FITNESS & NUTRITION EXPERT PROGRAM

NUTRITION SESSION 2:

Blood Sugar Management,
Cholesterol and more!

Nutrition Session 2: What we are going to cover

BLOOD SUGAR MANAGEMENT

- Understanding what happens in our bodies, the role of insulin and glucagon and the Glycemic Index and Glycemic Load

LOW GLYCEMIC EATING

- The Complete in 3 rule and how it applies to your clients

CHOLESTEROL

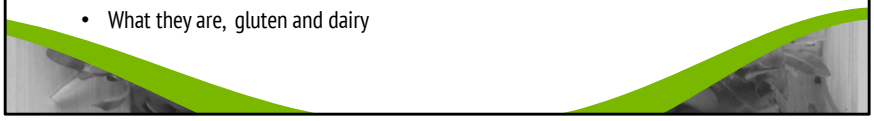
- What it is, why we need it and how to manage and what could be causing it other than diet

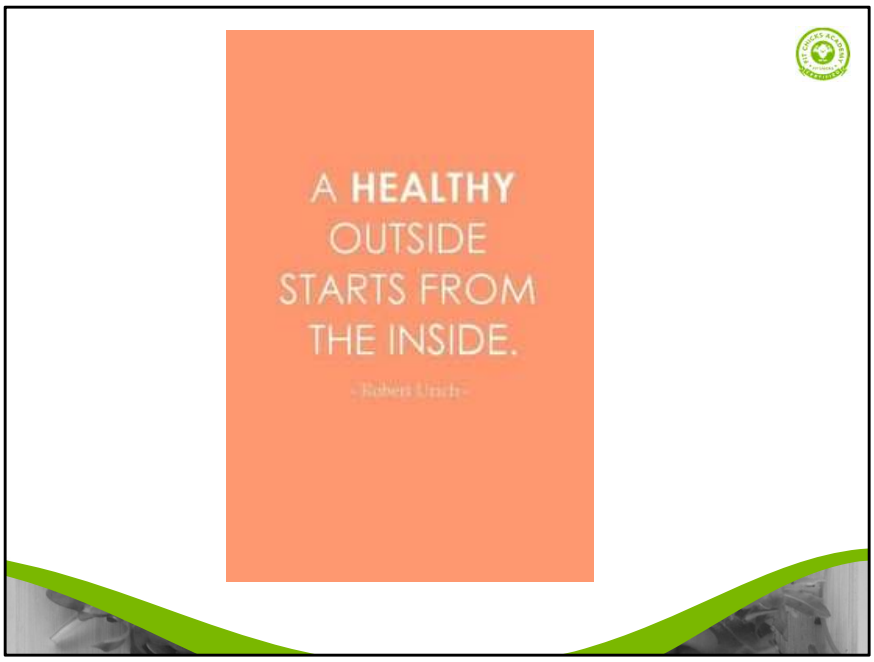
THE ESSENTIAL FATS

- More on EFA'S, how to store and cook with fats and what they do

FOOD ALLERGIES AND INTOLERANCES

- What they are, gluten and dairy

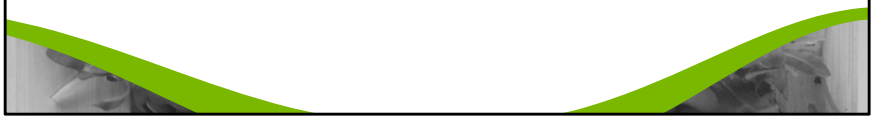


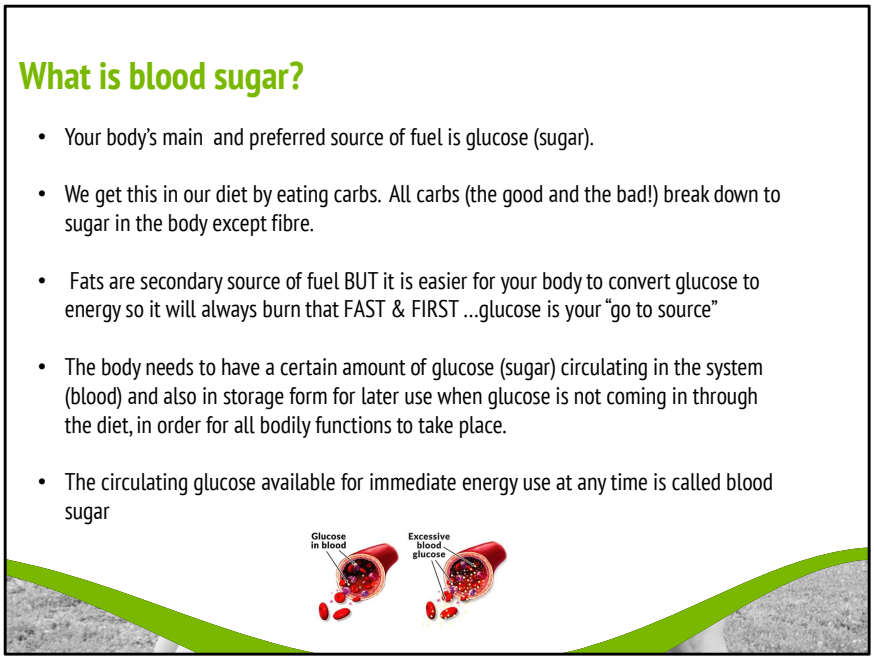

A HEALTHY
OUTSIDE
STARTS FROM
THE INSIDE.
- Robert Urich -

What you need before we start:

1. Water
2. Put your finger tips together
3. Take 3 deep breaths

Blood sugar management and why it's important!





The body's main source of fuel is glucose (fatty acids are also used for fuel but glucose is the go to source). Each and every cell of the body needs glucose to do its "work" and make additional energy to do work for extended periods of time. This includes all metabolic activities that happen on a daily basis to keep us alive, all movement, and all cognitive activity we engage in.

The body needs to have a certain amount of glucose (sugar) circulating in the system (blood) and also in storage form for later use when glucose is not coming in through the diet, in order for all bodily functions to take place.

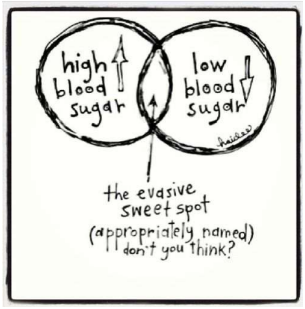
The circulating glucose available for immediate energy use at any time is called blood sugar. In order to keep energy levels stable there needs to be roughly 4 g of circulating glucose in the blood at all times. Anything higher or lower than this causes immediate energy imbalance. Over the long term imbalances can cause problematic health issues, the most significant of which is diabetes

WHAT ARE BLOOD SUGAR LEVELS?

In order to keep energy stable, there need to be approx. 4g of circulating glucose in the blood at all times

Higher or lower than 4g causes immediate energy imbalance

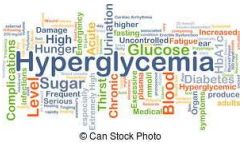
- Short term not ideal but long term = DANGER
- A leading cause of weight, health & mental issues with the most significant being diabetes



What hyperglycemia & hypoglycemia?

HYPERGLYCEMIA

- An elevated level of blood sugar is referred to as **hyperglycemia**
- **Symptoms of hyperglycemia include:** fatigue, lack of mental clarity (brain fog), aches and pains, extreme thirst and symptoms of dehydration, excessive urination, loss of appetite.

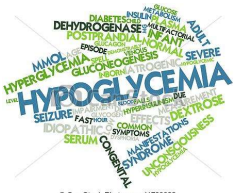


© Can Stock Photo

**These are the same symptoms you will find in type 1 and type 2 diabetes.*

HYPOGLYCEMIA

- A blood sugar level that is too low is referred to as **hypoglycemia.**
- **Symptoms of hypoglycemia include:** dizziness, feeling shaky, sweating, anxiety, panic, lack of mental clarity, hunger, in extreme cases fainting



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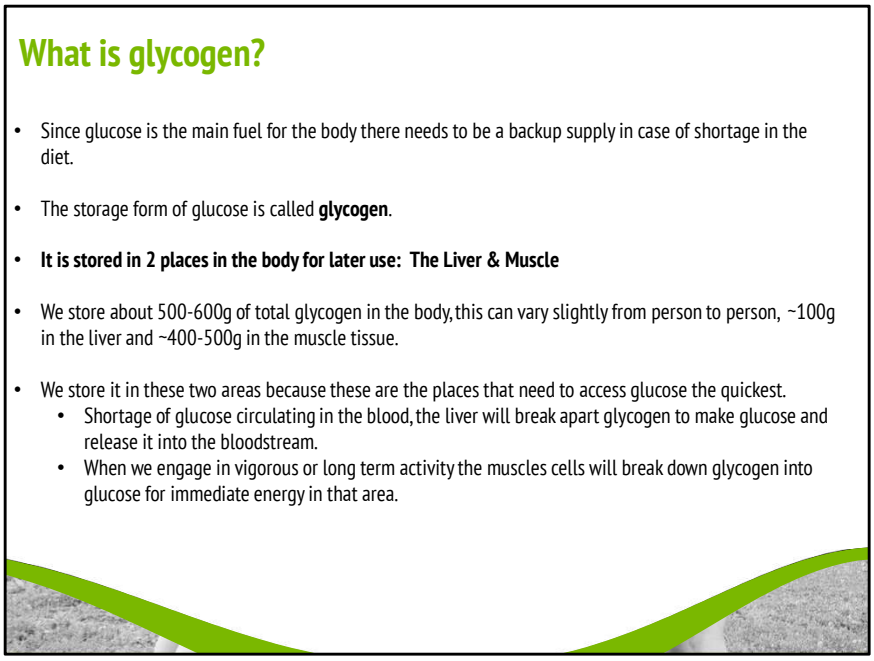


Glycogen
Since glucose is the main fuel for the body there needs to be a backup supply in case of shortage in the diet.

The storage form of glucose is called **glycogen**.

The body basically takes the simple units of glucose and makes them into long carbohydrate chains to form glycogen that can be stored in the liver and the muscle tissue. We store about 500-600g of total glycogen in the body, this can vary slightly from person to person, ~100g in the liver and ~400-500g in the muscle tissue.

We store it in these two areas because these are the places that need to access glucose the quickest. When there is a shortage of glucose circulating in the blood the liver will break apart glycogen to make glucose and release it into the bloodstream. When we engage in vigorous or long term activity the muscles cells will break down glycogen into glucose for immediate energy in that area.

Why is Blood Sugar Management important to weight loss?

Because if your body has too much sugar in the blood and can not effectively store or use it as energy, it gets stored as FAT!

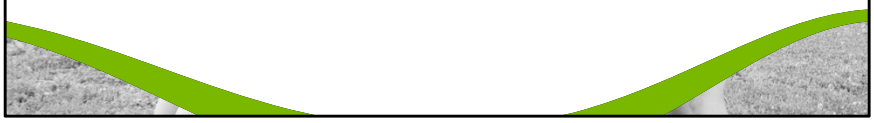
This is why our society is so overweight & is not losing...

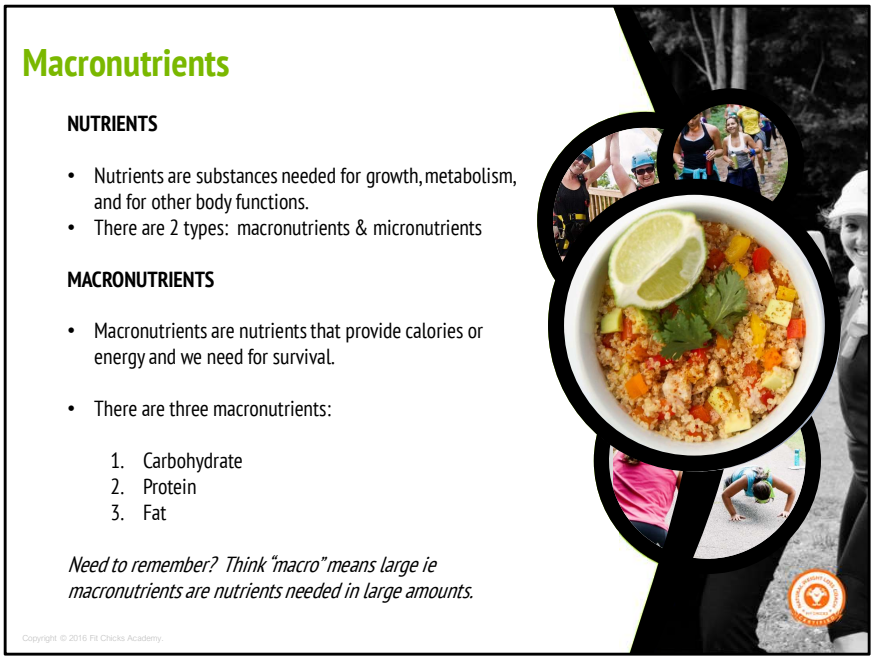
Eating a super carb heavy diet = too much blood sugar = nowhere to store = body stores as excess body fat!

