



Welcome to today's webinar:

Your Presenter is Dr Wolfgang Marx
Your Facilitator is Andrea Salmon

1

Acknowledgement



We acknowledge and pay respect to the traditional custodians past and present on whose lands we meet today.

We acknowledge the deep feelings of attachment and the relationship of Aboriginal people to country and respect the cultural authority of the elders in each community.

Multiple Sclerosis Limited

2

Handouts

MS

Handouts have been sent separately.
If you didn't receive them please email
education@ms.org.au to request

The webinar recording and will be
available on our website: www.ms.org.au via the
Webinar library within 7 days.



Multiple Sclerosis Limited

3

Introduction to Presenters

MS

Multiple Sclerosis Limited

4

Informed Choice



This presentation has been prepared and is presented by an independent expert.

The views presented are not necessarily the views of Multiple Sclerosis Limited.

Individuals are encouraged to seek further advice regarding the relevance of the information presented for their situation.

Multiple Sclerosis Limited

5



Gut Health and Multiple Sclerosis

Dr Wolfgang Marx
Food & Mood Centre
Deakin University



A DEAKIN IDEA

6

Disclosures

- Joint funded by a research fellowship by Multiple Sclerosis Research Australia and Deakin University
- Previous industry funding from Cobram Estate Pty. Ltd.
- Consultancy funding from Nutrition Research Australia.
- Speakers honoraria from The Cancer Council Queensland and the Princess Alexandra Research Foundation.
- The Food & Mood Centre has received Grant/Research support from Fernwood Foundation, Wilson Foundation, the A2 Milk Company, and Be Fit Foods



