



32ND NATIONAL CONFERENCE
DIETITIANS ASSOCIATION OF AUSTRALIA
DIETITIANS DRIVING CHANGE
PERTH, WESTERN AUSTRALIA 13-16 MAY 2015

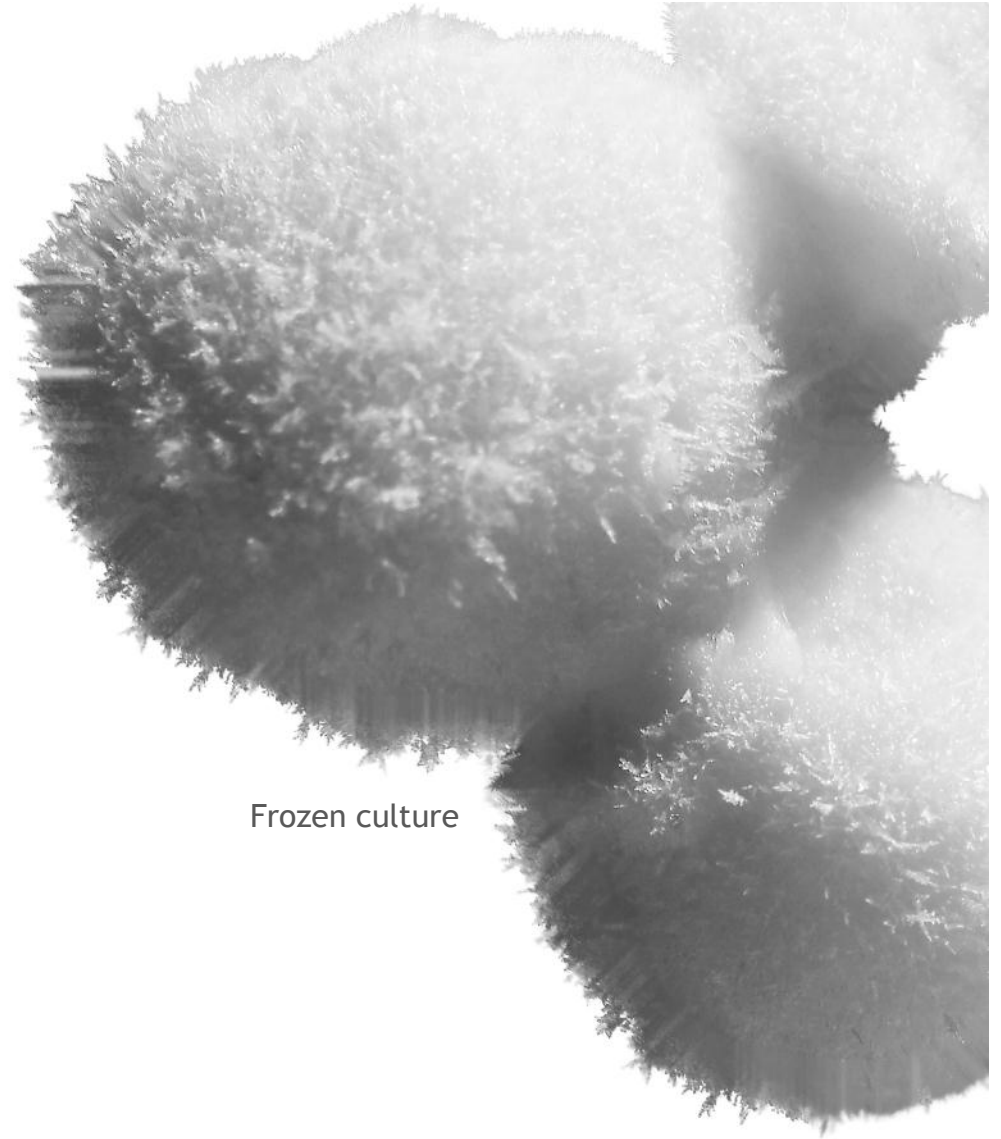
Why Choose a Probiotic Yoghurt?

Duncan Hamm
*Regional Industry Technical Manager, APAC
Cultures & Enzymes Division
Chr. Hansen Singapore*



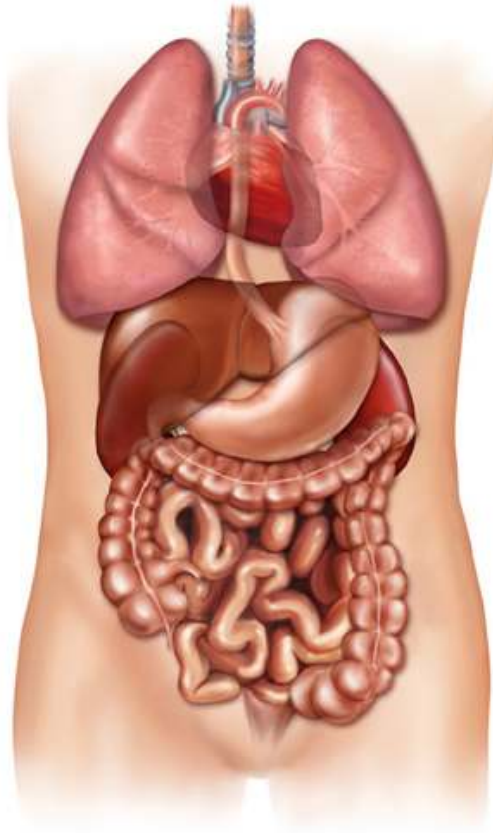
Agenda

- ▶ Introducing the human microbiome
- ▶ Probiotics and the human microbiome
- ▶ Why choose a probiotic yoghurt?



Frozen culture

Part I: Introducing the human microbiome



The human

- ▶ 1 species
- ▶ 37 trillions cells
- ▶ Encoded by 23.000 human genes

The human microbiome

- ▶ Up to 1500 different species
- ▶ 100 trillions cells
- ▶ >3 million non-human genes

The bacteria within us

The human microbiome

■ What is it?

All microorganisms in and on the human body
Contains bacteria, fungi, viruses and protozoa
Some researchers consider the microbiome 'a new organ'

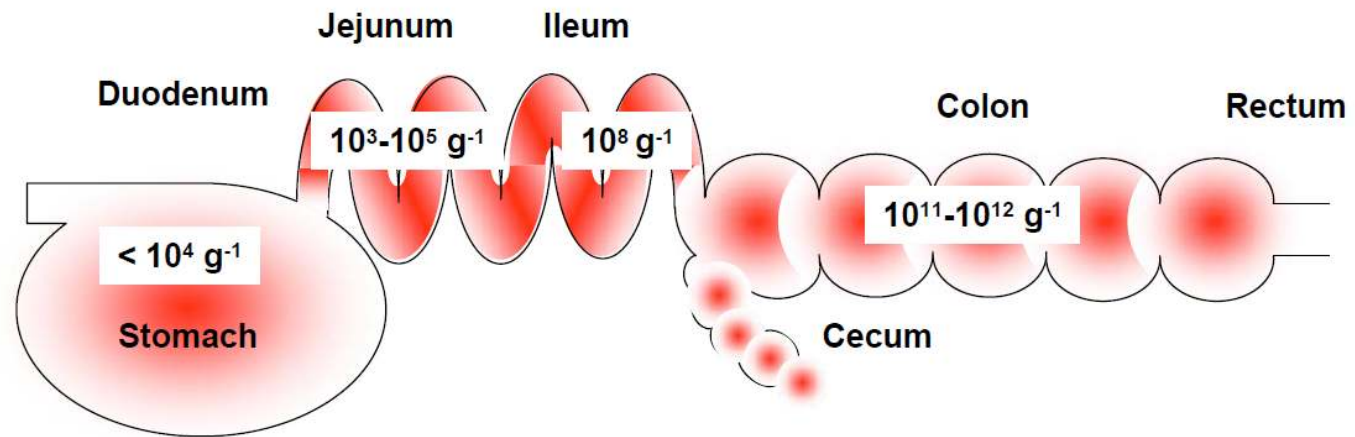
■ Why is it relevant?