(Important- *This is why calorie counting does not work for long term weight loss without macronutrient balance (ie balance of protein, carbs & fat). Even if you aren't eating a ton BUT eating too many carbs, your blood sugar will be out of whack & your body goes into storage mode! We MUST balance blood sugar for weight loss or it will always be a losing battle.)*

NUTRITION LINGO….

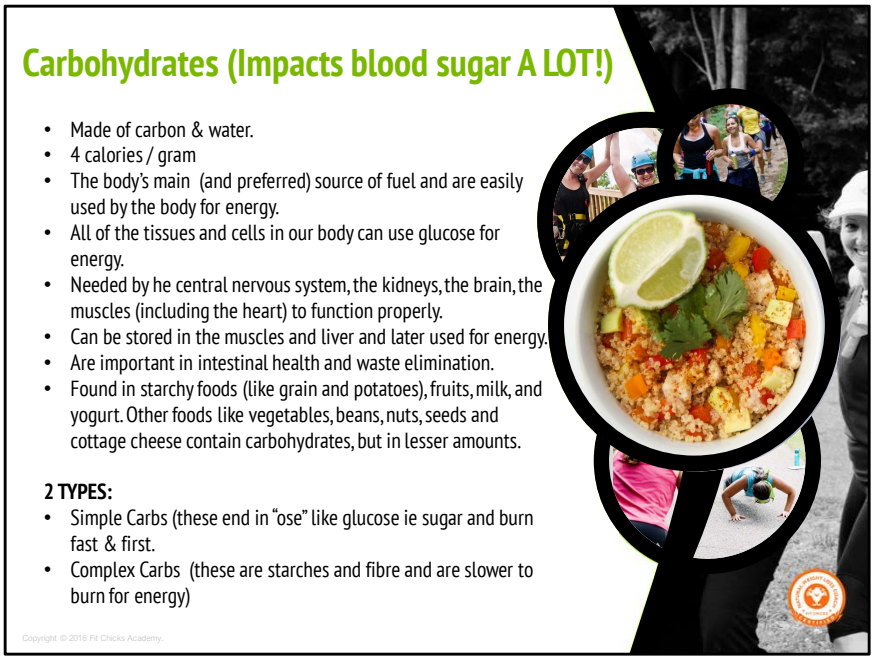
let's recap the macronutrients to understand their role on blood sugar!





WHAT ARE MACRONUTRIENTS?
Macronutrients are nutrients that provide calories or energy. Nutrients are substances needed for growth, metabolism, and for other body functions. Since "macro" means large, macronutrients are nutrients needed in large amounts. There are three macronutrients:

Carbohydrate
Protein
Fat
While each of these macronutrients provides calories, the amount of calories that each one provides varies.
Carbohydrate provides **4 calories per gram.**
Protein provides **4 calories per gram.**
Fat provides **9 calories per gram.**
This means that if you looked at the Nutrition Facts label of a product and it said 12 grams of carbohydrate, 0 grams of fat, and 0 grams of protein per serving, you would know that this food has about 48 calories per serving (12 grams carbohydrate multiplied by 4 calories for each gram of carbohydrate = 48 calories).



http://www.mckinley.illinois.edu/handouts/macronutrients.htm

WHY DO WE NEED CARBOHYDRATES?
Carbohydrates are the macronutrient that we need in the largest amounts. According to the Dietary Reference Intakes published by the USDA, 45% - 65% of calories should come from carbohydrate. We need this amount of carbohydrate because:

- Carbohydrates are the body's main source of fuel.
- Carbohydrates are easily used by the body for energy.
- All of the tissues and cells in our body can use glucose for energy.
- Carbohydrates are needed for the central nervous system, the kidneys, the brain, the muscles (including the heart) to function properly.
- Carbohydrates can be stored in the muscles and liver and later used for energy.
- Carbohydrates are important in intestinal health and waste elimination.
- Carbohydrates are mainly found in starchy foods (like grain and potatoes), fruits, milk, and yogurt. Other foods like vegetables, beans, nuts, seeds and cottage cheese contain carbohydrates, but in lesser amounts.

Fiber refers to certain types of carbohydrates that our body cannot digest. These

carbohydrates pass through the intestinal tract intact and help to move waste out of the body. Diets that are low in fiber have been shown to cause problems such as constipation and hemorrhoids and to increase the risk for certain types of cancers such as colon cancer. Diets high in fiber; however, have been shown to decrease risks for heart disease, obesity, and they help lower cholesterol. Foods high in fiber include fruits, vegetables, and whole grain products.

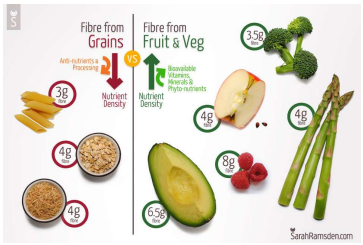
Fibre (does not impact blood sugar)

- refers to certain types of carbohydrates that our body cannot digest
- These carbohydrates pass through the intestinal tract intact and help to move waste out of the body

2 TYPES of fibre

- Insoluble= increase bulk (like stalks, leaves and seeds)
- Soluble= gel to help you absorb nutrients more slowly (like flax, psyllium husk)

- While they don't provide energy, SUPER important to overall health, digestion, weight loss and more.



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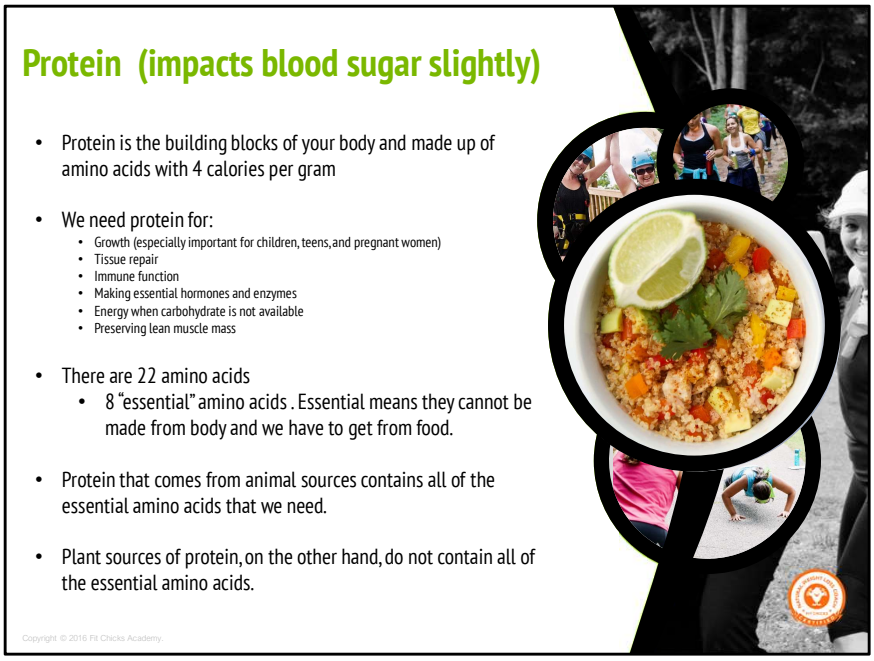
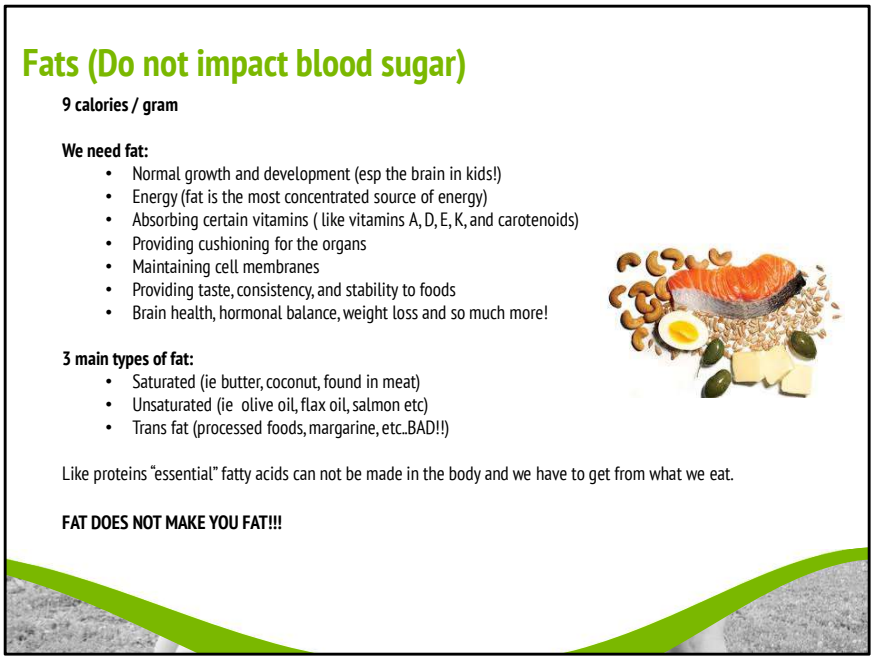


WHY DO WE NEED PROTEIN?

According to the Dietary Reference Intakes published by the USDA 10% - 35% of calories should come from protein. Most Americans get plenty of protein, and easily meet this need by consuming a balanced diet. We need protein for:

- Growth (especially important for children, teens, and pregnant women)
- Tissue repair
- Immune function
- Making essential hormones and enzymes
- Energy when carbohydrate is not available
- Preserving lean muscle mass
- Protein is found in meats, poultry, fish, meat substitutes, cheese, milk, nuts, legumes, and in smaller quantities in starchy foods and vegetables.

When we eat these types of foods, our body breaks down the protein that they contain into amino acids (the building blocks of proteins). Some amino acids are essential which means that we need to get them from our diet, and others are nonessential which means that our body can make them. Protein that comes from animal sources contains all of the essential amino acids that we need. Plant sources of protein, on the other hand, do not contain all of the essential amino acids.

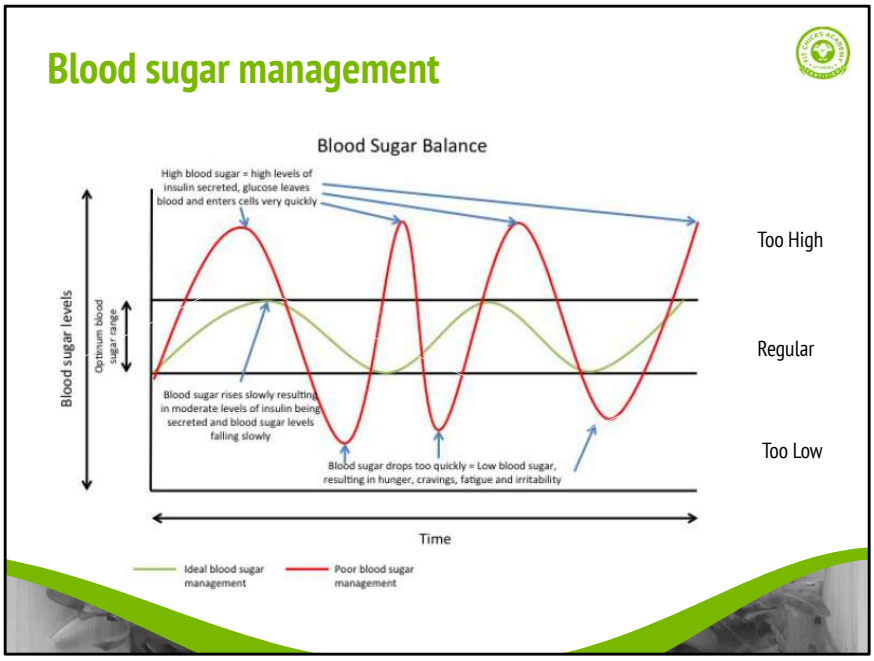


WHY DO WE NEED FAT?

