

Dr. Zsuzsanna Fajcsak

Phd, MA, MA, MSc, CNS

Once your head is “cracked”, meaning you have the right mindset: have the right reason for your healthy eating; learnt about the fashion diets, and made sense why blood sugar regulating eating is good for your body, then are you ready to learn the basics in nutrition.

Today my intention is to share with you simple common sense of understanding of your body, how to use food for fuel and get optimize your body weight the fastest way. This basic knowledge can be applied to any type of ethnic or cultural foods. Once you understand the following, you will be able to create your own menu plan and chose to the type of „food- fuel” what is the favored by your taste buds. Seems like a valuable tool to have, isn’t it? So have your cake and it too.

How do we get energy from food?

There are three major food groups/ nutrients, which once digested / broken into tiny pieces and then absorbed into the body keeps the body alive;

1. Carbohydrates (digested to sugar/glucose) – provides energy, to function and move
2. Protein (digested to amino acid) – builds, repairs the body tissues esp muscle and immune system
3. Fat – stores energy

Each nutrient has its own function for us and work together.

The first step in choosing in healthy eating is to recognize the major nutrients in food, and learn what is considered as a carbohydrate, a protein and a fat. See the tables below.

Fuel Nutrients

Carbohydrates

- Starch: Bread, pasta, rice, cereal, corn, pastry
- Legumes
- Fruits
- Vegetables

Fat

- Animal - solid: pork lard etc, dairy fat (butter, cream)
- Plant - liquid: oil – olive, sunflower, corn, soy, nuts and seeds, avocado
- Fish oil, flax seed,

Protein

- Meat, poultry, fish
- eggs, dairy, soy
- Shrimp, tofu

Meals considered as carbohydrate:

Pancake, Baked potato, Banana
Chapati,
Roti, double roti,
toast, sandwich
Noodle soup
Steamed rice
Fried rice
Biryani
Cereal
Pasta
Fried noodle
Muffin
Waffle
Rice porridge
Oatmeal
Muesli
Fruit salad
Vegetable soup
Mixed vegetables soup or fried
Beans
Peas
Lentils
dhal

Meals considered as Protein:

Chicken curry
Grilled Chicken Sweet-sour chicken
Steak
Beef /lamb stew
Fish
Eggs
Satay
Sausage
Milk (low fat)
Prawn
Tofu (bean curd)

Meals considered as Fat:

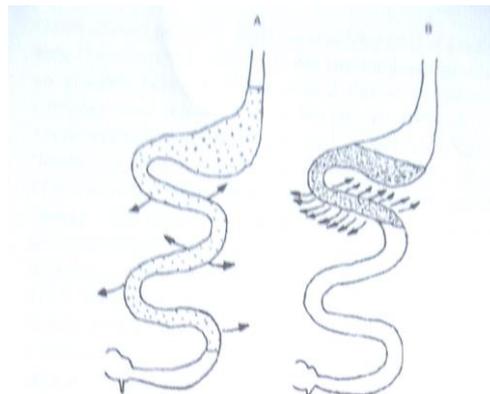
Butter
Cream
Margarine
Oil
Peanut butter
Walnut
Mayonnaise
Thousand island salad dressing
Cheese
Coconut milk
Croissant
Fried potato
Chocolate cake
Ice cream

Why do we need to regulate for our blood sugar level to stay healthy and perform well?

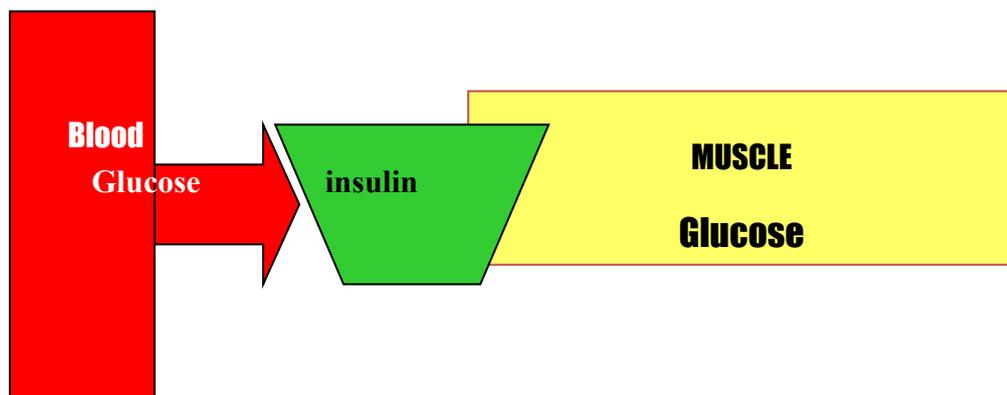
In this section we will be talking about carbohydrates and rather sugar in a most simple least scientific manner. Sugar in this sense its not only the white crystallized sugar to sweeten food and drinks, but bread, potato, pasta, rice, bakery items, fruit, dhals, and vegetables are also carbohydrates.

