

# Gut Health – Looking Beyond the Hype

Graham MacKenzie Ph.C  
Stone's Pharmasave, Baddeck

Author: Healthy Logic, Gut Logic



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## Presenter Disclosure

- ▶ No potential or perceived conflict of interest
- ▶ No financial or in-kind support from any commercial or other organization other than an honorarium from Dalhousie to present this webinar
- ▶ This program has no industry involvement but will involve using commercial brand names for clarity in giving recommendations.

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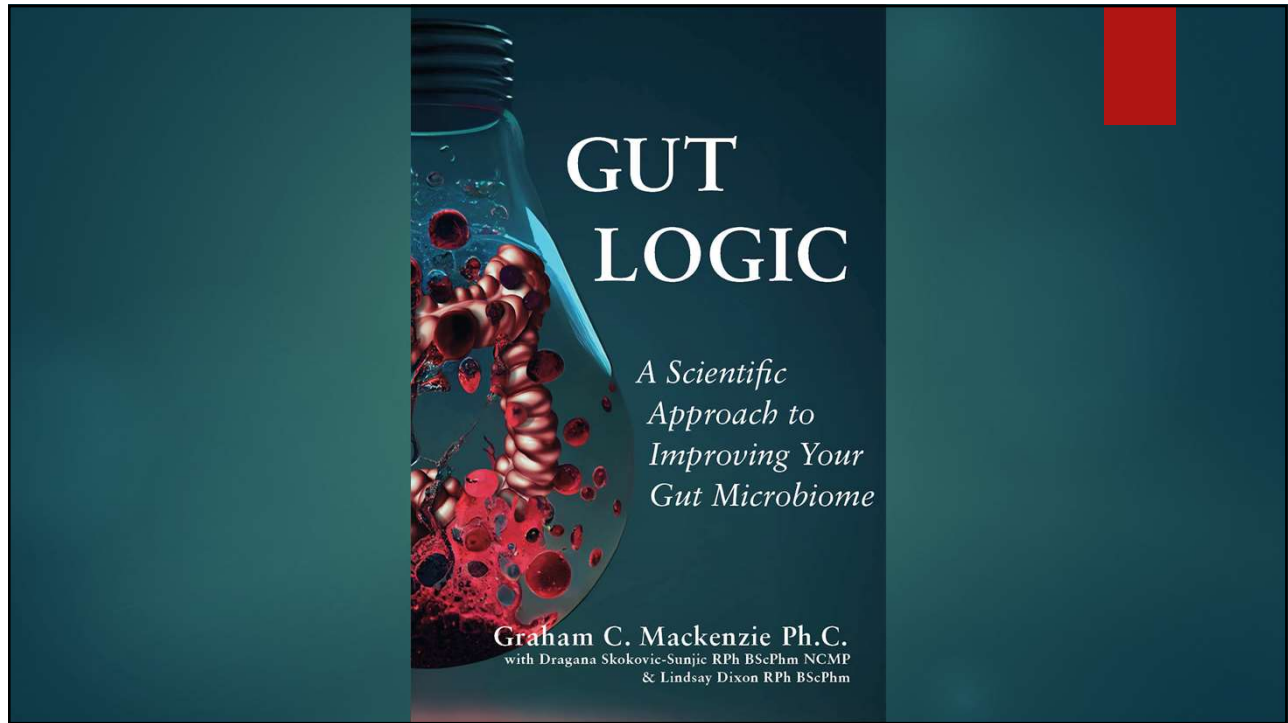


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## Learning Objectives

- ▶ Learn the basics of probiotic nomenclature and terms
- ▶ Become familiar with using AEPbio.com in making probiotic recommendations
- ▶ Challenges with probiotic recommendations
- ▶ Understand brand specific recommendations for various conditions and the evidence behind them
- ▶ Learn the best way to take probiotics and when not to
- ▶ Understand basic information on what prebiotics are and what they do for gut health

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## Pick a side

- ▶ A) For the most part, I recognize the value probiotics and recommend them quite often
- ▶ B) For the most part I am too skeptical of probiotics and rarely recommend them
- ▶ C) I rarely recommend probiotics mainly because I don't know enough about them to feel comfortable recommending them

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## Naming a Probiotic

- ▶ genus species strain
- ▶ Bifidobacterium longum CECT 7347
- ▶ Genus - Bifidobacterium
- ▶ Species – longum
- ▶ Strain – CECT 7347
- ▶ CFU's

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GENUS & SPECIES	STRAIN	BRAND
<i>Bifidobacterium lactis</i>	CNCM I-2494	Activia
<i>Bifidobacterium infantis</i>	35624	Align
<i>Lactobacillus rhamnosus</i>	HA111	Bacid
<i>Lactobacillus reuteri</i>	DSM 17938	Biogaia
<i>Lactobacillus acidophilus</i>	CL1285	Bio-K
<i>Lactobacillus casei</i>	LBC80R	
<i>Lactobacillus rhamnosus</i>	CLR2	
<i>Lactobacillus casei</i>	CNCM I-1518	DanActive
<i>Saccharomyces boulardii</i>	Iyo	Florastor
Several genus and species	Several strains	Probiacac
<i>Lactobacillus plantarum</i>	299v	TuZen
Several genus and species	Several defined strains	VSL#3
<i>Bifidobacterium lactis</i>	BB-12	Yoptimal
<i>Lactobacillus acidophilus</i>	LA-5	

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## Essential Terms

- ▶ Probiotic – live microorganisms that, when administered in adequate amounts, confer a health benefit on the host
- ▶ Prebiotic – Source of food and nutrition for the healthy bacteria of the gut
- ▶ Postbiotic – non-living substances/remnants produced by microorganisms. Cell wall fragments, vitamins, metabolites, proteins, peptides.
- ▶ Synbiotic – a mixture of probiotic and prebiotic
- ▶ Microbiota – the entire mix of microbiome in the body including bacteria, virus, parasites and fungi.

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## Checking Health Canada's Information on Specific probiotic (Florastor) falling under Drugs

<https://www.canada.ca/en/health-canada/services/drugs-health-products/natural-non-prescription.html>

### Recommended use or purpose:

Helps prevent antibiotic associated diarrhea. Helps reduce the symptoms related to acute diarrhea (infectious). Source of Probiotics. Helps support intestinal/gastrointestinal health. Could promote a favourable gut flora. Helps to reduce the risk of antibiotic-associated diarrhea. Helps reduce the symptoms related to acute infectious diarrhea. Helps to reduce the risk of traveller's diarrhea. Helps to treat acute infectious diarrhea in children. An adjunct to physician-supervised antibiotic therapy in patients with Helicobacter pylori infections. Helps reduce recurrent Clostridium Difficile Associated Diarrhea (CDAD) when used as an adjunct to antibiotics.

