

# Module 3: Blood Sugar Balance

NOT just for diabetics!



## Why does blood sugars matter for everyone?

Because it's fuel for our cells!







### Blood sugars go up &

Increases when we eat carbs
Decreases when insulin helps move it out of our bloodstream & into our cells

optimal range is 70-120 mg/dL

Chronically elevated BS = inflammation



### **Blood sugar balance** determines energy



• We feel our best when we have a nice rolling wave

- crash



• <u>Good balance</u>: nice relaxing day at the beach, waves gently roll in and roll out • <u>Poor balance</u>: tidal wave followed by huge

• Impacts other hormones • having low or high BS (especially long term) will affect your stress hormones (like cortisol)



### How do we manage blood sugar?

- with
- insulin sensitivity)



• Height and speed of spikes depends on the type of carbs we eat and what we eat them

• Depth and speed of crashes depends on how much insulin we produce and how responsive our body is to the insulin (referred to as

• think of insulin as the key needed to unlock access to your cells



### Role of the gut in blood sugar balance

- sensitivity
- balance improves



• The health of our gut microbiota impacts our body's ability to manage our blood sugar • There are bacteria that affect our blood sugar

• As our gut health improves, our blood sugar

• And blood sugar balance is foundational for healing your gut

### Breakdown of Types of Carbs

### **Simple Carbs:**

VS.

- 1-2 sugar molecules
- Breaks down into glucose (aka blood sugar)
- Examples: juice, soda, candy, white bread, pasta, cereal, etc.



### **Complex Carbs:**

• 3+ molecules of sugar • Breaks down into glucose/blood sugar • Examples: potatoes, whole grains (quinoa, brown rice, whole wheat, barley, etc.), legumes



### Fiber

- seeds, avocado



### • All complex carbs have fiber • Doesn't break down into glucose/BS • Examples: greens, cruciferous veggies (broccoli, Brussels sprouts, cabbage), chia

### How Blood Sugar Works



- Food is broken down by chewing and salivary amylase
- Next it's broken down by HCL in your stomach
- Food hits the small intestine and pancreatic enzymes (like amylase) breakdown carbs into dextrin and maltose

 Carbs hit your bloodstream: small intestine releases enzymes like lactase, sucrase, and maltase, breakdown the carbs further into GLUCOSE (i.e. blood sugar)

 Glucose is then transported across the intestinal wall and absorbed into the bloodstream

- As your blood sugar goes up, the pancreas produces insulin
  - $\circ~$  The more your blood sugar goes up, the more insulin you'll produce
  - $\circ$  Need insulin, but don't want to produce too much  $\rightarrow$  affects blood sugar sensitivity
  - Can improve blood sugar spikes by how you are combining foods (we'll come back to this)

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Food is broken down by chewing & salivary amylase



It's then further broken down by HCL in the stomach

Food hits small intestine & pancreatic enzymes (like amylase) breakdown carbs into dextrin & maltose

The small intestine releases enzymes like lactase, sucrase, and maltase, which breakdown the carbs further into **GLUCOSE** (i.e. blood sugar)

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Glucose is then transported across the intestinal wall & absorbed into the bloodstream





As your blood sugar goes up, the pancreas produces insulin

The more your BS increases, the more insulin you produce



### Glucose & storage

- Eating more carbs at once → a higher blood sugar spike → more insulin is produced
- Glucose not used for energy gets stored in one of two places
  - $\circ$  muscles
  - liver



### Insulin

- As your blood sugar increases, the pancreas releases insulin
- This is a STORAGE hormone
  - Moves glucose from the
     bloodstream into our cells for
     storage or use



### Insulin

- Insulin sensitivity:
  - How well your cells respond to
     insulin and accept the transfer of
     glucose out of the bloodstream
  - The more insulin sensitive you are,
     the less insulin you need to produce
- <u>High insulin sensitivity</u>: regular exercise and more fiber
- <u>Low/weak insulin sensitivity</u>: aka insulin resistance
  - affects stress hormones and digestion
  - often involved in weight loss resistance



