

Bausteine Webinar

Verfügbare Inhaltsstoffe für die Magistral-Rezepturen

Wim de Jong, Ingrid Brünner, 9. Juli, 2025

Agenda

- 1. Intro: neu hinzugefügte Bausteine**
- 2. Fragen zu den jeweiligen Bausteinen**
- 3. Ausblick**

1. Intro:

Kürzlich hinzugefügte Bausteine

Limosilactobacillus fermentum ME-3

- Von einem Kind in Estland isoliert (in 1995^{1,7})
- Ausgiebig untersucht wegen seiner ausgezeichneten Antioxidativen Funktion. Es kann selbst Gluthation produzieren, weil es ein komplettes Produktionssystem entwickelt hat¹⁻³.
- Klinisch sieht man folgendes:
 - Systemically increased antioxidative potential³⁻⁶ (fig)
- Auch sieht man folgende Evidenz:
 - Anti-Entzündungs-Effekte^{7,8}
 - Verbesserung der Barriere Funktion
 - Metabolische Dysfunktion^{7,9}
 - Pathogen inhibition, including Salmonella (e.g.¹⁰) and H. pylori (e.g.¹¹)
- **Typischer Einsatz: oxidativer Stress**

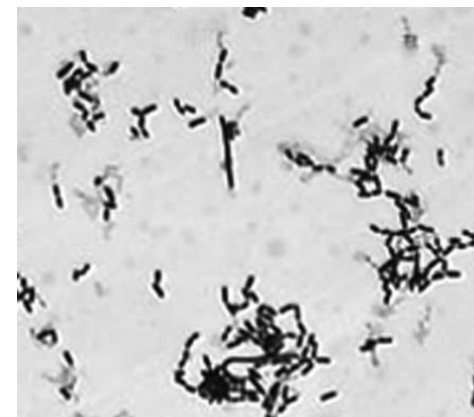


Table 1. The glutathione status and redox ratios of the skin and blood.

Skin	GSSG (µg/g skin)		GSH (µg/g skin)		GSSG/GSH	
	Before	After	Before	After	Before	After
ME-3 (n=10)	31±8	13±2	184.8±26.1	149.2±58.4	0.18±0.04	0.13±0.03*
		P=0.001				P=0.05
Control (n=6)	38±11	29±8	124±94	166±44	0.16±0.03	0.16±0.03
Blood	GSSG (µM/L)		GSH (µM/L)		GSSG/GSH	
	Before	After	Before	After	Before	After
ME-3	38±5	38±8	1075±73	1313±81*	0.032±0.003	0.025±0.006
				P=0.001		P<0.05
Control	40±12	35±11	1105.0±59.3	1153±89	0.036±0.010	0.030±0.007

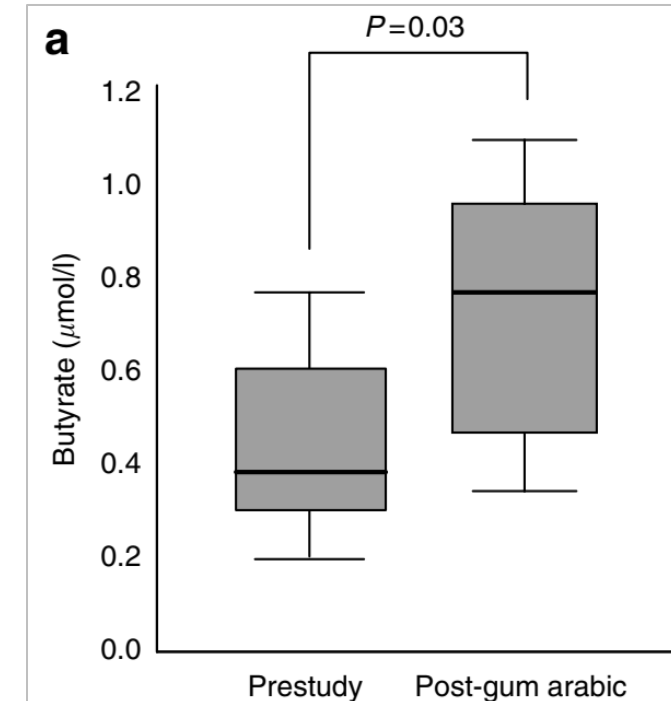
*P<0.05 as compared to control group

1. Kullisaar, T. et al. International Journal of Food Microbiology. 72, 215–224. (2002)
2. Mikelsaar, M. et al. Microbial Ecology in Health and Disease. 21, 1–27. (2009)
3. Kullisaar, T. et al. Appl Biochem Microbiol. 46, 481–486. (2010)
4. Songisepp, E. et al. Nutr J. 4, 22. (2005)
5. Kaur, S. et al. Open Medicine. 3, 215–220. (2008)
6. Rehema, A. et al. Open Life Sciences. 10, (2015)
7. Kullisaar, T. et al. Nutr J. 15, 93. (2016)
8. De Gregorio, A. et al. IJMS. 24, 6225. (2023)
9. Kullisaar, T. Endocrinol Diabetes Metab J. 3, (2019)
10. Truusalu, K. et al. APMIS. 118, 864–872. (2010)
11. Mikelsaar, M. et al. Microbial Ecology in Health and Disease. 20, 184–188. (2008)

Akazienfasern aus dem Senegal

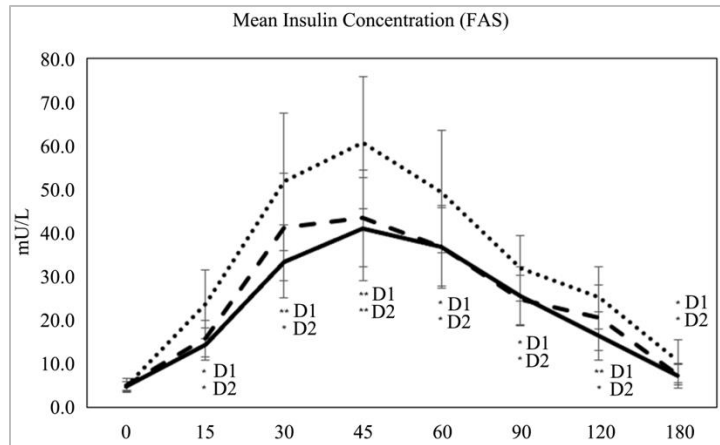


- Dieser Ballaststoff ist von dem Harz der Akazie aus dem Senegal gewonnen.
- Dieser Ballaststoff ist extrem oft in klinischen Studien untersucht worden (seit 1980)
- Obgleich die Studien tägliche Dosen von 25 g erwähnen, gibt es auch Studien, die 5 g pro Tag einsetzen.
- Als wichtiger Butyrat-Produktions-Stimulator bekannt. 6/7 (fig)

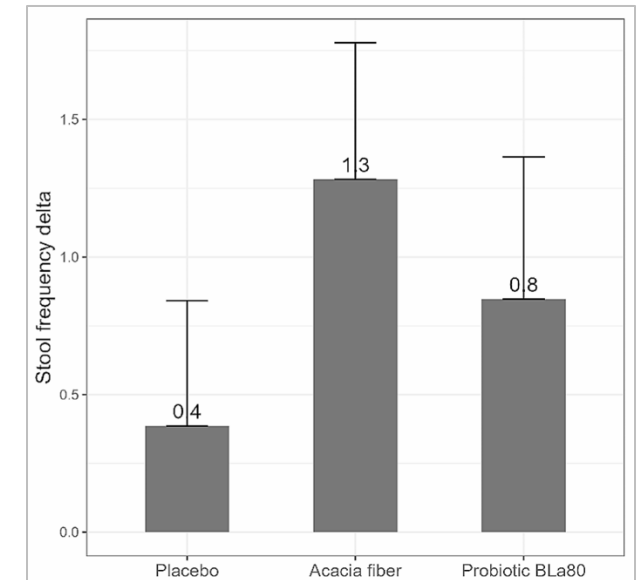


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Akazienfasern aus dem Senegal

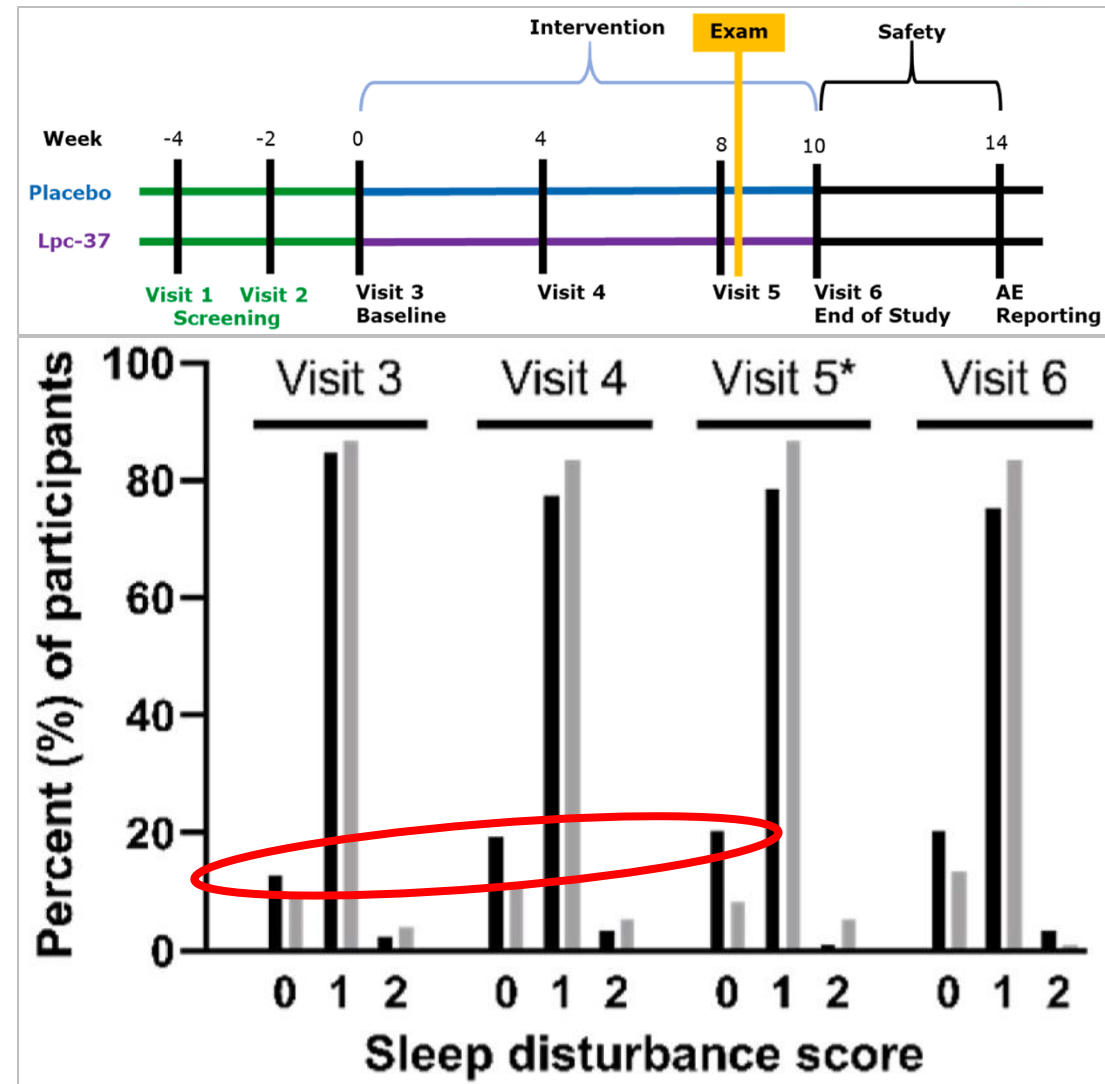
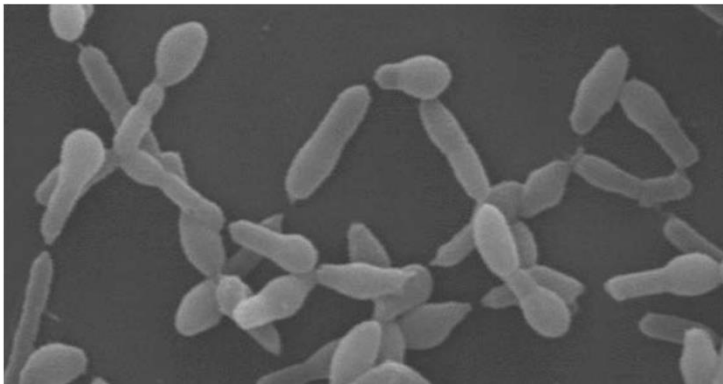


- Wichtige Studien über Akazienfasern:
 - Insulin Resistenz (several studies, e.g.^{1,2}, fig)
 - Obstipation (e.g.^{3,4}, fig)
- Other evidence-based uses:
 - Blähungen⁵
 - Entzündungen (e.g.^{7,8})
 - Oxidativer stress (e.g.⁹)
- Typischer Gebrauch: Metabolische Dysfunktion, wenig Butyrat



Lacticaseibacillus paracasei Lpc-37

- Isoliert von einem Milchprodukt
- Wurde in einigen Einzelstudien untersucht, aber auch in Mischungen
- Eine sehr interessante Einzelindikation ist bei Schlafstörungen (Durchschlafstörungen), fig)^{3,4}

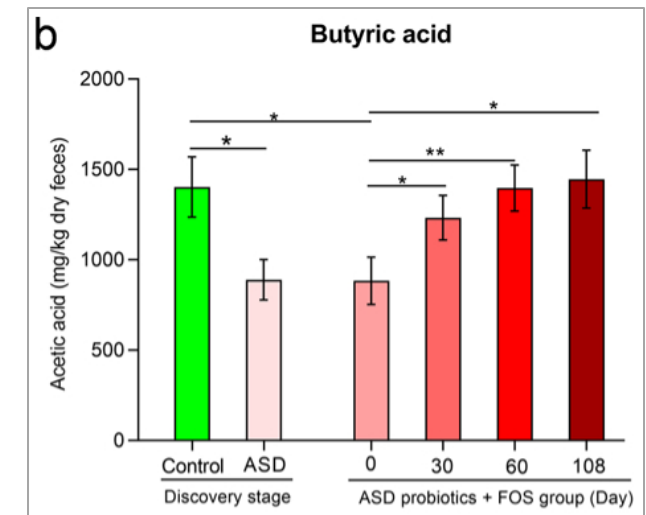
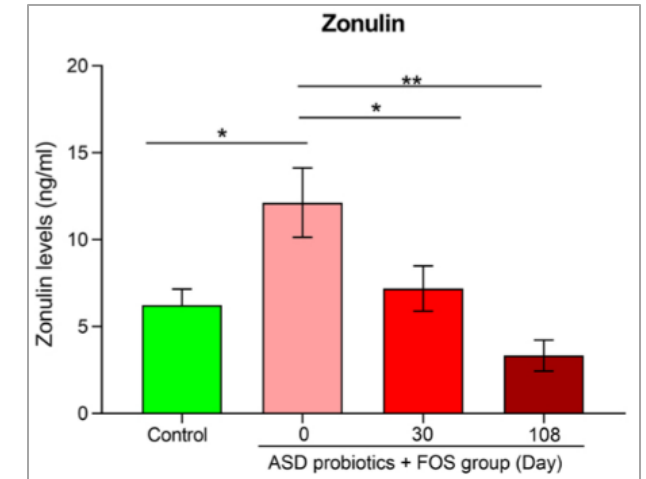
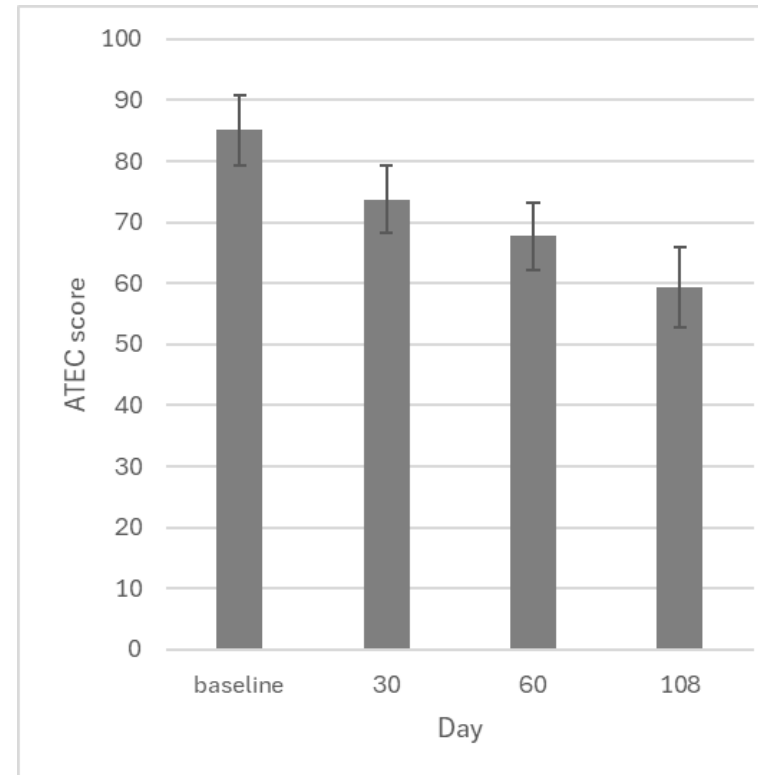


1. Hemalatha, R. et al. European Journal of Nutrition & Food Safety.4,.325–341.(2014)
2. Ouwehand, A. C. et al. Vaccine.32,.458–463.(2014)
3. Mäkelä, S. M. et al. Brain, Behavior, & Immunity - Health.32,.100673.(2023)
4. Patterson, E. et al. Neurobiol Stress.13,.100277.(2020)
5. Li, L. et al. Front. Microbiol.14,.1202858.(2023)
6. Waitzberg, D. L. et al. Clinical Nutrition.32,.27–33.(2013)
7. Santana, S. I. et al. J Clin Periodontol.49,.828–839.(2022)
8. Wang, Y. et al. Pharmacological Research.157,.104784.(2020)

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Lactaseibacillus paracasei Lpc-37

- Eine weitere, sehr interessante Studie ist mit der Indikation Autismus (fig)⁸
- Auch für weitere Indikationen gibt es gute Ergebnisse:
- Prevention of diarrhea and fever¹
 - AAD and *C. difficile* infection e.g.²
 - Stress^{3,4}
 - Heuschnupfen⁵
 - Constipation e.g.⁶
 - Mucositis⁷
- Typischer Einsatz: Verbesserung der Schlafqualität unter Stress kombiniert it GI Beschwerden



1. Hemalatha, R. et al. European Journal of Nutrition & Food Safety.4,.325–341.(2014)
2. Ouwehand, A. C. et al. Vaccine.32,.458–463.(2014)
3. Mäkelä, S. M. et al. Brain, Behavior, & Immunity - Health.32,.100673.(2023)
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6. Waitzberg, D. L. et al. Clinical Nutrition.32,.27–33.(2013)
7. Santana, S. I. et al. J Clin Periodontol.49,.828–839.(2022)
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Unser eigener Stamm: *Escherichia coli* MC231

- Ausgesucht aus einer langen Reihe von Probiotika
- Warum dieser Stamm?
 - Bakterien Spezies von *E. Coli* spielen eine entscheidene Rolle im Mikrobiom
 - Weitgehend identisch mit dem Stamm *E. coli* nissle 1917
 - Sicher! *E. coli* Nissle 1917 hat eine sehr lange, sichere Anwendung

4.3.2 Mapping Statistics with Reference Genome

The mapping rates of samples reflect the similarity between each sample and the reference genome. The depth and coverage are indicators of the evenness and homology with the reference genome.

