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Gut Health Myths

Dr Joanna McMillan

50% of Australians experience Gut Health Problems

Some symptoms of poor gut health



BLOATED
STOMACH



FREQUENT
HEARTBURN



ABDOMINAL
PAIN



EXCESSIVE
FLATULENCE



GROWLING
STOMACH



CONSTIPATION
/ DIARRHOEA



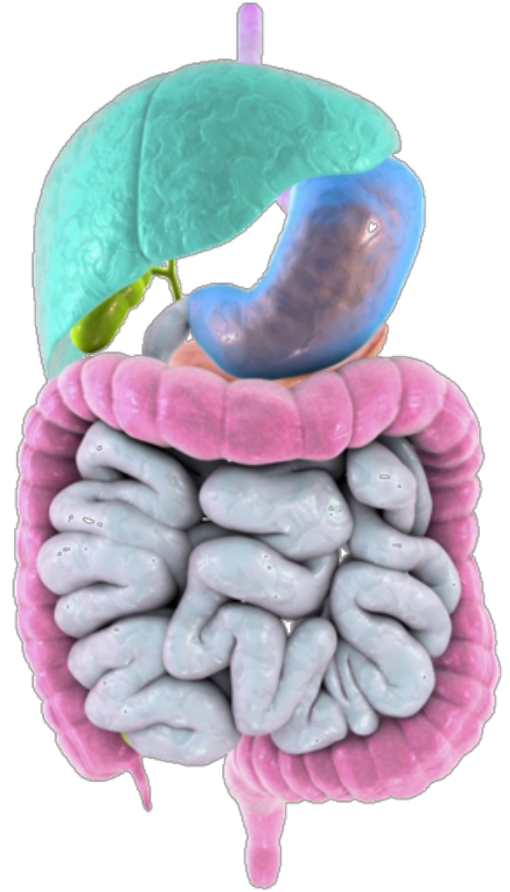
FREQUENT
NAUSEA



EXCESSIVE
BURPING

What is IBS?

- ➔ Chronic relapsing symptoms such as lower abdominal pain, bloating, distension, diarrhoea and constipation
- ➔ Subtypes: IBS-D, (diarrhoea predominant), IBS-C, (constipation predominant), IBS-M (mixed)
- ➔ No abnormal pathology
- ➔ 1 in 7 adults suffer from IBS



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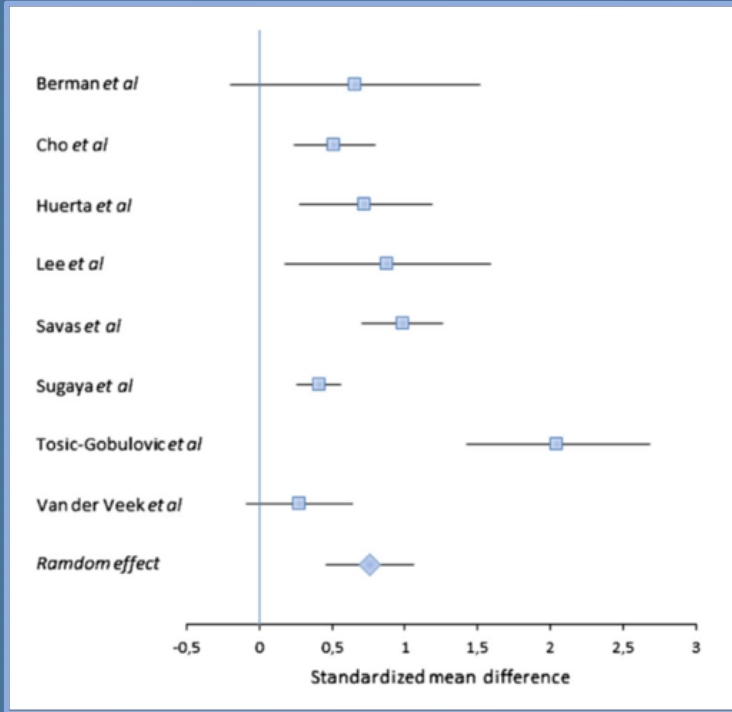


Why is IBS so common?

