

Pasta, Starches, and Glycemic Index



Thursday May 1, 2025

Wheat Retreat

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Learning outcomes...

By the end of this short presentation, you should

Have learned a few key definitions.

Understand how the structure of our food and the preparation and re-using of leftovers can impact its digestion and change the glycemic index profile of a wheat food like pasta and bread.



Did you know...

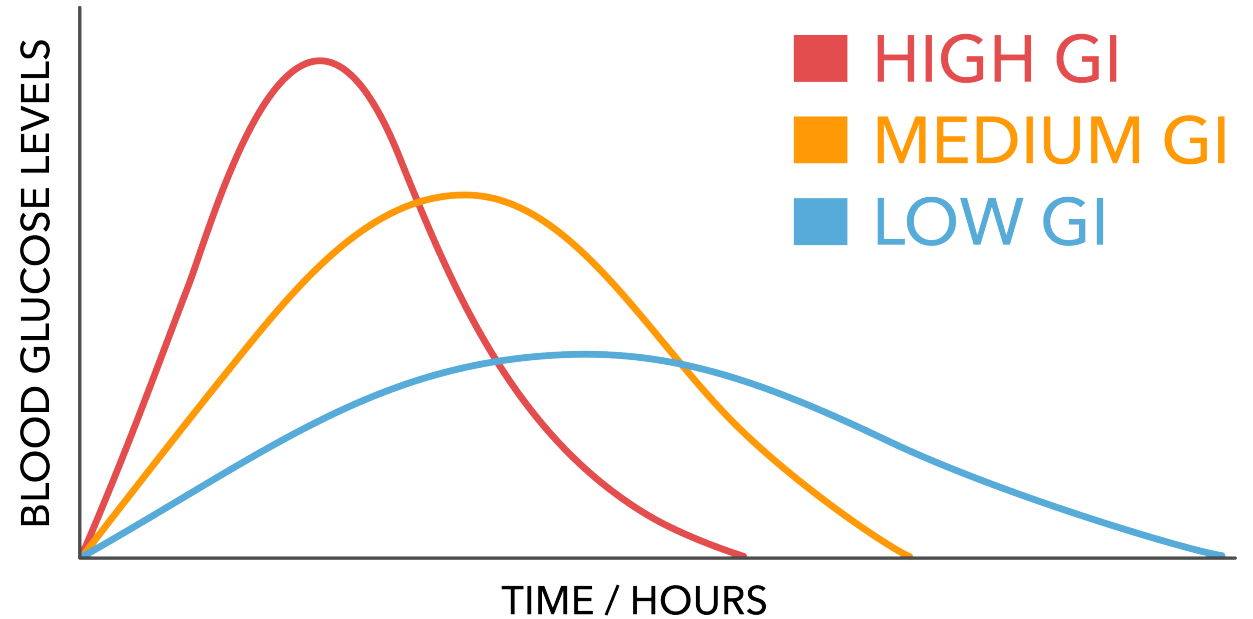
- The **complex structure of our food** and how it's **prepared** can change how it is digested in our bodies.
- Our food changes not only when we prepare and cook it, but also in how we freeze, thaw, reheat, and cook leftovers.
- How we store and re-use foods, like pasta and bread, can create changes in the structure of the food that we can't even see but results in **positive health outcomes on our gut and our digestion of carbohydrates**.





Glycemic Index (GI)

A scale from 0 to 100 that ranks a carbohydrate food or drink based on how much it raises your blood sugar levels after consumption.

