HumanBiota

Code: FE2285 – 30 enteric-coated vegetable capsules

HUMAN BIOTA is characterised by containing: a selection of scientifically proven probiotic strains of human origin, together with complementary prebiotics of natural origin. It represents the evolution of probiotic supplementation and is an ideal product for restoring healthy gut flora after illness or antibiotic use.

Each HUMAN BIOTA capsule contains over 42 billion live cells from 12 beneficial strains of human origin. Although the origin of a probiotic strain is not the sole criterion for efficacy, strains of human origin exhibit the ability to colonise at multiple sites in the gastrointestinal tract.

The activity of the strains helps to boost immune function, disease resistance, optimal digestion and absorption of nutrients, improved vitamin synthesis, better lactose tolerance, and improved gastrointestinal transit.

The GPS™ enteric coating of the capsule protects the product from gastric juices and ensures 100% potency.

Ingredients: Potato starch, bacterial culture (42 billion live active healthy cells per capsule; see nutritional information), inulin (from chicory root, *Cichorium intybus*), arabinogalactan (from *Larix laricina*), antioxidant (l-ascorbic acid), anticaking agent (magnesium salts of fatty acids), GPS™ enteric-coated vegetable capsule (glazing agent: hydroxypropylmethylcellulose; aqueous enteric-coating solution; purified water).

Nutritional information:	**1 enteric capsules (640 mg)**
Lactobacillus rhamnosus UB5115	31,5 billion CFU
Lactobacillus casei UB1499	8,324 billion CFU
Lactobacillus acidophilus UB5997	1,680 billion CFU
Bifidobacterium infantis UB9214	105 million CFU
Bifidobacterium lactis UB3963	105 million CFU
Bifidobacterium bifidum UB4280	42 million CFU
Bifidobacterium breve UB8674	42 million CFU
Bifidobacterium longum UB7691	42 million CFU
Lactobacillus crispatus UB4719	42 million CFU
Lactobacillus gasseri UB8141	42 million CFU
Lacobacillus acidophilus LA-14	37,8 million CFU
Lactobacillus rhamnosus GG	37,8 million CFU
Inulin	15 mg
Arabinogalactan	15 mg

CFU: Colony-Forming Unit Cells
The enteric coating GPS™ protects capsule contents from stomach acids and delivers 100% potency to the intestines.

Size and format:

30 enteric-coated vegetable capsules

Recommended daily dose:
1 capsule daily. If you are taking antibiotics, take this product at least 2-3 hours before or after taking them.

Do not exceed the stated recommended daily dose.

Store preferably refrigerated.

Indications and uses:
- Helps restore mucosal barrier integrity and function
- To help repopulate the flora of the entire intestinal tract.
- To strengthen the immune system after illnesses.
- To prevent and overcome antibiotic-associated diarrhoea
- To promote long-term general well-being.

Cautions:
Consult a health-care practitioner before using if you have fever, vomiting, bloody diarrhoea, or severe abdominal pain; or if you have a special medical condition, or if you have an immune-compromised condition (e.g. AIDS, lymphoma). Discontinue use if symptoms of digestive upset persist beyond 3 days.

The seven species of *LACOBACILLUS* in our formula support the digestive process by focusing on breaking down and absorbing nutrients. While eating the right foods is important, having an adequate and diverse spectrum of probiotic species provides many health benefits. The Lactobacillus species release and intensify functional ingredients and vitamins in foods, while also producing B vitamins and vitamin K. Furthermore, as their name suggests, they break down the lactose present in milk, which is found in many foods and can cause problems ranging from mild intestinal discomfort to food intolerance.

LACTOBACILLUS RHAMNOSUS: it contains two beneficial human strains belonging to this species: UB5115 and GG.
It is one of the most widely researched probiotic species due to its tolerance to acidic conditions. This product contains more than 3,5 billion colony-forming units (CFU) from this species. It colonises in the gut membranes and offers numerous health benefits: it increases lactic acid production, actively suppressing the growth of harmful bacteria such as *Salmonella* [(1)], and it is effective in preventing antibiotic-associated diarrhoea [(2)] and *Clostridium difficile*-associated diarrhoea [(3)]. It strengthens the immune system and is a good coadjuvant for the influenza vaccine [(4)]. It improves intestinal barrier function for the relief of autoimmune diseases such as arthritis [(5)] and allergies [(6)]. It improves the blood lipid profile [(7)] and reduces cholesterol [(8)]. It may prevent or relieve symptoms of postpartum depression and anxiety [(9)], regenerate the vaginal flora in women by reducing colonisation by oral bacteria and fungi [(10)], and may reduce the prevalence of gestational diabetes mellitus [(11)]. In children, it reduces the frequency and duration of diarrhoea and vomiting [(12)], rotavirus diarrhoea [(13)], and antibiotic-associated diarrhoea [(14)]. It reduces the incidence of atopic dermatitis [(15-16)]. Drinking milk supplemented with *L. rhamnosus* reduces the risk of tooth decay in children [(17)].

> *L. rhamnosus* GG strain: one of the most studied probiotic strains in the world. Its benefit has been described in infant diarrhoea [(18)], respiratory infections [(19)], antibiotic-associated diarrhoea [(20)], infectious diarrhoea associated with Clostridium difficile [(21)], inflammatory bowel diseases such as Irritable Bowel Syndrome [(22)], improves gastrointestinal function after pancreatic surgery [(23)].

LACTOBACILLUS CASEI: this product contains the UB1499 human strain. It reduces the duration and incidence of infections such as bronchitis, pneumonia and rhinopharyngitis [(24-26)]. Regarding intestinal infections, it boosts immunity against bacterial infections (e.g., E. coli) and viral infections (e.g., influenza vaccinations) [(27-30)]. In children, it improves allergic rhinitis symptoms [(31)], helps to eradicate H. pylori in combination with antibiotic therapy [(32)], is effective against viral diarrhoea [(33)], and improves the general incidence of infections [(34)].