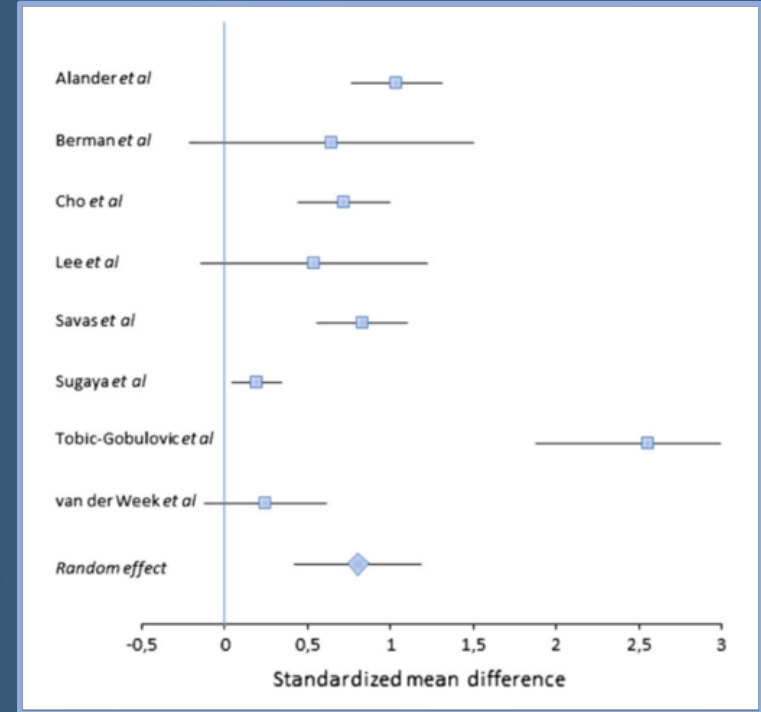
- Microbiome changes
 - Mode of delivery, feeding, weaning, antibiotic use
- Diet throughout life
- Stress
- Lifestyle

Links with Anxiety & Depression

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Meta-analysis Anxiety in IBS



Meta-analysis Depression in IBS

What about wheat?

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➔ wheat allergy

➔ Coeliac disease

➔ Non-coeliac gluten sensitivity (NCGS)

➔ Or are the fructans the problem?

What are FODMAPs?

Fermentable Oligosaccharides, Di-saccharides, Monosaccharides And Polyols

⇒ Fructans and GOS (galacto-oligosaccharides) - barley, rye, wheat, legumes, cashews, pistachios, nectarines, watermelon, inulin, garlic & onion

⇒ Fructose (in excess of glucose) - asparagus, artichokes, sugar snap peas, apples, figs, dried fruit, fruit juices

⇒ Lactose - milk, yoghurt, soft cheese, custard, ice cream

⇒ Polyols - sorbitol & mannitol in natural sweeteners and in some fruits & vegetables (e.g. apples, apricots, pears, cauliflower, mushrooms, watermelon)

