BUILDING A LIFESTYLE

Recall that in athletic applications, the off season was "improvement season." In aesthetic applications, the off season is typically a pursuit of balance or better stated, creating a lifestyle.

We know that the habits of the active diet and the subsequent weight gain of the recovery based diet are not sustainable methods, so the off season must help find a middle ground.

Physique competitors will want to leverage physique enhancement in this phase which will require a more significant level of diligence, but they are more the exception and not so much the rule.

Instead, the majority of individuals are not concerned with adding an extra inch to their biceps but rather being able to enjoy "life." This comes in many forms for people, but usually involves some combination of less frequent tracking, the introduction of more "non traditional diet foods" in social settings, and a lower overall feeling of stress relative to food consumption.

We will not go so far as to say that the off season is 100% about a shift to intuitive eating, because that simply is not true. In fact, absolute statements like this are the problem in our industry, never the solution.

Instead, the off season should be about building foundational habits that will be sustainable for life.

Perhaps it is as simple as consuming protein at every meal…

Or maybe it is an emphasis on food pairings…

For some it will be limiting alcohol intake to specific intervals…

The list is truly endless.

Because this book is about application, it is imperative that you decide YOUR (or your clients) correct application. This may take a bit of experimenting, but that is truly the beauty of custom diet protocols and this phase of a diet.

CHAPTER 5

Applications for Longevity

In full transparency, longevity based nutrition is the least researched facet inside the triangle of awareness. However, research is continuing to emerge, and this chapter will give distinct applications that individuals can apply to their lives and diets to maximize overall health.

Fasting

The use of time restricted eating patterns, or fasting protocols, appear to be some of the best longevity tactics that individuals can deploy to maximize longevity. Fasting has routinely been shown to improve insulin sensitivity (more in chapter 7) and decrease inflammation, both of which are directly related to improvements in biomarkers related to life extension. Most recently, fasting has been associated with a process known as autophagy, or programmed cell death. The theory here is that when the body is not digesting food and enters a fasted state, it can turn off and kill cells that are dying and malfunctioning. Even without autophagy, we do see that when in a fasted state, the rate of cellular repair is improved as is the production of new stem cells. Extending a fast to prolonged period of times, specifically 3-5 days can have the largest impact, and is correlated directly to cancer prevention, anti-aging, controlling diabetes, and improving cardiovascular disease.

Anti-Inflammatory Foods and Antioxidant Rich Foods

While the debate between food quality and food quantity still continues in the aesthetic world, the research is very clear that the food quality is king in relation to longevity!

Recently plant based diets have gained a significant amount of notoriety when examining their effects on longevity, but this is not the only option. Small amounts of animal proteins are advised to maintain muscle mass, but the rest of the diet should come primarily from plants, legumes, colorful fruits, and fermented foods.

This protocol will deliver high quantities of fiber - Earth's very own cancer fighting agent.

In practical application, we can see this type of diet mostly consumed in our world's blue zones - or the areas that contain the highest number of centenarians.

Time in nature and sun exposure

We know that the importance of Vitamin D, yet we still see a deficiency in very high concentrations in those with chronic disease. Going for a walk daily and allowing the sun to hit our skin is a great way to calm stress and allow our body to synthesize this important vitamin. Additionally, time in nature and frequent walks can lead to increased social engagement which has been directly linked to improved mental health and overall longevity.

Daily movement

Recent studies point to the fact that being sedentary may in fact be worse for your health than smoking cigarettes! However, excessively intense exercise is also not in any way conducive to improving longevity.

Instead, opt for daily, low stress movement. Consider daily walks, yoga, or other movement protocols that will yield a parasympathetic shift.

Alcohol Consumption

While there is not a lot of research that examines alcohol consumption and longevity, the observational data that does exist points to a very favorable effect from consuming 1-2 drinks daily.

You are welcome :)

Once again, this list may be seem incomplete relative to what is being discussed in society today but the CONCLUSIVE research is very few and far between at this moment. We firmly believe that in future editions of this book we will better be able to dive deeper into this topic, but for now the facts we have presented are what appear to be backed by science.

Ultimately, anyone seeking maximal longevity should aim to reduce stress, sleep adequately, move daily, eat high quality foods, and socialize.

CHAPTER 6

Micronutrients and Fiber

In the nutritional world today, macronutrients usually end up taking center stage. However the role of micronutrients are quickly creeping up in importance and appear to be stealing some of the macronutrients' spotlight... and rightfully so.

MICRONUTRIENTS

We know that micronutrients help provide some much-needed nutritional stability within the functions of the body. However, most still do not really grasp how essential they truly are to every facet of life. Additionally, if the body ever becomes low in any one of these much-needed nutrients, it cannot and will not perform optimally.

In the majority of situations involving macronutrient deficiencies, outward physical symptoms of malnutrition are easy to identify; however, this will not always hold true when a person is deficient in certain micronutrients.

The effects of Micronutrient deficiencies are less obvious, but they can affect virtually every aspect of the human body including (but not limited to) sleep, exercise performance, hormone creation/balance, antioxidant levels, stress management, and so much more. Unlike proteins that can be synthesized from amino acids and fats that can be synthesized in the liver, micronutrients are unable to be created in the body, which means that they will need to be provided through the diet or through exogenous supplementation.

Micronutrients are a fairly small category of bioavailable vitamins and minerals that serve countless functions in the human body such as helping in controlling the aging process, regulating a person's mood, keeping a person mentally and physically healthy, and even playing a huge role in your physical fitness level.

They include both vitamins and minerals and can be divided into four separate groups; water-soluble vitamins, fat-soluble vitamins, micro minerals, and trace minerals. Vitamins are organic substances that are derived from living matter and exist in either a water-soluble or fat-soluble form. In fat-soluble form, they include vitamins A, D, E and K, and in a water-soluble form, which include the B-complex vitamins and vitamin C. The vitamins that are dissolvable in water or water-soluble are not easily stored in the human body and any excess get flushed out with urine. Fat-soluble vitamins do not dissolve in water and their absorption is maximized when consumed alongside a source of dietary fat. After consumption, fat-soluble vitamins that

are not readily used are stored in in the liver and/or fatty tissues for future use.

Minerals are different from vitamins in that they are inorganic substances that the body cannot make on its own. Each of the 16 minerals plays a particular role in the health of the body and they can be broken up into two categories consisting of macro minerals such as sodium, potassium, chloride, calcium, phosphorus, magnesium and sulfur, and trace minerals which include iron zinc, iodine, selenium, copper, fluoride, chromium, molybdenum and manganese. Macro minerals are required in larger quantities in the body while trace minerals are required in much smaller quantities.

Micronutrients are categorized in two ways; as essential nutrients or as non-essential nutrients. The key difference here is that essential nutrients must be consumed by a person as the human body is NOT able to synthesize these nutrients on its own. Non-essential nutrients can be synthesized in sufficient quantities in the human body. There is actually a third classification as well called conditionally essential nutrients. The body CAN create these, just not in sufficient enough quantities. While essential, non-essential and conditionally essential micronutrients are found in many of the foods that come from the Earth, as well as the environmental and lifestyle factors present in society today, and the average population is just not getting enough of them in their diet.

In a perfect world, we would be able get all of the micronutrients we require for optimal health purely from the foods we consume. That is not the case. Due to a mixture of problems ranging from soil depletion to the over processing of our food supply, there are simply not enough micronutrients in the food that we eat today as compared to foods we ate years ago. For example, a person would have to eat 8 to 10 oranges grown in today's soil to get the same vitamin C levels that they would have received from a single orange that was grown 50 years ago.

That means that even the most carefully-selected diets may no longer provide you with all of the essential vitamins and minerals that you will need to thrive. That means a large percentage of the population will require micronutrient supplementation. And if someone has a higher-than-average nutrient requirement (prone to illnesses or diseases, exposed to environmental and genetic factors, or a high performing athlete), the deficiency is even more pronounced.

Medical studies continue to support just how large of a role micronutrient deficiencies play in the development of many serious health problems. With this information, the supplement industry has jumped on an opportunity to help fill that gap as micronutrient supplementation has soared in use and popularity. A large majority of the population takes at least a basic multivitamin.