LACTOBACILLUS ACIDOPHILUS: this product contains the UB5997 and LA-14 human strains. It improves the general symptoms of patients with Irritable Bowel Syndrome [(35)]. It helps to maintain an acidic environment in the intestinal tract by preventing the growth of harmful bacteria and reduces antibiotic-associated diarrhoea [(36)]. It reduces total plasma cholesterol and low-density lipoprotein (LDL) cholesterol [(37-38)]. It helps to improve digestive health by maintaining the intestinal barrier, restoring intestinal flora, improving digestion, boosting the immune system, and supporting beneficial bacteria that thrive in the colon [(39)]. It helps to improve symptoms of allergic rhinitis [(40)], hay fever [(41)], and atopic dermatitis [(42)]. When used in combination with *B. bifidum*, it reduces the incidence of radiotherapy-induced diarrhoea in cervical cancer patients [(46)].

> *L. acidophilus* LA-14 strain: is well known for its effects on proper vaginal health. After one week of oral consumption they colonise the vagina [(44)]. It also has microbicidal activity against various pathogens responsible for bacterial vaginosis and aerobic vaginitis [(45)]. Preliminary studies also indicate that it may promote kidney health [(46)]. Its effect on immunity by increasing IgG levels has also been studied [(47)]. In addition, this strain has been found to be resistant to a number of antimicrobials and to produce a bacteriocin with antimicrobial activity against Listeria moncytogenes [(48)]. A recent study reveals that it may have benefits in the prevention of liver damage [(49)].

LACTOBACILLUS CRISPATUS: this product contains the human strain UB4719. Numerous studies have shown its considerable potential for maintaining the health of the female reproductive system, helping to prevent recurrent urinary tract infections, as well as bacterial vaginosis and candidiasis [(50-52)]. It is also capable of modulating the immune system [(53)], reducing allergic symptoms in mice [(54)].

LACTOBACILLUS GASSERI: this product contains the human strain UB8141. It improves functional dyspepsia by improving the gastric microbiota and helping to suppress Helicobacter pylori in the stomach [(55)]. It is also a predominant species in the vaginal flora, inhibits the adherence of pathogenic bacteria and helps prevent and treat bacterial vaginosis [(56)]. It has antimicrobial activity through the production of bacteriocins [(57-58)], improves symptoms such as diarrhoea in Irritable Bowel Syndrome [(59-60)], helps strengthen the immune system [(61)] and may help regulate allergic response [(62)]. In recent years, its effect on weight control has been studied. It has reducing effects on abdominal adiposity, body weight and other measures of obesity, helping to regulate blood lipids (triglycerides, cholesterol), suggesting its beneficial influence on metabolic disorders [(63-65)].

The five strains of *BIFIDOBACTERIUM* in the HUMAN BIOTA are the dominant species within the large intestine (colon) of healthy individuals. They are among the first probiotics that we are exposed to at birth, which attach to the mucosal lining of the colon to establish a strong immune system. Strengthening their numbers further enhances the body's resistance to disease, including common cold and flu viruses.

BIFIDOBACTERIUM LONGUM: this product contains the human strain UB7691. A protein factor produced by B. longum inhibits the adhesion of the enterotoxigenic strain of *Escherichia coli* [66]. It has anti-inflammatory properties and is indicated for gastrointestinal complaints such as ulcerative colitis [67], antibiotic-associated diarrhoea [68-69], Irritable Bowel Syndrome [70], and seasonal allergies [71-72]. It aids the formation of lactic acid and formic acid, lowering the pH of the intestines and preventing the proliferation of harmful bacteria [73]. It is also a significant producer of B vitamins [74].

BIFIDOBACTERIUM INFANTIS: this product contains the human strain UB9214. It is the dominant probiotic inhabiting the distal part of the small intestine and colon. It is one of the first species to colonise the infant intestinal tract [75] and is critical in adults for intestinal health and immune system function [76]. It is extremely good at surviving stomach and bile acids [77] and is generally able to adhere to intestinal tissues [78]. It produces acetic acid and inhibits pathogenic bacteria [79]. It produces bacteriocins, which act against *Salmonella*, *Shigella*, and *E. coli* [80-81]. It relieves many symptoms of Irritable Bowel Syndrome (e.g., pain, bloating), normalises bowel movements, and regulates the IL-10/IL-12 ratio [82-84]. It reduces systemic pro-inflammatory biomarkers in chronic inflammatory diseases such as ulcerative colitis, chronic fatigue syndrome, and psoriasis, demonstrating that the immunomodulatory effects of microbiota are not limited to the mucosa but encompass the systemic immune system [85]. It can alleviate symptoms of untreated coeliac disease [86].

BIFIDOBACTERIUM BIFIDUM: this product contains the human strain UB4280. They are found in the mucosal lining of the last part of the small intestine and are the predominant strains that colonise the large intestine and support bowel health, hygiene, and functionality. They reduce serum cholesterol and dissolve bile salts [87-88]. *B. bifidum* also provides antibacterial activity against *Helicobacter pylori* [89-90], reduces apoptosis in the intestinal epithelium of children with necrotising enterocolitis [91], regulates the immune system response [92-94], reduces the duration and severity of colds [93], provides anti-inflammatory activity in chronic diseases of the large intestine (e.g., irritable bowel syndrome) [95-96], and reduces the incidence of radiotherapy-induced diarrhoea associated in cervical cancer patients [97].

