Fibre is more than just roughage

Participant questions

Q: What is the main difference between resistant starch and insoluble fibre?
A: Resistant Starch is starch that escapes digestion via enzymes in the small intestine, and is virtually completely fermented by bacteria in the gut. The resistant starch in Barley+ has been shown to stimulate butyrate production, which is a short chain fatty acid by-product of biological importance that some gut bacteria produce. Essentially, resistant starch is a prebiotic but does not aid in laxation. Insoluble fibre, is the 'roughage-type' fibre we associate with plant cell walls (e.g. wheat bran), is largely non-starch polysaccharide that escapes digestion in the small intestine and it promotes laxation by mechanically irritating the bowel and stimulating water & mucus secretion to help keep us regular. Importantly, when Insoluble fibre is consumed with resistant starch, the insoluble fibre carries the resistant starch further down the large bowel for fermentation to take place, which is important because that means the good by-products of fermentation (prebiotic effect) are localised to further down the large bowl, the major site of bowel cancer.

Q: Lower carb diets are very popular and while they encourage non-starchy vegetables, they discourage/eliminate grains and even fruits & ample legumes. What impact is this likely to have on fibre and resistant starch intake and gut health?
A: We now know that fibre is a vast, heterogeneous group of compounds and that they are all key to maximising gut health. We know that certain fibres have prebiotic effects and this includes resistant starch and oligosaccharides including fructans. We also know that restricting prebiotic fibres alters both the diversity of bacteria types and the ratio of beneficial microbes to those less beneficial. So, restricting a diverse fibre impact can have profound effects on gut bacteria profiles. However, we don't know what this means in terms of long term health outcomes, although some evidence suggests links to obesity, diabetes, cardiovascular disease and mental health, to name a few conditions.

Q: Not a question, but serving tip: I've been processing up Barley+, oat porridge into flour and using it in cooking, such as pancakes, crepes, fruit loaves, cookies and energy balls
A: Thank you for your feedback. Funnily enough, I do the same thing.

Q: Recently asked by a member on the paed DAA group- about recommendations for weaning foods to promote optimal fibre intake, but with negative minimal effects on iron absorption. I am interested in this as I haven't seen any resources focusing on types of fibre from the start, only an iron focus. Can you recommend any resources on this?
Especially some targeted at parental education.
A: As a starting point, it's helpful to recall that breastmilk is quite rich in prebiotic fibres (called human milk oligosaccharides) and some infant formula are fortified with prebiotics, to provide formula fed babies with these fibres. I'd suggest the infant feeding guidelines and the dietary guidelines for Toddlers are an ideal starting place to obtain general level nutrition information for young children of weaning age and toddlers. These guidelines
recommend that young ones include a variety of foods, and when followed, will help to ensure a broad range of dietary fibre types are obtained. This is similar for adults, where there is a broad 'fibre' intake recommendation, but no recommendations for individual fibre type intakes. To that end, it is super important to include a broad range of foods rich in complex carbohydrates, such as legumes, barley, various other whole grains and of course, loads of fruit and vegetables, to ensure a range of fibre types is consumed. In terms of resistant starch, there is a handful of foods rich in this fibre, including Barley+, firm bananas, cooked and cooled potatoes (cold potato salad), rice and el dente pasta, cooked and cooled oats, cashews, sorghum, and of course, legumes. Little ones may eat all of these foods, without hindering iron absorption.

Q: Are there negative consequences of really high fibre diets?
A: Evidence suggests that Palaeolithic humans consumed upwards of 100 g of fibre per day and that there was a lot of fermentable fibre in that fibre intake. However, if an individual moves rapidly from a low fibre diet to a high fibre diet, the consequences may well be extreme and rapid onset bowel actions (have you ever eaten too many poached prunes, all at once in a bircher muesli?) Thus, the trick is to gradually increase fibre diversity intake over a number of weeks to provide sufficient time for the gut bacteria and environment to adapt to increased fibre loads. If not, the somewhat immediate increased gastrointestinal transit time that may result from sudden increases in bowel motions may result in increased mineral and water excretion and unnecessary losses of valuable nutrients.

Q: It's surprising to see that males are having more fibre than females
A: Yes, Mean daily fibre intake for Males >2 years is 24.0 g/day, whilst for women it's 20.5 g/day. Perhaps the increased intake for men compared to women is a reflection of their increased energy intakes (and so food), thus the increased fibre intake for men may be a serendipitous result of a greater food intake?