### Insulin

- Improve insulin sensitivity through:
  - $\circ~$  eating fiber with every meal
  - $\circ~$  short bouts of exercise consistently
    - HIIT (only if tolerated)
    - Power walk





### Summary – What you need to know!

- Carbs are an essential macronutrient, they provide energy for our cells, and are the main power source for our brain
- The type and amount of carbs we eat at once determines how high our blood sugar will rise and how low it will fall
- Fiber is a type into glucose
- UPCOMING: We can influence our BS spikes/crashes by eating carbs with protein, fat, and fiber
- Fiber is a type of carb, but it's not broken down

# Where does fiber come in?

### Let's break it down

- Since fiber is not broken down into glucose and absorbed, it slows the absorption of other sugars
- **A 4**" **waffle** with 16g of CHO and 1g fiber vs.
- A cup of broccoli with 6g CHO and 3g of fiber
  - Waffle net\* CHO: 15g 😔 😂 😂 😂 😂



• Broccoli net\* CHO: 3g 🎘 🎘

\*Net carbs tells you how much carb is absorbed into your blood stream



### Let's break it down

- When food is wrapped in fiber your body responds differently
- We can't digest some fibers, which is where our gut bugs come in!
  - i.e. prebiotic fiber (favorite fuel source for those good bacteria)
  - ex. asparagus, onions, garlic, leeks
- GOAL: think about what you pair with high carb foods, like waffles, to help soften the BS spike

#### Shoot for:

- Meals = 8-10g fiber per meal
- Snacks = 2-4g fiber per snack



What if I can't eat fiber?

# High-fiber foods & FODMAPs

- Common for these foods to cause/increase symptoms when our needs support
  - $\circ~$  can lead to avoid ance of these foods
- This sequence of events says more about the gut than the foods
- The answer is to focus energy on healing the gut and SLOWLY and STRATEGICALLY increasing your tolerance to these foods

Plant food/fiber diversity = gut diversity = a healthy gut



### What about fruit?

- Fruit does impact BS, BUT it also has fiber
- Fructose is different from glucose because its metabolized in the liver
- High fiber fruits are a great way to get sweet flavor with a balanced amount of glucose and fructose



## Managing Blood Sugar Swings



### **Balanced meals**

spikes

longer



**Recap:** larger amounts of carbs cause higher BS

**BUT:** adding fiber, protein, and fat can improve BS balance - aka <u>Balanced Meals & Snacks</u> • This reduces the spike and allows for a gradual drop, which helps you feel full for



### **Balanced meals**

#### Where to Start:

- Choose higher fiber carbs first (look at net carbs – waffle/broccoli example)
  - - beans/legumes
    - whole grains
    - fruits
- together)
- Add some color (i.e. fruits and veggies)

#### **Balanced meal = carb + fiber + protein + a little fat** + color **Balanced snack = carb + fiber/protein/fat**



- Add protein + a little fat (these often come



### **Balanced meals**

- What about starch?
  - Choose rice over rice flour crackers
    - (complex version vs. simple version)
  - Cooked/cooled starch (i.e. rice, potatoes,
    - - important fuel source for "good" gut bugs
- Just because it's "GF" doesn't mean it's better • Often lower in fiber
- - High fiber grains that are naturally GF:
    - buckwheat, teff, sorghum



pasta, etc.) = **Resistant Starch** 

### Let's talk about Naked Carbs!

### What's a "naked carb"?

- Carbs without their clothes on!
  - $\circ\,$  i.e. fiber, protein, and fat
- Don't need to label foods as "good" or "bad"
- Feel informed, not rigid
- Don't let enjoying a piece of birthday cake make you feel that you have "failed"
- Keeping blood sugar stable throughout the day
  - Helps you tolerate "naked carbs" here and there



### Cravings

- When you're craving things like cookies, sweets, etc. throughout the day, we're seeking a dopamine spike
- Dopamine: leaves us needing to metabolize more carbs making you feel worse
- The more we do it, the more we crave it
- Often an indicator of imbalanced blood sugars earlier in the day
- Eating balanced meals and snacks helps decrease these cravings