BIFIDOBACTERIUM BREVE: this product contains the human strain UB8674. it maintains colonic homeostasis by reducing inflammation through induction of intestinal IL-10 producing Tr1 cells [98]. It protects colon function, relieves constipation, and reduces gas, bloating, and diarrhoea [98-99]. It improves ulcerative colitis symptoms [100]. In addition, it stimulates the immune system [99, 101], inhibits *Escherichia coli* [102], and suppresses the Candida fungus [103]. It reduces fat, liver function, and systemic inflammation in people prone to obesity [104]. In neonates, it improves gastrointestinal problems by stabilising the intestinal flora [105] and reduces the incidence of necrotising enterocolitis [106]. In children with coeliac disease, it reduces the pro-inflammatory cytokine TNF-alpha [107]. It improves adverse effects in chemotherapy patients, such as fever, infections, and intestinal disorders [108].

BIFIDOBACTERIUM LACTIS: this product contains the human strain UB3963. It has an immunoregulatory effect, mitigating allergic rhinitis [109], strengthens the immune system [110-112], it can help prevent eczema in children [113], improve symptoms of the Irritable Bowel Syndrome [114], can help with dental health [115], intestinal transit [116] and in children it helps balance the intestinal flora [117], strengthen the immune response in newborns [118] and to reduce the symptoms of acute diarrhoea [119]. It can also help regulate lipids and inflammation in patients with metabolic syndrome and obesity [120-121].

INULIN: It is a fructooligosaccharide (FOS) of plant origin, extracted from the root of chicory (*Cichorium intybus*). It acts as a prebiotic, creating the right environment for probiotics or beneficial microorganisms to reproduce faster and in greater numbers [122-124]. It increases the population of *Bifidobacterium* probiotics in the colon and reduces toxic metabolites and harmful enzymes. It prevents pathogenic and autogenous diarrhoea and constipation and protects liver function [125].

ARABINOGALACTAN: It is an arabino-oligosaccharide (AOS) of plant origin from the larch tree (*Larix laricina*). It is an excellent prebiotic that increases the production of short-chain fatty acids (mainly butyrate), which acts as an energy substrate for the epithelial cells of the colon and protects the intestinal mucosa. It activates the immune response and selectively stimulates the growth and activity of probiotic bacteria [126]. It is useful in fighting infections due to its ability to decrease bacterial adherence [127-128]. In addition, it lowers the intestinal pH and improves mineral absorption [128-131].

References:

