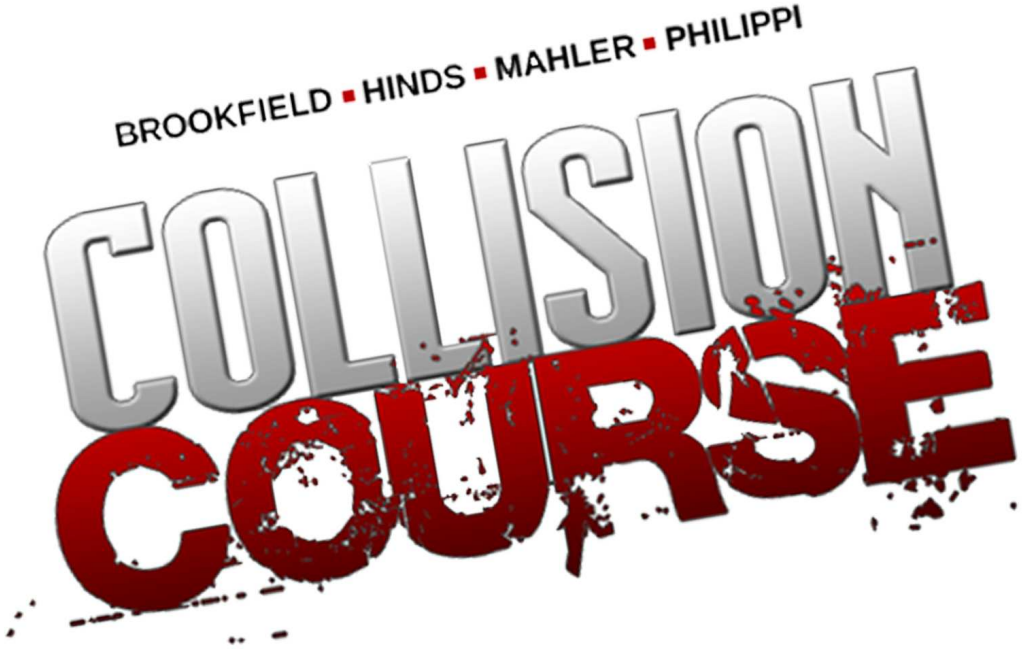
MAHLER'S
AGGRESSIVE STRENGTH




# *Optimizing Hormones Through Nutrition, Exercise, and Lifestyle*

*By: Mike Mahler*

Disclaimer
The advice contained here is for information purposes only. You should consult a physician before engaging in any health program. The author Mike Mahler is not responsible in any manner whatsoever for the injury which may occur through reading and following the instructions herein.

Markers Of Aging To Be Aware Of
1. Insulin resistance (body is not able to use the insulin you make)
2. Decline in muscle mass and strength
3. Decline in immune function
4. Increased body fat
5. Increased blood pressure
6. Decline in aerobic capacity
7. Decreased zeal for life
8. Declining Memory
9. Arthritis
10. Decrease in sex drive and function
11. long lasting inflammation from workouts and every day living

Hormones must be optimized to be in an anti-aging state. If your hormones are not healthy you are not healthy.

**What are hormones?**
Hormones are essentially biochemical messengers that call for a specific action. They are biological communication systems. For example testosterone is connected to the desire for sex in both men and women. It also increases protein synthesis, which calls for an increase in muscle mass. The more muscle mass you have the less fat you have.

**There are three types of hormones:**

**Endocrine:**
Hormones that travel through the blood such as testosterone and estrogen

**Autocrine:**
Hormones that are released from a cell and come right back on the same cell or a close neighbor. These are fat based hormones such as good and bad eicosanoids (explained later).
**Pancrine:**

Hormones that are territorial and circulate over a certain area. The mood-regulating hormone Serotonin is an example. Drugs such as Prozac block serotonin from returning to the source. Diet, exercise, and proper rest can optimize all of the above hormones. Most people will not need to go the hormone replacement route or spend a lot of money on exotic supplements. Where are hormones produced? Everything starts in the brain. The brain sends signals to certain glands to produce various hormones. If your brain is not able to send out the right signals and get the right signals back then hormones will not be at optimal levels. Hormonal communication is critical to proper hormone optimization.

**Hypothalamus:**
Controls sex drive, hunger, thirst, and body temperature. Thyroid: controls metabolism Thymus: Controls immune function Adrenal glands: Controls stress response (whether your body makes too much of the stress hormone cortisol or not enough)

**Pancreas:**
Controls blood sugar (where insulin is produced) Ovaries: in women control sex development

**Testes:** controls male development Important Hormones, much more than any other hormone, anti-aging and hormone optimization starts with keeping Insulin in the ideal range. If you are only going to focus on one hormone focus on Insulin.