A DEAKIN IDEA

7

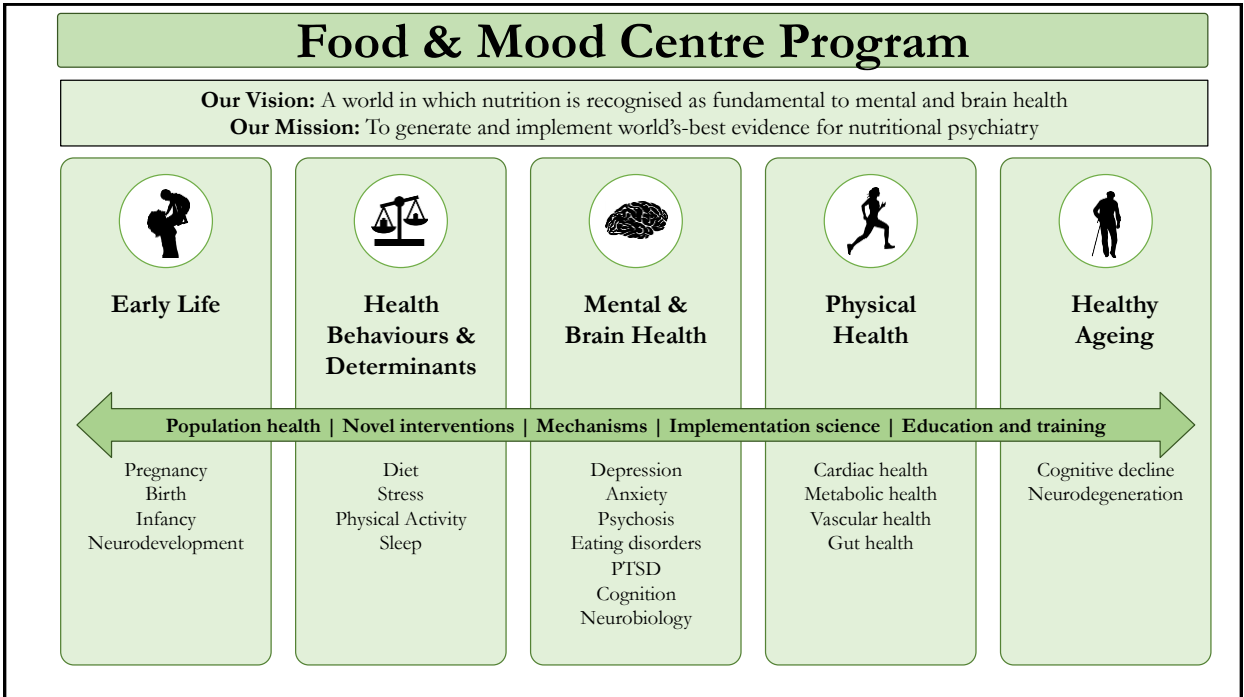


A DEAKIN IDEA

8



9



10

Overview

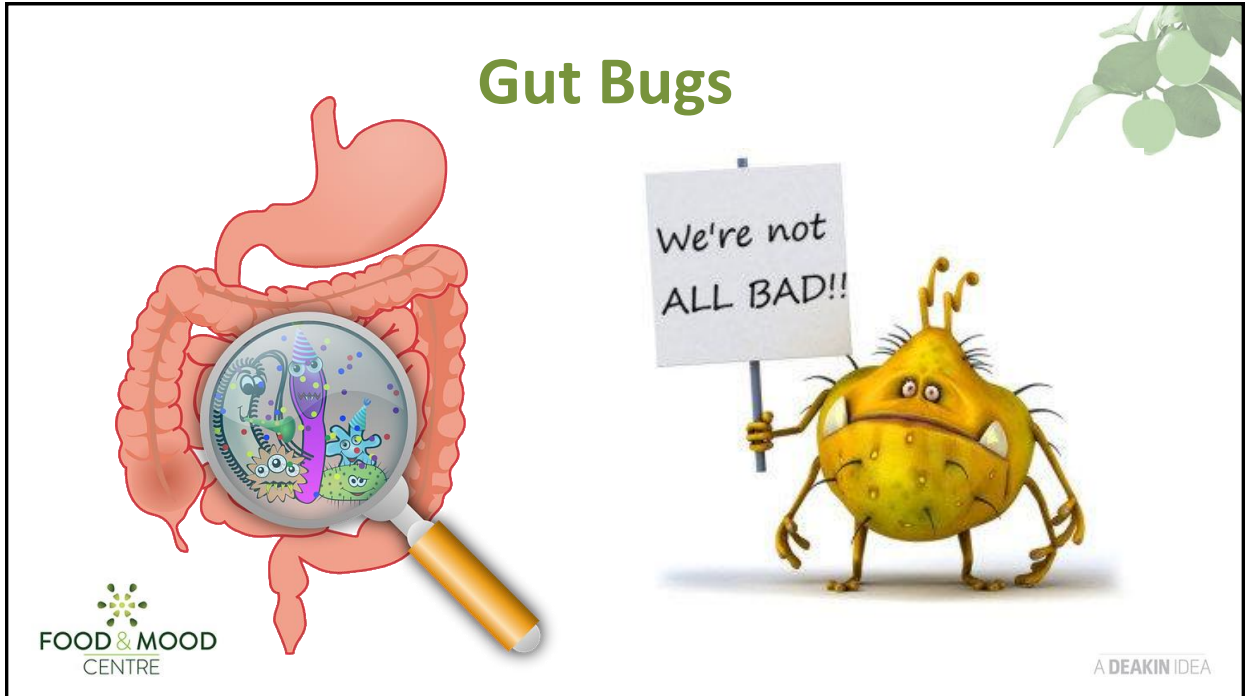


- The gut-brain axis
- Gut microbiome and multiple sclerosis
- Microbiome targeted interventions