1) De Keersmaecker, Sigrid CJ, et al. "Strong antimicrobial activity of *Lactobacillus rhamnosus* GG against *Salmonella typhimurium* is due to accumulation of lactic acid." FEMS microbiology letters 259.1 (2006): 89-96.
2) Szajewska, H., and M. Kołodziej. "Systematic review with meta-analysis*: Lactobacillus rhamnosus* GG in the prevention of antibiotic-associated diarrhoea in children and adults." Alimentary pharmacology & therapeutics 42.10 (2015): 1149-1157.
3) Goldenberg, Joshua Z., et al. "Probiotics for the prevention of *Clostridium difficile*-associated diarrhea in adults and children." The Cochrane Library (2013).
4) Davidson, Lisa E., et al. "*Lactobacillus* GG as an immune adjuvant for live-attenuated influenza vaccine in healthy adults: a randomized double-blind placebo-controlled trial." European journal of clinical nutrition 65.4 (2011): 501-507.
5) Baharav, Ehud, et al. "*Lactobacillus* GG bacteria ameliorate arthritis in Lewis rats." The Journal of nutrition 134.8 (2004): 1964-1969.
6) Thomas, Debra J., et al. "*Lactobacillus rhamnosus* HN001 attenuates allergy development in a pig model." PLoS One 6.2 (2011): e16577.
7) Kekkonen, Riina A., et al. "Effect of probiotic *Lactobacillus rhamnosus* GG intervention on global serum lipidomic profiles in healthy adults." World journal of gastroenterology: WJG 14.20 (2008): 3188.
8) Costabile, Adele, et al. "Effect of soluble corn fibre with *Lactobacillus rhamnosus* GG and the pilus-deficient derivative GG-PB12 on faecal microbiota, immune function and metabolism in healthy elderly (Saimes study)." Frontiers in Immunology 8 (2017): 1443.
9) Slykerman, R. F., et al. "Effect of *Lactobacillus rhamnosus* HN001 in pregnancy on postpartum symptoms of depression and anxiety: a randomized double-blind placebo-controlled trial." EBio- Medicine 24 (2017): 159-165.
10) Reid, Gregor, et al. "Oral use of *Lactobacillus rhamnosus* GR-1 and *L. fermentum* RC-14 significantly alters vaginal flora: randomized, placebo- controlled trial in 64 healthy women." Pathogens and Disease 35.2 (2003): 131-134.
11) Wickens, Kristin L., et al. "Early pregnancy probiotic supplementation with *Lactobacillus rhamnosus* HN001 may reduce the prevalence of gestational diabetes mellitus: a randomized controlled trial." British Journal of Nutrition 117.6 (2017): 804-813.
12) Basu, Sriparna, et al. "Effect of *Lactobacillus rhamnosus* GG in persistent diarrhea in Indian children: a randomized controlled trial." Journal of clinical gastroenterology 41.8 (2007): 756-760.
13) Szymanski, H., et al. "Treatment of acute infectious diarrhoea in infants and children with a mixture of three *Lactobacillus rhamnosus* strains–a randomized, double-blind, placebo-controlled trial." Alimentary pharmacology & therapeutics 23.2 (2006): 247-253.
14) Ruszczynski, M., A. Radzikowski, and H. Szajewska. "Clinical trial: effectiveness of *Lactobacillus rhamnosus* (strains E/N, Oxy and Pen) in the prevention of antibiotic-associated diarrhoea in children." Alimentary pharmacology & therapeutics 28.1 (2008): 154-161.
15) Wu, Yi-Jie, et al. "Evaluation of efficacy and safety of *Lactobacillus rhamnosus* in children aged 4–48 months with atopic dermatitis: An 8-week, double-blind, randomized, placebo-controlled study." Journal of Microbiology, Immunology and Infection 50.5 (2017): 684-692.
16) Kalliomäki, Marko, et al. "Probiotics in primary prevention of atopic disease: a randomized placebo-controlled trial." The Lancet 357.9262 (2001): 1076-1079.
17) Kaye, Elizabeth Krall. "Daily Intake of Probiotic *Lactobacilli* May Reduce Caries Risk in Young Children." Journal of Evidence Based Dental Practice 17.3 (2017): 284-286.
18) Li, Ya-Ting, et al. "Efficacy of *Lactobacillus rhamnosus* GG in treatment of acute pediatric diarrhea: A systematic review with meta-analysis." World journal of gastroenterology 25.33 (2019): 4999.
19) Liu, Shan, et al. "*Lactobacillus rhamnosus* GG supplementation for preventing respiratory infections in children: a meta-analysis of randomized, placebo-controlled trials." Indian paediatrics 50.4 (2013): 377-381.
20) Mantegazza, Cecilia, et al. "Probiotics and antibiotic-associated diarrhea in children: A review and new evidence on *Lactobacillus rhamnosus* GG during and after antibiotic treatment." Pharmacological Research 128 (2018): 63-72.
21) Segarra-Newnham, Marisel. "Probiotics for *Clostridium difficile*–associated diarrhea: focus on *Lactobacillus rhamnosus* GG and *Saccharomyces boulardii*." Annals of Pharmacotherapy 41.7-8 (2007): 1212-1221.
22) Pedersen, Natalia, et al. "Ehealth: low FODMAP diet vs *Lactobacillus rhamnosus* GG in irritable bowel syndrome." World Journal of Gastroenterology: WJG 20.43 (2014): 16215.
23) Folwarski, M., et al. "Effects of *Lactobacillus rhamnosus* GG on early postoperative outcome after pylorus-preserving pancreatoduodenectomy: a randomized trial." European Review for Medical and Pharmacological Sciences 25.1 (2021): 397-405.
24) Guillemard, E., et al. "Consumption of a fermented dairy product containing the probiotic *Lactobacillus casei* DN-114 001 reduces the duration of respiratory infections in the elderly in a randomised controlled trial." British journal of nutrition 103.1 (2010): 58-68.
25) Cobo Sanz, JMa, J. A. Mateos, and A. Muñoz Conejo. "Efecto de *Lactobacillus casei* sobre la incidencia de procesos infecciosos en niños/as." Nutrición Hospitalaria 21.4 (2006): 547-551.
26) Turchet, P., et al. "Effect of fermented milk containing the probiotic *Lactobacillus casei* DN-114001 on winter infections in free-living elderly subjects: a randomised, controlled pilot study." The journal of nutrition, health & aging 7.2 (2003): 75-77.
27) Isolauri, Erika, et al. "Improved immunogenicity of oral D x RRV reassortant rotavirus vaccine by *Lactobacillus casei* GG." Vaccine 13.3 (1995): 310-312.
28) Matsuzaki, T., et al. "The effect of oral feeding of *Lactobacillus casei* strain Shirota on immunoglobulin E production in mice." Journal of Dairy Science 81.1 (1998): 48-53.
29) Ingrassia, Isabelle, Antony Leplingard, and Arlette Darfeuille-Michaud. "*Lactobacillus casei* DN-114 001 inhibits the ability of adherent-invasive *Escherichia coli* isolated from Crohn's disease patients to adhere to and to invade intestinal epithelial cells." Applied and environmental microbiology 71.6 (2005): 2880-2887.
30) Boge, Thierry, et al. "A probiotic fermented dairy drink improves antibody response to influenza vaccination in the elderly in two randomised controlled trials." Vaccine 27.41 (2009): 5677-5684.
31) Giovannini, Marcello, et al. "A randomized prospective double blind controlled trial on effects of long-term consumption of fermented milk containing *Lactobacillus casei* in pre-school children with allergic asthma and/or rhinitis." Pediatric research 62.2 (2007): 215-220.
32) Sýkora, Josef, et al. "Effects of a specially designed fermented milk product containing probiotic *Lactobacillus casei* DN-114 001 and the eradication of *H. pylori* in children: a prospective randomized double-blind study." Journal of clinical gastroenterology 39.8 (2005): 692-698.
33) Guarino, Alfredo, et al. "Oral bacterial therapy reduces the duration of symptoms and of viral excretion in children with mild diarrhea." Journal of pediatric gastroenterology and nutrition 25.5 (1997): 516-519.
34) Merenstein, D., et al. "Use of a fermented dairy probiotic drink containing *Lactobacillus casei* (DN-114 001) to decrease the rate of illness in kids: the DRINK study A patient-oriented, double-blind, cluster-randomized, placebo-controlled, clinical trial." European journal of clinical nutrition 64.7 (2010): 669-677.
35) Sinn, Dong Hyun, et al. "Therapeutic effect of *Lactobacillus acidophilus*-SDC 2012, 2013 in patients with irritable bowel syndrome." Digestive diseases and sciences 53.10 (2008): 2714-2718.
36) Gao, Xing Wang, et al. "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." The American journal of gastroenterology 105.7 (2010): 1636-1641.
37) Ooi, L-G., et al. "*Lactobacillus acidophilus* CHO-220 and inulin reduced plasma total cholesterol and low-density lipoprotein cholesterol via alteration of lipid transporters." Journal of dairy science 93.11 (2010): 5048-5058.
38) Rerksuppaphol, Sanguansak, and Lakkana Rerksuppaphol. "A randomized double-blind controlled trial of *Lactobacillus acidophilus* plus *Bifidobacterium bifidum* versus placebo in patients with hypercholesterolemia." Journal of clinical and diagnostic research: JCDR 9.3 (2015): KC01.
39) Bader J, et al. "Processing, consumption and effects of probiotic microorganisms." Encyclopedia of Life Support Systems. (2012).
40) Ishida, Y., et al. "Clinical effects of *Lactobacillus acidophilus* strain L-92 on perennial allergic rhinitis: a double-blind, placebo-controlled study." Journal of Dairy Science 88.2 (2005): 527-533.
41) Ishida, Yu, et al. "Effect of milk fermented with *Lactobacillus acidophilus* strain L-92 on symptoms of Japanese cedar pollen allergy: a randomized placebo-controlled trial." Bioscience, biotechnology, and biochemistry 69.9 (2005): 1652-1660.

