



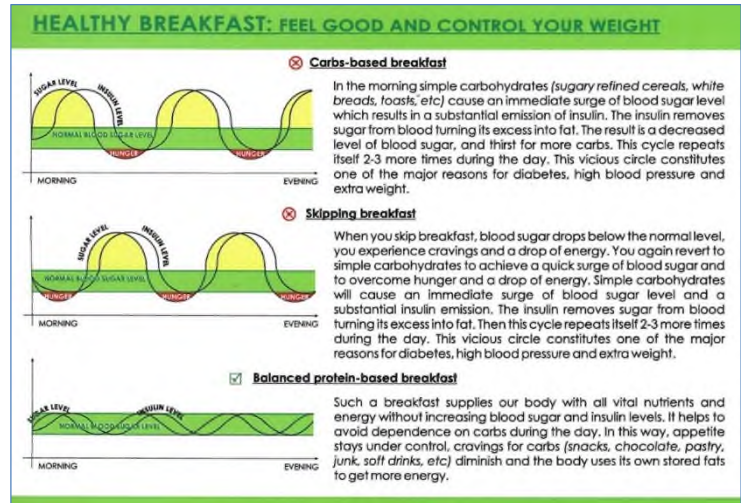
Carbohydrates

Educate Yourself:

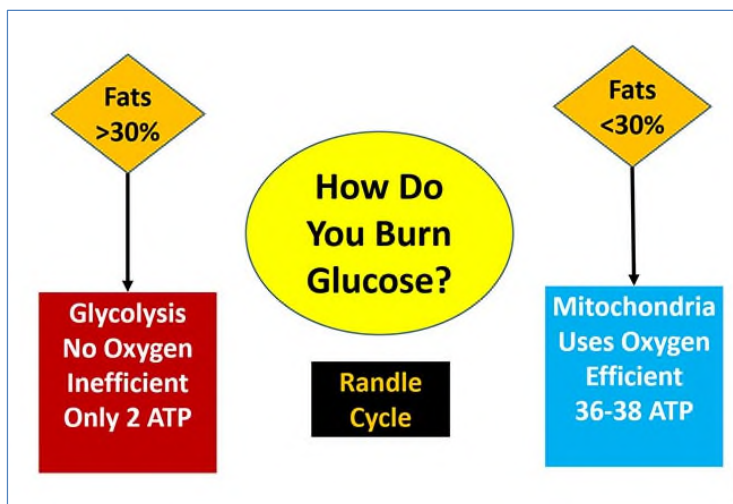
Most of the food we eat contains carbohydrate. Eventually, through metabolism, all carbohydrates are converted to glucose.

As we can see from the diagram of the Randle Cycle, it's HOW you burn that glucose that is the critical piece.

- * Do you have a normal body temp?
- * Do you have boundless energy?
- * Are you at your ideal weight?



If any of these answers are NO, then (in the presence of adequate protein) you are most likely eating the wrong carbohydrates, too much dietary fat and / or the wrong dietary fat.



ATP is adenosine tri-phosphate. It is literally **cellular energy**. The more ATP you create, the more energy you have— and the more glucose you have burned.

A stable blood sugar is important, so the type of carbohydrate we eat is important. **“The liver requires a steady supply of glucose to convert the inactive thyroid hormone T4 into its active form, T3”** (Peat R., *Generative Energy*, 2001a pp. 73-74).

Let's talk about carbohydrates from a cellular perspective.