### Cortisol

- Produced by the adrenals
- Under "normal" conditions it's at its highest in the morning (to help you get going) and decreases throughout the day
- Extra cortisol is produced with stress (remember, BS swings are stress)
- Eating higher protein/fat within 30-60 min of waking up helps bring cortisol down and helps with BS balance throughout the day
- Eating balanced meals/snacks can help decrease impact of stressful situations



### Hunger vs. Appetite





### Hunger

- Hunger is not bad
- Physiological impulse hard-wired into our brains and bodies (regulated by our brain)
- When our body feels threatened by starvation (i.e. not meeting our caloric/energy needs)  $\rightarrow$ 
  - drives up hunger hormones
    - - hormones that are produced
    - BUT this situation also teaches us to ignore these cues



- The longer you've been
  - restricted/undereating, the more hunger



### Appetite

- hormones



• Emotional longing or yearning to eat particular foods that elevate "reward"

• Can be aroused by environment • Ex: walking past a bakery • OK to satisfy your appetite • Helps reward centers in the brain



### **BS** management impact

- Hunger hormones will be balanced and appetite impulses decreased
- The brain and body communicate better
- Satiety: feeling satisfied (brain satisfaction)
  - at each meal it helps with satisfaction satisfaction
  - When you eat protein, fat, fiber and color • High sugar and low fiber meals lead to low
- Why diets don't work:
  - Just counting calories and not paying attention to balance might make you feel hungrier and less satisfied



### Signs your BS are out of balance...

- You have lots of cravings or you feel like you have a "sugar addiction" – especially later in the day/evening
- Your energy levels drop by mid afternoon
- You feel chronically fatigued
- You consistently feel nauseous, struggle with headaches, and/or have a hard time concentrating



• You have a hard time deciphering your

hunger/fullness cues

• You consistently wake up in the middle of the night and have a hard time falling back asleep (BS are dropping overnight)

### Take Action!



### How to keep BS balanced:

**Balanced meals and snacks** – naturally balances BS and increases satisfaction

Balanced meal = CHO + fiber + a little fat + protein + color

Balanced snack includes two of the above categories and one should always be a protein

Solely focusing on calories and not blood sugar balance will leave you hungry, moody, lots of cravings, and unsatisfied





### How to keep BS balanced:

#### **Meal timing:**

- Not skipping meals
- Eating every 3–4 hours
- Eating within 30-60 min of waking up

If you've been restricting/skipping breakfast for awhile it can take time for the body to readjust to this new eating pattern

Give yourself time and start with a small wake-up snack with protein



### How to keep BS balanced:

Weekday Meal Timing Example: Weeker

 Wake up: 6:30AM
 Wake up: 8:30AM

 Breakfast: 7:00-7:30AM
 Breakfast: 9:00-9:30AM

 Lunch: 11:00-12:00PM
 Lunch: 12:30-1:30PM

 PM Snack: 2:30-3:00PM
 PM Snack: 3:30-4:00PM

 Dinner: 6:30-7:30PM
 Dinner: 7:30-8:30PM

 Bedtime Snack (as needed): 9:30PM
 Dinner: 7:30-8:30PM



### Weekend Meal Timing Example:



### Focus on + NOT -

As in, adding variety, not taking foods out/eliminating

#### Plant variety: GOAL = 30 plants per week

- Veggies (fresh or frozen)
- Fruit: fresh, frozen or dried (no sugar added)
- Beans/legumes
- Grains
- Herbs & Spices



### Homework



Continue using the **Symptom Tracking Worksheet** from Module 1.

Start using the **Food Tracking Worksheet** for Modules 3-5.

- Count how many different plant foods you're currently eating in one week.
- If higher fiber foods cause more symptoms, SLOWLY work on increasing these foods using the Fiber Reintroduction Guide





### Homework





Take 10–25 minutes to reflect on the following journal prompt:

• Take a look at the barriers to accomplishing your transformation in Module 2. What is one possible solution you've learned here that will help you break down at least one of those barriers?