42) Torii, Shinpei, et al. "Effects of oral administration of *Lactobacillus acidophilus* L-92 on the symptoms and serum markers of atopic dermatitis in children." International archives of allergy and immunology 154.3 (2011): 236-245.
43) Chitapanarux, Imjai, et al. "Randomized controlled trial of live *Lactobacillus acidophilus* plus *Bifidobacterium bifidum* in prophylaxis of diarrhea during radiotherapy in cervical cancer patients." Radiation Oncology 5.1 (2010): 31.
44) De Alberti, Davide, et al. "*Lactobacilli* vaginal colonisation after oral consumption of Respecta® complex: a randomised controlled pilot study." Archives of gynecology and obstetrics 292.4 (2015): 861-867.
45) Bertuccini, Lucia, et al. "Effects of *Lactobacillus rhamnosus* and *Lactobacillus acidophilus* on bacterial vaginal pathogens." International Journal of Immunopathology and Pharmacology 30.2 (2017): 163-167.
46) Giardina, Silvana, et al. "In vitro anti-inflammatory activity of selected oxalate-degrading probiotic bacteria: potential applications in the prevention and treatment of hyperoxaluria." Journal of food science 79.3 (2014): M384-M390.
47) Paineau, Damien, et al. "Effects of seven potential probiotic strains on specific immune responses in healthy adults: a double-blind, randomized, controlled trial." FEMS Immunology & Medical Microbiology 53.1 (2008): 107-113.
48) Todorov, Svetoslav Dimitrov, et al. "Bacteriocin production and resistance to drugs are advantageous features for *Lactobacillus acidophilus* La-14, a potential probiotic strain." New Microbiologica 34.4 (2011): 357-370.
49) Lv, Longxian, et al. "*Lactobacillus acidophilus* LA14 Alleviates Liver Injury." Msystems 6.3 (2021): e00384-21.
50) Stapleton, Ann E., et al. "Randomized, placebo-controlled phase 2 trial of a *Lactobacillus crispatus* probiotic given intravaginally for prevention of recurrent urinary tract infection." Clinical infectious diseases 52.10 (2011): 1212-1217.
51) Hemmerling, Anke, et al. "Phase 1 dose-ranging safety trial of *Lactobacillus crispatus* CTV-05 (LACTIN-V) for the prevention of bacterial vaginosis." Sexually transmitted diseases 36.9 (2009): 564.
52) Wang, Shuai, et al. "Antimicrobial compounds produced by vaginal *Lactobacillus crispatus* are able to strongly inhibit *Candida albicans* growth, hyphal formation and 53) Eslami, Solat, et al. "*Lactobacillus crispatus* strain SJ-3C-US induces human dendritic cells (DCs) maturation and confers an anti-inflammatory phenotype to DCs." Apmis 124.8 (2016): 697-710.
54) Tobita, Keisuke, Hiroyuki Yanaka, and Hajime Otani. "Anti-allergic effects of *Lactobacillus crispatus* KT-11 strain on ovalbumin-sensitized BALB/c mice." Animal science journal 81.6 (2010): 699-705.
55) Koga, Yasuhiro, et al. "Probiotic *L. gasseri* strain (LG21) for the upper gastrointestinal tract acting through improvement of indigenous microbiota." BMJ open gastroenterology 6.1 (2019): e000314.
56) Lin, Ta-Chin, et al. "Improvement of Bacterial Vaginosis by Oral *Lactobacillus* Supplement: A Randomized, Double-Blinded Trial." Applied Sciences 11.3 (2021): 902.
57) Ishikawa, Takumi, et al. "Antibacterial activity of the probiotic candidate *Lactobacillus gasseri* against methicillin-resistant *Staphylococcus aureus*." Asian Pacific Journal of Dentistry 20.1 (2020): 1-8.
58) Kobayashi, R., et al. "Oral administration of *Lactobacillus gasseri* SBT2055 is effective in preventing *Porphyromonas gingivalis*-accelerated periodontal disease." Scientific reports 7.1 (2017): 1-10.
59) Shin, Suk Pyo, et al. "A double blind, placebo-controlled, randomized clinical trial that breast milk derived-*Lactobacillus gasseri* BNR17 mitigated diarrhea-dominant irritable bowel syndrome." Journal of clinical biochemistry and nutrition 62.2 (2018): 179-186.
60) Suzuki, Takayoshi, et al. "Yogurt containing *Lactobacillus gasseri* mitigates aspirin-induced small bowel injuries: a prospective, randomized, double-blind, placebo-controlled trial." Digestion 95.1 (2017): 49-54.
61) Nishihira, Jun, et al. "*Lactobacillus gasseri* SBT2055 stimulates immunoglobulin production and innate immunity after influenza vaccination in healthy adult volunteers: a randomized, double-blind, placebo-controlled, parallel-group study." Functional Foods in Health and Disease 6.9 (2016): 544-568.
62) Nishihira, Jun, et al. "*Lactobacillus gasseri* potentiates immune response against influenza virus infection." Immunity and Inflammation in Health and Disease. Academic Press, 2018. 249-255.
62) Chen, Yue-Sheng, et al. "Randomized placebo-controlled trial of lactobacillus on asthmatic children with allergic rhinitis." Pediatric pulmonology 45.11 (2010): 1111-1120.
63) Kadooka, Y., et al. "Regulation of abdominal adiposity by probiotics (*Lactobacillus gasseri* SBT2055) in adults with obese tendencies in a randomized controlled trial." European journal of clinical nutrition 64.6 (2010): 636-643.
64) Kim, Joohee, et al. "*Lactobacillus gasseri* BNR17 supplementation reduces the visceral fat accumulation and waist circumference in obese adults: a randomized, double-blind, placebo-controlled trial." Journal of medicinal food 21.5 (2018): 454-461.
65) Wang, Chen, et al. "The effect of probiotic supplementation on lipid profiles in adults with overweight or obesity: A meta-analysis of randomized controlled trials." Journal of Functional Foods 86 (2021): 104711.
66) Fujiwara, Shigeru, et al. "Proteinaceous factor (s) in culture supernatant fluids of bifidobacteria which prevents the binding of enterotoxigenic *Escherichia coli* to gangliotetraosylceramide." Applied and environmental microbiology 63.2 (1997): 506-512.
67) Furrie, Elizabeth, et al. "Synbiotic therapy (*Bifidobacterium longum*/Synergy 1) initiates resolution of inflammation in patients with active ulcerative colitis: a randomised controlled pilot trial." Gut 54.2 (2005): 242-249.
68) Orrhage, K., B. Brismar, and C. E. Nord. "Effect of supplements with *Bifidobacterium longum* and *Lactobacillus acidophilus* on the intestinal microbiota during administration of clindamycin." Microbial Ecology in Health and Disease 7.1 (1994): 17-25.
69) Koning, Catherina JM, et al. "The effect of a multispecies probiotic on the intestinal microbiota and bowel movements in healthy volunteers taking the antibiotic amoxycillin." The American journal of gastroenterology 103.1 (2008): 178-189.
70) Ortiz-Lucas, María, et al. "Effect of probiotic species on irritable bowel syndrome symptoms: A bring up to date meta-analysis." Rev Esp Enferm Dig 105.1 (2013): 19-36.
71) Xiao, Jin-zhong, et al. "Clinical efficacy of probiotic *Bifidobacterium longum* for the treatment of symptoms of Japanese cedar pollen allergy in subjects evaluated in an environmental exposure unit." Allergology international 56.1 (2007): 67-75.
72) Takahashi, N., et al. "Immunostimulatory oligodeoxynucleotide from *Bifidobacterium longum* suppresses Th2 immune responses in a murine model." Clinical & Experimental Immunology 145.1 (2006): 130-138.
73) Makras, Lefteris, and Luc De Vuyst. "The in vitro inhibition of Gram-negative pathogenic bacteria by bifidobacteria is caused by the production of organic acids." International Dairy Journal 16.9 (2006): 1049-1057.
74) LeBlanc, J. G., et al. "B-Group vitamin production by lactic acid bacteria–current knowledge and potential applications." Journal of Applied Microbiology 111.6 (2011): 1297-1309.
75) He, Fang, et al. "Comparison of mucosal adhesion and species identification of bifidobacteria isolated from healthy and allergic infants." Pathogens and Disease 30.1 (2001): 43-47.
76) Ishibashi, N., T. Yaeshima, and H. Hayasawa. "Bifidobacteria: their significance in human intestinal health." Malaysian Journal of Nutrition 3.2 (1997): 149-159.
77) Sun, Wenrong, and Mansel W. Griffiths. "Survival of bifidobacteria in yogurt and simulated gastric juice following immobilization in gellan–xanthan beads." International Journal of Food Microbiology 61.1 (2000): 17-25.
78) Bernet, Marie-Francoise, et al. "Adhesion of human bifidobacterial strains to cultured human intestinal epithelial cells and inhibition of enteropathogen-cell interactions." Applied and environmental microbiology 59.12 (1993): 4121-4128.
79) Gibson, G. R., and Xin Wang. "Regulatory effects of bifidobacteria on the growth of other colonic bacteria." Journal of Applied Microbiology 77.4 (1994): 412-420.
80) Cheikhyoussef, Ahmad, et al. "Antimicrobial activity and partial characterization of bacteriocin-like inhibitory substances (BLIS) produced by *Bifidobacterium infantis* BCRC 14602." Food Control 20.6 (2009): 553-559.
81) Cheikhyoussef, Ahmad, et al. "Bifidin I–A new bacteriocin produced by *Bifidobacterium infantis* BCRC 14602: Purification and partial amino acid sequence." Food Control 21.5 (2010): 746-753.
82) Whorwell, Peter J., et al. "Efficacy of an encapsulated probiotic *Bifidobacterium infantis* 35624 in women with irritable bowel syndrome." The American journal of gastroenterology 101.7 (2006): 1581-1590.

