The most popular questions submitted by delegates during the live webinar event: The prebiotic potential of our diets – fibre and more are answered below by our expert speakers, Dr Megan Rossi, Prof Glen Gibson, Dr Stacey Lockyer and Prof Jan Delcour. These cover many of the topics around gut microbiota, diet and health.

Dr Megan Rossi, King’s College London, responds

- Is there evidence that we can alter gut microbiota with pre/probiotics to make people ‘responders’ to low FODMAP diets who might otherwise not benefit from symptom relief?
  ‘Unfortunately there is no evidence for this. Nice hypothesis though!’

- The public see ‘fermented’ as shorthand for ‘healthy/good/must eat’ — any comments on this and what advice to give consumers?
  ‘There is limited clinical evidence for them, but if people enjoy the taste then I would say go right ahead. I focus on taste more so than the health benefits. There is never going to be a silver bullet and diversity is much more important than how much kombucha you drink.’

- Are there recommendations for specific prebiotics in IBS management?
  ‘Not yet! But our team has just finished a randomised controlled trial lead by Dr Wilson looking at the effects of a prebiotic in IBS. Results are due to be published in the next 6 months.’

Prof Glen Gibson, University of Reading, responds

- Do we know if, following an episode of food poisoning, our acquired microbiome will be depleted with loss of good bacteria? And if so, do you think it would take a long time to reacquire the microbiome built up over the years?
  ‘Probably not, at least not for long. The body is generally good at dealing with infections but we do suffer while this is going on, for example, diarrhoea in the case of food poisoning. When the problem is dealt with the microbiome probably resets itself within a few days. Probiotics and prebiotics will help this.’

- **How does exercise change the composition of the microbiome?**
  ‘This is not really known but exercise will help things like transit time which is favourable for the gut flora. Pro and prebiotics are used because of their potential to help resist infections when exercising and to speed up recovery after strenuous performance (by boosting the immune response).’

- **When probiotic bacteria ‘die off’ in the large intestine, are they utilised by the remaining live bacteria, becoming in effect a source of food or potential prebiotics for the remaining bacteria?**
  ‘Usually there is enough substrate (or food) for the microbiome to function capably. This largely comes from diet. However, lab work has shown that your point is true when yeasts die off in model systems i.e. their cell walls can help boost certain bacteria.’

Dr Stacey Lockyer, British Nutrition Foundation, responds

- Do the fibre meal plans you described meet other nutritional requirements such as iron and calcium?
  ‘The BNF 7 day meal planner illustrates, in practice, what a diet that meets the recommendations of no more than 5% of calories from free sugars and at least 30g AOAC fibre per day may look like for adults. The plan was also modelled to meet energy, other macronutrient and key micronutrient (including iron and calcium) recommendations over the week, including contributing less than 6g salt per day, less than 10% of total energy as saturated fatty acids and...’
meeting the food labelling reference intake for total sugars (90g for adults). It also meets all the current food-based guidelines, such as 5-A-Day and the inclusion of at least one portion of oil-rich fish over the week. The Diabetes UK low carbohydrate meal plans provide information on calories, carbohydrate and number of portions of fruit and vegetables, and is described as ‘nutritionally balanced’ and ‘ensuring the right amounts of dairy (calcium).’

- Is fermentable fibre the same as prebiotics – what are the differences in definition?
  ‘Fermentation is the breakdown of a substrate to release energy in the absence of oxygen. Microbial fermentation of food components that are not absorbed in the small intestine (and so reach the large intestine) yields end products such as short chain fatty acids and gases. Some types of fibre such as pectin, resistant starch and beta-glucan are fermentable, whereas some types are non-fermentable such as cellulose. Fibre types that are accepted as prebiotics at present (GOS, FOS and inulin) are all fermentable but not all fermentable fibres are classed as a prebiotic. According to the 2017 International Scientific Association for Probiotics and Prebiotics (ISAPP) consensus statement, the definition of a prebiotic is ‘a substrate that is selectively utilized by host microorganisms conferring a health benefit’ and selectivity is key – i.e. a fermentable fibre (or in fact any fibre type) that is utilized by all host microorganisms (rather than just selected species) would not be classified as a prebiotic.’

- Does the food matrix make a difference to the health benefits of fibre – for example, is eating whole chickpeas better than chickpea flour?
  Looking at individual foods and ‘health’ is complex and fibre is, of course, not the only nutrient of benefit that pulses contain. The 2015 SACN report, ‘Carbohydrates and Health’, recommended that we consume fibre from a variety of food sources (e.g. fruit, vegetables, pulses, nuts, seeds, wholegrains, potatoes with skins). These foods all provide other important nutrients such as vitamins, minerals, as well as phytochemicals such as polyphenols of varying types and proportions. Chickpeas whether dried, canned or ground to flour are fibre-rich and contain resistant starch. However, whilst whole pulses have been studied with regards to their beneficial effects on post-prandial glycaemia and satiety in human trials, whether ingredients made from pulses retain the health benefits of whole pulses is less clear. To date, a limited amount of research has examined the impact of pulse flours and pulse fractions, with benefit on glycaemic response noted when chickpea flour replaces wheat flour in, for example, pasta and bread. The physical and chemical form of the nutrient within the food structure, as well the presence of enhancers or inhibitors of absorption influence nutrient bioavailability/bioaccessibility. Whether the chickpea is whole, split, hulled, whether it’s canned or cooked, the variety of chickpea and how the pea is processed to make the flour will make a difference to nutritional composition. Chickpea flour (or gram flour) numerically per gram contains more fibre than chickpeas (and more fibre than wheat flour), but both chickpeas and chickpea flour are good sources of fibre and protein.’

Prof Jan Delcour, KU Leuven, responds

- Could you get the same benefit from eating wheat bran as you do from AXOS?
  ‘The main benefit of wheat bran is stool bulking as a result of water binding. Wheat bran is considered to be only marginally fermentable. AXOS, in contrast, are highly fermentable. This in itself is considered to be a beneficial effect. They also stimulate the growth of bacteria in the colon which are associated with health and wellbeing.’

Key references included in the webinar:
- ISAPP - International Scientific Association for Probiotics and Prebiotic;
- Lassale C et al. Healthy dietary indices and risk of depressive outcomes: a systematic review and meta-analysis of observational studies, Molecular Psychiatry;
- Rajendran SRCK et al. Structural features underlying prebiotic activity of conventional and potential prebiotic oligosaccharides in food and health, J Food Biochemistry;