Table 4.5 Statistics of mapping rate, depth and coverage

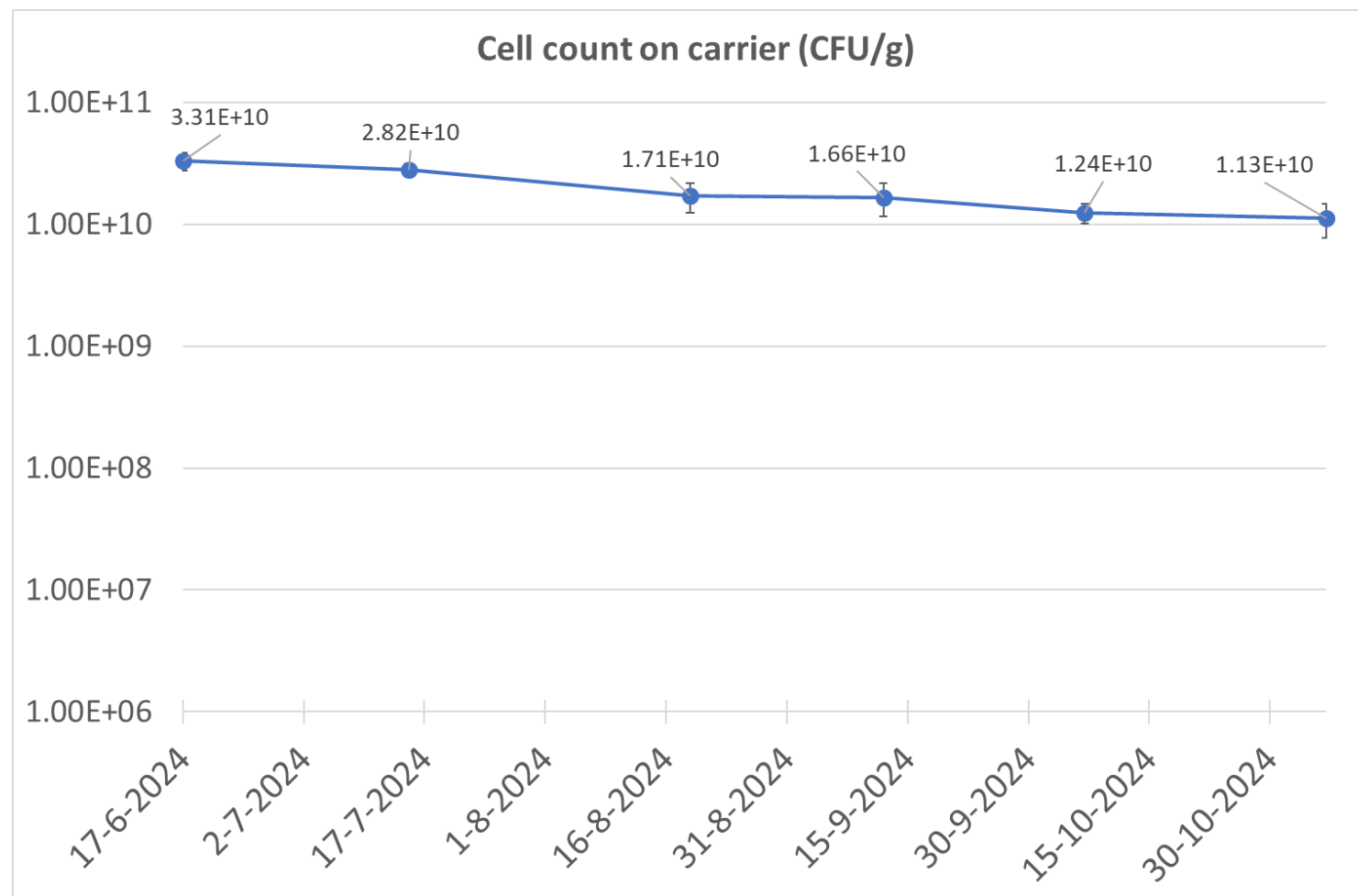
Sample	Mapped reads	Total reads	Mapping rate (%)	Average depth(X)	Coverage at least 1X (%)	Coverage at least 4X (%)
MC231_02	9,119,407	9,130,850	99.87	201.96	100.00	100.00

4.3.3 Mapping Summary

For the current 5,064,093 bp reference genome, the mapping rate of this sample is 99.87%. Refer to the reference genome (without Ns), the average depth is 201.96X, and more than 1X coverage reaches 100.00%. This result is in the qualified normal range and may serve in the subsequent variation detection and related analyses.

Development of *E. coli* MC231

Stability



Welche Einsatzgebiete hat dieser E.coli MC 231?

→ Ulcerative colitis

Maintaining remission of ulcerative colitis with the probiotic *Escherichia coli* Nissle 1917 is as effective as with standard mesalazine

W Kruis, P Frič, J Pokrotnieks, M Lukáš, B Fixa, M Kaščák, M A Kamm, J Weismueller, C M Stolte, C Wolff, J Schulze

Gut 2004;53:1617–1623. doi: 10.1136/

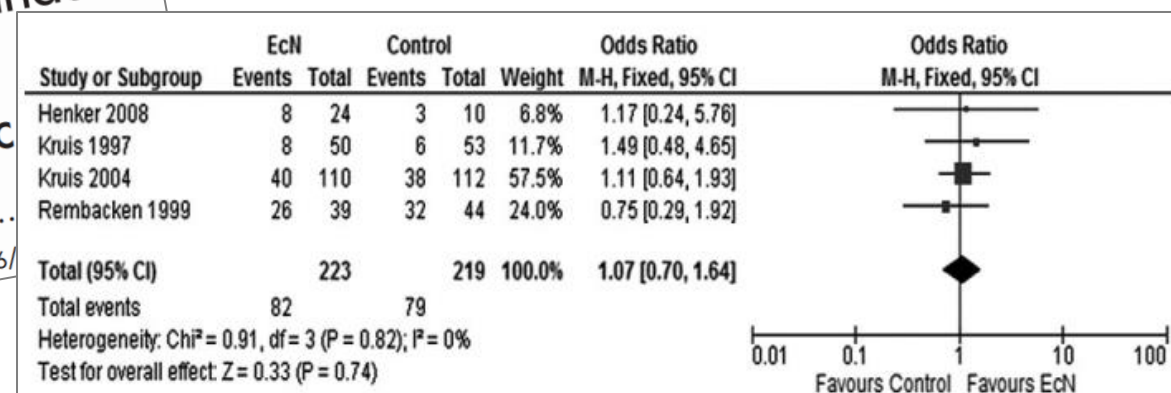


Fig. 3. Forest plot of the efficacy of EcN in maintaining remission for ulcerative colitis.

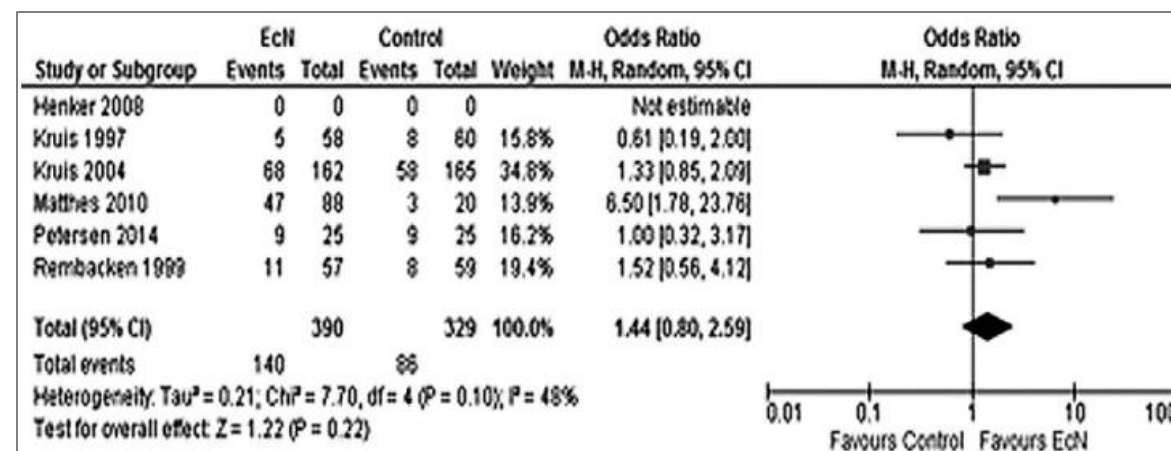
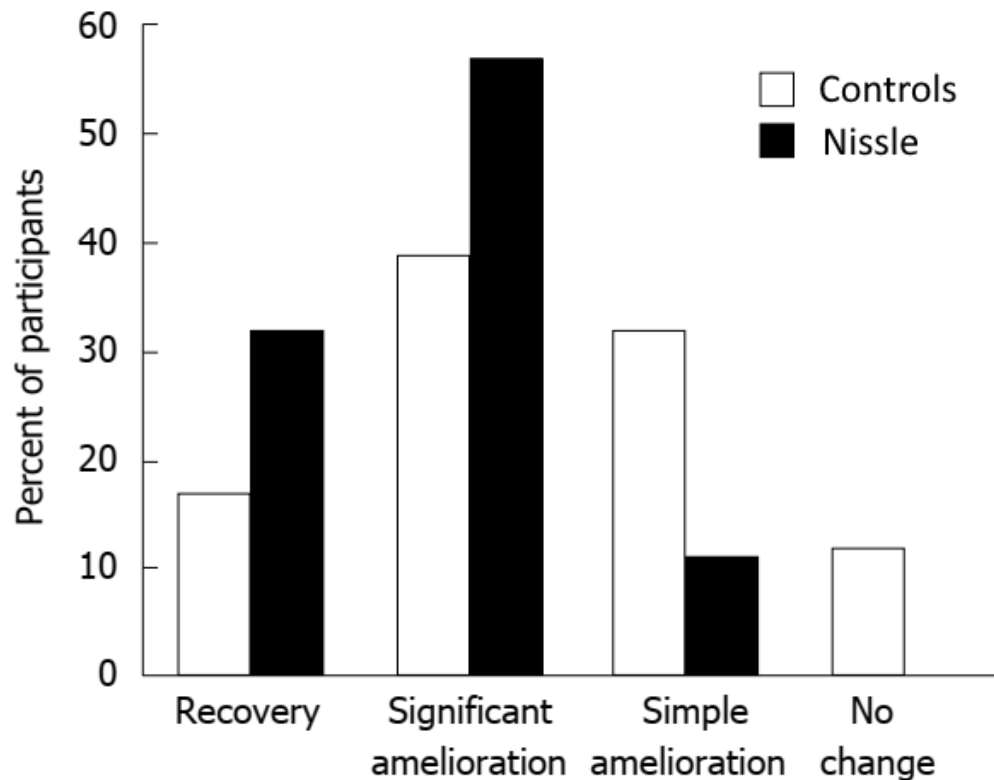


Fig. 4. Forest plot of the side effects observed in EcN treatment.

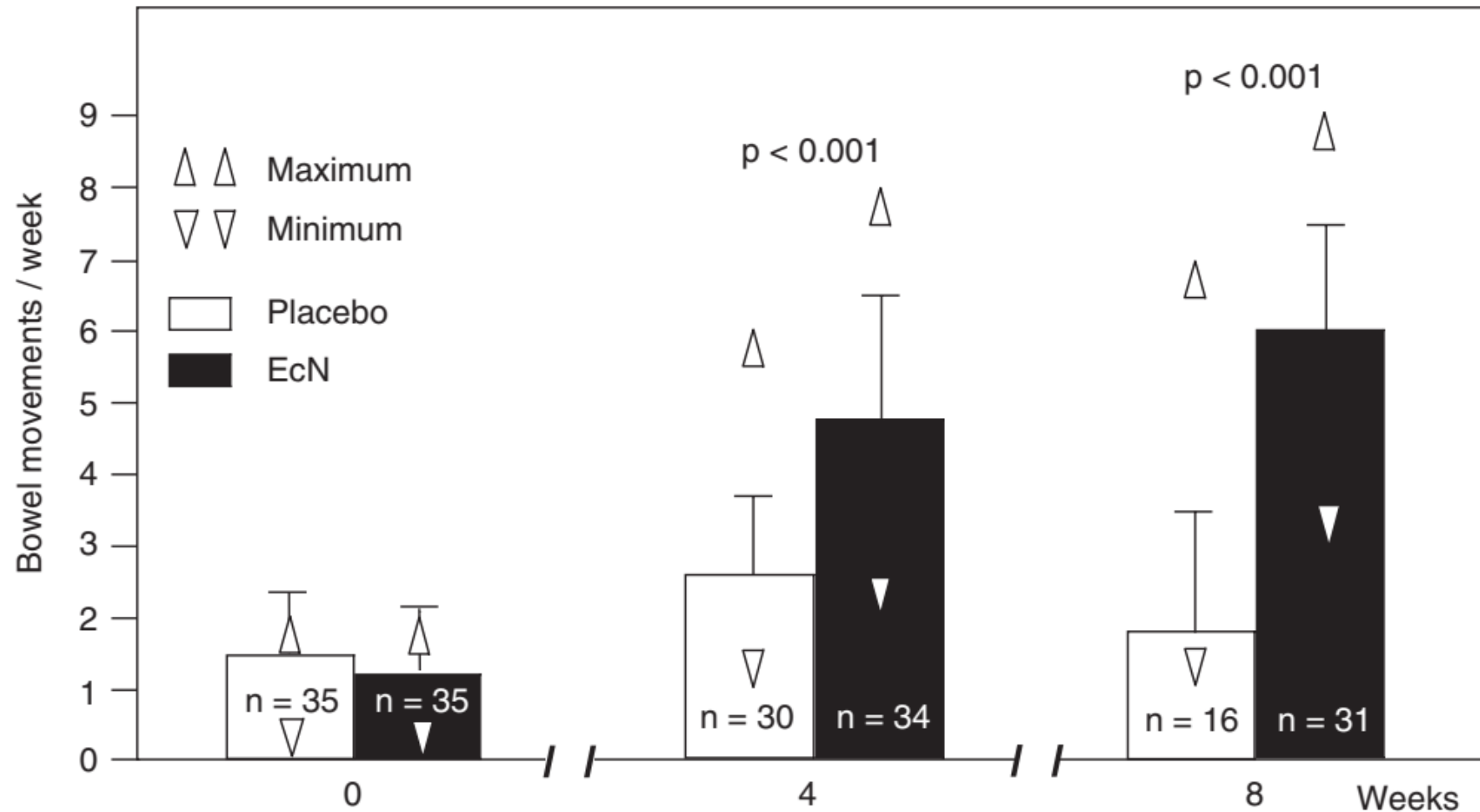
Was kann dieser Stamm noch?

→ Dermatosis with pimples (acne, rosacea, seborrheic dermatitis)



Was kann dieser Stamm außerdem?

→ Obstipation

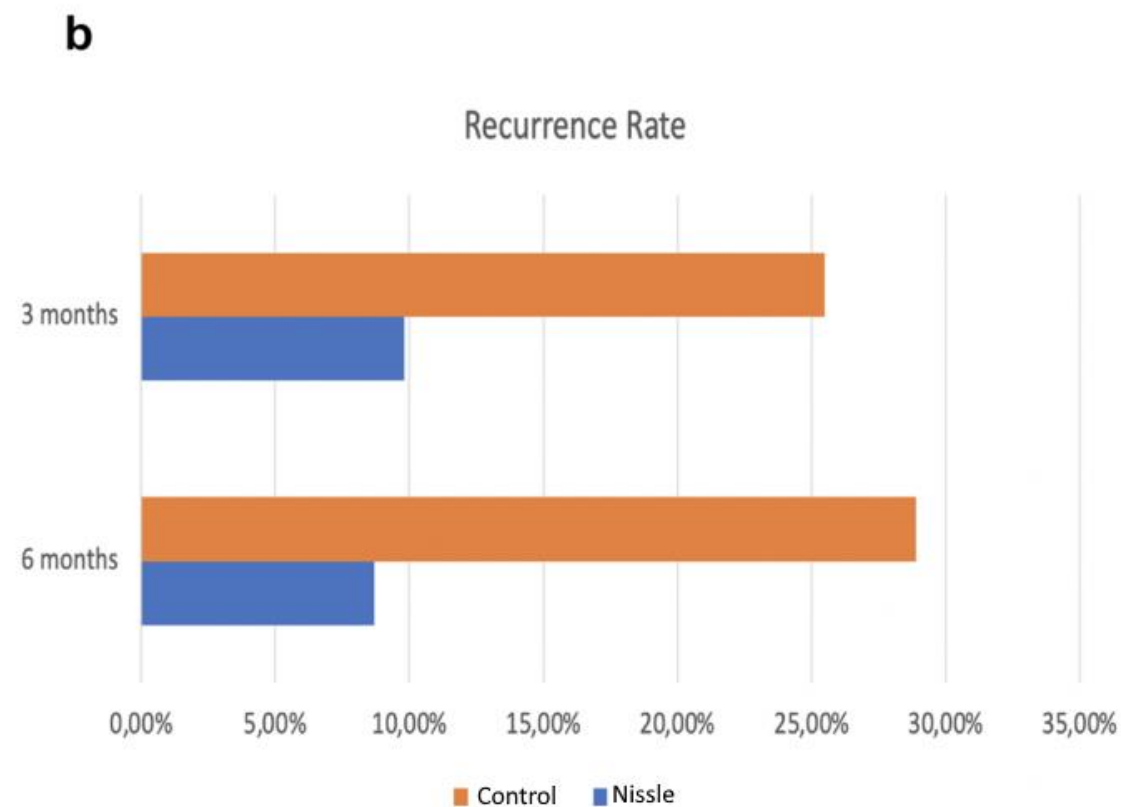
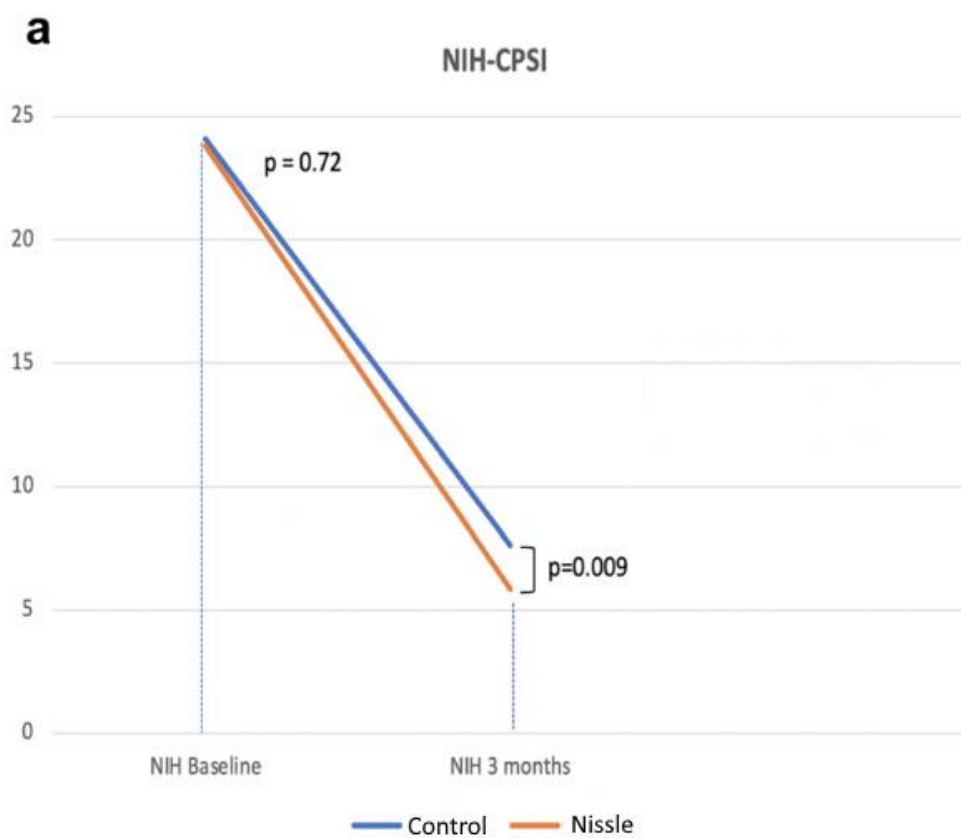


1. Möllenbrink, M. et al. *Med Klin (Munich)*.89,.587–593.(1994)
2. Sonnenborn, U. et al. *Microbial Ecology in Health and Disease*.21,.122–158.(2009)

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Was kann E.coli MC 231 noch?