83) Brenner, Darren M., and William D. Chey. "*Bifidobacterium infantis* 35624: a novel probiotic for the treatment of irritable bowel syndrome." Reviews in gastroenterological disorders 9.1 (2009): 7-15.
84) O'Mahony, Liam, et al. "*Lactobacillus* and *bifidobacterium* in irritable bowel syndrome: symptom responses and relationship to cytokine profiles." Gastroenterology 128.3 (2005): 541-551.
85) Groeger, David, et al. "*Bifidobacterium infantis* 35624 modulates host inflammatory processes beyond the gut." Gut microbes 4.4 (2013): 325-339.
86) Smecuol, Edgardo, et al. "Exploratory, randomized, double-blind, placebo-controlled study on the effects of *Bifidobacterium infantis* natren life start strain super strain in active celiac disease." Journal of clinical gastroenterology 47.2 (2013): 139-147.
87) Klaver, F. A., and Roelof Van Der Meer. "The assumed assimilation of cholesterol by *Lactobacilli* and *Bifidobacterium bifidum* is due to their bile salt-deconjugating activity." Applied and Environmental Microbiology 59.4 (1993): 1120-1124.
88) Zanotti, Ilaria, et al. "Evidence for cholesterol-lowering activity by *Bifidobacterium bifidum* PRL2010 through gut microbiota modulation." Applied microbiology and biotechnology 99.16 (2015): 6813-6829.
89) Shirasawa, Y., et al. "*Bifidobacterium bifidum* BF-1 suppresses Helicobacter pylori-induced genes in human epithelial cells." Journal of dairy science 93.10 (2010): 4526-4534.
90) Chenoll, E., et al. "Novel probiotic *Bifidobacterium bifidum* CECT 7366 strain active against the pathogenic bacterium *Helicobacter pylori*." Applied and environmental microbiology 77.4 (2011): 1335-1343.
91) Khailova, Ludmila, et al. "*Bifidobacterium bifidum* reduces apoptosis in the intestinal epithelium in necrotizing enterocolitis." American Journal of Physiology-Gastrointestinal and Liver Physiology 299.5 (2010): G1118-G1127.
92) Fu, Yu-Rong, et al. "Effects of *Bifidobacterium bifidum* on adaptive immune senescence in aging mice." Microbiology and immunology 54.10 (2010): 578-583.
93) De Vrese, Michael, et al. "Probiotic bacteria reduced duration and severity but not the incidence of common cold episodes in a double blind, randomized, controlled trial." Vaccine 24.44 (2006): 6670-6674.
94) Park, Ji-Hee, et al. "Encapsulated *Bifidobacterium bifidum* potentiates intestinal IgA production." Cellular immunology 219.1 (2002): 22-27.
95) Guglielmetti, Simone, et al. "Randomised clinical trial: *Bifidobacterium bifidum* MIMBb75 significantly alleviates irritable bowel syndrome and improves quality of life—a double-blind, placebo-controlled study." Alimentary pharmacology & therapeutics 33.10 (2011): 1123-1132.
96) Kim, Namju, et al. "Oral feeding of *Bifidobacterium bifidum* (BGN4) Prevents CD4+ CD45RB high T cell-mediated inflammatory bowel disease by inhibition of disordered T cell activation." Clinical Immunology 123.1 (2007): 30-39.
97) Chitapanarux, Imjai, et al. "Randomized controlled trial of live *Lactobacillus acidophilus* plus *Bifidobacterium bifidum* in prophylaxis of diarrhea during radiotherapy in cervical cancer patients." Radiation Oncology 5.1 (2010): 31.
98) Jeon, Seong Gyu, et al. "Probiotic *Bifidobacterium breve* induces IL-10-producing Tr1 cells in the colon." PLoS pathogens 8.5 (2012): e1002714.
99) Tabbers, M. M., et al. "Is *Bifidobacterium breve* effective in the treatment of childhood constipation? Results from a pilot study." Nutrition journal 10.1 (2011): 19.
100) Ishikawa, Hideki, et al. "Beneficial effects of probiotic bifidobacterium and galacto-oligosaccharide in patients with ulcerative colitis: a randomized controlled study." Digestion 84.2 (2011): 128-133.
101) Mullié, Catherine, et al. "Increased poliovirus-specific intestinal antibody response coincides with promotion of *Bifidobacterium longum-infantis* and *Bifidobacterium breve* in infants: a randomized, double-blind, placebo-controlled trial." Pediatric research 56.5 (2004): 791-795.
102) Sheehan, Vivien M., et al. "Improving gastric transit, gastrointestinal persistence and therapeutic efficacy of the probiotic strain *Bifidobacterium breve* UCC2003." Microbiology 153.10 (2007): 3563-3571.
103) Mendonça, Fabio Henrique Boarini Pacheco, et al. "Effects of probiotic bacteria on Candida presence and IgA anti-Candida in the oral cavity of elderly." Brazilian dental journal 23.5 (2012): 534-538.
104) Minami, Jun-ichi, et al. "Oral administration of *Bifidobacterium breve* B-3 modifies metabolic functions in adults with obese tendencies in a randomised controlled trial." Journal of nutritional science 4 (2015).