Micros Are Required As Cofactors In Every Process In The Body

One of the most important functions that micronutrients perform is that they serve as cofactors and coenzymes for every type of reaction that takes place in the body. If a cofactor is organic, it is referred to as a coenzyme. The main difference between a cofactor and a coenzyme is that coenzymes are just the protein portion of the enzyme and thus are much smaller molecules. The second difference between the two is that a large majority of all coenzymes are derived from vitamins where many of the body's cofactors are derived from inorganic substances such as minerals.

Coenzymes take part in each reaction in the body by assisting the primary enzyme, but are not considered the primary substrate that are required for the reaction to take place. Coenzymes perform this function by specifically acting as carriers of atoms, electrons, and specific operational groups that are transferred from one substance to the next in a particular reaction.

If your body is lacking in any one of the micronutrients that serve as cofactors and coenzymes, then many of the body's processes may not take place or they will end up taking place at a much slower rate.

Just to detail how important certain micronutrients are when it comes to all of the reactions in the body, let's quickly cover some of the biggest. When it comes to water-soluble vitamins, many of the B vitamins act as coenzymes that are necessary for energy production. Vitamin B1, or thiamine, converts the physical nutrients that your eat into energy, while vitamin B2 is required to maintain proper cell function and fat metabolism. Vitamin B12 is needed in sufficient amounts when it comes to the creation of red blood cells. Vitamin C plays a long list of vital functions, but most important are the creation of neurotransmitters, adrenal hormones, and all of the collagen proteins that get used in generating skin cells.

Because water-soluble vitamins do not get stored in body in sufficient enough amounts, it is vital to consume enough of them from food or supplementation on a daily basis.

Unlike water soluble vitamins, the fat-soluble vitamins A, E, D and K can be stored in the body tissues. Despite that they too need to be consumed in adequate amounts in order for the body to function optimally. The list of functions that fat-soluble vitamins play is extensive. Vitamin A is needed to support vision, vitamin D is required for calcium absorption (for strong bones), and vitamin K is required for blood clotting.

Microminerals also play an important role in the body and are just as essential to vitality and health as water-soluble and fat-soluble vitamins. For example, calcium is required for the formation of bone, magnesium helps regulate

blood pressure (in addition to over 300 additional enzymatic processes in the body), sodium aids in electrolyte balance, chloride helps in the creation digestive juices such as hydrochloric acid, and sulfur is required for the construction of the amino acids methionine and cysteine.

Digestion And Absorption

While all of this is important, none of this matters if micronutrients cannot get absorbed into your bloodstream. After 15+ years of education, we often see the concepts of digestion and absorption get mixed up -they are in fact, not the same.

Digestion is a singular process by which food or macronutrients are broken down into simple chemical compounds. Examples would include amino acids coming from proteins, simple sugars from carbohydrates, and smaller lipids from fats so that they can be absorbed and utilized by the body. Most of the digestive process takes place mainly in the small intestine but there is a good amount that also takes place in the stomach.

Absorption is the assimilation of nutrients into the bloodstream. Absorption occurs via diffusion and/or osmosis and uses various gateways in the digestive tract (i.e., the gut lining, or various mucous membranes in the body such as the mouth or even the skin).

A simple and easy way to think about the difference between the two processes is that digestion is the physical breakdown of the foods you eat into smaller particles so the body can properly absorb them, while absorption is the physical process of transferring those broken-down nutrients into the bloodstream through the passage of the gatekeepers in the body such as the gut lining. It is important to understand that if either digestion or absorption are compromised in any way, then the nutrients from food cannot be utilized by the body.

The difference between physical and chemical digestion is another important aspect of the digestive process.

Mechanical digestion is a relatively simple process that starts with the physical breakdown of food through the act of chewing and mastication. This physical breakdown does not alter the chemical makeup of the food that comes into the body; however, chemical digestion does.

Chemical digestion is a much more complex process that involves breaking down the chemical building blocks of larger food such as proteins, lipids, nucleic acids, and starches so that they are small enough (and in the right form) where they can finally get into the bloodstream to nourish the cells of

the body. This process of chemical digestion is accomplished by numerous digestive enzymes and juices as well as through the process of hydrolysis.

Let's now look at what happens in the chemical digestive process and how the absorption of all three macronutrients really takes place.

Macronutrient Chemical Digestion

While the chemical digestion of starches begins in the mouth with the release of the enzyme called salivary amylase, the majority of chemical digestion takes place in the small intestine where the pancreatic amylases take over for the salivary amylase. It is the amylase enzymes that digest and break down starches into smaller fragments, followed by the secondary gut lining enzymes, or what are referred to as brush border enzymes, which break things down one step further into simple sugars so that these can be absorbed into the bloodstream.

The chemical digestion of proteins first begins in the stomach. It is in the stomach where hydrochloric acid (with the help of an enzyme called pepsin) first begins disassembling the chemical bonds of those proteins before proceeding into the second part of protein digestion that takes place in the small intestine. It is in the small intestine where the chemical digestion process continues with the help of the pancreatic enzymes, or specifically the protease enzymes. These protease enzymes help break the proteins down one step further into individual amino acids. At that point, the brush border cells secrete their own enzymes that break things down one more step resulting in molecules that are small enough to be absorbed and enter the bloodstream.

Now when it comes to the chemical digestion of fats, your body uses lipid-dissolving enzymes just like carbohydrates and proteins; however, the fat dissolving enzymes are only produced in the pancreas and not in the mouth. Almost every phase of lipid digestion takes place in the small intestine. The pancreatic enzymes in the small intestine along with the help of bile, emulsify and break down each triglyceride into two free fatty acids and a monoglyceride, and those end up being the simplest forms that can then be absorbed into the bloodstream through the gut lining.

Nutrient Absorption

The mechanical or physical process of chewing, the movement of digestive muscles that churn and mix the food in the stomach, and the chemical digestive process, all work together with a singular goal in mind - to break down the macronutrient food molecules to a form and size that are small enough to be absorbed through the cells of the gut lining in the small intestine

and thereby enter into the bloodstream for assimilation into cells.

Upwards of 80-90% of all nutrient absorption takes place in the small intestine with the rest occurring in the large intestine; although nutrient absorption in the large intestine is mostly just the reabsorption of some electrolytes and water. The processed food bolus that makes it way to the large intestine after passing through the small intestine is just indigestible food particles that consist mostly of plant fibers, a little water, and lots of bacteria.

Just as each macronutrient is digested differently, they also get absorbed into the bloodstream in different ways.

Carbohydrate Absorption

All carbohydrates must first need to be broken down or properly digested into monosaccharides or a single or mono sugar molecules. When carbohydrates are broken down into monosaccharides they are very efficiently absorbed. The indigestible carbohydrates, being mostly fibers, pass through the small intestine where they make their way to the large intestine to feed your beneficial gut bacteria and afterwards get eliminated in the stool. The monosaccharides that are most easily absorbed include glucose, galactose and fructose. As all three make their way through the epithelial cells of the gut lining, this is called active transport or the process of diffusion. Active transport is the movement of molecules across a semi-permeable membrane without the help of carrier protein. Active transport and diffusion are the movement of molecules from a region of higher concentration to a region of lower concentration.

Protein Absorption

After protein is broken down by your stomach and the small intestine into di, tri and single peptides, 95-98% of all their absorption takes place in the upper portion of small intestine referred to as the duodenum and jejunum. The fully and semi digested protein molecules get into the bloodstream via the active transport through the epithelial cells using the same process that takes place with carbohydrates. However, there are a few differences in terms of how the peptides are physically broken down and how they then gain entrance compared to their carbohydrate compadres.

For example, single peptides are readily transported across the epithelial cells without any delay and are freely admitted into circulation, but the amino acids that are still in dipeptides (two peptide bonds) or tripeptides (three amino acid form) first need to be broken down into single peptides before they can enter into the bloodstream; and it is that breakdown of the peptides

that actually takes place in the epithelial cells.