**Insulin**

***What is Insulin?***
Insulin is produced in the pancreas. Type 1 diabetics do not produce insulin at all and thus have to take insulin injections. Type 2 diabetics produce too much insulin due to insulin resistance. This means that while insulin is being made in ample supply it is not being utilized and thus the body makes more to keep glucose levels from going to high. Unfortunately this leads to fat storage and a host of other health problems.

The true villain in heart disease is excess insulin not dietary fat as manymisinformed experts believe. Dietary fat does not lead to clogged arteries. Excess insulin causes vasoconstriction, which leads to clogged arteries. *(Explained in detail below)* When insulin sensitivity is optimal everything falls into place. When insulin resistance occurs more insulin is needed to drive down glucose levels. More insulin production equals more stored body fat.

The optimal level of fasting insulin is less than 10 uU/ml. If you are over 15uU/ml you are in an aging state. You can find out your number with a blood test. The biggest stimulators of Insulin are carbohydrates in particular refined sugars. Protein is a mild stimulator of Insulin (especially dairy proteins due to the lactose) and fat has no effect on insulin at all.
The goal is not to get insulin levels down to zero or too low. Insulin is needed to carry nutrients to cells. Otherwise the cells will die off. Insulin is necessary to supply glucose for optimal brain function. If you do not give your body what it needs to make glucose from food it will turn to the muscles to get it. This is often why people lose weight on low carb diets. Unfortunately what they are losing is muscle more than fat. Moreover, glucose is needed for mood regulation, which is why many feel terrible on low carb diets. If you follow a low carb diet for too long you will inevitably gain a lot of fat back when you introduce carbs back into your diet.

Your body has been deprived of carbs and will store the carbs that you give it whenever it can resulting in increased fat. On the other hand, High carb diets (more than 60% of total calories) increase glucose levels too much which results in increased insulin to drive down the excessive glucose levels. The end result will be poor body composition, poor mood, and poor health. Excess insulin production from high carbohydrate diets will increase stored body fat, which compromises the metabolism of sex hormones. The fatter you are the more estrogen receptors you have and the less access you have to testosterone. This is why you cannot use Testosterone no matter how much you are making if Insulin is not in the right range.
Insulin must be balanced with its opposite brother the hormone Glucagon.

Insulin must be balanced with the hormone glucagon. While Insulin drives nutrients into cells, glucagons mobilize stored energy to circulate in the blood stream as a source of energy. High insulin levels block the release of glucagons, which is needed for brain function. Excess Insulin levels are an indicator of excess calories in particular carbohydrates. Moreover, the more you eat the more free radicals you make resulting in a compromised immune system. High insulin levels also cause the stress hormone cortisol to be used as a backup system which leads to excess cortisol production. Excess cortisol destroys testosterone, DHEA, and Growth hormone production. Cortisol increases insulin resistance and indirectly increases insulin. It makes the pancreas pump out more insulin to bring the cortisol levels down. Excess cortisol causes death of cortisol sensitive cells in the brain. This is why more and more research is linking Alzheimer's to cortisol. Through cortisol, insulin resistance causes the decline of other hormones.

The master hormone pregenelone has to make a choice between making DHEA, progesterone, or cortisol and when glucagons levels are inadequate the body will do what is necessary for surviving rather than thriving. As a result pregnenelone will not make DHEA and progesterone

and DHEA will not convert into androstendione and androstendione will not convert into testosterone. This is why trying to optimize one hormone without optimizing Insulin and glucagons is futile and ineffective. Insulin is increased by carbohydrate consumption and glucagon is increased by protein consumption. Thus you must have protein and carbs at every meal to balance the protein/glucagons axis. Low carb diets (below 20% of total calories) will deprive the brain of blood glucose, which the brain needs for optimal function and mood regulation.

**What about fat?**
Low fat diets (lessthan 20% of total calories) are a big mistake, as fat is needed to produce autocrine hormones. Insulin controls the production of the good and bad hormones eicosanoids (more on this later).

**What about artificial sweeteners?**
Many people have the illusion that they can indulge in artificial sweeteners such as aspartame and alternative sweeteners such as stevia and xylitol without the negatives of eating sugar. Unfortunately that is not the case. Anything sweet will signal for the release of stored insulin into the bloodstream in anticipation that carbs are on the way. Thus you have all the negatives of eating carbs without eating them. You mind as well eat real carbs and enjoy it rather than deluding yourself with artificial and alternative sweeteners. Optimal time of eating for keeping insulin in optimal range

Keeping meals balanced is more important than when you eat the meals. However, keep in mind that serotonin levels rise at night and the later you eat the more insulin will be secreted and calories will be stored as fat. However, if you eat light during the day you will increase insulin sensitivity, which will block any of the negative effects of having a big meal in the evening. As long as the meal is a balance of protein, fat, and carbs you are fine. Avoid eating a lot right before bedtime and you are fine. Stop all eating two hours before bedtime.