Many diseases are associated with changes of the microbiome:
diarrhea, IBS, IBD, obesity, diabetes, atopic dermatitis, bone health, dental health and many others

■ Where is it relevant?

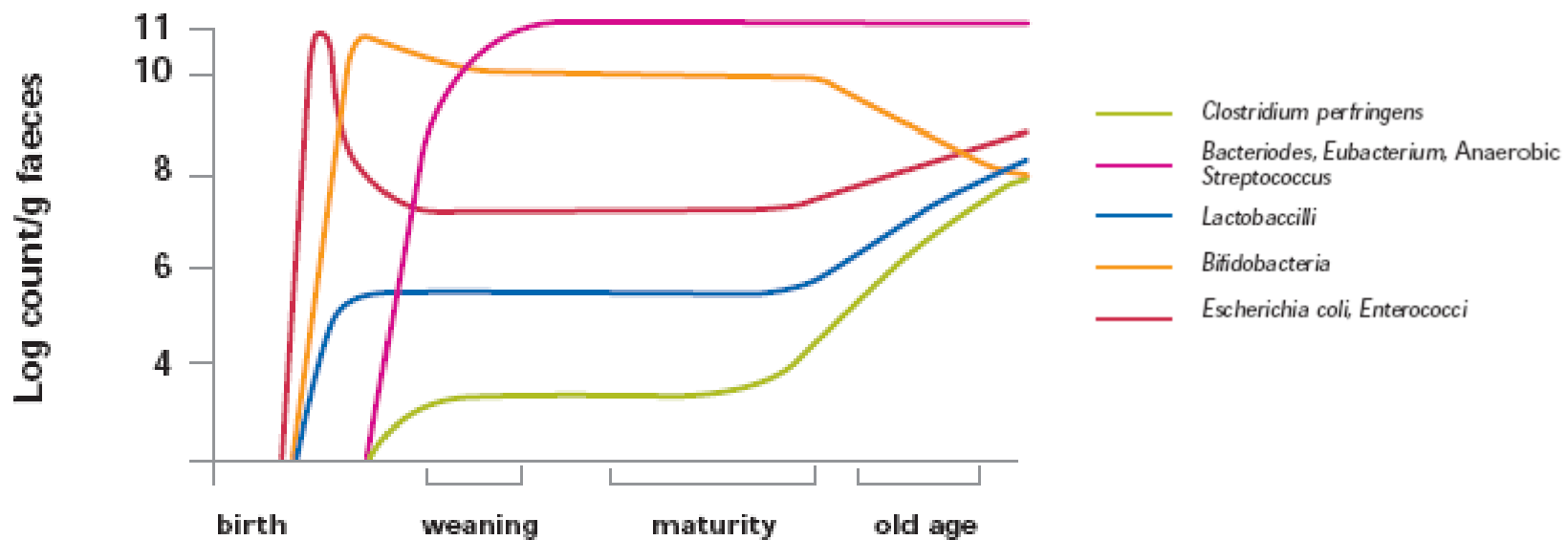
Microbiome has potential to provide therapeutic drugs and new probiotic species and strains used as food ingredient, food supplement, in lotions etc.

Relative bacterial population through digestive tract



pH	1.5–2.5	5–6	6–6.5	6–8
O ₂ (μmol l ⁻¹)	100–150	60–130	20–100	10–80
Bile (mM)	10	1		
Flow	1–4 h			24–48 h
Nutrients	Fluctuating			Stable
Diversity		Low		High
Stability		Low		High

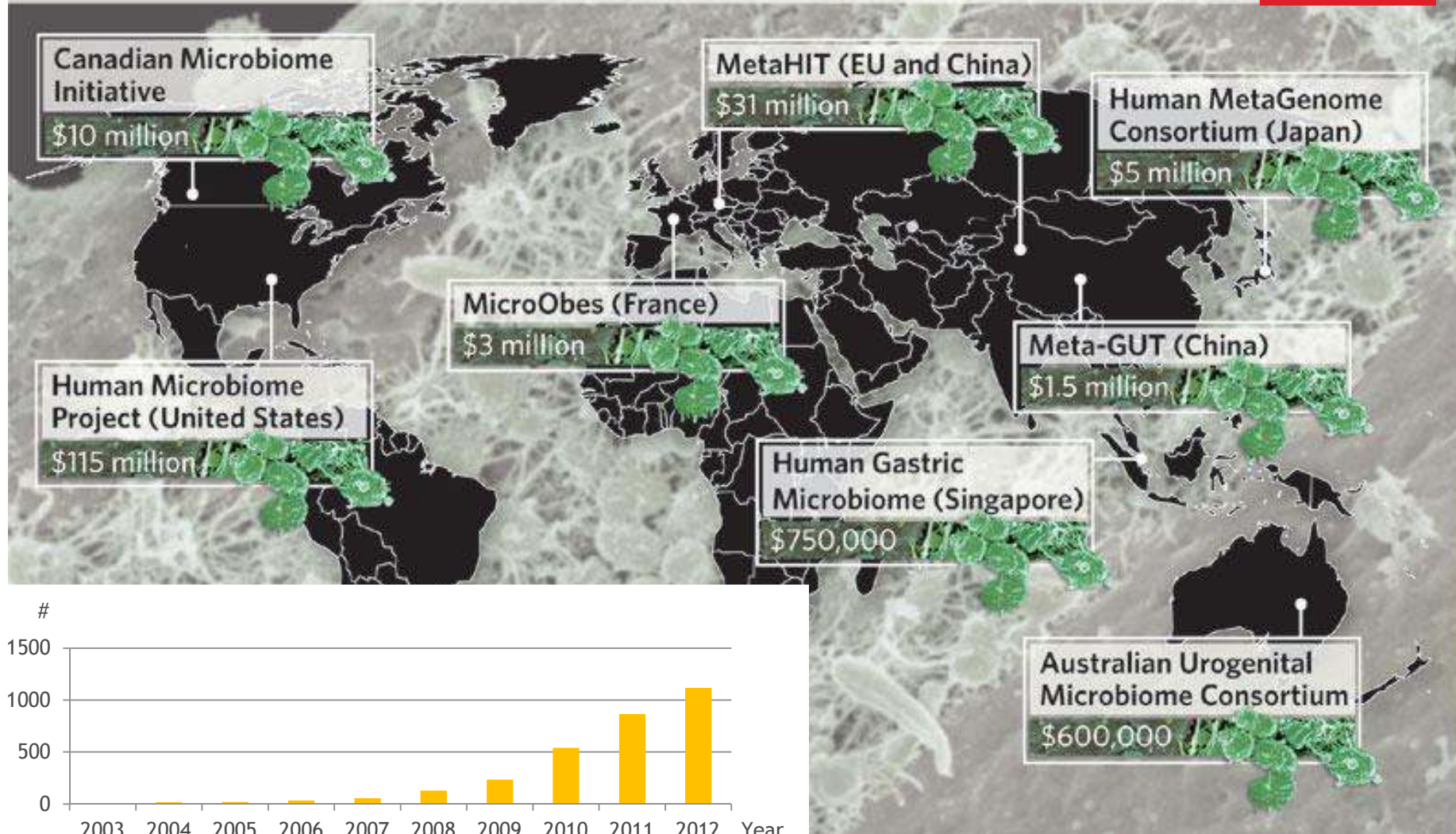
The development of The gastrointestinal microbiota