105) Kitajima, Hiroyuki, et al. "Early administration of *Bifidobacterium breve* to preterm infants: randomised controlled trial." Archives of Disease in Childhood-Fetal and Neonatal Edition 76.2 (1997): F101-F107.
106) Braga, Taciana Duque, et al. "Efficacy of *Bifidobacterium breve* and *Lactobacillus casei* oral supplementation on necrotizing enterocolitis in very-low-birth-weight preterm infants: a double-blind, randomized, controlled trial–." The American journal of clinical nutrition 93.1 (2010): 81-86.
107) Klemenak, Martina, et al. "Administration of *Bifidobacterium breve* Decreases the Production of TNF-alfa in Children with Celiac Disease." Digestive diseases and sciences 60.11 (2015): 3386-3392.
108) Wada, Mariko, et al. "Effects of the enteral administration of *Bifidobacterium breve* on patients undergoing chemotherapy for pediatric malignancies." Supportive care in cancer 18.6 (2010): 751-759.
109) Singh, A., et al. "Immune-modulatory effect of probiotic *Bifidobacterium lactis* NCC2818 in individuals suffering from seasonal allergic rhinitis to grass pollen: an exploratory, randomized, placebo-controlled clinical trial." European journal of clinical nutrition 67.2 (2013): 161-167.
110) Arunachalam, K., H. S. Gill, and R. K. Chandra. "Enhancement of natural immune function by dietary consumption of *Bifidobacterium lactis* (HN019)." European Journal of Clinical Nutrition 54.3 (2000): 263-267.
111) Gill, Harsharnjit S., et al. "Enhancement of immunity in the elderly by dietary supplementation with the probiotic *Bifidobacterium lactis* HN019." The American journal of clinical nutrition 74.6 (2001): 833-839.
112) Holscher, Hannah D., et al. "*Bifidobacterium lactis* Bb12 enhances intestinal antibody response in formula-fed infants: a randomized, double-blind, controlled trial." Journal of parenteral and enteral nutrition 36 (2012): 106S-117S.
113) Kim, Ji Yeun, et al. "Effect of probiotic mix (*Bifidobacterium bifidum*, *Bifidobacterium lactis*, *Lactobacillus acidophilus*) in the primary prevention of eczema: a double-blind, randomized, placebo-controlled trial." Pediatric Allergy and Immunology 21.2p2 (2010): e386-e393.
114) Martoni, Christopher J., Shalini Srivastava, and Gregory J. Leyer. "*Lactobacillus acidophilus* DDS-1 and *Bifidobacterium lactis* UABla-12 improve abdominal pain severity and symptomology in irritable bowel syndrome: randomized controlled trial." Nutrients 12.2 (2020): 363.
115) Alanzi, A., et al. "Effect of *Lactobacillus rhamnosus* and *Bifidobacterium lactis* on gingival health, dental plaque, and periodontopathogens in adolescents: a randomised placebo-controlled clinical trial." Beneficial microbes 9.4 (2018): 593-602.
116) Yang, Yue-Xin, et al. "Effect of a fermented milk containing *Bifidobacterium lactis* DN-173010 on Chinese constipated women." World journal of gastroenterology: WJG 14.40 (2008): 6237.
117) Mohan, Ruchika, et al. "Effects of *Bifidobacterium lactis* Bb12 supplementation on intestinal microbiota of preterm infants: a double-blind, placebo-controlled, randomized study." Journal of Clinical Microbiology 44.11 (2006): 4025-4031.
118) Holscher, Hannah D., et al. "*Bifidobacterium lactis* Bb12 enhances intestinal antibody response in formula-fed infants: a randomized, double-blind, controlled trial." Journal of parenteral and enteral nutrition 36 (2012): 106S-117S.
119) Abou El-Soud, Neveen Helmy, et al. "*Bifidobacterium lactis* in treatment of children with acute diarrhea. A randomized double blind controlled trial." Open access Macedonian journal of medical sciences 3.3 (2015): 403.
120) Bernini, Luciana Jesus, et al. "Beneficial effects of *Bifidobacterium lactis* on lipid profile and cytokines in patients with metabolic syndrome: A randomized trial. Effects of probiotics on metabolic syndrome." Nutrition 32.6 (2016): 716-719.
121) Pedret, Anna, et al. "Effects of daily consumption of the probiotic *Bifidobacterium animalis* subsp. *lactis* CECT 8145 on anthropometric adiposity biomarkers in abdominally obese subjects: a randomized controlled trial." International Journal of Obesity 43.9 (2019): 1863-1868.
122) Institute of FoodTechnologists (IFT). What are fructooligosaccharides and how do theyprovidedigestive, immunity and bonehealthbenefits?. ScienceDaily (2013).
123) Gibson, Glenn R. "Dietary modulation of the human gut microflora using the prebiotics oligofructose and inulin." The Journal of nutrition 129.7 (1999): 1438S-1441s.
124) Flamm, Gary, et al. "Inulin and oligofructose as dietary fiber: a review of the evidence." Critical reviews in food science and nutrition 41.5 (2001): 353-362.

