



The Hungry Microbiome: Why resistance starch is good for you

YouTube ref: <http://youtu.be/NI3KtR3LoqM>

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Transcript

[Image changes to show three jars of plant derived foods]

[Image changes to show an animated picture of lots of cells]

Narrator: We know that many plant foods benefit our health. Scientists now believe one reason for this lies with the gut Microbiome - the bacteria in your intestines.

[Text appears: The Hungry Microbiome]

[Image changes to show a serve of mixed beans on a plate dressed with some herbs]

Your microbiome is nourished by meals like this, rich in one type of dietary fibre, called resistant starch.

[Image changes to show a child taking a spoon of beans from the plate and eating them]

Resistant starch can't be digested by your body, but instead becomes food for your gut bacteria.

[Image changes to show an animation of the digestion process as described below]

Most starch is easily digested. Starch is dissolved in the small intestine and then absorbed by your body, providing you with energy and nutrients. The remaining, non-digestible portion is called resistant starch. The resistant starch continues its journey through your gut and arrives at the large Intestine.

[Image changes to show an animation of the resistant starch reaching the large intestine, with text: Large Intestine]

We see that the resistant starch has become exposed to the healthy bacteria of the gut microbiome.

[Camera zooms in on an animated piece of resistant starch, represented by a white dot, with bacteria on it, represented by small green dots]

This species of bacteria specialize in breaking down resistant starch. This breakdown process provides the bacteria with the fuel they need to survive. As they use the starch for energy, they release small carbohydrate molecules.

[Image changes to show an animation of the carbohydrate molecules being released as described above]

The neighbouring bacteria feed on these carbohydrates.

[Image changes to show an animation of the carbohydrate molecules and bacteria coming together]

As he bacteria feed, they excrete even smaller molecules as waste. One of the final waste products is called butyrate, an energy source for your body.

[Image changes to show an animation of the butyrate being absorbed in to the large intestine]

As the butyrate builds up, it is absorbed by the large intestine. The presence of butyrate encourages blood to flow into the vessels of the large intestine, keeping the tissue healthy. If your diet includes enough resistant starch, these cells will use butyrate as their main source of energy.

[Image changes to show an animation of an intestinal cell being covered in special proteins as described below]

Here, we can see the molecular surface of one of the intestinal cells. The surface is covered in special proteins that actively pump butyrate molecules into the cell. Once inside, they can be harvested for energy. In addition, butyrate has other benefits.

[Image changes to show an animation of a damaged intestinal cell]

Intestinal cells are sensitive to DNA damage, caused by environmental factors. This cell's DNA has been damaged, resulting in a mutation. More damage could accumulate over time as the cell divides, which could lead to colorectal cancer. But, a steady supply of butyrate allows the damage to be more easily detected, and, the cell can activate a suicide program in response. Because the damaged cell destroys itself, it can't progress to form a cancer.

[Image changes to show examples of plant derived foods, including lentils, beans, fruit and herbs]

A starved microbiome is unable to protect you from cancer. By eating foods rich in resistant starch, you can nourish your microbiome and improve your health!

[Text appears: To learn more: www.csiro.au/hungrymicrobiome]

[Credits: An Animation by Chris Hammang. Producers, Sean O'Donoghue and Kate Patterson. Scientific Consultation, David Topping, Trevor Lockett and Julie Clarke. Music and Mixing, Richard Tamplenizza. Sound Design, Tara Webb. Additional Recording, Kenneth Sabir. Art and Technical Direction, Drew Berry, Christian Stolte. Sponsors logos appear to the right of screen An Australian Government Initiative, Inspiring Australia and CSIRO with text: Funding provided by. www.csiro.au/hungrymicrobiome]

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[Music plays, CSIRO logo appears with text: Big ideas start here www.csiro.au]