Source: Mitsuoka, T. (1990). *Bifidobacteria and their role in human health*. *Jnl Ind. Micro.*, 6 263-268

THE PROLIFERATION OF HUMAN MICROBIOME PROJECTS

nature



Publications related to the microbiome

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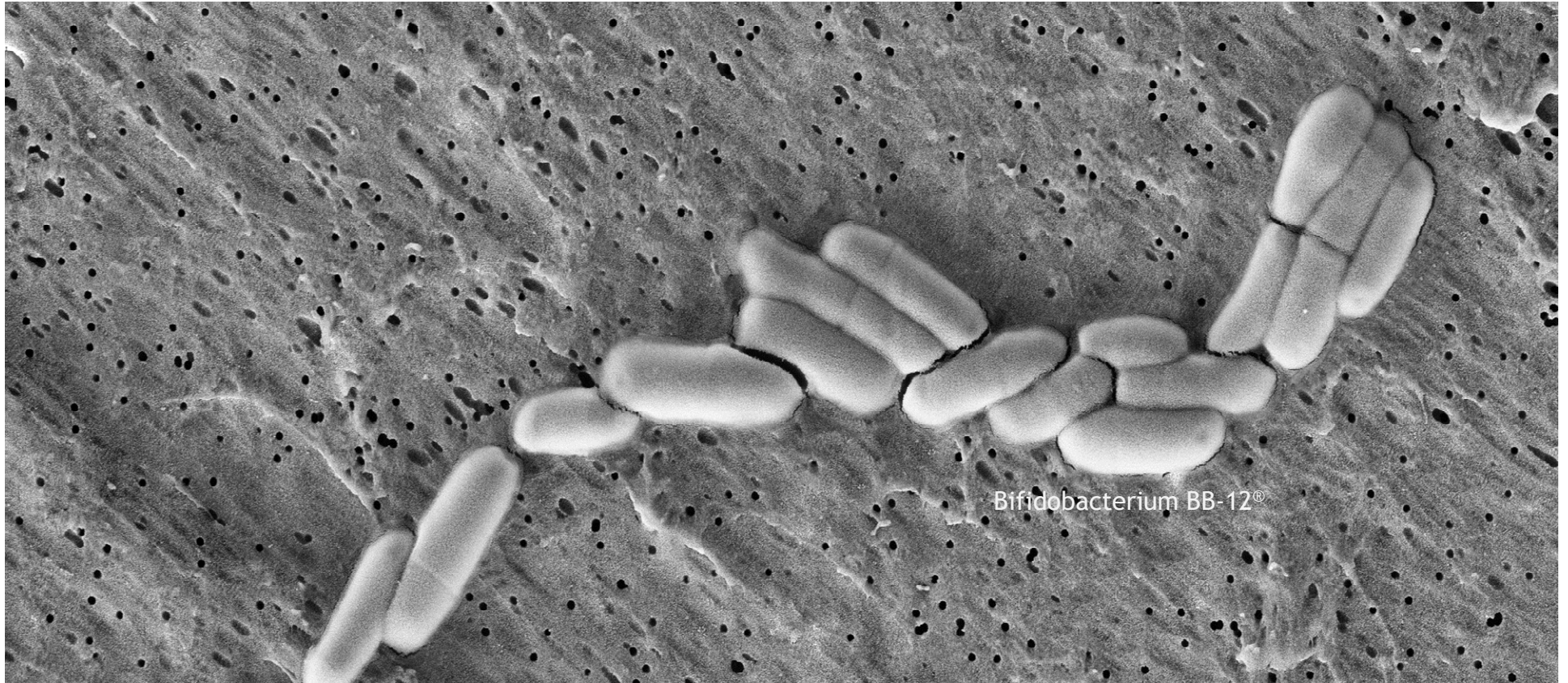
The human microbiome in the popular press



The human microbiome -
me, myself, us
The Economist,
18 August 2012

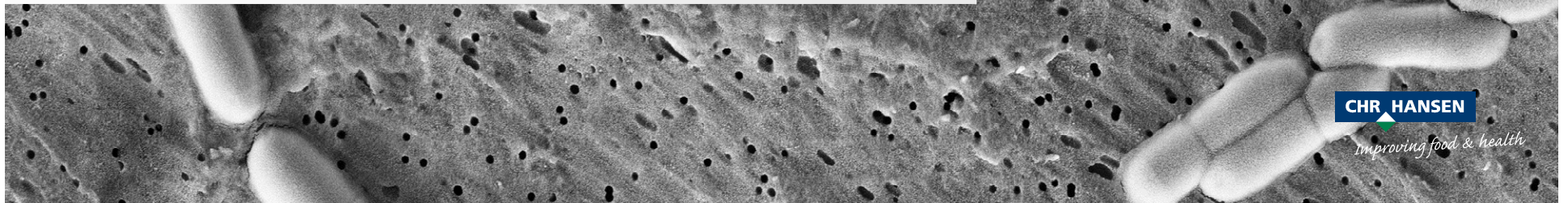


Germs are us
The New Yorker,
22 August 2012



Bifidobacterium BB-12®

Part II: Probiotics and the human microbiome



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What are probiotics?