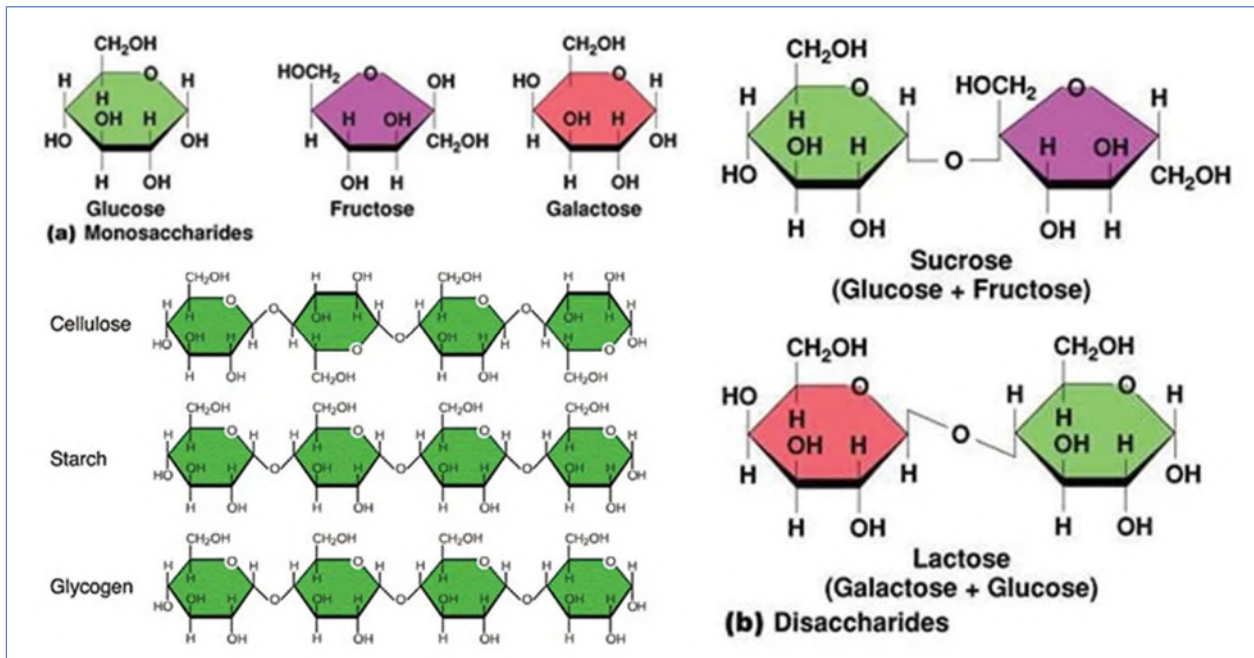
You did want a chemistry lesson today, yes?

****It's important to remember that ANY time you make a dietary change, your body needs some time to adjust.****
Go slowly.



**Carbohydrates can be divided into three groups:
monosaccharides, disaccharides, and polysaccharides.**

<https://microbenotes.com/carbohydrates/>



Monosaccharides

Glucose: This is the preferred fuel for all of the cells in your body. It is available as glucose syrup, but rarely consumed by itself. “Glucose is also vital for metabolic health” (*Peat, R., Generative Energy, 2001a, pp.73-74*) When glucose goes through the mitochondrial transport chain it burns far “cleaner” than fat, creating almost a minimal amount of reactive oxygen species (ROS). Remember the Randle Cycle: glucose in the presence of <30% fat = 36 – 38 ATP!

Fructose: Fruit sugar. The interesting thing about fructose is that it must be metabolized by the liver, where it is turned into fatty acids and does not require insulin.

Galactose: a simple sugar found in many foods, including milk, fruits, vegetables, and legumes that is metabolized into glucose in the liver. “Galactose serves as a substrate for cerebrosides, gangliosides and mucoproteins in the brain and nervous system, which supports its neural and immunological role.” (*from Fact Sheet from the International Dairy Federation*)

Polysaccharides

Sucrose: This is table sugar. Organic cane sugar is best. This is one molecule of glucose and fructose, which is quickly broken down.

Lactose: Milk sugar. One molecule of glucose and galactose.

What Happens in the Absence of Glucose?

The Anti-Metabolic Hormone: Cortisol

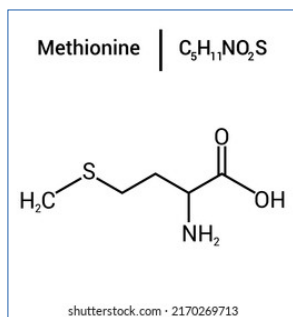
One of the problems with low carb diets is that a chronic lack of glucose activates the adrenalin and cortisol pathways. **“High cortisol can result in muscle wasting and premature aging.”** (Lerche, p. 108)

Glycogen is glucose that has been stored in the liver or muscle.

Gluconeogenesis is creating glucose from other available substrates – such as your muscle mass.

It's much easier on your body if you give it glucose, in the form of monosaccharides or polysaccharides, as described previously.