### Risk Information:

#### Cautions and Warnings

Discontinue use and consult a health care practitioner if symptoms of digestive upset (e.g. diarrhea) occur, worsen or persist beyond 3 days. Consult a health care practitioner prior to use if you have an abnormal condition of the gastrointestinal tract lining (i.e. ulcer or other GI tract disorders). The concurrent administration of Saccharomyces boulardii lyo and intestinally acting antimycotics may decrease the efficacy of Saccharomyces boulardii lyo. Treatment does not replace rehydration when this is necessary.

#### Contra-Indications

Do not use in the acute-care setting (ICU, CCU, NICU, etc.), with critically ill patients, especially in those individuals with open arterial and venous access required (such as a Vascath, Permcath, or AV fistula). Do not use for any individual with a central line or port or in the surroundings of any patient with a central line or port. Central lines include short- and long-term central venous catheters (CVCs) and peripherally inserted central catheters (PICCs). Do not use if you are severely immunocompromised, have an immune-compromised condition (e.g. AIDS, lymphoma, long-term corticosteroid treatment, pre- or post- organ/bone marrow transplant). Do not use and consult a health care practitioner if you are experiencing nausea, fever, vomiting, bloody diarrhea or severe abdominal pain. Do not use if you have hypersensitivity to any component of the product (especially allergy to yeast).

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## Probiotics may also fall under Food with Health Canada

- ▶ <https://www.canada.ca/en/health-canada/services/food-nutrition/food-labelling/health-claims/accepted-claims-about-nature-probiotic-microorganisms-food.html>

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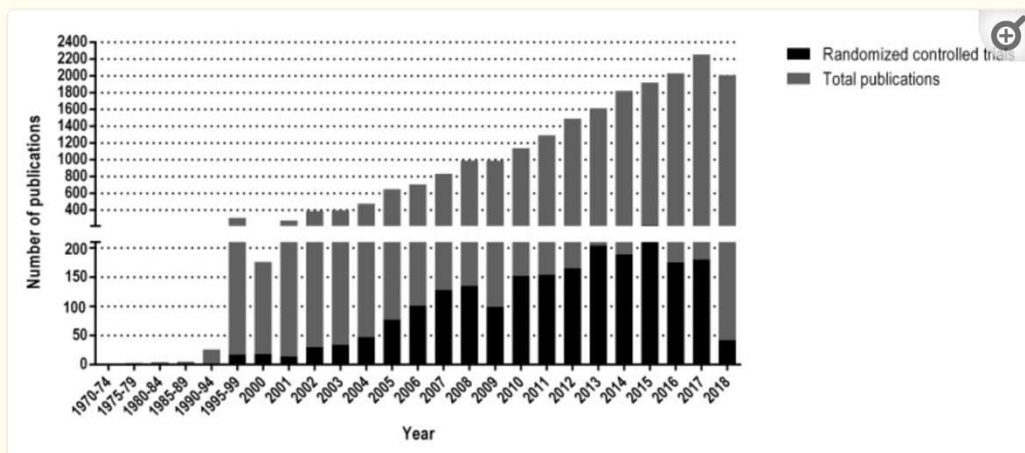


Figure 1

**FIGURE 1: Total number of publications about probiotics on the scientific database PubMed.**

Gray corresponds to the total number of publications, while those corresponding to randomized controlled trials are shown in black. The Y axis was divided in two segments for ease of visualization.

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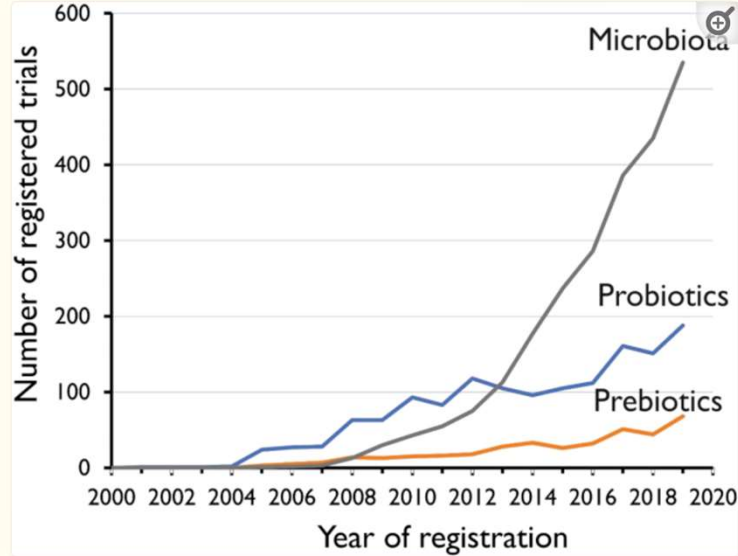


Figure 2

Figure 1. Development in the number of clinical trials over time (in [ClinicalTrials.gov](https://clinicaltrials.gov)) on probiotics (blue line), prebiotics (orange line) or microbiota (grey line). The Y-axis shows the number of registered studies per calendar year.

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## Forty-five-year evolution of probiotic therapy

Scarlett Puebla-Barragan<sup>1,2</sup> and Gregor Reid<sup>1,2,\*</sup>

<sup>1</sup> Departments of Microbiology & Immunology, and Surgery, Western University.

<sup>2</sup> Lawson Health Research Institute.

\* Corresponding Author:

Dr. Gregor Reid, Lawson Health Research Institute, Room F3-106, PO BOX 5777, STN B London, ON N6A 4V2 Canada; Tel: +1 519-646-6100; E-mail: [gregor@uwo.ca](mailto:gregor@uwo.ca)

**ABSTRACT** In the past forty-five years, the field of probiotics has grown from a handful of laboratory studies and clinical ideas into a legitimate research and translational entity conferring multiple benefits to humans around the world. This has been founded upon three principles: (i) the need for alternatives to drugs that either have sub-optimal efficacy or severe adverse effects; (ii) a growing interest in natural products and microbes, in particular cata-

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has been found for NEC [88, 89], then it seems reasonable to include them in a meta-analysis. However, a lack of understanding of probiotics can lead to scientific publications that make unsubstantiated conclusions and find their way to the mainstream media claiming that probiotics might not be as useful as commonly believed [93] or deeming them even potentially harmful to the host microbiota [94]. To make

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The image shows a screenshot of a CBC Radio website article. At the top, there is a navigation bar with the CBC logo, a 'MENU' dropdown, and links for 'radio', 'Top Stories', 'Shows', 'Podcasts', 'Schedules', 'Frequency', and 'Listen Live'. Below the navigation bar is a promotional banner for 'JUNOS' with the text 'LIVE March 24, 2024' and 'TICKETS ON SALE NOW' with a link 'cbcmusic.ca/junos'. The main content area features the article title 'Probiotics probably aren't making you well, and they could make you sicker' under the sub-header 'Quirks and Quarks'. Below the title is a sub-headline: 'A recent study suggests half of those who take probiotics just poop them right out'. The article is dated 'CBC Radio · Posted: Nov 02, 2018 6:09 PM ADT | Last Updated: November 2, 2018'. At the bottom of the article is a photograph of a pharmacy shelf labeled 'PROBIOTICS' containing various brands of probiotic supplements, including 'ULTIMATE FLORA PROBIOTIC CRITICAL CARE 50 Billion', 'ULTIMATE FLORA PROBIOTIC DAILY CARE 30 Billion', 'NATURE'S BOUNTY PROBIOTIC', 'PRO PB7', 'PRO-BIOTIX 12', 'Relief Biotic', and 'Calme Biotic'.