Lipid Absorption

Nearly 95% of all lipids are absorbed via the small intestine. That being said, large chain fatty acids must first be broken down into short-chain fatty acids through emulsification with bile, and then into an even smaller forms through the digestive enzyme lipase. An easy way to think about emulsification is what dish soap does to large globules of fat in the sink - it breaks them down into smaller globules, which represent the shorter chain fatty acids. Short chain fatty acids are, for the most part, water soluble, and they can enter the enterocytes (the absorptive/epithelial cells) directly through the simple process of diffusion and then end up following the same route that the monosaccharides and amino acids take when they enter the bloodstream.

Clearly the absorption of micronutrients plays a vital role in a healthy body. No amount of micronutrient consumption will matter if you are unable to properly digest and absorb them. Even the "healthiest" diet will not yield improvement in any of the areas of the triangle of awareness if these processes are not happening internally.

FIBER - THE UNSUNG HERO OF THE NUTRITION REALM

"So how many grams of protein should I be getting in per day?"

"How many carbohydrates should I consume?"

"How many grams of fish oil should I take in per day?"

While all of these are very common "health related" nutrition questions, what is not often asked is, "How much fiber should I be getting on a daily basis? And what types of fiber should I be eating?"

If fiber were a body part, it would be leg day. Everyone loves to train chest, back, shoulders, and most definitely arms (let's not forget the booty ladies), but very few people like to hit legs. Unfortunately, fiber gets the same focus in the nutritional world. We all love to discuss how much protein, carbs, and fats we should be consuming, but most often we overlook the simple conversation of how much fiber we should be intaking daily.

And in the end, I get it, fiber's renowned function is anything but a sexy concept. Most just consider it as something that helps keeps the bowels

moving (you mean poop isn't a sexy topic?!?!). Even if you are paying attention to your fiber intake, very rarely are you focusing on making sure you are getting in the right types of fiber which can directly impact whether you get sick or remain healthy.

Now because this is *Macros Applied* and not *Macros Explained* we are going to assume that a person who is reading this is somewhat experienced in terms of the importance that fiber plays in the body.

The reality is that fiber does way more than just help you have a healthy bowel movement or prevent colon cancer - although those are pretty significant. Despite your level of expertise, I am betting that you did not know that dietary fibers main role in the body is to feed gut bacteria so that those beneficial bacteria can produce short-chain fatty acids.

Those short chain fatty acids get absorbed into the bloodstream and then play a huge role in the regulation of the immune system, decreasing systemic inflammation, and feeding and nourishing the cells of your gut lining. A large percentage of healthy bacteria reside in the large intestine and when you consume a low fiber diet or a diet that is high in processed foods, almost all of the that food gets digested and absorbed long before it can make its way into the large intestine (assuming that you have healthy digestive system of course).

Conversely, higher fiber diets that include more raw and cooked whole vegetables, fruit with their skins intact, and whole, intact grains are all loaded with healthy fibers. When those fibers are consumed regularly, they reach the lower intestines relatively intact where they get consumed by the good gut bacteria, keeping your healthy gut flora fed and ready to help you thrive.

The human body cannot physically breakdown dietary fiber and that's why they play such an important part in the digestive process. But before we talk about that, let's quickly review the main types of fiber - soluble, insoluble, and prebiotic fibers.

Soluble fiber, like that found in cucumbers, blueberries, beans, and nuts, dissolves into a gel-like texture, and actually slow down the digestive transit time. This enables better absorption of excess water in the colon so that the stool contains less water and is more formed when it makes its way out. The physical and mental benefits of getting more soluble fiber into the diet is that it can help you feel fuller and for a longer period of time.

Insoluble fiber, found in foods like dark green leafy vegetables, green beans, celery, and carrots, does not dissolve in water at all and as a result, adds some weight and density to your stool. This additional weight or density helps the digestive muscles and increases the speed in which food moves through the

digestive tract, thus enabling healthy and regular bowel movements. A large majority of all whole foods that come from the ground, especially fruits and vegetables, naturally contain both soluble and insoluble fiber. For this reason, it is highly advisable that we eat a variety of foods that come from Mother Earth.

The 3rd type of fiber that needs to be covered is really more of a subclass of insoluble fibers called prebiotic fibers. Prebiotics are a group of fibers that have the very specific role of feeding the probiotics (or a person's healthy gut flora). In fact, the name prebiotic originated as in the pre-feeds the pro. Some of the best natural food-based prebiotics can be found in raw Jerusalem artichokes, raw chicory root, raw dandelion greens, raw garlic, raw leeks, raw onions and cooked onions, raw asparagus, raw wheat bran, baked wheat flour and raw or green bananas.

The Relationship Between Prebiotics And Probiotics

Before the role of prebiotics can be truly appreciated let's review how prebiotics and probiotics are interrelated. I do think that everyone has probably heard the word probiotics and they understand that they are live microorganisms that live inside of a person' gastrointestinal tract. You also likely know that they have some pretty important health roles in the body. What many may not know is that probiotics facilitate healthy digestion by crowding out any bad bacteria, acting as the "bouncers" of the GI Tract. They can create and manufacture certain nutrients in your body and can help in making sure that the digestive tract is always moving (creating regularity in bowel movements). They also make up a large percentage of your immune defense system. And just like any living thing, they too need to get nourishment from somewhere - when properly nourished, they can keep your digestive and immune system healthy and happy.

Prebiotics are the sole source of nourishment for a specific category of probiotics. The more prebiotics you consume in your diet from foods and supplementation, the more food that your probiotics will have to eat.

Prebiotics naturally come in many of foods that we eat daily, especially wheat products - although this comes with the assumption that you do NOT eat the Standard American Diet (or SAD). Real foods that come from the ground are foods that are naturally loaded with healthy fibers. The goal should always be to eat real foods, and by doing so you will be getting in lots of fiber.

Prebiotics can be a little more complicated and that is why it is important for you to know which foods and supplements they naturally exist in. Once you are aware of that list, you should try to add in a few into your diet (just as you would add in some fermentable foods such as kimchi or sauerkraut).

Fiber May Not Always Be Your Friend, So Knowing What To Look For Is Important

While it may seem that fiber is the long-lost messiah of the nutrition realm, there are going to be a few scenarios where increasing your dietary fiber and/or prebiotic consumption could cause some issues. For example if you have chronic digestive symptoms such as diarrhea, flatulence, stomach pains, reflux, intestinal permeability or leaky gut syndrome, food allergies/food intolerances, dysbiosis (an overgrowth of bad bacteria in the gut), or if a small intestinal bacterial overgrowth (SIBO) type infection is suspected; then it would be a good idea to dial back on the fiber intake.

In these circumstances, a higher fiber diet, or prebiotic fiber consumption, might be causing the problem to worsen as they can potentially feed the harmful microbes allowing their proliferation.

There should always be a healthy balance of the good to bad bacteria in the gut, also known as the microbiome. Every person has a mix of pathogenic bacteria as well as healthy bacteria inside of them, but it is the pathogenic bacteria that are usually kept in check and balanced out by your healthy microbes. Once the pathogenic bacteria in the gut starts to overcrowd the healthy microbes, it can drastically disrupt any balance that may be in place. Most of the pathogenic bacteria in the gut love to feed on sugars and they thrive and flourish in an inflammatory state. However, if the gut flora is positively balanced in the favor of beneficial bacteria, then it will be those microbes that end up feeding on the healthy fibers and flourish instead of the harmful microbes.

On the flip side of that, if your gut is overpopulated with pathogenic bacteria such as yeast or fungi or even parasites, then there is the possibility that the fibers are consumed could make symptoms worse, as those pathogenic microbes end up feeding on that fiber allowing it keep reproducing at an uncontrolled rate. This can definitely make health problems and symptoms even worse. Those are some of the concepts to keep in mind if symptoms appear after increasing fiber intake.

CHAPTER 7

Insulin Sensitivity and its Role in Dieting

It is a very common phenomenon for you or your clients to find themselves at a weight loss plateau even though they actively exercise and are eating a clean and balanced diet. Even though you increase the time spent at the gym or even make the plunge and go 100% organic, you just can't seem to get under that that coveted scale weight or attain the body you really want. Well, to the surprise of many, the root of the problem may be called insulin resistance. Getting insulin resistance in check may just be the biggest obstacle to ultimately see results!