→ Chronische bakterielle Prostatitis



2. Interaktiver Teil:

Was wollen Sie



über die bestimmten Bausteine noch wissen?

Building block overview

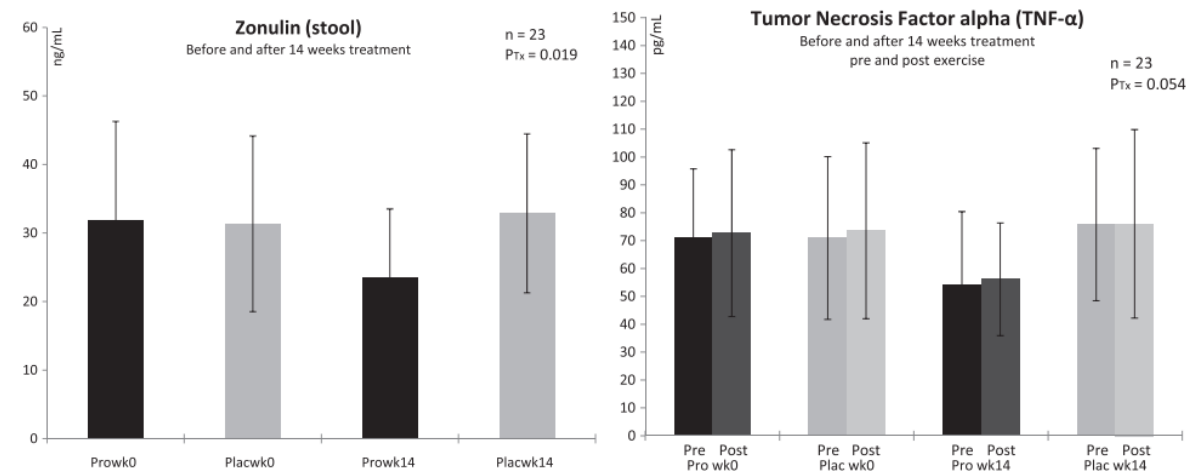
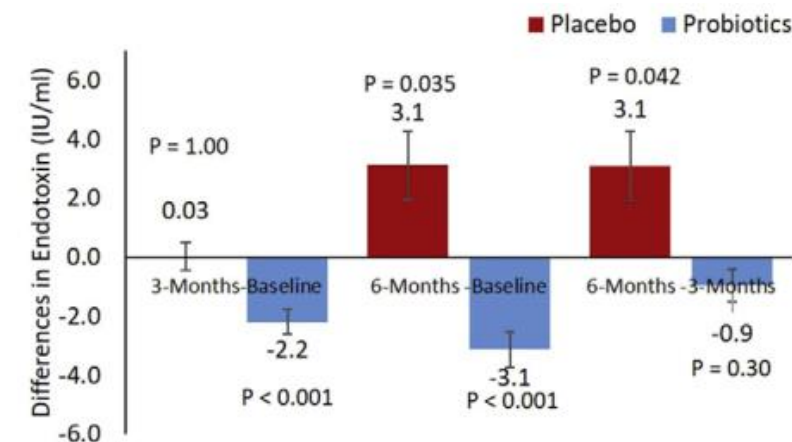
2020	1	Barrier
	2	Bifido booster
	3	DJ repair
	4	IL-10 Immune balancer
	5	TH1/TH2 Immune balancer
	6	Pathogene reduction
	7	Yeast reduction
	8	Vitamin K2 booster
	9	Butyrate generator
	10	Microbiota booster – fiber complex
2021	11	S. Boulardii
	12	L. acidophilus LA02
	13	L. rhamnosus GG
	14	Bacillus clausii UBBC-07
	15	Bacillus coagulans Unique IS-2
	16	E. faecium Rosell-26 + B. Rosell-179
	17	2'-Fucosyllactose
	18	L. plantarum P8

2022	19	PHGG
	20	L. sakei probio65
	21	Anaerobutyricum soehngenii
	22	Gut enricher
	23	L. Plantarum DR7
2023	24	L. rhamnosus SP1
	25	Akkermansia
	26	Bifidobacterium lactis HN019
	27	Vaginal suppositories
2024	28	Limosilactobacillus fermentum ME-3
	29	Acacia fiber
2025	30	Lactiseibacillus paracasei Lpc-37
	31	Eschericia coli MC231

Barriere Booster



- This BB contains four strains:
 - *Bifidobacterium bifidum* W23
 - *Lactobacillus acidophilus* W37
 - *Bifidobacterium lactis* W51
 - *Lactobacillus brevis* W78
- It is developed to improve gut barrier integrity, for which there is both in vitro and in vivo evidence (fig)¹⁻⁴.
- Other evidence for therapeutic uses, often linked to barrier integrity, include:
 - Anti-inflammatory effects^{4,5}
 - Type 2 diabetes^{2,3}
 - Sad mood/depression^{6,7}
 - Respiratory tract infections⁸
- Typical use: one of these disorders with leaky gut



1. Lépine, A. F. P. et al. Front. Microbiol. 9, 1439 (2018)
2. Sabico, S. et al. Clinical Nutrition (2018)
3. Szulińska, M. et al. Nutrients 10, 773 (2018)
4. Lamprecht, M. et al. J Int Soc Sports Nutr 9, 45 (2012)
5. Niers, L. E. M. et al. Clin. Exp. Allergy 35, 1481–1489 (2005)
6. Chahwan, B. et al. Journal of Affective Disorders 253, 317–326 (2019)
7. Papalini, S. et al. Neurobiology of Stress 10, 100141 (2019)
8. Strasser, B. et al. Nutrients 8, (2016)

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Bifido booster

- This BB contains six bacterial species of the genus *Bifidobacterium*:
 - *Bifidobacterium bifidum* W23
 - *Bifidobacterium breve* W25
 - *Bifidobacterium bifidum* W28
 - *Bifidobacterium lactis* W51
 - *Bifidobacterium lactis* W52
 - *Bifidobacterium longum* W108
- Bifido's are known for their immune-modulating properties.
- There is in vitro evidence for:
 - Anti-inflammatory effects (fig)^{1,2}
 - Th2 to Th1 skewing^{1,3}
 - Pathogen inhibition⁴
- Clinical evidence for an effect on constipation (fig)^{5,6}
- Typical use: low abundance of bifido's with inflammation

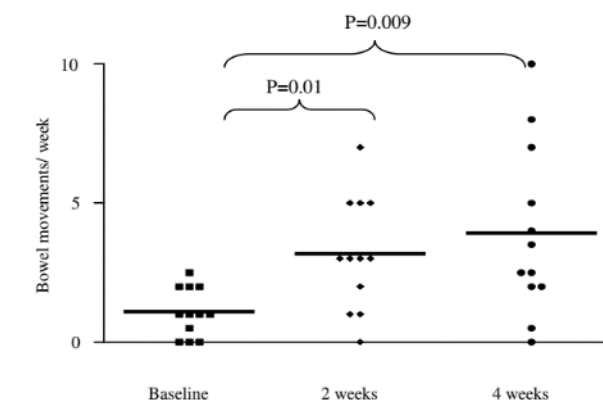
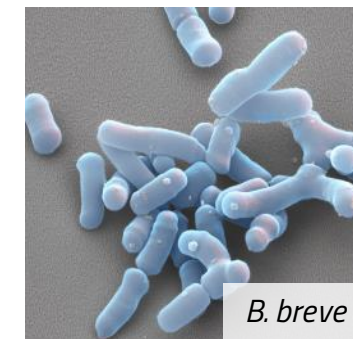
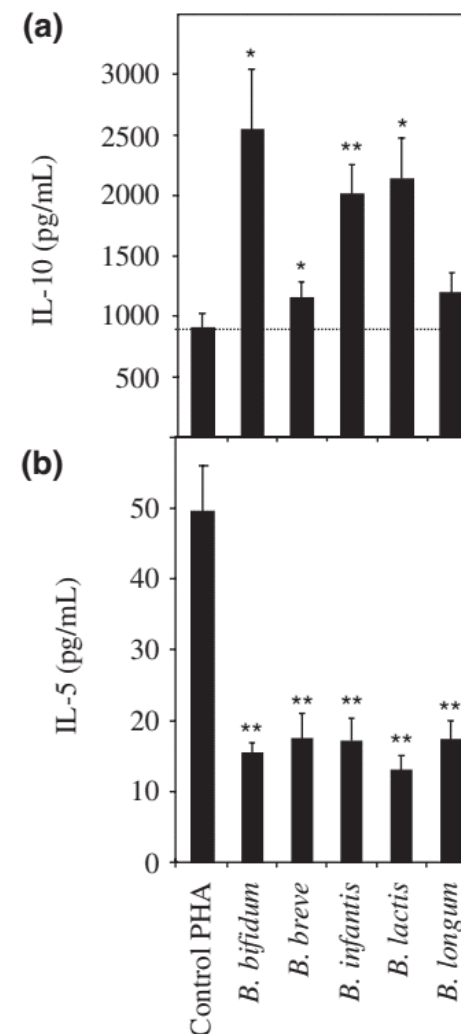
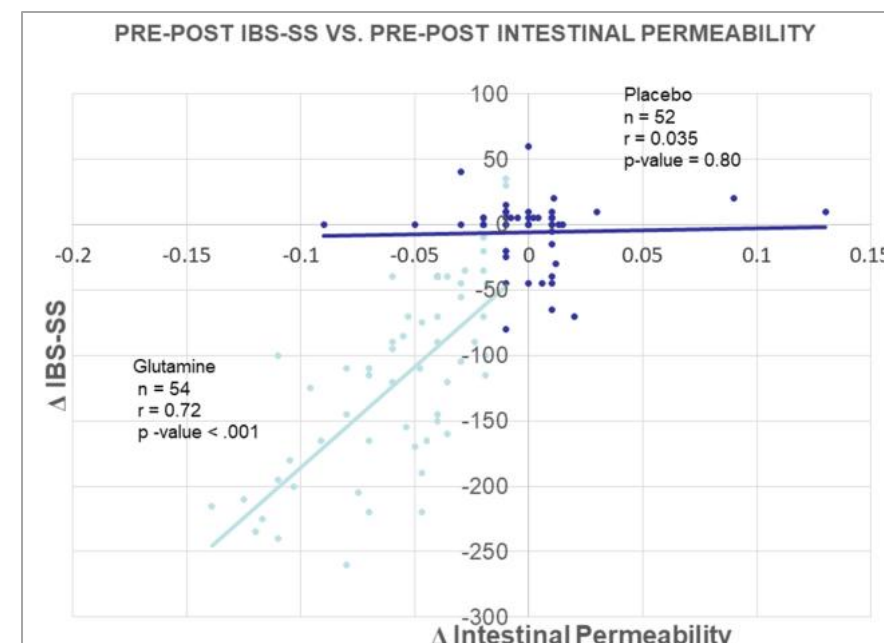
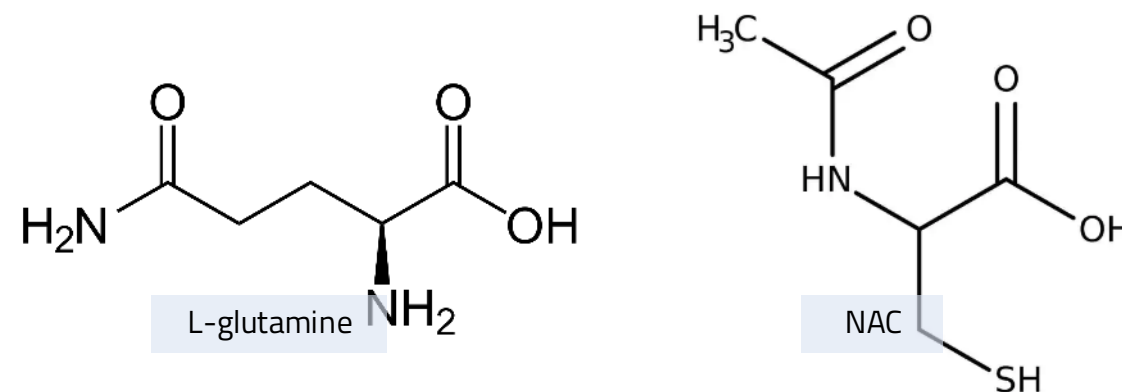


Figure 2
Bowel movements (BM) per week in children presenting with <3 BMs/week.

1. Niers, L. E. M. et al. Clin. Exp. Allergy 35, 1481–1489 (2005)
2. Roock, S. D. et al. Clinical & Experimental Allergy 40, 103–110 (2010)
3. Niers, L. E. M. et al. Clin Exp Immunol 149, 344–352 (2007)
4. Campana, R. et al. Gut Pathog 9, (2017)
5. Bekkali, N.-L.-H. et al. Nutr J 6, 17 (2007)
6. de Milliano, I. et al. Nutr J 11, 80 (2012)

DJ repair

- This BB consists of L-glutamine (90%), N-acetylcysteine (9.9%), and zinc (0.1%).
- This mixture is designed to aid the intestinal barrier function. Evidence shows that:
 - L-glutamine^{1,2} and zinc^{3,4} improve barrier function (fig).
 - NAC decreases oxidative stress^{5,6}
- Other evidence-based therapeutic uses include:
 - IBS²
 - Side effects of radio or chemotherapy^{7,8}
 - Improve fatigue⁹
- Typical use: one of these disorders with leaky gut

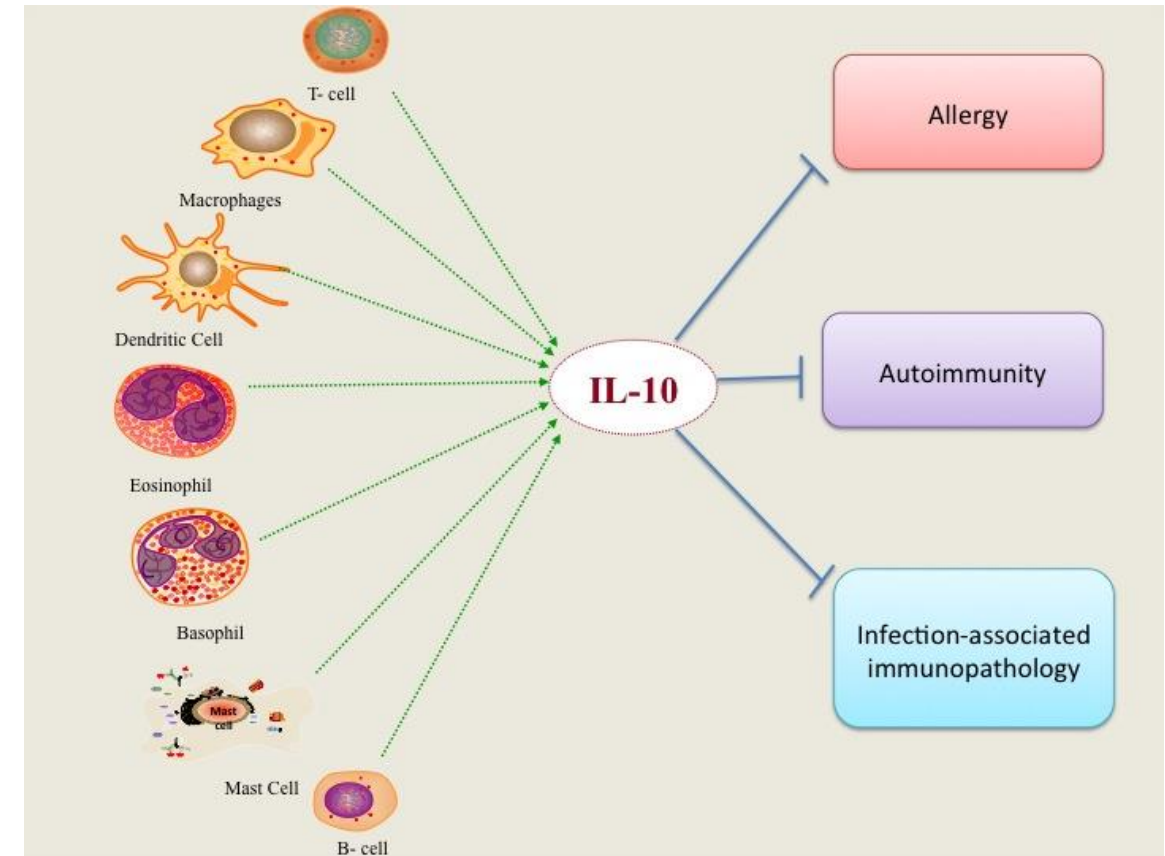


1. Quan, Z.-F. et al. World J Gastroenterol 10, 1992–1994 (2004)
2. Zhou, Q. et al. Gut 2017;315:136 (2018)
3. Roy, S. K. et al. J. Pediatr. Gastroenterol. Nutr. 15, 289–296 (1992)
4. Wessells, K. R. et al. J Pediatr Gastroenterol Nutr 57, 348–355 (2013)
5. Kasperczyk, S. et al. Clin Toxicol (Phila) 51, 480–486 (2013)
6. Shahbazian, H. et al. Saudi Journal of Kidney Diseases and Transplantation 27, 88 (2016)
7. Li, Y. et al. Tumori Journal 92, 396–401 (2006)
8. Kucuktulu, E. et al. Support Care Cancer 21, 1071–1075 (2013)
9. Maes, M. et al. Neuro Endocrinol. Lett. 29, 902–910 (2008)

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IL-10 immune balancer

- This BB contains four strains from three genera:
 - Bifidobacterium bifidum W28
 - Bifidobacterium animalis subsp lactis W53
 - Enterococcus faecium W54
 - Lactobacillus acidophilus W55
- This BB is designed for an anti-inflammatory via, among other things, the induction of IL-10^{1,2}.
- IL-10 is a key regulatory cytokine that prevents damage from prolonged inflammation^{3,4}.
- Some strains stimulate FOXP3 release⁵, which is indicative of the activation of regulatory T cells (Treg) that play an important role in inhibiting autoimmune diseases and allergic reactions.
- Typical use: patients with allergic or auto-immune diseases

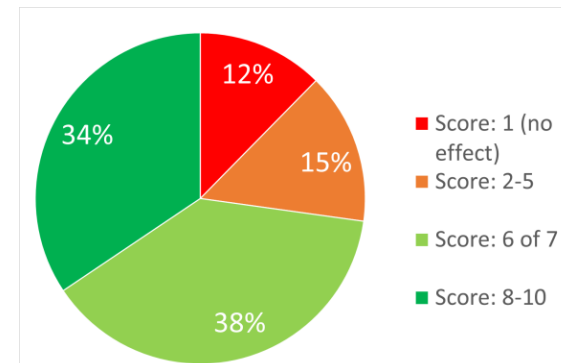
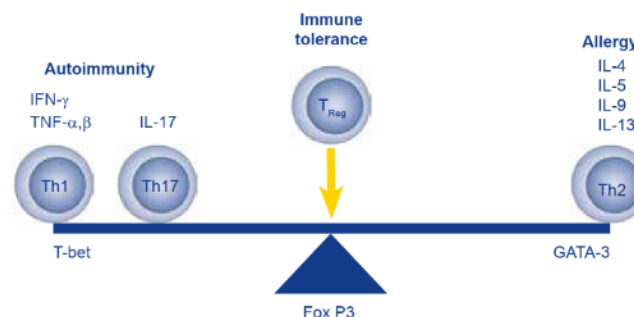