Although fats have received a bad reputation for causing weight gain, some fat is essential for survival. According to the Dietary Reference Intakes published by the USDA 20% - 35% of calories should come from fat. We need this amount of fat for:

- Normal growth and development
- Energy (fat is the most concentrated source of energy)
- Absorbing certain vitamins (like vitamins A, D, E, K, and carotenoids)
- Providing cushioning for the organs
- Maintaining cell membranes
- Providing taste, consistency, and stability to foods

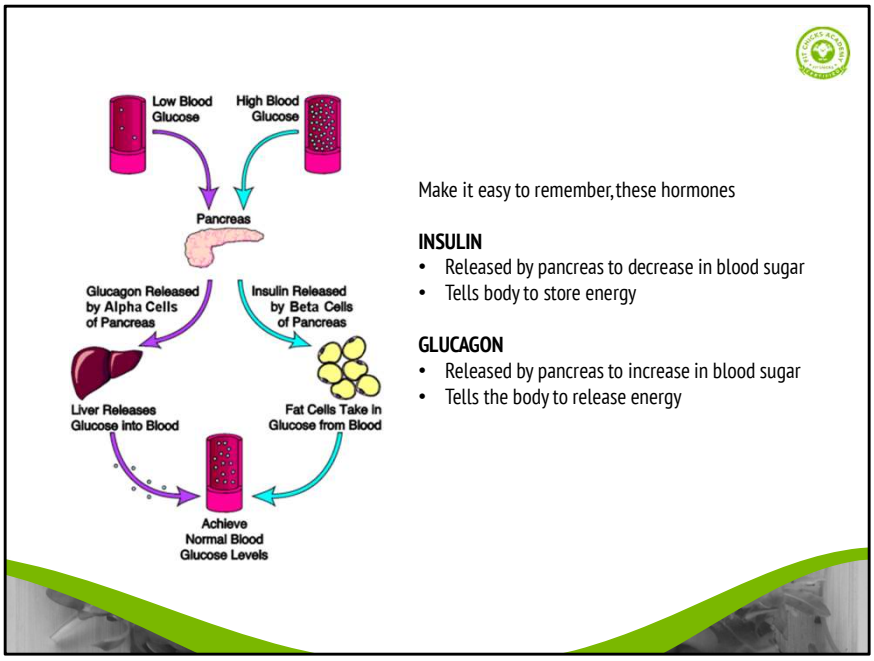
Fat is found in meat, poultry, nuts, milk products, butters and margarines, oils, lard, fish, grain products and salad dressings. There are three main types of fat, saturated fat, unsaturated fat, and trans fat. Saturated fat (found in foods like meat, butter, lard, and cream) and trans fat (found in baked goods, snack foods, fried foods, and margarines) have been shown to increase your risk for heart disease. Replacing saturated and trans fat in your diet with unsaturated fat (found in foods like olive oil, avocados, nuts, and canola oil) has been shown decrease the risk of developing heart disease



Normal Blood Sugar Management Process:

In a fed state, blood sugar will rise (but not too high!) in response to eating glucose.

In a fasted state, blood sugar will drop (but not too low!) in response to lack of glucose in the blood.



Source: "Protein Power" by Dr Michael Eades and Dr. Mary Eades

According to food surveys, the most commonly eaten food in the USA is white flour in the form of bread, pasta and similar foods. The runner up is white flour and sugar combinations such as pie, cake, cookies, donuts, etc.

All carbohydrates, both starch and sugars, are converted to sugar in the digestive process. White flour is in the form of sugar by the time it reaches the blood. Carbohydrate intake causes a rise in blood sugar. A rise in blood sugar causes a rise in insulin. The pancreas has to put out insulin to enable blood sugar to enter cells for energy production, and to keep the blood sugar level normal.

Balancing Act

Insulin and glucagon are hormones that help regulate levels of blood sugar (glucose) in your body. Glucose, which comes from the food you eat, is important to fueling your body. Insulin and glucagon are equally important in managing blood glucose, making sure your body functions well.

Insulin and glucagon are like the yin and yang of blood glucose maintenance. These hormones partner to balance your blood sugar, keeping your levels in the narrow

range required by your body. When you eat, your pancreas releases insulin to help lower blood sugar; between meals, your pancreas releases glucagon to help keep blood sugar levels steady.

If you have diabetes or prediabetes, your body either can't use the insulin you make properly, doesn't produce enough insulin or doesn't produce insulin at all. In turn, this causes an improper amount of glucagon to be released. When the system is thrown out of balance, it can lead to dangerous levels of glucose in your blood.

How Insulin Works

Insulin is a vital hormone produced by cells in your pancreas. Insulin works to move glucose from the blood and into cells for energy or storage for later energy. During digestion, foods that contain carbohydrates are digested and converted to glucose. This causes a rise in blood glucose. The increase in sugar signals your pancreas to produce the amount of insulin you need to manage the level of sugar in your blood. When insulin is produced, glucagon is suppressed. Insulin stimulates the cells throughout your body to take in glucose from your bloodstream. Your cells then use glucose as energy.

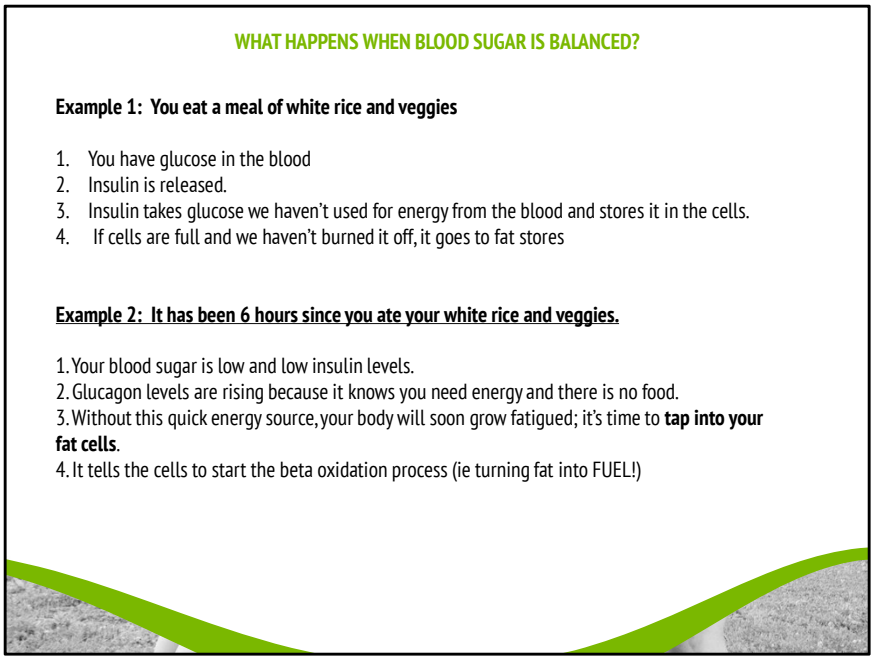
In order to help fuel the body between meals, excess glucose is stored in cells of the liver and muscles as glycogen. As glucose is converted to energy or stored in the liver and muscles, its levels in your blood are reduced.

How Glucagon Works

Like insulin, glucagon is a protein hormone produced in the pancreas. It is a counterbalance to insulin.

Approximately four to six hours after you eat, the glucose levels in your blood become reduced. This triggers the production of glucagon in the pancreas. When the pancreas secretes glucagon, it suppresses insulin.

Glucagon signals the liver and muscles to break down glycogen into glucose and release glucose back into your bloodstream. This keeps your blood sugar levels from dipping too low.



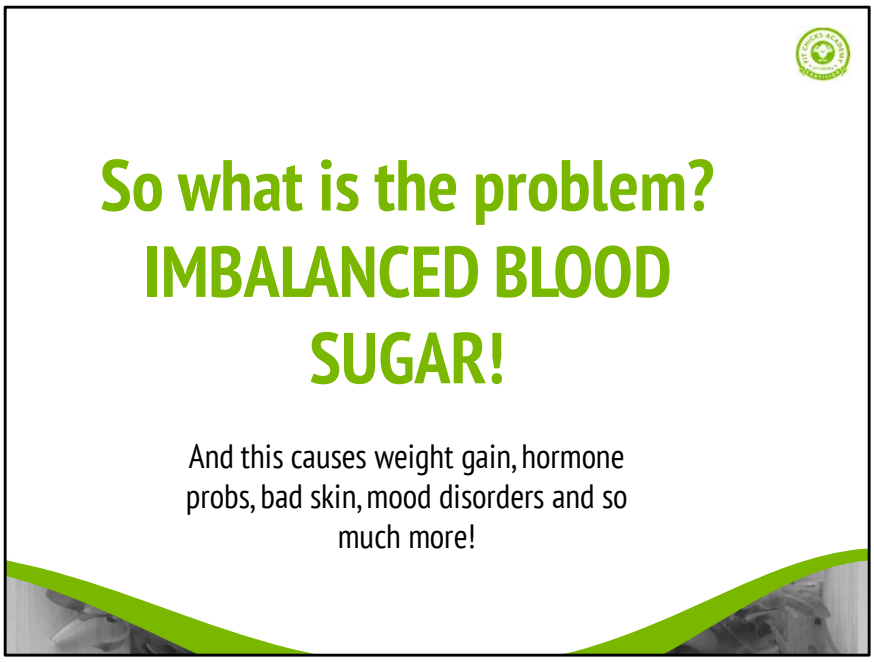
What is blood sugar management and imbalanced blood sugar?

When we talk about balancing blood sugar and blood sugar management we are talking about implementing dietary and lifestyle strategies to ensure that the circulating amount of sugar in the blood is neither too high or too low and that insulin and glucagon are working effectively and efficiently.

When you have eaten a meal and digested the complex carbohydrates into simple forms (glucose and other singe unit sugars - monosaccharides) you will use some of that glucose immediately in the cells if energy is needed, use some to make ATP for even more immediate energy, and then store some for later.

In order for all of this to happen we need insulin and other hormones in the endocrine system. If everything is balanced and working efficiently, all this goes according to plan and the right amount of sugar is present in all areas of energy metabolism.

When carbohydrates are not coming in from the diet for a prolonged period or time or the body's energy needs are exceeding the amount of circulating glucose, then glucagon will activate the breakdown of glycogen to provide glucose and blood sugar levels stabilize. This mechanism ensures blood sugar levels never get too low.



Symptoms associated with a Blood Sugar Imbalance are
Irritability
Anxiety
Depression
Mood swings
Poor concentration
Fat storage, especially around the midriff
Brain fog
Insomnia
Cravings, especially for sweet foods
Excessive thirst
Addictions to caffeine containing drinks and/or alcohol and cigarettes
Drowsiness during the day
Excessive sweating
Difficulty losing weight

The problem with a Blood Sugar Imbalance
As if the symptoms above are not enough, if your blood sugar remains unbalanced too frequently the body starts to ignore the insulin message, a condition called insulin

resistance. This leads to permanently high blood sugar levels which can cause weight gain and can eventually lead to type 2 diabetes.

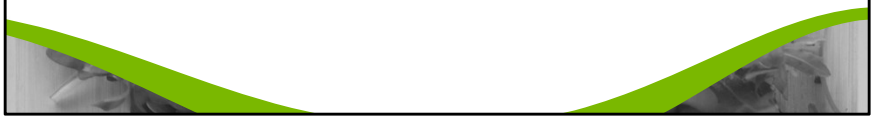
Contributing factors to imbalanced blood sugar include:

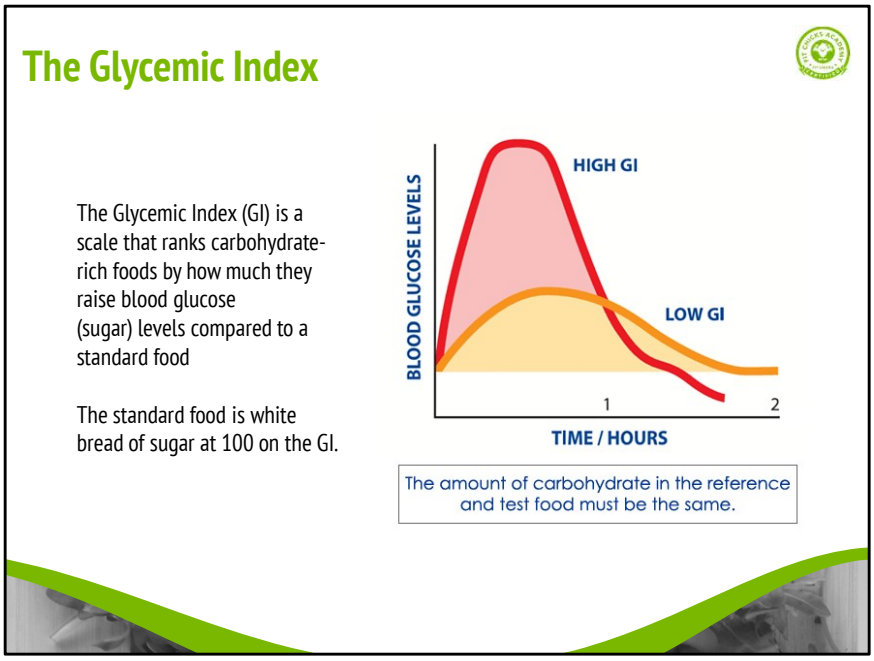
- Poor dietary choices
- Weight
- Stress
- Nutrient Deficiencies
- PCOS and other hormonal disturbances

Source: http://www.smartnutrition.co.uk/conditions/energy/blood-sugar-imbalance/

Understanding the role of carbohydrates on blood sugar management

Remember, protein has a small impact on blood sugar but fat does not....





http://www.glycemicindex.com/

The glycemic index (GI) is a ranking of carbohydrates on a scale from 0 to 100 according to the extent to which they raise blood sugar levels after eating. Foods with a high GI are those which are rapidly digested and absorbed and result in marked fluctuations in blood sugar levels. Low-GI foods, by virtue of their slow digestion and absorption, produce gradual rises in blood sugar and insulin levels, and have proven benefits for health. Low GI diets have been shown to improve both glucose and lipid levels in people with diabetes (type 1 and type 2). They have benefits for weight control because they help control appetite and delay hunger. Low GI diets also reduce insulin levels and insulin resistance.
Recent studies from Harvard School of Public Health indicate that the risks of diseases such as type 2 diabetes and coronary heart disease are strongly related to the GI of the overall diet. In 1999, the World Health Organisation (WHO) and Food and Agriculture Organisation (FAO) recommended that people in industrialised countries base their diets on low-GI foods in order to prevent the most common diseases of affluence, such as coronary heart disease, diabetes and obesity.

