Biohacking Training Webinar

Lesson 5

Energy Production Metabolic Pathway

Tricarboxylic Acid (fast oxidiser) / Beta Slow Oxidiser Balances

Mark Hathaway

Some legal stuff

I understand that Mark Hathaway provides educational assistance, tutoring, consulting and coaching services to help me understand concepts in nutrition, diet, food and other areas deemed important in order to live a fuller and healthier life, and in association with this education to learn specifically of the foods, dietary supplements or more that can assist in balancing my state of health.

I further request and accept the use of any tools of the "health trade," and at my sole discretion under retained right, in whatever form available in a free market that may be provided for my use to further my health education be it software, workshops, testing or health auditing apparatus, clinical or laboratory equipment.

I understand that Mark received certification in Flow Systems technology for health auditing through professional training programs from Biomedx (Chicago), but is neither offering nor providing a service under this agreement under any official government certification and/or license as a health, or diet professional.

I understand that the health coaching services under this agreement does not, cannot, and will not provide any diagnosis, prescription, or treatment options for any medically or otherwise defined health ailment wherein only a licensed professional may be competent to address such issue, and further, should miscommunication result in a perception that such is the case, I acknowledge that I alone bear full responsibility for any actions taken due to the miscommunication. At no time is this coaching service intended as a substitute for regular medical or other licensed care.

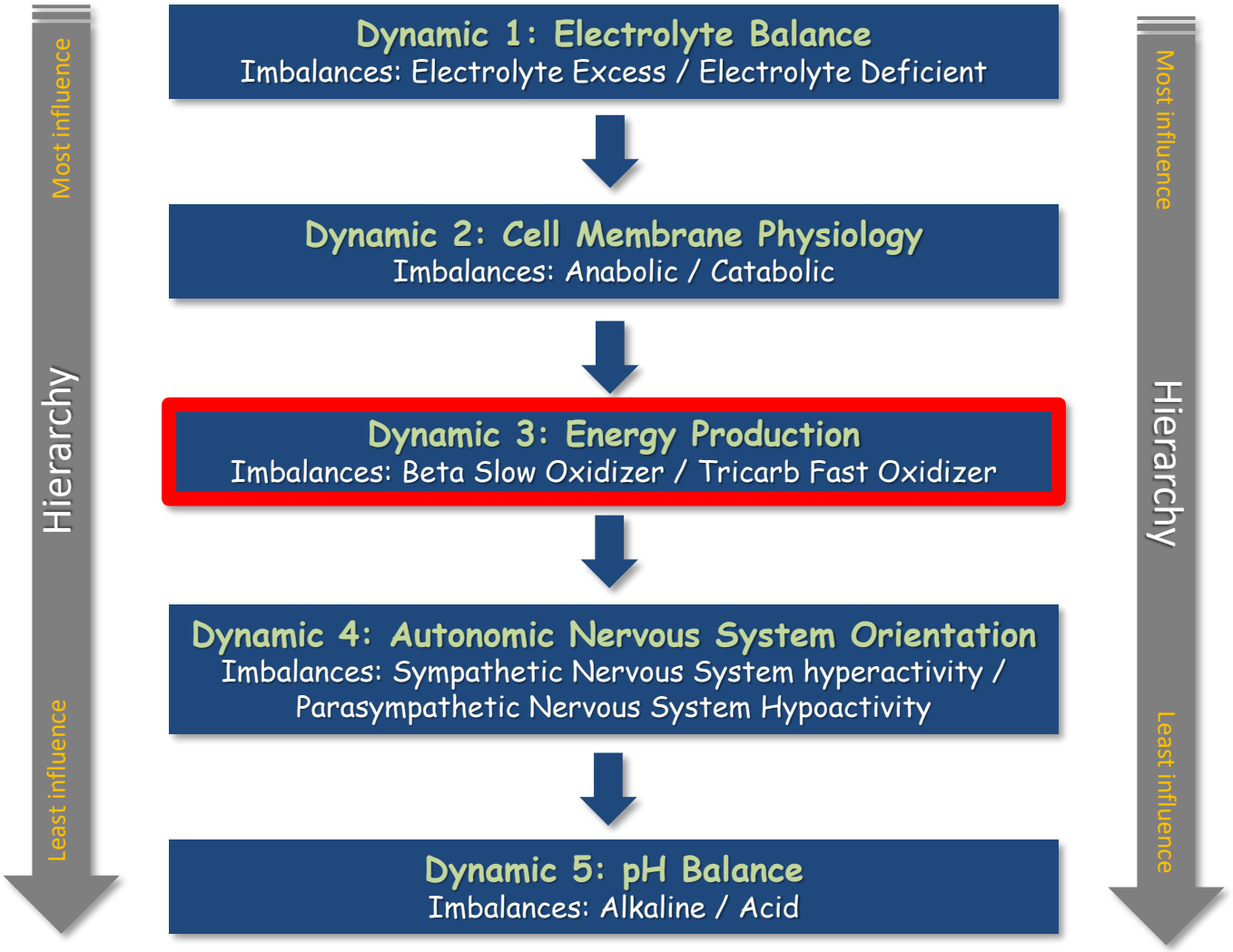
I understand that I assume all risks from the use, non-use or misuse of information, materials or opinions provided by Mark Hathaway during my health coaching sessions, trainings or presentations.

Today's Topics

1. **ENERGY PRODUCTION METABOLIC PATHWAY** - What is your body's preferred fuel source, Carbohydrates or fats? This is vital for energy production, weight loss, mental health and achieving your physical health goals. You will be learning how to measure, profile and re-balance this fundamental metabolic control mechanism.

2. **Discussion** / Q & A to follow Next Weekend

The Five Fundamental Balances



Where does this work come from?

Synthesizing *the primary contributions* of the greatest minds in health *science of the* past century and *sequencing the best of their strategies* into a hierarchical structure that logically *points you to the most* important concerns, balance points, *and interference* patterns causing problems *in fluid dynamics.*

Dr. Emanual Revici

Cancer Therapy
Cell Membrane Physiology
Lipid/sterol mechanics
Anabolic/Catabolic
Diphasic nature of human life

Dr. Carey Reams

Fluid dynamics
Uncovered what he believed to be the mathematical equation for perfect health in the human body.
Reams Biological Theory of Ionization

CS + [1.5 6.4/6.4 6-7 C .04 M 3/3] = PH

CS (Common Sense) plus the equation for [the ideal line of least resistance in body chemistry] equals PH (perfect Health).

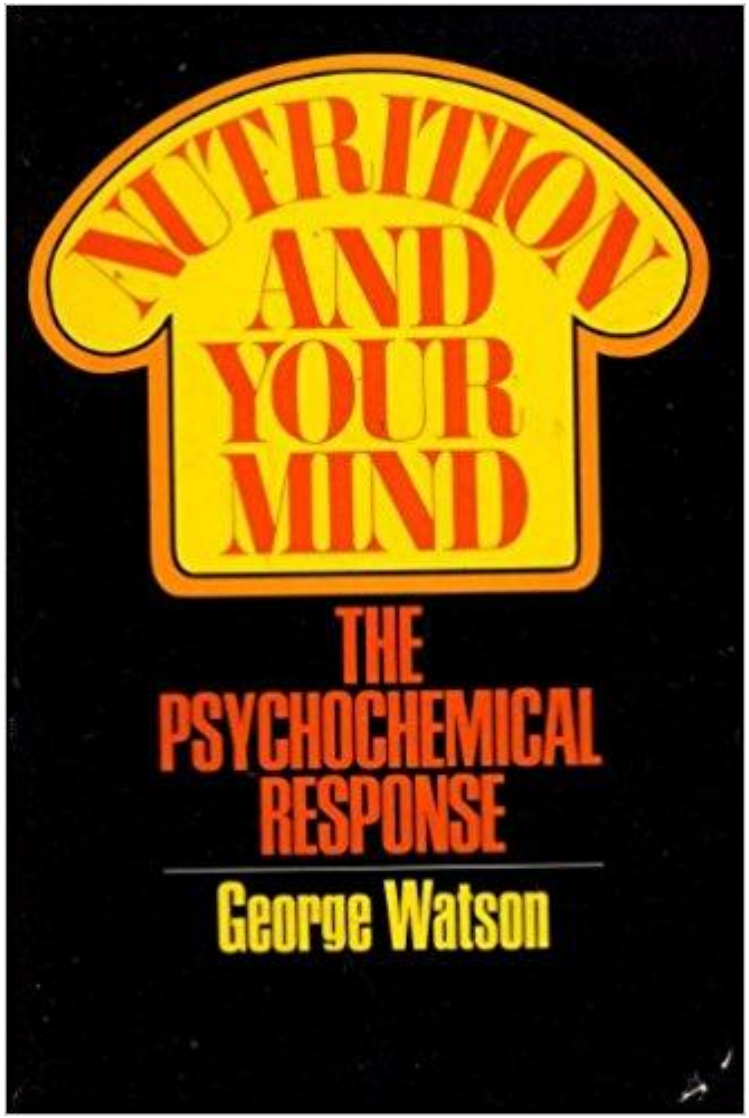
Dr. T.C. McDaniel

Cardiovascular expert
Zeta Potential - the measured ratio of an-ions to non-ions and cations in the body's circulatory terrain.
Wrote the book, Disease Reprieve - Living Into the Golden Years

Dr. George Watson, PhD.

Nutritional Psychiatry for Emotional Health & Cognitive Performance.
Cellular metabolism and energy production.
Coined the terms "fast / slow oxidiser"
Fuel for Proper Brain Function and Balanced Emotions

Where this work comes from



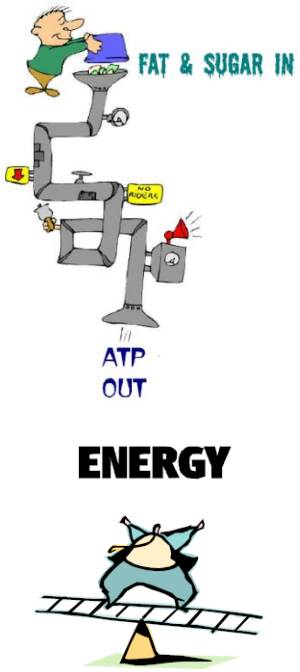
Energy Production Metabolic Pathway

ATP = The Energy that Runs Your Body

FAT and SUGAR is the fuel that mitochondria uses to generate ATP
The beta-oxidation metabolic pathway uses fat – The tricarboxylic acid metabolic pathway uses sugar

Beta-Oxidiser
(Burns fats over carbs)

Inducing – for:
Fatigue
Depression/Anxiety
Low body temp
High serum pH
High blood sugar
High triglycerides
Bilirubin in urine – liver overload
Ketones in urine most times



Tri-Carb
(Burns carbs over fat)

Inducing – for:
Fatigue
Depression/Anxiety
Low body temp
Low serum pH
Low blood sugar
High cholesterol
Bilirubin in urine – gall stones
Ketones in urine after not eating

Mitochondria **is an intracellular bacteria which possesses** a mechanism (the krebs cycle) whose end-product is **ATP (Adenosine Triphosphate)**

Energy Production Metabolic Pathway

A slow oxidiser imbalance is by far the most common imbalance I see with this energy production control mechanism. I rarely see someone who's a Fast Oxidiser.

INTERESTING!!!

Energy Production Metabolic Pathway

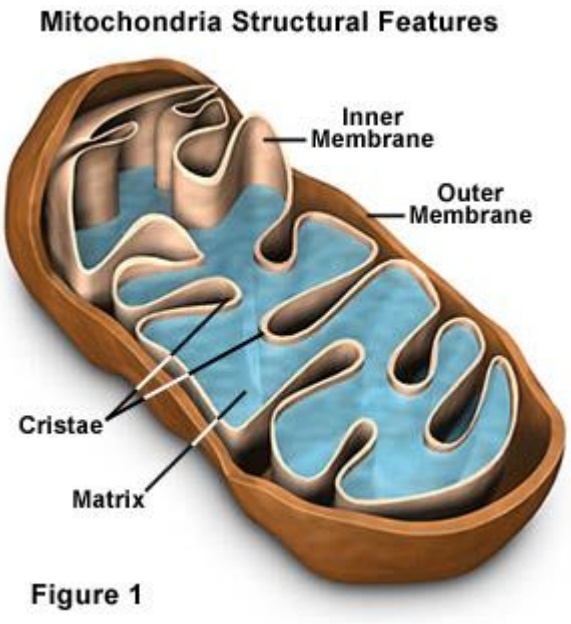


Figure 1

With this mechanism we examine the operation of the energy machine (mitochondria) within the cells by looking at clues that point to imbalance in the Krebs cycle. This cycle has two key pathways of operation and ultimate production of ATP (adenosine triphosphate – the fuel that runs the body). The tricarboxylic acid pathway turns carbohydrates into energy and the beta oxidation pathway turns fat into energy.