1. Roock, S. D. et al. Clinical & Experimental Allergy 40, 103–110 (2010)
2. Proprietary data
3. Saraiva, M. et al. J Exp Med 217, e20190418 (2019)
4. Nagpal, G. et al. Sci Rep 7, 42851 (2017)
5. Kepert, I. et al. Journal of Allergy and Clinical Immunology 139, 1525–1535 (2017)

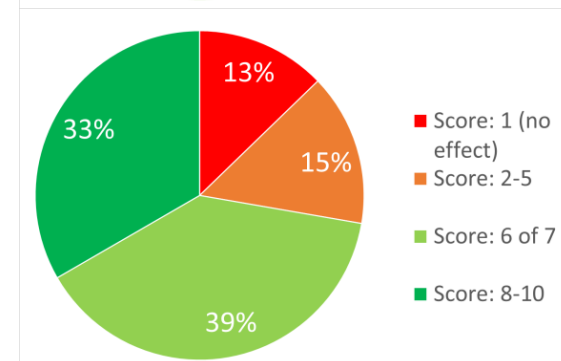
Th1/Th2 immune balancer

Data till December 2023

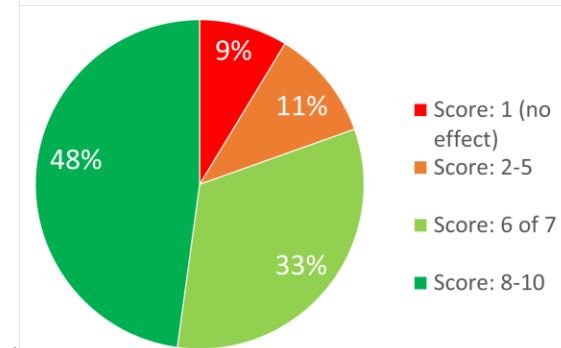
- This BB contains four strains from three genera:
 - Bifidobacterium lactis* W28
 - Bifidobacterium animalis subsp lactis* W53
 - Lactobacillus casei* W56
 - Lactococcus lactis* W58
- It is designed to skew the Th1/Th2 balance towards Th1. This balance, which is also affected by Treg expression, is crucial in allergic diseases¹.
- The strains are selected for dampening Th2, stimulating Th1 and Treg²⁻⁴.
- Other evidence for therapeutic uses:
 - Pathogen inhibition⁵
 - Anti-inflammatory effect²⁻⁴
 - Type 2 diabetes^{6,7}
 - Sad mood/depression^{8,9}
- Data analysis: indeed favorable effect in allergies (fig)
- Typical use: patients with allergies



All patients
(n=1195)



All patients
with allergy
(n=321)



Patients with
allergy using
Th1/Th2
immune
balancer
(n=46)

1. Akdis, C. A. et al. (European Academy of Allergy and Clinical Immunology, 2014)
2. Niers, L. E. M. et al. Clin. Exp. Allergy 35, 1481–1489 (2005)
3. Kepert, I. et al. Journal of Allergy and Clinical Immunology 139, 1525–1535 (2017)
4. Niers, L. E. M. et al. Clin Exp Immunol 149, 344–352 (2007)
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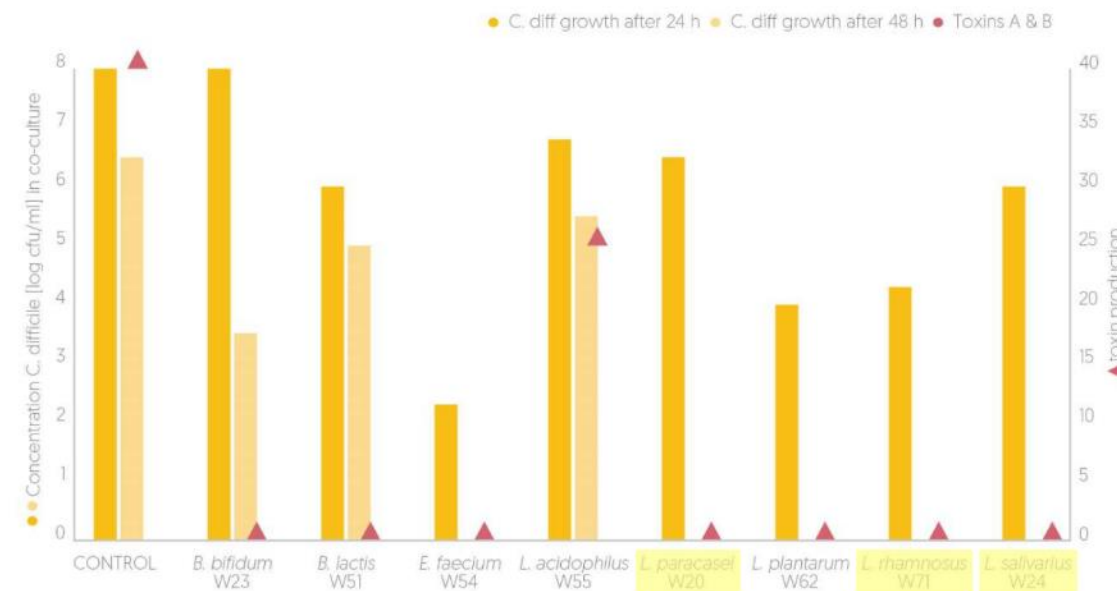
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Pathogen reduction

- This BB consist of:
 - *Lactobacillus paracasei* W20
 - *Lactobacillus plantarum* W21
 - *Lactobacillus salivarius* W24
 - *Lactobacillus rhamnosus* W71
- These strains were selected for their strong pathogen inhibiting effects.
- For these strains in vitro evidence shows strong inhibition of *Clostridium difficile*, pathogenic *Enterococcus faecalis*, pathogenic *Escherichia coli*, *Salmonella enteritidis*, and *Listeria monocytogenes* (fig)^{1,2}
- Typical use: patients with overgrowth of pathogenic bacteria

Table 2 Antimicrobial activity of the cell-free supernatants (CFCs) produced by the different LAB strains toward human intestinal pathogens strains performed by agar well diffusion method

CFCs	Inhibition zone (mm ± sd)				
	<i>S. enteritidis</i> ATCC 13076	<i>L. monocytogenes</i> ATCC 7644	<i>E. coli</i> O157: H7 ATCC 35150	<i>C. sakazakii</i> ATCC 29544	<i>C. jejuni</i> ATCC 33291
<i>B. bifidum</i> W23	–	10.1 ± 0.25	11.0 ± 0.35	12.1 ± 0.25	12.1 ± 0.32
<i>L. salivarius</i> W24	10.1 ± 0.32	–	–	10.2 ± 0.11	10.1 ± 0.28
<i>L. acidophilus</i> W37	–	11.1 ± 0.12	–	–	12.1 ± 0.36
<i>L. casei</i> W56	–	11.1 ± 0.51	–	10.2 ± 0.21	17.1 ± 0.21
<i>L. lactis</i> W58	11.0 ± 0.15	11.0 ± 0.27	12.0 ± 0.28	11.1 ± 0.15	10.5 ± 0.51
<i>L. plantarum</i> W21	10.1 ± 0.31	14.1 ± 0.34	10.0 ± 0.20	10.1 ± 0.28	13.5 ± 0.52
<i>L. rhamnosus</i> W71	10.1 ± 0.24	12.1 ± 0.31	11.0 ± 0.15	10.2 ± 0.25	17.2 ± 0.21
Positive control	16.3 ± 0.53 (Gen)	19.3 ± 0.63 (W)	15.6 ± 0.64 (Gen)	16.3 ± 0.52 (Strep)	32 ± 0.51 (Gen)

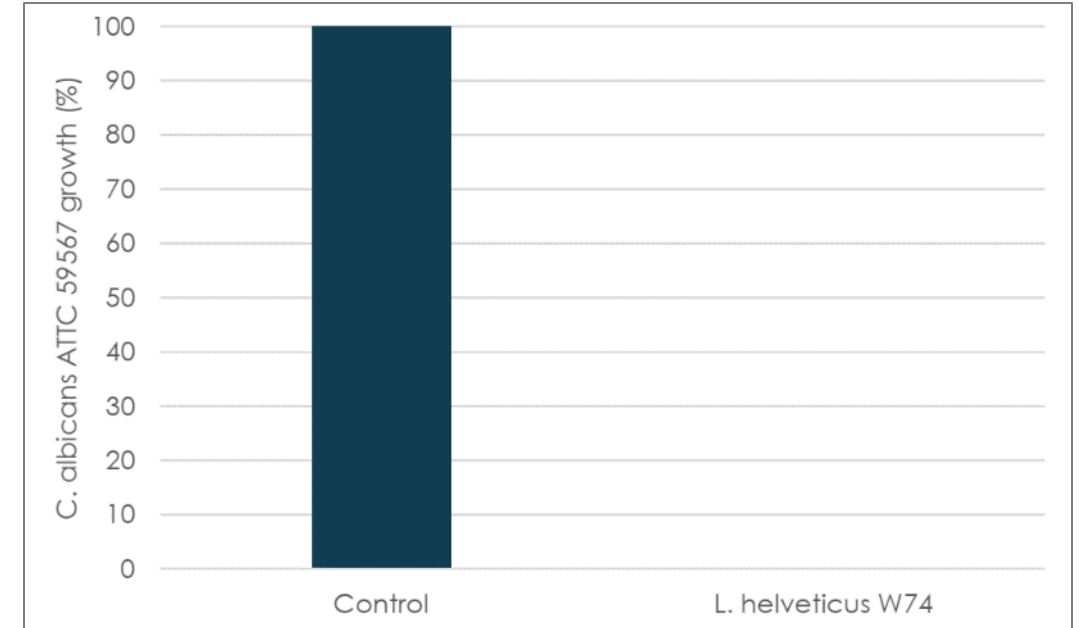


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1. Campana, R. et al. Gut Pathog 9, (2017)
2. Proprietary data

Hefen-Reduzierer

- This BB consists of:
 - *Lactobacillus plantarum* W21
 - *Lactobacillus acidophilus* W22
 - *Lactobacillus salivarius* W57
 - *Lactobacillus helveticus* W7
- The strains are selected for their ability to inhibit pathogenic yeasts such as *Candida albicans* ATCC 14053, *Candida albicans* ATCC 59567 and *Candida glabrata* ATCC 90030 (fig)¹.
- In addition, there is some evidence for:
 - Pathogen inhibition^{1,2}
 - Th1/Th2 balancing³
- Typical use: patients with overgrowth of candida



1. Proprietary data
2. Campana, R. et al. Gut Pathog 9, (2017)
3. Kepert, I. et al. Journal of Allergy and Clinical Immunology 139, 1525–1535 (2017)

Vitamin K2 booster

- This BB consists of:
 - Lactobacillus brevis* W78
 - Bacillus coagulans* W183
 - Propionibacterium freudenreichii* W200
 - Bacillus subtilis* W201
- These strains are selected for their capacity to produce vitamin K2 in various subtypes (fig)¹.
- Vitamin K2 produced by bacteria in the gut can be absorbed and contributes to vitamin K2 use by other commensals^{2,3}.
- Evidence for therapeutic uses of vitamin K2:
 - Osteoporosis (meta-analysis of RCTs, fig)⁴
 - Arterial stiffness⁵
 - Glycemic control / T2DM⁶⁻⁸
 - Depression⁹
- Typical use: patients with osteoporosis or arterial stiffness combined with metabolic dysfunction

	MK4	MK5	MK6	MK7	MK8	MK9	MK9-4H	MK10
<i>B.subtilis</i> W201		0,1	0,4	105,9	1,9	0,2		
<i>P. freudenreichii</i> W200		0,2		0,02	0,3	20,1	1040	
<i>B. coagulans</i> W64		0,1	0,1	23,7	1,3	0,1		0,1
<i>L. brevis</i> W63				0,01	0,004	0,007		

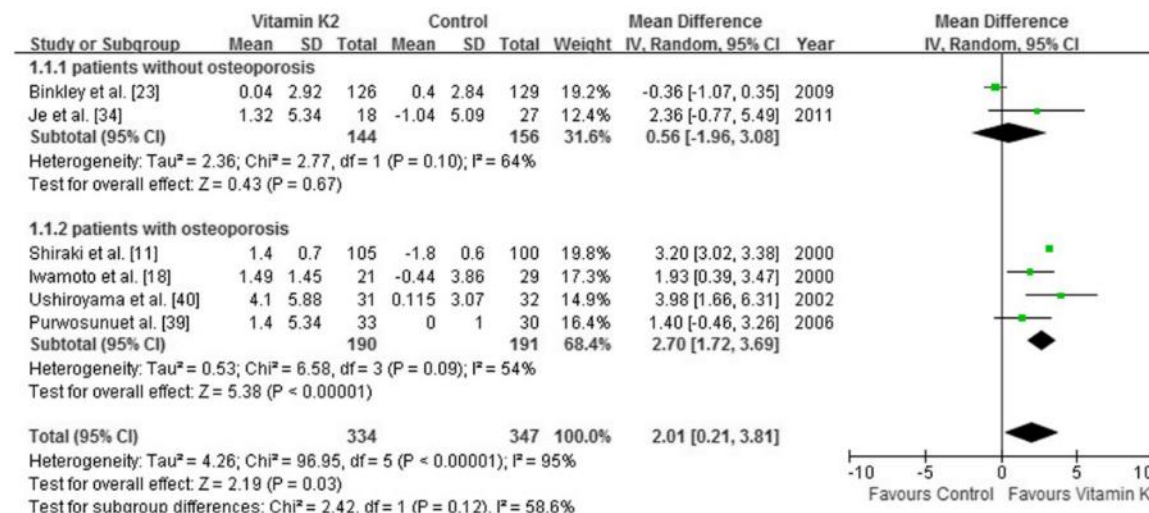


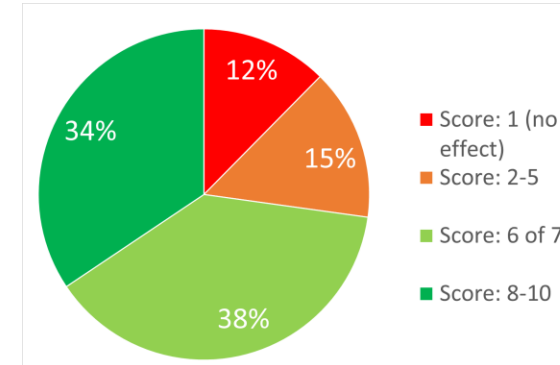
Fig. 2 Forest plot of the medium-term follow-up of vertebral BMD changes, showing a significant improvement of vertebral BMD in osteoporosis subgroup analysis and overall effect for vitamin K2 over control group

- Proprietary data
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- Knapen, M. H. J. et al. Thrombosis and Haemostasis 113, 1135–1144 (2015)
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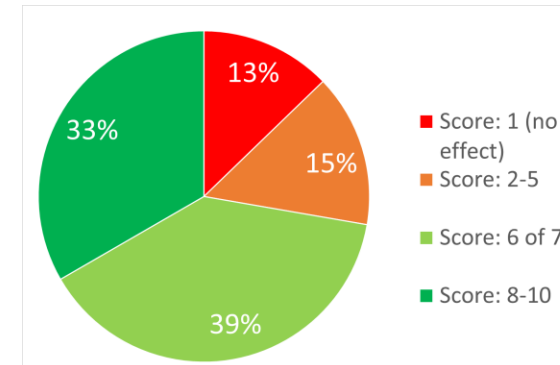
Interventions - Butyrate generator

Data till December 2023

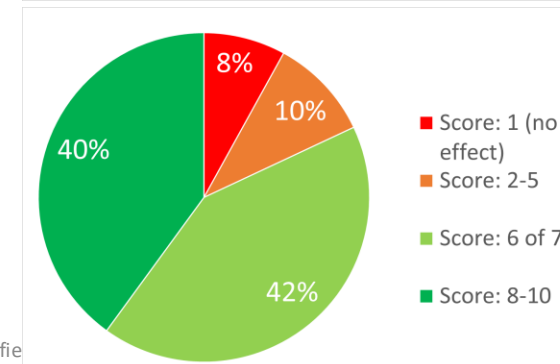
- This building block contain three strains:
 - *Enterococcus faecium* T-110
 - *Clostridium butyricum* TO-A
 - *Bacillus subtilis* TO-A
- On the Japanese market as medicine since 1963
- Strains act symbiotically, yielding *in situ* butyrate production of *C. butyricum*
- Butyrate has strong anti-inflammatory properties¹⁻³
 - Exemplified by effect of this building block on ulcerative colitis⁴⁻⁶
- For this building block there is also evidence for:
 - Anti-inflammatory effects^{4,7,8}
 - Infectious diarrhea^{7,8}
- Data analysis: favorable effect in patients with allergy.
- Typical use: inflammation with low butyrate-producing capacity.