Source:

http://www.hsph.harvard.edu/nutritionsource/carbohydrates/carbohydrates-and-blood-sugar/

Glycemic index
In the past, carbohydrates were commonly classified as being either “simple” or “complex,” and described as follows:

Simple carbohydrates:
These carbohydrates are composed of sugars (such as fructose and glucose) which have simple chemical structures composed of only one sugar (monosaccharides) or two sugars (disaccharides). Simple carbohydrates are easily and quickly utilized for energy by the body because of their simple chemical structure, often leading to a faster rise in blood sugar and insulin secretion from the pancreas – which can have negative health effects.

Complex carbohydrates:
These carbohydrates have more complex chemical structures, with three or more sugars linked together (known as oligosaccharides and polysaccharides). Many complex carbohydrate foods contain fiber, vitamins and minerals, and they take longer to digest – which means they have less of an immediate impact on blood sugar, causing it to rise more slowly. But other so called complex carbohydrate foods such as white bread and white potatoes contain mostly starch but little fiber or other beneficial nutrients.

Dividing carbohydrates into simple and complex, however, does not account for the effect of carbohydrates on blood sugar and chronic diseases. To explain how different kinds of carbohydrate-rich foods directly affect blood sugar, the glycemic index was developed and is considered a better way of categorizing carbohydrates, especially starchy foods.

SOURCE:
http://www.hsph.harvard.edu/nutritionsource/carbohydrates/carbohydrates-and-blood-sugar/

The glycemic index ranks carbohydrates on a scale from 0 to 100 based on how quickly and how much they raise blood sugar levels after eating. Foods with a high glycemic index, like white bread, are rapidly digested and cause substantial fluctuations in blood sugar. Foods with a low glycemic index, like whole oats, are digested more slowly, prompting a more gradual rise in blood sugar.

Low-glycemic foods have a rating of 55 or less, and foods rated 70-100 are considered high-glycemic foods. Medium-level foods have a glycemic index of 56-69.

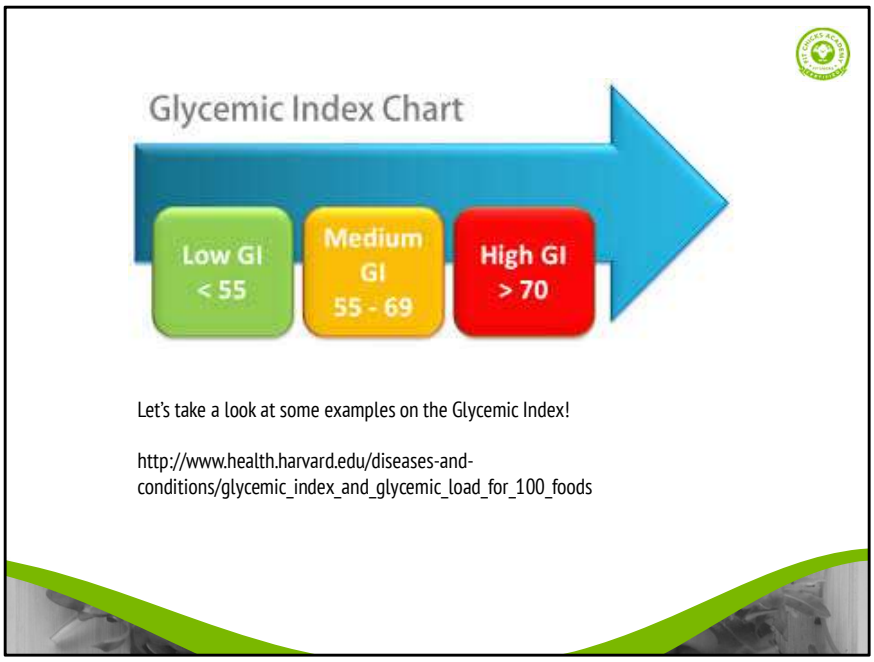
Eating many high-glycemic-index foods – which cause powerful spikes in blood sugar – can lead to an increased risk for type 2 diabetes, (2) heart disease, (3), (4) and overweight, (5,6) (7). There is also preliminary work linking high-glycemic diets to age-related macular degeneration, (8) ovulatory infertility, (9) and colorectal cancer. (10)

Foods with a low glycemic index have been shown to help control type 2 diabetes and improve weight loss.
A 2014 review of studies researching carbohydrate quality and chronic disease risk showed that low-glycemic-index diets may offer anti-inflammatory benefits. (16)

The University of Sydney in Australia maintains a searchable database of foods and their corresponding glycemic indices. http://www.glycemicindex.com/

Many factors can affect a food's glycemic index, including the following:

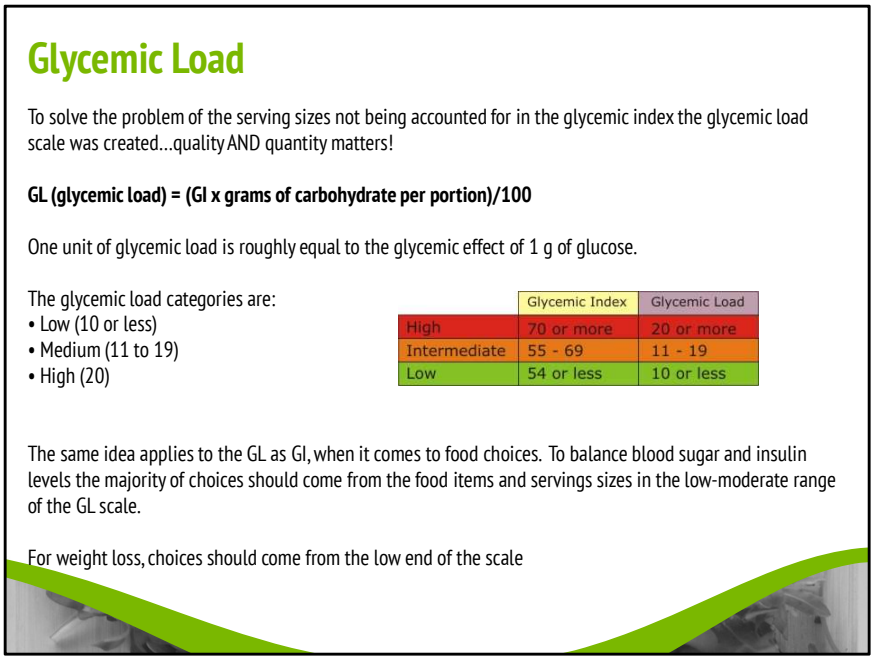
Processing: Grains that have been milled and refined—removing the bran and the germ—have a higher glycemic index than minimally processed whole grains.
Physical form: Finely ground grain is more rapidly digested than coarsely ground grain. This is why eating whole grains in their "whole form" like brown rice or oats can be healthier than eating highly processed whole grain bread.
Fiber content: High-fiber foods don't contain as much digestible carbohydrate, so it slows the rate of digestion and causes a more gradual and lower rise in blood sugar.
Ripeness: Ripe fruits and vegetables tend to have a higher glycemic index than un-ripened fruit.
Fat content and acid content: Meals with fat or acid are converted more slowly into sugar.
Numerous epidemiologic studies have shown a positive association between higher dietary glycemic index and increased risk of type 2 diabetes and coronary heart disease. However, the relationship between glycemic index and body weight is less well studied and remains controversial.



A lower glycemic index suggests slower rates of digestion and absorption of the foods' carbohydrates and may also indicate greater extraction from the liver and periphery of the products of carbohydrate digestion.

What are some challenges with using the glycemic index alone?

1. It only takes into account the food on it's own, not combined with other foods
2. It doesn't take into account the nutrient value in food, just impact on blood sugar
3. Doesn't always take into account the amount of food consumed (ie if 1 apple is a 55, how much is 2 apples in 1 sitting?)
4. It is not always clear how the food is cooked which alters the GI
5. Hard to manage, track and determine for your clients



Source:
http://www.hsph.harvard.edu/nutritionsource/carbohydrates/carbohydrates-and-blood-sugar/

Glycemic load

One thing that a food's glycemic index does not tell us is how much digestible carbohydrate – the total amount of carbohydrates excluding fiber – it delivers. That's why researchers developed a related way to classify foods that takes into account both the amount of carbohydrate in the food in relation to its impact on blood sugar levels. This measure is called the glycemic load. (11,12) A food's glycemic load is determined by multiplying its glycemic index by the amount of carbohydrate the food contains. In general, a glycemic load of 20 or more is high, 11 to 19 is medium, and 10 or under is low.

The glycemic load has been used to study whether or not high-glycemic load diets are associated with increased risks for type 2 diabetes risk and cardiac events. In a large meta-analysis of 24 prospective cohort studies, researchers concluded that people who consumed lower-glycemic load diets were at a lower risk of developing type 2 diabetes than those who ate a diet of higher-glycemic load foods. (13) A similar type

of meta-analysis concluded that higher-glycemic load diets were also associated with an increased risk for coronary heart disease events. (14)

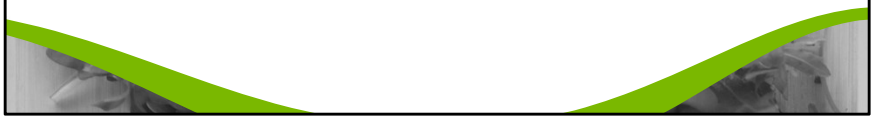
Here is a listing of low, medium, and high glycemic load foods. For good health, choose foods that have a low or medium glycemic load, and limit foods that have a high glycemic load.

Low glycemic load (10 or under)
Bran cereals
Apple
Orange
Kidney beans
Black beans
Lentils
Wheat tortilla
Skim milk
Cashews
Peanuts
Carrots

Medium glycemic load (11-19)
Pearled barley: 1 cup cooked
Brown rice: 3/4 cup cooked
Oatmeal: 1 cup cooked
Bulgur: 3/4 cup cooked
Rice cakes: 3 cakes
Whole grain breads: 1 slice
Whole-grain pasta: 1 1/4 cup cooked

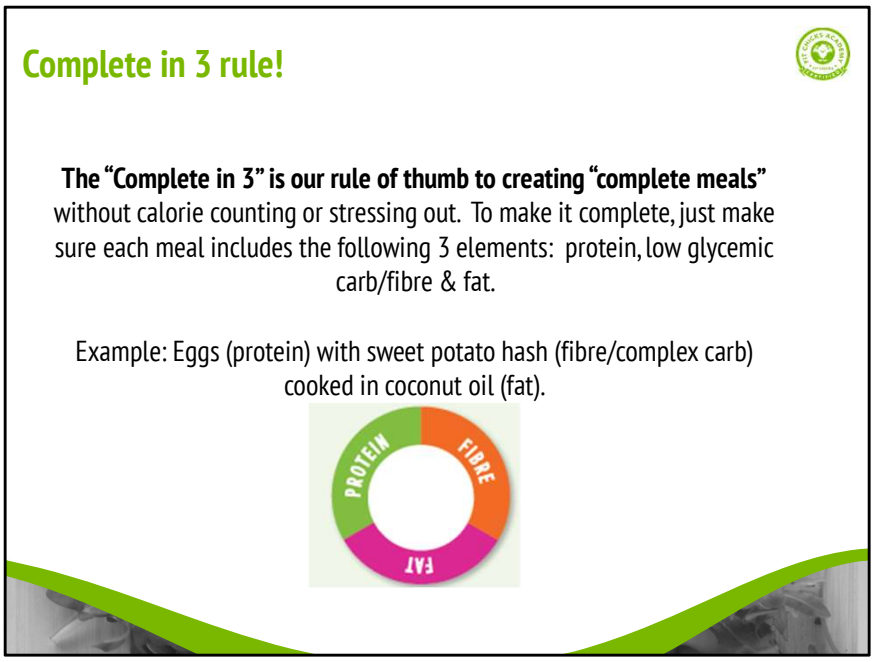
High glycemic load (20+)
Baked potato
French fries
Refined breakfast cereal: 1 oz
Sugar-sweetened beverages: 12 oz
Candy bars: 1 2-oz bar or 3 mini bars
Couscous: 1 cup cooked
White basmati rice: 1 cup cooked
White-flour pasta: 1 1/4 cup cooked (15)
Here's a list of the glycemic index and glycemic load for the most common foods.

Are we confused yet? Let's make it simple!