- Definition “**Live** microorganisms which when administered in **adequate amounts** confer a **health benefit** on the host” [FAO/WHO 2001]
- ‘Probiotic’ means “for life” [Derived from Greek language]
- Generally bacteria but can be yeast, e.g.
Lactobacilli spp.
Bifidobacteria spp.
Saccharomyces boulardii
- By ingesting probiotics the gastro-intestinal microbiota is beneficially affected

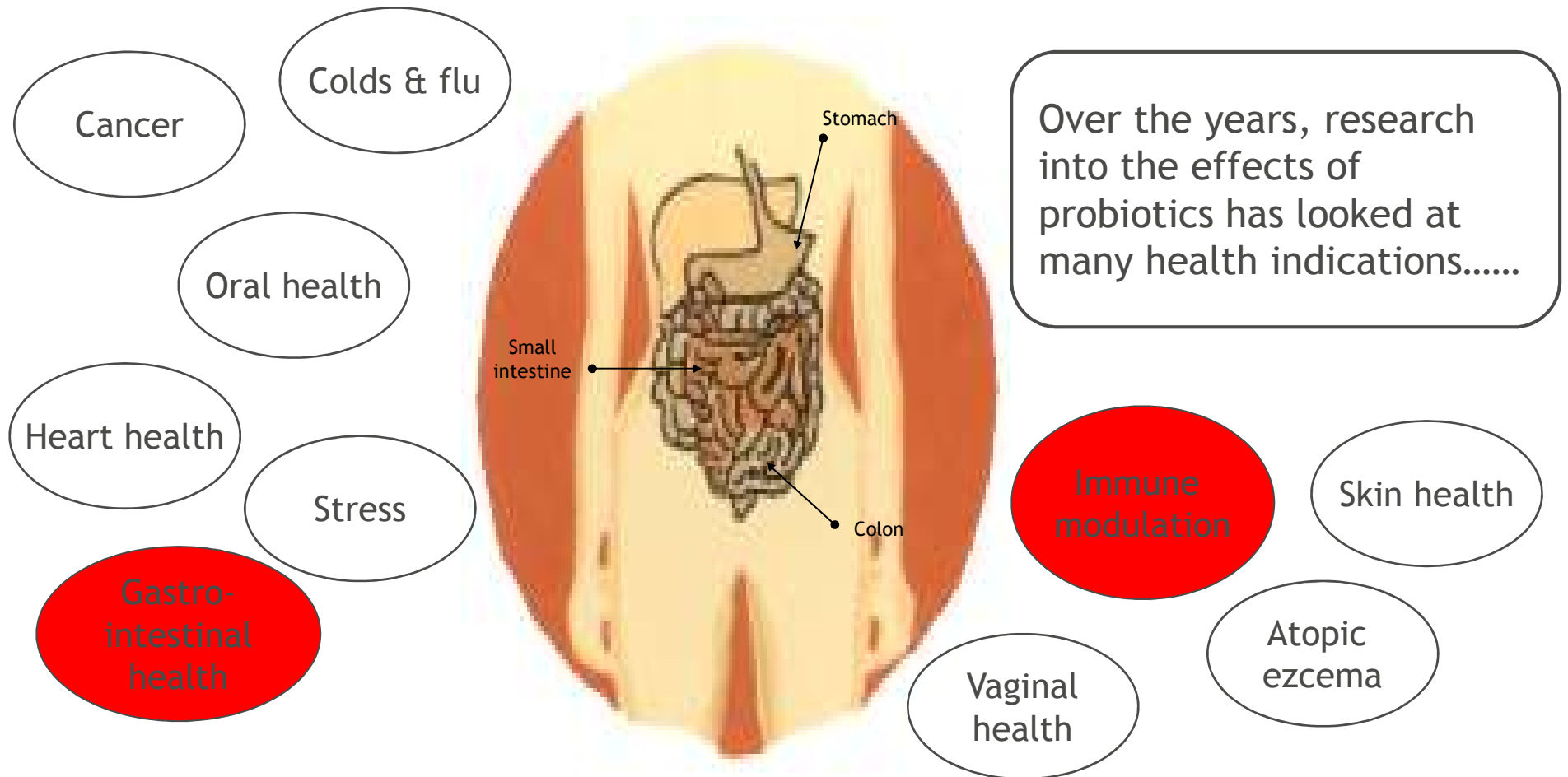


Frozen probiotics

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Areas of probiotic research...



....however, most significant documentation is within ***gastrointestinal and immune areas***

Epithelial anatomy and functions



Nutrient uptake and retention

- Carbohydrates
- Amino acids
- Lipids
- Water/electrolytes

Exclusion of microbes

- Epithelial renewal/gut motility
- Mucus production
- Cell junctions
- IgA
- Antimicrobials

Neutralization of microbes/chemicals

- Innate and adaptive immune response
- Detoxification

Probiotic mechanisms



Pathogen inhibition

- Compete with pathogens
- Produce antimicrobial compounds
- Lower pH by production of lactic acid and SCFA

Barrier function enhancement

- Strengthen tight junctions
- Reduce cell death
- Enhance mucus layer
- Increase production of mucosal IgA and defensins

Immune interactions

- Increase antibody production
- Modulate immune signaling and cell activity
- Induce phenotype change in dendritic cells

Presence of history

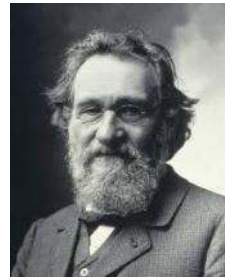
Kefir, yoghurt and other fermented products have been consumed for ages



1857: Pasteur discovers lactic acid bacteria



1874: Chr. Hansen is established



1908: Metchnikoff suggests health benefits of lactic acid bacteria



1935: First commercial product with lactic acid bacteria launched in Asia



Jalna was the first company in Australia to introduced 'aB' probiotics from early 1970's and later added 'c' probiotic strain in mid 1990's

1965: The term **probiotic** is used for the first time

1850

1900

1950

2000

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Part III: Why choose a probiotic yoghurt?



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”...clinical use of probiotics should focus on matching the probiotic strain and dosage to the condition for which it has shown benefit in clinical trials.”