In order for carbohydrate to be part of the body it must be digested/ broken into tiny pieces. Every carbohydrate will be broken down into sugar before it can absorb and be part of the body and gives us energy. In order for our body to work smooth we have to have constant amount of fuel available. And regulating blood sugar level means that we keep the blood sugar level the most stable as possible.

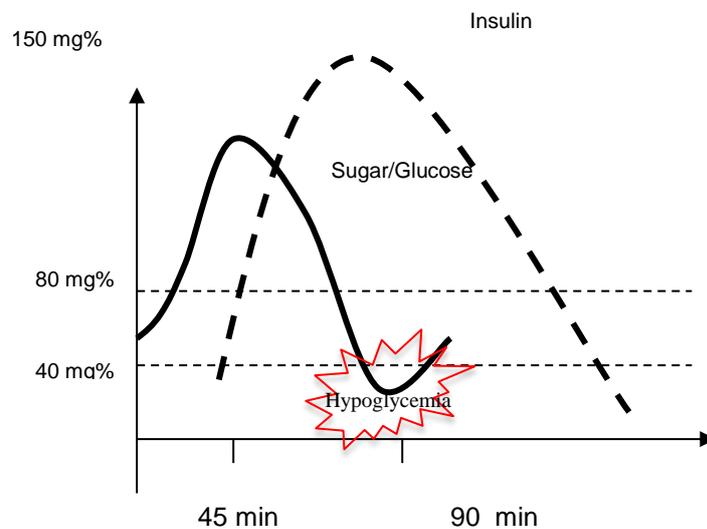
Depending on the type of carbohydrate food we eat, the digestion and absorption may be slower or faster hence our blood sugar level may rise slowly or fast. The picture below shows that slower digesting carbohydrates keeps your stomach full longer and raise blood sugar level slowly and sustain energy level. Carbohydrates which digests fast, raises blood sugar fast and makes you hungry faster.



Depending on the level of the sugar in the blood our body produces a hormone called insulin, which assists the sugar from the blood entering the cell; where the sugar is either used for energy or stored as fat.



When the blood sugar level rises too high (hyperglycemia) or drops too low (hypoglycemia – see picture below) the body response in certain unpleasant symptoms like, sleepiness, craving sweet, unable focus, poor energy level, making mistakes, being irritable and stressed, and even fainting. On the long run diabetes, hypertension, heart disease and stroke are waiting in line.



(The next section is a little more detailed for in-depth understanding and if you are not interested skip it and go to the meal planning section.)

Sugar is the most efficient fuel for our body. It is the most efficient because the body can make energy of sugar/glucose the fastest way and with the least amount of energy input. Simply it costs the least for the body to make fast energy from glucose. This is why our cells and primarily the brain prefer to use glucose for energy. The brain (the liver and kidney as well) receives the glucose straight from the blood but all other tissues, such muscles can only take up glucose with the help of a hormone, called insulin. Since the brain is the highest authority regulating our body, it is most important to provide constant fuel for the brain. If the brain does not get enough glucose we can feel it immediately. Low blood sugar level is a stress for the body and it is called hypoglycemia. This is when we become sleepy, tired, cannot concentrate and have the shakes or crave sweets.

*Low Blood sugar (Hypoglycemia) is stress for the body.
High Blood sugar levels destroys the blood vessels, causing hypertension and CVD.*

Hypoglycemia creates a series of events in the body which is regulated by other hormones as well, to elevate blood sugar level back, mostly by using our sugar storage in the liver and muscle as well as braking down and transforming muscle protein to glucose.

The body does not allow high blood sugar level either. When the sugar is high in the blood for a long time, it can deposit to the wall of the blood vessels, making them lose flexibility and causes high blood pressure and diabetes. Insulin is the hormone, which will bring the glucose into the body’s cell so it can be used for energy and it also protects the blood vessel from damage. Having high blood sugar level, therefore results in high insulin levels hence to reduce blood sugar level the faster. The higher the blood sugar level the more insulin is being produced and the fastest the sugar level will be dropping down in the blood. If you eat a lot of carbohydrate which elevates blood sugar level high (e.g. rice) a lot of insulin will be produced to decrease blood sugar level. High insulin level then can drop your blood sugar level so low that you may get a so-called hypoglycemia caused by the food you ate.