Energy Production Metabolic Pathway

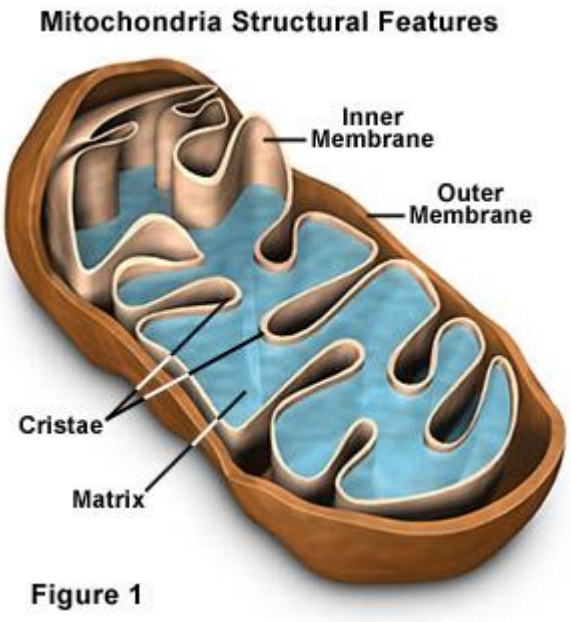


Figure 1

If one side is not operating efficiently, the body can shift and use the other side. So we can have a situation whereby one side dominates. This is usually the case when some intermediate metabolite is not present to run the mitochondrial machinery or some element has thrown a monkey wrench so to speak into the picture and is messing up the machinery.

Energy Production Metabolic Pathway

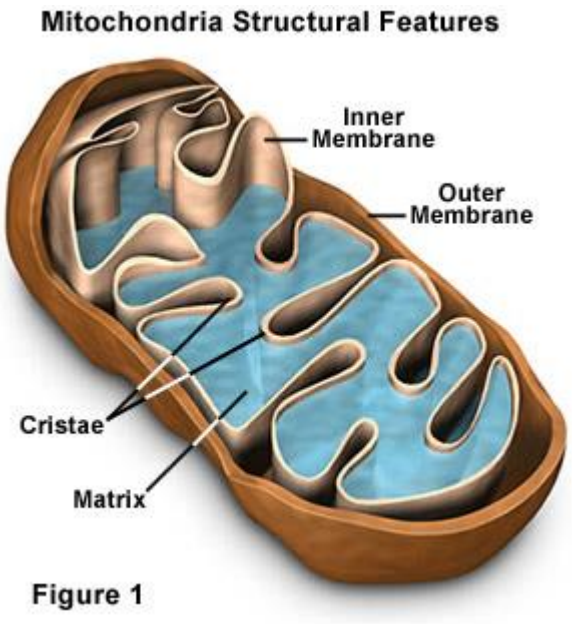


Figure 1

If an individual is primarily utilising one side of the process like the beta side, then they have a problem getting to the tricarb side for energy production. If this were the case, they would be burning fats for energy and they would be deficient in burning carbohydrates. Their blood would lean alkaline, they would likely be hyper-glycemic (they are not burning sugar), and they would be classified as slow oxidisers and ketogenic.

Energy Production Metabolic Pathway

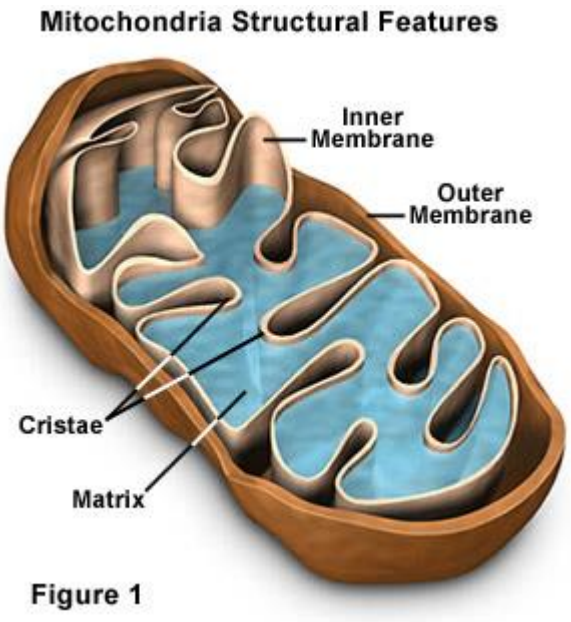


Figure 1

On the other side, if they test numbers showed that they were on the tricarb side, that would infer they were primarily burning carbohydrate for fuel. They are not using fats well, they are hypo-glycemic (burning all the sugar they can find to maintain energy), their blood would lean acidic, and they would be classified as fast oxidisers and glucogenic.

Energy Production Metabolic Pathway

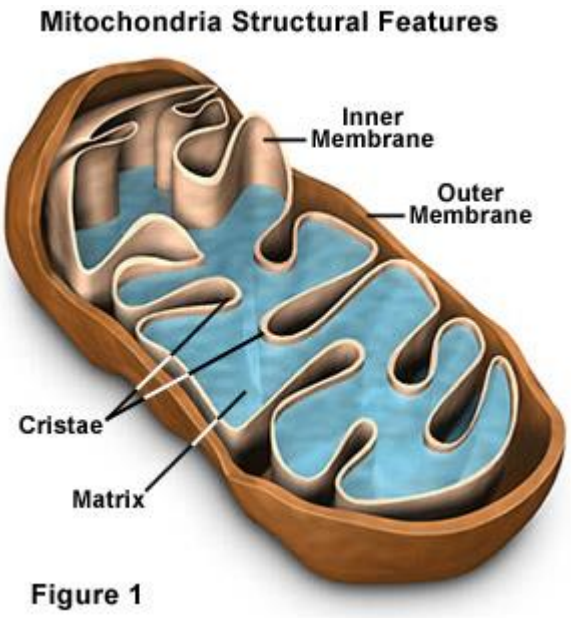


Figure 1

The concept of fast and slow oxidiers is derived in large measure through the work of Dr. George Watson. He discovered through working with psychiatric patients that their neurosis were often the result of eating the wrong foods in relation to how that food was being used for energy. If individuals did great on carbohydrates but poorly on fats, Dr. Watson noticed that their blood was typically more to the acid side and he termed these individuals fast oxidisers.

Energy Production Metabolic Pathway

Note the correlation to pH in the sense that lower pH usually means less resistance to the flow of electricity, hence things are moving faster.

Energy Production Metabolic Pathway

Have you ever wondered….

- What's the best diet to lose fat?
- How can I tap into the tens of thousands of calories of real energy I carry around with me every day
- Why can't I burn this body fat no matter how hard I work-out or however strict I diet?
- How can I have the body of my dreams AND my sanity at the same time?

Energy Production Metabolic Pathway

Have you ever wondered….

- What is the underlying physiological cause of most depression/anxiety/& mental illness?
- What's the key to happiness? (Really though, at least part of the puzzle is answered below in understanding the relationship of energy metabolism and brain function.)
- What does mental performance and emotional health have to do with burning fat?

Energy Production Metabolic Pathway

Fortunately for us…..

Burning fat, emotional health and mental performance all go together in a balanced body.

Energy Production Metabolic Pathway

Energy burn rate

The rate at which we burn through different energy sources, and which types of energy sources (fats, carbohydrates, and proteins) significantly impacts the amount of energy we have to think, move, exercise and also how we feel emotionally.

Energy Production Metabolic Pathway

Metabolic Tendency

Your Metabolic Tendency refers to your body's tendency to burn through carbohydrates for energy quickly or slowly. If your body burns through carbohydrates quickly, you may be classified as a "Fast Oxidiser".

Energy Production Metabolic Pathway

Metabolic Tendency

If you burn through carbohydrates slowly, you could be classified a "Slow Oxidiser".

Energy Production Metabolic Pathway

Metabolic Tendency

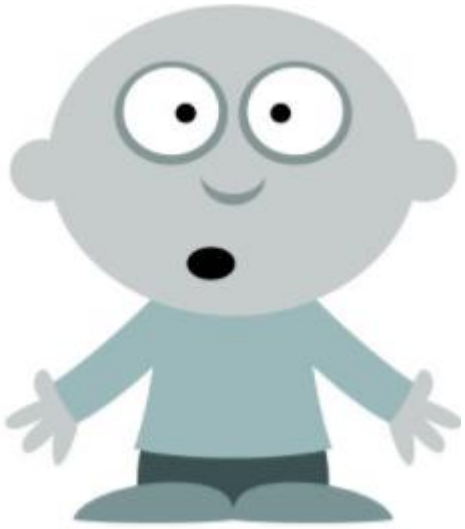
Further, if you do not burn through any energy source efficiently, you could be classified as a "Sub Oxidiser".

Energy Production Metabolic Pathway

Metabolic Tendency

For maximum energy production, we have a balanced oxidation rate - which would mean that our body has a steady stream of energy available to it at all times - which requires that we are efficient at metabolising all fuel sources (carbs, fat & protein) AND that our diet provides the right kinds and ratios of fuel sources and the cofactors necessary to process them.

Energy Production Metabolic Pathway



Simply Speaking...

If you burn through carbohydrates too quickly (fast oxidiser) due to poor diet choices or ineffective digestion of proteins or fats, then you cannot tap into those most abundant sources of energy (protein and fat) that could come from your diet & body energy reserves. If you burn through carbohydrates too slowly (slow oxidiser) then your body lacks all the pieces of the metabolic puzzle needed to burn fat and protein for energy.

Energy Production Metabolic Pathway

Metaphorically Speaking...

Think of carbohydrates as the kindling needed to start a fire. The enzymes in your salvia are the match that initially lights the kindling. The kindling provides some immediate warmth and light (energy), but it's not the real fire. Your body fat and dietary fats and proteins are the major fuel for the fire - they are the big logs that will give you abundant warmth and light (real metabolic energy).

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Energy Production Metabolic Pathway

Metaphorically Speaking...

The energy from the kindling literally dims in comparison to the potential fire from the big logs, BUT you can't get the fire going with the big logs if you didn't start with the kindling first. Same so in our body - essential digestive intermediaries created as sugar is metabolised as necessary to start the metabolic utilisation of energy from stored body fat and dietary fats and proteins.

Energy Production Metabolic Pathway

Blood Glucose Test

A blood glucose test is used to give pointers to the tricarb/betaoxi imbalance and also to correlate blood sugars to brix/SG (refractometer) for more definition of diabetic tendencies that are real and recognition of syndrome X (high fasting blood sugar).

Energy Production Metabolic Pathway

Blood Glucose Test

The normal range for blood sugar is 70 mg/dl on the low end and up to 110 mg/dl on the high end The lowest blood sugars are usually attained when food has not been eaten for a number of hours. This is know as the fasting state. They are also affected by rigorous, sustained exercise. The highest blood sugars are usually 1 to 2 hours after meals, especially meals with a large amount of carbohydrate.

Energy Production Metabolic Pathway

Sugar Burn Rate

More sugar burning produces more carbon dioxide which translates to more acid (C02 being a byproduct of carbohydrate metabolism) which the body is going to want to get rid of. Now if we were to take a look at the world of scuba diving we would see that individuals with more acidic blood will go through a tank of oxygen at twice the speed as someone with more alkaline blood.

Energy Production Metabolic Pathway

When more carbon dioxide is being produced due to burning higher levels of carbs, this acidic C02 will find its way into the tissues and due to the fact that Saliva pH is a reflection of what's happening at the tissue level / lymph system, you will find that saliva pH will tend to be a little on the low side when this is happening.

Energy Production Metabolic Pathway

Sugar Burn Rate

So, as an individuals breath rate increases above 18 breaths per minute and the time they can hold their breath decreases, this is an indicator that their body is trying to blow off this extra carbon dioxide, a major source of which is sugar metabolism. Hence this is a HUGE pointer that says the individual is stuck in the tricaboxylic acid side of energy production and is the classic FAST OXIDISER.