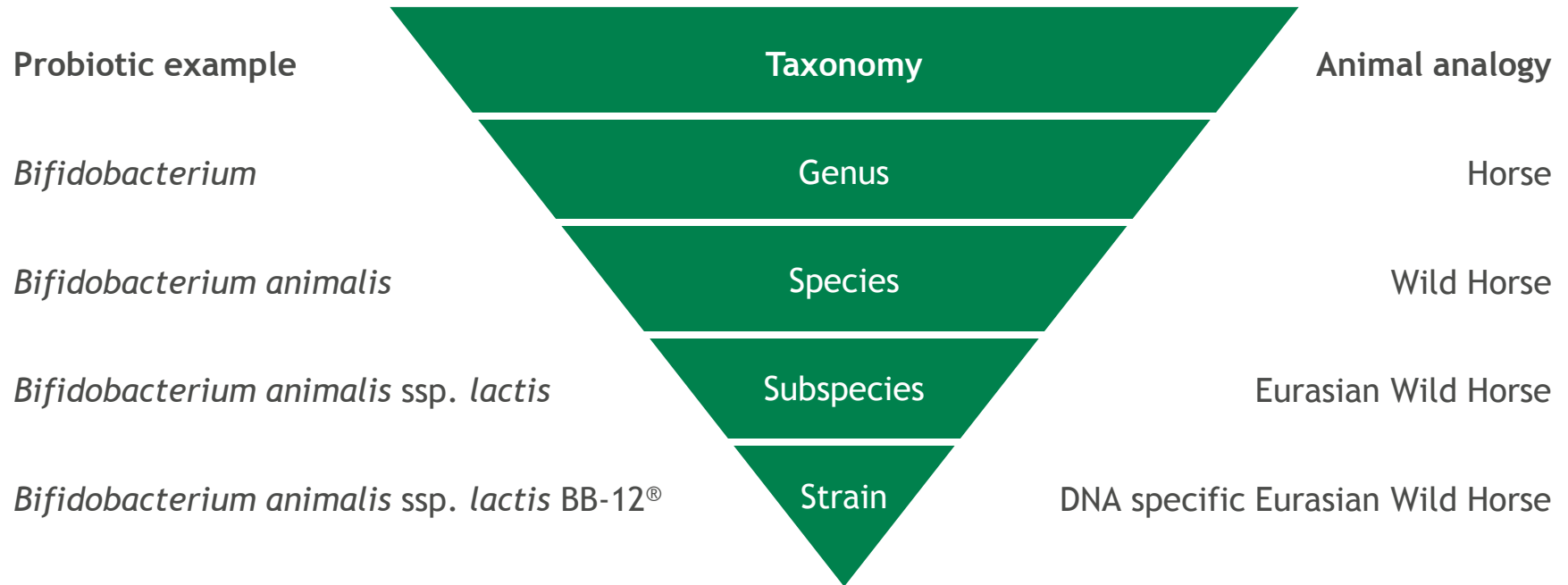
Matthew Ciorba, MD

In a review from September 2012:

A gastroenterologist's Guide to Probiotics

Clin Gastroenterol Hepatol 2012;10(9):960-68

Strain specificity



*Not just any
bacteria will do!*



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*”...the probiotic effect
seems to be
strain specific”*





World Health Organization



*“It is important to note
that the effects are
strain specific”*

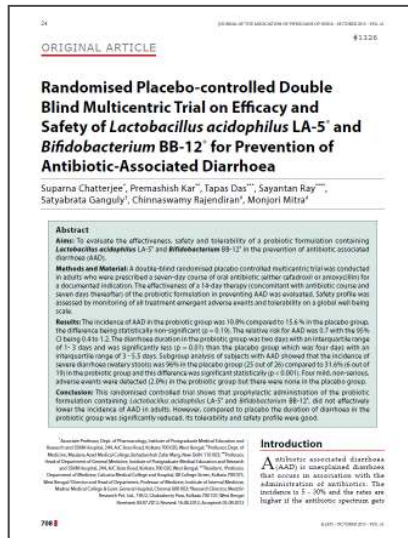


Chr. Hansen probiotics offer robust Documentation in these areas

	Gastrointestinal health	Bifidobacterium BB-12®
		Bifidobacterium BB-12® + Lactobacillus acidophilus LA-5®
	Immune support	Lactobacillus paracasei ssp. paracasei, L. casei 431®

Example of LA-5[®] documentation

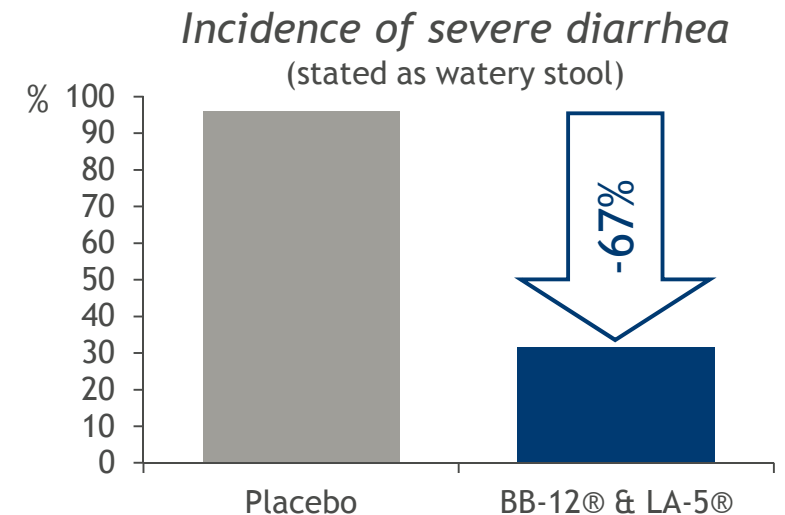
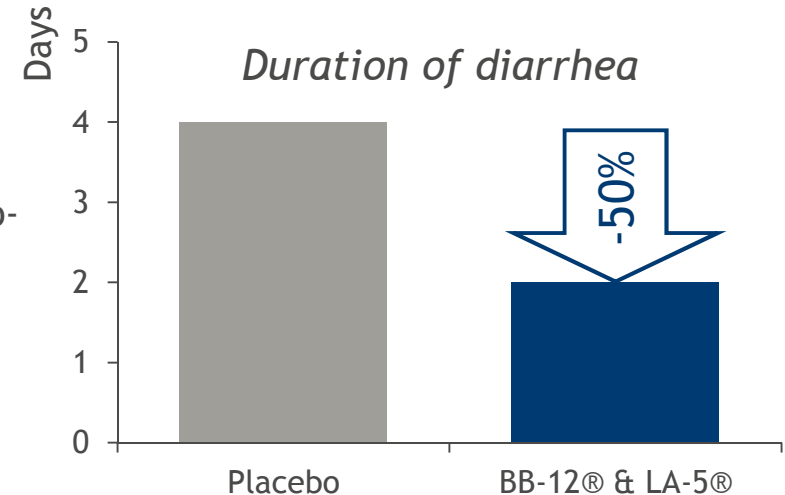
Used in combination with BB-12[®] for digestive health



Chatterjee 2013

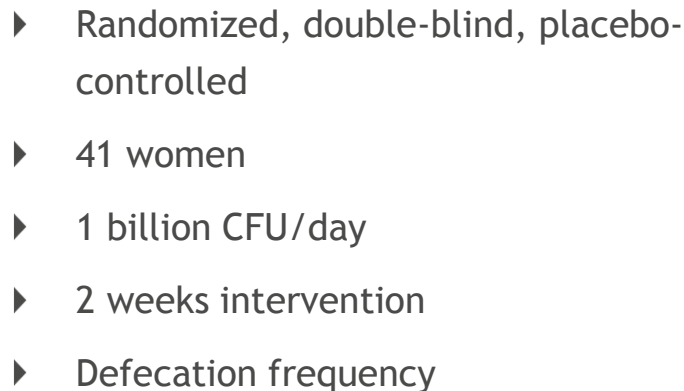
Design

- ▶ Randomized, double-blind, placebo-controlled
- ▶ 343 Indian adults
- ▶ 4 billion CFU/day in capsules
- ▶ 2 weeks duration. First week with concurrent antibiotic treatment
- ▶ Primary endpoints
 - ▼ Incidence of diarrhea
 - ▼ Duration of diarrhea
 - ▼ Severity of diarrhea