**What about the role of exercise in keeping insulin in the optimal range?**
No doubt exercise is important. In addition to helping keep insulin in the optimal range it helps eat up excessive cortisol (assuming you are not over training). However, you only exercise a few times a week and few exercise several times a day every day. On the other hand most people eat 3-5 times per day and thus what you eat plays a much bigger role in keeping Insulin in the right range. The take home message is to eat less often and eat the right things when you do eat. Optimal range of Insulin (fasting blood test) The optimal level of fasting insulin is less than 10 uU/ml. If you are over 15uU/ml you are in an aging state. You can find out your number with a blood test.

**Eicosanoids**

***What are Eicosanoids?***

Eicosanoids are master hormones and having a good ratio of good to bad eicosanoids is critical for health and well being. High insulin levels increase the production of bad eicosanoids. Eicosanids are autocrine hormones that are made in every cell in the body. They are the ultimate regulators and there are good eicosanoids and bad eicosanoids. A balance must be kept between the two. Good eicosanoids are vasodilators, anti-inflammatory, and enhance the immune system. Bad eicosanoids are vasoconstrictors, pro-inflammation, and suppress the immune system. Bad eicosanoids are vasoconstrictive which decrease the size of capillaries around lung tissue and cause high blood pressure and high cholesterol levels.

As a result bad eicosanoids have a deleterious effect on aerobic capacity by compromising lung capacity. Aerobic capacity is the ability to delver adequate levels of oxygen to the muscles so that lactic acid does not accumulate. You will notice a tremendous increase in cardio capacity by increasing good eicosanoid production and lowering bad eicosanoid production. Bad eicosanoids also have a deleterious effect on muscle mass by ruining testosterone and growth hormone levels. Without T and GH muscle mass will not be maintained or increased. Good eicosanoids are bronchodilators that keep blood vessels dilates and healthy.
As a result lung capacity is enhanced and asthma symptoms will decrease. Keeping Insulin in the optimal range helps creates good eicosanoids.Just about every chronic disease such as high blood pressure, cancer, type 2 diabetes, and arthritis is from having far more bad eicosanoids than good.

**What are eicosanoids made from?**

Eicosanoids are made from essential fatty acids such as flax seed oil and fish oil. Gamma linolenic acid is the building block of good eicosanoids. Arachidonic Acid which many supplement companies are selling, as a muscle-building supplement ironically is the producer of bad eicosanoids. The goal is not to eradicate AA from our diet but to have a favorable ratio of GLA to AA. This is achieved from taking in adequate levels of EPA from Omega 3 sources. When you take more EPA less AA is produced. A popular source of EPA is fish oil. Fish oil is certainly high in EPA and DHA, which is important for brain health.

However, many of the sources are rancid are loaded with mercury and other toxic ingredients. You are better off eating organic fish several times a week and if you do not want to eat fish you can take a high quality supplement called V Pure Omega 3 which is a marine algae source of EPA and DHA. More info at: www.waterforlife.net You want a total of 300-400mg of EPA per day. Hard training athletes may need to double or triple that amount.

As for GLA you only need 1-2 mg per day. Most supplements contain way too much such as 240mg and this can lead to too much bad eicosanoid production which can result in grogginess, irritability, constipation, and very dense stools.

Eicosanoids are hormones at the cellular level and do not travel through the blood. Thus there is no blood test that you can do to see what your levels are. However, there are several self-monitoring tests that you can do.

**Signs of good eicosanoid levels:**

- Increase in daily performance
- Good mental concentration
- Decrease in cravings for carbs
- Appetite suppressed for longer after meals
- Increased fingernail strength
- Increased hair strength
- Stools that are floaters
  *(nope I am not kidding so do a stool analysis after every movement. However, do not take photos to send to me for myfeedback!)*
- Better sleep
- Less grogginess when you wake up
- Sense of well being
- Signs of too much good eicosanoids
- Diarrhea from too much water flow
- Low energy from glucose levels that are too low
- Signs of too much bad eicosanoids
- Constipation or very dense stools that sink to the bottom
  *(your goal is to produce a floater every time!)*
- Tired all the time
- Grogginess in the morning
- Depression
- Dry skin and eczema
- Flatulence
- Headaches

If you are making too much bad eicosanoid production then ramp up EPA and cut down GLA. Make sure you are not taking any EFA products that are loaded with GLA.

**Cortisol**

***What is Cortisol?***

Cortisol is a hormone produced in the adrenal glands to deal with stress. It plays a critical role in stress management and too little cortisol production is just as bad if not worse than too much cortisol production. The goal is not to lower cortisol too far but to create a balance of corticosteroids.

**Why is too little stress a problem?**

If too little stress takes place the adrenal glands atrophy and fail to produce cortisol. This is called adrenal burnout and can lead to Addison's disease. Thus, we as human beings need stress in order to thrive and be healthy. This is why many retirees become depressed and wither away. Stress is what makes us who we are.