Energy Production Metabolic Pathway

Sugar Burn Rate

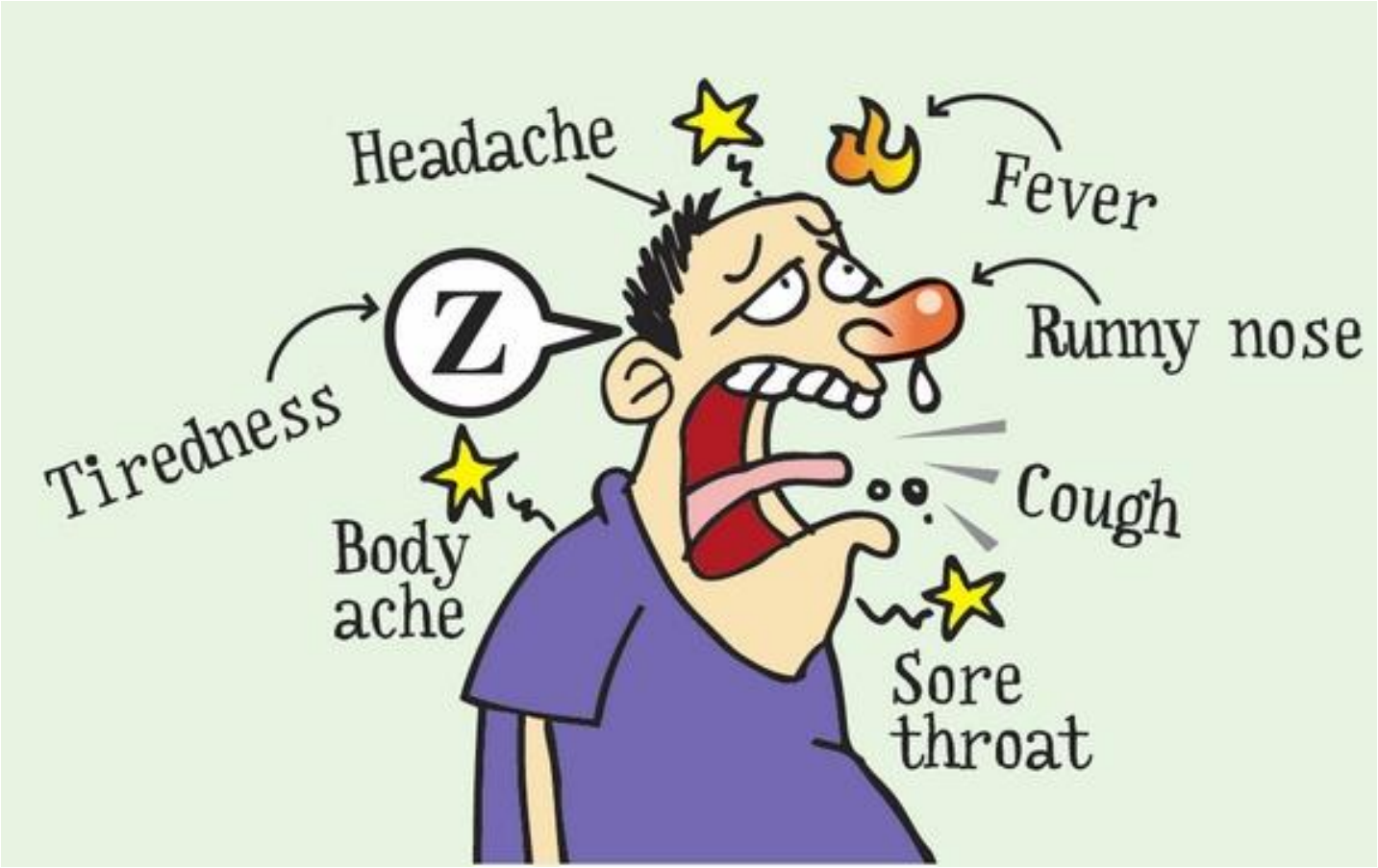
The reverse holds for the individual that is the classic slow oxidiser side of energy production when breath rate will drop below 14 breaths per minute. The further below 14 breaths per minute the deeper you will tend to be moving into this imbalance.

Energy Production Metabolic Pathway

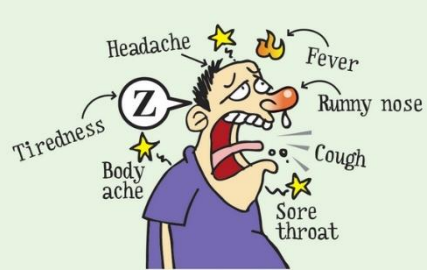
Our kidney's are our fist line of defense when it comes to buffering blood pH. So, when breath rate has been altered away from the ideal of between 16-18 breaths per minute we can quite confidently assume that the kidneys are struggling to manage. This is why the respiration system has been employed to 'take up the slack' and 'vent off' or 'hold onto' the acidic C02.

Energy Production Metabolic Pathway

Some Slow Oxidiser Symptoms



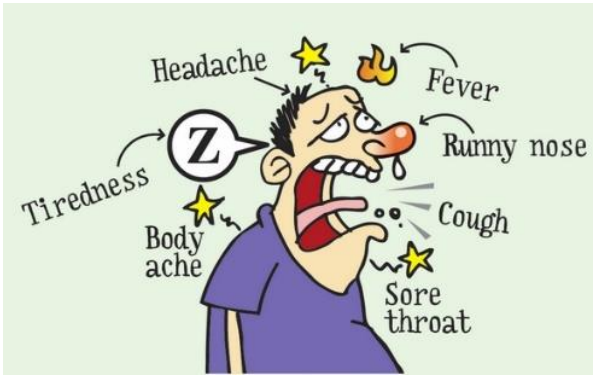
Energy Production Metabolic Pathway



Some common symptoms of a Slow Oxidiser Imbalance

- High Cholesterol (High LDLs and Low HDLs)
- High Triglycerides
- Type II Diabetes
- Weight Gain
- Lack of Energy (physical and mental)
- Chronic Fatigue
- High Blood Pressure
- Metabolic syndrome

Energy Production Metabolic Pathway



Some common symptoms of an Slow Oxidiser Imbalance

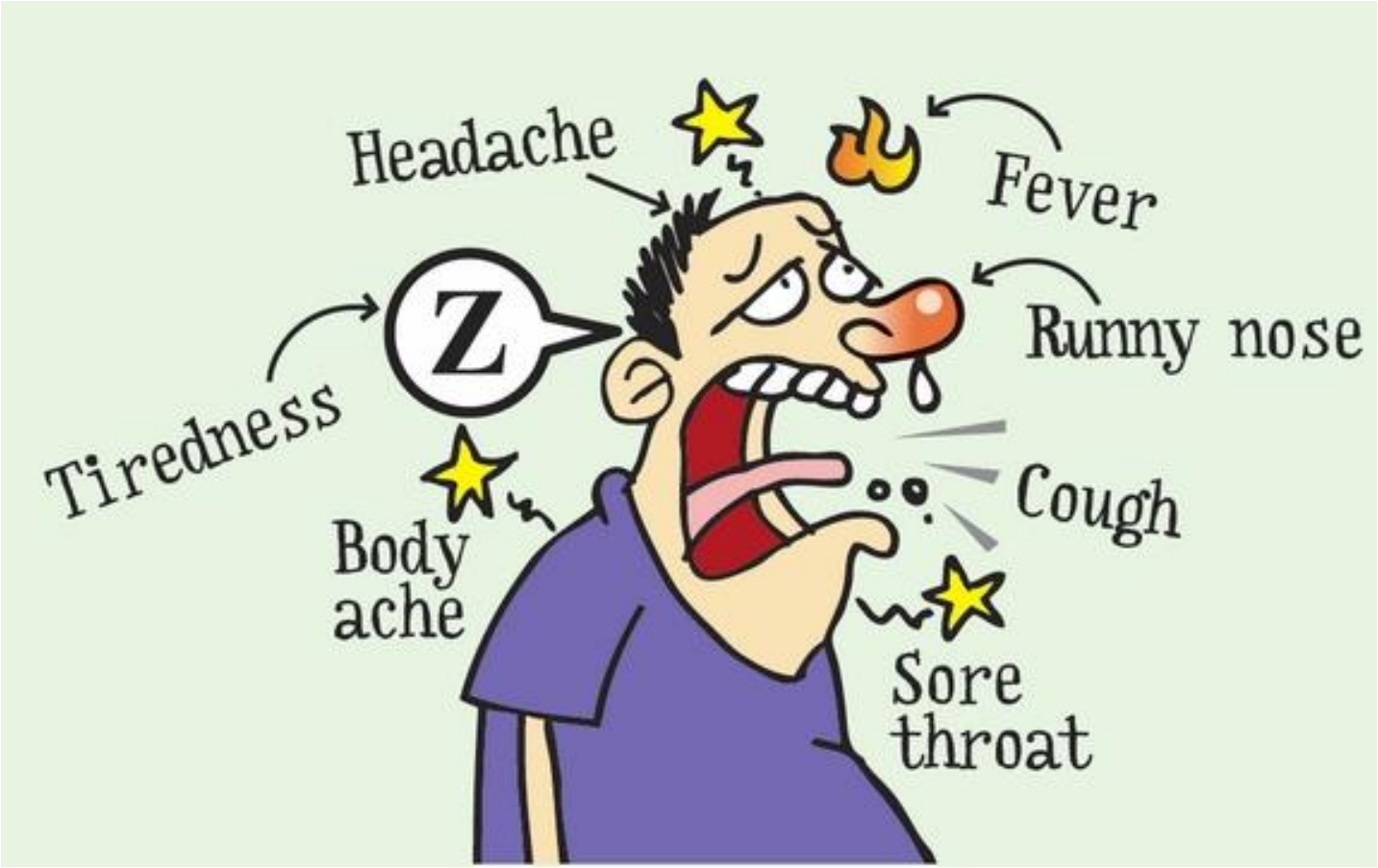
- High Blood Sugars
- Cardiovascular disease
- Low body temperature
- Mental Disorders
- Depression
- ADD or ADHD
- Gallbladder trouble
- Premature aging associated with glycation, and with insufficient vital oxidation

Energy Production Metabolic Pathway

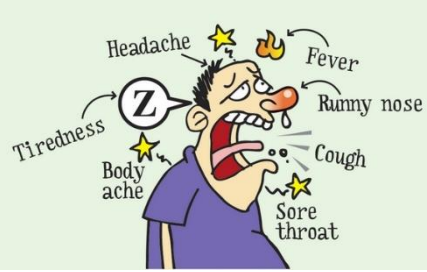
You may have noticed Type II Diabetes on the list above. This doesn't mean that if you have a Slow Oxidiser imbalance that you're diabetic. It just means that in this fat burning state, the body prefers to burn fat and can often move into a predicament where it will burn very little glucose, if any. In these cases, glucose can accumulate in the bloodstream and you can become diabetic.

Energy Production Metabolic Pathway

Some Fast Oxidiser Symptoms



Energy Production Metabolic Pathway



Some common symptoms of a Fast Oxidiser Imbalance

- Over dependence on glycogenic energy production
- Deficient ketogenic energy production
- Premature ageing associated with free radical peroxidation of fatty acids, and with glycation
- Low body temperature
- Bilirubin in urine – gallbladder dysfunction with gall stone formation.
- Blood fats elevated (especially cholesterol)
- Blood sugar decreased

Energy Production Metabolic Pathway

Some common symptoms of a Fast Oxidiser Imbalance

- General Fatigue
- If anemic, responds to increased protein and Vitamin B12
- Shortness of breath
- Depression
- Anxiety
- Irritable when hungry
- Weight issues (over or under)

Energy Production Metabolic Pathway

Some Beta Slow Oxidiser Biological markers

Energy Production Metabolic Pathway

Some Beta Slow Oxidiser Biological markers:

- Urine pH < 6.1
- Saliva pH > 6.9
- Breath Rate <13
- Breath Hold > 60 seconds
- Fasting Glucose > 100
- Resting Systolic BP > 133

Energy Production Metabolic Pathway

Some Fast Oxidiser Biological markers

Energy Production Metabolic Pathway

Some Fast Oxidiser Biological markers:

- Urine pH > 6.3
- Saliva pH < 6.6
- Breath Rate > 18
- Breath Hold < 50 seconds
- Fasting Glucose < 70
- Resting Systolic BP < 112

Energy Production Metabolic Pathway

Foods to Implement if you're a Slow Oxidiser

Energy Production Metabolic Pathway

Foods to **IMPLEMENT** if you're a Slow Oxidiser

- Fish
- Poultry (especially white meat)
- Eggs
- Dairy products
- All vegetables
- Appropriate fats. These can include coconut oil, real butter, unheated virgin olive oil, and those found in eggs (the whole egg) or animal proteins.