Easy steps to eat lower on the glycemic index and manage blood sugar

1. **Focus your diet around real, whole foods** (made with love!) – think quality like Mother Nature made and remove processed, packaged foods
2. **Combine lots of low GI foods with a small amount of high GI foods** (limit refined!)
3. **Eat 1 – 4 times per day (at least 4 hours in between)**
4. **Follow the "Complete in 3" Rule** for balanced meals!



HOW MAKE IT A COMPLETE MEAL:

We like to keep it simple at FIT CHICKS. So to help you make sure every meal is "complete" follow the

COMPLETE IN 3 RULE!

The "Complete in 3" is our rule of thumb to creating "complete meals" without calorie counting or stressing out. To make it complete, just make sure each meal includes the following 3 elements: protein, fibre & fat.

Example: Eggs (protein) with sweet potato hash (fibre/complex carb) cooked in coconut oil (fat).

Eating this way will keep your blood sugar balanced to avoid dips in energy, weight gain & overeating. No matter if you are vegan, vegetarian, diabetic, low carb, gluten free….complete in 3 is the way EVERY chick should be eating for optimal health!

What happens if I don’t eat complete meals?

If you just eat a meal with carbs, this will spike your blood sugar, make your body hold on to weight, have an energy crash and be starving very quickly. If you just have protein, you may be low on energy and fuzzy headed. If you just have fat, you will be lacking important nutrients and vitamins. They all work together to provide all the goodness you need for your body to run and a steady stream of energy to balance your blood sugar. So next time you grab that apple, have it with some all natural peanut butter (this contains both protein and fat) to keep your body & waistline happy □

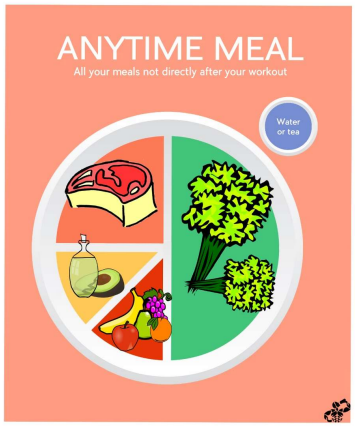
Make it a complete meal!

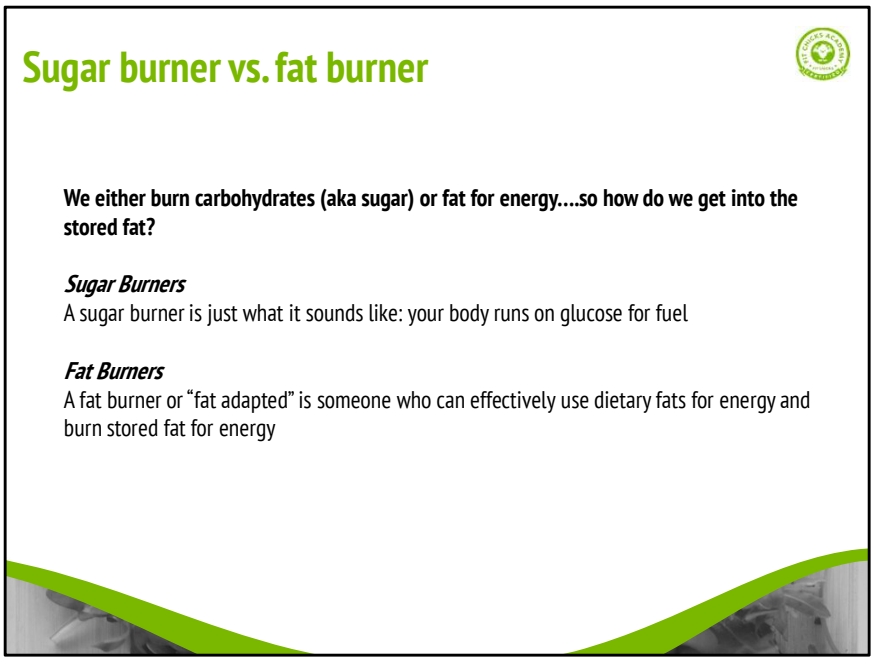
A complete meal means AUTOMATIC LOW GLYCEMIC EATING:

- Low Glycemic eating is all about keeping your insulin and blood sugar level.
- There are so many diets / eating styles but the main thing for weight loss, high energy, muscle building, etc is keeping your blood sugar level.
- We want to avoid spikes (this means highs and lows) in blood sugar to regulate weight, hormones, moods & more – it is SO IMPORTANT for optimal health!

HOW TO STRUCTURE YOUR COMPLETE IN 3 MEALS

1. **FOCUS ON FIBRE RICH FOODS** - make your meals around vegetables, not meat (think of meat as a condiment!)
2. **EAT LOW GLYCEMIC VEGGIES WITH EVERY MEAL!** At least 2 servings incl breakfast
3. **ROTATE YOUR PROTEINS, CARBS & FATS** – Don't eat the same thing everyday to make sure you get all the nutrients!





The body will determine which form of substrates to use depending on the energy system being used at the time (the intensity and nature of your physical activity).

To simply things I want you to think about your body being able to produce energy with or without the presence of readily available oxygen. There are several different pathways for energy production depending on the intensity of exercise, but it mostly comes down to the presence of readily available oxygen.

For the purpose of this discussion, the most important thing to know is **the body cannot use fat for energy outside of the aerobic energy system**. This means that while you're doing exercise that is higher intensity in nature you'll only be able to use glucose (sugar) or lactic acid (a by-product of anaerobic energy production) for fuel in the cells.

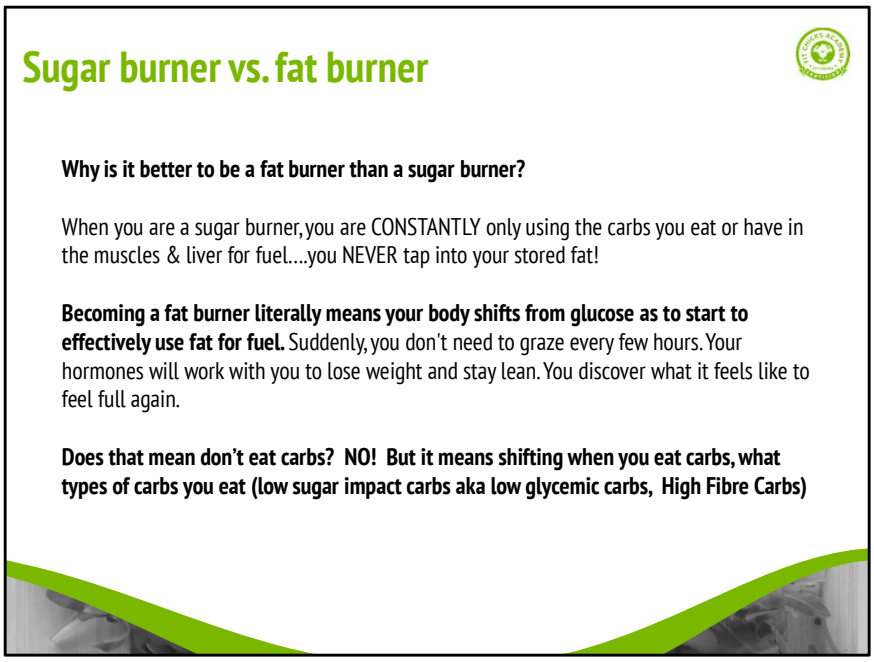
What happens after the physical activity is over is another story. I say this so you don't get hung up on the idea of being in your "fat burning zone" all the time like we frequently hear from some so called experts. This whole concept is misleading to say the least.
It's imperative that you look at what your body can use for fuel both during and after

exercise. Often times it's what you'll burn for fuel after your workout that makes the most significant impact on body composition changes.

If the body doesn't need the glucose for immediate energy demands, it stores the excess glucose in the liver and muscles as glycogen. This glycogen can be broken back down to glucose and used for fuel later on when the body needs energy.

In the presence of readily available glucose the body will always use this for fuel preferentially over fats in the beginning of an exercise session.
During exercise while you're in an aerobic state (in the presence of readily available oxygen) the body will use glucose first then gradually start shifting to fat for energy production. Without getting into too much detail your body will use both substrates for energy with low-moderate intensity exercise.
The longer you go with aerobic exercise, the more your body will call upon fats for energy production.
As I mentioned earlier, when the intensity of exercise increases or if you're doing short bursts of all-out effort, your body won't be able to continue using fat. It basically comes down to the fact that your body can't use fat for energy production outside of the aerobic energy system.

Fats as fuel sources for your body
Dietary fat is digested and assimilated into smaller units much like carbohydrates although the processes are different. When fats reach the small intestine they're broken down with the assistance of bile acids and salts. The smaller droplets of fat are then acted upon by lipases and ultimately converted into fatty acids and glycerol.



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How does the body use stored fat for energy production?
As you can see there's always a physiological process for using any substrate for energy production, be it carbs, dietary fat, or stored body fat.
Contrary to what some slick marketing pitches would have you believe, fat doesn't get "zapped, melted, or incinerated" on the spot. In other words, **stored body fat does NOT get burned right there in the fat cell. It must be liberated and sent to a muscle cell**.

The process for this liberation involves a somewhat complex hormonal/enzymatic pathway. Basically to simply things, an important enzyme called "hormone sensitive lipase" is used as the catalyst for the lipolysis or breakdown of fat in the cells to smaller forms of fatty acids and glycerol that the body can use.
So what triggers this process of lipolysis or the breaking down of stored fat in fat cells to be used by the body for energy? One word…DEMAND.
When your body needs more fuel to meet energy demands than is readily available

from stored glucose (glycogen) in the muscles and liver, dietary fat, or sugars consumed in the diet, it goes looking for it elsewhere. Hence, your fat cells open up and provide the needed energy due to demand.

Here's the part you need to get your head around. While you need some carbohydrate in the diet to facilitate the process of liberating stored body fat for fuel, if you're constantly meeting energy demands from sugars or dietary fat, there's no need to go looking for it elsewhere.

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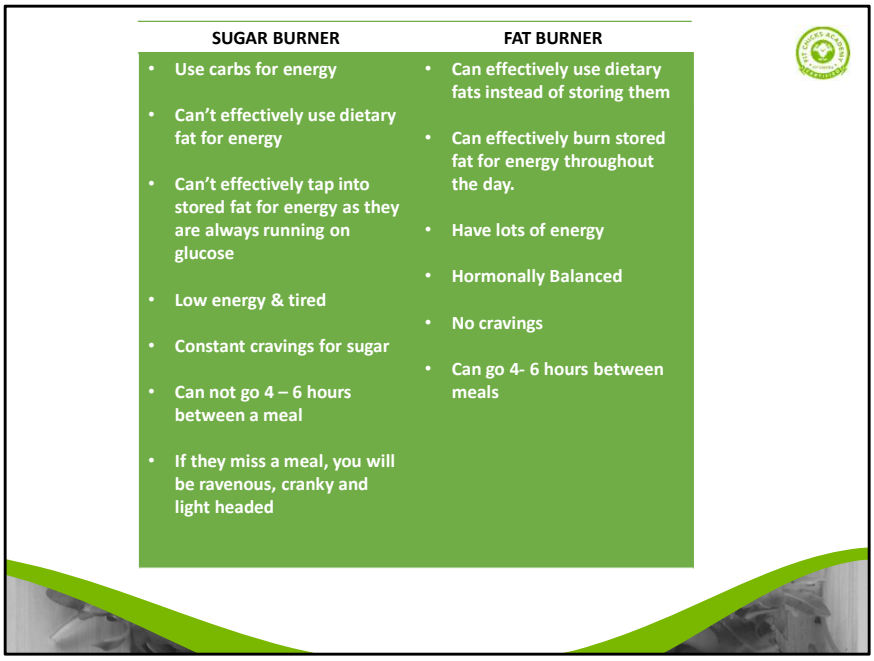

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For starters, you want to make sure you restrict carbohydrate intake at times (key point: not ALL the time) so that you don't always have enough dietary fuel to meet energy demands. Caloric shifts where you restrict for short periods of time (days not weeks), while going "lower-carb" followed by periodic re-feeds are going to work best for most people to create the necessary demand for body fat as a fuel source.
If you restrict energy (calories) too much, for too long, the body will simply down-regulate the metabolism through hormonal processes. Everything should work in short windows of time. Restrict for a while then put more calories, especially from carbs, back in to keep your metabolism humming along.
From an exercise viewpoint, you want to avoid consuming dietary fat prior to an exercise session. A little bit of glucose from say a piece of fruit is a better choice. This is to ensure you have some fuel to support the intensity of your workout. Not a lot though, around 20-25 grams of carbs from a simple sugar source will be enough to support most workouts.
The idea is you want to be able to provide your body with energy to support the demands of your workout while at the same time not overloading on fuel so there's

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Post-workout, I recommend to my clients that they consume a fast assimilating protein like whey combined with a small amount of simple sugar. This is going to be an ideal way to jump start the anabolic processes of muscle repair and rebuilding.