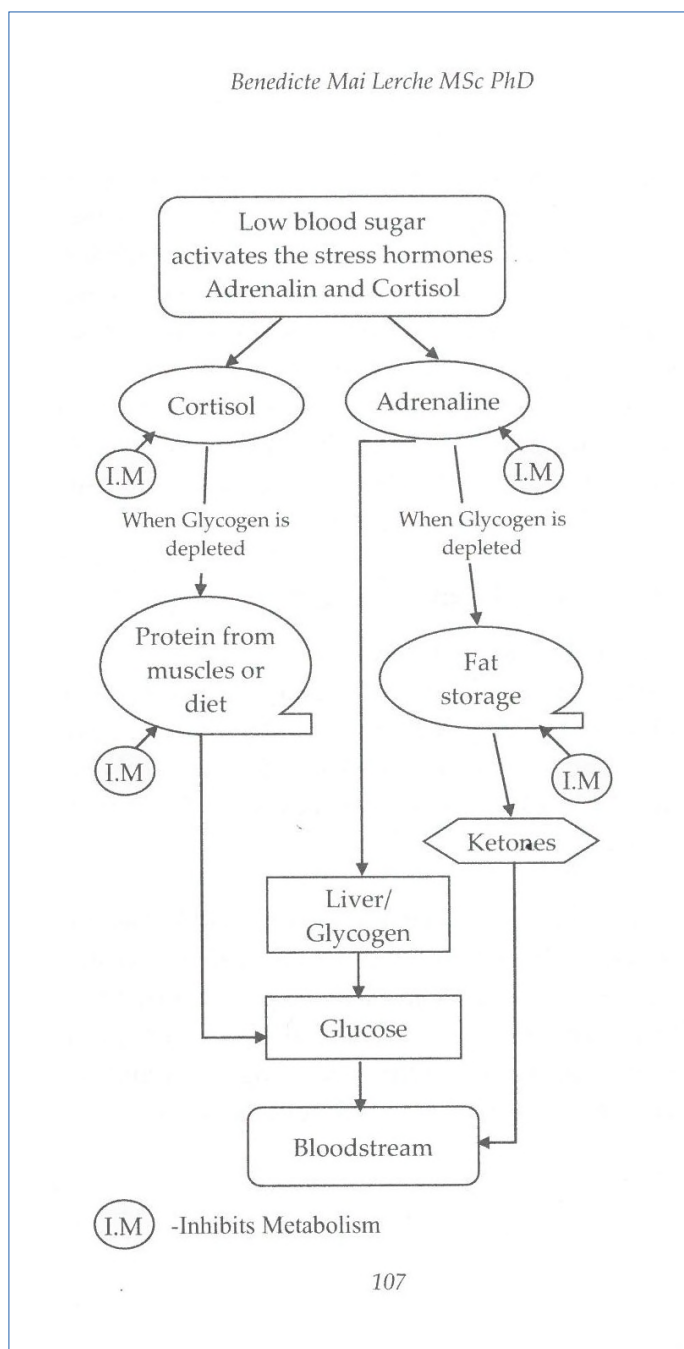
Another challenge: Methionine

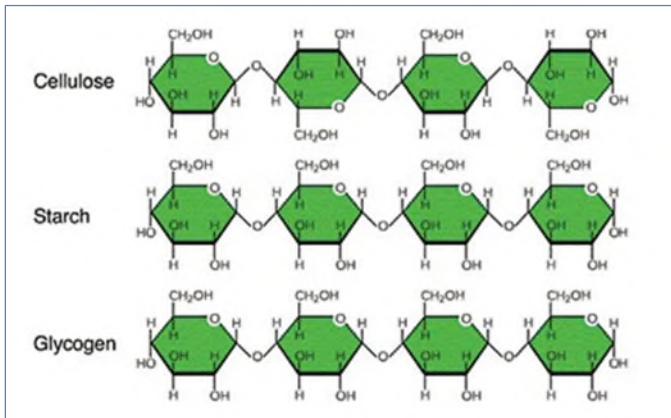


Methionine is a driver of obesity and can act as an endotoxin in the gut. Eggs and muscle meat is a main source of methionine. Low methionine foods are apples, grapes, strawberries, bananas, tomatoes, potatoes, broccoli, carrots, rice, oatmeal, peas, soybeans. Collagen, branched amino acids and aspirin can also be used to block the methionine absorption.