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### Are probiotics today even worth taking?

According to Brett Finlay from the University of British Columbia, there are a few health ailments that probiotics available on the market today that have been scientifically proven to work. Examples might be antibiotic associated diarrhoea, eczema, and some cases of colic in babies.

"But the problem is, there's a bewildering number of probiotics."

He suggested if people want to be smart consumers when it comes to buying probiotics, they can check the [Clinical Guide to Probiotic Products Available in Canada](#). The site charts clinical evidence for the efficacy of specific probiotics for specific illnesses, and has been reviewed by a team of health professionals.

“[The idea that] taking one probiotic that is going to cure all and make you feel better and [is] just wonderful wonder drug, that doesn't exist.”

- Dr. Brett Finlay, UBC


"I think if people are serious about probiotics, they really should take the time to look at this site and say, 'What is the clinical evidence for a particular probiotic and a particular condition,'" said Finlay.

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Many healthcare professionals have had the same questions you have about probiotics over the last few decades. Most of us were amazed by the published research and evidence growing exponentially year after year, looking at the potential for probiotics as an intervention. However, most of us were confused with the question: How do I know what probiotics to recommend? This particular study is telling me I should be recommending this complicated-sounding strain of *Lactobacillus rhamnosus* with a series of letters and numbers behind it. If I gave this name to my patient, would they know what product to buy?

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**AEProbio**  
Alliance for Education on Probiotics

**2024** 

Clinical Guide to  
**Probiotic Products**  
Available in Canada: **16<sup>th</sup> Edition**

**Dosage Formats | Applications | Clinical Evidence to date**

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**Author**  
**Dragana Skokovic-Sunjic**  
*BScPhm RPh NCMP*

**Reviewers**  
**Dr Vivien Brown**  
*MDCM CCFP FCFP NCMP*  
**Iris Krawchenko**  
*BScPhm RPh ACPR*  
**Dr John Marshall**  
*MD MSc FRCPC AGAF*  
**Dr Tom Smiley**  
*BScPhm PharmD*

**Editor**  
**Rebecca L. Johnson**  
*PhD candidate*

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**Acronyms:**

<b>AAD</b>	Antibiotic associated diarrhea - Prevention	<b>ID</b>	Infectious diarrhea
<b>BV</b>	Bacterial vaginosis	<b>LDL-C</b>	Reduces LDL and total cholesterol
<b>C</b>	Constipation	<b>LH</b>	Liver Health (NASH/NAFLD/MHE; as adjunct to standard therapy; see studies for specific population)
<b>CDAD</b>	Clostridium difficile associated diarrhea - Prevention	<b>M/A</b>	Mood and Affect (symptoms related to stress/anxiety; not a substitute for standard treatment)
<b>CE/AD</b>	Childhood eczema/ Atopic dermatitis	<b>Mastitis</b>	Mastitis in breastfeeding mothers (treatment and prevention)
<b>CID</b>	Common infectious disease - community acquired	<b>NEC*</b>	Necrotizing Enterocolitis (newborn) *as per hospital protocol, not for self-administration
<b>CMPA</b>	Cow Milk Protein Allergy (including Colic due to CMPA)	<b>NI</b>	Nosocomial infections prevention - hospital acquired
<b>Colic</b>	Colic	<b>OH</b>	Oral health (reductions of tonsillitis, laryngitis, and dental caries)
<b>FAP</b>	Functional abdominal pain	<b>Regurg/ GI Mot</b>	Reduces regurgitation/ Improves gastrointestinal motility
<b>HP</b>	Helicobacter pylori - Adjunct to standard eradication therapy	<b>TD</b>	Traveler's diarrhea prevention
<b>IBD-P</b>	Inflammatory bowel disease - Pouchitis	<b>VC</b>	Vulvovaginal candidiasis
<b>IBD-UC</b>	IBD - Ulcerative colitis - Adjunct to standard therapy	<b>WM</b>	Weight Management (aids in reduction of body weight, body fat mass, and waist circumference)
<b>IBS</b>	Irritable bowel syndrome		

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## Levels of Evidence

**Level of Recommendation:**

<b>Level I</b>	Evidence obtained from at least one appropriately designed trial (e.g. randomization, blinding, appropriate population comparisons) with a power calculation for the outcome(s) of interest. The expert review board reserves the right to make the final decision for the level of recommendation. <b>(HIGHEST LEVEL)</b>
<b>Level II</b>	Evidence obtained from well-designed controlled trials without randomization. Evidence obtained from randomized trials not satisfying all criteria listed in Level I. Evidence obtained from well-designed cohort or case-control analytic studies, preferably from more than one center or research group. Evidence obtained from multiple time series with or without the intervention. Dramatic results in uncontrolled trials might also be regarded as this type of evidence.
<b>Level III</b>	Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees.

Readers are strongly encouraged to review the evidence listed for each product for themselves. Please refer to individual publications for specifics of patient populations studied (e.g. age, gender, comorbidities) and details of clinical effect (statistical significance, size of treatment effect, precision of the confidence intervals).