The Gut-Brain Axis

How our guts and our brains are linked





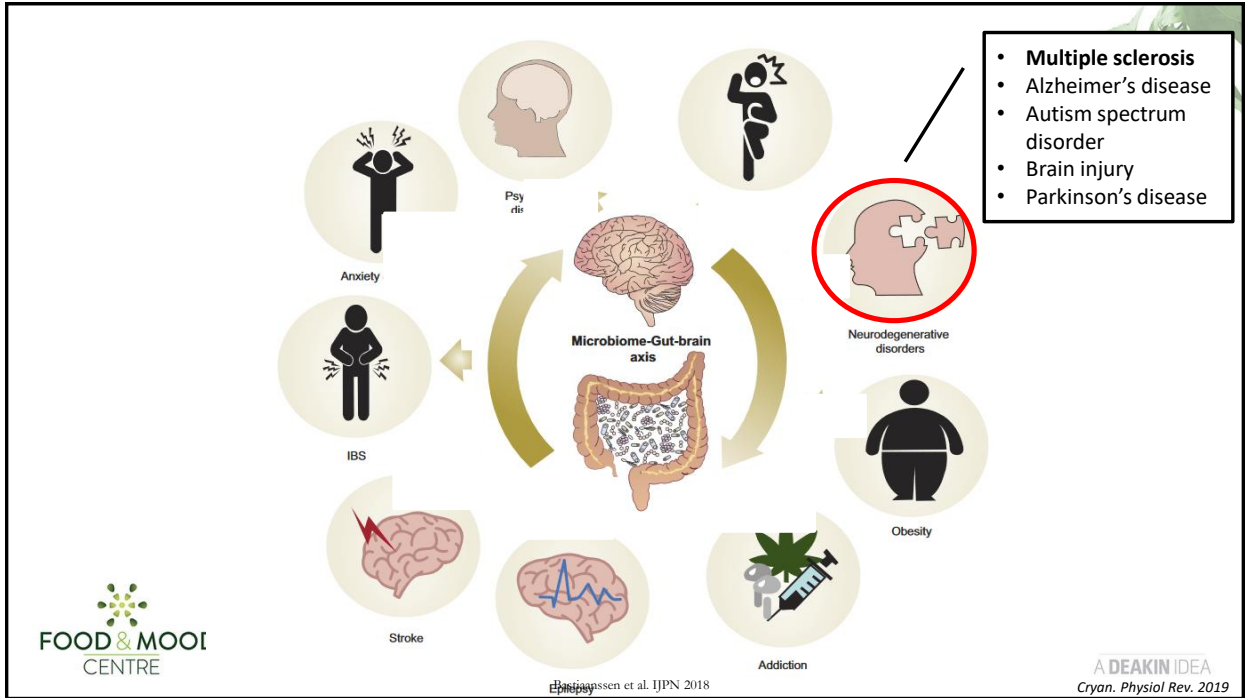
13

THE GUT MICROBIOTA

- Consists of tens of trillions of microorganisms (and more!)
- More than 3 million genes living exclusively in the gastrointestinal (GI) tract
- 100 times more bacterial genes than human genes
- Accounts for 50% of our total cell count

FOOD & MOOD
CENTRE
Image: Sonnenburg laboratory, Stanford Medicine (2017)

14



15

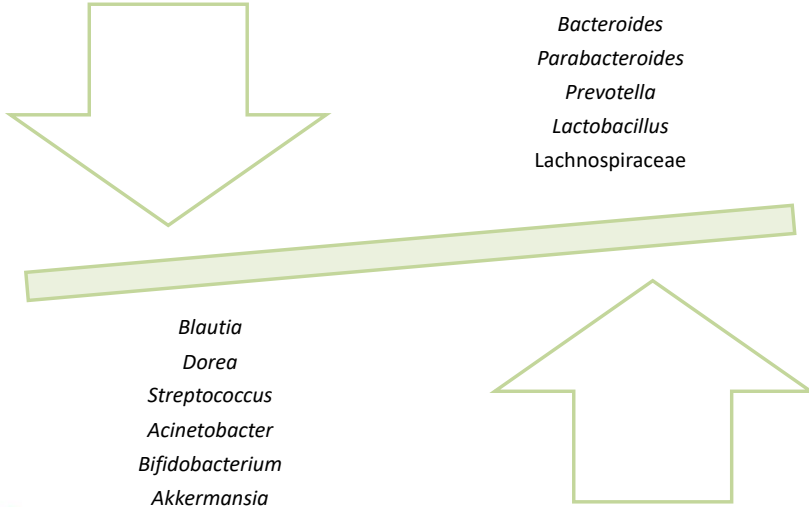
The gut microbiome and MS: What does the evidence say?