Energy Production Metabolic Pathway

Foods to **Implement** if you're a Fast Oxidiser

Energy Production Metabolic Pathway

Foods to **IMPLEMENT** if you're a Fast Oxidiser

- Non-starch vegetables
- Vegetables like zucchini, squash, broccoli and asparagus may be beneficial because they can provide carbs without such a high level of carbs that the meal spikes your insulin levels.
- Eating some carbs early in the day But try to avoid meals made up predominantly of carbs.

Energy Production Metabolic Pathway

Foods to **IMPLEMENT** if you're a Fast Oxidiser

- Liver and other organ meats
- Keeping your glucometer on you at all times Knowing when your blood sugar is low (say, below 70) will allow you to manage your blood sugar instead of being at the mercy of it..

Energy Production Metabolic Pathway

Foods to Avoid if you're a Slow Oxidiser

Energy Production Metabolic Pathway

Foods to **AVOID** if you're a Slow Oxidiser

- Avoid eating polyunsaturated oils. These can include some salad dressings, margarine, mayonnaise and foods fried or cooked with vegetable oils. Coconut oil, real butter and unheated virgin olive oil are all okay.
- Avoid meals consisting predominantly of sugars or starches (a serving of protein and saturated fat is essential with EVERY meal
- Fruit Juices

Energy Production Metabolic Pathway

Foods to **AVOID** if you're a Slow Oxidiser

- Limit your fruit intake to one (low sugar) piece of fruit per day
- Liver and other organ meats
- Alcohol
- Soft drinks (soda)
- Peanuts and peanut butter
- All soy products

Energy Production Metabolic Pathway

Foods to **Avoid** if you're a Fast Oxidiser

Energy Production Metabolic Pathway

Foods to **AVOID** if you're a Fast Oxidiser

- Sugar and similar items like corn syrup and honey
- Fruit juices and large quantities of fruit
- Coffee, tea, and alcohol
- Polyunsaturated oils. Thiese can include some salad dressings, margarine, mayonnaise and foods fried or cooked with vegetable oils. Coconut oil real butter and unheated virgin olive oil are all okay.

Energy Production Metabolic Pathway

Foods to **AVOID** if you're a Fast Oxidiser

- Meals consisting predominantly of sugars or starches.

Energy Production Metabolic Pathway

Supplement that can help a Slow Oxidiser

Energy Production Metabolic Pathway

Specific supplements to help correct an a Slow Oxidiser Imbalance:

- Magnesium Malate Avoid with a Catabolic Imbalance. (Best taken with breakfast. Avoid at night.)
- Vitamin A Limit with a Catabolic Imbalance.
- L-Taurine An amino acid -Avoid with Electrolyte Deficiency or Catabolic Imbalances.
- Folic Acid Limit with an Anabolic Imbalance.
- L-Tyrosine An amino acid -Avoid with a Catabolic Imbalance. (Avoid at night.)

Energy Production Metabolic Pathway

Specific supplements to help correct a Slow Oxidiser imbalance:

- Banaba Chrome (help reduce blood sugar levels) – 1 cap with each meal
- Beet Flow – 1-3 caps with each meal

Energy Production Metabolic Pathway

Supplement that can help a Fast Oxidiser

Energy Production Metabolic Pathway

Specific supplements to help correct an a Fast Oxidiser Imbalance:

- B12 Avoid with a Catabolic Imbalance. Can help move fat into the mitochondria to be burned for fuel. (Best taken with breakfast and/ or lunch. Avoid at night.)
- Vitamin B5 B5 (Pantothenic acid) Also great for breakouts if the person is not processing fats correctly -Limit use with an Anabolic Imbalance. (Best taken at night.)
- L-Glutamine An amino acid -Avoid with Anabolic or Electrolyte Excess Imbalances

Energy Production Metabolic Pathway

Specific supplements to help correct a Slow Oxidiser imbalance:

- L-Taurine - An amino acid - Avoid with Electrolyte Deficiency or Catabolic Imbalances.
- L-Tyrosine - An amino acid - Avoid with a Catabolic Imbalance. (Avoid at night.)
- MSM – 1-3 tsp before breakfast and before tea (not too late).

Energy Production Metabolic Pathway

Supplements to AVOID with a Slow Oxidiser Imbalance

- Vitamin B5 (Pantothenic acid)

Energy Production Metabolic Pathway

Supplements to AVOID with a Fast Oxidiser Imbalance

- Vitamin D3
- L-Histadine An amino acid
- Vitamin E

Energy Production Metabolic Pathway

How Exercise can help a Slow Oxidiser

Exercise, especially lifting weights, helps to move glucose out of the blood stream and into your cells. This will lower your insulin levels and teach your body how to burn glucose for fuel more often so it doesn't build up in your blood stream.

Energy Production Metabolic Pathway

The Science Behind Losing Weight

Based on information from Tony Hale's book 'Kick your fat in the nuts'

The Science Behind Losing Weight

High Insulin Levels

When talking about the ability for carbs to spike insulin levels, I'm talking about higher-carb foods. Foods like bread, pasta, rice, cereal, baked goods, potatoes, fruit, desserts, etc. Carbs are converted to glucose (or sugar) in the body and foods higher in carbs, convert to higher levels of glucose.

The Science Behind Losing Weight

High Insulin Levels

In any case, the fact that you are consuming these carbs isn't even the major problem. The real villain in most people's weight loss story is how eating these carbs can push insulin levels too high, too often. Anytime we eat carbs, our insulin levels spike in order to sweep the excess glucose out of the bloodstream and into the cells. .

The Science Behind Losing Weight

High Insulin Levels

The more carbs taken in, the higher the insulin spike. Liquid carbs or sugars like juice, soft drinks, and alcohol spike insulin even higher because liquid hits the bloodstream faster.

The Science Behind Losing Weight

High Insulin Levels

Glucose levels can come down pretty quickly, but here's the kicker…

Insulin levels stay high a lot longer!

The Science Behind Losing Weight

High Insulin Levels

The problem is, as long as your insulin levels are high, your body's ability to burn stored fat is impeded. There are more hormones involved in this total process, but viewing high insulin levels as the trigger that makes it all go to hell is a simple way to explain it.

The Science Behind Losing Weight

High Insulin Levels

High insulin levels also send the signal to your body to store fat. It says, "We have plenty of glucose to use here so store other fuel as fat in case we don't have glucose later." Make sense? So, the sugars are burned in a couple hours, yet your body can't access stored fat for fuel while the insulin levels are still high.

The Science Behind Losing Weight

High Insulin Levels

No glucose and no access to stored fat means you don't have a good fuel source!

The Science Behind Losing Weight

High Insulin Levels

Now, you start to crave more carbs because your body needs fuel to function. Even though the insulin isn't going to come down for another two or three hours, you eat a snack that's filled with carbs and your insulin spikes again, never giving the insulin a chance to come down and allow your body to burn fat for fuel.

The Science Behind Losing Weight

High Insulin Levels

This pattern can result in insulin spike after insulin spike, all day long. Considering the way some people eat, do you see how it can be literally impossible to burn stored fat?

The Science Behind Losing Weight

How it works

The Science Behind Losing Weight

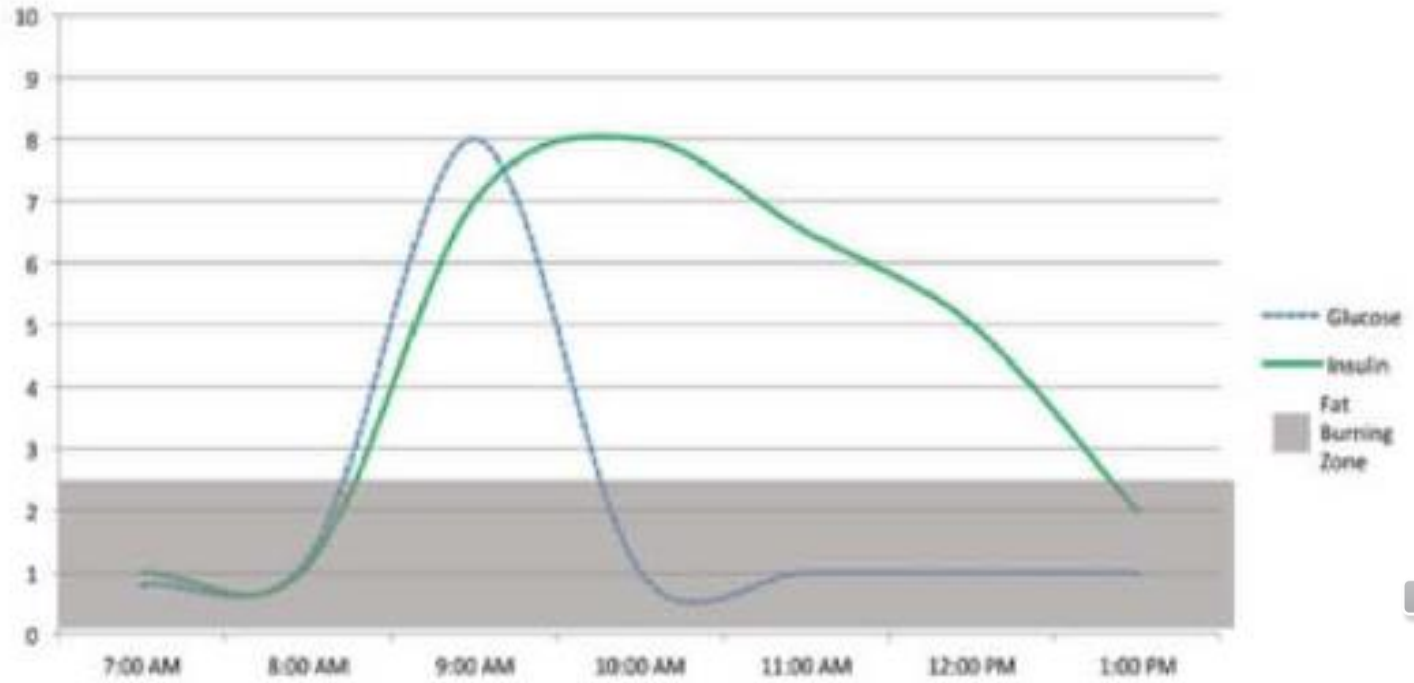
Let's look at some examples of how certain meals could affect insulin levels and, therefore, fat storage. In the meal graphs that follow we use a general scale from one to ten. We're not using actual blood glucose or insulin numbers. This is a visual to show how high each level is on a scale of one to ten.

The Science Behind Losing Weight

Meal 1 - 8:00 AM (Carb Count: 73 grams) Bowl of oatmeal, whole wheat English muffin with jam, and a glass of orange juice.