All patients
(n=1195)



All patients
with allergy
(n=321)



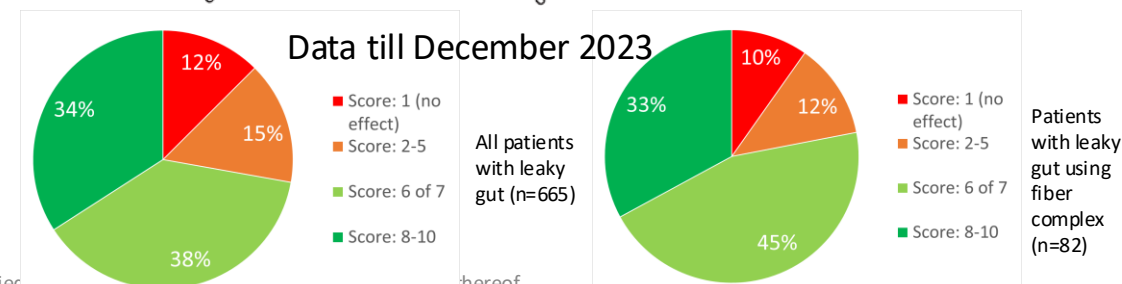
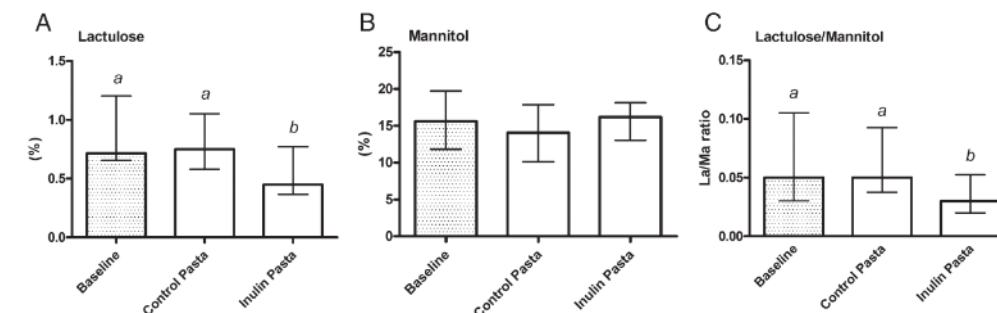
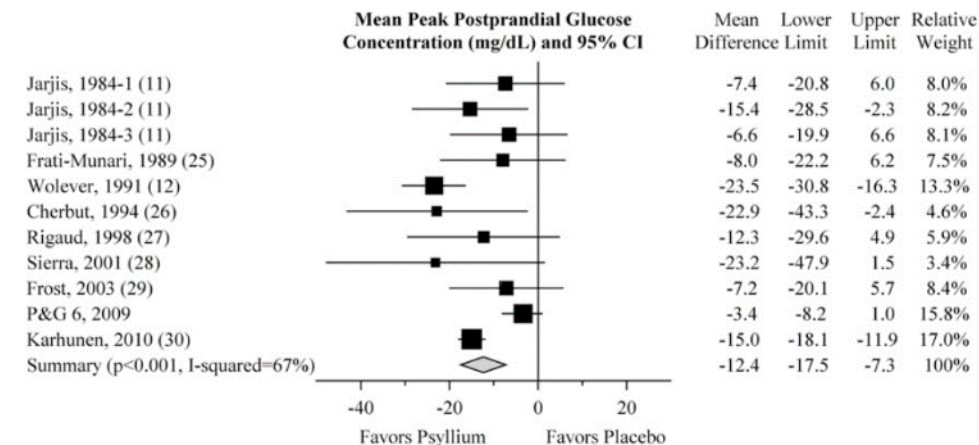
Patients with
allergy using
butyrate
generator
(n=100)

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Microbiota booster – fiber complex

- This BB contains five different fibers:
 - Psyllium fibers
 - acacia fibers
 - inulin fibers
 - pea fibers
 - konjac fibers (glucomannan)
- Not studied in this combination, but at individual level.
- There is evidence for effects in:
 - Diabetes type 2 (meta-analyses, fig)¹⁻³
 - Intestinal permeability (fig)^{4,5*}
 - Constipation^{6,7}
- *Often with higher daily doses, but data analysis shows positive results on intestinal permeability (fig).
- Typical use: patients with intestinal permeability and T2DM or constipation, without severe food intolerances



[Return to overview](#)

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S. Boulardii

- *Saccharomyces cerevisiae* var *boulardii* CNCM-I-1079 is a yeast.
 - Much bigger than most bacteria.
- Isolated in 1923 by Henri Boulard from skin of tropical fruits in Southeast Asia, after he observed that people who ate these did not get diarrhea from cholera^{1,2}.
- Extensively studied, > 120 clinical trials. Most studied for several types of diarrhea (meta-analyses):
 - Antibiotics-associated diarrhea^{3,4}
 - Travelers' diarrhea⁵
 - Infectious diarrhea⁶
- Other evidence-based therapeutic uses:
 - *Helicobacter pylori* eradication (fig)⁷
 - Parasitic infections (fig)⁸⁻¹⁰
 - Anti-inflammatory effects¹¹
 - SIBO¹²
 - Etc.
- Typical use: diarrhea, parasites, or SIBO

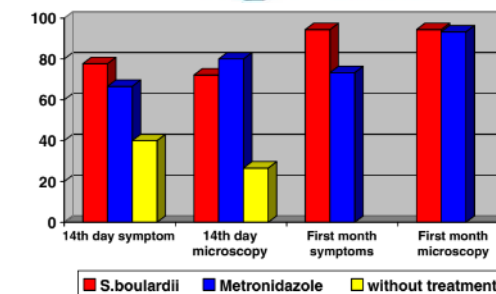
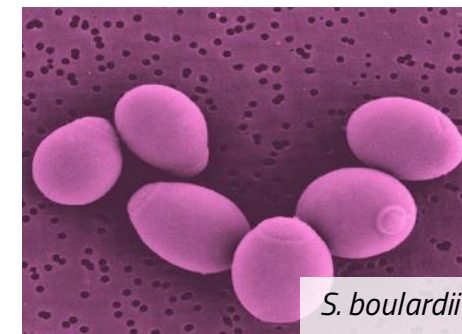


Fig. 1 Cure rate for clinical findings and parasitological examinations between study groups on the 14th day and first month

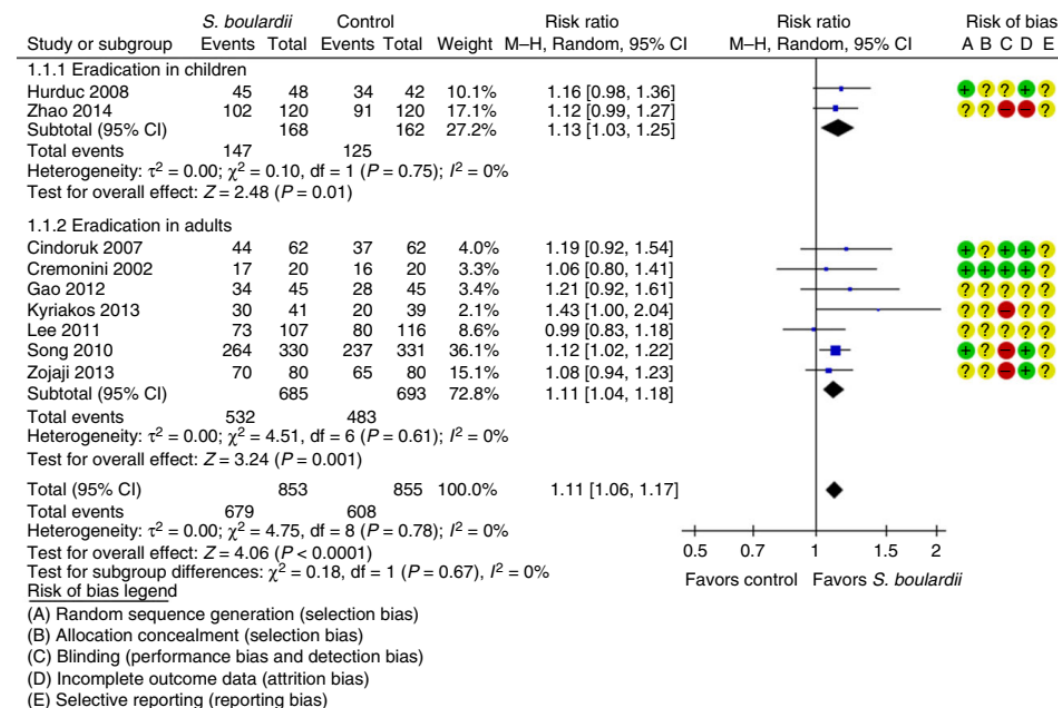


Figure 1 | Primary outcome: Effect of *Saccharomyces boulardii* (SB) on *Helicobacter pylori* eradication rates.

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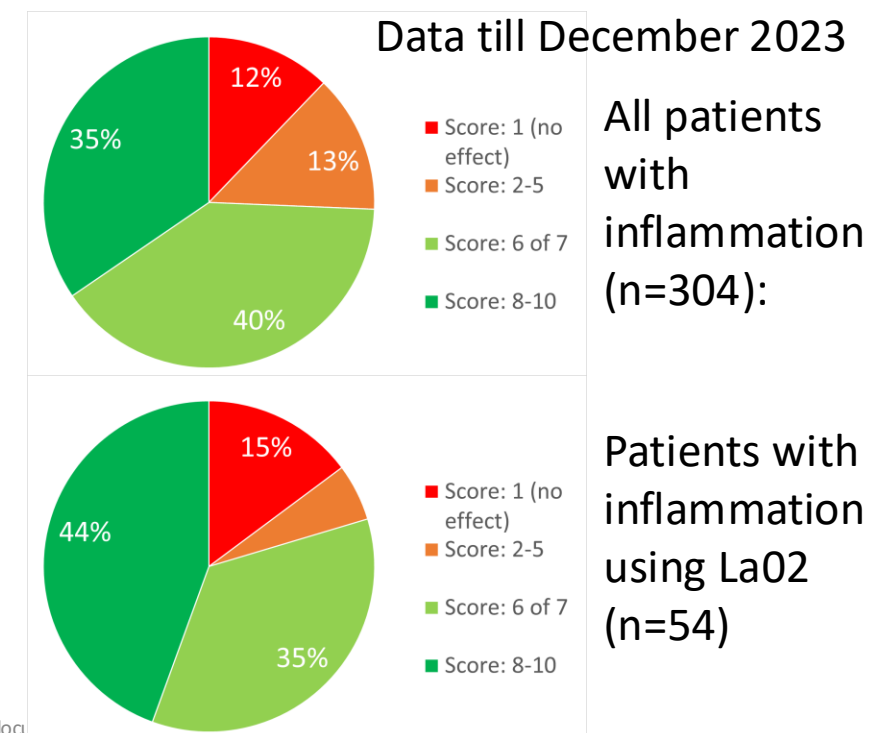
L. acidophilus LA02

- The *Lactobacillus acidophilus* La02 is selected for its oxalate metabolizing capacity¹.
 - Oxalate metabolism may lower the risk of kidney stones.
- Other evidence-based therapeutic uses:
 - Inhibiting pathogens²
 - Inhibiting candida⁵
 - Improving intestinal barrier²
 - IBS³
 - Vaginosis (vaginal application)^{4,5}
- Data analysis: promising in inflammation (fig)
- Typical uses: low oxalate-metabolizing capacity, candida, IBS

Time	Sample	<i>C. albicans</i>	<i>Candida</i>	<i>Candida krusei</i>	<i>C. albicans</i>	<i>Candida glabrata</i>
		ATCC 10231	<i>parapsilosis</i> ATCC 22019	ATCC 6258	ATCC 90028	ATCC 2001
(A) Fresh broth cultures						
Time 0 (inoculum)	Yeast alone	2450	3100	1870	1300	1000
24 h	Yeast alone	3,860,000	600,000	660,000	4800,000	12,000,000
	Yeast + LA02	260,000	260,000	280,000	470,000	2,280,000
48 h	Yeast alone	4,500,000	3,500,000	2,700,000	8,800,000	34,000,000
	Yeast + LA02	61,000	120,000	1500	59,000	1,170,000

TABLE 1. Clinical Outcome (Efficacy Analysis) of Study Population

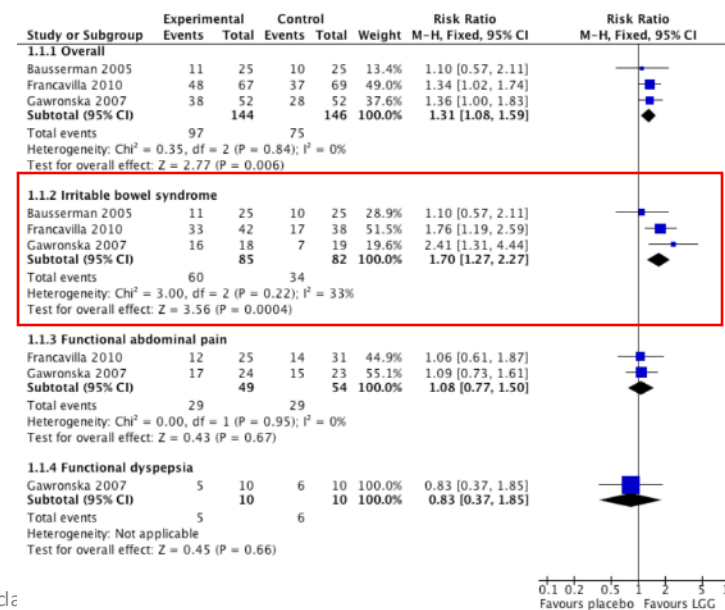
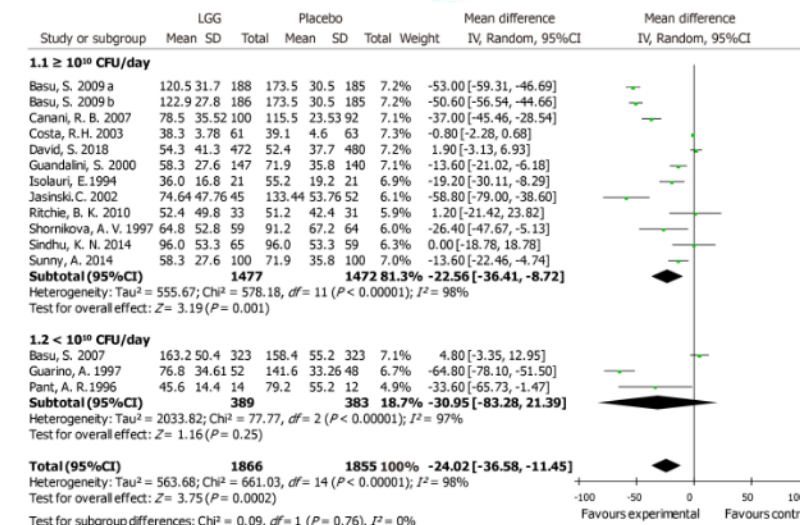
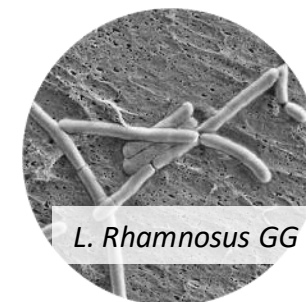
Time	n/N (%)	
	Cure	Recurrence
Prophylactic phase		
I phase—10 d	58/57 (98.3)	58/1 (1.7)
II phase—10 wk	57/49 (86.0)	57/8 (14.0)
Observation phase (mo)		
1	49/45 (91.8)	49/4 (8.2)
3	45/43 (95.6)	45/2 (4.4)
7	43/42 (97.7)	43/1 (2.3)
Cumulative rate	58/42 (72.4)	58/16 (27.6)



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L. rhamnosus GG

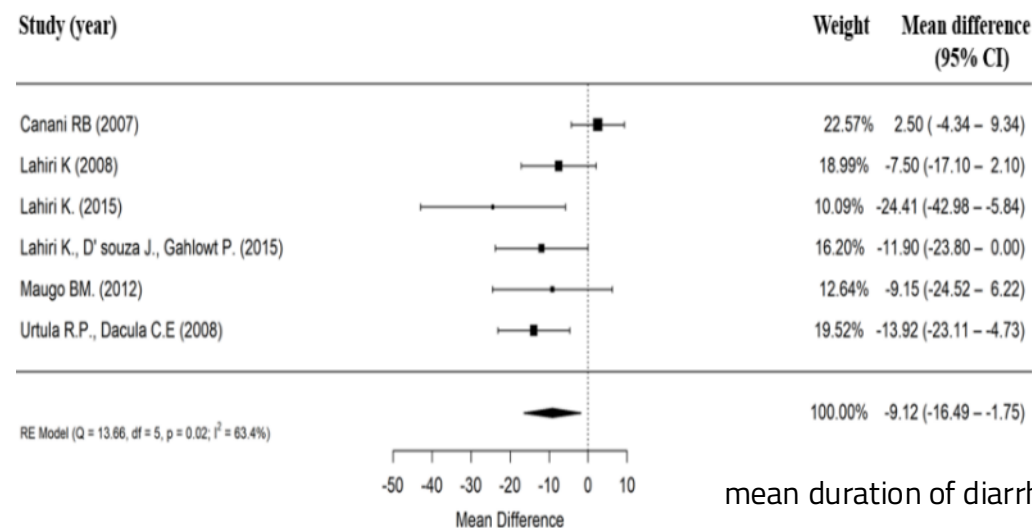
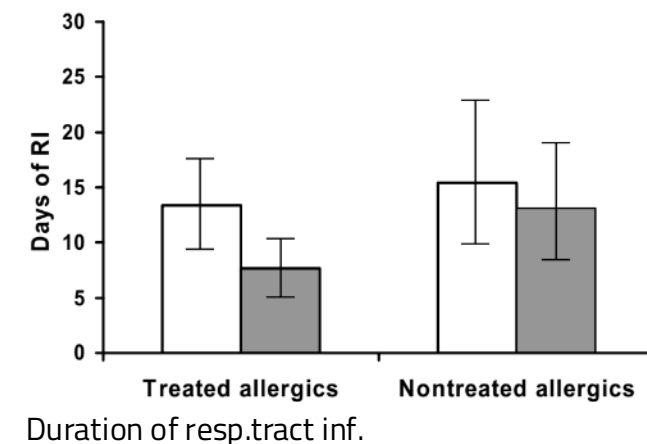
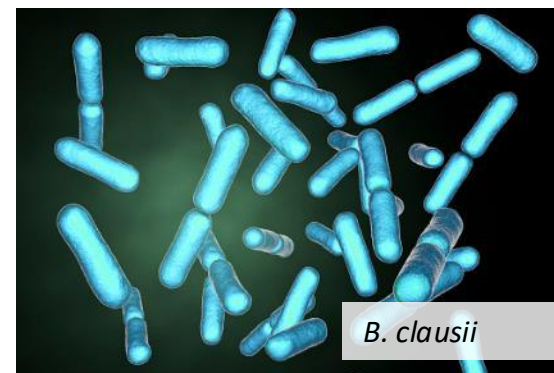
- *Lacticaseibacillus rhamnosus* GG is world's most studied probiotic strain (>1650 articles in Pubmed (Feb '24)).
- It is the go-to strain for researchers who want to study a probiotic, often without a rationale selection.
 - Not effective in all studied indications
- Indications with meta-analyses of RCTs:
 - Acute diarrhea (fig)^{1,2}
 - Antibiotics-associated diarrhea^{3,4}
 - IBS (fig)^{5,6}
- Other evidence-based indications:
 - Liver steatohepatitis⁷
 - Respiratory tract infections⁸
 - Candida infection^{9,10}
 - Intestinal permeability¹¹
 - Etc.
- Typical uses: diarrhea, IBS, candida overgrowth



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Bacillus clausii UBBC-07

- *Bacillus clausii* UBBC-07 is a spore-forming strain, making it extremely stable.
- It is genetically closely related to the metagenome of a set of *B. clausii* strains that have been studied extensively¹.
- The evidence-based therapeutic uses consist of:
 - Acute diarrhea²⁻⁴ (fig)
 - Antibiotics-associated diarrhea^{5,6}
 - SIBO^{7,8}
 - Respiratory tract infections (fig)⁹
 - Gingivitis (as mouth wash)¹⁰
 - Pathogen inhibition^{11,12}
 - Ulcerative colitis¹³
 - Mucositis¹⁴
 - Etc.
- Typical uses: SIBO with pathogens, diarrhea