If you are in a hypoglycemic state you cannot concentrate, you make a lot mistakes, you can’t train hard and will perform poorly on competition. Furthermore, low blood sugar level caused by high insulin levels locks the fat storages in, so you cannot lose fat if you are on a weight loss program. High blood sugar level decreases activity of the immune cells. If you eat a lot of sugar you may catch a cold easier. Low blood sugar levels inhibits healing and regeneration of the body, so if you have frequent blood sugar spikes your injury will take longer to heal.

What are the consequences of high blood sugar and insulin levels?

The higher the sugar in the blood the more insulin is being produced in the pancreas. The higher the insulin level the faster it takes sugar to the cells and the faster it drops bloods sugar level. Insulin level peaks approximately 90 – 120 minutes after a meal. This is the time when insulin has the strongest effect and drops blood sugar level down. The blood sugar level reaches the lowest point this time – as naturally the sugar is being displaced from the blood to the cells. The fluctuation (increases and decreases) of blood sugar and insulin level after a meal is called the glycemic response of that meal.

What is Hypoglycemia?

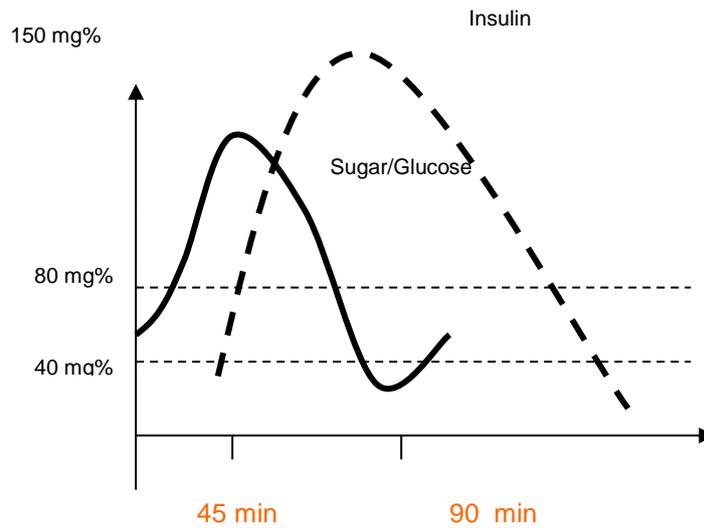
Hypoglycemia or low blood sugar level occurs when blood sugar level drops approximately below 40 mg%. The reasons for **hypoglycemia may be genetic, however in most cases it is caused by excess consumption of those carbohydrate, which have an unfavorable glycemic response.** These foods are called high glycemic index foods (**potato, rice, white bread, roti, corn**). After consuming high glycemic index foods bloods sugar and insulin levels raises and drops down fast and causes hypoglycemia.

Why hypoglycemia is bad for the body?

Hypoglycemia is stress for the body. During hypoglycemia the brain does not get enough fuel and can’t function well. In hypoglycemic state we can’t concentrate, our

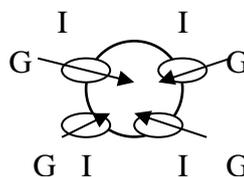
energy level drops down, we feel tired, sleepy, and have a bad mood. Our body's natural response this time to crave sweets. Once blood sugar level dropped down too low we can faint. Giving sugar immediately to the person can save life this time.

The consequences of eating too much carbohydrate: Hypoglycemia



The higher the blood sugar level the more insulin is produced and the more insulin receptor called for work. ¹ The higher the level of insulin the more insulin receptor works and the faster the cell takes up sugar, therefore the faster the bloods sugar level drops.

The drawing below shows One body cell with the insulin sensor gates (empty circles) G (Glucose, I (Insulin). When Insulin attaches to the sensor the gate opens and Glucose goes inside the cell.



¹ In order for insulin to bring the sugar inside the cell, it has to open a “gate” on the cell membrane. These gates are called receptors, or sensors. Once they sense insulin, the gates are open and sugar can go inside the cell

What happens to the Glucose/sugar in the cell?