**Why is too much cortisol bad?**

If stress is too high for too long adrenal fatigue will occur and more likely adrenal failure. When you have adrenal failure your body can no longer produce cortisol to deal with stress. You no longer have a defense mechanism to handle stress. Too much stress is never a good thing and overproduction of cortisol can lead to Cushing's syndrome. Symptoms of Cushing's syndrome include muscle wasting, abdominal fat accumulation, depression, poor immune function, and bone loss. When cortisol levels go up good eicosanoid synthesis is halted. Fortunately good eicosanoid levels go back up after the brain is given the signal to lower cortisol. However, if cortisol levels stay up for too long adrenal failure is the end result.

**What is the connection between high carb meals and cortisol?**

High carb meals take insulin way up in order to being glucose levels down. Cortisol is then produced to bring glucose back up into normal ranges for proper brain functioning. Cortisol is doing what protein would have done if it were in the meal. Protein produces glucagons which balance insulin and helps keep glucose steady. When not enough protein is consumed in a meal, the end result is increased levels of cortisol. Which in turn destroys anti-aging hormones such as DHEA and testosterone.

**Exercise and Cortisol**

Moderate exercise reduces insulin levels and glucose is kept in a good range from the exercise induced glucagons. Intense exercise increases cortisol production and free radicals. This does not mean that you cannot train intense ever. However, it does mean that you want to avoid intense training when you are under a lot of stress. Or it means you have to balance the equation with stress reducing methods such as quality sleep, meditation, massage, and a high quality diet.

Intense exercise in and of itself is not the real problem. The problem is trainees that bite off more than they can chew. You need to give yourself time to adapt to the stimulus of intense exercise. If you want to train hard for the rest of your life you have to build up the intensity gradually and apply training cycling to your workouts. Also for every intense weight training workout that you do follow it up the next day with a moderate cardio workout.
The heart uses lactic acid for energy and a great deal of lactic acid is created from intense weight training 20-40 minutes of moderate cardio will eat up the lactic acid, reduce stress, and decrease recovery time. Intense exercise is a powerful Growth Hormone and Testosterone Booster and you must do it to optimize hormones naturally.

However, you have to recover from the workouts as well. Balance Intense Exercise and Stress With Mediation and other forms of restoration Meditation is a time-tested proven method to reduce cortisol. Get it in your routine for at least thirty minutes every day. It is a gift to yourself and will make you a better person to everyone in your life. I really like the Holosync meditation program. I have been using it for over a year and love it. Get a relaxation massage ever other week or once a month to further induce relaxation. Finally get 7-9 hours of quality deep sleep every night.

Optimal Range Of Cortisol *(saliva test)*
Men and women: 1.5-11ng/ml *(morning)*
Men and women 0.4-3ng/ml *(evening)*

**Testosterone**
***What is Testosterone?***
This is the most controversial hormone and the one that every man focuses on for good reason. Testosterone is what makes a man a man. If you do not have enough you will have an irresistible urge to watch sex in the city marathons and jump up and dance every time an ABBA song is on. Adequate levels of testosterone are critical for muscle mass maintenance and for muscle building. Sex drive and sex function is also largely controlled by testosterone. Testosterone is also important for heart health (the highest concentration of testosterone receptors is in the heart) and for overall wellbeing.

Simply stated if you want a zeal for life you need testosterone. More importantly you need access to what you are making. Testosterone is required in the production of red blood cells and is needed to transfer oxygen. Testosterone is one of the most important hormones for heart health and there is an abundance of testosterone receptors in the heart. In healthy men, testosterone is found in large amounts in the brain, heart, and testicles.

Ironically if testosterone levels are too high bad eicosanoid production goes up. Thus the goal is not to take testosterone through the roof but to get it in an optimal zone (varies with each man) and create a good testosterone to estrogen ratio.

**How is testosterone produced?**

Like all endocrine hormones it starts in the brain. The brain tells the testes to get going and the testes use cholesterol to make pregnenelone, which is the mother of all hormones. Cholesterol is critical for proper hormone production and thus following a low fat diet is a great way to destroy testosterone production. Pregnenelone is the precursor to the hormones DHEA and progesterone. Progesterone is a very important hormone for men and more so for women. DHEA is also a very important hormone for both men and women but more so for men. If men have low DHEA levels they will have low testosterone levels (unless they are taking hormone replacement). DHEA and progesterone convert into Androstendione and androstendione converts into testosterone.

Keep in mind that Pregnenelone can also converts into estrogen or cortisol. Unfortunately when many men take hormones directly such as pregnenelone, DHEA, and before it was banned androstendione they ended up producing more estrogen *(estradiol and estrone)* than the desired testosterone. The higher your bodyfat, the more estrogen receptors you have and the higher the likelihood that you will convert direct hormones into estrogen rather than testosterone. Having a low bodyfat decreases the probability of estrogen conversion but does not eliminate it. Thus I do not recommend hormone replacement in any form for most people. Certainly not without doctor supervision and regular blood or saliva testing.