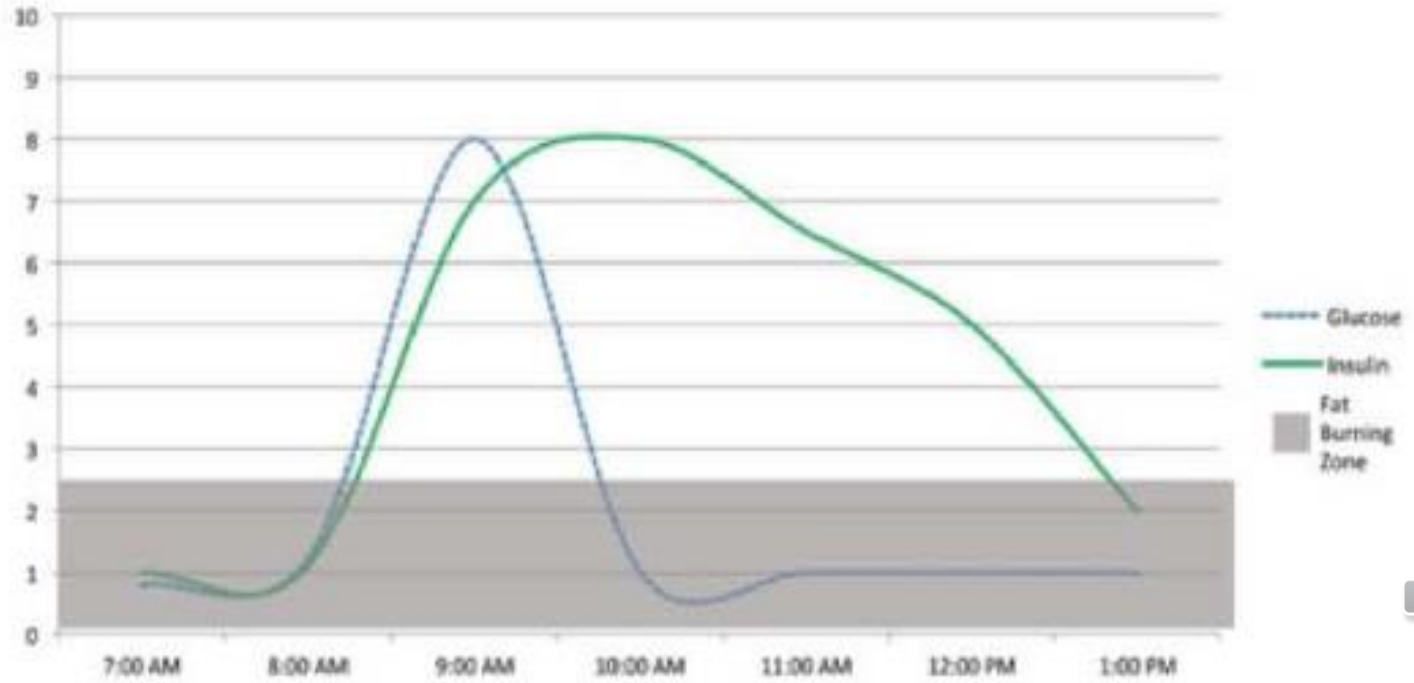
The Science Behind Losing Weight

If Penny eats meal 1 at 8:00 AM, in the graph below, we see her glucose (the dotted line) rise to a level 8 and her insulin (the solid line) follow right behind it. The shaded zone that tops out around 2.5 is the fat burning zone. Insulin levels need to be within this zone in order for your body to access stored fat and burn it as fuel. While insulin levels are outside that zone, not only can your body not access stored fat, but also your body will likely be storing more fat



The Science Behind Losing Weight

By 9:30 AM Penny's glucose has come down, but her insulin is still very high and will likely take a couple more hours to come down. With glucose levels as low as they appear near 10:00 AM, the body would normally dig into fat storage and burn this fat as a fuel source. Yet, in this graph you can see that the high insulin levels block the body's ability to access stored fat, leaving Penny with no fuel. What does Penny do? She eats a banana and drinks pomegranate juice because she's read that pomegranate juice has health benefits.



The Science Behind Losing Weight

Meal 2 - 10:00 AM (Carb Count: 59 grams) Banana and a glass of pomegranate juice.

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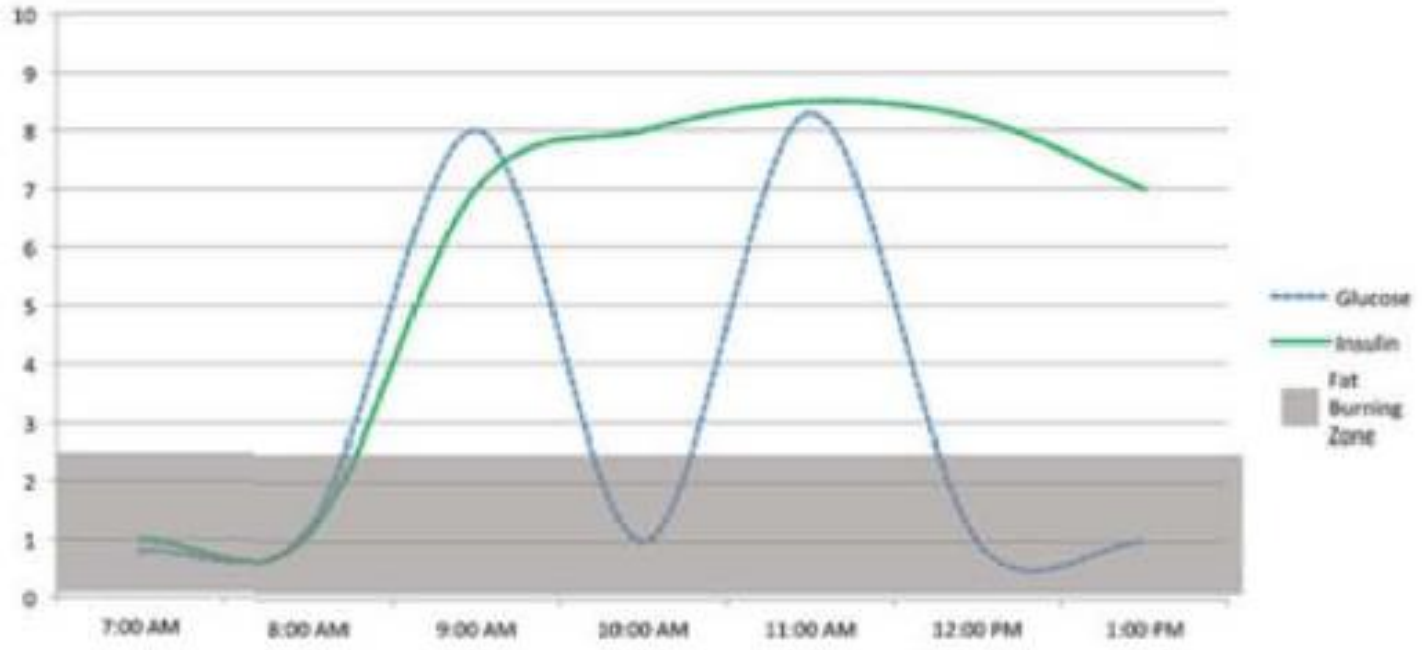
In the Meal 1 Graph you can see how insulin levels would have come down gradually, putting Penny back into the fat burning zone later that day. However, in the Meal 2 Graph below you can see that once she consumed Meal 2 with all those carbs (especially liquid sugars, which can spike insulin even higher than sugars in solid form) her glucose soars straight up again and another increase in insulin follows immediately. The sugar supplies her with an energy boost, but her insulin levels never have the chance to come back down before the sugars create another jump in insulin.

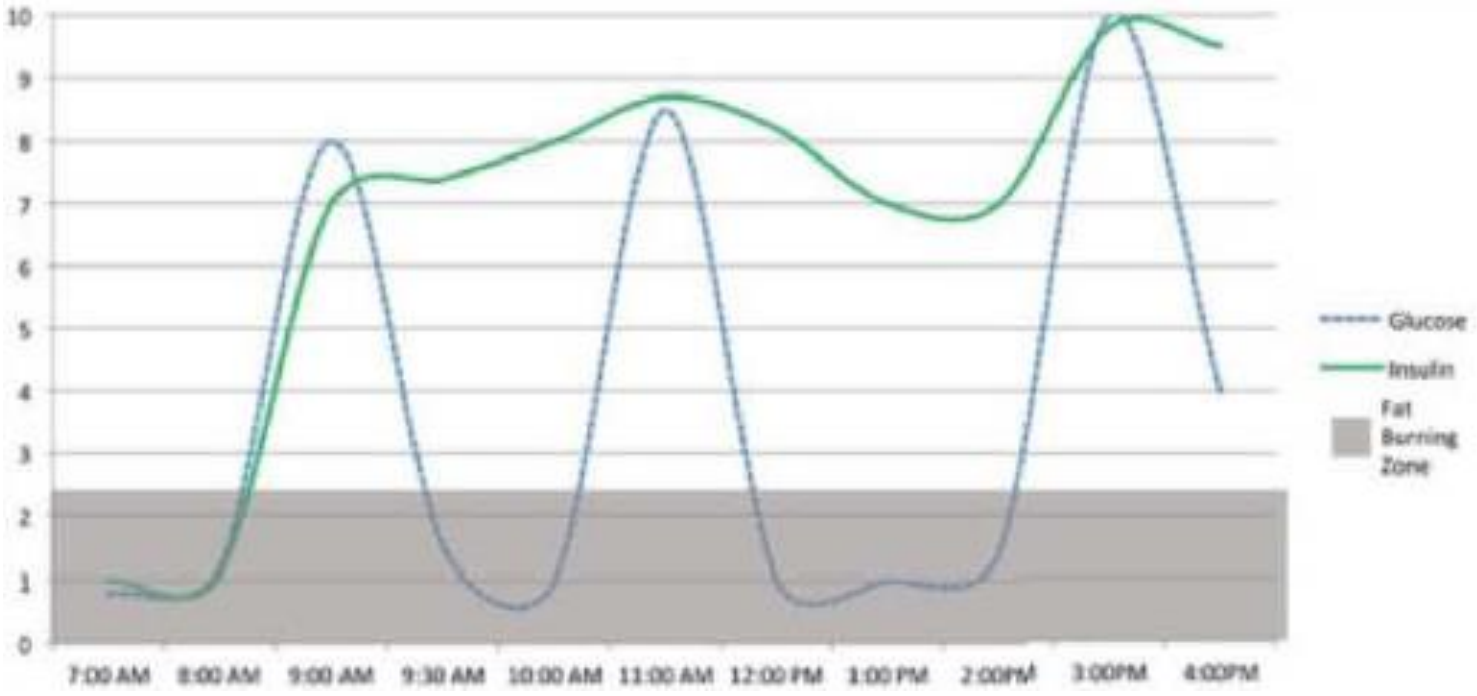


The Science Behind Losing Weight

Meal 3 - 2:00 PM (Carb Count: 130 grams)
Turkey sandwich on whole grain bread with lettuce, tomato and fat-free dressing, side of brown rice and a fat-free mocha latte.

The Science Behind Losing Weight

You can see that Penny was trying to "eat right" by selecting choices many consumers believe will lead to weight loss; yet, look at how this meal cranks her insulin levels off the charts in the Meal 3 Graph.



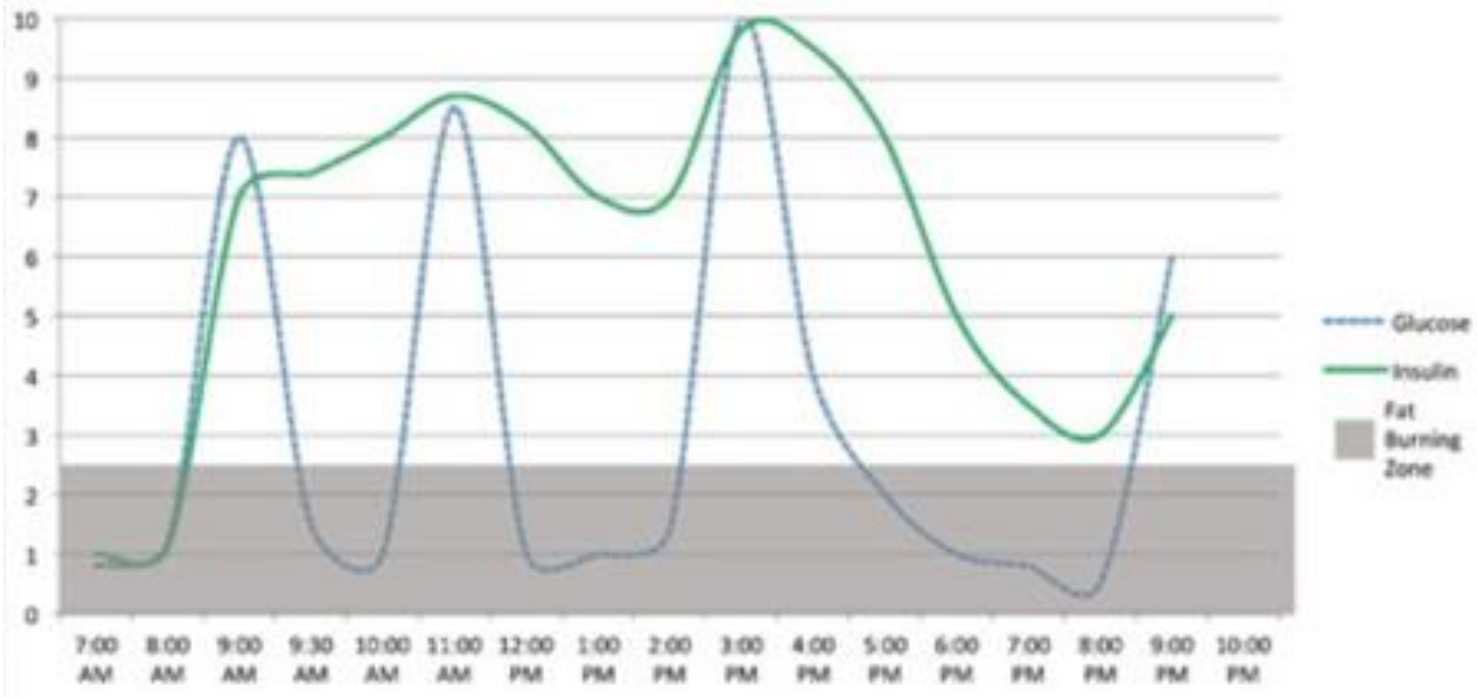
The Science Behind Losing Weight

Meal 4 - 8:00 PM (Carb Count: 47 grams)

Small salad with ranch dressing and two rice cakes.