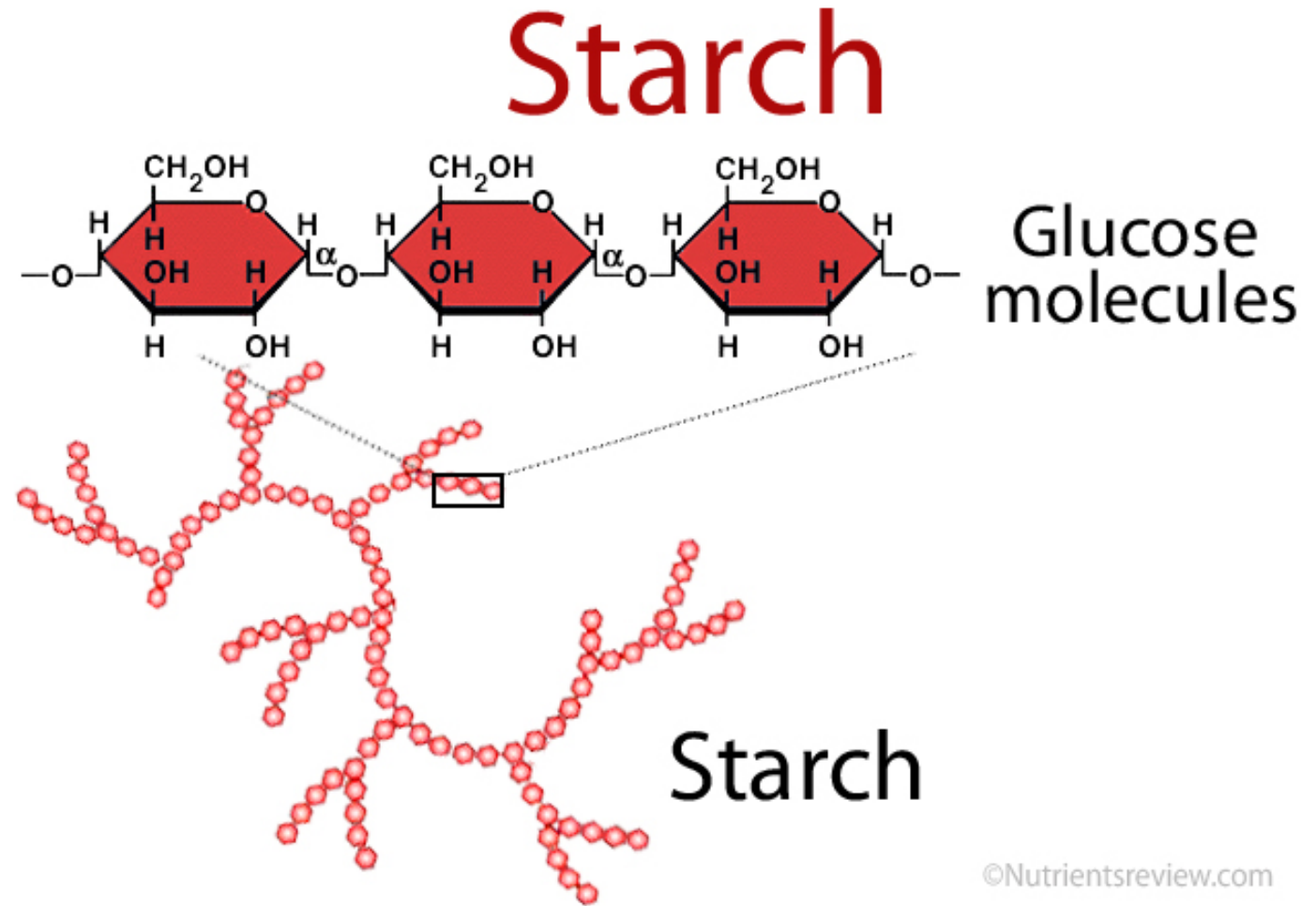


Glycemic Index and Glucose Levels



Starches

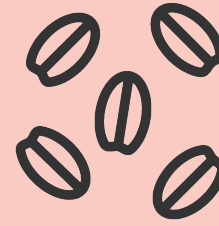
Long chains of glucose (a sugar) that is found in plants including wheat. Starches are classified depending on how quickly or slowly they are digested in our digestive tract.



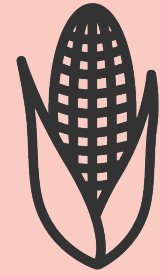


Resistant Starch

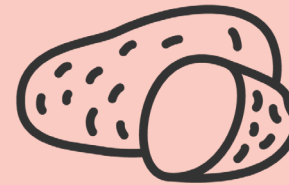
One type of starch that passes through parts of our digestive tract unchanged and makes its way to our colon where it is fermented by the bacteria in our gut to produce short chain fatty acids.