WHAT IS INSULIN?

Insulin is a storage hormone that is produced from the Beta cells in the pancreas and it is the primary means by which blood sugar is regulated and/or balanced. it is insulin alone that transports all of glucose or sugars in the bloodstream into the muscle, fat, liver, and every other cell in the body so it can be used for fuel.

Despite the importance that insulin plays in the body, the most common usage of the word is usually in reference to muscle and fitness gurus talking about how important insulin is to building big muscles - or about all of its anabolic qualities. Justifiably so, as it is absolutely true that insulin is normally a requirement in order to build lean mass by building up your muscle cells, but what most of us fail to realize is that those very same anabolic tendencies of insulin can also do that same thing for our fat cells - making them grow as well! Insulin is non selective, and does not just target the muscle cells - it also targets fats cells when it gets released.

Insulin is released into the bloodstream after specific foods are consumed. Its release is very sensitive to the consumption of carbohydrates and in a smaller amount by protein, but fats have zero effect on insulin production. Therefore higher carbohydrate meals will elevate the release of insulin the highest amounts, which help transport the glucose from those consumed carbohydrates into the cells where they are burned for energy. However, if for some reason the cells become resistant to insulin and are not able to perform their role in the body, then there will be less glucose that ends up getting burned for energy, and that can then result in that glucose getting stored in the fat cells instead.

Insulin's Role And Sensitivity

While insulin serves as the main transport system of glucose into the cells, it also plays the role of being a builder hormone. It does so by building up and maintaining the integrity of the body's internal systems and tissues. It will build up your energy stores in your muscles and in your liver in the form of glycogen, and will assist in the creation of triglycerides in your fat cells too. Insulin, for the most part, is very protective in the body unless it builds up in the bloodstream.

Insulin production and its level of sensitivity in cells have been shown to be much higher in those with lower body fat levels and in those who have larger amounts if lean mass. The production of insulin and the sensitivity of your receptors also gets stronger the more you exercise. This comes as a result of the spike in insulin sensitivity that occurs 30-45 minutes immediately after training. Additionally, insulin sensitivity is also at its peak when you first wake up in the morning.

Insulin Resistance

Let's cover this one more time - in order for your body to use the glucose in the bloodstream as fuel source, your body requires insulin to get those glucose and or sugars into the cell. This helps maintain a balanced and/or homeostatic blood sugar level.

When too much sugar is consumed in your diet, eventually cells and tissues start sending out distress signals that they can't handle any more of the sugar and this results in the downregulation of the insulin receptors on the cells. This results in insulin not functioning properly and blood sugar levels naturally increase.

This mainly takes place in the body as a protective mechanism which prevents any damage from occurring as a result of blood sugar elevations. When this does happen, a condition known as insulin resistance is created.

Over time the vicious cycle of blood sugar imbalances and insulin resistance ends up preventing glucose from entering your cells. This cycle places an even higher demand on the pancreas to secrete even more insulin and over time your pancreas is just not able to continue meeting that high demand.

When this happens, high amounts of sugar build up in the bloodstream which will inevitable lead to weight gain, prediabetes, and even diabetes.

Insulin resistance in many circles is also commonly referred to as prediabetes, although the comparison is not necessarily an accurate one. It is important to note that you can still have insulin resistance while not concurrently having

a blood sugar level that is high enough to qualify as a prediabetic. That being said, all diabetics are insulin resistant.

Some of the most common insulin-resistant symptoms include body fat around the midsection area, the development of a fatty liver, an increase in thirst and/or hunger level, severe fatigue, blurry vision, the formation of dark patches of skin on the neck, groin, and armpit region (called acanthosis nigricans), and having tingling sensations in the hands or feet.

Insulin resistance is the body's way of sending out warning signals. It is clearly stating that if some interventions and lifestyle changes do not take place soon, diabetes is coming next. That is why it is so important to really understand what insulin resistance is and how it occurs in the body. It is almost always caused by a poor diet and high stress level, but the good news is that it can almost always be reversed by making some positive lifestyle changes.

Identifying Insulin Resistance By Assessing A Person's Body Type

Body mass index (BMI) is usually the measurement used in determining obesity. Being overweight or obese is the most significant risk factor when it comes to developing diabetes, or its precursor, insulin resistance, However, using BMI to calculate ideal weight is not a reliable metric, particularly if you are someone who carries around a good amount of muscle mass, or if you hold a larger percentage of fat in specific areas such as the midsection and/or hips and buttocks.

But while any overweight person is generally at an increased risk for diabetes, it is those that carry around a large percentage of their body fat levels in the midsection and belly area that are at a much higher risk. If you or your client have more of a round shape (often referred to as an apple shaped body), it is possible that you will have a large amount of subcutaneous fat that circles the belly area. This not only signifies a likelihood of insulin resistance, it also predisposes a higher risk of developing diabetes (as well as numerous other chronic health conditions).

APPLICATION POINT - a quick assessment of where you or your client collects most of your body fat can be an important tool when it comes to them identifying if insulin resistance may be present.

It is important to remember that when it comes to body shapes, a person is not always doomed to have a particular figure. The good news in that anyone that is willing to put in a little work can totally reshape their body and turn things around for the better. Before we detail how that can happen, let's classify what determines if a person is more of an apple or a pear shape.

As stated previously, if you accumulate or collect more fat around your waistline (or have more of a round profile with central adiposity), you may end up being grouped into the body type called an apple shape. The technical for this would be an android body type.

If you have more of pear shape, then you tend to accumulate more of that fat in the buttocks and thigh region. This is predominantly seen in higher incidences in women, but still does occur in men. It is usually preferable to have a pear-shaped body as the accumulation of fat around the hips and buttocks is normally hormonally related, and this particular type of fat distribution does not usually lead to insulin resistance or type 2 diabetes. The pear-shaped figure also has a technical name called a gynecoid shape, due to the fact that a majority of the fat that accumulates in the buttocks and thigh area is called gluteofemoral fat.

Most of us accumulate our body fat throughout all regions of the body and at a fairly even rate, regardless of shape but it is important to note that obesity in any sense always increases your risk of developing insulin resistance and or type 2 diabetes, as well as a host of other health issues.

So, what if you cannot tell if you are an apple or a pear just by looking in the mirror? Or, maybe you have a long-distant client and you cannot see them.

Or what if you, like many, have a distorted view of your body image and a casual glance in the mirror doesn't leave you with a clear determination of what your body type is.

When that is the case, there are two important measurements that can help your determine your body shape and/or if insulin resistance is present. The two measurements inclue overall waist circumference, and waist-to-hip ratio.

To measure overall waist measurement, find the spot about 1-2 inches above the belly button (but not measured at the skinniest point of the waist) and measure the circumference. Women who have waistlines greater than 35 inches will have a higher prevalence towards developing insulin resistance as well as an increased risk for type 2 diabetes. For men, the number that you want to be under is the 40-inch mark.

The waist-to-hip ratio is the second physical marker that can determine risk and it is even more accurate when it comes to identifying if you or a client have insulin resistance. The simple process measures the circumference of the smallest part of the waist; usually about 1-2 inches above the belly button. (While doing this is also important to not suck in your stomach when measuring!) Next, measure the circumference largest or widest part of your hips (or where your buttocks stick out the most from the frontal view). Divide the waist number by the hip number in order to get the final waist-to-hip ratio.

An ideal waist-to-hip ratio for woman should be under 0.8, while for a man that number is under 0.9. If the ratio is at or above the 0.8 or 0.9 mark, then that may be a sign that some changes may need to be made.

Treating Insulin Resistance

While this book is not in any way to be confused with medical advice, we must state that current western medicinal practices do not always align with the research that exists when it comes to treating insulin resistance. There is a huge disparity, even backed by the diabetic association, as to the consumption of carbohydrates such as breads and grains to help lower a person's blood sugar levels - as well as the use of insulin to help lower blood glucose levels in diabetes patients.