A DEAKIN IDEA

FOOD & MOOD CENTRE

16

Gut microbiome differences in MS



A DEAKIN IDEA
Chu et al, 2018

17

'GERM FREE MICE'



Altered myelination

Altered neuroinflammation



Altered levels of microglia

Altered Blood brain barrier

Altered immune system

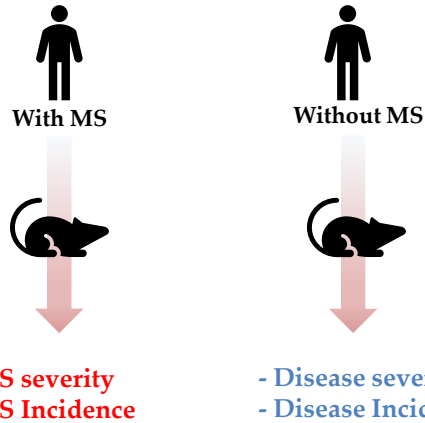


A DEAKIN IDEA

Braniste 2014. Erny 2015. Hsiao 2013. Dinan 2016

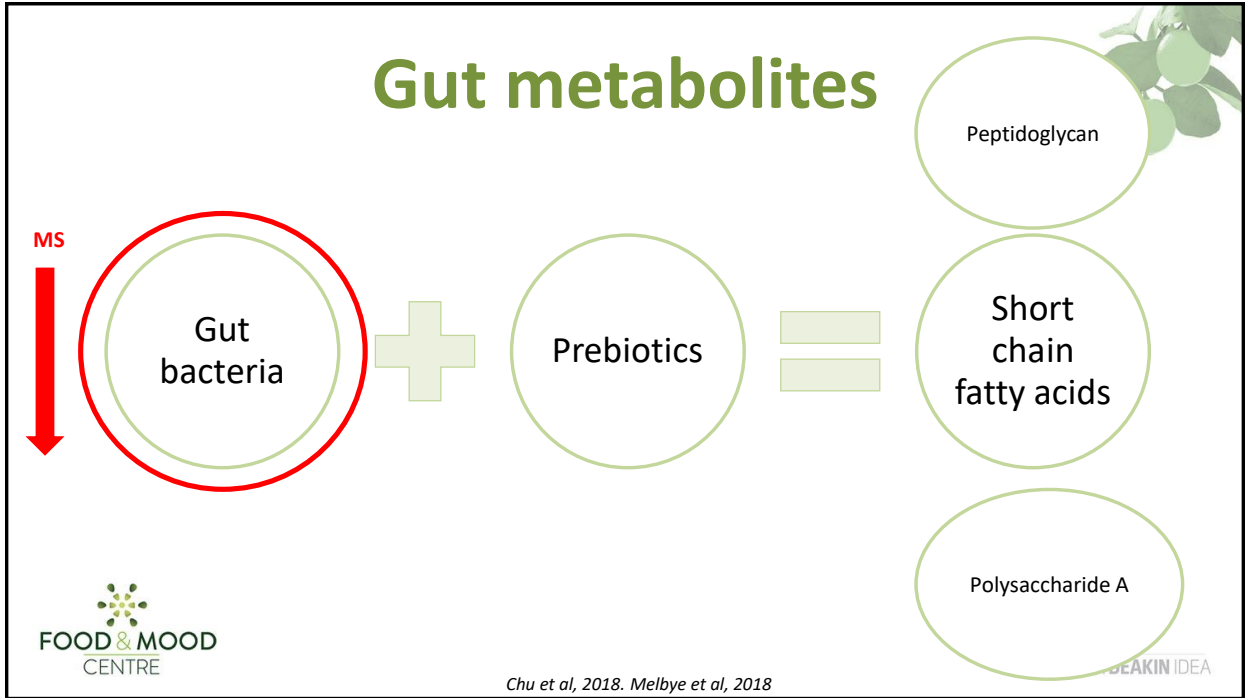
18

Gut microbiome transplant

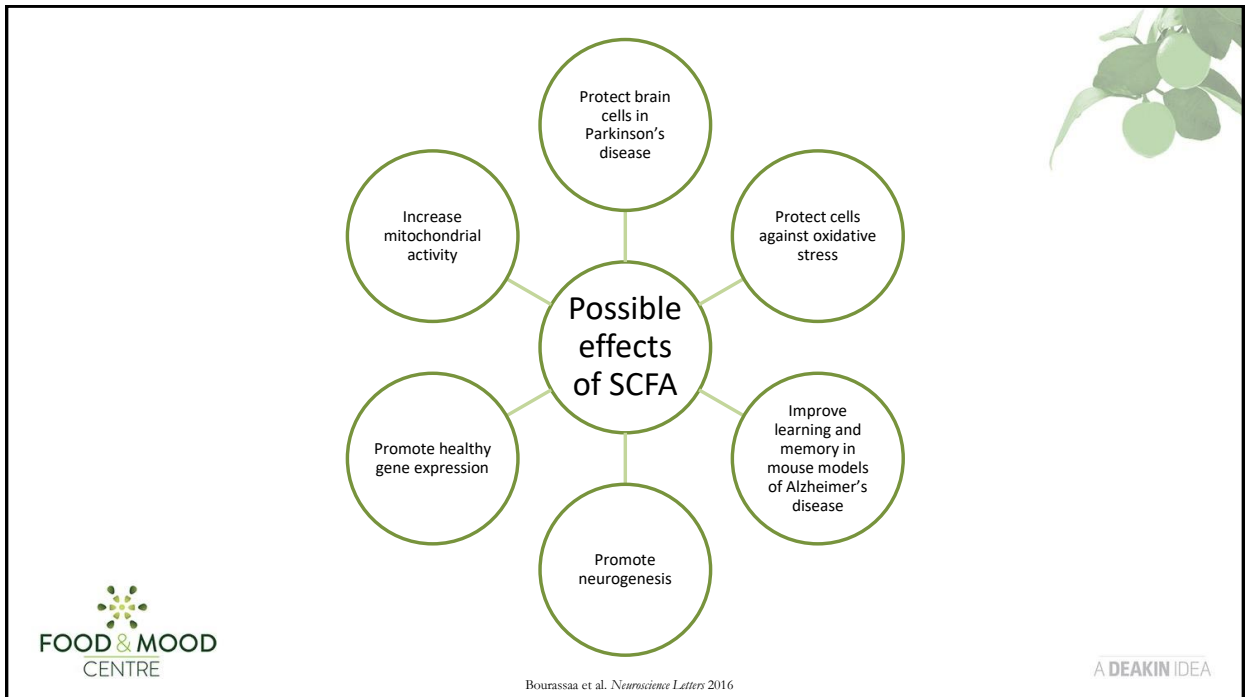


Probiotics vs Prebiotics

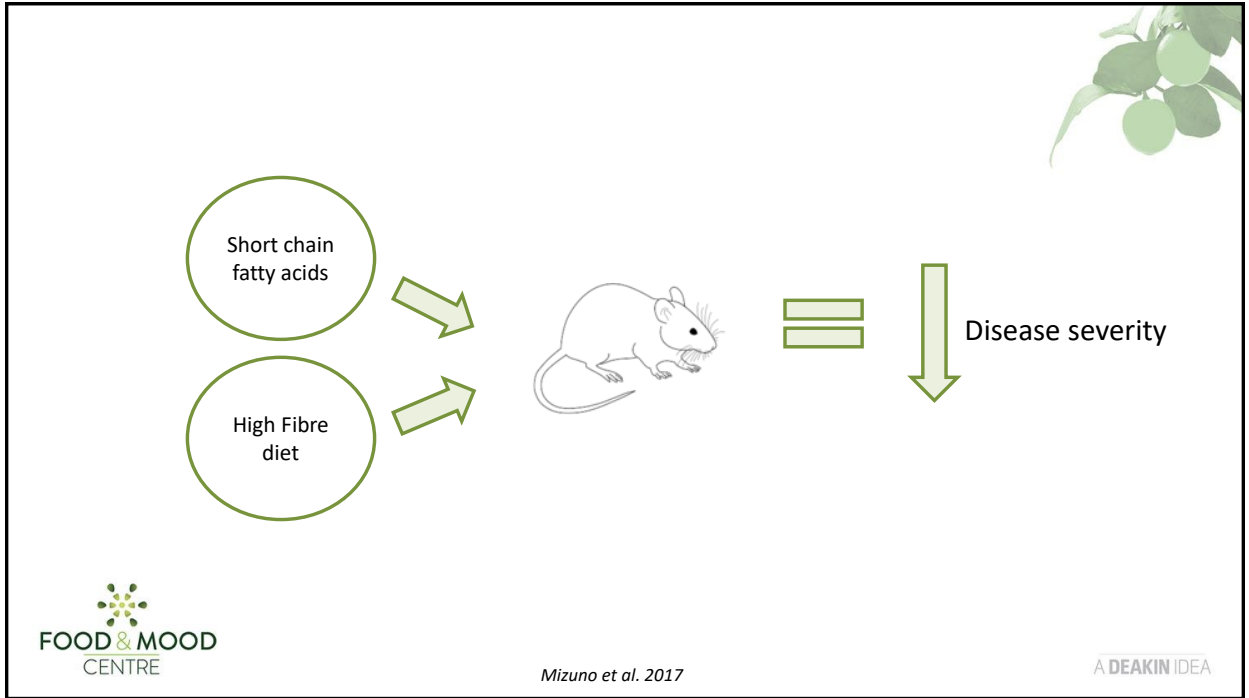
- Probiotics - deliver specific strains of bacteria that may influence gut microbiota composition and activity
- Prebiotics - “a substrate that is selectively utilized by host microorganisms conferring a health benefit”.