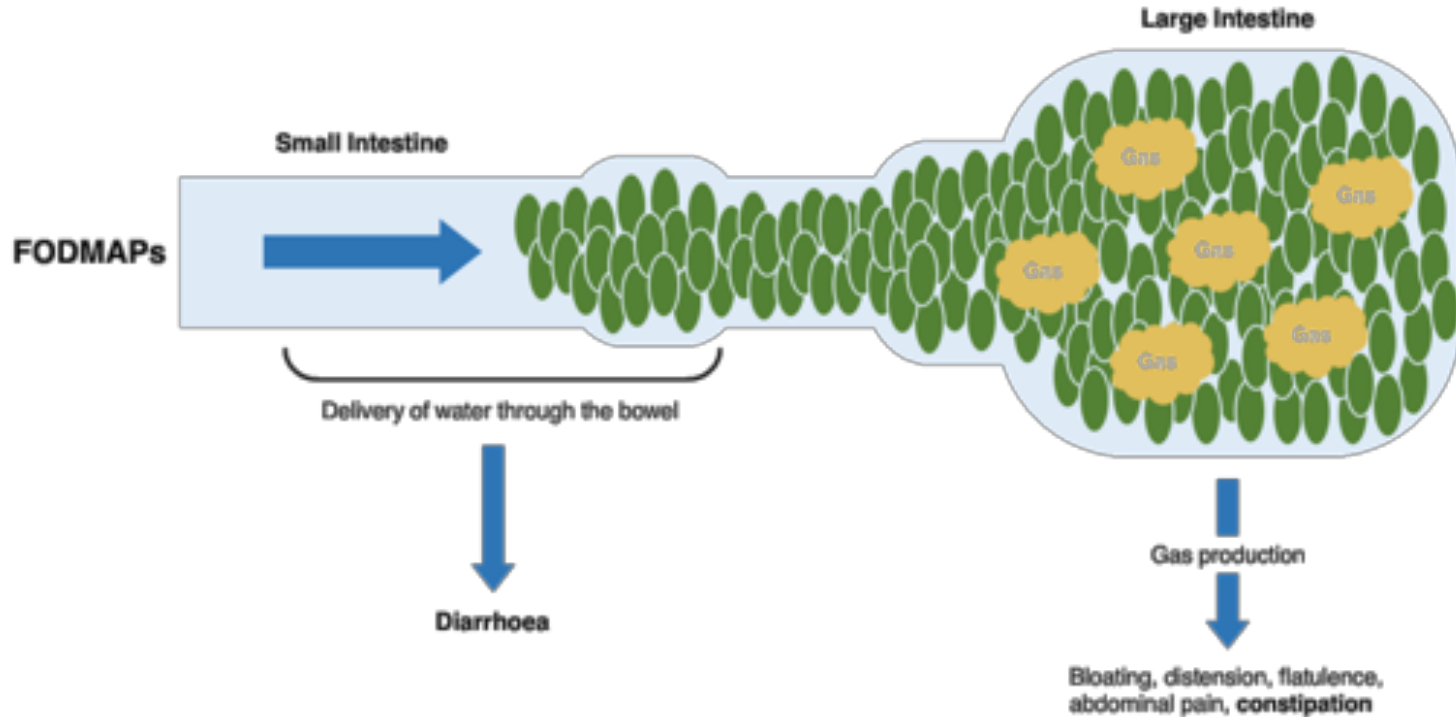


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FODMAPs

Food Category	High FODMAP foods	Low FODMAP food alternatives
Vegetables	Artichoke, asparagus, cauliflower, garlic, green peas, leek, mushrooms, onion, sugar snap peas	Aubergine / eggplant, beans (green), bok choy, capsicum (bell pepper), carrot, cucumber, lettuce, potato, tomato, zucchini
Fruits	Apples, apple juice, cherries, dried fruit, mango, nectarines, peaches, pears, plums, watermelon	Cantaloupe, grapes, kiwi fruit (green), mandarin, orange, pineapple, strawberries
Dairy and alternatives	Cow's milk, custard, evaporated milk, ice cream, soy milk (made from whole soybeans) sweetened condensed milk, yoghurt	Almond milk, brie / camembert cheese, feta cheese, hard cheeses, lactose-free milk, soy milk (made from soy protein)
Protein sources	Most legumes / pulses, some marinated meats / poultry / seafood, some processed meats	Eggs, firm tofu, plain cooked meats / poultry / seafood, tempeh
Breads and cereal products	Wheat / rye / barley based breads, breakfast cereals, biscuits and snack products	Corn flakes, oats, quinoa flakes, quinoa / rice / corn pasta, rice cakes (plain), sourdough spelt bread, wheat / rye / barley free breads
Sugars / sweeteners and confectionary	High fructose corn syrup, honey, sugar free confectionary	Dark chocolate, maple syrup, rice malt syrup, table sugar
Nuts and seeds	Cashews, pistachio	Macadamias, peanuts, pumpkin seeds, walnuts

How do FODMAPs affect those with IBS?