125) Cardarelli, Haíssa R., et al. "Inulin and oligofructose improve sensory quality and increase the probiotic viable count in potentially synbiotic petit-suisse cheese." LWT-Food Science and Technology 41.6 (2008): 1037-1046.
126) Robinson, Ramona R., Joellen Feirtag, and Joanne L. Slavin. “Effects of dietary arabinogalactan on gastrointestinal and blood parameters in healthy human subjects.” Journal of the American College of Nutrition 20.4 (2001): 279-285.
127) Gibson, Glenn R. “Dietary modulation of the human gut microflora using the prebiotics oligofructose and inulin.” The Journal of nutrition 129.7 (1999): 1438S-1441s.
128) Flamm, Gary, et al. “Inulin and oligofructose as dietary fiber: a review of the evidence.” Critical reviews in food science and nutrition 41.5 (2001): 353-362.
129) Van Loo, Jan, et al. “On the presence of inulin and oligofructose as natural ingredients in the western diet.” Critical Reviews in Food Science & Nutrition 35.6 (1995): 525-552.
130) Niness, Kathy R. “Inulin and oligofructose: what are they?.” The Journal of nutrition 129.7 (1999): 1402S-1406s.
131) Rao, A. V. “Dose-response effects of inulin and oligofructose on intestinal bifidogenesis effects.” The Journal of nutrition 129.7 (1999): 1442S-1445s.