Not all of the physicians follow these outdated guidelines, but there are still some who follow what is called "standard of care" and will place very little emphasis on improving diet. They will only attempt to treat diabetes or prediabetes or insulin resistance with medications alone. If you wish to properly treat insulin resistance and/or reverse this condition, you may have to use your better judgement and take matters into your own hands and adjust your diet independently.

Diet and Insulin Resistance

Hands down the most effective way to reverse insulin resistance is to improve your diet. It should be noted that improving your diet is going to require more than just removing junk food consumption, cutting out the carbohydrates, or even reducing calories. While these all CAN be steps in the right direction, these steps will rarely be absolutely enough to lower insulin levels or allow for any significant amount of body fat reduction. The reason for this is because there are numerous secondary factors that contribute to, or cause your insulin resistance, such as other hormone imbalances, stress, lack of eating and improper sleep.

In fact, chronic and recurrent stress and lack of sleep are two of the largest drivers that can potentiate insulin resistance. In addition, if you have hypothyroidism, then it is also very common to have some form of insulin resistance as thyroid hormones are the primary driver behind metabolism.

The list of causes of insulin resistance can go on and on. You should do more than just make a few dietary changes. Addressing such factors as hormone imbalances, stress levels, sleep quality, as well as reducing inflammatory and/or poor-quality foods may be necessary. It may also require eating plenty of the nutritious foods to help properly regulate things.

What Should People Eat?

Note that this subheading is titled “what should people eat,” not “what should people NOT EAT.” This distinction tends to create a much higher compliance rate and it will provide a more positive message about food. When there is a realization that all of the real (non manufactured) and whole foods they desire, as well as some realistic recipe ideas that actually fit into their schedule, overall rates of compliance and success increase dramatically!

Identifying real or whole foods is easy - make sure all the ingredients are easily recognized and are pronounced without difficulty. That alone should be the deciding factor. However, if there are still some questions about the types of foods that should be consumed to reduce insulin resistant situation, then follow the list of healthy foods below - this will be a great place to start:

Vegetables such as light and dark leafy greens, all of the brassica-family of vegetables such as broccoli, brussels sprouts, cabbage and kale, artichokes, asparagus, and bean sprouts, brightly colored vegetables such as peppers, carrots, beets, tomatoes, and some starchy vegetables in smaller amounts such as summer squashes and sweet potatoes. Fruits consisting of berries such as blueberries, blackberries, cranberries, raspberries, kiwi, lemons and limes are all still allowed but should be kept to 2-3 servings per day. Fats should come primarily from the ground in the form of coconut oil, avocado oil, olive oil, olives. Nuts and seeds should include walnuts, almonds, cashews, hemp, chia, and flax. Healthy animal sources such as low-mercury cold water and wild-caught fish such as salmon, mackerel, herring and sardines as advised. Last are some healthy protein sources such as organic chicken, turkey, wild-caught fish, pasture-raised eggs, lean cuts of red meat that ideally come from grass-fed cows and even wild game meats.

When all else fails, simply ask the questions, “Is this real food that I am about to eat created in a factory?” “Has it in some way been adulterated by man’s hand?” If the answer is YES to either of these two questions, then that food should NOT be eaten.

Other questions to ask include, “Does this food have 5 ingredients or less?” “Can I pronounce all the ingredients?” “Does it have any additional added sugars in it?” “Would my grandmother recognize the ingredients?” “Does this food make me feel good after I eat it?” If you answer YES to any of these, then the foods are GOOD to eat.

CHAPTER 8

Hormonal Imbalances

When you are creating macro prescriptions, a hormonal profile may impact how you determine an emphasis on quantity or a quality of food. There are numerous hormones in the body that if in balance, will allow things to run smoothly. The major players here will include the sex hormones testosterone, estrogen and progesterone, and the stress hormone cortisol. If we exclude the thyroid hormones from this discussion, these four hormones, will have the largest impact on aesthetics, performance and longevity.

With that in mind, this section of Macros Applied is intended to give you a cliff notes' version of some of the most common hormonal issues that occur in the world today, how to spot them, and then understand the tremendous role that food plays in hormone levels.

With all of that to be covered, let's first start out the role that estrogen and progesterone play in maintaining balance in women's bodies - and why estrogen can be the biggest trouble maker.

ESTROGEN

Before we jump into estrogen dominance, let's first explain some of the main characteristics of estrogen. Besides the fact that it is the main female hormone that allows a female to develop her primary female features and allows for her reproduction, it also plays many other roles in the body - and just like all other hormones it needs to be properly balanced.

Where exactly does estrogen fit into that desired balance?

When should you have higher levels of estrogen or lower levels?

When do the rise and fall of other hormones, such as progesterone, affect the body's production of estrogen?

These are all are good questions!

One thing we must understand about estrogen is that there needs to be a good balance of both estrogen and progesterone in the body. Now as stated earlier, it is primarily estrogen that gives females their female features; however, that is just one way to think about its use in the body.

Perhaps a more accurate way to think of estrogen is to think of it as a hormone that builds - it builds tissues, it builds life, and it builds maturity. When the female body first starts to manufacture larger amounts of estrogen during puberty, a female technically goes from being a child to an adult in terms of the ability to reproduce.

Now when it comes to adult females, it is their estrogen and progesterone that is required to perform a perfect dance together each month in order to maintain health and overall hormonal balance. When levels of estrogen or progesterone increase or decline from one another, that's where problems usually begin to occur. So, with that perfect dance in mind, let's look at one of the biggest problems that can occur when an imbalance takes place in estrogen dominance.

When estrogen becomes the dominant hormone in a female's body, it usually takes place because of two main reasons.

The first is due to the fact that the balance between a female's progesterone level and their strongest of the three estrogens, estradiol (or E2), becomes heavily swayed in the estrogens' (or E2's) favor.

Now when this happens in a male, it is an imbalance of their estrogen/E2 to testosterone level.

But in both males and females there is no set hormonal number that always indicates if a person is estrogen dominant or not, as all people will be different. That is why symptoms should always be considered in conjunction with any hormonal levels that are measured in the blood.

The second major way in which estrogen dominance occurs in the body (and this is only applicable to females) is when the internal balance of the two more aggressive estrogens (estrone or E1, and estradiol or E2) starts to grossly outnumber or overpower the more protective and less potent estrogen in the body known as estriol (or E3). As the internal balance of all three estrogens in the female body is commonly referred to the "Estrogen Quotient," it is really only a number that can be truly measured through a saliva test due to the fact that estriol is found in very tiny amounts in the blood.

When an estrogen dominant situation does materialize, it can cause numerous negative physical and mental symptoms with some of the biggest and most common being severe PMS, fatigue, anxiety, weight gain (particularly in hips, midsection and thighs), heavy periods, swelling and water retention around menstruation, breast tenderness, fibroids, endometriosis, abnormal or irregular menstruation, insomnia and lastly even breast cancer.

When it comes to men who have too much estrogen (as compared to their testosterone levels), they can experience negative symptoms including enlarged breast tissue (a medical condition known gynecomastia), sexual dysfunction or difficulty maintaining erections, and even infertility.

Now on the flip side of that, when estrogen levels are seen at low levels in women it can cause a whole different set of symptoms such as hot flashes, vaginal dryness resulting in painful sex and even painful urination, depression, moodiness, brain fog, and quite a few more. Because the high to low symptoms are very different, symptoms can be a better method of identifying if a female may be estrogen dominant, if they have low estrogen, or even if they are having symptoms of both highs and lows in the very same cycle.

By knowing these facts you should properly be able to identify the type of food plan a female should be on, and whether it is the right time to put someone into a calorie deficit, focus on a performance goal, or build a macro plan to maximize longevity. Whatever route you decide to take a catered food plan should always first consider the individual, as well as their symptoms; and only then should the focus be placed on calories, macronutrients and micronutrients.

Remember that food can be medicine, but it can also be a form of a poison - and it will depend upon what type or form of it enters the body particularly when it comes to hormonally-imbalanced female.

Conventional medicine's first line of approach when it comes to dealing with estrogen dominance scenarios in females is to prescribe hormonal birth control in an attempt to reduce symptoms.