1. When we eat normal healthy portion, as much as our body needs, the sugar in the cell is used to keep our blood sugar stable for our cells to functions right, for physical activity, for growing, repairing and regenerating damaged tissue.
2. The body stores sugar in the liver and muscle. The storage form of sugar is called glycogen. An average person stores about 2000 Kcal (500g) carbohydrate in the form of glycogen. This glycogen provides energy during sleep at night and during short term fasting. The body uses this glycogen to burn fat, when we don't eat enough from food. The glycogen stored in the liver is responsible for maintaining blood sugar level (provide constant energy for the brain) and the glycogen in the muscle provides energy for muscle movement such as exercise.
3. Eating lots of bread, pasta, rice, pastry while living inactive the excess carbohydrate will transform to fat and store in the fat storage all over the body, hips and tummy mostly. Eating too much carbohydrate, which happens on a fat free diet may cause further fat gain.

How do we develop diabetes from eating the wrong foods?

Eating too much carbohydrate for a long time may lead to obesity, high cholesterol level and the de-sensitization of the insulin receptors. When the blood sugar and insulin levels are always high the insulin sensing receptors cannot sense insulin anymore. They simply become tired, and sugar can't go in to the cell. In this case both, the sugar and the insulin level remain high in the blood stream. This state is called insulin resistance, which leads to type 2. diabetes mellitus.

The second stage after insulin resistance is when the pancreas gets too tired to produce enough insulin to keep up with the demand. In this case the blood sugar level stays high and insulin level is very low. This state is called type 1. diabetes mellitus, where the patient need to receive insulin shots several times a day to stay alive.

What lifestyle factors can keep blood sugar level stable?

First of all a healthy eating is part of a healthy lifestyle, which includes physical activity as well. You need to accumulate 45-60 minutes of physical activity every day. Aerobic exercise will help blood sugar regulation the next 24 - 48 hours.

Second, you need to look into yourself and view food as fuel for your body and not the main source of enjoyment. The **first reason why people overeat, eat too much sweets and fatty foods, is to compensate for the lack of love in their lives.** Eat to live and don't live to eat!

Third, there is no magic pill regarding the diet, but here is a healthy eating plan by which you can actually regulate your blood sugar levels, hormones and physiological processes as well as strengthen your immune system, and this is based on the GI of foods.

What is Glycemic controlled diet?

The healthy eating based on the keeping an eye on the sugar load (Glycemic index (GI) and the glycemic load GL) what you are bringing into your body.

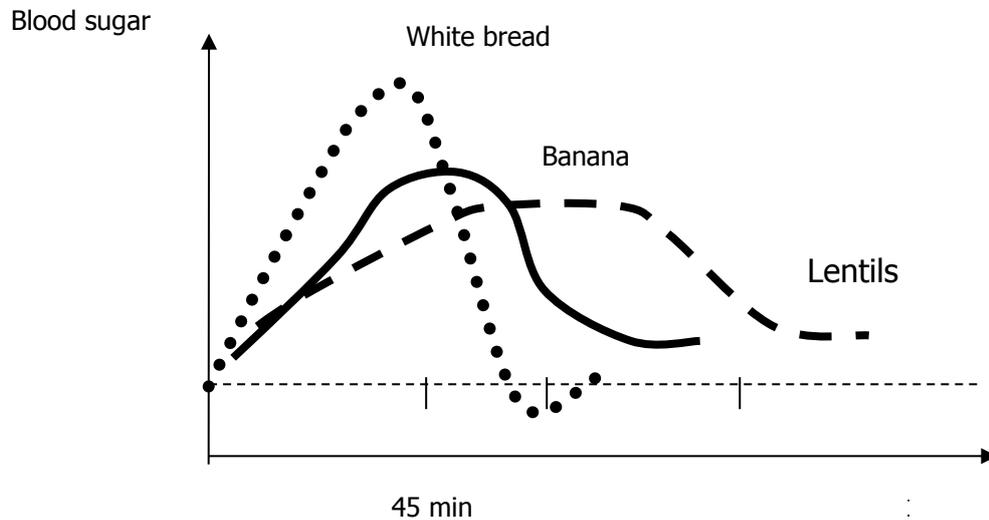
This planned food intake stabilizes the blood sugar and insulin levels therefore gives you high energy level during the day to work and perform efficiently not only your daily activities by improving concentration, your physical performance as an athlete but also to lose fat weight and keep off the lost weight. It will strengthen your immune system as well, so won't get sick so easily.

If you eat a low fat high carbohydrate diet, where the carbohydrates come in form high GI rice, potato and white bread and pastry your blood sugar and insulin levels will be fluctuating like spikes.