- Examples:
 - Dietary fibre
 - Polyphenols
 - Polyunsaturated fatty acids



21



22



23

Probiotic and MS

This section features three images related to probiotics. On the left, two glass jars of white yogurt. In the center, a glass jar of sauerkraut with a metal lid. On the right, two bottles of probiotic supplements: "INNER HEALTH ON THE GO" (30 capsules) and "BLACKMORES PROBIOTICS+ DAILY HEALTH" (30 capsules).

FOOD & MOOD CENTRE

A DEAKIN IDEA

24

Probiotics vs Prebiotics

- Probiotics - deliver specific strains of bacteria that may influence gut microbiota composition and activity
- Prebiotics - “a substrate that is selectively utilized by host microorganisms conferring a health benefit”.
- Examples:
 - Dietary fibre
 - Polyphenols
 - Polyunsaturated fatty acids



A DEAKIN IDEA
Gibson. *Nature reviews Gastroenterology & hepatology*. 2017

25

Probiotics in MS: Animal models

Bifidobacterium animalis
Lactobacillus casei



↓ inflammation
↓ progression
↓ symptoms
↑ anti-inflammatory



A DEAKIN IDEA

26

Probiotics in MS: Humans

Multi-strain
probiotics



↓ Symptoms
↓ Inflammation
Antioxidant status

Probiotics tips

- Look for expiry date
- Refrigerated or “enteric coated”
- Efficacy of particular strains is not well-known
- Rule of thumb: >1 billion colony-forming units (or “CFU”) per day.
- Missing other nutrients that probiotic food provides
- High doses can result in GI symptoms