Paul Saladino MD interview with Georgi Dinkov

<https://www.youtube.com/watch?v=9ZM9sCfmAGc> timestamp: 1:50





Disaccharides: Should We Be Eating Plants? An Introduction to Plant Anti-nutrients

Cellulose is a fibrous carbohydrate also known as “dietary fiber.” The molecules are joined by glucose molecules. “The bonds between the glucose molecules in cellulose cannot be broken down by human digestive enzymes, so we do not

derive nutritional value from consuming fiber” (*Lerche, p. 95*). Some believe this is good, but these fibers end up being fermented in the large intestine which can lead to the creation of endotoxin by “feeding and amplifying the presence of harmful bacteria within the gut” (*p. 96*).

Starch is easily broken down by digestion, liberating the glucose. Glycogen is the storage form of glucose, stored in the liver and muscle (*p. 96*).

In addition, there are many ways that plants protect themselves from being eaten. They contain toxins and some even have physical attributes that act as weapons.

Cyanide – while smoke inhalation is the most common cause of cyanide poisoning, it is also found in plants. Cyanide displaces oxygen on the red blood cell. “Cyanide-containing substances occur naturally in over 2,000 plant species; some of these are food plants such as bamboo shoots, cassavas and seeds or stones of apples, apricots, grapes, pears, plums, prunes, cherries, peaches, etc. Cyanogenic glycosides per se are relatively non-toxic; however, they are converted into toxic hydrogen cyanide in the intestinal tract. Young children are more susceptible and chewing only a few seeds of these plants may cause cyanide poisoning. Cooking cyanogenic plants thoroughly in boiling water can effectively reduce their toxicity levels.” https://www.cfs.gov.hk/english/multimedia/multimedia_pub/multimedia_pub_fsf_110_01.html

Glycoalkaloids – nightshade family: tomato, eggplant, potatoes, peppers

Glycoalkaloids are created by the vegetable to act as an insect repellent. It is neurotoxic in high levels or for sensitive people by disrupting cell membranes. It can cause gastrointestinal symptoms, as well as anxiety, restlessness, mental confusion, insomnia, among others. More than 20 mg

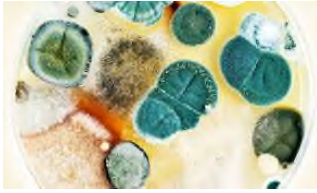
can cause death. [https://www.sciencedirect.com/topics/medicine-and-](https://www.sciencedirect.com/topics/medicine-and-dentistry/glycoalkaloid#:~:text=POTATOES%20AND%20RELATED%20CROPS%20%7C%20The%20Root%20Crop%20and%20its%20Uses&text=Tubers%20develop%20bitterness%20and%20off,of%20glycoalkaloid%20causes%20fatal%20illness.)

[dentistry/glycoalkaloid#:~:text=POTATOES%20AND%20RELATED%20CROPS%20%7C%20The%20Root%20Crop%20and%20its%20Uses&text=Tubers%20develop%20bitterness%20and%20off,of%20glycoalkaloid%20causes%20fatal%20illness.](https://www.sciencedirect.com/topics/medicine-and-dentistry/glycoalkaloid#:~:text=POTATOES%20AND%20RELATED%20CROPS%20%7C%20The%20Root%20Crop%20and%20its%20Uses&text=Tubers%20develop%20bitterness%20and%20off,of%20glycoalkaloid%20causes%20fatal%20illness.)



Goitrogens – also covered in the protein section, goitrogens block iodine uptake in the thyroid which inhibits thyroid function. They are found in soy but also bok choy, broccoli, cabbage, kale, Brussels sprouts, cauliflower, etc.