**What hampers testosterone production and utilization?**

It all comes back to Insulin and Cortisol. High levels of insulin block the freeing of testosterone form sex hormone binding globulin. In other words, the testosterone is bound up and not accessible. This is why you want to find out what your free levels are. You can have high total testosterone levels and poor free levels depriving you of all of the benefits of testosterone. High estrogen levels also obliterate testosterone levels and utilization. The enzyme responsible for converting testosterone into estrogen is in abundance in fat cells. The more fat cells you have the more of these estrogenconverting enzymes you have.

When the stress hormone cortisol goes up testosterone goes down. High stress depletes the bodies Zinc levels and zinc is the most important mineral for optimal T levels. Magnesium is also a critical mineral for hormone production. If magnesium levels are low, hormone levels will be low. Stress depletes zinc, magnesium, as well as B vitamins.

**How can a man increase testosterone production and utilization?**
You must lose fat in order to lower estrogen and increase testosterone and the only way to lose fat is to lower high insulin levels. Cortisol has to be kept in optimal ranges to keep testosterone production optimal. In a healthy person cortisol is high in the morning and goes down during the day until it is low in the evening and in particular before bedtime. High cortisol at night will lead to insomnia. Low cortisol early in the day will lead to brain and physical fatigue.

Intense weight training workouts with short breaks *(no more than a minute)* and no longer than forty-five minutes boost testosterone and growth hormone. However, if you are in an over trained state or under a lot of stress intense weight training will only make things worse. You must manage stress in order to train hard and you must train hard to ramp up testosterone and growth hormone naturally.

**What about supplements?**
Supplements that focus on boosting T can be useful as an aid but should not be the focus of optimizing hormone levels. Remember you must create an optimal hormone environment. Even if the supplement does boost T it will only work if your insulin levels are optimal and if you are eating adequate levels of fat in order to make cholesterol. If you are going to take supplements to boost T the best ones are the ones that focus on boosting the mother of all hormones pregnenelone and no taking supplemental pregenelone is not the answer. Oddly enough the best supplement for increasing pregenelone and in turn progesterone, DHEA, androstendione, and testosterone is Biogenics magnesium cream. This cream increases intracellular levels of magnesium is advertised as a DHEA optimizer. I take it and it took my DHEA levels up big time. This in turn boosted by free testosterone levels dramatically. However, my saliva test also shows that my progesterone and androstendione levels went way up.

While I did not have my pregnenelone levels checked there is no way that I could have increased, DHEA and progesterone without ramping up pregnenelone. Thus in my option the magnesium cream is a pregenelone optimizer which in turn optimizes all other hormones. That said I doubt that it will work will if Insulin levels are high or if your bodyfat is high. My bodyfat and insulin levels are low and it worked very well for me. The only other supplements that I would recommend are zinc and Vitamin A. 30mg of Zinc citrate will get the job done. Zinc is the most important mineral for testosterone production and is wiped out when cortisol levels are high. Vitamin A is the most important vitamin for testosterone. No need to supplement with either individually. Just take a good multi-vitamin that covers the entire basis. No mega dosing is necessary or recommended.

**Optimal Testosterone *(free level)* Range**

Men: 90-150pg/ml *(saliva test)*
Women: 25-50pg/ml *(saliva test)*

**Estrogen**
***What is estrogen?***
Estrogen is an endocrine hormone that is secreted in the ovaries, placenta,adipose (fat reserves), and testes that stimulate the development of female secondary sex characteristics and promotes the growth and maintenance of the female reproductive system.

**There are three main types of estrogen:**
- Estradiol (the strongest and most harmful in men)
- Estrone (an adrenal estrogen that can be elevated with adrenal stress)
- Estriol (a beneficial estrogen that is largely responsible for all of the health benefits of estrogen such as bone health, good mood, and sex drive)

**Why is estrogen bad?**
The right amount of estrogen is not only good but also essential for both men and women for mood regulation, bone health, and libido. However, too much estrogen referred to, as "estrogen dominance" is very harmful and occurs when there is an excess of estrogen in the body that deactivates beneficial hormones such as progesterone, DHEA, androstendione, and testosterone. Excess estrogen especially from chemical estrogens (xenoestrogens) can cause feminization and sterilization in men and some of the worst cancers in both men and women. There is more and more evidence linking estrogen to prostate cancer in men.

**What causes estrogen dominance?**
*There are many factors that contribute to estrogen dominance.*
**Some of the culprits include:**

***Genetics:***
Some men and women have a genetic predisposition towards estrogen dominance.
Stress (increased cortisol that stays up for too long will increase estrogen levels) Excess Body-fat: If you carry too much body fat you have estrogen receptors as estrogen receptors are in abundance in fat cells. Men should strive to stay at 15% and below (below 10% is better for most) and women should strive to stay below 20% (around 15% is even better).