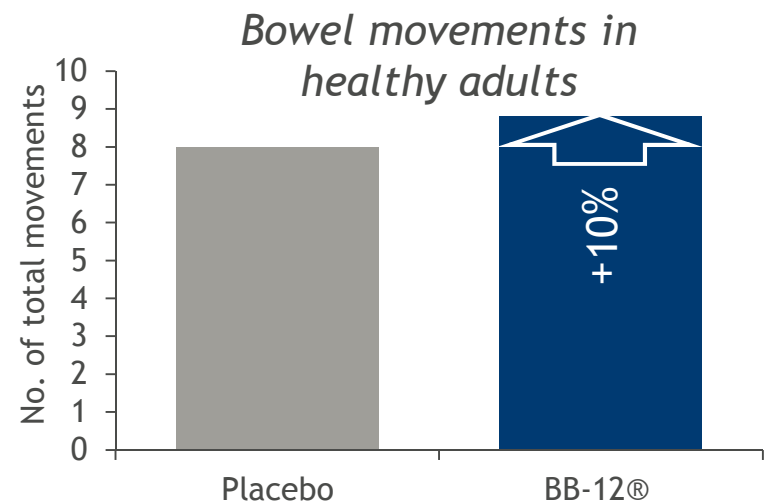


Pitkälä et al. 2007

- ▶ Randomized, double-blind, placebo-controlled
- ▶ 209 elderly living in residential homes
- ▶ 1 billion CFU/day
- ▶ 7 months intervention
- ▶ Bowel movements assessed



Uchida et al. 2005



Review

The Science behind the Probiotic Strain *Bifidobacterium animalis* subsp. *lactis* BB-12[®]

Mikkel Jungersen ^{1,*}, Anette Wind ^{2,†}, Eric Johansen ^{2,†}, Jeffrey E. Christensen ^{3,†},
Birgitte Stuer-Lauridsen ^{2,†} and Dorte Eskesen ^{1,†}

¹ Scientific Affairs, Chr Hansen A/S, Hørsholm DK-2970, Denmark;

E-Mail: dkdoe@chr-hansen.com

² Cultures and Enzymes Division-Innovation, Chr Hansen A/S, Hørsholm DK-2970, Denmark;

E-Mails: dkawi@chr-hansen.com (A.W.); dkejo@chr-hansen.com (E.J.);

dkbsl@chr-hansen.com (B.S.-L.)

³ Health and Nutrition Division-Innovation, Chr Hansen A/S, Hørsholm DK-2970, Denmark;

E-Mail: dkjyc@chr-hansen.com

[†] These authors contributed equally to this work.

* Author to whom correspondence should be addressed; E-Mail: dkmkj@chr-hansen.com;

Tel.: +45-22572678.

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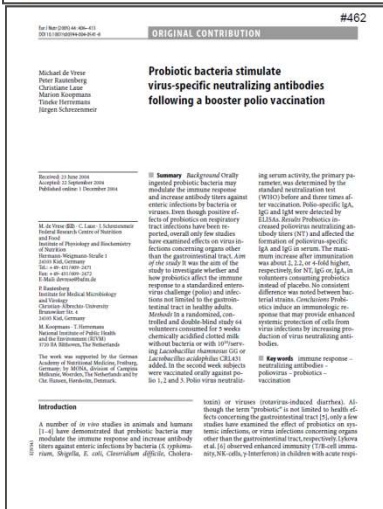
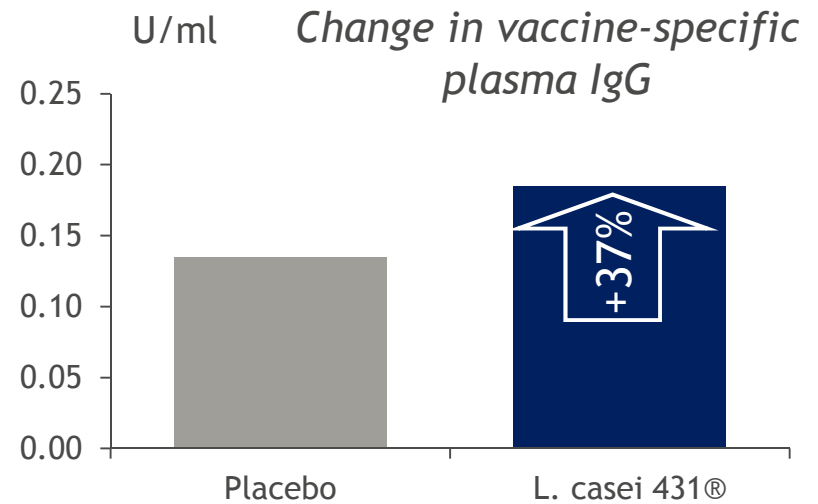
Abstract: This review presents selected data on the probiotic strain *Bifidobacterium animalis* subsp. *lactis* BB-12[®] (BB-12[®]), which is the world's most documented probiotic *Bifidobacterium*. It is described in more than 300 scientific publications out of which more than 130 are publications of human clinical studies. The complete genome sequence of

Focus on immune response

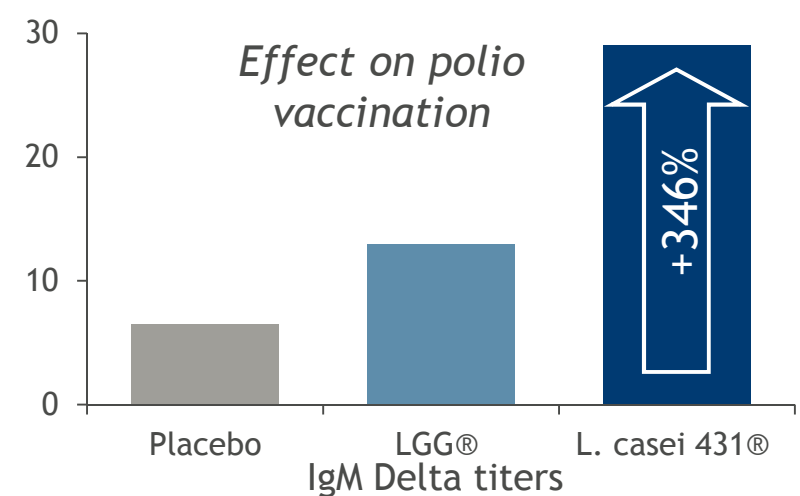
Rizzardini et al. 2011



- ▶ Randomized, double-blind, placebo-controlled
- ▶ 211 healthy adults
- ▶ 1 billion CFU/day of BB-12® in a capsule or L. casei 431® in an acidified dairy drink
- ▶ 6 weeks intervention. Two weeks prior to influenza vaccination followed by 4 weeks