**Uncooked
Rolled Oats**



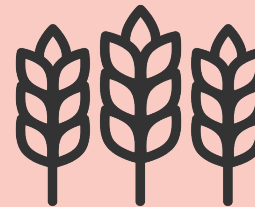
**High-Amylose Maize
or Corn Starch**



**HIGH-Amylose
Potato Starch**



**Cooked, Then Cooled
Rice, Pasta, and Potatoes**



Whole Grains



Legumes



**Under-Ripe
Green Bananas**

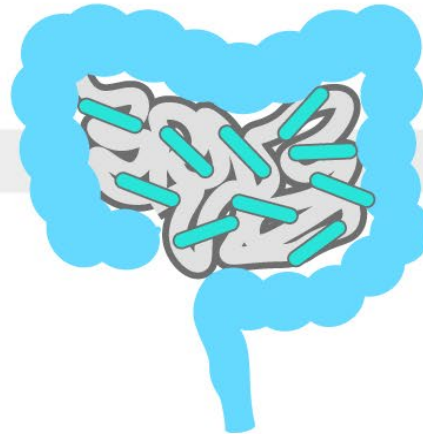


Short Chain Fatty Acids

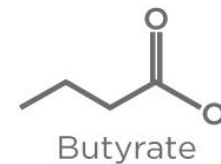
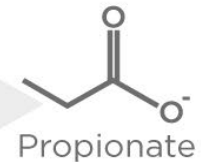
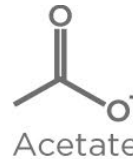
Linked to several health benefits and disease risk reduction due to how they interact with our digestive system and because they provide energy (or food) for our gut bacteria and for us.



Dietary
Fiber



Gastrointestinal
Microbiome

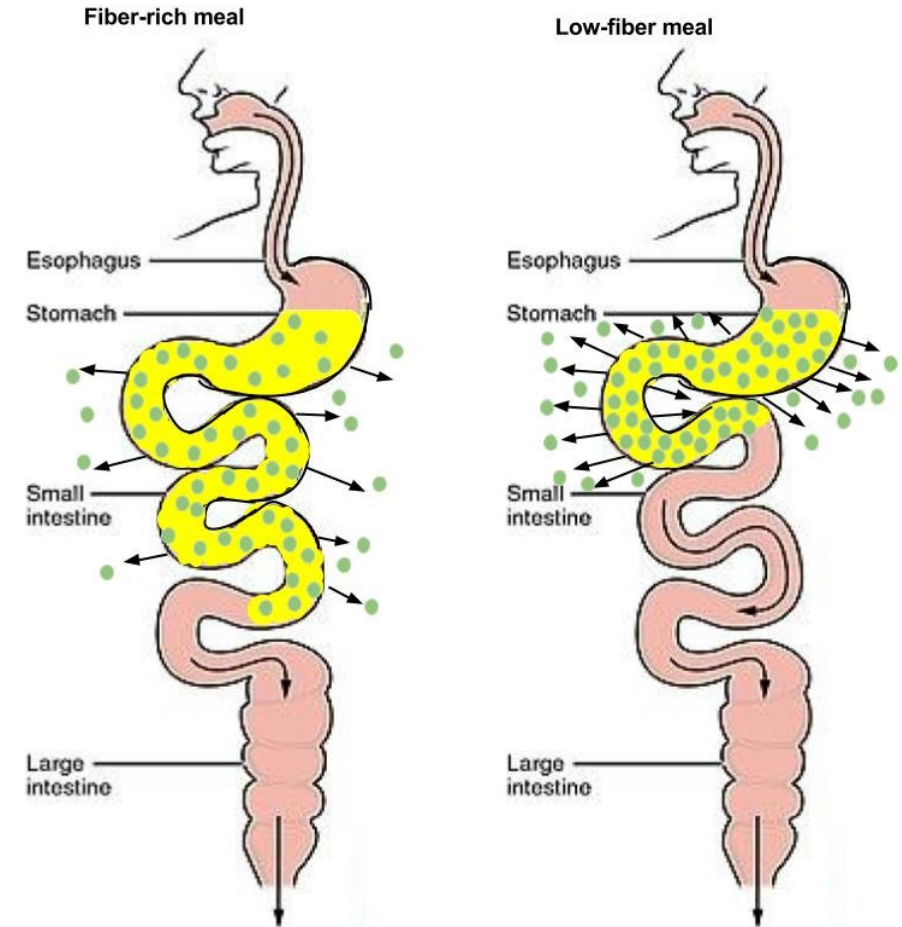
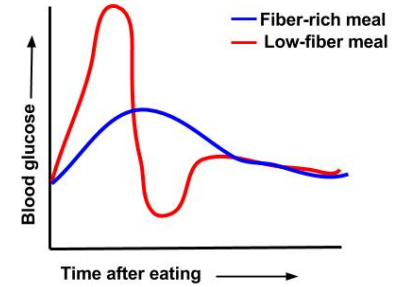