***Environmental pollutants:***
We are bombarded with estrogen chemicals on a daily basis that are far more harmful than any natural estrogen. These are known as xenoestrogens. Xenoestrogens are plentiful in plastic water bottles and food that is not 100% organic. Avoid using plastic bottles whenever possible and always eat 100% organic food (especially animal products) as your health is worth it.

***Diet:***
Over consuming meat and dairy that is a highly processed and loaded with harmful estrogenic chemical. Again, eat 100% organic or do not eat meat at all.

***How do you know if your estrogen levels are high?***
Men and women that have excess body fat (over 20%) for the most part will have high normal estrogen levels and likely even higher. Doing a saliva or urine test is a good idea to determine what your estrogen levels are. Test for estradiol and estrone.

**Ideal Estrogen levels** *(saliva test)*

**Men:**
Estradiol: 1-10pg/ml
Estrone: 0.8 -2 pg/ml

**Women:**
Estradiol: 2-10pg/ml (post-menopausal)
5-25pg/ml (follicular)
2-25/pg/ml (luteal)
Estrone: 1.5 to 4.5 pg/ml

**What Can I do to combat estrogen dominance?**
- Keep your bodyfat in the ideal range
- Build as much muscle as possible
  *(muscle doe not have to mean bulk. You can build muscle without taking up more space)*
- Eat 100% organic food as much as possible
- Include cruciferous veggies in your diet daily or at least several timesa week.
  Some examples are broccoli, cauliflower, brussel sprouts, and cabbage.
- Consume omega 3-oils daily such as flaxseed or hempseed oils, nuts and seeds.
- Eat several servings of fruits and veggies daily
- Eat several servings daily of raw nuts, seeds, avocado, and non soy legumes.

• Take a B-Vitamin tablet every day. B-vitamins help push out estrone in the adrenals. The more stress you are under the more B-vitamins you need.
• Make sure progesterone levels are optimal

**Progesterone**:
***What is Progesterone?***
Progesterone is an endocrine hormone found in both men and women that is responsible for keeping estrogen in balance. It is secreted by the ovaries in women any by the adrenal glands in both men and women. In women progesterone promotes development of the mammary glands. In men progesterone helps keep estrogen at bay so that testosterone is free to do what it needs to do.

**Benefits of Optimal Progesterone Levels:**
• Elevates Mood
• Increases bone density
• Fights the production of too much estrogen
• Helps block the conversion of testosterone into estrogen
• Increases libido
• Helps increase muscle mass
• Helps keep bodyfat levels low
• Has a protective effect on the brain
• Helps keep the heart healthy
• Has a protective effective on the prostate in men

**What is the optimal range of progesterone?**

**Men**
50-100 pg/ml (saliva test)

**Women:**
50-100pg/ml (post menopausal)
100-250pg/ml (follicular)
300-600pg/ml (luteal)

**How can one increase progesterone levels naturally?**
Progesterone is an endocrine hormone that is made from the mother of all hormones

pregnenelone. Pregnenelone is made from cholesterol and thus you need a good amount of healthy fat in your diet to give your body the stuff that it needs to make pregnenelone and in turn progesterone. Get at least 20-40% of all calories from healthy fat sources such as coconut milk and oil, nuts and seeds, flaxseed and hempseed oil etc.

Next, magnesium cream (I use Biogenics) is a very powerful and natural way to increase pregnenelone, which in turn helps increase progesterone,DHEA, and testosterone.
My most recent saliva test is proof of that. Magnesium deficiently can lead to a host of health problems including heart problems so make sure your magnesium levels are optimal.

**Growth Hormone**

***What is growth hormone?***

Growth hormone is an endocrine hormone that is made in the brain. More specifically the pituitary glad. Without adequate levels of protein you are not giving your body the stuff it needs to make growth hormone. GH is not made from cholesterol like sex hormones such as pregenelone and testosterone. The Brain signals the liver to make growth hormone. Fat cells actually contain growth hormone receptors. However, this does not mean that you want more fat cells as fat cells also contain estrogen receptors. GH causes fat cells to release stored fat for energy and growth of new muscle.

This is why working out on an empty stomach is highly beneficial for GH production and in turn fat loss. By targeting the liver, GH produces IGF-1 (Insulin like growth factor), which is responsible for all of the muscle building properties of GH. Interestingly enough, IGF-1 looks very similar to Insulin and they both compete for the same receptors. This is why spiking insulin during or after workouts is a big mistake as it shuts down the exercise induced IGF-1 production. High carb, low protein diets result in poor GH production and an increased likelihood of fat gain via the insulin surge.

IGF-1 will also plummet on low calorie diets, which is why many dieters lose more muscle than fat on low calorie diets. Much of the negatives associated with low calorie diets can be controlled by adequate protein and fat consumption. Thus if you do low calorie it becomes more important to get the majority of calories from Protein and fat. Especially protein.