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Brand Name	Probiotic Strain(s)	Dosage Form	CFU/dose	No. of doses/day	C	HP	CDAD	IBS	ID	AAD	IBD-P	TD
Align®	<i>B. longum</i> 35624	Capsule	1B/capsule	1 capsule				I (1-4)				
Align® Chewables		Tablet	1B/tablet	1 tablet				I (1-4)				
Bio-K+® Antibio Pro <small>Shelf stable and refrigerated options available</small>		Capsule	50B/capsule	1-2 capsules				I (6-10)		I (5-7)		
Bio-K+® Drinkable Probiotics	<i>L. acidophilus</i> CL1285 <i>L. casei</i> LBC80R <i>L. rhamnosus</i> CLR2	Ferm. milk lq. Ferm. vegan lq.	50B/bottle 50B/bottle	1 bottle 1 bottle				I (6-10)		I (5-7)		
Bio-K+® IBS Pro <small>Shelf stable and refrigerated options available</small>		Capsule	50B/capsule	2 capsules				I (8)				
BioGaia® Protectis® Baby Drops		Drops	100M/5 drops	5 drops	I (17)	I (13-16)			II (11)	II (12)		
BioGaia® Protectis® Chewable Tablets		Chewable tablet	100M/tablet	1 tablet	I (17)	I (13-16)			II (11)	II (12)		
BioGaia® Protectis® Drops with Vitamin D	<i>L. reuteri</i> DSM 17938	Drops	100M/5 drops	5 drops	I (17)	I (13-16)			II (11)	II (12)		
BioGaia® Junior Tablets with Vitamin D		Chewable tablet	100M/tablet	1 tablet	I (17)	I (13-16)			II (11)	II (12)		
Biomed Bacillus Coagulans	<i>Bacillus coagulans</i> MTCC 5856	Capsule	1B/capsule	2 capsules				II (19)				
Culturelle® Digestive Daily Probiotic Chewables	<i>L. rhamnosus</i> GG	Chewable tablet	10B/tablet	1 tablet		I (24)	III (25-27)		I (23)	II (28)	II (29,30)	
Culturelle® Digestive Health Daily Probiotic Capsules		Capsule	10B/capsule	1 capsule		I (24)	III (25-27)		I (23)	II (28)	II (29,30)	
Digestive Care™ 10 Billion Daily Probiotic	<i>L. plantarum</i> 299v	Capsule	10B/capsule	1-2 capsules			III (32,36)	I (33-35)	II (31)			

- Product requires refrigeration  
 - Approved by Health Canada for listed indication; applicable to supplements  
 - Gluten Free

Clinical Guide to Probiotic Products Available in Canada 16th Edition 2024

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Probiotic Products for Digestive and Liver Health in Adult Population:												
Brand Name	Probiotic Strain(s)	Dosage Form	CFU/dose	No. of doses/day	C	IBD-UC	CDAD	IBS	AAD	IBD-P	LH	
Purica Probiotic Intensive GI	<i>L. plantarum</i> CECT7484/KABP022® <i>L. plantarum</i> CECT7485/KABP023® <i>P. acidilactici</i> CECT7483/KABP021®	Capsule	3B/capsule	1 capsule				I (7,74)				
Ultra Probiotic Complex by GNC	<i>L. acidophilus</i> CUL-60 <i>L. acidophilus</i> CUL-21 <i>B. bifidum</i> CUL-20 <i>B. lactis</i> CUL-34	Packet Capsule	25B/packet 25B/ 50B/ 75B per capsule	1-2 packets 1-2 capsules			II (52)	II (53)				
UltraFlora® Balance	<i>L. acidophilus</i> NCFM® <i>B. lactis</i> Bi-07®	Capsule	15B/capsule	2 capsules				II (78)				
UltraFlora® Intensive Care	<i>L. plantarum</i> 299v	Capsule	10B/capsule	2 capsules			III (32,36)	I (33-35)	III (31)			
UltraFlora® Restore	<i>B. lactis</i> Bi-07® <i>L. acidophilus</i> NCFM® <i>B. lactis</i> Bi-04 <i>L. paracasei</i> Lpc-37	Capsule	20B/capsule	1 capsule					I (75,76)			
Visbiome® <small>This combination of strains is known as "De Simone Formulation" and is the same one listed in references that cite VSL#3 as treatment regimen</small>	<i>L. acidophilus</i> DSM24735/SD5212 <i>L. paracasei</i> DSM24733/SD5218 <i>L. delbrueckii subsp. bulgaricus</i> DSM24734/SD5210 <i>L. plantarum</i> DSM24730/SD5209 <i>B. longum</i> DSM24736/SD5220 <i>B. infantis</i> DSM24737/SD5219 <i>B. breve</i> DSM24732/SD5206 <i>S. thermophilus</i> DSM24731/SD5207	Sachet	450B/sachet	1-4 sachets	II (81,92)	I (82-84)				I (83,85-87)	I (88-91, 93,94)	

- Product requires refrigeration  
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 - Gluten Free

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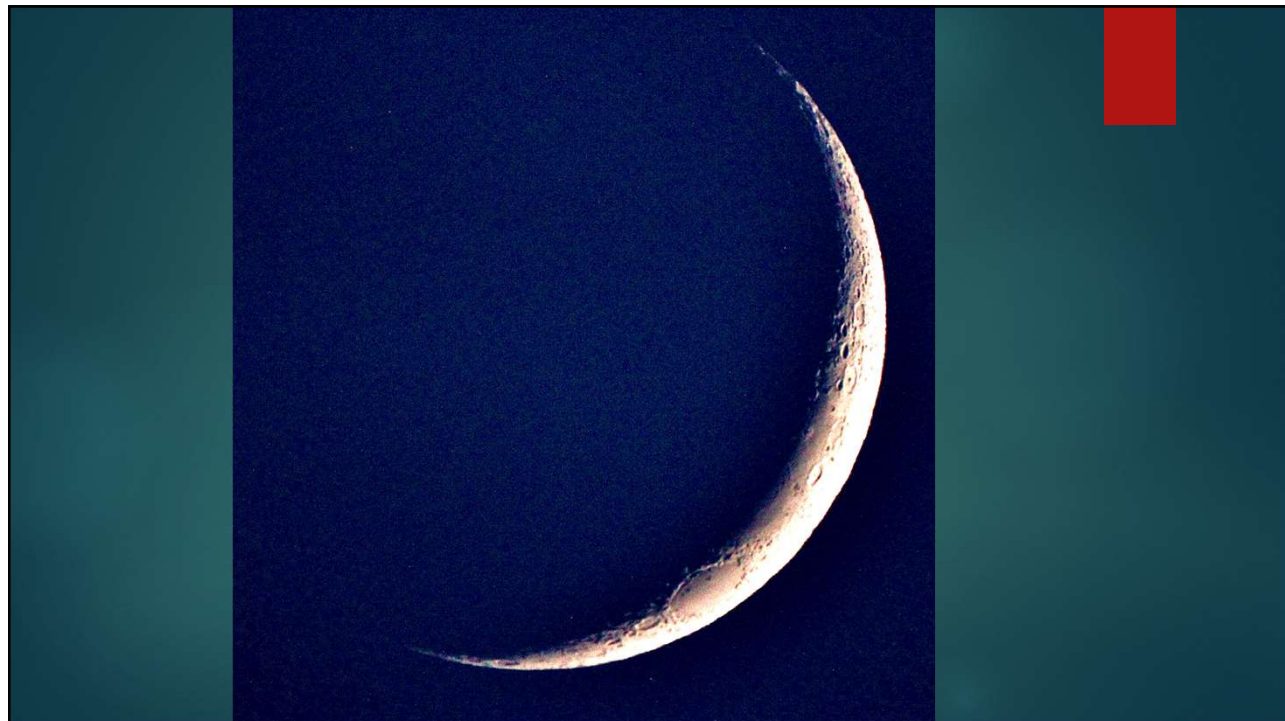
### Probiotic Products for Digestive and Liver Health in Adult Population:

Brand Name	Probiotic Strain(s)	Dosage Form	CFU/dose	No. of doses/day	IBD-UC	HP	CDAD	IBS	AAD	TD
<b>FlorastorMax®</b> 🌾	<i>Saccharomyces boulardii</i> lyo CNCM I-745	Sachet	10B/sachet	1 sachet	III (43,47-50)	I 🌿 (44-46)	I 🌿 (8,9,38,39,51)		I 🌿 (37,38)	I 🌿 (40-42)
<b>Florastor®</b> 🌾		Capsule Sachet	5B/capsule 5B/sachet	1-2 capsules 1-2 sachets	III (43,47-50)	I 🌿 (44-46)	I 🌿 (8,9,38,39,51)		I 🌿 (37,38)	I 🌿 (40-42)
<b>HMF</b>	<i>L. acidophilus</i> CUL-60 <i>L. acidophilus</i> CUL-21 <i>B. animalis</i> subsp. <i>lactis</i> CUL-34 <i>B. bifidum</i> CUL-20	<b>Forte</b> 🌿	Capsule	10B/capsule	2-3 capsules		II (52)	II 🌿 (53)		
		<b>IBS Relief</b> 🌿	Capsule	25B/capsule	1 capsule		II (52)	II 🌿 (53)		
		<b>Intensive</b> 🌿	Capsule	25B/capsule	1 capsule		II (52)	II 🌿 (53)		
		<b>Intensive 50</b> 🌿	Capsule	50B/capsule	1 capsule		II (52)	II 🌿 (53)		
		<b>Intensive Powder</b> 🌿 ❄️	Powder	25B/1 scoop (1 gram)	1 scoop		II (52)	II 🌿 (53)		
<b>Super Powder</b> 🌿 ❄️	Powder	10B/1 scoop (1 gram)	2-3 scoops		II (52)	II 🌿 (53)				
<b>Mutaflor®</b> ❄️	<i>Escherichia coli</i> Nissle 1917	Capsule	2.5-25B/capsule	1-2 capsules	I (57-60)					
<b>Pregnancy Care Probiotic</b> 🌿	<i>L. rhamnosus</i> R0011 <i>L. helveticus</i> R0052	Capsule	2B/capsule	1-2 capsules				III (69)		
<b>Probiotic 10 Billion Active Cells Daily Maintenance</b>	<i>Lactococcus lactis</i> (UALI-08) <i>L. gasserii</i> (UALg-05) <i>L. rhamnosus</i> (UALr-06) <i>B. animalis</i> subsp. <i>lactis</i> (UABla-12) <i>B. breve</i> (UABbr-11) <i>L. paracasei</i> (UALpc-04) <i>L. rhamnosus</i> (UALr-18) <i>L. acidophilus</i> (DDS®-1) <i>L. plantarum</i> (UALp-05) <i>B. longum</i> subsp. <i>longum</i> (UABI-14) <i>B. bifidum</i> (UABb-10) <i>L. casei</i> (UALc-03) <i>L. reuteri</i> (UALre-16) <i>B. longum</i> subsp. <i>infantis</i> (UABI-13)	Capsule	10B/capsule	3 capsules	II (66)					

❄️ - Product requires refrigeration  
 🌿 - Approved by Health Canada for listed indication; applicable to supplements  
 🌾 - Gluten Free

[www.ProbioticChart.ca](http://www.ProbioticChart.ca)

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## Important quotes from Gut Logic

- ▶ “As a consumer, you may be left out in the cold, not knowing what brand of probiotic has the exact strains you need for a given ailment.”
- ▶ “As I outlined in Healthy Logic (2021), my first priority, either with an OTC selection or a prescription medication, is that the therapy is safe. My second concern is that it works.”
- ▶ “Just to put into context the difficulty in interpreting the results of these experiments and applying them to real-life recommendations, the microbial species *Bifidobacterium longum* is a microbial species, but there are over 400 strains of this species. ”

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Chapter 11: Tackling Eczema
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## True or False

- ▶ The most effective strains of probiotics require refrigeration

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## True or False

- ▶ The expiry date of refrigerated probiotics is typically longer than unrefrigerated probiotics

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## True or False

- ▶ Probiotics that are unrefrigerated on the shelf before purchased should be refrigerated once opened.

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Select a specific strain for your particular problem.

Select the amount that is proven to work; do not go with the "the more, the merrier" idea.

Most of us do not need to take probiotics forever unless we have a chronic condition and our healthcare provider recommends it.

A wrong belief exists that refrigerated probiotics are better than those at room temperature. It all depends on the strain. Some strains are resilient and resistant to the influence of oxygen, light, and temperature and stay viable after exposure; other strains are very fragile and need to be protected, kept in dark bottles, specific formulations, and refrigerated to prolong their viability.

You do not need to get your gut tested to see what is missing. Each of us has a different blend and composition of the gut microbiome. Each of us has a different

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[AEProbio.com](https://www.aeprobio.com). The reason why this site is so valued, in my opinion, is because it does something that most other references do not. Dragana and her colleagues give the pedestrian reader the exact commercial product that corresponds to the strain or strains that have evidence of working. As I have explained to many health professionals and in this book, simply telling someone probiotics work or don't work for a medical condition means nothing without the actual product referenced as well. Most people will hunt forever for

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## Knowing the specificity of the recommendation

- ▶ 2008 The guide recommended Bacid (ERFA)
- ▶ Lactobacillus rhamnosus GG (10B CFU / capsule)
- ▶ Common hospital formulary inclusion
- ▶ 2009 The Guide learned the company changed the strain to Lactobacillus rhamnosus HA111.
- ▶ Health Canada requirement was to report the strain designation to them but no requirement to be on the label
- ▶ It continued to be dispensed in hospitals for AAD and CDAD even though there was no evidence for efficacy for the new strain
- ▶ Removed from The Guide in 2011. The original strain in Bacid was since sold as Culturelle in Canada

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## Knowing the specificity of the recommendation