The Science Behind Losing Weight

Penny tries not to eat too many calories late at night so she made a low-calorie meal. Too bad these low-calorie options still have high carbs. Rice cakes are one of the most nutrient-depleted, insulin-spiking foods you can eat, and many ranch dressings have more sugar than a candy bar. Graph 4 represents her glucose and insulin reaction to this meal.



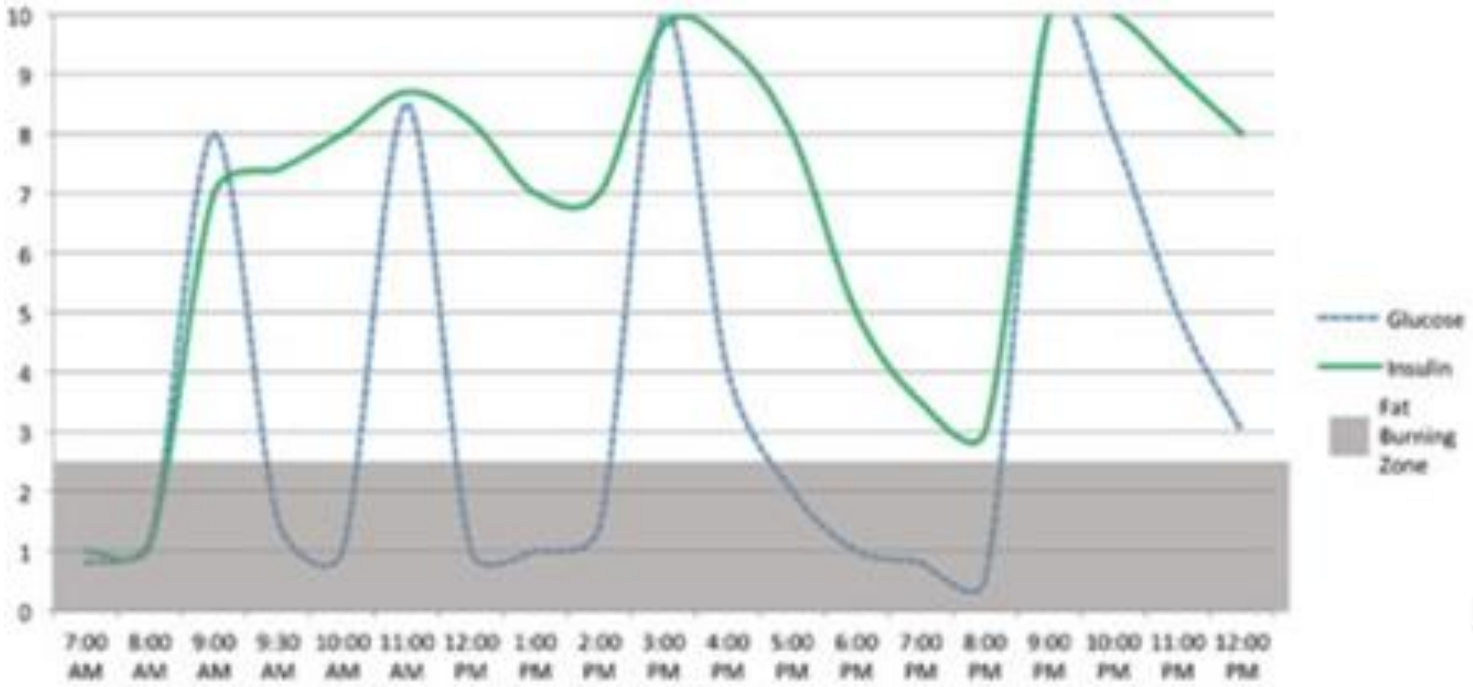
The Science Behind Losing Weight

Oops - 8:20 PM (Carb Count: 64 grams)

One litre of chocolate ice cream.

The Science Behind Losing Weight

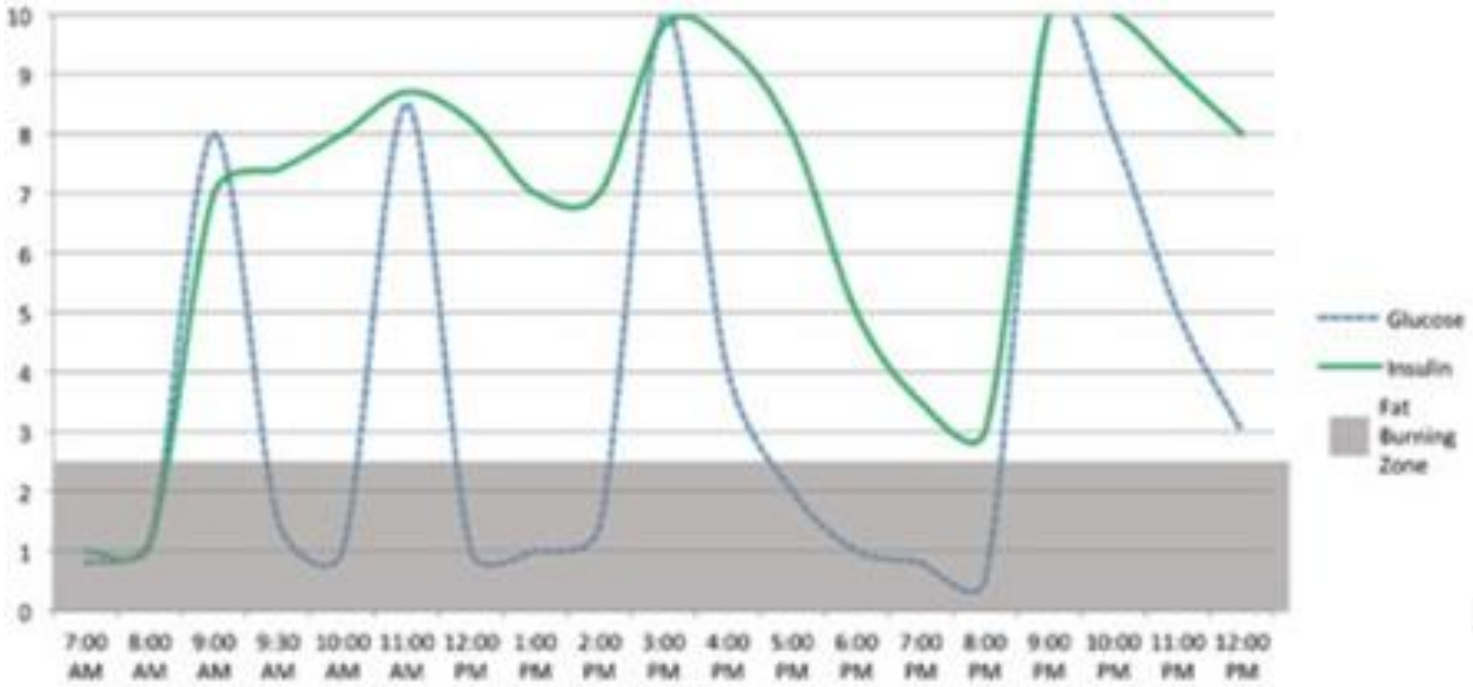
An even bigger problem shows up after Penny eats her night-time meal fit for a bird. Since she went six hours without eating, she is now ravenous. She already lost her mind and snapped at an elderly lady in traffic earlier that afternoon. Now, after her tiny dinner, she thinks she'll just have a few bites of ice cream. Ten minutes later she realises she has wiped out the whole tub of ice cream.



The Science Behind Losing Weight

Looking at Penny's insulin levels over the span of the day, it's easy to see that, not only was her body unable to access stored fat for most of the day, she will likely stay out of fat burning mode for most of the night as well.

What would her insulin levels look like with different choices?



The Science Behind Losing Weight

Meal 1 Alternative - 8.00 AM (Carb Count: 2 grams) Spinach omelette with butter, two turkey sausages, and one cup of chamomile tea. This meal provides a very nominal rise in insulin levels. Now, Penny can go right back into fat burning mode before it's time for a snack. She may be able to skip the snack altogether since her body will have the ability to access stored fat for fuel and she will have plenty of energy. But let's throw a snack in there anyway to see what happens.

The Science Behind Losing Weight

Meal 2 Alternative - 10:00 AM (Carb Count: 18 grams) Cottage cheese with berries.

This snack provides Penny with some needed carbs without spiking insulin levels too high.

The Science Behind Losing Weight

Meal 3 Alternative - 1:00 PM (Carb Count: 3 grams) Grilled chicken Caesar salad without croutons. The Caesar dressing contains good fats to help keep Penny satiated.

The Science Behind Losing Weight

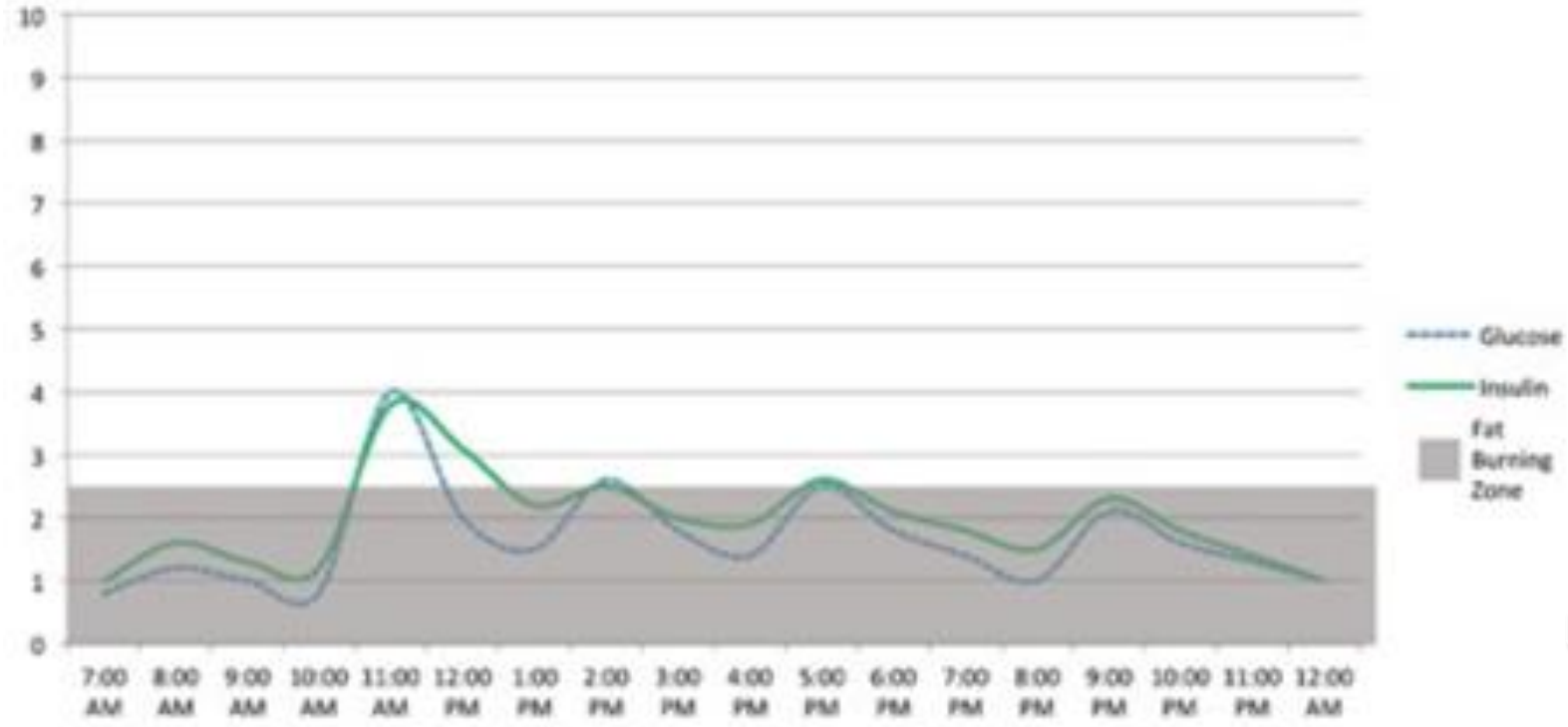
Meal 4 Alternative - 4:00 PM (Carb Count: 6 grams) Protein shake and a handful of raw almonds..