SCFAs



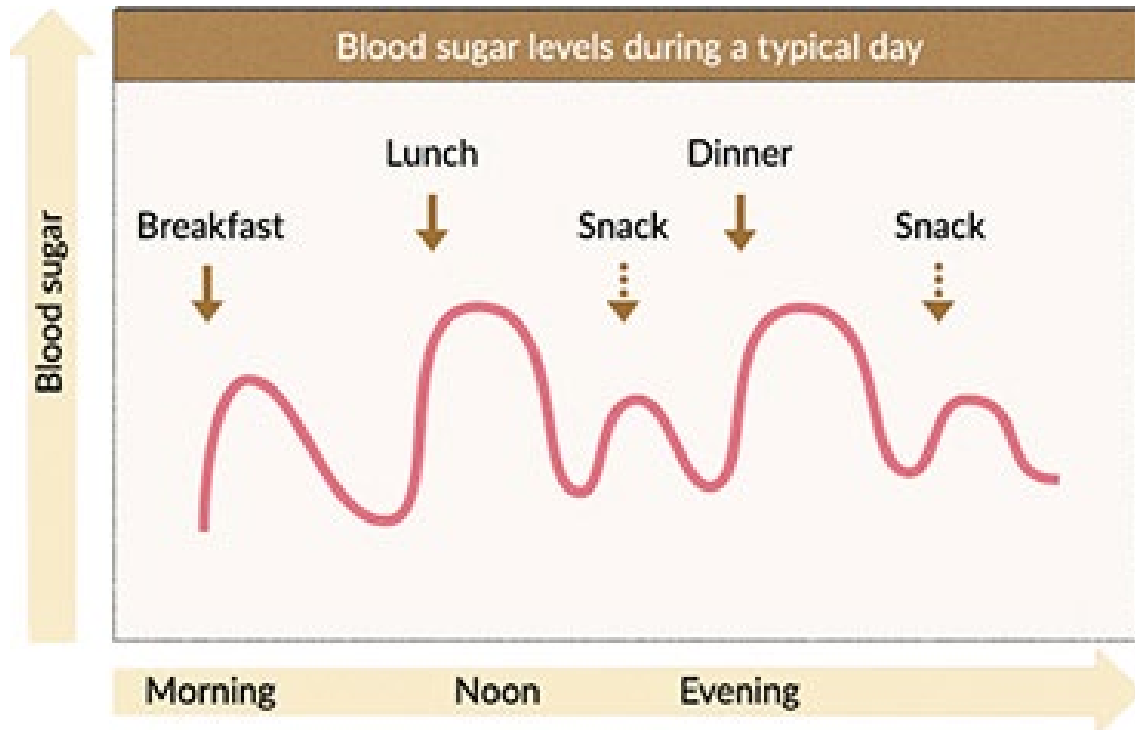
How can pasta be a low GI food?

- The structure of our food can impact its digestion.
- Why? There are many reasons including:
 - Fibre, resistant starches, and gluten.
- All of these components contribute to a compact structure which makes the pasta harder for our digestive system to break down.
- The longer and harder our body must work to breakdown the carbohydrates into sugar, the longer it will take for these sugars to be released and absorbed into our bloodstream.





How we prepare and re-heat our food matters too!



- The process of cooling and reheating directly increases the resistant starch content of wheat-based foods like pasta and bread.
- Research has looked at blood sugar levels in people after eating:
 - Pasta that is cooked, cooled, and then reheated, and;
 - Bread that is frozen, thawed, and reheated/toasted
- What they found in all these methods of cooling and reheating is a slower absorption of glucose into our bloodstream and thus a lower score on the glycemic index.



Why does cooling and re-heating our food change its glycemic index value?

- The cooling process increases resistant starch content in pasta and bread by forming retrograded starch.
- Retrogradation occurs when cooked starch is cooled down, which causes starch molecules to form a crystalline structure that is resistant to digestion by the enzymes in our gut. This makes it harder for the gut to digest and absorb, delaying the absorption of glucose or sugar into our blood.



Summary

Science has shown that **increasing low glycemic index foods and resistant starch** (and fibre) in our diet can have **positive impacts** on gut health, digestion, heart health and diabetes.

While some foods have more resistant starch than others to begin with, the way you **prepare your food** can also impact how much is present.

The common theme with these foods and preparation methods is that it **makes our food harder or slower to digest**, which *decreases* the **absorption of sugar/carbs** into our blood from our digestive tract.

What we eat is still important, but science is showing that how we eat also matters.



References

- <https://www.sciencedirect.com/science/article/pii/S1756464622001645#s0050>
- <https://www.gowinglife.com/why-you-should-freeze-and-toast-your-bread/>
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