- ▶ Similar situation with Danactive.
- ▶ Dropped strength from 10B to 1B CFU's per dose
- ▶ Insufficient to provide the health benefits as before

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## True or False

- ▶ Contrary to popular belief, there are no indications for taking a probiotic in an otherwise healthy person

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You should know who this recommendation of probiotics is for. It may surprise you to know that supplementing with probiotics isn't for everyone. Most people who are relatively healthy and symptom-free of bothersome issues really aren't going to benefit much from probiotics. There really is very little evidence to support taking random probiotics or even targeted probiotics, for that matter, for long-term health outcomes. This

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J Neurogastroenterol Motil, Vol. 17 No. 3 July, 2011  
DOI: 10.5056/jnm.2011.17.3.252  
Journal of Neurogastroenterology and Motility

Review

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## Irritable Bowel Syndrome, Gut Microbiota and Probiotics

**Beom Jae Lee and Young-Tae Bak\***

*Department of Gastroenterology, Korea University Guro Hospital, Seoul, Korea*

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Irritable bowel syndrome (IBS) is a complex disorder characterized by abdominal symptoms including chronic abdominal pain or discomfort and altered bowel habits. The etiology of IBS is multifactorial, as abnormal gut motility, visceral hypersensitivity, disturbed neural function of the brain-gut axis and an abnormal autonomic nervous system are all implicated in disease progression. Based on recent experimental and clinical studies, it has been suggested that additional etiological factors including low-grade inflammation, altered gut microbiota and alteration in the gut immune system play important roles in the pathogenesis of IBS. Therefore, therapeutic restoration of altered intestinal microbiota may be an ideal treatment for IBS. Probiotics are live organisms that are believed to cause no harm and result in health benefits for the host. Clinical efficacy of probiotics has been shown in the treatment or prevention of some gastrointestinal inflammation-associated disorders including traveler's diarrhea, antibiotics-associated diarrhea, pouchitis of the restorative ileal pouch and necrotizing enterocolitis. The molecular mechanisms, as cause of IBS pathogenesis, affected by altered gut microbiota and gut inflammation-immunity are reviewed. The effect of probiotics on the gut inflammation-immune systems and the results from clinical trials of probiotics for the treatment of IBS are also summarized.

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**Key Words**  
Immunity; Inflammation; Irritable bowel syndrome; Microbiota; Probiotics

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# Irritable Bowel Syndrome

- ▶ Symptoms well known, pathophysiology not as much
- ▶ Correspondingly, how probiotics work is hypothesized
- ▶ Microbiota between healthy and IBS patients shows a difference (some with SIBO and some not) – coliforms, lactobacilli and Bifidobacterium species lower in IBS. Varies geographically.
- ▶ Concentrations of short chain fatty acids, acetic acid and propionic acids are higher in IBS symptoms
- ▶ Non absorbed antibiotics (neomycin and rifaximin) reduce the concentrations of these products and can improve IBS flare ups.
- ▶ Align (1/day), BioK+IBS Pro (2/d), Ultraflora Intensive care(2/d)

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## RESEARCH ARTICLE

### ***Lactobacillus acidophilus* CL1285, *Lactobacillus casei* LBC80R and *Lactobacillus rhamnosus* CLR2 improve quality-of-life and IBS symptoms: a double-blind, randomised, placebo-controlled study**

K. Preston , R. Krumian , J. Hattner , D. de Montigny , M. Stewart , S. Gaddam   
Corresponding author: [morgan.stewart@prim.com](mailto:morgan.stewart@prim.com)

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Abstract    References    Cited by    Full-text

#### Abstract

A combination of *Lactobacillus acidophilus* CL1285, *Lactobacillus casei* LBC80R and *Lactobacillus rhamnosus* CLR2 was compared to placebo for relief of symptoms of irritable bowel syndrome (IBS). A total of 113 subjects at 3 clinical sites were randomised in a 2:1 ratio and followed for 12 weeks. Subjects ingested either 2 capsules of active study product, containing  $50 \times 10^9$  cfu of live organisms, or 2 placebo capsules daily. Endpoints included improvement in abdominal pain, days of pain, distention, stool consistency and frequency, quality of life (QOL), and adequate relief (AR) of IBS symptoms. IBS subtypes constipation (IBS-C), diarrhoea (IBS-D), and mixed (IBS-M) were evaluated separately; the effect of gender was also examined. For all efficacy endpoints improvement of 30% or more vs placebo was considered clinically significant. With the exception of pain intensity and AR, the endpoints demonstrated a therapeutic advantage of active over placebo for IBS symptoms in at least some subject subgroups. The IBS-D and female subgroups showed the largest and most consistent effects. Stool frequency and consistency were evaluated in the IBS-C and IBS-D subgroups, and improvement of active vs placebo was noted in both. QOL improvement was seen overall and in specific domains. Adverse events (AEs) were limited to 7 subjects; all were of mild or moderate intensity except one, severe cramping. Four AEs in the same subject in the placebo group were judged to be related to study product; these resolved by the end of study. There were no serious AEs.

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## Traveller's Diarrhea

- ▶ Florastor (1-2/day) and
- ▶ Florastor Max (1/day)

### Meta-analysis of probiotics for the prevention of traveler's diarrhea

Lynne V McFarland <sup>1</sup>

Affiliations + expand

PMID: 17298915 DOI: [10.1016/j.tmaid.2005.10.003](https://doi.org/10.1016/j.tmaid.2005.10.003)

#### Abstract

**Background:** Traveler's diarrhea (TD) is a common health complaint among travelers. Rates of TD can range from 5% to 50%, depending on the destination. The use of probiotics for this disease remains controversial. The objective of this study was to compare the efficacy of probiotics for the prevention of TD based on published randomized, controlled clinical trials.

**Methods:** PubMed, Google Scholar, metaRegister, NIH registry of clinical trials and Cochrane Central Register of Controlled Trials were searched from 1977 to 2005, unrestricted by language. Secondary searches of reference lists, authors, reviews, commentaries, associated diseases, books and meeting abstracts. Inclusion criteria included: randomization, controlled, blinded, efficacy trials, in humans, peer-reviewed journals. Exclusion criteria were: pre-clinical, safety, phase 1 studies in volunteers, reviews, duplicate reports, trials of unspecified probiotics, trials of prebiotics, and inconsistent outcome measures.

**Results:** Twelve of 940 screened studies met the inclusion and exclusion criteria. The pooled relative risk indicates that probiotics significantly prevent TD (RR=0.85, 95% CI 0.79,0.91, p<0.001).

**Conclusion:** Several probiotics (*Saccharomyces boulardii* and a mixture of *Lactobacillus acidophilus* and *Bifidobacterium bifidum*) had significant efficacy. No serious adverse reactions were reported in the 12 trials. Probiotics may offer a safe and effective method to prevent TD.