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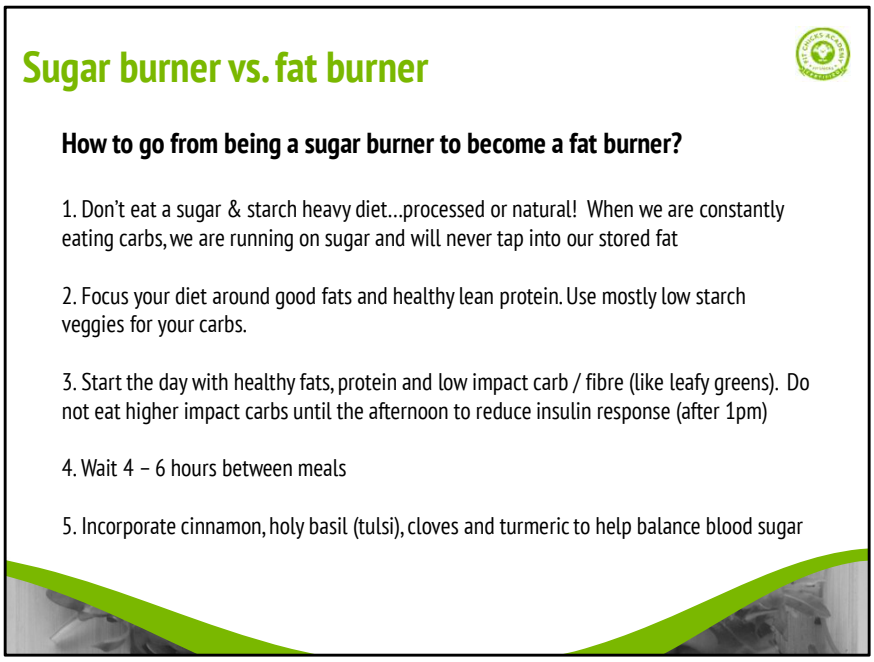
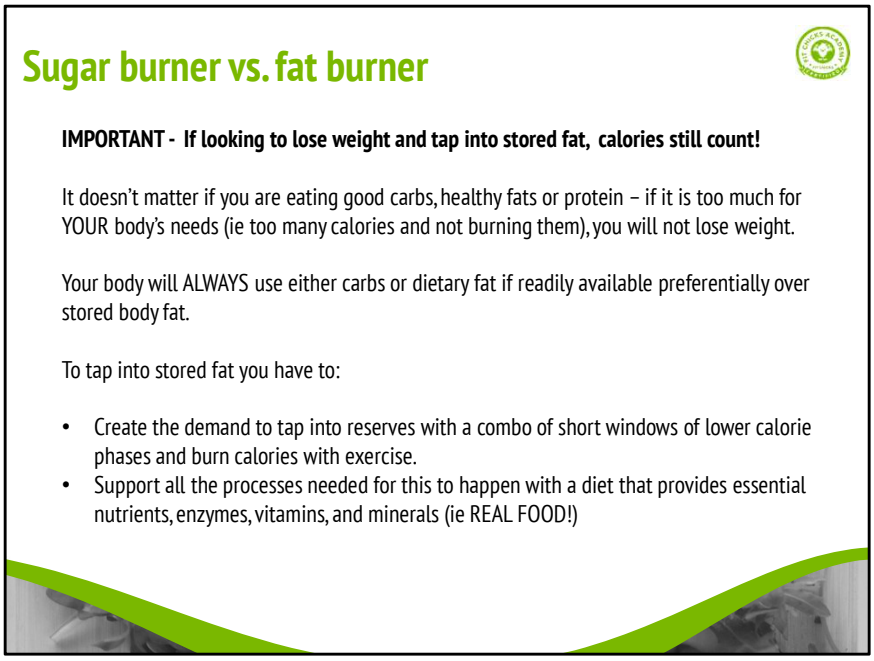


Holy Basil for Balancing Blood Sugar - http://draxe.com/holy-basil-benefits/

Natural Blood Sugar Balance: http://draxe.com/how-to-reverse-diabetes-naturally-in-30-days-or-less/



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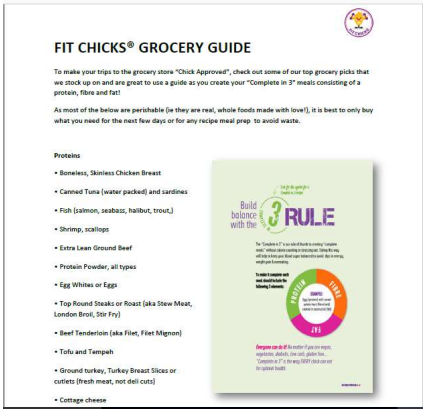
What to eat?

Start with the FIT CHICKS Grocery Guide!



FIT CHICKS® GROCERY GUIDE

To make your trips to the grocery store "Chick Approved", check out some of our top grocery picks that we stock up on and are great to use a guide as you create your "Complete in 3" meals consisting of a protein, fibre and fat!

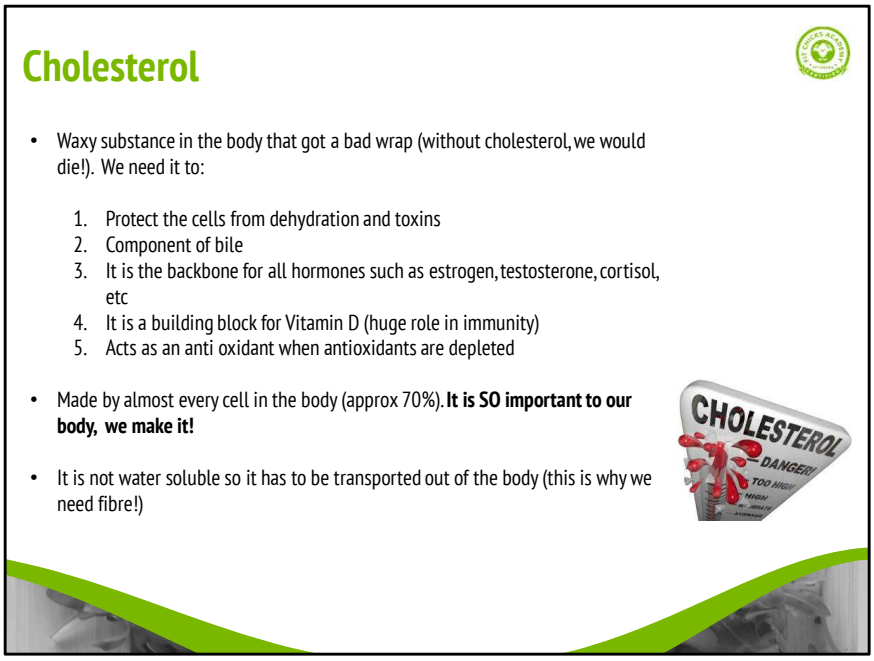
As most of the below are perishable (ie they are real, whole foods made with love!), it is best to only buy what you need for the next few days or for any recipe meal prep to avoid waste.

Proteins

- Boneless, Skinless Chicken Breast
- Canned Tuna (water packed) and sardines
- Fish (salmon, seabass, halibut, trout,)
- Shrimp, scallops
- Extra Lean Ground Beef
- Protein Powder, all types
- Egg Whites or Eggs
- Top Round Steaks or Roast (aka Stew Meat, London Broil, Stir Fry)
- Beef Tenderloin (aka Filet, Filet Mignon)
- Tofu and Tempeh
- Ground turkey, Turkey Breast Slices or cutlets (fresh meat, not deli cuts)
- Cottage cheese

Understanding the role of cholesterol in the body

Plus the importance of EFA'S, Sat fats and why we need!



What is cholesterol and where does it come from?
Cholesterol is a waxy substance that comes from two sources: your body and food. Your body, and especially your liver, makes all the cholesterol you need and circulates it through the blood. But cholesterol is also found in foods from animal sources, such as meat, poultry and full-fat dairy products. Your liver produces more cholesterol when you eat a diet high in saturated and *trans* fats

Cholesterol is a molecule that is absolutely vital to life. Without cholesterol, we would die… and our bodies have developed elaborate mechanisms to manufacture it, to make sure we always have enough. Every cell membrane in our bodies is loaded with it. It is used to make hormones like cortisol, testosterone and estradiol.

While your body needs cholesterol to continue building healthy cells, having high cholesterol can increase your risk of heart disease.

Great video to watch about cholesterol:
http://www.cbc.ca/natureofthings/episodes/the-cholesterol-question

Good vs Bad Cholesterol:

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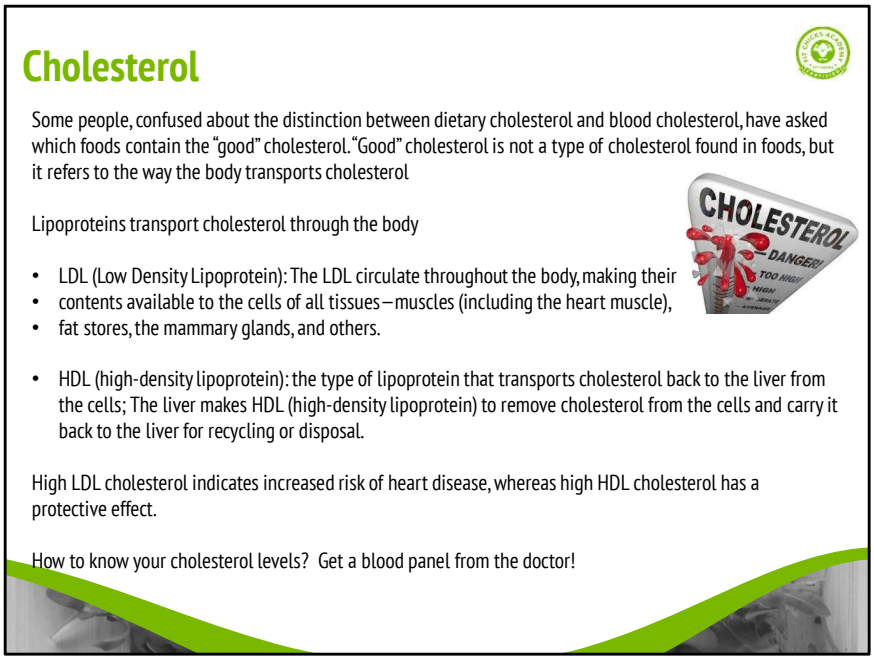

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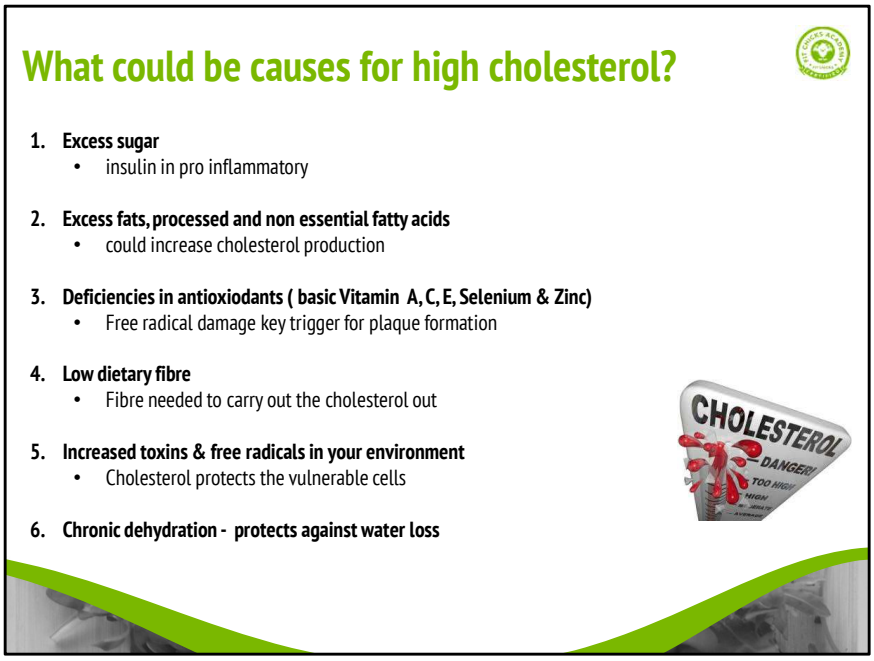
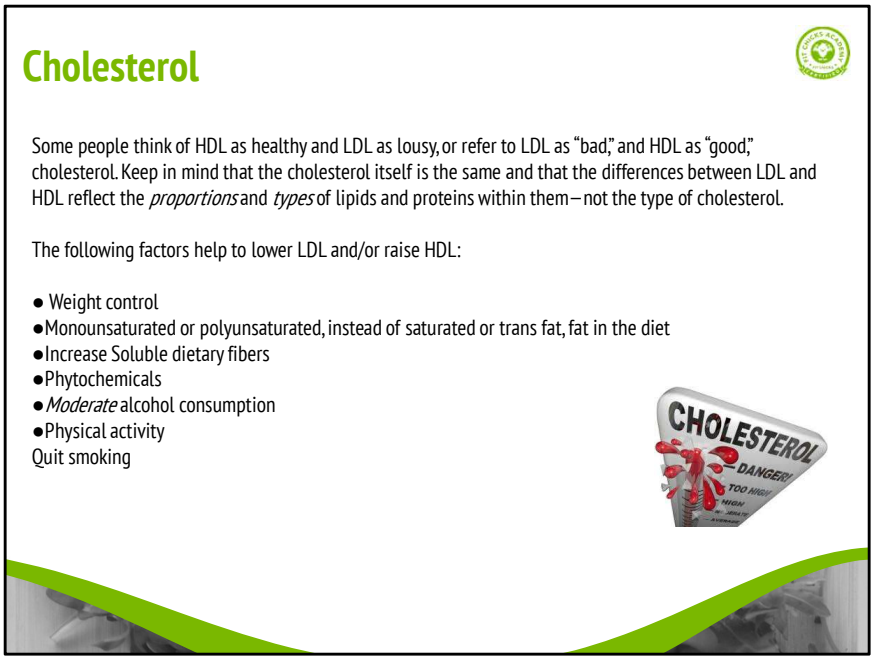