While it may reduce symptoms, it does nothing to take care of the root cause of the problem and in many situations can even worsen the problem. In fact, using hormonal birth control can cause the root cause of the estrogen dominance to be exacerbated!

It is also widely known that many of the most commonly prescribed forms of birth control can also leave women with a laundry list of side effects that can range from negatively affecting the microbiome to causing nutrient deficiencies. For many, the side effects can make an estrogen dominance situation even worse.

So, after knowing the negatives, you should try to remember that any hormonal imbalance should always be first attacked through diet and lifestyle changes.

There are targeted supplements, foods, and specific lifestyle protocols that can help balance out hormone levels naturally and we recommend that

you try these first. The use of medications alone may or may not alleviate symptoms, but they will never get rid of the root cause that is causing the hormonal imbalance.

The Power Of Progesterone And The Estrogen-progesterone Ratio

In the hormone world, progesterone is known as the great equalizer, and it exists in higher amounts in the female body compared to estrogen. When it becomes out of balance with estrogen, that condition is what truly creates the problems associated with estrogen dominance.

It is the opinion of many practitioners that females should have a progesterone to estrogen ratio of 200 to 1 in order to maintain homeostasis in the body. There are two times in a female's life when their progesterone levels are naturally going to be lower than estrogen levels; during puberty and during peri-menopause.

So, with the understanding that a balance should always be maintained, 9 times out of 10 it is going to be negative lifestyle factors in terms activity levels, diet and even a buildup of environmental exposure, that can prematurely bring a female out of balance and leave them in an estrogen dominant situation. It is extremely rare that a person's lifestyle will end up causing them to have an imbalance in terms of too much progesterone (compared to their estrogen levels), but it can happen.

A great way to quickly check to see if your female clients may be out of balance hormonally is to look at her Progesterone to Estradiol ratio or, what is easily recognized as her Pg/E2 ratio. Many of the largest standard blood testing companies and labs do not calculate and report a person's progesterone to estrogen ratio. It is, however, commonly calculated by many functional labs which test saliva or blood spot. These provide a better representation of both the free and available hormone levels compared to what a standard blood draw will show.

A Pg/E2 ratio value can be helpful to patients and even clinicians when both values independently appear to be in the normal reference range, yet symptoms are present that suggest an imbalance. This ratio will show if that imbalance is occurring, whereas the standalone values by themselves may not show this.

If a woman finds herself with an elevation in Progesterone/Pg compared to her Estradiol/E2 level, then there may be a progesterone dominant situation that can result. This is most commonly seen when a person ends up over supplementing with progesterone as the over supplementation can result

in the down regulation of estrogen receptors potentially causing a form of estrogen resistance in the body. This can result in a high Pg/E2 ratio and present symptoms in line with low estrogen even when lab work would should E2 to be in a normal reference range.

Reducing progesterone supplementation or increasing estradiol levels through diet, exercise or some additional forms of supplementation may be required to bring your female client back into balance. A progesterone dominant scenario is usually most commonly seen during menopause as estrogen is no longer being produced from the ovaries, or after a woman first starts using supplemental progesterone during her perimenopausal years.

All of the previous estrogen and progesterone markers that were just explained can be clues used to help understand what type of hormonal balance that a female may be experiencing and how to cater a food and macro plan to a specific time in their lives.

WHAT ARE ANDROGENS?

Androgens are in the sex hormone classification, and just like estrogen and progesterone - they too need to be properly balanced for proper health and vitality. The primary androgens consist of testosterone, androstenedione and dehydroepiandrosterone (DHEA); however, in most circles they are simply referred to as male hormones. It is important to not let the male part confuse you, as androgens play just as many important functions in the female body as estrogens do in the male body - over 200 different functions and roles to be exact. Both the male and female body produce androgens, they just do so in different quantities.

The higher quantity of androgen production is the defining factor that differentiates males from females. Androgens are what give a male their traits and reproductive possibilities. One additional androgen includes dihydrotestosterone (DHT) - an androgen metabolite that is actually three times stronger than testosterone and is usually the biggest cause behind many of the high androgen symptoms, such as acne, oily skin and unwanted hair growth.

If androgen levels become too high, a hyperandrogenism scenario can present itself. Conversely, when experiencing low levels of androgens, that is referred to as condition known as hypoandrogenism and or hypogonadism.

High Androgen Levels

For any reason, when both males or females produce androgens in excess or when their androgen levels become imbalanced compared to their estrogen and progesterone levels, it can result in virilizing type symptoms such as acne, hirsutism (which is the excessive hair growth in all places of the body that a person does not want hair growth) as well as the thinning of your hair on the top of your head or balding. Women, as well as men, can and will lose their hair when androgen levels become too elevated or become improperly imbalanced.

Around 10% of the female population in industrialized countries have a condition referred to as polycystic ovarian syndrome (PCOS). PCOS is a conglomeration of symptoms that involves elevated levels of androgens, irregular or absent menstrual periods, infertility, blood sugar imbalances, insulin issues, acne, and excessive unwanted hair growth. A large majority of women with PCOS are also overweight or obese and they may have higher levels of muscle mass (although there are just as many females who has PCOS and have normal body types and or body weights).

If not properly dealt with or managed, PCOS can be a precursor to a numerous serious health conditions such as insulin resistance and diabetes, hyperlipidemia or high cholesterol, elevated blood pressure, and even heart disease. This is why it is so important for you to be on the lookout for high androgen and/or PCOS symptoms that may present themselves so that an appropriate nutritional and medical plan can be specifically created.

HIGH STRESS HORMONES

Glucocorticoids are steroid hormones that help regulate the level of glucose in your blood, hence the glucose prefix. Natural glucocorticoids are produced by the cortex of the adrenal gland. There are in fact several glucose-regulating hormones; however, the big dog on the block that we are going to primarily discuss is the hormone cortisol. Now even though cortisol is commonly referred to as the stress hormone, its primarily function in the body is to regulate blood sugar level. This becomes extremely important when it comes to how the body manages stress.

Cortisol is manufactured mainly from cholesterol in your adrenal glands (which sit on top of the kidneys) and in a healthy person the highest quantity of cortisol is released when they first wake up in the morning, in secondary amounts during exercise, and lastly during times of chronic and acute stress.

Cortisol is normally released into circulation after you experience any type of stressor, prompting a reaction from the adrenals that evokes a fight-or-flight mechanism. The fight-or-flight response is a natural way in which the body reacts to either eustress (a good form of stress such as what you might experience before giving a speech or getting married) or distress (a bad form of stress such as what you might experience during and after car accident, or from the death of a loved one).

After the release of cortisol, the body springs into action in an attempt to deal with the stressor. When the stressor has been removed, the body will ramp down their stress response and then it enters in the rest and digest mode. This is how the normal stress cycle SHOULD operate.

In order for this to happen, there has to be a physical and/or mental release of stressors before the fight or flight response can be shut off and you can resume a state of rest and recovery. If this does not happen, high levels of cortisol will continue to be created and over time, this will end up tearing down both the body and mind.

Having chronically elevated levels of cortisol in the bloodstream can interfere with your memory and cognitive abilities, suppress your immune system, cause bones to become brittle, increase body fat levels, elevate blood pressure, cause elevations in unhealthy cholesterol levels, and even increase the risk of developing heart disease.

Since modern society stresses our bodies more than ever, and unchecked cortisol can cause serious damage - cortisol is typically demonized by the public. However, the simple fact remains that it is vital to survival and without it you would die from the simplest of life's little stressors.

All Hormones Need To Be In Balance And Cortisol Is No Exception To The Rule

If you or your client lives a life that would be considered high-stress, have a A Type Personality, or are always in "high gear," the body may naturally be cranking out too much cortisol. Now if cortisol production is high, then there could be some negative effects such as blood sugar dysregulation, weight gain (especially in the mid-section), a suppressed immune system (or always getting sick), digestive problems, and even the initial stages of heart disease. A few of the mechanisms as to how and why these symptoms occur in in the body are the next topic of discussion.

As pointed out earlier, elevated cortisol levels can negatively affect blood sugar regulation, so it is vital that we discuss the concept of maintaining balance once again.