<https://www.sciencedirect.com/science/article/abs/pii/B9780128039687000423>



Mycotoxins – “metabolites of fungi that are generally produced during the growth or storage of plant products (e.g., coffee, cereal grains, nuts, corn, sorghum, rice, dried beans, and apples). The most common is aflatoxin.” Aflatoxins damage the liver, which can lead to cancer. Peanuts are a common source. *Samantha E. Gad, Shayne C. Gad, in Encyclopedia of Toxicology (Second Edition), 2005.*

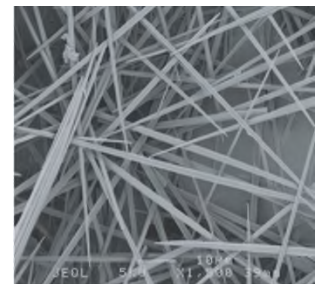
Phytate (Phytic Acid) – can be found in all plants but especially the outer coating of seeds, beans, nuts and grains (especially “whole grain products”). If not deactivated, it will interfere with the absorption of minerals, which can lead to osteoporosis. Cooking, soaking overnight in water, sprouting (germination), fermentation, and pickling can all break down phytic acid.

[/www.webmd.com/diet/foods-high-in-phytic-acid](http://www.webmd.com/diet/foods-high-in-phytic-acid)



Oxalates – physical defenses for plants. Oxalates are microscopic crystals that can damage the GI tract and kidneys, and can be lodged in all tissues causing inflammation and pain. They are primarily eliminated through the kidneys. They tend to combine with minerals, especially calcium and magnesium, cause mineral depletion. Photo is calcium oxalate from kiwi. A good source for information on oxalate content of various foods is www.oxalate.org
<https://sallyknorton.com/oxalate-science/oxalate-basics/>

High Oxalate Foods		
Spinach	Kiwi	All nuts
Swiss chard	Raspberries	Peanuts
Beans	Blackberries	Cashews
Beet greens	Guava	Almonds
Beets	Pomegranate	Almond flour
Okra	Buckwheat	Chia seeds
Plantain	Amaranth	Sesame seeds
Potatoes	Quinoa	
Sweet potatoes	Cocoa powder	
Rhubarb	Chocolate	



<https://nourishinghope.com/low-oxalate-diet/>

Gluten – This is a situation where protein becomes the enemy in people who are sensitive to it. The protein portion of wheat, rye and barley can create a very serious problem in the intestinal tract called *leaky gut syndrome*. Some people have intestinal symptoms such as acid reflux, bloating, cramping, gas and/or diarrhea. Others have systemic problems such as autoimmune diseases, headaches, joint/bone pain, eczema or psoriasis, respiratory issues including asthma, behavioral issues such as ADD/ADHD and schizophrenia.



How Do I Know if I am Gluten Intolerant? Dr Amy Meyers (mindbodygreen.com)

Do you have ...

1. Digestive issues such as gas, bloating, diarrhea and even constipation?
2. Fatigue, brain fog or feeling tired after eating a meal that contains gluten?
3. Diagnosis of an autoimmune disease?
4. Neurologic symptoms such as dizziness or a feeling of being off balance?
5. Hormone imbalances such as PMS, PCOS or unexplained infertility?
6. Migraine headaches?
7. Diagnosis of chronic fatigue or fibromyalgia?
8. Inflammation, swelling or pain in your joints such as fingers, knees or hips?
9. Mood issues such as anxiety, depression, mood swings and ADD?
10. Keratosis Pilaris, (also known as 'chicken skin') on the back of your arms?

Okay then, What Should We Eat?

“Avoiding the starches such as cereals and beans, and using fruits as a major part of the diet helps to minimize the effects of the polyunsaturated fats.”
<https://raypeat.com/articles/articles/glucose-sucrose-diabetes.shtml>

This is the carb lecture, so we will focus on which carbs to focus on But here is a quick reminder about plant protein.



Remember one-third.

Keep your carbs at about 1/3 of your total calories. Same for protein and fat.

List of Good Carbohydrates (p 151-154)

Sugars:

White table sugar
Honey
Pure fructose powder
Dairy products (lactose)

Examples of Good Low-Starch Sweet Fruits:

Apricots	Berries	Cherries	Dates
Figs	Grapes / grape juice	Lemon juice	Lychee (canned ok)
Melons	Nectarines	Orange juice (no pulp)	Papaya
Peaches	Raisins	Watermelon	

Crisp fruits such as apples and pears should be cooked and consumed with saturated fats such as good quality ice cream, whipped cream or Greek yogurt.