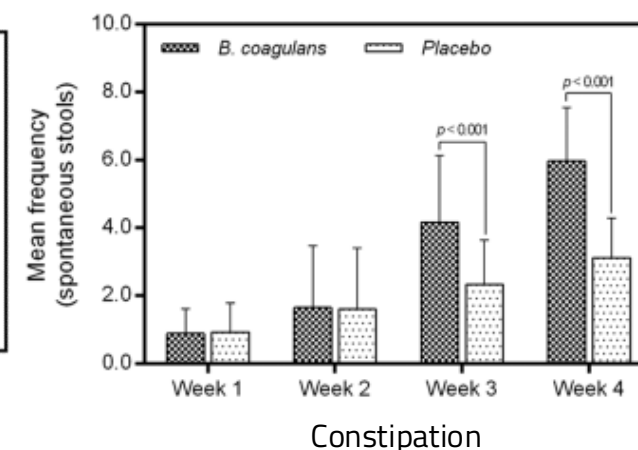
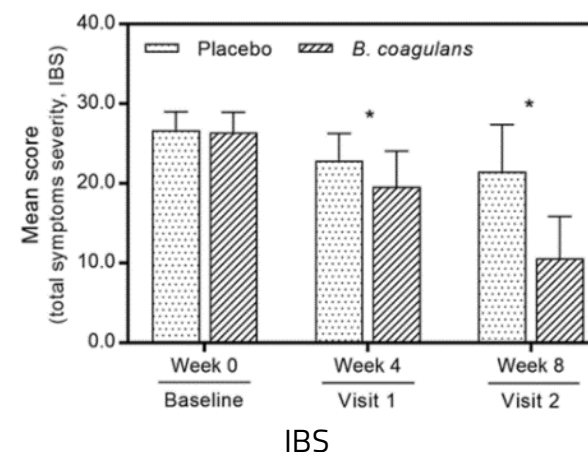
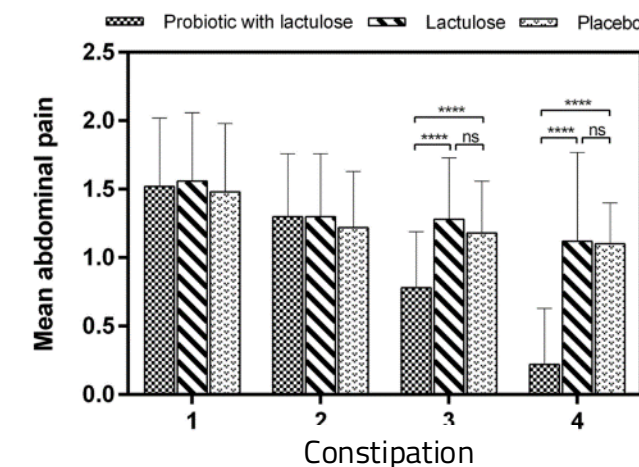
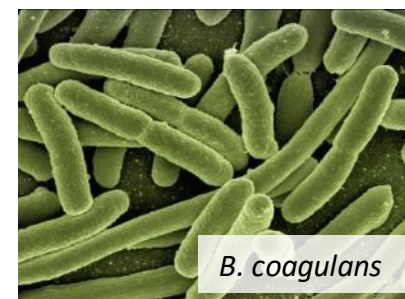


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Bacillus coagulans Unique IS-2

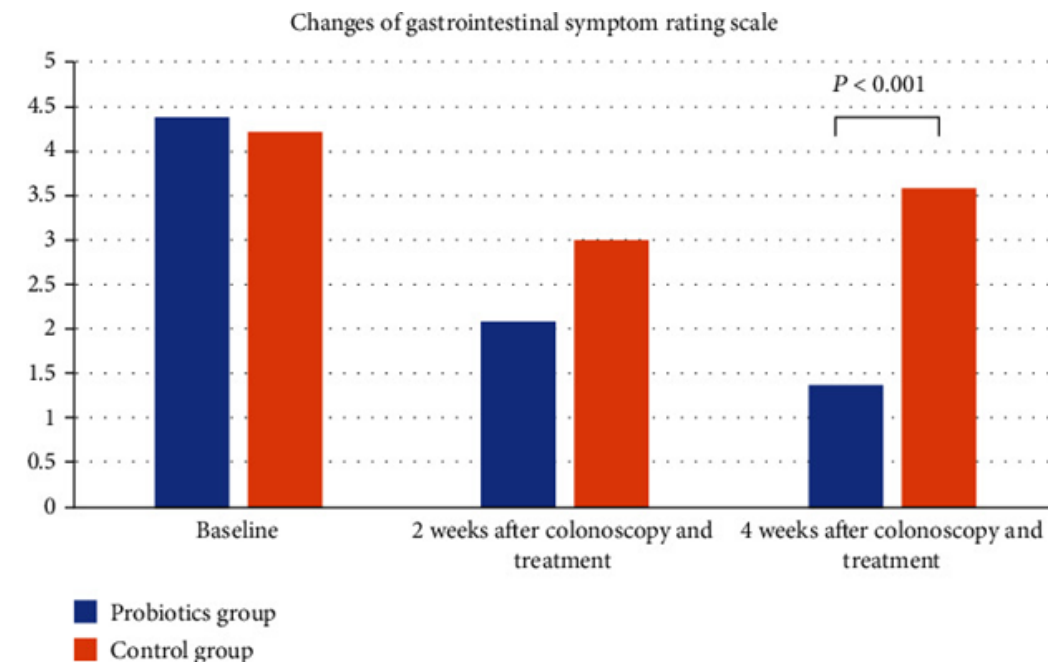
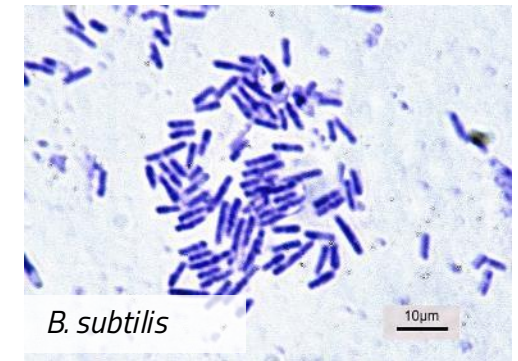
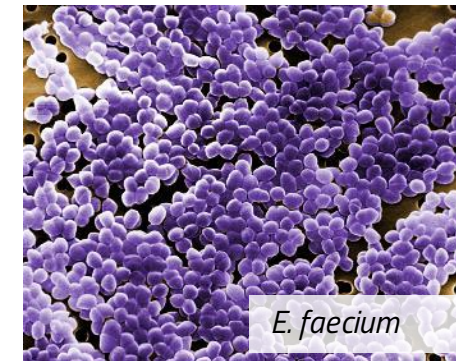
- *Bacillus coagulans* Unique IS-2 is a spore-forming strain, making it extremely stable.
- *Bacillus* species are often called 'soil-based' probiotics, but this strain is isolated from a human stool sample¹.
- The evidence-based therapeutic uses consist of:
 - Constipation (fig)^{2,3,9}
 - IBS (fig)⁴⁻⁶
 - SIBO⁷
 - Liver cirrhosis⁸
 - Vaginosis (oral use)⁹
 - Ulcerative colitis¹⁰
- Typical uses: constipation, SIBO/IBS



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E. faecium + *B. subtilis*

- This ingredient is a combination of two strains: *Enterococcus faecium* Rosell-26 + *Bacillus subtilis* Rosell-179
- On the market as a drug in Asia.
- This drug has been studied extensively, primarily for ulcerative colitis, as shown in a meta-analysis of >50 RCTs¹.
- There is also scientific evidence for:
 - Anti-inflammatory effects^{1,2}
 - IBS and abdominal pain^{3,4}
 - Respiratory tract infections⁵
 - SIBO (fig)^{6,7}
 - Etc.
- Typical use: inflammation (or UC) or SIBO



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2'fucosyllactose

- This building block consists of the most abundant Human Milk Oligosaccharide (HMO) in breast milk: 2'fucosyllactose (2'FL).
- Typical daily dose: 5g/d (N.B.: most food supplements use 0.25g/d)
- 2'FL contributes to the development of the microbiome (prebiotic, anti-pathogenic), tuning of the immune system, and gut-brain axis¹.
- Therapeutic effects include:
 - Anti-inflammatory effects^{2,3}
 - Stimulate *Akkermansia* and *A. soehngenii*^{4,5}
 - Inhibit pathogens^{6,7}
 - Management of allergies (fig)^{8,9}.
- Typical use: low *Akkermansia*, allergies

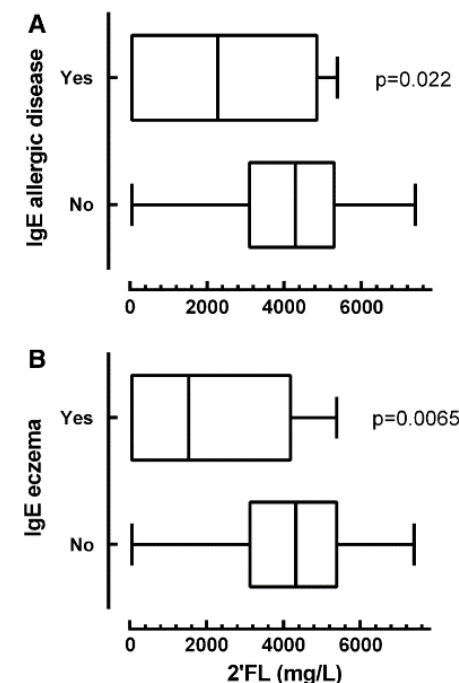
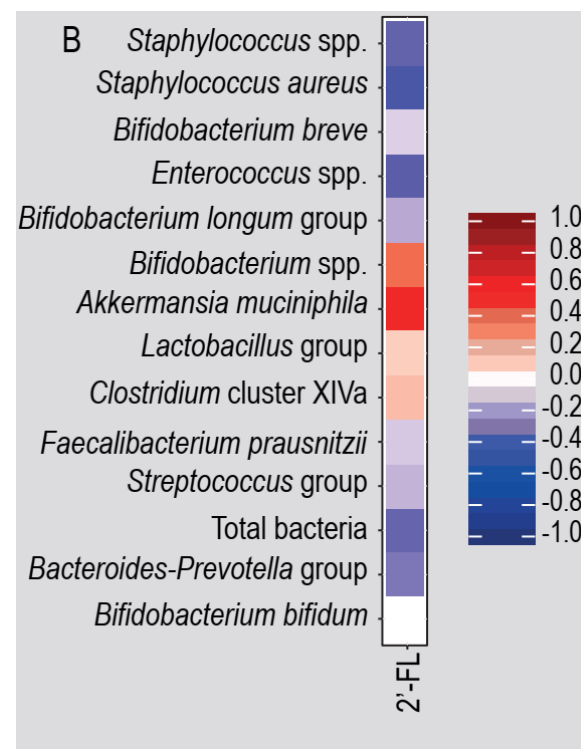


Fig. 2 Breast milk consumed by C-section-born infants who did not show IgE-associated allergic disease and IgE-associated eczema contained higher levels of 2'-fucosyllactose a proxy for FUT2-dependent oligosaccharides. 2'-Fucosyllactose (2'FL) levels in early breast milk (2.6 ± 1.1 days *postpartum*) that was consumed by C-section-born infants who showed IgE-associated allergic disease (**a**) or IgE-associated eczema (**b**) at 2 years or not. Box and whisker plots are shown with median and minimal and maximal values. Two-tailed *p* values from unpaired *t* test are indicated

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L. plantarum P-8

2058

L.-C. Lew et al. / Clinical Nutrition 38 (2019) 2053–2064

- The *Lactiplantibacillus plantarum* P-8 is isolated from a traditional fermented dairy product from Mongolia.
- A well-designed RCT shows an effect on **depression, stress and anxiety**², which is expected to be caused by changes in microbial production of neuro-active substances such as GABA³.
- In addition, there is evidence for:
 - IBS⁴
 - Anti-inflammatory effect^{4,2}
 - Increasing sIgA excretion⁵
 - Reduction of bile acids⁵
- Typical use: depression/anxiety, IBS

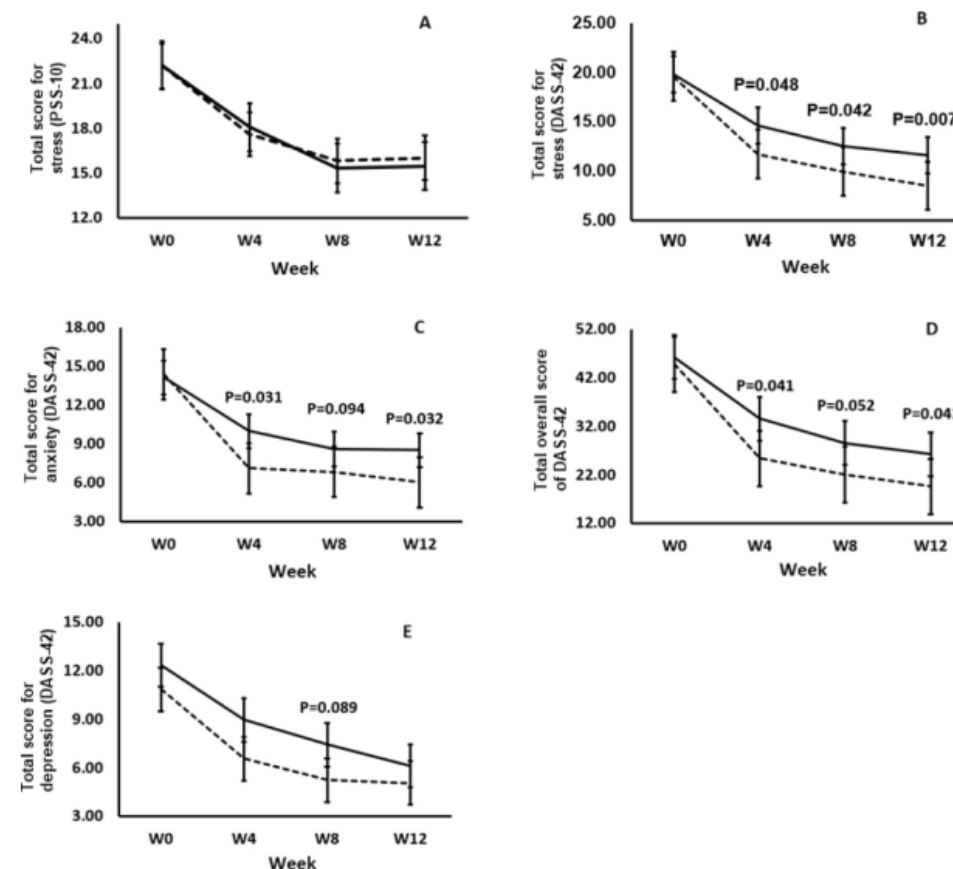


Fig. 2. Effects of a 12-week administration of probiotic *L. plantarum* P8 (---) or placebo (—) on the total scores of (A) stress based on the PSS-10 questionnaire (W: $P < 0.001$, T: $P = 0.788$, TxW: $P = 0.820$), (B) stress (W: $P < 0.001$, T: $P = 0.030$, TxW: $P = 0.293$), (C) anxiety (W: $P < 0.001$, T: $P = 0.077$, TxW: $P = 0.170$), (D) total scores (W: $P < 0.001$, T: $P = 0.054$, TxW: $P = 0.427$), and (E) depression (W: $P < 0.001$, T: $P = 0.163$, TxW: $P = 0.787$) based on the DASS-42 questionnaire. P-values indicated difference between treatment groups at individual time points. Results are expressed as mean; error bars (SEM); $n = 103$. Repeated measures ANOVA provided statistical significance on W: effect of weeks; T: effect of treatment groups P8 and placebo; TxW: interaction between weeks and treatment.

PHGG



- This fiber is derived from the guar bean (*Cyamopsis tetragonoloba*) and partially hydrolyzed enzymatically to make it less viscous¹.
- This fiber is extremely well-studied, hundreds of clinical studies have been conducted since 1970's.
- Contrary to most other fibers, PHGG has found to be efficacious at daily doses of ~5g.
- Important therapeutic uses:
 - Insulin resistance (dozens of studies, e.g., fig^{2,3})
 - IBS, abdominal pain, bloating^{1,4,5}
 - Constipation^{6,7}
 - Diarrhea^{8,9}
 - Depression and anxiety¹
 - SIBO¹⁰
- Typical use: IBS and symptoms, SIBO, diabetes

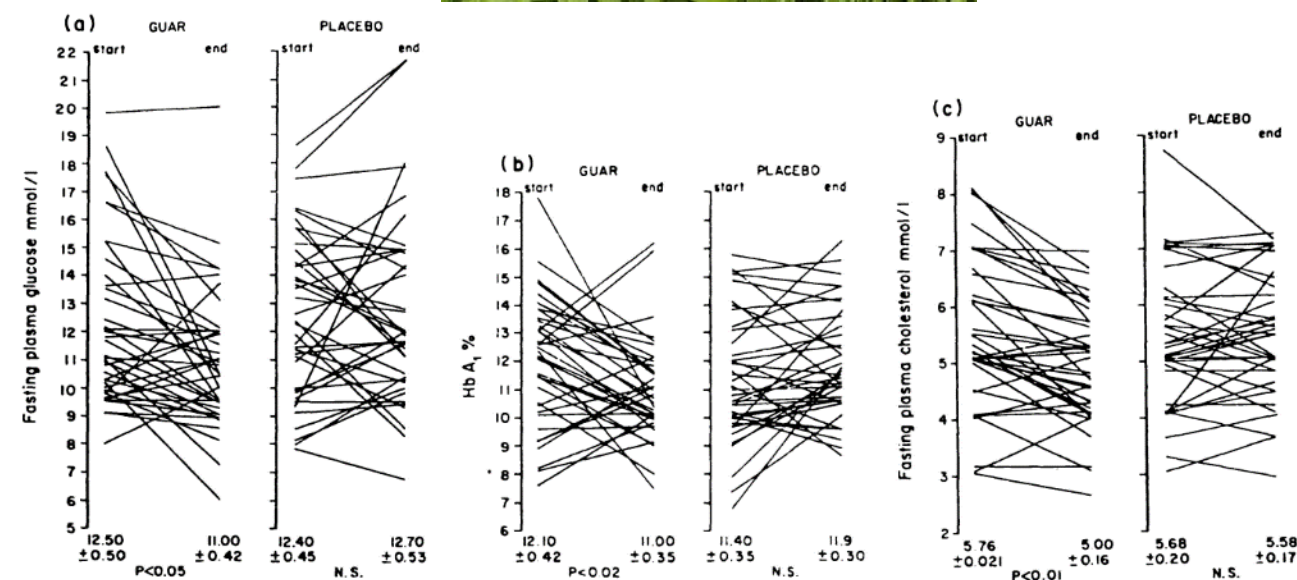


FIGURE 1. Individual changes in fasting plasma glucose (a), glycosylated hemoglobin (b), and cholesterol (c) in all 39 patients.

L. sakei probio65

- *L. sakei* probio65 is isolated from kimchi
- Mostly studied for its effect on atopic dermatitis (fig)
 - Two RCTs^{1,2}
 - Several animal studies
- In addition, in vitro and preclinical studies show:
 - Anti-inflammatory effects^{3,4}
 - Pathogen inhibition⁵
 - Increasing insulin sensitivity^{6,7}
- Typical use: allergies (dermatitis)

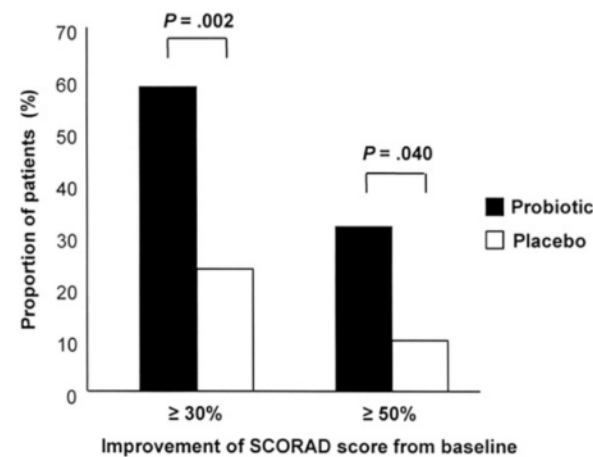


Figure 2. Patients achieving at least 30% and 50% improvement in SCORAD score from baseline. The chart shows the proportion of patients (%) for Probiotic (black bars) and Placebo (white bars) groups. The x-axis categories are '≥ 30%' and '≥ 50%'. The y-axis ranges from 0 to 70. P-values are indicated for comparisons between groups: P = .002 for ≥ 30% improvement and P = .040 for ≥ 50% improvement.