It is cortisol's main job to break down muscle tissue through gluconeogenesis in an attempt to bring up your blood sugar levels. However, when high levels of cortisol are always elevating blood sugar levels, the pancreas oftentimes cannot keep up with the demand for insulin. This can result in blood sugar levels staying elevated causing cells to not get the fuel or sugar that they need in order to deal with the day and their stressors.

Next it is common to associate cortisol dysregulation with weight gain. The reason for this is that during the initial stages of stress the brain is screaming to the body that it needs more energy to deal with the stressor. This then results in the brain sending out signals that you are hungry and need to eat. These so-called "false hunger signals" can create blood sugar imbalances which can cause you to search for higher-calorie foods - resulting in overeating and weight gain. Remember, unused glucose in the blood is eventually stored as body fat.

It was previously stated that another one of cortisol's main functions in the body is to reduce inflammation levels. There are healthy levels of inflammation that are beneficial to the body but if cortisol production stays elevated for too long then it can quickly go from being healthy to unhealthy. When this happens, it can eventually end up suppressing the immune system due to it being exhausted from attempting to deal with constant inflammation. This creates a situation whereby you are unable to fight off the even the simplest of illnesses, such as the common cold. You could also develop food intolerances or allergies, and even possibly the develop autoimmune disorders.

During times of stress, it is normal for your body to slow down some non-essential bodily functions in an attempt to divert energy to other areas. One of the first functions to get slowed down is your digestion - which translates into slower transit time of the bowel. This could result in not being able to properly digest and absorb the nutrients from your food. This can possibly lead to ulcers, intestinal permeability or leaky gut, dysbiosis and even irritable bowel syndrome. Also common for people with digestive tract diseases such as Crohn's disease or Ulcerative Colitis is to experience a large majority of their symptom flare ups during times of high stress.

These are just a few of the major negative effects resulting from elevated levels of cortisol over an extended period of time.

But before too much damage is done, your brain usually steps in and slows down the production of cortisol in an attempt to protect your body from its long-term catabolic effects. When this cortisol ramp-down does takes place, we refer to it as Hypothalamic Pituitary Adrenal (HPA) Axis Dysfunction or as it is commonly known, adrenal fatigue.

When HPA Axis dysfunction does set in, it can create a new list of nasty symptoms that can include bouts of extreme fatigue, muscle weakness, an increased level of aches and pains due to the lack of cortisol's anti-inflammatory effects, the loss of appetite, weight gain, diarrhea, low blood pressure, depression and irritability, salt cravings and, lastly hypoglycemia or low blood sugar levels.

As you can see by now, cortisol is very important hormone. The problem is that most do not realize just how important it is until they start experiencing symptoms low levels of primary stress hormone. Having a low cortisol output can dramatically put a damper on your life, and even if all the proper steps are taken, it may still take several months to even a year to possibly recover.

Identifying An Adrenal (Hpa Axis) Problem

There are many times when you can be confused as to if whether you have elevated or low cortisol levels since cortisol output can fluctuate wildly. As cortisol fluctuations take place throughout the day, it can feel like being on a roller coaster of highs and lows when it comes to energy levels. If you or your client falls into this category, and you feel like you have a mixture of all of the symptoms listed here (as well as experiencing high levels of stress), then an adrenal saliva test might be the next best plan of action.

This test will enable you to see where you fall in the spectrum in terms of HPA Axis dysfunction. But if testing is not an option and you are still experiencing cortisol-related symptoms, you can begin moving forward by treating the adrenals as the culprit behind the problem and take the appropriate lifestyle steps to help correct it. If a medical problem is truly suspected, this should be done under the supervision of a medical professional.

Regardless, it is important to identify the reasons as to why adrenal issues exist in the first place.

Upwards of 95% of the time, adrenal issues are caused by chronic and ongoing stressors of everyday life and our inability to withstand them. Work stressors, family stressors, relationship stressors, social media stressors, email stressors, or even the stress of constantly being on the go and never getting a chance to sit back and decompress can all contribute to HPA Axis dysfunction. We must understand that STRESS - regardless of the source - is the culprit behind so many of the dysfunctions we see today.

Being in tune with your body as well as understanding current stress levels will better enable a person to manage their stress within their lifestyle. By implementing the simplest of practices such as getting enough sleep,

choosing the best forms of exercise, deep breathing, laughing with friends, getting in some daily sunshine, and scheduling non-stressful leisure activities, you can begin to regain your health.

All of the above tactics are easy to implement and would be a great place to start. However, as simple as many of these things sound they can not be taken for granted and must still be observed as essential from an implementation standpoint.

Correcting Adrenal Problems And Getting Your Energy Levels Back

This should go without saying but always, always, always start with nutrition and the diet as opposed to immediately jumping into supplementation. Eating nutrient dense foods as well as anti-inflammatory foods that come from the ground is the simplest and easiest place to start.

To clarify further, anti-inflammatory foods are foods that are not processed and that almost always come directly from the Earth. They have not been enriched or injected with hormones and have not been genetically modified. These anti-inflammatory foods include things such as organic and grass-fed meats, wild-caught fish, healthy sources of omega-3 fats such (fish oils), walnuts, chia seeds, and brightly colored fruits such as red and purple berries.

Next consider adding in some anti-inflammatory herbs to foods and dishes such as turmeric, ginger and rosemary and cilantro.

Finally, eliminate all the inflammation raising foods such refined vegetable oils (e.g. corn, soy and safflower oils).

After making sure the diet is on the right track, the next thing to do is to physically find ways to take the body out of a stress response and help initiate the rest and digest phase. This can be accomplished through the use Epsom salts before bed, going to a yoga class, getting a massage, reading a non-stimulating book, breathing deeply with a guided imagery app, or writing in a gratitude journal before bed. There are literally hundreds of tools and resources online that can aid in de-stressing. It is extremely important to just make time to do it each day - consider scheduling it just like a work meeting or chances are it may not get done.

Supplements can help the body and the adrenals better adapt to the stressors, while also providing many of the raw materials that are needed to create stress hormones in the first place. One of the most popular categories of adrenal supplements are called adaptogens, aptly named because they help a person better adapt to stress. Some of the best supplements to include in an adrenal healing plan include Ashwagandha, Panax or Siberian Ginseng,

Rhodiola Rosea and Cordyceps, all of which can be used to help with low cortisol symptoms or low cortisol levels.

Now if you or your client have the feeling of constantly being tense or has issues winding down and falling asleep at night, then phosphatidylserine can be used to reduce cortisol levels. There are also some raw material supplements that can be used so that the body can refill its stores to create stress hormones. These supplements include the daily introduction of vitamin C, zinc and B vitamins (especially vitamin B5 and B1).

Environmental Factors Can Play A Role In Hormonal Imbalances

We are slowly starting to realize that many of the world's health and hormonal problems such as estrogen dominance, PCOS, insulin resistance, autoimmune conditions, and high or low cortisol levels can all be greatly impacted by over exposure to certain environmental factors.

Most of us never give a second thought about environmental toxins or things like heavy metals, but like it or not, they have been slowly and quietly impacting the health of the industrialized world for many years now.

Instead of just forecasting the end of the world through a slow death by environmental chemicals and toxin exposure, let's instead cover some of the biggest factors and how you can improve your hormonal health (as well as reduce your waistline).

The first and most obvious source of chemicals and toxins is your diet. Extra chemicals and toxins are present in commercially raised meats and dairy products, pesticides & herbicides covering fruits and vegetables, and artificially grown or genetically modified crops. All of these can increase toxin levels in our bodies.

Processed foods can also increase the levels of inflammation in the body, so always aim to eat local and organic foods as much as possible. If that is not possible, choose to focus on avoiding produce from the Dirty Dozen and eating produce from the Clean Fifteen. Choose leaner cuts of meat and lower fat dairy products. Ultimately by doing so you will dramatically reduce toxin exposure.

It is important to note that if a person is overweight or obese, their fat cells create an enzyme called aromatase that actually converts androgen hormones such as testosterone and DHEA into estrogens, thereby possibly creating an imbalance. The more body fat a person has, the more this type of conversion can take place.