The Science Behind Losing Weight

Meals Alternative - 8:00 PM (Carb Count: 5 grams) Lamb chops with sautéed broccolini and asparagus.

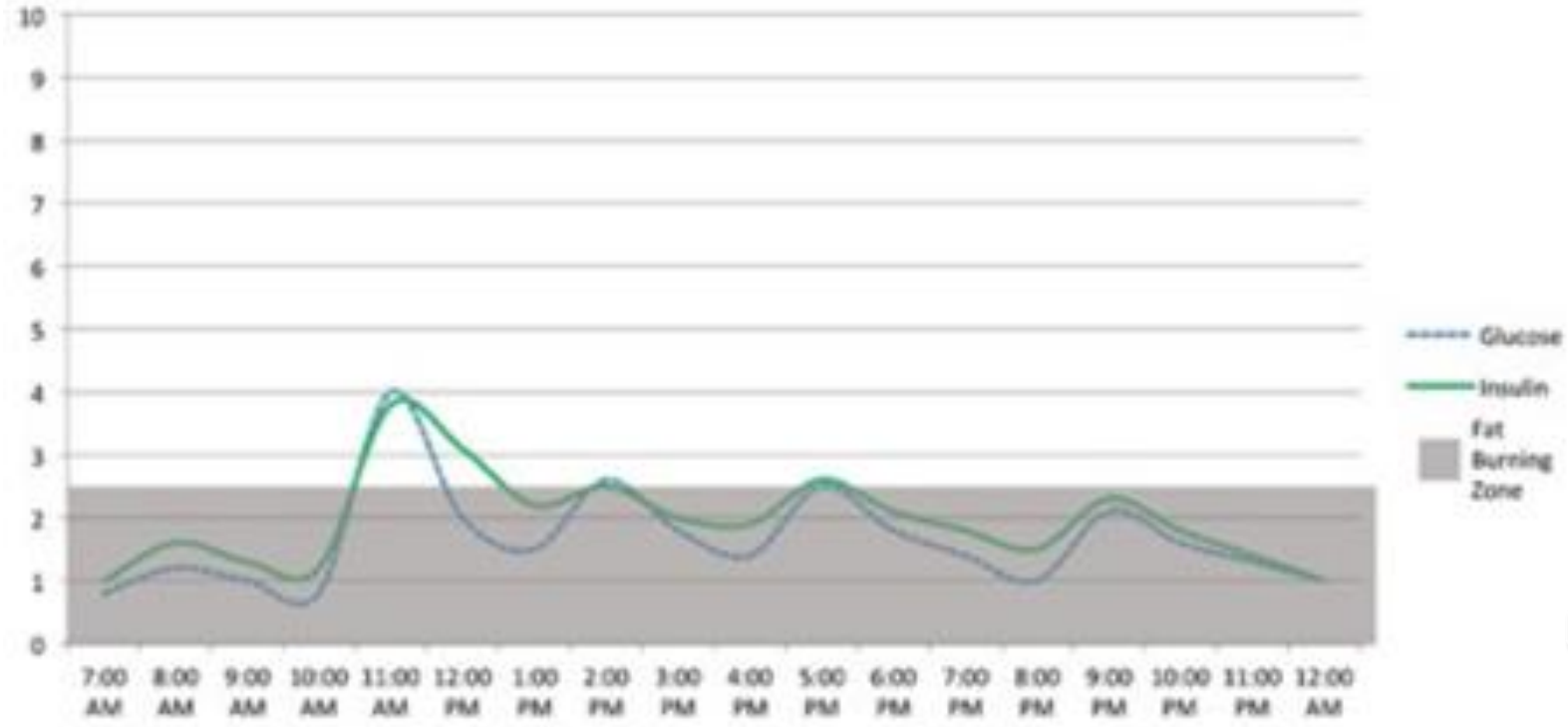
The Science Behind Losing Weight

Though Penny had one small insulin spike mid-morning, look at the extended periods in the day where she is able to access stored fat and burn it for fuel. This is the science behind weight loss. There is no getting around this science. If insulin levels are high, you will not burn much stored fat, and in most cases you will end up storing more fat.



The Science Behind Losing Weight

The only difference from person to person is the strength at which the insulin operates, whether or not that person's cells are still receptive to insulin, and how much insulin needs to be utilised to move glucose into the cells.



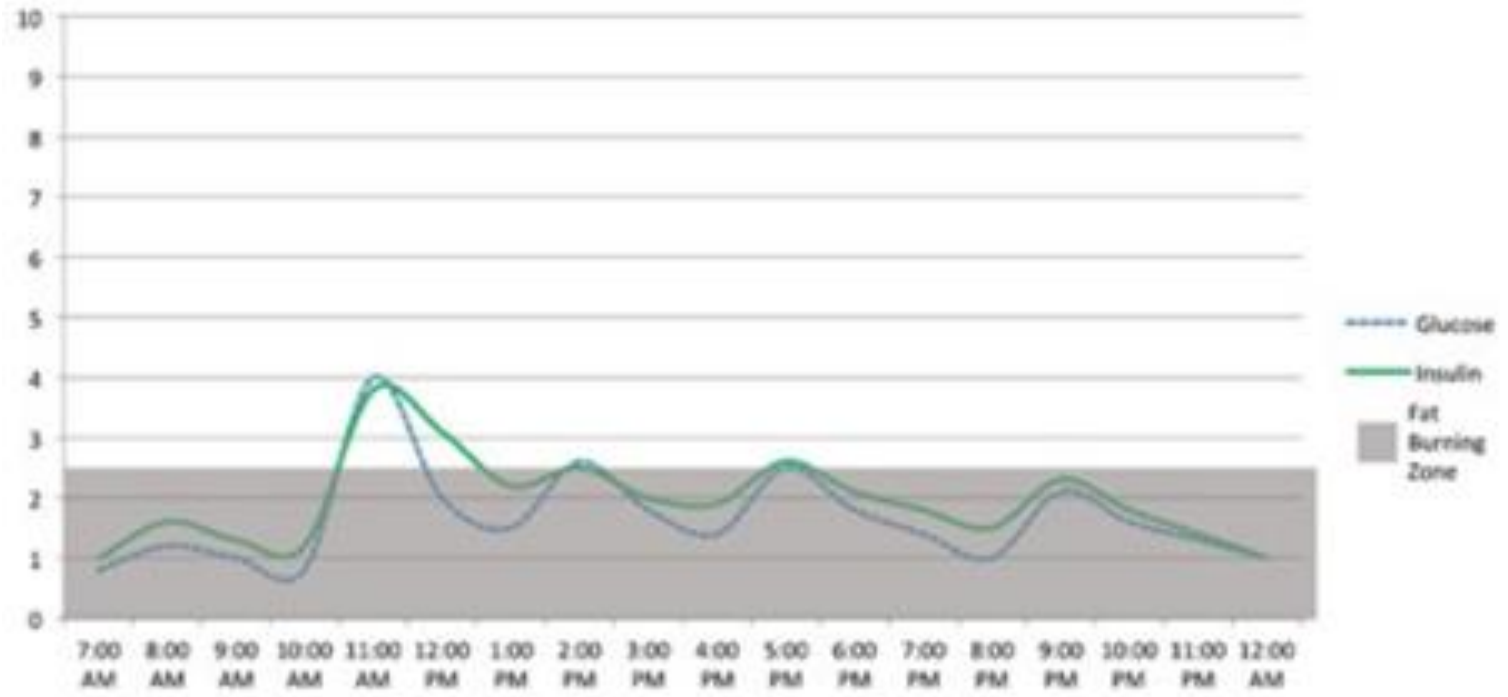
The Science Behind Losing Weight

Did you know?

Insulin has a very strong affect in an alkaline environment. A very weak affect in an overly acidic environment.

The Science Behind Losing Weight

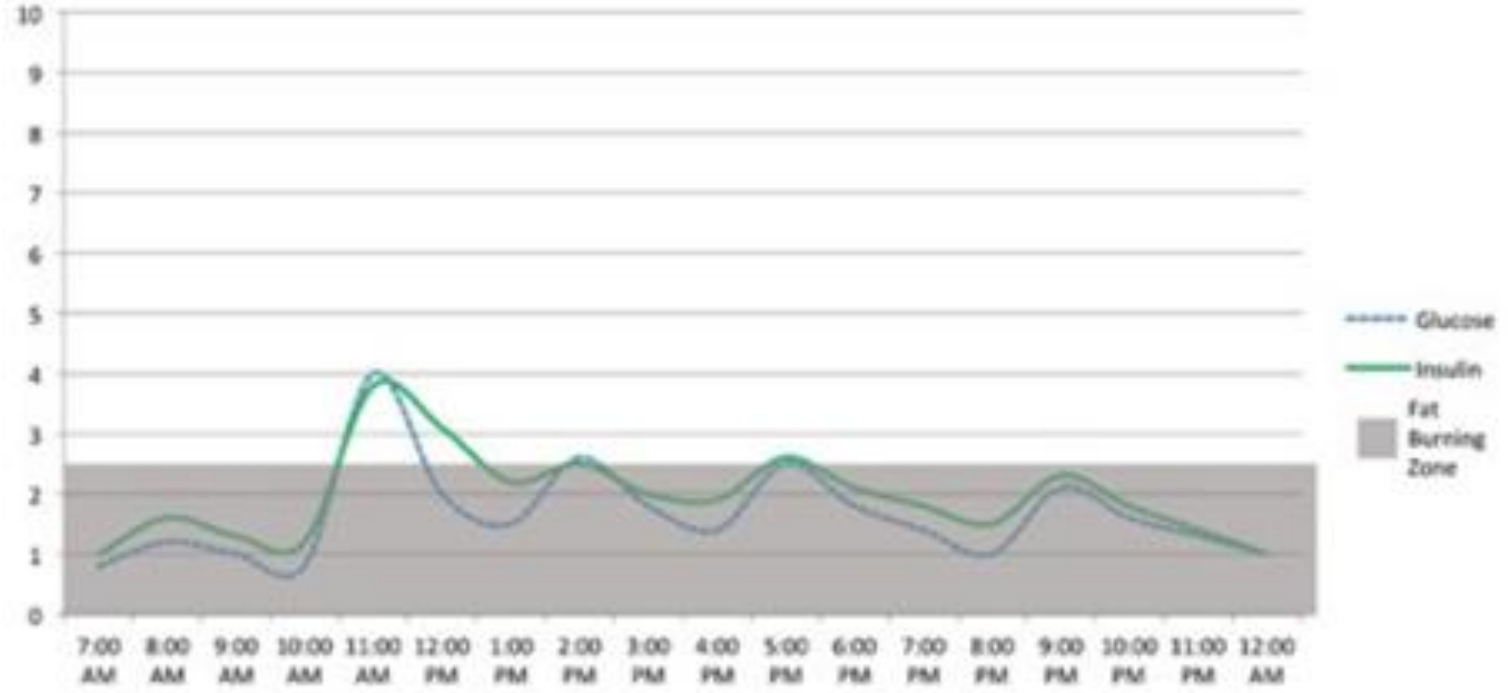
This is one of the factors that allows some people to eat a high-carb diet with no weight gain. If their insulin is strong enough, they can move a large amount of glucose into the cells with a relatively low amount of insulin; therefore, they rarely have a big insulin spike. It's not the amount of sugar that we consume that necessarily dictates the amount of body fat we store. It's the level of insulin needed to move that glucose into the cells that dictates how long the body will stay in the fat-storage mode and out of the fat-burning mode.