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## C.Diff and Antibiotic Associated Diarrhea Prevention

- ▶ BioK+ Antibio Pro (1-2/d)
- ▶ Bio-K+ Drinkable Probiotic (1/day)

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## Dose-response efficacy of a proprietary probiotic formula of *Lactobacillus acidophilus* CL1285 and *Lactobacillus casei* LBC80R for antibiotic-associated diarrhea and *Clostridium difficile*-associated diarrhea prophylaxis in adult patients

Xing Wang Gao<sup>1</sup>, Mohamed Mubasher, Chong Yu Fang, Cheryl Reifer, Larry E Miller

Affiliations + expand

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### Abstract

**Objectives:** Standard therapies for antibiotic-associated diarrhea (AAD) and *Clostridium difficile*-associated diarrhea (CDAD) have limited efficacy. Probiotic prophylaxis is a promising alternative for reduction of AAD and CDAD incidence.

**Methods:** In this single-center, randomized, double-blind, placebo-controlled dose-ranging study, we randomized 255 adult inpatients to one of three groups: two probiotic capsules per day (Pro-2, n=86), one probiotic capsule and one placebo capsule per day (Pro-1, n=85), or two placebo capsules per day (n=84). Each probiotic capsule contained 50 billion c.f.u. of live organisms (*Lactobacillus acidophilus* CL1285 + *Lactobacillus casei* LBC80R Bio-K+ CL1285). Probiotic prophylaxis began within 36 h of initial antibiotic administration, continued for 5 days after the last antibiotic dose, and patients were followed for an additional 21 days.

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**Results:** Pro-2 (15.5%) had a lower AAD incidence vs. Pro-1 (28.2%). Each probiotic group had a lower AAD incidence vs. placebo (44.1%). In patients who acquired AAD, Pro-2 (2.8 days) and Pro-1 (4.1 days) had shorter symptom duration vs. placebo (6.4 days). Similarly, Pro-2 (1.2%) had a lower CDAD incidence vs. Pro-1 (9.4%). Each treatment group had a lower CDAD incidence vs. placebo (23.8%). Gastrointestinal symptoms were less common in the treatment groups vs. placebo and in Pro-2 vs. Pro-1.

**Conclusions:** The proprietary probiotic blend used in this study was well tolerated and effective for reducing risk of AAD and, in particular, CDAD in hospitalized patients on antibiotics. A dose-ranging effect was shown with 100 billion c.f.u., yielding superior outcomes and fewer gastrointestinal events compared to 50 billion c.f.u. (ClinicalTrials.gov number [NCT00958308](https://clinicaltrials.gov/ct2/show/study/NCT00958308)).

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## Notable Level I evidence and Health Canada Recommendations

- ▶ Constipation – BioGaia Protectis (baby and child products)
- ▶ Bacterial Vaginosis and Vulvovaginal Candidiasis - Provacare vaginal ovule, Ultraflora Women's oral caps, RepHresh ProB probiotic oral caps
- ▶ Colic – Purica Probiotic Baby Colic drops, HMF Baby drops, BioGaia Protectis drops and chewable tablets.

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### Efficacy of *Bifidobacterium animalis* subsp. *lactis* BL-99 in the treatment of functional dyspepsia: a randomized placebo-controlled clinical trial

Qi Zhang, Guang Li, Wen Zhao, Xifan Wang, Jingjing He, Limian Zhou, Xiaoxu Zhang, Peng An, Yinghua Liu, Chengying Zhang, Yong Zhang, Simin Liu, Liang Zhao, Rong Liu, Yixuan Li, Wenjian Jiang, Xiaoyu Wang, Qingyu Wang, Bing Fang, Yuyang Zhao, Yimei Ren, Xiaokang Niu, Dongjie Li, Shaoqi Shi, ... Fazheng Ren  [+ Show authors](#)

[Nature Communications](#) **15**, Article number: 227 (2024) | [Cite this article](#)

432 Accesses | **3** Altmetric | [Metrics](#)

#### Abstract

Current treatment for functional dyspepsia (FD) has limited and unsustainable efficacy. Probiotics have the sustainable potential to alleviate FD. This randomized controlled clinical trial (Chinese Clinical Trial Registry, ChiCTR2000041430) assigned 200 FD patients to receive placebo, positive-drug (rabeprazole), or *Bifidobacterium animalis* subsp. *lactis* BL-99 (BL-99; low, high doses) for 8-week. The primary outcome was the clinical response rate (CRR) of FD score after 8-week treatment. The secondary outcomes were CRR of FD score at other periods, and PDS, EPS, serum indicators, fecal microbiota and metabolites. The CRR in FD score for the BL-99\_high group [45 (90.0%)] was significantly higher than that for placebo [29 (58.0%),  $p = 0.001$ ], BL-99\_low [37 (74.0%),  $p = 0.044$ ] and positive\_control [35 (70.0%),  $p =$

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- ▶ Daily *Bifidobacterium animalis lactis* BL-99 supplementation for 8 weeks at a dose of 50 billion CFU per day improved the functional dyspepsia score clinical response rate in 200 trial participants. Randomized Controlled trial.

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## Probiotic for pathogen-specific *Staphylococcus aureus* decolonisation in Thailand: a phase 2, double-blind, randomised, placebo-controlled trial

Pipat Piewngam\*, Sunisa Khongthong\*, Natthrit Roekngam, Yongyuth Theapparatt, Somkiat Sunpaweravong, Damrongsak Faroongsarng, Michael Otto



### Summary

**Background** Decolonisation is considered a valuable means to reduce *Staphylococcus aureus* infection rates. However, previous topical strategies targeting the nose or skin had little success, and oral antibiotic-based decolonisation is ill advised because of eradication of the microbiota and development of antibiotic resistance. We previously showed that the probiotic *Bacillus subtilis* significantly diminished *S aureus* at the main intestinal colonisation site via specific bacterial interaction in mice; in this study, we tested this probiotic approach to control *S aureus* colonisation in humans.