With that fact in mind let us also understand that many of the world's toxins are considered lipophilic, meaning that fats cells love to absorb them. When this does occur, and a person's fat cells increase in size and number, adsorption also increases. Therefore, the goal should always be to keep body fat levels in check because these fat cells could be actually making a person fatter.

Finally, we should note that xenoestrogen consumption that occurs from plastics or hygiene products can possibly create a synthetic form of estrogen dominance. While there is not a large degree of literature surrounding this currently, it is a popular topic that we feel should be addressed in this book.

Adequate sleep and/or poor quality sleep can be the fastest way to find yourself with a hormonal problem. We know that a lack of sleep leads to a lack of recovery, and as you know by now a lack of recovery leads to adrenal (HPA Axis) issues that can deplete the body of vital nutrients that are required for all hormone production. **MAKE SLEEP A PRIORITY!**

Heavy metals such as mercury, lead, and aluminum have been creeping into our bodies for years and most of us do not have a clue as to the damage that they do or even how they get into the body. They accumulate in tissues and glands, can block up the liver leading to poor toxin filtration, and they can create hormonal imbalances - especially when it comes to estrogenic molecules. As a result, it is important to know where exposure is occurring and remove the sources as soon as possible. Avoiding high mercury fish, drinking filtered water, filtering shower water, removing amalgam fillings, and eliminating aluminum soda cans would be good places to start.

When little is done to reduce environmental toxin exposure and the toxins build up in your body, it can result in a slowed detoxification process that will prevent your body from removing used up and metabolized hormones. When this happens the liver's ability to decrease and subsequently balance out estrogen levels in both men and women can be drastically slowed.

A perfect way to start aiding the body in its detoxification abilities is to eat from the rainbow and add in cruciferous vegetables. Also, consume some supplemental healthy fiber daily as this helps the body detoxify by binding metabolized hormones and toxins so that they can be excreted safely from the body.

Reduce daily exposure (or at least as much) to industrial chemicals. Chemicals come in so many forms these days and constant exposure ads up. This all contributes to what is known as the chemical and toxin body burden. Some of the easiest changes here would include the removal and/or replacing of plastics in the kitchen, household cleaners, personal hygiene products, poor quality makeups, and of course herbicides and pesticides that come with

many of our so-called “healthy” food options.

Lastly, the over consumption of caffeine can also cause numerous hormonal issues from depleting your adrenals to increasing our estrogen production; both of which can lead to key nutrients being depleted such as magnesium, vitamin C and B vitamins. The general rule for caffeine simply to not overdo it. Stick with 1-2 cups per day and never consume caffeine past 2 pm as caffeine has a 5-6 hours half-life.

CHAPTER 9

Understanding Psychology in the Process

By now you understand several things about applying dietary protocols - you know they must account for what goals are and are not, you know that they must be periodized, and you know that they must encompass the whole individual, including any vitamin/mineral deficiencies and hormonal imbalances. What you do not see listed in this statement, or anywhere in this book, are expectations pertaining to results.

Unfortunately every dieter (including the author of this book) wants results yesterday. To be fair, this isn't 100% our fault as the media and marketers love to market results in 30 days, 90 days, 6 weeks, and who knows what other time frames. However, while playing the blame game is fun, it does not ultimately yield the results we are after and often leaves us diet hopping in pursuit of the over-hyped results.

The real solution, and the proper foundation of every dietary protocol is far simpler than all of the concepts we have laid out until this point - it comes in the form of MINDSET.

Physically, we are all capable of making the right choices.

Intellectually, you now have all of the proper information after reading both this book and *Macros Explained.*

But EMOTIONALLY, you must be in the right frame of mind with the right outlook to create success.

iN3 has long recognized that this is the real missing link, and it was the single greatest driver in making us the top coaching company in the space for several years now. The goal of this chapter is to begin giving you some of the tools that we have used with our clients, and at least help you begin the process of creating the proper mindset for you (or your clients) to fully create dietary success.

(NOTE - if MINDSET is something you want to learn more about beyond this book, be sure to check out the MINDSET SPECIALIST course from the Nutritional Coaching Institute.)

Embracing and Understanding Failure

As you know by now, nutritional prescription is a largely a game of "guess and check." Obviously our "guesses" are guided by formulas and data available to us, but we can NEVER guarantee that our initial prescriptions are going to be

accurate. Even the best designed diets will fail, and nearly every diet will have set backs - it is simply part of the process!

Unfortunately, diet culture today lives far too much in the "black and white." We have begun viewing actions as "right and wrong", and therefore we have vilified the negative.

This begs the question - is there really such thing as "wrong" when it comes to dieting?

It is my opinion that "right and wrong" do not exist in the dietary space, and are words that should not be used in conjunction with a dietary endeavor. Instead, we need to begin viewing actions as exactly what they are - "actions." The results of these actions simply become data - period.

Numerical data points are non emotional and simply provide data. The data derived from them can help guide future actions.

While conceptually this seems simple and relatively straight forward, from an implementation standpoint it will be far more difficult. However, if we can create this shift around the way in which we view our actions - future success will be had.

APPLICATION POINT - Understand that nothing you or your clients do is inherently wrong. Instead, identify actions as either "in line" or "not in line" with a given protocol. Even the actions that are in line with our protocol may not yield the desired result, but either situation will leave us with data that we can use effectively moving forward.

Appropriate and Ongoing Goal Setting

One of the advantages of the periodized model is that it allows for the reassessment of APPROPRIATE goals frequently. In each phase there is a desired outcome, and the protocol is built accordingly.

From a mindset perspective this can be extremely advantageous.

A great illustration of this is an earlier example we used - an "in season" individual that is performing CrossFit with the desired outcome to be maximized performance (this can be recreational or competitive).

This individual will usually do nearly everything perfectly in the "preseason" phase and into the beginning of the "season," but around the halfway mark becomes a critical time. At this point things are either going according to plan or they are not - both of which will drastically affect the mindset and subsequent actions.

You know by now that we should NOT be viewing the outcomes through the lens of "right and wrong," but let's be honest - most athletes will.

Athletes that perceive things to be going "wrong" at this point, or those that are disappointed in someway with their current outcomes are likely beginning to feel defeated. While we certainly have empathy for not placing as one desires, this emotion can NOT directly dictate immediate action. Unfortunately, this is often the case.

Individuals who are not where they desire to be midseason will immediately begin thinking of the improvements that need to be in the upcoming "off season," but likely ignoring the maintenance restoration that we know MUST occur in the immediate future that is "post season."

As you know by now, this oversight can absolutely become disastrous long term, and lead to an athlete never truly achieving their full potential.

For this reason, continuing to assess, reassess, and plan specific goals on smaller scales is a fantastic way to ensure that mindset does not yield actions that will hinder long term progress.

APPLICATION POINT - Be sure to clearly define each phase of a protocol - both the desired outcomes and the necessary action steps needed to achieve those outcomes.

Understanding Individuality

The final piece that we will leave you with in this book is a reiteration of the individuality needed to truly create success dietarily.

No two individuals are exactly the same - not their physicality, not their physiology, not their preferences, and certainly not their lifestyle. Obviously this will lead to us creating individual specific applications for each of us ourselves or for each of the clients we work with, but it should also leave us with the knowledge that we must stop playing the comparison game.

Sadly, as we know, this just doesn't hold true in the real world.

When we see a diet work for one person, we immediately assume that it should work for us. Even worse, when it doesn't work for us we begin creating the assumption that WE are the ones who are broken.

STOP THE MADNESS!

There are people who can achieve extremely low levels of bodyfat on 3000+

calories, and there are others who will require nearly 1000 to hit “stage lean” - neither is “right” and neither is “wrong.” Further, none of us should look to either of these individuals to learn what is right for us!

Clearly it is natural to look around us at other people, and to create expectations accordingly - do not beat yourself up if you have done this. However, as we conclude this book we recommend that you re-read everything again and ensure that it is through the lens of what is needed for YOU, not what you currently see with other people.

Macros INDIVIDUALLY Applied :)