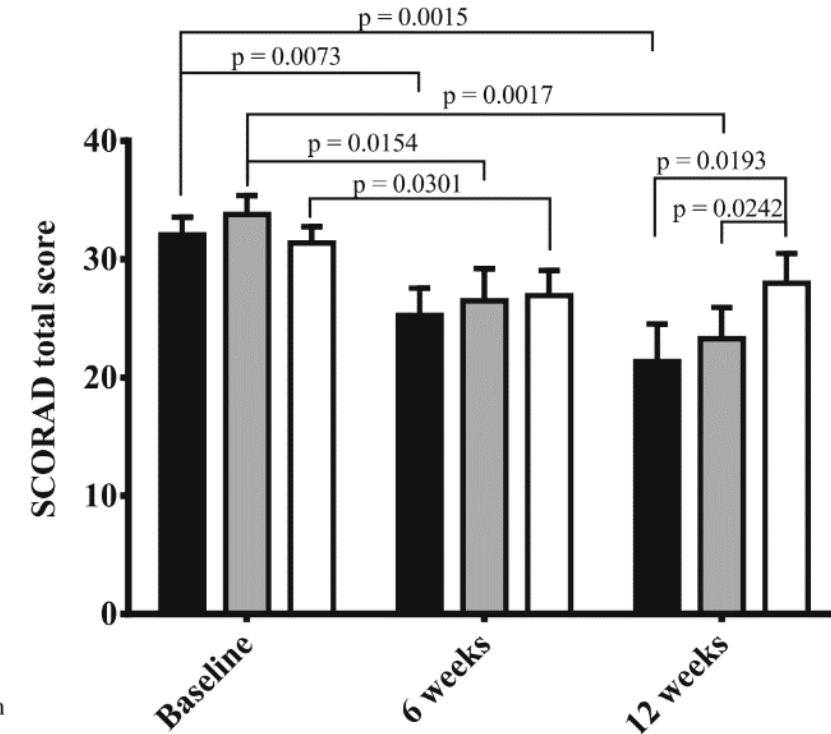


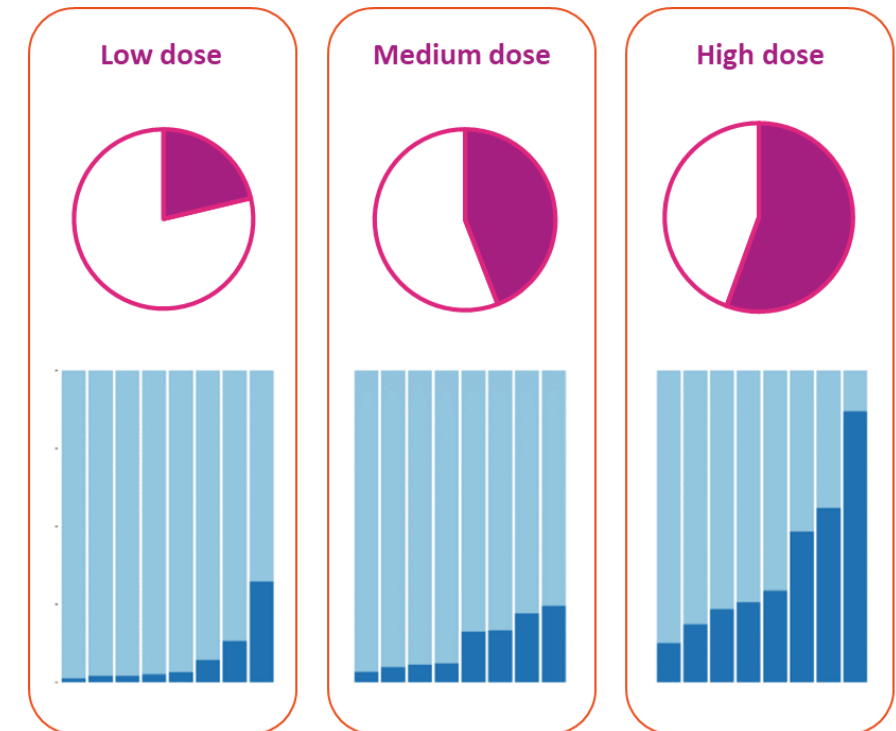
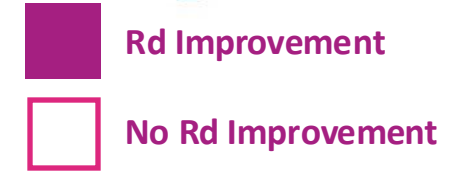
Fig. 2 Assessment of SCORAD total score. Results are expressed as mean; error bars (SEM). Statistical analysis was performed using paired t-tests when comparing within same group while Wilcoxon rank sum test was used when comparing between groups. I. Live cell (bar in black): freeze-dried *Lactobacillus sakei* proBio65 (1×10^{10} cells/day; $n = 16$). II. Dead cell (bar in gray): freeze-dried dead *Lactobacillus sakei* proBio65 (1×10^{10} cells/day; $n = 22$). III. Placebo (bar in white): microcrystalline cellulose only ($n = 20$). Statistical analysis was performed using paired t tests.

Anaerobutyricum soehngenii

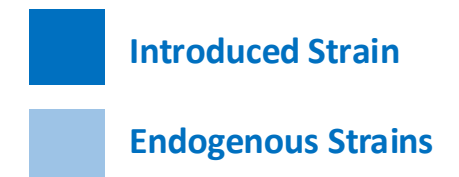


- *A. soehngenii* is isolated from stool of an 11-month-old healthy infant¹.
- In fact, *A. soehngenii* (*E. hallii*) is one of the earliest butyrate-producing colonizers, already found at in healthy infants 2 weeks of age².
- It has the capacity to also produce butyrate from lactate in a low pH environment such as the proximal small intestine³.
 - Other butyrate producers (e.g. *F. prausnitzii* or *Ruseburia* spp.) cannot utilize lactate.
 - *A. soehngenii* can thrive in the small intestines as well.
- This specific strain has been shown:
 - To be safe at even a high dose⁵.
 - To stimulate GLP-1 production and lower **insulin resistance**^{4,5}.
- Butyrate has anti-inflammatory effects and often lowered in IBD:
 - *A. soehngenii* abundance is found to be lowered in IBD⁶.
 - Conversely, high relative abundance of *A. soehngenii* is best predictor of success of fecal transplantation in ulcerative colitis⁷.

Hyperinsulinemic Euglycemic Clamp



Proportion of Administered Strain



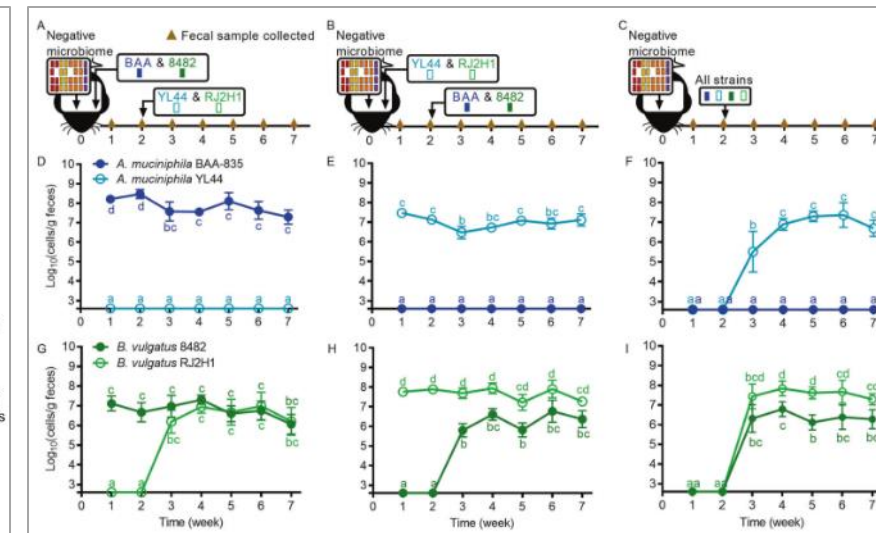
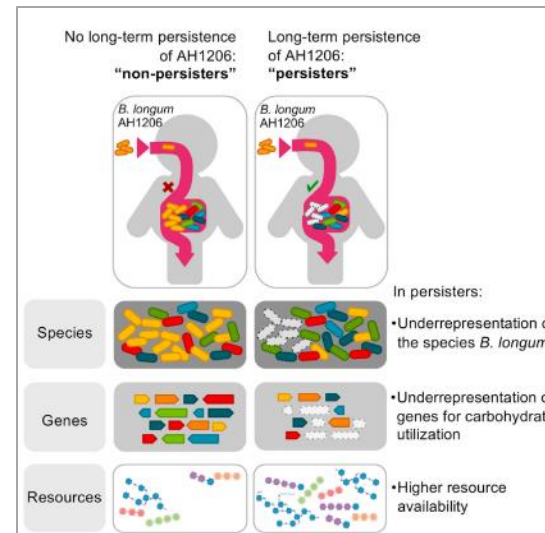
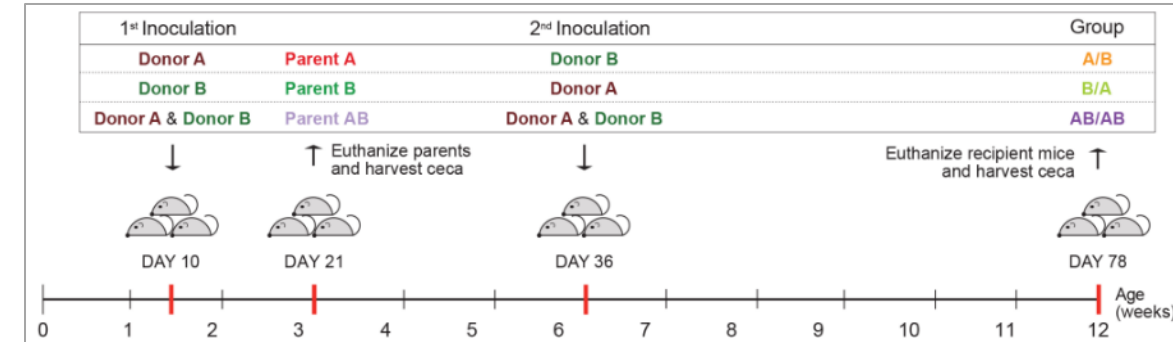
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2. Pham, V. T. et al. Environmental Microbiology 18, 2246–2258 (2016)
3. Duncan, S. H. et al. Appl Environ Microbiol 70, 5810–5817 (2004)
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Gut enricher

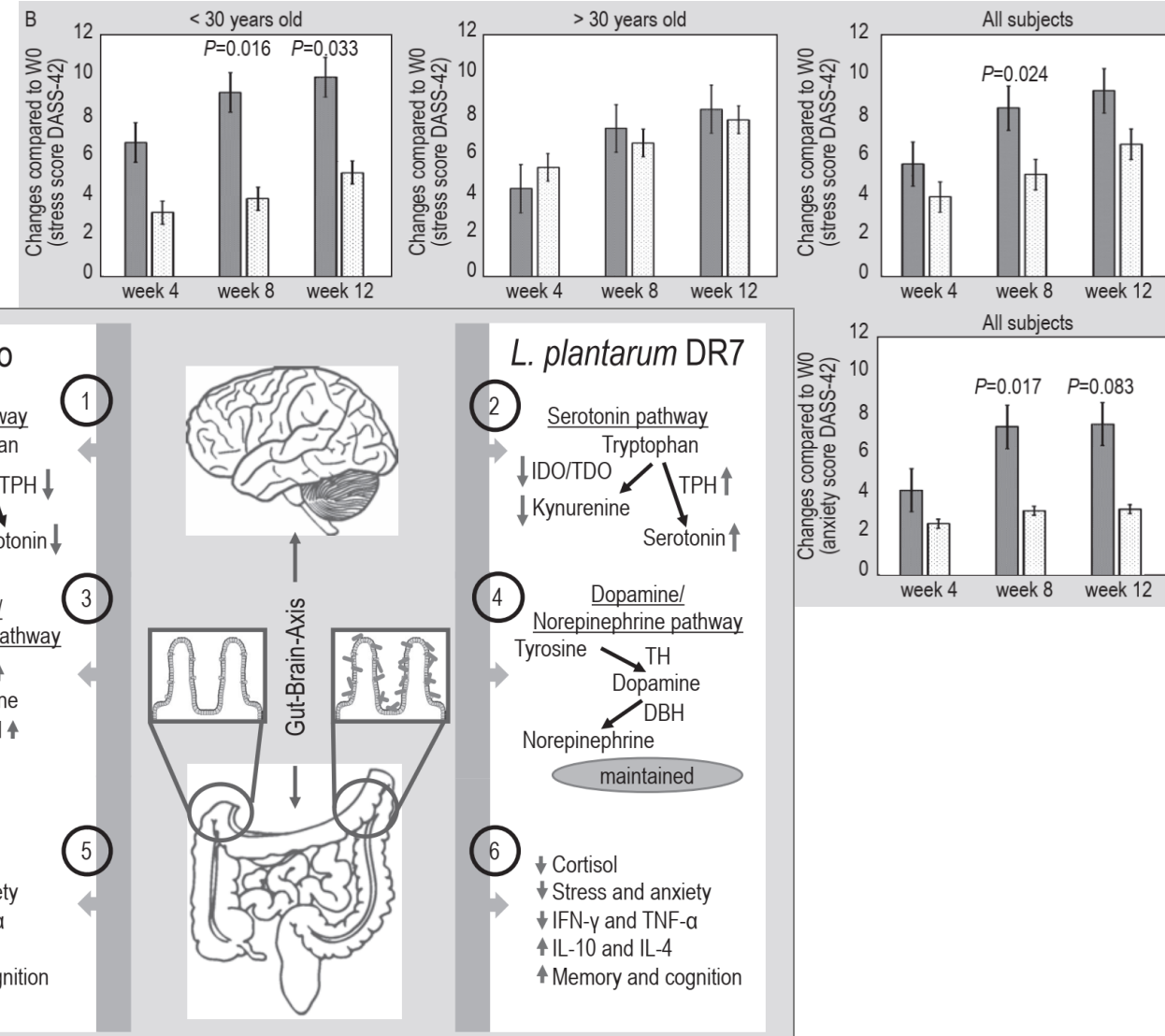
- Recent insights have shown that ecological principles define the microbiome (fig):
 - Order of colonization¹
 - Open niches allow colonization^{2,3}
 - Strains adapt to host/niche⁴
- Host actively selects/supports bacteria:
 - Bacterial entero-mammary transfer⁵⁻⁷
 - Prevents commensals from starvation, curates composition of microbiome⁸
- Low microbiome diversity and richness is associated with many diseases^{9,10}.
- This BB consists of all currently available strains (~40 strains) at low dose (~10⁶ cfu/g).
- This BB supports selection of strains by individual ecology and host factors in patients with low diversity (≤4).
- Typical use: low diversity



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- Tuddenham, S. et al. *Curr Opin Infect Dis* 28, 464–470 (2015)
- Álvarez, J. et al. *Gastroenterol Hepatol* 44, 519–535 (2021)

L. plantarum DR7

- The *Lactiplantibacillus plantarum* DR7 is isolated from cow's milk from Penang, Malaysia.
- A well-designed RCT shows an effect on **stress and anxiety**², which is expected to be caused by changes in the tryptophan and tyrosine pathways and inflammatory activity².
- In addition, there is evidence for:
 - Respiratory tract infection^{3,4}
 - Anti-inflammatory effect^{2,3}
 - Increasing AMPK activity^{1,6,7}
 - Improved insulin signaling
- Typical use: stress/anxiety, airway infections



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- Chong, H.-X. et al. Benef Microbes 10, 355–373 (2019)
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- Lew, L.-C. et al. Int J Mol Sci 21, E5872 (2020)
- Yap, P.-G. et al. Appl Biochem Biotechnol 191, 226–244 (2020)

Lacticaseibacillus rhamnosus SP1



- The *Lacticaseibacillus rhamnosus* SP1 is a human isolate.
- A small but well-designed RCT shows an effect on **acne**¹; insulin sensitivity is expected to a mechanism of action.
- In addition, there is evidence for:
 - Denture stomatitis²
 - Inhibition of Candida²
 - Prevention of caries^{3,4} (fig, lower beta-defensin probably due to healthier oral microbiome)
 - Degrading immunogenic gluten peptides⁵
- Typical use: acne, caries, gluten sensitivity

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Table 2. Dental Caries in the Intervention Group (n = 123) and Control Group (n = 82) at Baseline and at the End of the Study.

	Probiotic Group	Control Group	Odds Ratio
Nursery schools, n	8	8	
Participants, n	123	82	
ICDAS 2–6 >0, baseline, %	39.3	42.3	0.94 (0.62–1.44)
ICDAS 2–6 >0, 12 mo, %	54.4	65.8	0.76 (0.51–1.14)
ΔICDAS 2–6 >0, 12 mo – baseline, %	16.2	20.8	0.76 (0.38–1.51)
ICDAS 5–6 >0, baseline, %	23.3	22.5	1.17 (0.68–2.01)
ICDAS 5–6 >0, 12 mo, %	33.3	45.1	0.71 (0.43–1.15)
ΔICDAS 5–6 >0, 12 mo – baseline, %	9.7	24.3	0.35 (0.16–0.79) ^a

Table 2. Change from baseline to 12 weeks in the investigator’s global improvement rating of adult acne in the two study groups (data are given as counts and percentages).