Examples of Good Root Vegetables:

Celery root	Leeks	Garlic	Ginger
Green onions	Jerusalem artichoke	Onions	Parsley root
Turmeric	White potatoes		

Examples of Good Fruit-Like Vegetables: Items with an * can be eaten raw.

Bell/sweet peppers*	Chili peppers*	Cucumber*	Eggplant
Olives*	Tomatoes*	Summer squash	

 Let's say this is a "large" order of McDonalds French fries (approximately 150g), commonly fried in canola, corn & soybean oil Nutritional info per 150g: Fat: 25g Carbs: 64g Protein: 6g Calories: 505	 And this is a plate of steamed and then seasoned potatoes (also 150g, for nutritional comparison purposes) Nutritional info per 150g: Fat: 0g Carbs: 30g Protein: 3g Calories: 99 @strong.sistas
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What about Fiber??

There is a lot of evidence that "fiber" can feed gut bacteria and cause intestinal inflammation (endotoxins). In addition, corn starch is a big source of intestinal inflammation, and is one of the "accidental ingredients" in high fructose corn syrup.

What about Starch / Grains (including oatmeal)??

Grains should be minimized, since there is often lots of fiber, which is irritating to the gut lining. In addition, grains contain quite a bit of the bad PUFA fats.

What's the deal with Resistant Starch?

When rice or potatoes are cooked, then cooled, they become "resistant" to digestion. Some schools of thought are that this is a good thing. Others say they should be avoided because they create endotoxin in the large intestine, which should always be avoided. Adding saturated fat (butter, coconut oil) mitigates the endotoxin response.

What are the Safe Starches?

- Safe starches are well cooked white potatoes – but of course NOT cooked in soybean oil.
- If you want to eat rice, make sure it is white rice, and combined with fat such as coconut oil.
- Lime-treated corn flour (Masa Harina) can be eaten “in abundance” without adverse effects.
- Sourdough bread is allowed, provided the dough has risen a minimum of 9 hours.
- Other breads or pasta should be white flour only.
- Other vegetables should be well cooked to break down their fibers.

And now it gets really weird ...

Beneficial Antimicrobial Fibers

Typical dietary fiber can potentially cause bacterial overgrowth and intestinal inflammation. Carrots, and cooked bamboo shoots, have developed antimicrobial substances that protect them and can be beneficial to the human gut. Raw carrots – never cooked, pureed or juiced as they then have an anti-metabolic effect – are the perfect companion to any meal. They “act like natural antibiotics, inhibiting the overgrowth of bacteria and fungi” (p. 127).

Grate the carrots lengthwise, then dress with olive, MCT or coconut oil. Also using vinegar in the dressing will add to the germicidal effect of the fibers. You can add meat, cheese, tomatoes, bell peppers and other ingredients to your salad to make it a full meal (p. 130).

Take Action:

1) Count Your Carbs! Tracking your carbs is critical to knowing where you’re at.

- Aim for about one-third of your daily calories to be carbohydrate.
- Focus on sweet fruits.
- Reduce your fat to 33% and replace those calories with carbs.
- Remember that good quality proteins (33% of calories) are important.

2) Consider the Idea of Going Gluten and Grain Free.

Many have found the improvements in their health to be astounding. It’s an all or nothing proposal. Simply cutting back will probably not be sufficient, but even significant reductions may help.

3) Worried about not getting adequate micro-nutrients? Add Formula 2 Multivitamin.



3) Try our appetite-curbing products: MultiBurn and Total Control. And don't forget the protein products!



Resources for Further Study:

Braley, James and Hoggan, Ron (2002) *Dangerous Grains*. Avery Publishing.

Chaffee, Anthony (Nov 5, 2022) *Plants Are Trying To Kill You*.

<https://www.youtube.com/watch?v=j1cqNDDG4aA>

Davis, William (2011, Rodale Press) *Wheat Belly*.

Korn, Danna (2010) *Living Gluten-Free for Dummies*. Wiley Publishing.

Lerche, Benedict Mai (2024, BiochemNordic) *How to Boost Metabolism with Food*.

Myers, Amy (2013, January 22) *10 Signs You're Gluten Intolerant*. Retrieved September 24, 2017 from www.mindbodygreen.com/0-7482/10-signs-youre-gluten-intolerant.html

Norton, Sally K (2023, Rodale) *Toxic Superfoods*