In a favorable GI meal you may consume rice and potato but as part of a balanced meal. See below and learn to make your balanced meals.

You can balance blood sugar level by eating lots of vegetables, fruits and legumes (beans lentils, peas) with lean chicken, turkey, fish, beef, lamb, eggs, and tofu in one meal. A GI favorable meal for an average person have about only one handful of high GI rice, potato or white bread in one meal.

Blood sugar levels after consuming different Carbohydrates



This picture above shows how different carbohydrate foods have different blood sugar levels in the blood. Depending on how fast the carbohydrate digests and absorb we can simply divide to three glycemic index categories: high, intermediate or low GI. Spending some time studying these tables below will be the base of your healthy eating later.

Low GI Foods (GI < 55)

Food	Quant.	GI	CHO (g)
Muesli, toasted	56 g	43	41
Orange juice	240 ml	46	26
Orange, 1 medium	112 g	44	10
Apple juice nature, 240 ml		40	33
Dried apricot, 5-6 pc (30g)		31	13
Apple, 1 medium		38	18
Cherry, 10 pc		22	10
Grapefruit, ½ of medium		25	5
Pear, 1 medium		38	21
Fat free milk, 240 ml		32	13
Spaghetti par-boiled	168 g	41	56
Yogurt, low fat, strawberry	200 g	28	33
Prunes, 6pc (40 g)		29	25
Chocolate bar, 42 g		49	26
White chocolate, 29 g		42	18
Beans in tomato sauce, 112 g		48	21
Oatmeal cooked, 224 g		49	26
Lentil soup, 240 ml(224 g)		44	24

Intermediate GI Foods (GI = 55-70)

Food	Quant.	GI	CHO (g)
Carrot cooked	70 g	49	3
Pineapple	2 slices	66	10
Sponge cake	1 slices (60 g)	46	32
Green banana	1 medium	55	32
Pita bread	1	57	38
Whole grain bread	1 slice	69	14
Ice cream vanil.	50 g	61	10
Mango	1	55	19
Strawberry jam	1 tbs	51	18
Grapes	84 g	46-50	15
Honey	1 tbs	58	16
Raisin	30 g	64	28
Rice noodle, cooked, 168 g		58	48
Table sugar	1 tsp	65	5
Sweet corn	84 g	55	15
Muesli nature	62 g	56	28
Angel-hair spaghetti, 168 g		56	
Macaroni & cheese, 146 g		64	48

CHO “Free” Low GI Foods
Low-GI and have little CHO

Alfalfa sprout
Bell peppers
Bok choy
Cabbage
Celery
Chicory
Chinese cabbage
Cucumber
Lettuce
Endive
Escarole
Lettuce
Parsley
Radicchio
Radishes
Spinach
Salads
Tuna

High GI Foods (GI>70)

Food	CHO(g)	Qant.	GI
• White bread		1 slice (35 g)	80
• Corn flakes	30 g		84
• Puffed rice	30 g		82
• White rice, boiled	180 g		109
• Cracker	3 pc		74
• Candy	10g		80
• Baked potato,	1 (120 g)		93
• Watermelon	140 g		72

Food is a powerful tool to regulate blood sugar level. Balanced blood sugar level means --You should be never feel hungry.