**Exercise and GH production**

Sprinting and intense weight training with short breaks will ramp up IGF-1 levels. The IGF-1 increase does not occur during the workout but 15-30 minutes after. Thus avoid having a post workout recovery meal right after a workout. Instead take a 30 minute nap on an empty stomach

and then wake up and have a protein shake with a good amount of fat, protein, and carbs to refuel and keep insulin levels steady to keep the IGF-1 levels as high for longer periods.
Sleep and GH production

Intense exercise results in the largest increase of natural IGF-1 production.Sleep comes in second. Without adequate sleep cortisol levels will be high and hormone optimization becomes impossible. A great deal of IGF-1 production occurs when you sleep. The deeper the sleep the great the IGF-1 production. Deep sleep with vivid dreams is a good sign that your body is ramping up IGF-1 levels. While length of sleep is important, quality is even more important. Five hours of deep sleep is better than eight hours of tossing and turning. However eight hours of deep sleep is better than five. The harder you train the longer and better your sleep needs to be. Try listening to the Holosync meditation program before bedtime and or mediate for 15-30 minutes before bedtime. A hot shower or bath soaking in Epsom salt can also help induce relaxation and sleep. Taking magnesium cream or oral magnesium will also help. I prefer the cream, as it is powerful hormone inducers as well.

**Supplements for GH**
There are a few supplements that work for increasing IGF-1 production. However, you have to do the above to get the full benefits. Simply taking IGF-1 supplements without doing the right exercise and diet is futile and utterly moronic. However, if you eat right and train right homeopathic GH boosters can increase IGF-1 levels by 10-30%.

I recommend NOW IGF-1 spray or lozenges or always-young homeopathic GH.
You can get the Now IGF-1 Spray at ***www.bodybuilding.com*** or ***www.bulknutrition.com***.

**Optimal IGF-1 Levels**
Men and women 200ng/dl to 300ng/dl *(blood test)*

**Serotonin**
***What is Serotonin?***
Serotonin is a pancrine hormone. Meaning it is a hormone that travels short distances. It plays a very important role in regulating mood and insulin levels. If you have low serotonin levels you will be depressed and are more likely to be violent. Violence is more related too low serotonin and depression than it is too much testosterone, which is the ultimate mood enhancer, and feel good hormone. *(Have you ever been depressed with a high sex drive and zeal for life?)*
It is also a precursor to the hormone melatonin, which is critical for quality sleep and a strong immune system. Melatonin is several times more powerful than any other antioxidant.

Without adequate melatonin you will not sleep well and will not get adequate GH production. Ideally serotonin is high during the day and then turns into melatonin at night to induce quality sleep. When you start yawning at night that is a sign that melatonin levels are adequate.
Where does serotonin come from? Serotonin and melatonin are both made from the amino acid tryptophan, which we must get from the diet, specifically protein consumption. What can you do to ensure serotonin levels are optimal?

One you can take supplemental tryptophan or 5-HTTP. Both work well and help with sugar cravings and drops in mood when on low calorie diets. However, a more powerful and practical way to ensure optimal serotonin levels is to optimize diet. Adequate carbohydrate consumption helps with adequate serotonin levels. However, too much carb consumption ramps up Insulin levels. On the other hand, low carb diets result in protein burning burned for glucose, which deprives one of the serotonin boosting elements of protein consumption. Carbs have a protein sparing effect and must be consumed.

The key is the right range, which for most will be 30-50% of overall calories. It really depends on whether fat is your preferred source of fuel or carbs. If fat then you want more fat and less carbs in your diet. If carbs you want more carbs and less fat. Regardless of which category you fall in you must have protein, carbs, and fat at every meal.

**Optimal Serotonin Level**
Serotonin is a pancrine hormone and is not released in the blood. Thus it cannot be measured by blood or saliva tests.

**Thyroid Hormones**
***The Importance Of Thyroid Hormones***

The thyroid is a very controversial gland and one that many fat people use as an excuse for being fat. While this is in large part a cop out it is not completely inaccurate as proper thyroid functioning plays a critical role in the function of the metabolism and overall health. The Thyroid also helps keep cholesterol levels in the right range.

**What do thyroid hormones do?**
Thyroid hormones control body temperature, metabolism, mood, growth, and development. There are three thyroid hormones: T4, T3, TRH.
T4 is the primary thyroid hormone and is releases in the bloodstream and is converted into T3 in the peripheral tissue. T3 is the most active form and is 3-8 times more active than T4.

TRH is not produced in the thyroid gland. The brain releases TRH, which binds to receptors in the thyroid gland. When your TRH levels are high it means the thyroid is not producing adequate levels of T4. Thus, the brain is trying to ramp things up. This is not the goal as you want the thyroid gland to produce adequate levels of T4 and more importantly you want conversion into T3.