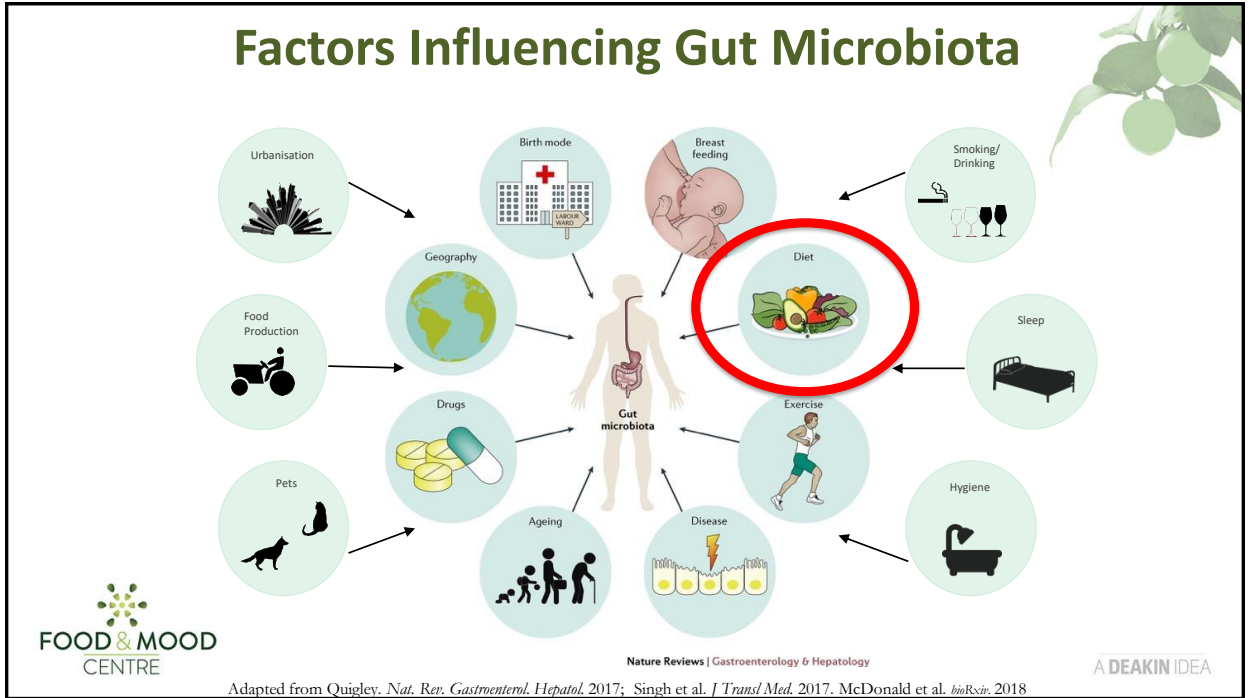
Tryptophan metabolism



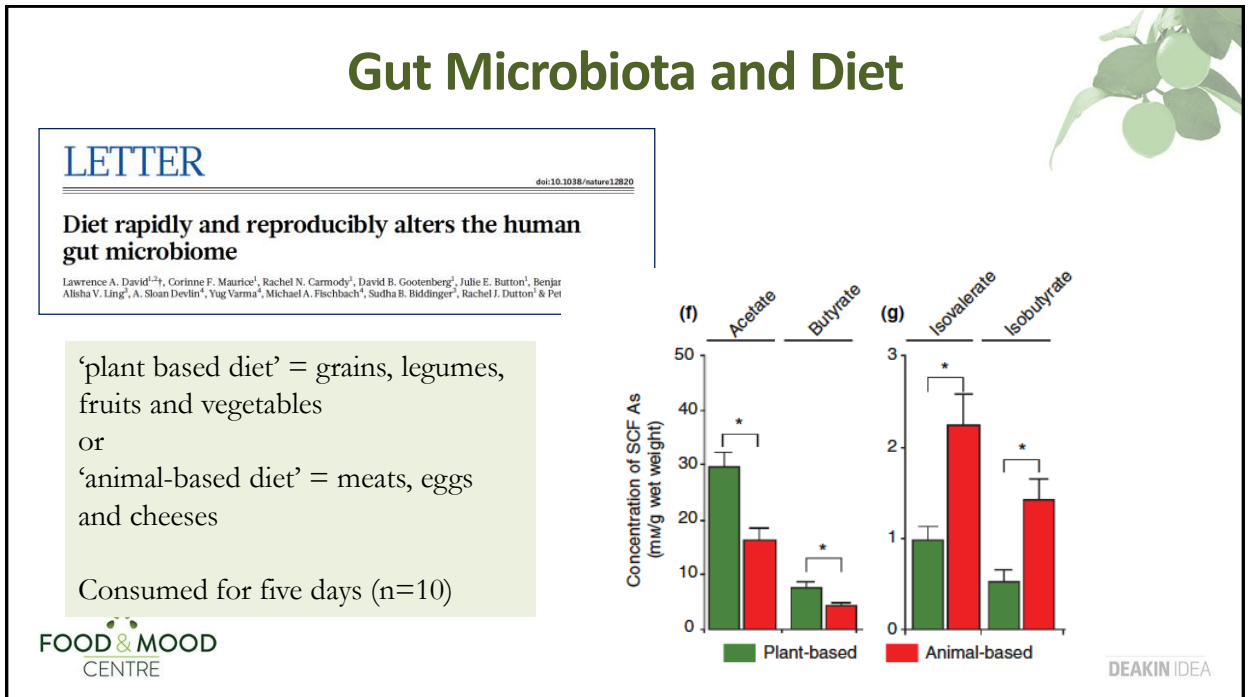
Pre/probiotics and tryptophan metabolism?



- Thirteen studies included
 - Eleven of the 13 total studies reported that pre or probiotic interventions significantly altered at least one kynurenine metabolite.
- Meta-analysis
 - Significant increase in 2 metabolites
- Preliminary evidence
 - Few studies conducted with prebiotics
 - None conducted in people with MS
 - Probiotics might modulate the kynurenine pathway



31



32

Feed your microbiota



Fermented foods

Yoghurt, kefir, sauerkraut

Fibre

Gut microbes preferred fuel source → SCFA

Colourful foods

Rich in antioxidants and polyphenols

Prebiotic foods

Onions, leeks, garlic, asparagus, bananas

Resistant starch

Oats, legumes, cooked and cooled rice, potatoes and pasta

~~Processed, salty, high fat foods~~

33

Fermented foods



- Some have high sugars, preference for low sugar alternatives
 - Aim for 5-10grams per 100 grams
- Look for those that state live active cultures or even better, label the strain and dose
- Not all FODMAPs friendly
- Do it yourself!



34

Feed your gut

Vegetables, fruits and nuts

- Aim to include vegetables at each meal
- Select fruits, vegetables and nuts as snacks



Feed your gut

Legumes, fish and olive oil

- Aim to eat beans, lentils (legumes) 2-3 times per week
 - Eat oily fish at least 2 times per week
- Use extra virgin olive oil as the main fat in your diet



Special foods for special occasions

Sweets, high fat foods, processed foods



Summary



- Results are exciting but preliminary
- General healthy eating advice applies
- Prebiotics and Probiotics may be beneficial but much more evidence is needed
- New knowledge is rapidly developing!




Email: wolf.marx@Deakin.edu.au
 @marx_wolf

@foodmoodcentre
 @IMPACTDeakin




39



Microbiome testing





Should I test my gut microbes to improve my health?
 March 16, 2020 5:50am AEDT

www.theconversation.com

Authors

-  **Amy Loughman**
Research Fellow, Deakin University
-  **Heidi Staudacher**
Postdoctoral Research Fellow, Food & Mood Centre, Deakin University

40

Thank you



MS Connect
1800 042 138

msconnect@ms.org.au

Please stay on after this webinar to complete a
short survey.

Multiple Sclerosis Limited