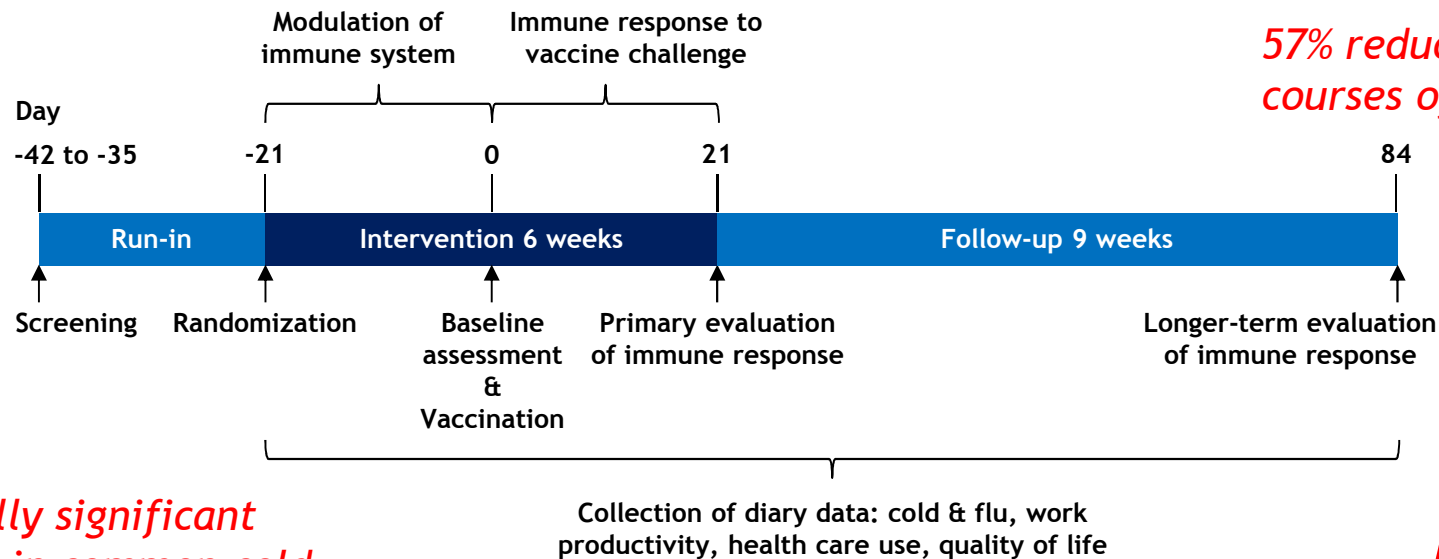
- ▶ Randomized, double-blind, placebo-controlled
- ▶ 64 healthy adults, 20-30 years
- ▶ 10 billion CFU/day of LGG® or L. casei 431®
- ▶ 5 weeks intervention. 1 week prior to poliovirus vaccination followed by 4 weeks



de Vrese et al. 2005

Examples of L. casei 431® documentation

Very latest research



57% reduction in # courses of antibiotics

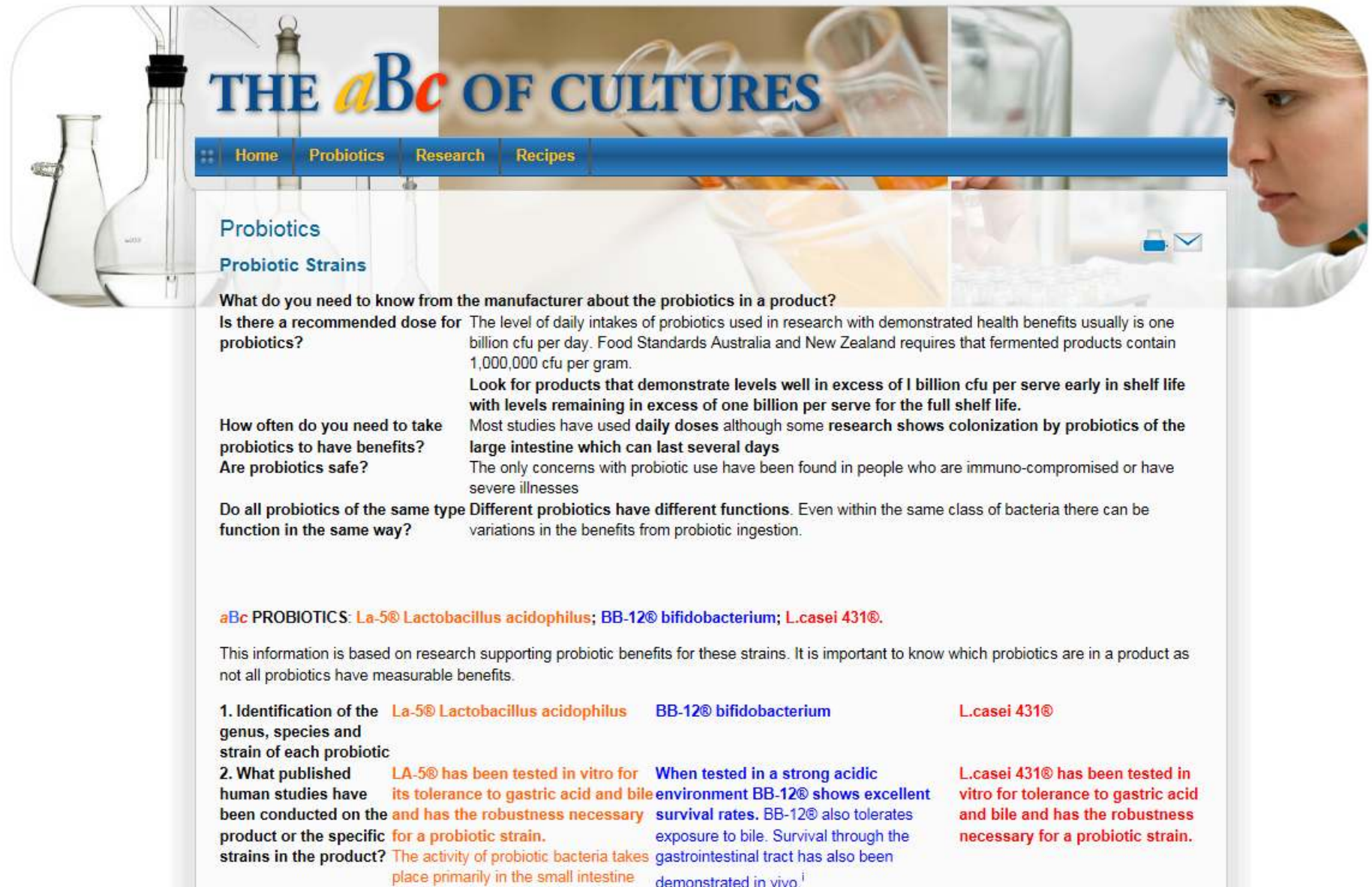
Statistically significant reduction in common cold and influenza-like symptoms

Illness	Weeks	Placebo mean (SD)	L. casei 431 mean (SD)
Common cold	1 - 3	7.3 (9.7)	6.4 (6.1)
	4 - 6	6.8 (7.1)	6.1 (9.5)*
ILI	1 - 3	7.8 (13.8)	7.2 (7.2)
	4 - 6	8.1 (10.5)	4.8 (3.1)*

		L. casei 431 (n=551)	Placebo (n=547)	P value
Use of Systemic Antibiotics	Number of subjects (%)	21 (3.8%)	31 (5.7%)	0.15
	Number of courses	22	38	0.036

Jespersen, L et al. 2015 Effect of Lactobacillus paracasei subsp. paracasei, L. casei 431 on immune response to influenza vaccination and upper respiratory tract infections in healthy adult volunteers: a randomized, double-blind, placebo-controlled, parallel-group study. Am J Clin Nutr April 2015

For further reading...