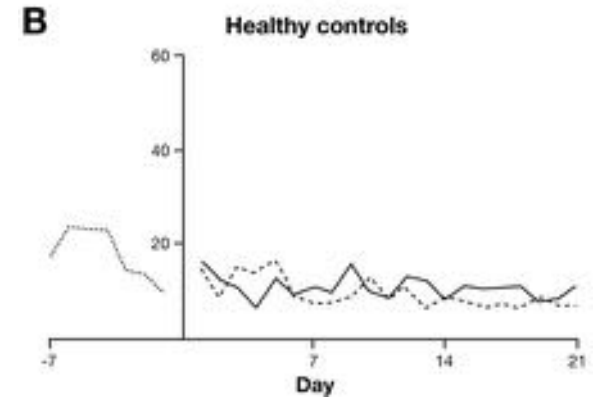
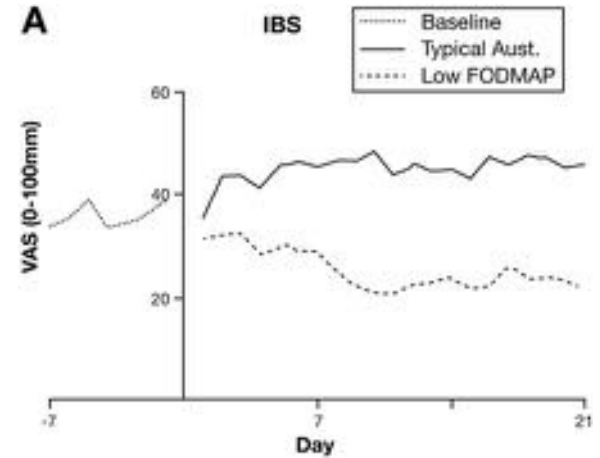


➔ Monash Uni RCT 30 patients with IBS & 8 healthy controls

➔ Crossover diet design

➔ Daily symptoms rated using visual analogue scale
Plant Food Diversity

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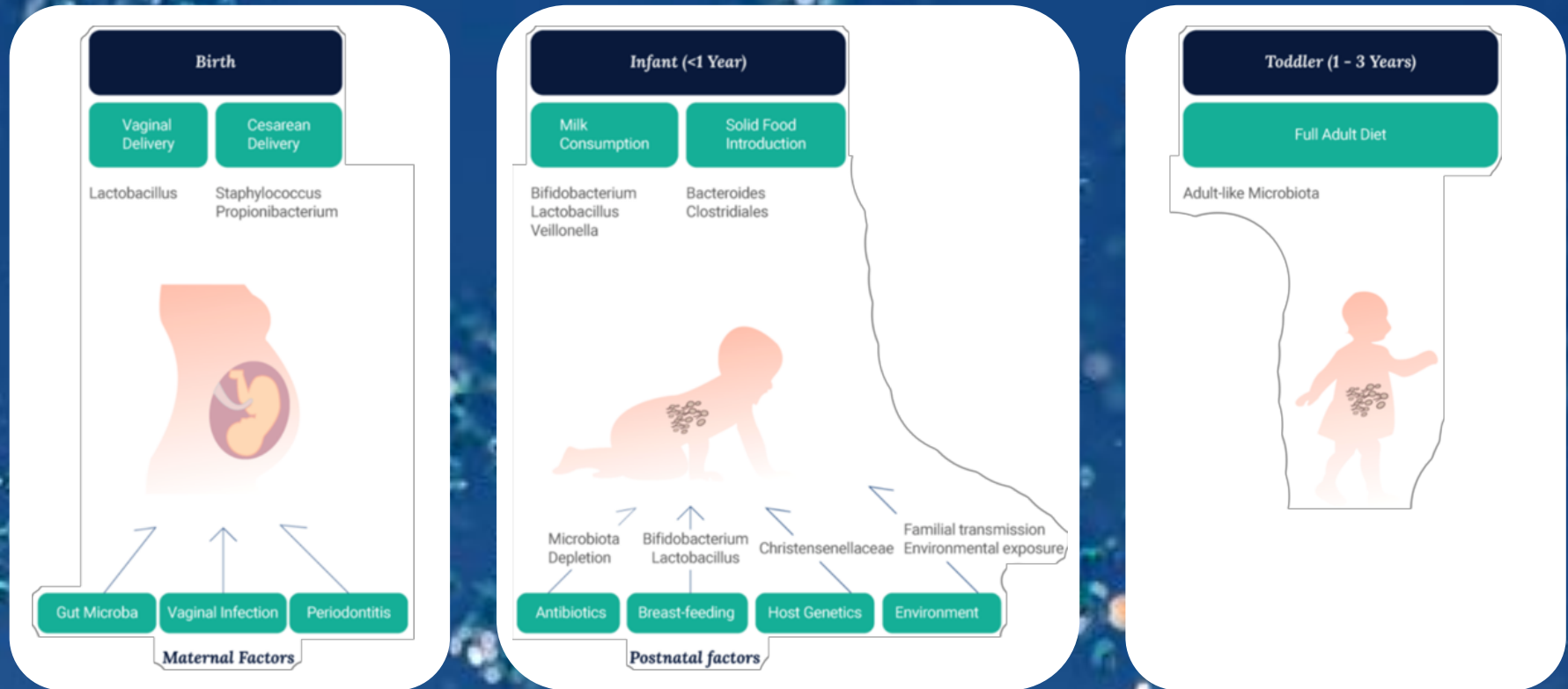