Learn to Make Your Own Glycemicly Favorable Meals

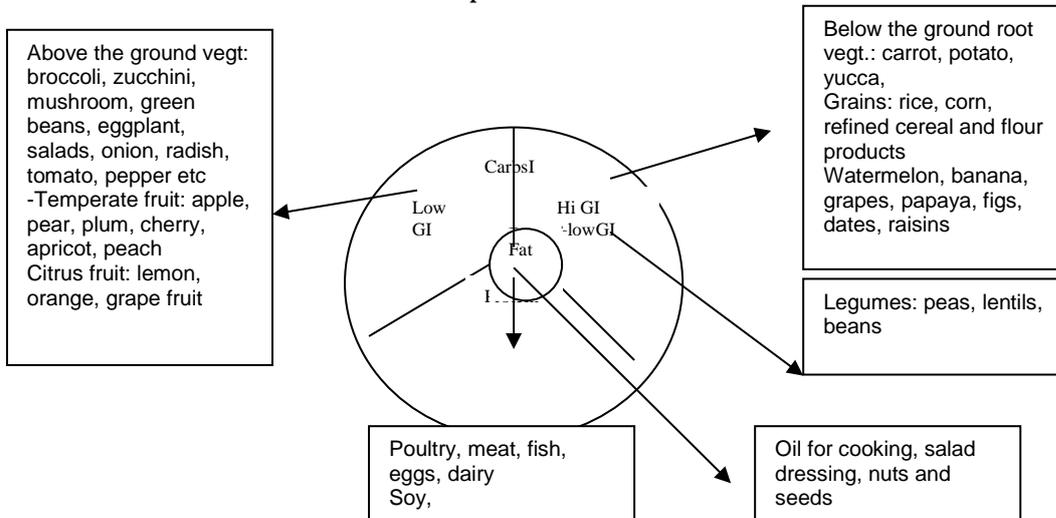
Practice Building your Sample Meals

Based on the previous guidelines, now it is your turn to design a one-day sample menu.

1. Note the parts of the plate above and chose your foods accordingly You decide how many meals and snacks you would like to try how they work for you.
2. Note the three major columns: **Protein, Carbohydrate** and **Fat**.
3. Look up the Fuel Nutrients for protein, carbohydrate choices
4. Pick your foods –protein, carbohydrate and fat—accordingly to the GI your portion size showing on the plate.
5. Use other GI lowering factors – acidity and fiber when consuming high-GI carbohydrates (rice, potato, refined grains).
6. Plan the time of your meals and snacks – they are no more than five hours apart – and the time of your workout. Use low-GI carbohydrates in each meal prior to your workout.
7. Plan to drink 2-3 dl of filtered or mineral water 1í minutes before each meal or snack, the total of 2-2,5L.
8. Make notes for easy food shopping
9. Keep low GI foods at home, so you never run out of good foods, such as dhal, lentil, chickpeas or peas in the can, frozen or roasted

Designing one meal

Food Distribution on plate 22-25 cm diameter



A sample lunch menu:

- A bowl of vegetable soup (cauliflower, cabbage carrot),
- Chicken (with any spice) with handful of rice with dhal, and cooked veggies. Cooked in low fat
- 1 apple

LOW GI EATING GUIDELINE

1. Eat 5-6 times a day every 3 hours
3 meals (breakfast, lunch, dinner) & 2 snacks
4 small meals & 1 snack – due to work and training
Don't let more than 5 hours between meals
2. Eat within 1 hour of awakening. Breakfast is your most important meal. Keep it low GI
3. Eat a small snack in the afternoon and before bedtime
4. Eat before you become hungry
When you are hungry your blood sugar level is too low. Remember when you stressed and have high anxiety you don't feel hunger and your body is using your muscle for energy
5. Consume 50-70% of your CHOs from low GI foods.
6. Take time and sit down in a calm environment to eat
Stress interferes with digestion.
7. Distribution kcal during the day—this is the time your body needs energy for sport
Night eating is unhealthy– consuming 50% of calorie after 19:00, interferes with digestion, rest- recovery and makes you gain fat
8. Drink 300-400ml water 10 minutes before each meal and drink your sport drink during training. 1.5L water of sport drink every hour of training

You should never feel tired after a meal! If you do feel tired after eating, that means you had a glycemically unfavorable meal.

Make changes to your meal (eat more beans, peas, lentils and whole meal bread instead of white rice potato and white bread) use the plate method and see what happens. You have a unique body and unique taste for food, so only individual eating plan will work for life. Once your body gets use to feeling good and energetic all day and you eat a bad meal you will feel bad even more. Your body will protect you from eating bad. Listen to your body. **You will feel difference from one meal already.** It takes about 2-3 weeks to set your new blood sugar balancing meals into your lifestyle. Don't you think it is worth to experiment for 2 weeks, which will give you a lifelong healthy eating plan? Get out of your habits and give yourself chance of health by building healthy habits and win your game

Cooking tips for GI favor meals

1. Use brown rice or red rice instead of white
2. Cook rice and pasta so it is little chewy. Overcooked and pasta very high GI
3. Half your fried rice noodle and pasta dish should be with vegetable
4. Use bean flour, chickpeas flour to thicken sauces or to add with stir fried food
5. Add peas to vegetable soup
6. Use olive oil and lemon/lime for salad dressing instead of too much mayo based Thousand Island dressing
7. Substitute mayonnaise with low fat yogurt in creamy salad dressings
8. Add kidney beans or lentil to green salad and some grilled chicken for a complete meal
9. Drink lemon water or unsweetened lemon tea with rice, potato foods.
10. Celery makes a better choice for crunchy snack than peanuts or other oily seeds
11. Substitute half of the white flour with bean or peas flour in cakes. You can never taste the difference. See recipe below