THE aBc OF CULTURES

Home Probiotics Research Recipes

Probiotics

Probiotic Strains

What do you need to know from the manufacturer about the probiotics in a product?

Is there a recommended dose for probiotics? The level of daily intakes of probiotics used in research with demonstrated health benefits usually is one billion cfu per day. Food Standards Australia and New Zealand requires that fermented products contain 1,000,000 cfu per gram.

Look for products that demonstrate levels well in excess of 1 billion cfu per serve early in shelf life with levels remaining in excess of one billion per serve for the full shelf life.

How often do you need to take probiotics to have benefits? Most studies have used **daily doses** although some **research shows** colonization by probiotics of the **large intestine which can last several days**

Are probiotics safe? The only concerns with probiotic use have been found in people who are immuno-compromised or have severe illnesses

Do all probiotics of the same type function in the same way? **Different probiotics have different functions.** Even within the same class of bacteria there can be variations in the benefits from probiotic ingestion.

aBc PROBIOTICS: **La-5®** *Lactobacillus acidophilus*; **BB-12®** *bifidobacterium*; **L.casei 431®**.

This information is based on research supporting probiotic benefits for these strains. It is important to know which probiotics are in a product as not all probiotics have measurable benefits.

	La-5® <i>Lactobacillus acidophilus</i>	BB-12® <i>bifidobacterium</i>	L.casei 431®
1. Identification of the genus, species and strain of each probiotic			
2. What published human studies have been conducted on the product or the specific strains in the product?	LA-5® has been tested in vitro for its tolerance to gastric acid and bile and has the robustness necessary for a probiotic strain. The activity of probiotic bacteria takes place primarily in the small intestine	When tested in a strong acidic environment BB-12® shows excellent survival rates. BB-12® also tolerates exposure to bile. Survival through the gastrointestinal tract has also been demonstrated in vivo. ⁱ	L.casei 431® has been tested in vitro for tolerance to gastric acid and bile and has the robustness necessary for a probiotic strain.

Why take probiotics via yoghurt?

- Yoghurt offers probiotics in a familiar and non-threatening way, when compared with capsules or other supplements
- It builds upon the existing health credentials of dairy
- Yoghurt allows for high numbers of the probiotic strains to be produced by including these strains in the fermentation process
- Probiotic yoghurt tastes good!



Why take probiotics via yoghurt?

2015 Survey by Dr. McMillan, 800 participants



89%
of health-conscious consumers know what probiotics are

67%
include yoghurt in their daily diet because it's probiotic

53%
state that "only documented specific strains should be trusted"

Demographics

The survey audience was made up of Dr. Joanna McMillan's subscriber base.

94%
of respondents were female

19%
were aged 18-30

53%
were aged 30-50

28%
were over 50

92%
would use probiotics if recommended by a dietitian.



The same number is 80%, if recommended by a GP



In conclusion

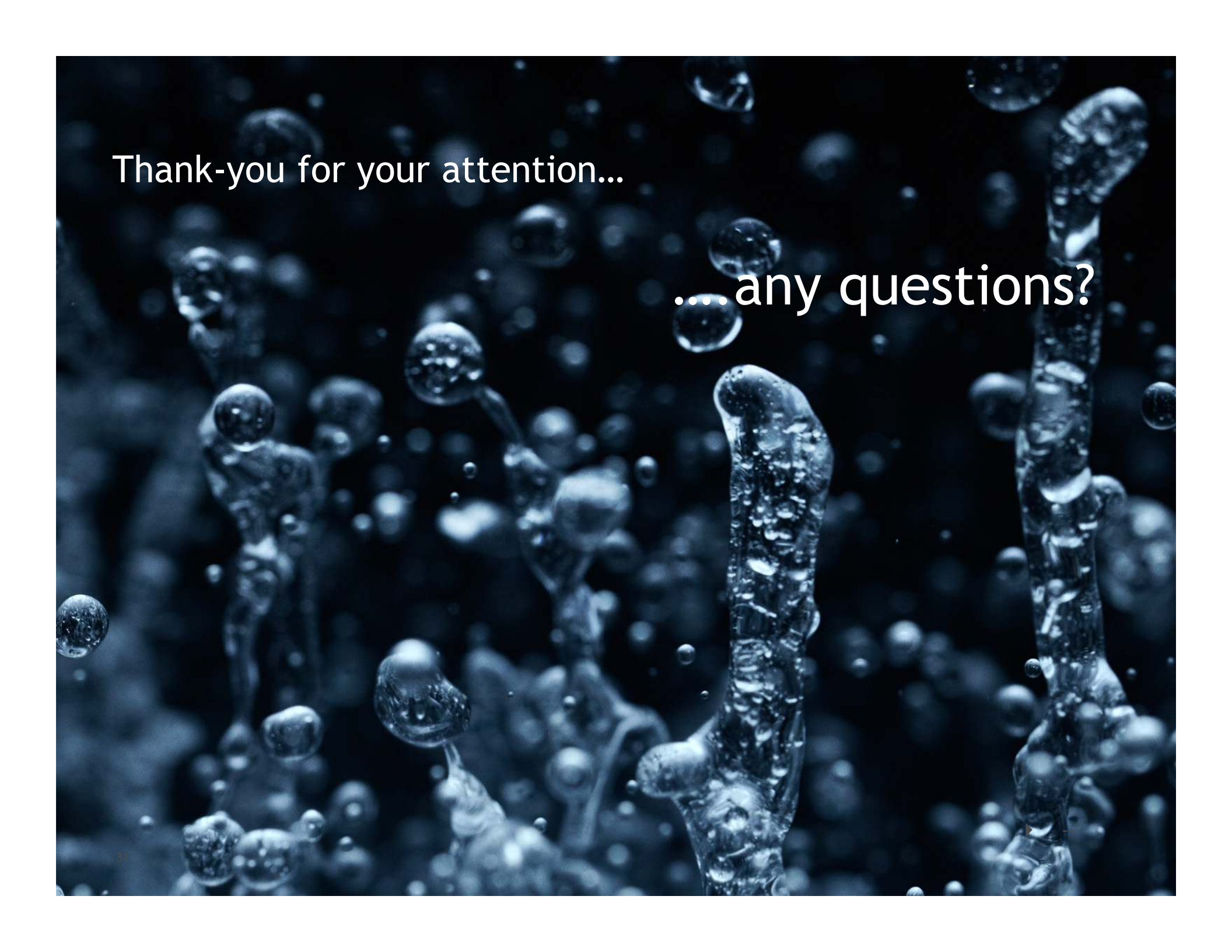
- The human microbiome is made up of 10x more bacterial cells than human ones
- Probiotics can beneficially affect the gastro-intestinal microbiota, for the better
- Not all microbes behave the same, to guarantee a probiotic effect, it is important to consume a well-documented strain

(and yoghurt is a convenient, healthy and tasty way to do this)



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Thank-you for your attention...

....any questions?