**Methods** We did a single-centre, phase 2, double-blind, randomised, placebo-controlled trial in adults from the Songkhla region of Thailand who were colonised by *S aureus*. Eligible participants were adults (aged  $\geq 18$  years) without history of intestinal disease, antibiotic treatment, or hospital admission within the previous 90 days. Participants were excluded if they were pregnant, breastfeeding, taking probiotics, or had diarrhoea. Participants were allocated (1:1) to groups by computer randomisation in blocks of four, and research coordinators were masked to group allocation. Participants received 250 mg of probiotic *B subtilis* MB40 or placebo once per day for 30 days and *S aureus* colonisation was determined after the last dose was received. The primary outcome was colonisation by *S aureus* (continuous, mean decrease in colony-forming-unit count) in the intestine (by faecal counts) and nares (by nasal swab). Secondary outcomes were the number of *B subtilis* probiotic. This trial is registered with the Thai Clinical

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\*Contributed equally

Pathogen Molecular Genetics Section, Laboratory of Bacteriology, National Institute of Allergy and Infectious Diseases, US National Institutes of Health, Bethesda, MD, USA (P Piewngam PhD, M Otto PhD); Faculty of Veterinary Science, Rajamangala University of Technology Srivijaya, Nakhon Si Thammarat, Thailand

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**Methods** We did a single-centre, phase 2, double-blind, randomised, placebo-controlled trial in adults from the Songkhla region of Thailand who were colonised by *S aureus*. Eligible participants were adults (aged  $\geq 18$  years) without history of intestinal disease, antibiotic treatment, or hospital admission within the previous 90 days. Participants were excluded if they were pregnant, breastfeeding, taking probiotics, or had diarrhoea. Participants were allocated (1:1) to groups by computer randomisation in blocks of four, and research coordinators were masked to group allocation. Participants received 250 mg of probiotic *B subtilis* MB40 or placebo once per day for 30 days and *S aureus* colonisation was determined after the last dose was received. The primary outcome was colonisation by *S aureus* (continuous, mean decrease in colony-forming-unit count) in the intestine (by faecal counts) and nares (by nasal swabs) after intervention (30-day regimen of *B subtilis* probiotic). This trial is registered with the Thai Clinical Trials Registry, TCTR20210128003.

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**Findings** The trial was done between Jan 29 and June 30, 2021, with enrolment taking place from Jan 29 to April 6, 2021. 115 participants were colonised by *S aureus*, either in the intestine (n=84), nose (n=50), or both (n=19), and were randomly assigned to treatment (n=55) and placebo groups (n=60). Oral probiotic *B subtilis* resulted in significant reduction of *S aureus* in stool (96.8%;  $p < 0.0001$ ) and nose (65.4%;  $p = 0.0002$ ). There were no differences in adverse effects or significant microbiome changes between the intervention and placebo groups.

**Interpretation** *B subtilis* probiotic eliminated more than 95% of the total *S aureus* colonising the human body without altering the microbiota. This probiotic strategy offers several key advantages over presently used decolonisation strategies for potential use in people with chronic or long-term risk of *S aureus* infection. Furthermore, by establishing a defining role of the intestinal colonisation site, our findings call for revisiting fundamental notions about *S aureus* colonisation.

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## When is the best time to take a probiotic?

- ▶ Information online is very contradictory
- ▶ It depends on the probiotic
- ▶ Stomach acid kills probiotics
- ▶ Enteric coated or encapsulated products – take anytime
- ▶ Rapid passage through the stomach helps (i.e. not with food)
- ▶ Lactobacillus – more viable in gastric acid
- ▶ Most Bifidobacteria are not acid stable (except lactis and animalis)
- ▶ Saccharomyces boulardii may be stable with or without a meal.
- ▶ Overall take as directed on label or ½ hour before a meal otherwise.
- ▶ Separate dose from antibiotic dose

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## Prebiotics

- ▶ Sometimes used instead of probiotics but with less evidence base
- ▶ Inulin, fructo-oligosaccharides (FOS) and galacto-oligosaccharides (gos)
- ▶ In return for this food, bacteria in the gut make acetate, propionate and butyrate
- ▶ This leads to a lower pH and increased absorption of Ca and Mg.
- ▶ SCFA like butyrate have proposed favorable effects on lipid metabolism and restrained lipogenesis and appetite suppression.
- ▶ Not all fiber is prebiotic. Bananas, pomegranate, apples, nectarines, asparagus, onions, legumes, garlic, snow peas and green beans are prebiotic

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## Fermented food

- ▶ Created by microbial growth in a controlled fashion
- ▶ Fermented food with probiotics : some yogurt and some kefir.
- ▶ Fermented food with live microbes : uncooked sauerkraut, kimchi
- ▶ Fermented foods without any microbes: wine, beer, sourdough bread, tempeh and chocolate.

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## Recap of Learning Objectives

- ▶ Learn the basics of probiotic nomenclature and terms
- ▶ Become familiar with using AEPbio.com in making probiotic recommendations
- ▶ Challenges with Probiotic recommendations
- ▶ Understand brand specific recommendations for various conditions and the evidence behind them
- ▶ Learn the best way to take probiotics and when not to
- ▶ Understand basic information on what prebiotics are and what they do for gut health

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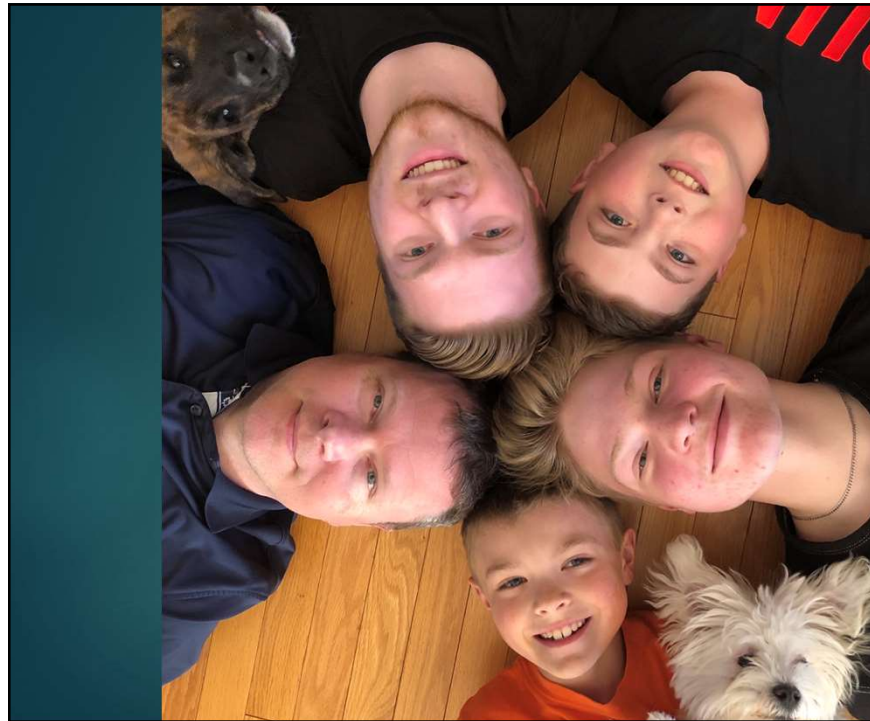
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Questions????



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