Roles of Sterols Many vitally important body compounds are sterols. Among them are bile acids, the sex hormones (such as testosterone, androgen, and estrogen), the adrenal hormones (such as cortisol, cortisone, and aldosterone), and vitamin D, as well as cholesterol itself. Cholesterol in the body can serve as the starting material for the synthesis of these compounds or as a structural component of cell membranes; more than 90 percent of all the body's cholesterol is found in the cells. Despite common misconceptions, cholesterol is not a villain lurking in some evil foods—it is a compound the body makes and uses. T

he chemical structure is the same, but cholesterol that is made in the body is referred to as **endogenous,** whereas cholesterol from outside the body (from foods) is referred to as **exogenous.** Right now, as you read, your liver is manufacturing cholesterol from fragments of carbohydrate, protein, and fat. In fact, the liver makes about 800 to 1500 milligrams of cholesterol per day, thus contributing much more to the body's total than does the diet. For
perspective, the Daily Value on food labels for cholesterol is 300 milligrams per day. Cholesterol's harmful effects in the body occur when it accumulates in the
Artery walls and contributes to the formation of **plaque.** These plaque deposits lead to **atherosclerosis,** a disease that causes heart attacks and strokes. Chapter

18 provides many more details.



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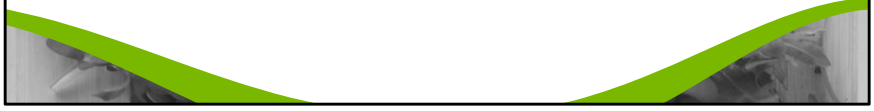
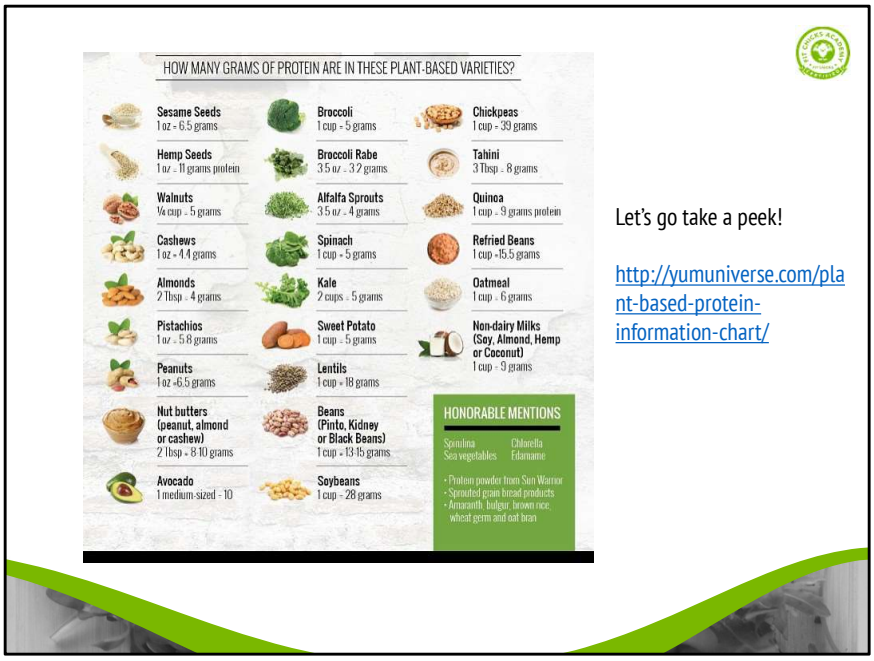
One question with someone trying to lower their cholesterol or focusing on a plant based diet ask is: "Where do I get my protein?"

LOTS OF AWESOME PLANT BASED SOURCES!



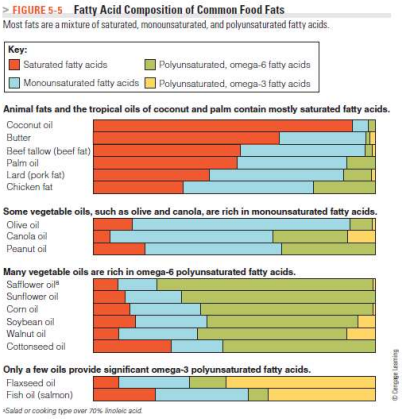


Let's go take a peek!

http://yumuniverse.com/plant-based-protein-information-chart/

For more awesome plant based protein options, check out :
http://yumuniverse.com/plant-based-protein-information-chart/

Fats have gotten a really bad rap! But they are so important to your health and should make up for 20 -35% of our diet. :



SATURATED VS UNSATURATED FATS

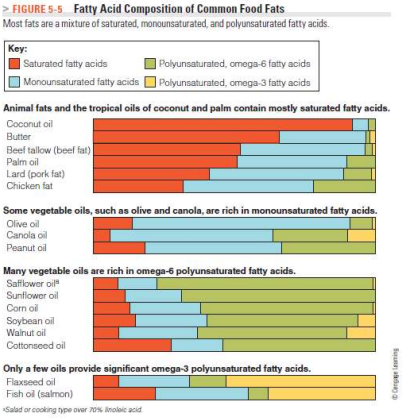
Saturated Fats are:

- Stabilize cell membrane in the body
- Not very susceptible to damage
- In foods, they are hard at room temperature (ex butter, lard, suet)
- They are less likely to turn rancid when exposed to elements such as heat, light and air.
- Higher smoke point when cooking

Unsaturated Fats are:

- Provide flexibility to the cell membranes
- Very delicate and susceptible to damage (very important how we handle them)
- Liquid at room temperature (ex. Olive oil, flax oil, fish oil)
- Turn rancid when exposed to heat, light and air
- Do not cook at high temperatures

We need BOTH saturated and unsaturated fats to stay healthy



Keep the fat!

Some of the BEST FATS TO CHOOSE FROM when cooking:

- *Avocado Oil*
- *Butter*
- *Ghee*
- *Coconut Oil*
- *Olive oil – medium heat*

Hemp Seed, Chia Seed and Flax oil are great to use for dressing only.

FATS TO AVOID CHOOSE FROM when cooking:

Stay far far away! *Usually made from genetically modified products and your body does not know what to do with them!*

Corn Oil, Cottonseed Oil, Peanut Oil, Soybean Oil
Any Vegetable oil (what vegetable has oil??)

To see the smoke points of fats, check out http://en.wikipedia.org/wiki/Smoke_point

Omega-6 and Omega-3 fatty acids are called **poly**unsaturated because they have many double bonds (poly = many). Our bodies don't have the enzymes to produce them and therefore we must get them from the diet. If we don't get any from the diet, then we develop a deficiency and become sick. That is why they are termed the "essential" fatty acids.

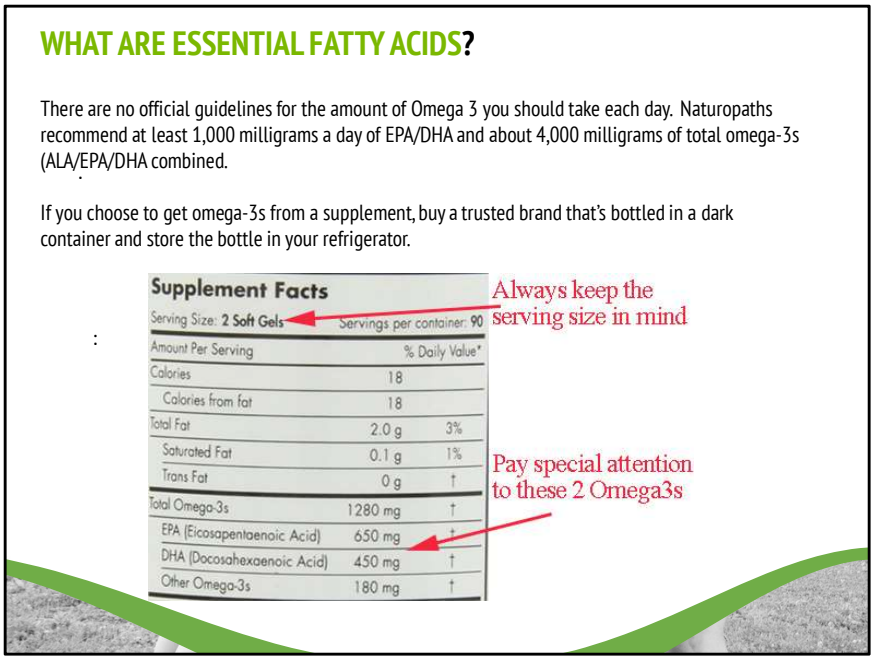
However, these fatty acids are different than most other fats. They are not simply used for energy or stored, they are biologically active and have important roles in processes like blood clotting and inflammation.

The thing is… Omega-6s and Omega-3s don't have the same effects. Omega-6s are pro-inflammatory, while Omega-3s have an anti-inflammatory effect (1).
Of course, inflammation is essential for our survival. It helps protect our bodies from infection and injury, but it can also cause severe damage and contribute to disease when the inflammatory response is inappropriate or excessive.

In fact, excess inflammation may be one of the leading drivers of the most serious diseases we are dealing with today, including heart disease, metabolic

syndrome,diabetes, arthritis, Alzheimer's, many types of cancer, etc.

Put simply, a diet that is high in Omega-6 but low in Omega-3 increases inflammation, while a diet that includes balanced amounts of each reduces inflammation (2).
The problem today, is that people who eat a typical Western diet are eating **way too many** Omega-6s relative to Omega-3s



What Are the Best Omega-3 Foods? https://draxe.com/omega-3-foods/

Here's a list of the top 15 omega-3 foods (percentages based on 4,000 milligrams per day of total omega-3s): (7)

Atlantic Mackerel: 6,982 milligrams in 1 cup cooked (174 precent DV)
Salmon Fish Oil: 4,767 milligrams in 1 tablespoon (119 percent DV)
Cod Liver Oil: 2.664 milligrams in 1 tablespoon (66 percent DV)
Walnuts: 2,664 milligrams in 1/4 cup (66 percent DV)
Chia Seeds: 2,457 milligrams in 1 tablespoon (61 percent DV)
Herring: 1,885 milligrams in 3 ounces (47 percent DV)
Alaskan Salmon (wild-caught): 1,716 milligrams in 3 ounces (42 percent DV)
Flaxseeds (ground): 1,597 milligrams in 1 tablespoon (39 percent DV)
Albacore Tuna: 1,414 milligrams in 3 ounces (35 percent DV)
White Fish: 1,363 milligrams in 3 ounces (34 percent DV)
Sardines: 1,363 milligrams in 1 can/3.75 ounces (34 percent DV)
Hemp Seeds: 1,000 milligrams in 1 tablespoon (25 percent DV)
Anchovies: 951 milligrams in 1 can/2 ounces (23 percent DV)
Natto: 428 milligrams in 1/4 cup (10 percent DV)

Egg Yolks: 240 milligrams in 1/2 cup (6 percent DV)

WHAT ARE ESSENTIAL FATTY ACIDS?

OMEGA 6 - LINOLEIC ACID

Linoleic acid is converted to GLA (GAMMA LINOLENIC ACID) in the body. From there, it breaks down even more to what's known as arachidonic acid.

Typical North American diet tends to contain significantly more omega-6 fatty acids than omega-3 fatty acids, particularly because omega-6 is in a lot of unhealthy foods, such as salad dressings, potato chips, pizza, pasta dishes and processed meats like sausage,.

The prob? Excessive consumption of vegetable oils, or linoleic acids, can contribute to inflammation and increase the risk of serious conditions like heart disease, cancer, asthma, arthritis and depression, which is one reason why you should keep your intake in moderation.