The Science Behind Losing Weight

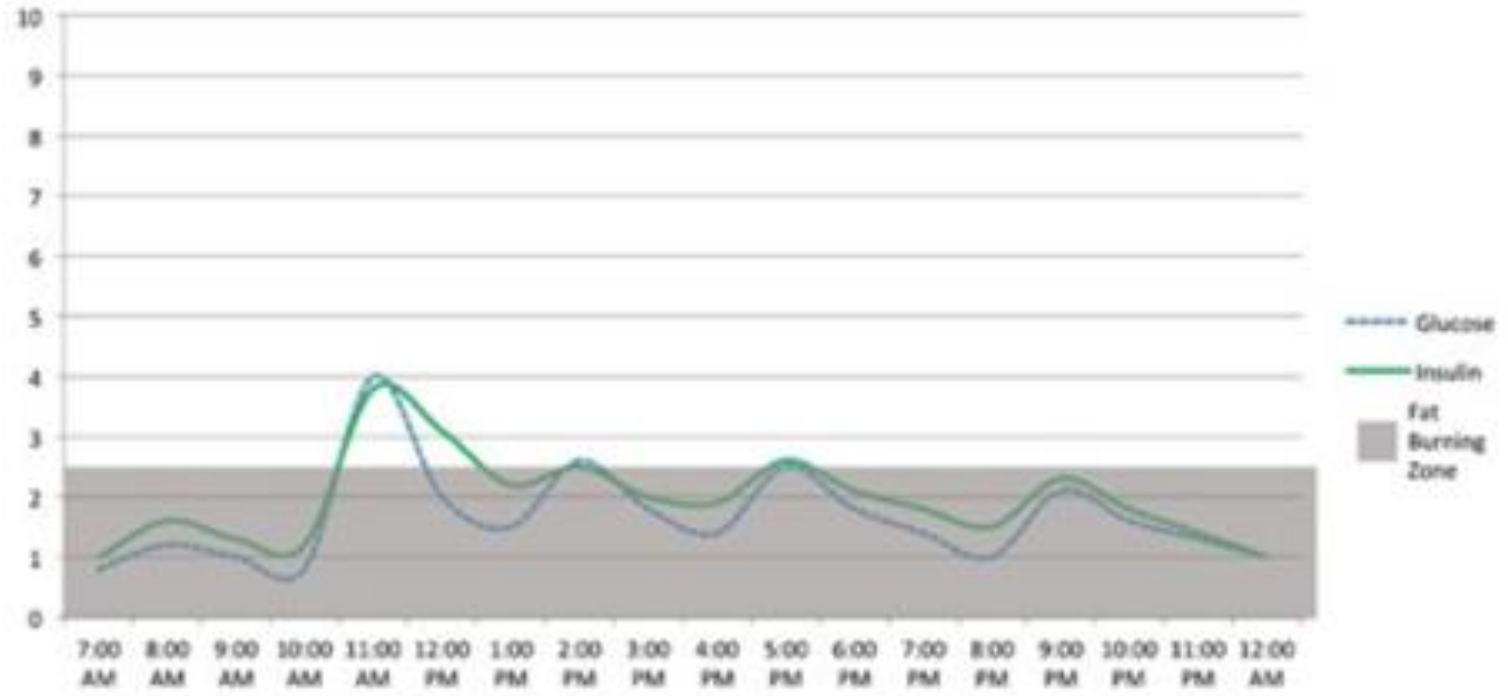
The more carbs consumed, the more insulin is normally needed to process those carbs; but the insulin is the driving force behind fat storage. If you can keep your insulin levels low, you can restrict the amount of fat your body stores and increase the amount of stored fat your body burns.

That's it. It's called science!



The Science Behind Losing Weight

Am I saying that everyone should go on a low-carb diet? No, I'm not. Many people don't qualify to go on a low-carb diet because they can't process other nutrients very well. If you take away their carbs, you will take away all of their fuel. They tend to get a little upset when that happens.



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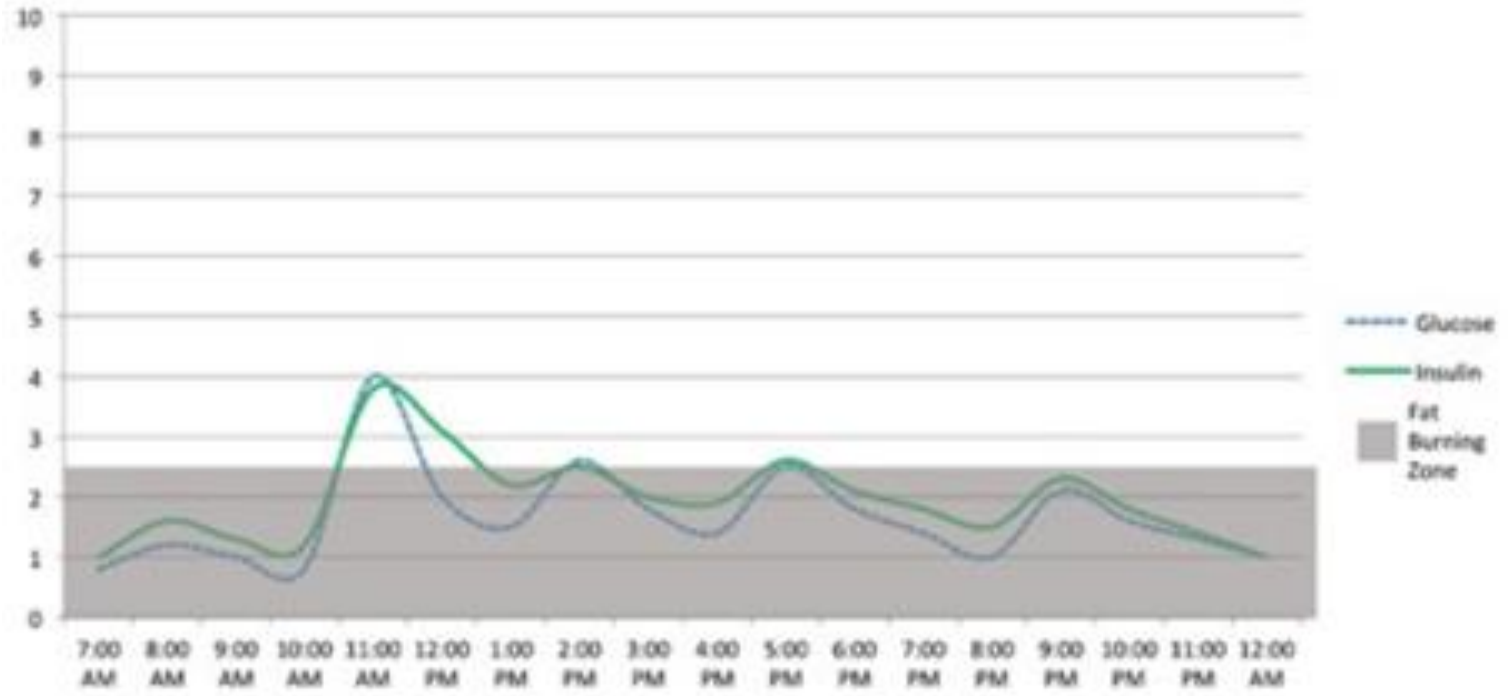


The Science Behind Losing Weight

3pm Carb Cut Off

The Science Behind Losing Weight

3pm Carb Cut Off

So, here's the trick.... Try to eat any carbs before 3:00 PM on every day that you can get away with it. If you're done with carbs by 3:00 PM, that gives your body fifteen or sixteen hours that it can focus on burning fat, removing junk (that could otherwise get stored as fat) and taking care of all the tasks that make us healthy - all the jobs that the body is meant to do but often can't because it's being slammed with high insulin levels all day long. (Keep in mind that most foods have at least a small amount of carbs in them. Proteins and low-carb vegetables are a great choice in this scenario. You just want to avoid the carbs that will spike insulin levels.)

The Science Behind Losing Weight

3pm Carb Cut Off

Many people like this trick because it allows them to have some of the foods that they like, just earlier in the day. In that way, you're not really depriving yourself of any one thing. That doesn't mean you should wake up and have two sandwiches, a bowl of pasta and whole box of cereal before 3:00 PM. You still have to eat healthy.

The Science Behind Losing Weight

3pm Carb Cut Off

Then, once a week or so, when you want to go out with friends and eat a bit of carbs at night or have a drink, you don't have to be so concerned about it because you just had five or six nights in a row where you allowed your body to do what it needs to do. Maybe one week you have two nights that include more carbs and one week you have none. Even if you just eliminate most carbs after 3:00 PM three or four times a week, it's still better than having carbs every night-and you should still see some improvement. But please remember that any type of carbohydrate "bingeing episode" can rock a variety of systems in the body that can take up to seventy-two hours to recover from.

The Science Behind Losing Weight

3pm Carb Cut Off

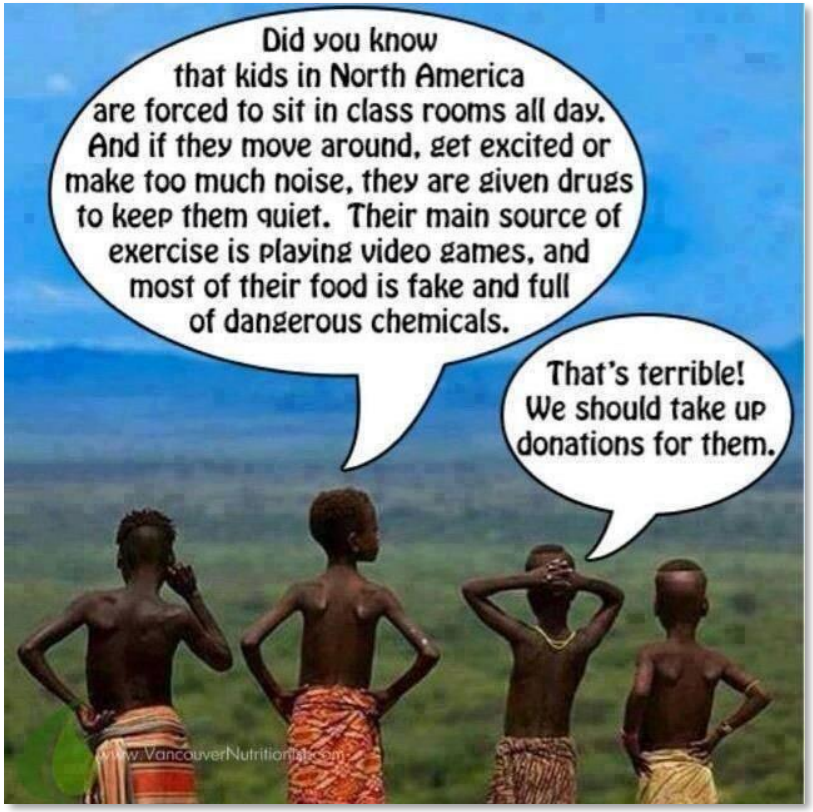
So, while I'm suggesting that you have fewer carbohydrates in the evening, overindulging in carbohydrates at any point during the day can really throw the body off its kilter. Some individuals will have more leeway while others may need to stick to this plan on a daily basis. It's just the knowledge of how the body works that will let you judge for yourself how often you want to implement this plan or not.

The Science Behind Losing Weight

3pm Carb Cut Off

Those who have enough mineral in their systems to reduce carbs for the majority of their meals will be able to achieve much faster results. For those who need carbs because you don't have enough mineral in the system to function properly, this 3:00 PM carb cut-off plan can be a great way to still get results.

Question Time!



Thank you for allowing me to share my passion with you today. I look forward to joining you for Lesson 6 in a couple of weeks

Mark Hathaway

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