Low FODMAPs: Not a diet for life

- Misunderstandings abound
- Therapeutic diet: 4 - 6 weeks under guidance of dietitian or trained health professional
- Reintroduction of foods to broaden diet

Development of the Microbiome

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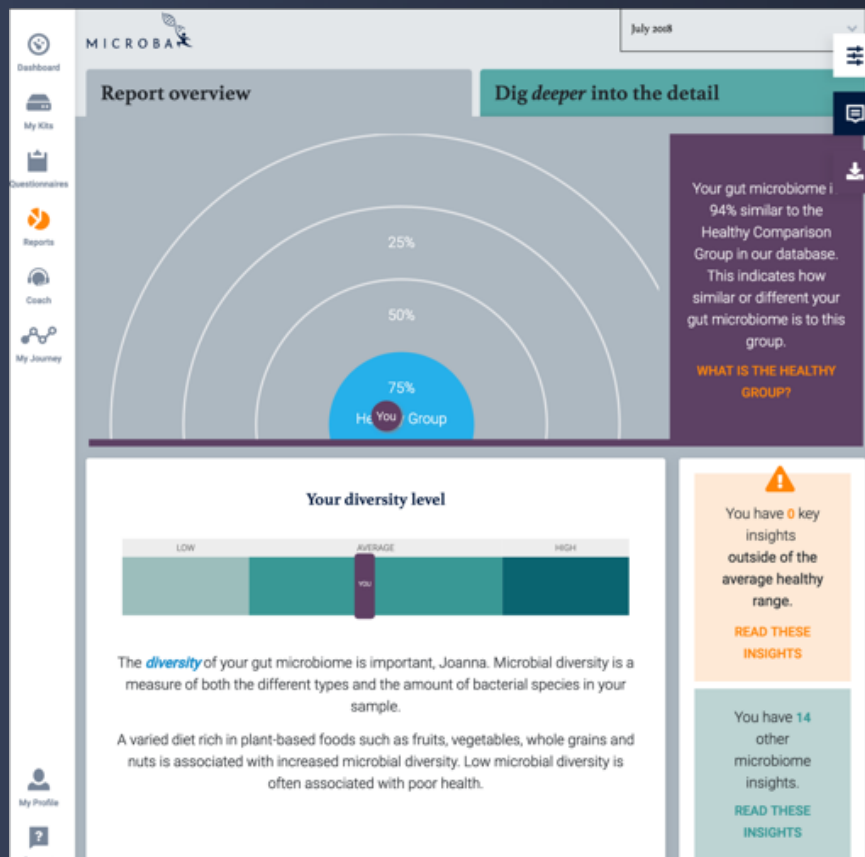




What does the Microbiome do?

- ✓ Trains the immune system in early life
- ✓ Influences immune function throughout life
- ✓ Helps with digestion
- ✓ Keeps gut lining healthy
- ✓ Metabolites travel to heart, lungs, liver, kidneys & brain influencing many aspects of physical & mental health

Measuring the Microbiome



What affects the

Adult Microbiome?



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Diet and the Microbiome

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Redefining Fibre

A prebiotic has been defined as:

A selectively fermented ingredient that allows specific changes, both in the composition and/or activity in the gastrointestinal microflora that confers benefits upon host well-being and health

MACs = Microbiota-Accessible Carbohydrates

Fibre Types

Soluble Fibre

- Slows enzyme attack & carbohydrate breakdown – lowers GI
- Reduces cholesterol re-absorption
- Largely fermentable by colonic bacteria – prebiotic

Sources:

Legumes
Oats & barley
Fruit & veg flesh

Isolated/synthetic soluble fibres

Beta-glucan, Psyllium husk,
Guar gum, Locust bean gum,
Pectin, Hydroxypropyl
methylcellulose

Insoluble Fibre

- Bulking agent – efficient laxation agent
- Smaller % are fermentable

Sources:

Wheat bran, brown rice
Wholegrain breads & cereals
Flaxseed & edible seeds
Skin & edible stems of fruit & veg
Brazil nuts

Isolated/synthetic insoluble fibre:

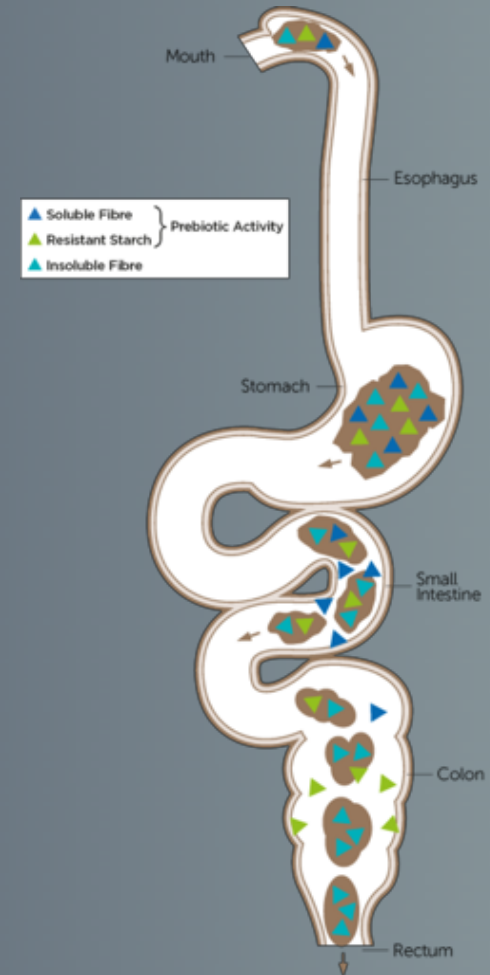
Cellulose

Resistant Starch

- Gold star fuel for colonic bacteria – prebiotic

Sources:

Legumes
Unripe bananas
Cooked & cooled pasta, rice, potatoes or wholegrains
Barley+, sorghum & millet
Raw oats
Cashew nuts
Hi-Amylose Maize
Starch



Effect of Low MAC Diet

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- Decline in overall bacterial diversity
- Promotes growth of mucin-degrading bacteria
 - Mucin-degrading specialists e.g. *Akkermansia muciniphila*
 - Mucin-degrading generalists e.g. *Bacteroides caccae*
- Irreversible loss of some bacterial strains - this gets worse over generations
- Specific immune pathways are affected
 - This was shown recently in patients with IBS
 - Increased susceptibility to infections
- Decreased epithelial integrity & increased gut permeability - translocation of bacterial products



Plant Food Diversity

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BERRIES

BLACK ELDERBERRY
BLACK CHOKEBERRY
BLACKCURRANTS
BLUEBERRIES
STRAWBERRIES
RASPBERRIES



SPICES

CLOVES
STAR ANISE
CAPERS
CURRY POWDER
GINGER
CUMIN
CINNAMON



FRUITS

POMEGRANATE
APPLE
PLUMS
BLACK GRAPES



VEGETABLES

GLOBE ARTICHOKE
RED CHICORY
RED ONION
SPINACH
BROCCOLI
CURLY ENDIVE



SEEDS

FLAXSEED



NUTS

CHESTNUTS
HAZELNUTS
PECANS
ALMONDS
WALNUTS



OLIVES

EVOO

Polyphenols



KEFIR



SAUERKRAUT



KIMCHI



KOMBUCHA



NATTO

Fermented Foods



YOGHURT



KVASS



PICKLES



MISO



TEMPEH

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Bone Broth

Probiotic Supplements



Low FODMAP + Probiotic

- RCT 104 patients with IBS - 4 groups
- Sham diet vs low FODMAPs - Probiotic vs Placebo
- Symptoms improved on low FODMAPs
- Bifidobacterium lower in low FODMAP group -
but increased with co-administration of probiotic



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Potential of Probiotics

- Suppression of pathogens
- Improvements of gut barrier function
- Immune modulation
- Production of signalling molecules to brain
- Perhaps play bigger role earlier in the gut

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The Future

- Personalised health including microbiome & DNA testing
- More specific targeted probiotics
- Dietary manipulation of microbiome
 - prebiotics & polyphenols
- Early life interventions to ensure development of healthy microbiome
- Dietitians key part of team!



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