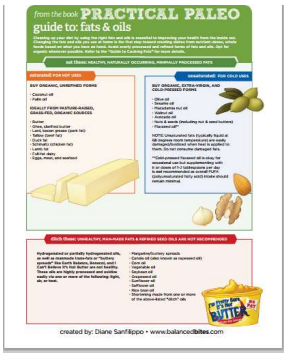
Ratio of Omega 6 vs 3 should be approx. 2:1. Avg American consuming 15:1

SOURCES OF GLA

Borage oil	20—27%	GLA
Black currant seed oil	15—20%	GLA
Evening primrose oil	7—14%	GLA
Spirulina	4—7%	GLA

What is important to know about buying and storing fats?

1. Buy in small bottles and keep fresh as long as possible
2. Buy oils in glass bottles, not plastic
3. Buy cold pressed oils or unrefined to avoid damage to the oils
4. Keep your oils in a cool, dark place
5. Keep all polyunsaturated oils in the fridge
6. Store nuts and seeds in the freezer
7. Do not buy ground flax, hemp, chia seeds



http://www.whfoods.com/genpage.php?tname=foodtip&dbid=202

The best oils are cold pressed. The oil is obtained through pressing and grinding fruit or seeds with the use of heavy granite millstones or modern stainless steel presses, which are found in large commercial operations. Although pressing and grinding produces heat through friction, the temperature must not rise above 120°F (49°C) for any oil to be considered cold pressed. Cold pressed oils are produced at even lower temperatures. Cold pressed oils retain all of their flavor, aroma, and nutritional value. Olive, peanut and sunflower are among the oils that are obtained through cold pressing.

Download :
http://balancedbites.com/PDFs/BOOK_EXTRAS/PracticalPaleo_GuidetoFatsOils.pdf

https://www.youtube.com/watch?v=D88TzOSUnGY

Food sensitivities
A food sensitivity is an adverse reaction to a food that other people can safely eat. Food sensitivities include food allergies, food intolerances and chemical sensitivities.

Food allergies
Food allergies are triggered when a person's immune system mistakes a food protein for something harmful. The first time the body is exposed to such a protein, it responds by creating antibodies called immunoglobulin E (IgE). The next time there is exposure to this same food protein, the body releases IgE antibodies and chemicals like histamine. Histamine is a powerful chemical that causes a reaction in the respiratory system, gastrointestinal tract, skin and/or cardiovascular system, and in the most extreme cases can be fatal.

Chemical sensitivities
These occur when a person has an adverse reaction to chemicals that occur naturally in, or are added to, foods. Typically people may react to caffeine in coffee, tyramine in aged cheese, and the flavour enhancer monosodium glutamate, also known as MSG.

Food intolerances

A food intolerance is a food sensitivity (such as lactose intolerance) that does not involve the immune system. Unlike food allergies or chemical sensitivities, where a very small amount of food can cause a reaction, it generally takes a 'normal'-sized portion to produce the symptoms of food intolerance. Reactions are likely to originate in the gastrointestinal system and are usually caused by an inability to digest or absorb certain foods, or components of those foods.

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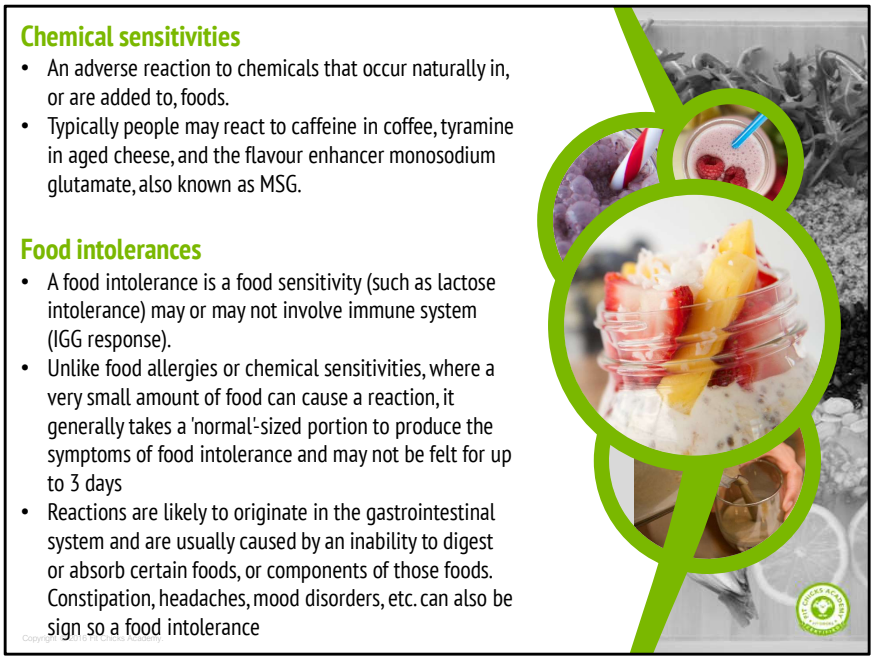

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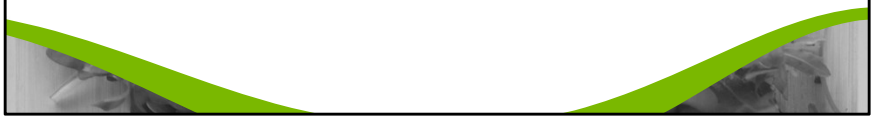
So what are some of the top food intolerances?



http://www.whfoods.com/genpage.php?tname=foodtip&dbid=202

The best oils are cold pressed. T10 Signs you may be gluten intolerant - http://www.mindbodygreen.com/0-7482/10-signs-youre-gluten-intolerant.html

http://en.wikipedia.org/wiki/Gluten
Celiac disease is an inherited autoimmune disorder that affects the digestive process of the small intestine.

"Non-celiac gluten sensitivity" (what many call "gluten intolerance") causes the body to mount a stress response (often GI symptoms) different from the immunological response that occurs in those who have celiac disease (which most often causes intestinal tissue damage). As with most allergies, a wheat allergy causes the immune system to respond to a food protein because it considers it dangerous to the body when it actually isn't. This immune response is often time-limited and does not cause lasting harm to body tissues.

Allowed foods
Many healthy and delicious foods are naturally gluten-free:

Beans, seeds and nuts in their natural, unprocessed form
Fresh eggs
Fresh meats, fish and poultry (not breaded, batter-coated or marinated)
Fruits and vegetables
Most dairy products
It's important to make sure that they are not processed or mixed with gluten-containing grains, additives or preservatives. Many grains and starches can be part of a gluten-free diet, such as:
Amaranth
Arrowroot
Buckwheat
Corn and cornmeal
Flax
Gluten-free flours (rice, soy, corn, potato, bean)
Hominy (corn)
Millet
Quinoa
Rice
Sorghum
Soy
Tapioca
Teff

Always avoid
Avoid all food and drinks containing:
Barley (malt, malt flavoring and malt vinegar are usually made from barley)
Rye
Triticale (a cross between wheat and rye)
Wheat
Avoiding wheat can be challenging because wheat products go by numerous names. Consider the many types of wheat flour on supermarket shelves — bromated, enriched, phosphated, plain and self-rising. Here are other wheat products to avoid:
Durum flour
Farina
Graham flour
Kamut
Semolina
Spelt

Avoid unless labeled 'gluten-free'
In general, avoid the following foods unless they're labeled as gluten-free or made with corn, rice, soy or other gluten-free grain:

Beer
Breads
Cakes and pies
Candies
Cereals
Communion wafers
Cookies and crackers
Croutons
French fries
Gravies
Imitation meat or seafood
Matzo
Pastas
Processed luncheon meats
Salad dressings
Sauces, including soy sauce
Seasoned rice mixes
Seasoned snack foods, such as potato and tortilla chips
Self-basting poultry
Soups and soup bases
Vegetables in sauce

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Download :
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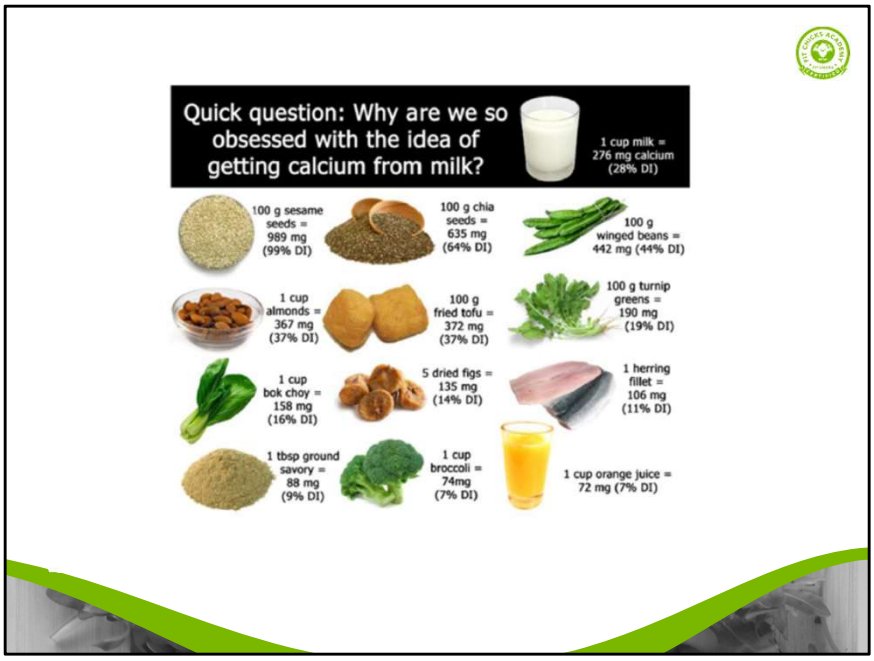
Dairy intolerance

Dairy is a pretty hot topic when it comes to nutrition

1. **Ethical**- is it good to drink another animals milk? We are the only species!
2. **Hormones in the animals (not in Canada)**
3. **Inflammatory food** – it is acid forming on the PH Scale (lets take a look at the PH Scale)
4. **Lactose Intolerance -** ¾ of the world is lactose intolerant (ie we do not produce lactase, the enzyme to break down lactose)

But what about calcium? There are tons of non dairy sources that are BETTER sources of calcium including almonds, kale, white beans, sesame seeds and more!

For more non dairy sources of calcium, check out: http://greatist.com/health/18-surprising-dairy-free-sources-calcium


Quick question: Why are we so obsessed with the idea of getting calcium from milk?
1 cup milk = 276 mg calcium (28% DI)
100 g sesame seeds = 989 mg (99% DI)
100 g chia seeds = 635 mg (64% DI)
100 g winged beans = 442 mg (44% DI)
1 cup almonds = 367 mg (37% DI)
100 g fried tofu = 372 mg (37% DI)
100 g turnip greens = 190 mg (19% DI)
1 cup bok choy = 158 mg (16% DI)
5 dried figs = 135 mg (14% DI)
1 herring fillet = 106 mg (11% DI)
1 tbsp ground savory = 88 mg (9% DI)
1 cup broccoli = 74mg (7% DI)
1 cup orange juice = 72 mg (7% DI)

pH stands for power of hydrogen, which is a measurement of the hydrogen ion concentration in the body. The total pH scale ranges from 1 to 14, with 7 considered to be neutral. A pH less than 7 is said to be acidic and solutions with a pH greater than 7 are basic or alkaline. Our ideal pH is slightly alkaline - 7.30 to 7.45. You can test your pH levels regularly by using a piece of litmus paper in your saliva or urine first thing in the morning before eating or drinking anything.

Dairy alternatives

Alternatives to milk: homemade nut milk including almond, cashew & hazelnut

Alternatives to cheese: not many actual alternatives but cashews & nutritional yeast are commonly used to provide texture and cheese flavour

If you can tolerate dairy:

- choose to use in small amounts
- recommended select from raw, fermented and unpasteurized sources
- goat or sheep cheese are typically easier to digest

If you can tolerate dairy and choose to use in small amounts, it is recommended select from raw, fermented and unpasteurized sources but ONLY if you know and have researched the source!

Nutrition Session 2: Recap

BLOOD SUGAR MANAGEMENT

- Understanding what happens in our bodies, the role of insulin and glucagon and the Glycemic Index and Glycemic Load

LOW GLYCEMIC EATING

- The Complete in 3 rule and how it applies to your clients

CHOLESTEROL

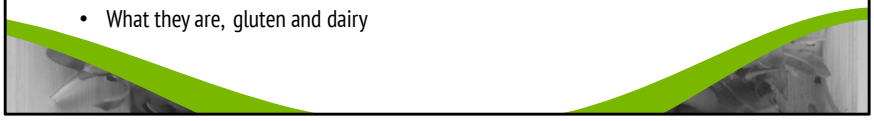
- What it is, why we need it and how to manage and what could be causing it other than diet

THE ESSENTIAL FATS

- More on EFA'S, how to store and cook with fats and what they do

FOOD ALLERGIES AND INTOLERANCES

- What they are, gluten and dairy



Any questions or inquiries, please email:

fne@fitchicks.ca

Let's have an amazing journey ahead!