Q: Are you aware of or do you think we will see RDI's for specific fibres - resistant starch, insoluble & soluble fibre, or even RDI for prebiotic fibre as a collective?
A: Our dietary Guidelines currently recommend the intake of a wide range of grains (preferably whole grains) fruit and vegetables and legumes. If we follow these guidelines, then a diverse range of fibres will be consumed. In terms of NRV's / RDIs, experts in this field suggest that the term Dietary Fibre no longer adequately describes the diversity of compounds and their various functions that currently fall within the definition. Given this, it does seem possible that in the future, given the 3 types of fibres defined under Australian Food Regulations (being Resistant Starch, Soluble Fibre and Insoluble Fibre), that RDIs for these 3 fibre types may be set individually in future years, in a way similar to the NRVs in Australia for essential fats and saturated fats.

Q: Do you think the low FODMAP diet may result in negatives in relation to its low prebiotic content?
A: Experts in the FODMAPs area highlight that "Diets that differ in their FODMAP content are associated with considerable changes to the structure of the faecal microbiota" (Halmos et al. 2015, GUT;64:93–100) and that "Strict FODMAP restriction induces a potentially unfavourable gut microbiota, although the impact of this consequence upon health is
unknown" (Hill et al. 2017, Gastroenterology & Hepatology;13(1):36-45). I think these two quotes effectively sum up the current understandings.

Q: If we are to breakdown the recommended grams of fibre into the different types, what would that look like?
A: That's a tricky one to answer and for me, a response is really a guess. As a starting place, perhaps ~10-20 g resistant starch, ~9 grams soluble fibre and ~9 g insoluble fibre/day

Q: Any recommendations for grams of resistant starch for all ages per day?
A: Well, little people require less total food/day and that includes fibre and resistant starch. Having said that, for resistant starch, some experts are recommending around 20 g/day. That seems like a reasonable recommendation, based on expert opinion. However, it's worth remembering that even within resistant starch, there are around 5 different resistant starch types, so even for resistant starch, we need to choose from a variety of food sources.

Q: We need food labels to have all 3 fibres.
A: Perhaps things are moving this way. Already, some manufacturers are listing all 3 fibre types. Take a look at the Barley+NIP and you'll see all three Fibre types listed, per serve and per 100 grams.

Q: As you mentioned that fibre is defined as those that are naturally existing in foods, what do you think about added fibre in foods (e.g. inulin)? E.g. wonder white bread, drinks with added fibre/prebiotics. Would you count these into the requirements, and would you still recommend these products to patients who struggle to meet their fibre requirements?
A: Added fibres have a place in total fibre intake. However, their functions may be a little different compared with when they're consumed as part of their original food source. For instance, inulin delivered as an isolated ingredient to the gastrointestinal tract will be fermented early in the large intestine, and this might also provoke symptoms early in the GI tract (e.g. bloating in those sensitive to fructans - inulin is a fructan, after all). However, if the inulin is consumed intact within its grain (e.g. the inulin which is intact in the Barley+ barley grain), then the prebiotic fibres get carried further distally with the insoluble fibre, to the place in the colon where they argueable do most good. So, the answer is every little bit counts, but we really need to be looking to whole food sources of prebiotic and other fibres as well, to meet the full range of physiological capabilities of these highly diverse compounds.

Q: Now that we have established that different types of fibre have different functions, do you think there's a need to refine the dietary recommendations so that there is a balanced consumption of each type of fibre? If so, how would you overcome the difficulty in educating the general public regarding these different fibre types?
A: Our dietary Guidelines currently recommend the intake of a wide range of grains (preferably wholes grains) fruit and vegetables and legumes. If we follow these guidelines, then a diverse range of fibres will be consumed. In terms of educating consumers, the messages should focus on consumption of a range of whole grains, good sources of resistant starch which means paying attention to cooking methods (cooked and cooled potatoes and
oats and rice), look for foods which supply a good source of resistant starch (e.g. cashew nuts and firm bananas) and to eat broadly from plant foods.

Q: Has BARLEYmax been studied in managing the treatment of SIBO?
A: No, not to our knowledge.

Q: What about people with Coeliac disease?
A: There are many non-gluten sources of resistant starch, including firm bananas, cooked and cooled potatoes (cold potato salad), rice, cooked and cooled oats, cashews, sorghum, and of course, legumes, to name a few...

Q: Are you aware of a good resource listing the content of insoluble, soluble and resistant starch fibres in foods that could be used with clients?
A: The dietitians at Freedom Foods Group will work to produce one and it will be posted here on Dietitian Connection once complete.