**How do you know if your thyroid levels are optimal?**
You can have a blood test for T4, T3, and TRH. However, there are alsomany symptoms of low thyroid that you can monitor:

- Cold intolerance
- High body fat
- Depression
- Fatigue
- Muscle Weakness
- Weak hair and nails
- Elevated cholesterol
- Dry Skin
- Weight Gain
- Very slow fat loss

**How do you optimize Thyroid hormone levels and thyroid function?**
Optimal levels of thyroid hormones control optimal thyroid function. Thus if you want your thyroid to work better you have to have the right levels of all the thyroid hormones.
Increased insulin lowers thyroid hormone levels. Increased insulin results in an increase of bad eicosanoids, which hampers thyroid hormone levels. Thus, eat protein, fat, and carbs at every meal to balance insulin levels. Also adequate EPA levels will keep the ration between good and bad eicosanoids optimal and will results in good thyroid function.

The stress hormone cortisol is also needed to convert T4 into T3. This is why if you have adrenal fatigue your thyroid levels will be low. Thus you must keep your adrenals healthy with the right diet, right levels of exercise, and adequate restoration and stress management.
You must keep the hormone DHEA in optimal ranges to keep cortisol in the right ranges.

**Optimal Thyroid Levels** *(blood test)*
Men and women
TSH: 0.450 to 4.5 uIU/ml
T3 (free levels) 2.3-4.2 pg/ml
T4 0.61-1.76
DHEA

**What is DHEA?**

DHEA is an adrenal hormone and a powerful stress-regulating hormone. High DHEA keeps cortisol low by binding to its receptors. In other words, DHEA and cortisol compete for the same receptors. If DHEA is not high enough then cortisol wins the game. Increased insulin lowers total DHEA levels in men. When Insulin levels go way up, the body produces Cortisol as a back up system to lower glucose levels and get Insulin down as well. Every time cortisol goes up and stays up DHEA goes down. Ironically increased Insulin has no effect on DHEA levels in women. DHEA is a very powerful hormone in women and is more likely to convert into testosterone in women than in men.

**How do you optimize DHEA hormone levels?**
A three-prong approach will work well:

1. Exercise regularly to eat up excess cortisol. However, make sure youavoid over training and recover from every workout adequate.
2. Keep Insulin levels steady by consuming the right amounts of protein, carbs, and fat at every meal without exception.
3. Make sure magnesium levels are adequate. Magnesium is a powerful mineral for adequate hormone production. I prefer magnesium cream, which increases magnesium on the cellular level. This works very well to increase pregnenelone, which increases DHEA, progesterone, androstendione, and testosterone.

**Optimal DHEA Levels** *(saliva test)*
Men (AM): 400-600 pg/ml (PM) 90-170 pg/ml
Women (AM) 150-400pg/ml (PM) 60-131 pg/ml

**Where do you go from here?**

***Recommended Steps***

- Make sure you have protein, fat, and carbs at every meal *(including post workout shakes)*. You will have to experiment to determine what the ideal ratio is for you. A good place to start is 30% protein, 40% carbs, and 30% fat. You do not have to get the ratios perfect to benefit.

**Just have all three macronutrients at every meal.**

- Get all food from organic real food sources.
- Get all carbs from fruits and veggies
- Address emotional issues such as child hood traumas. If you fail to do this, hormones will never be optimal. I know personally
- Start meditating 20 minutes daily. Beneficial any time but has particular benefits after workouts and before bedtime.
- Take charge of your life and responsibility for all that comes with it.
- Incorporate intense cardio training such as sprinting into your routine.
- Engage in heavy weight training with short breaks *(60 second breaks and 60-80% of one rep max)*. Focus on compound exercises
- Take Magnesium cream before bedtime and take 30mg of zinc.

For the cream I recommend: ***http://www.springvalleyherbs.com/catalog.php?itemID=2872***

**Recommended Reading**

**The Anti-aging Zone** By: Barry Sears Ph.D
*(great info on diet and hormone levels. However, I do not agree with his conclusion that intense exercise is bad for you. Also, I do not think you need to follow his 30-40-30 diet plan nor do you need to eat five times per day)*
www.thezonediet.com

**The Anti-estrogenic Diet** by: Ori Hofmekler
*(great info on how to lower estrogen and increase liver health via diet).*
www.warriordiet.com

**Ageless** by: Suzanne Sommers
*(great compilation of interviews with doctors as well as Suzanne's own story on hormones)*

**The Testosterone Syndrome** by: Eugene Shippen, M.D.
*(very good overview of the importance of testosterone for men as well as the pros and cons of hormone replacement)*

**Maximum Male Performance** by: Dr William Wong, N.D. Ph.D.

**The Miracle Of Bio-Identical Hormones** by: Michael E Platt, M.D.
*(good review of the pros and cons of bio-identical hormones. Also contains several case studies)*