Rating	Probiotic group (n=10)	Placebo group (n=10)
Worsened	0 (0%)	0 (0%)
Unchanged	2 (20%)	9 (90%)
Improved	6 (60%)	1 (10%)
Markedly improved	2 (20%)	0 (0%)
Resolved	0 (0%)	0 (0%)

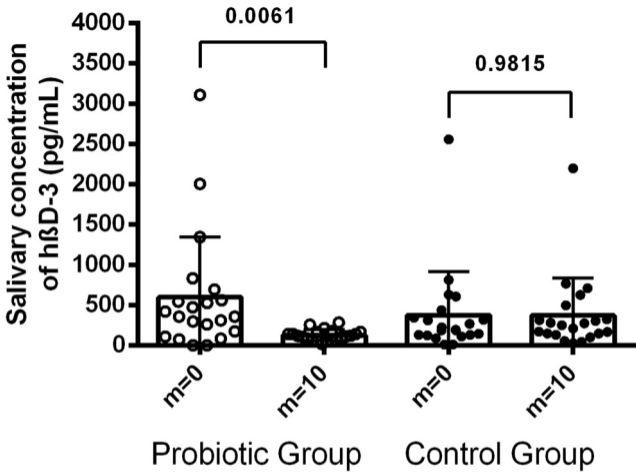
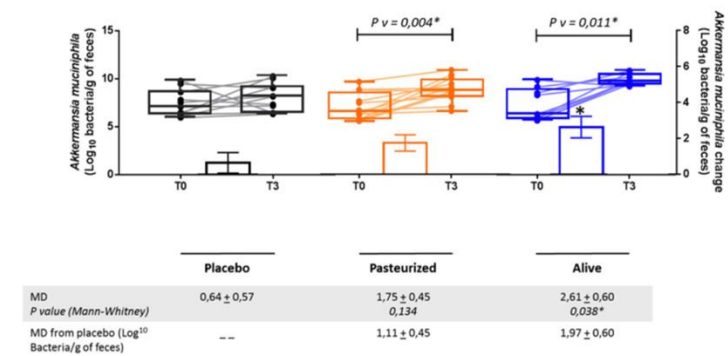
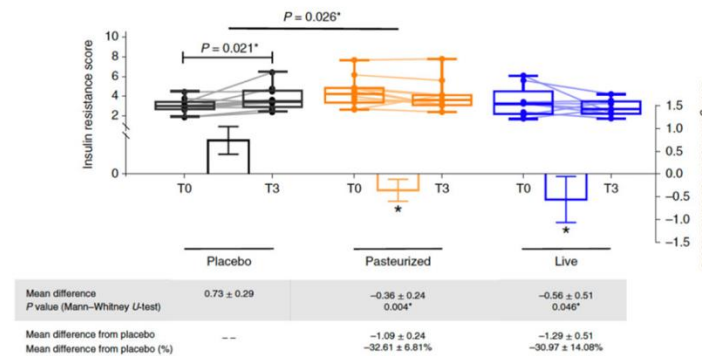
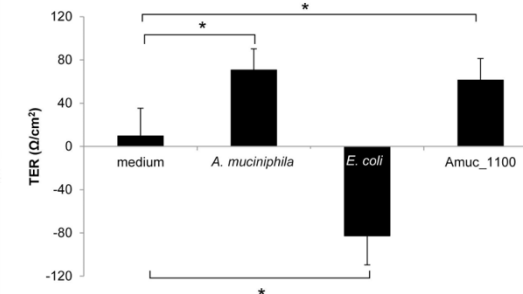
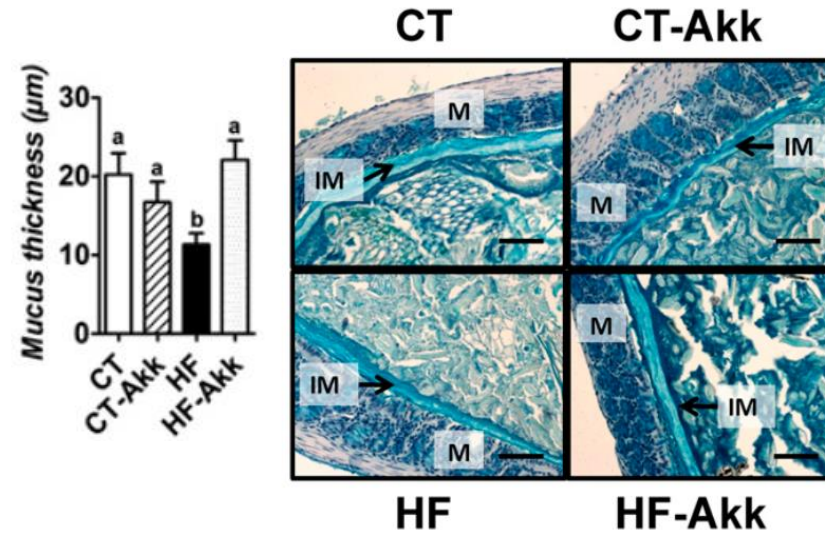


Fig. 2 Salivary concentration of hβD-3, expressed as pg/mL, of the groups at baseline (m = 0) and the end of the intervention (m = 10). The probiotic group showed a significant decrease in salivary concentration of hβD-3 (p = 0.0061) and a decrease in variability once the probiotic was consumed. No changes were observed in the control group

Pasteurized *Akkermansia muciniphila*

- First isolated in 2004 from the stool of a healthy Dutch Caucasian female¹. Highly abundant: relative abundance of approx. 3%².
- Lives in mucus layer. Restores mucus layer thickness³ (fig).
- Mediated via TLR-2 through Amuc_1100 pili⁴ (fig). Survives pasteurization.
- Improves insulin resistance (fig), can yield weight loss, and increases *Akkermansia* abundance (fig)⁵.
- In addition, there is observational evidence for:
 - Ulcerative colitis⁶
 - Atopic dermatitis/allergies⁷
 - Anti-inflammatory effects^{5,6}
 - Improved barrier function and mucus layer thickness^{5,6,8}
- Typical use: leaky gut/low mucus, metabolic dysfunction



1. Derrien, M. et al. *Int J Syst Evol Microbiol* 54, 1469–1476 (2004)
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6. Bian, X. et al. *Front Microbiol* 10, 2259 (2019)
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Bifidobacterium animalis subsp. lactis HN019

- Isolated from yogurt in the late 1990s¹.
- Extensively studied, for example:
 - Periodontitis (fig)²⁻⁴
 - Cellular immunity (fig)⁵
 - Respiratory tract infections (fig)⁶⁻⁸
- In addition, there is evidence for:
 - Constipation, flatulence, abdominal pain^(e.g. 9)
 - Depression and anxiety¹⁰
 - Pathogen inhibition
 - Anti-inflammatory effects
- Typical use: periodontitis, airway infections

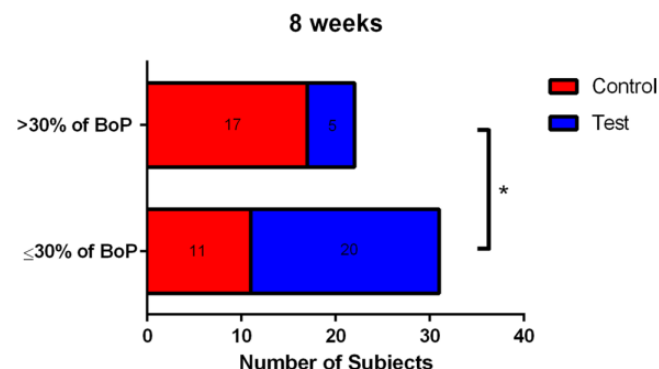


Fig. 3 Frequency of patients of the test and control groups presenting >30% bleeding sites (generalized gingivitis) and ≤30% bleeding sites (without generalized gingivitis) at 8 weeks. *Significant difference between groups (chi-square test, $p=0.0027$)

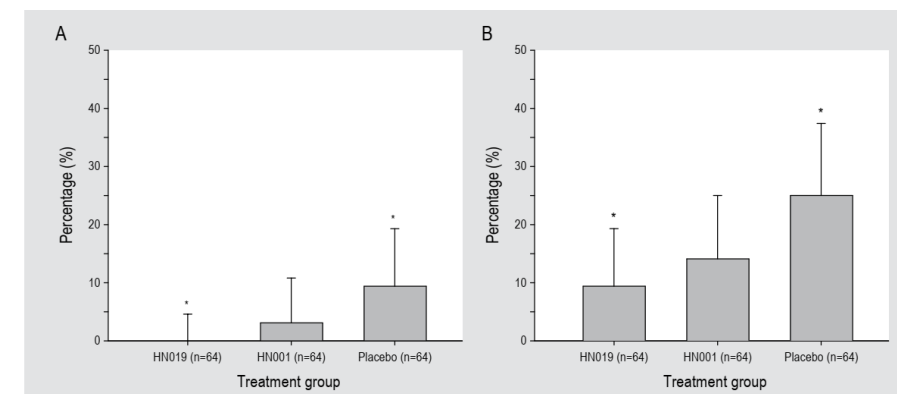


Figure 2. Incidence of (A) confirmed and (B) parentally reported (i.e. confirmed and unconfirmed) upper respiratory tract infections

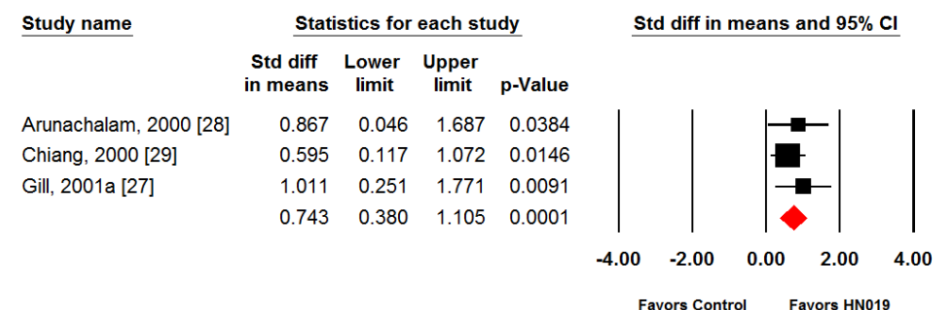


Figure 2. Forest plot of polymorphonuclear phagocytic capacity with consumption of *B. lactis* HN019 vs. control. Random effects meta-analysis using the standardized mean difference (SMD) statistic.

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- de Almeida Silva Levi, Y. L. et al. Clin Oral Investig 27, 387–398 (2023)
- Miller, L. E. et al. Nutrients 9, 191 (2017)
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- Huang, L. et al. Front Psychiatry 13, 990465 (2022)

Vaginal suppositories

- Fixed composition vaginal suppositories:
 - Contains three active strains:
 - Lactobacillus crispatus* SP28 (2.5×10^9 cfu/pc)
 - Lactobacillus crispatus* LCR01 (2.5×10^9 cfu/pc)
 - Lactobacillus acidophilus* La02 (2.5×10^9 cfu/pc)
 - Matrix from cacao butter with coconut butter.
- L. crispatus* is consistently associated with good vaginal health¹, and e.g. with lower risk of preterm birth².
- RCTs with different *L. crispatus* strain show decreased risks of: recurring vaginosis³ and recurring urinary tract infections⁴.
- Two open label studies with vaginal product containing *L. acidophilus* La02 showing effect on vulvovaginal candidiasis^{2,3}.
- Typical use: UTI, vulvovaginal candidiasis, fertility



TABLE 3. Overview of Data and Statistical Analysis

Parameters	Time 0	Time 28	p (T28 vs. T0)	Time 56	p (T56 vs. T0)	p (T56 vs. T28)
Total women with infection	30	4	< 0.001	7	< 0.001	—
Total women without infection	0	26	—	23	—	—
Percentage of healing	—	86.67%	—	76.67%	—	—
Total women with recurrences	—	0	—	3	—	0.083
Percentage of recurrences	—	—	—	11.54%	—	—

Bacterial Vaginosis Recurrence Status in the Intention-to-Treat Population.

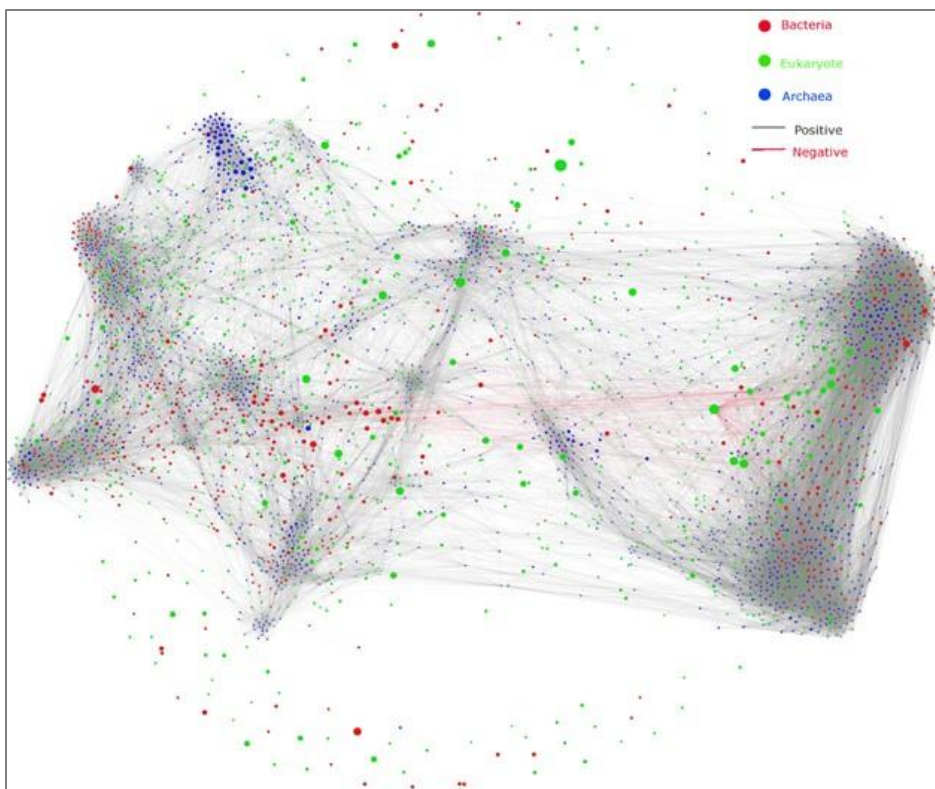
Variable	Lactin-V (N = 152)	Placebo (N = 76)	Risk Ratio (95% CI)*	P Value
<i>no. (%)</i>				
Status of recurrence by wk 12				
Recurrence [†]	46 (30)	34 (45)	0.66 (0.44–0.87)	0.01
No recurrence	87 (57)	30 (39)		
Unknown	19 (12)	12 (16)		
Status of recurrence by wk 24				
Recurrence	59 (39)	41 (54)	0.73 (0.54–0.92)	
No recurrence	63 (41)	21 (28)		
Unknown	30 (20)	14 (18)		

Table 2. Urinary Tract Infection Rates by Intervention and *Lactobacillus crispatus* Colonization Pattern

Intervention	No. (%) of participants developing recurrent UTI	Relative risk (95% CI)
Lactin-V (n = 48)	7 (15)	.5 (.2–1.2)
Placebo (n = 48)	13 (27)	...
Intervention, <i>L. crispatus</i> colonization pattern		
Lactin-V, high level (n = 41)	2 (5)	.07 (.02–.3)
Lactin-V, low level (n = 7)	5 (71)	...
Placebo, high level (n = 32)		
Placebo, high level (n = 32)	9 (28)	1.1 (.4–3.1)
Placebo, low level (n = 16)	4 (25)	...

3. Outlook: expected additions

3. Outlook for future



Microbiome Center is expanding

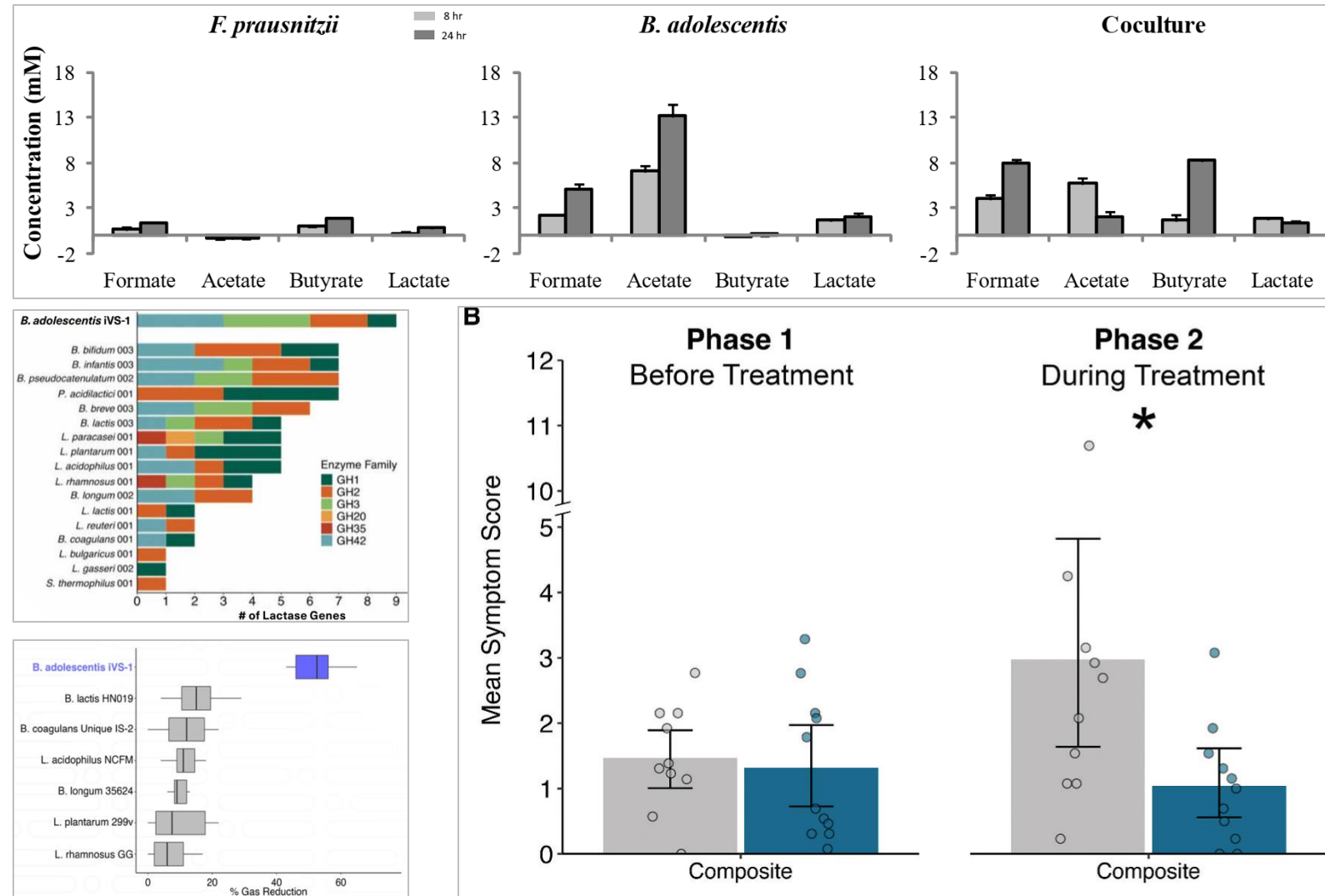
<i>Cumulative numbers</i>	2019	2020	2021	2022	2023	2024	June 2025
Patients	670	1,500	2,800	5,000	8,000	13,000	16,500
Doctors	113	133	222	359	482	729	873

We now have made the platform available in:

- The Netherlands
- Germany
- Switzerland
- Austria
- United Kingdom
- Belgium
- Italy
- Slovakia
- Poland
- ...

Bifidobacterium adolescentis SH001

- *Bifidobacterium adolescentis* SH001 is identical to strain iVS-1. Isolated from healthy human consuming high level of GOS¹.
- Interesting because:
 - *B. adolescentis* is known cross-feeder for *F. prausnitzii* (most abundant butyrate producer in our gut) e.g.¹ (fig)
 - Highest amount of lactase enzymes (fig) and reduces gas production the most
- There is evidence for:
 - Reduction of lactose intolerance symptoms (fig)²
 - Reduction of bloating, flatulence, abdominal pain²
 - Improve gut barrier³
- Typical use: GI diseases and symptoms, immune related problems



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 3. Krumbeck, J. A. et al. *Microbiome*.6,.121.(2018)

Other BBs that we expect to add soon

- Synbio (L. rhamnosus IMC501 + L. paracasei IMC502)
 - Evidence for: **bloating, constipation, fatigue, etc.**
- *Bifidobacterium longum* ES1
 - Evidence for: **IBS, abdominal pain, anxiety, headache, gluten sensitivity/celiac disease, etc**
- *Christensenella minuta* M03
 - Evidence for: **weight management among others**

Support patients without email (5y child or 85y grandma)

Add a medical file to an
existing account

Create account for new client ×

First name *

Last name *

Date of birth *

Country *

Email address

Confirm email address

By registering an account without an email address, you, the healthcare provider, will manage the medical file and will be able to log in as the patient.

Then simply switch between medical files

English ▼  pat HDNL ▼

🔑 Reset Password
👤 Switch medical file
🔌 Log Out

Last answered : 14:55 27-02-2025

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Switch medical file

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The following will be delivered to this address:

1. Analysis #11035	henk anonymus
1. Prescription #30320	straat
1. Prescription #30321	code plaats
	Netherlands

Please note that it may take up to 7 working days for your complete order to arrive a this address.

Payment method

☐ iDeal (Transactioncosts €0.00)

☒ CreditCard (Transactioncosts €1.25 + 3%)

☐ Manual (Transactioncosts €0.00) 

Calender



Starters, intervision, Arbeitskreis

- 11th of September, Arbeitskreis 1. (DE)
- 15th of September, Discussing case reports (NL)
- 23rd of September, Arbeitskreis 2. (DE)

Thematic webinars

- 3rd of July Building blocks (EN)
- 9th of July Building blocks (DE)

- 16th of September Implement microbiome treatment in your praxis part 1. (DE)
- 18th of September Implement microbiome treatment in your praxis part 1. (NL)
- 30th of September Implement microbiome treatment in your praxis part 2. (DE)
- 2nd of October Implement microbiome treatment in your praxis part 2. (NL)



Thank you for your attention!