HumanBiota

30 enteric-coated vegetable capsules / Code FE2285

HumanBiota contains more than **42 billion** CFU from **12** beneficial **strains** of **human origin** complemented **with prebiotics** of natural origin**: F.O.S**. (chicory root) and **A.O.S.** (larch tree). Strains of human origin exhibit the ability to colonise at multiple sites in the gastrointestinal tract.

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

FORMAT: 30 capsules.

FORMULA

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), GPSTM enteric-coated vegetable capsule (glazing agent: hydroxypropylmethylcellulose; aqueous enteric-coating solution; purified water).

Nutritional informatrion:	**1 capsule**
Human strains:	
Ligilactobacillus salivarius UB3488	16 billion CFU
Lactobacillus gasseri UB9507	5 billion CFU
Limosilactobacillus fermentum UB3678	4 billion CFU
Bifidobacterium longum ssp. infantis UB5660	3 billion CFU
Bifidobacterium animalis ssp. lactis UB9439	3 billion CFU
Bifidobacterium bifidum UB4925	3 billion CFU
Bifidobacterium breve UB3917	3 billion CFU
Bifidobacterium longum ssp. longum UB6897	3 billion CFU
Lactobacillus johnsonii UB2214	1 billion CFU
Bifidobacterium animalis ssp. lactis BL-04	400 million CFU
Lacticaseibacillus rhamnosus GG	400 million CFU
Lactobacillus acidophilus LA-14	200 million CFU
Inulin	15 mg
Arabinogalactan (AOS)	15 mg

CFU: Colony-Forming Unit Cells

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.

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.

DETAILS:

HumanBiota 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 **HumanBiota** 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:

The six species of ***Lactobacillus*** 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.

LIGILACTOBACILLUS SALIVARIUS: It inhibits the growth and activity of harmful pathogenic bacteria, including *Helicobacter pylori* [1,2] and *Salmonella* [3]. It helps to break down undigested proteins and deactivate toxins produced by intestinal putrefaction[4]. It improves the lipid (cholesterol) profile and reduces inflammation, tumour necrosis factor, and *Escherichia coli* populations [5]. When used in combination with prebiotics (fructooligosaccharides), it is effective in reducing the symptoms of atopic dermatitis in children [6] and adults [7].

LACTOBACILLUS GASSERI: It improves functional dyspepsia by improving the gastric microbiota and helping to suppress *Helicobacter pylori* in the stomach [8]. 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 [10,11], improves symptoms such as diarrhoea in Irritable Bowel Syndrome [12,13], helps strengthen the immune system [14,15] and may help regulate allergic response [16]. 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 [17-19].

LIMOSILACTOBACILLUS FERMENTUM: Combined oral use of *L. rhamnosus* and *L. fermentum* may reduce colonisation of the vaginal mucosa by pathogenic bacteria or fungi [20-22]. It is helpful in infectious mastitis during lactation, as well as its prevention [23-24]. It may be helpful in the treatment of cholesterol reduction [25], blood lipoproteins, oxidative stress and inflammatory profile [26].

LACTOBACILLUS JOHNSONII: It has several benefits, such as in *Helicobacter pylori* gastritis [27], regulates immune response [28], may help in the control of diabetes [29], is helpful against vaginal infections [30], and improves allergic rhinitis in children [31].

LACTICASEIBACILLUS RHAMNOSUS: It is one of the most widely researched probiotic species due to its tolerance to acidic conditions. 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* [32], and it is effective in preventing antibiotic-associated diarrhoea [33] and *Clostridium difficile*-associated diarrhoea [34]. It strengthens the immune system and is a good coadjuvant for the influenza vaccine [35]. It improves intestinal barrier function for the relief of autoimmune diseases such as arthritis [36] and allergies [37]. It improves the blood lipid profile [8] and reduces cholesterol [39]. It may prevent or relieve symptoms of postpartum depression and anxiety [40], regenerate the vaginal flora in women by reducing colonisation by oral bacteria and fungi [41], and may reduce the prevalence of gestational diabetes mellitus [42]. In children, it reduces the frequency and duration of diarrhoea and vomiting [43], rotavirus diarrhoea [44], and antibiotic-associated diarrhoea [45]. It reduces the incidence of atopic dermatitis [46,47]. Drinking milk supplemented with *L. rhamnosus* reduces the risk of tooth decay in children [48].

L. rhamnosus GG strain: one of the most studied probiotic strains in the world. Its benefit has been described in infant diarrhoea [49], respiratory infections [50], antibiotic-associated diarrhoea [51], infectious diarrhoea associated with *Clostridium difficile* [52], inflammatory bowel diseases such as Irritable Bowel Syndrome [53], improves gastrointestinal function after pancreatic surgery [54].

<u>*LACTOBACILLUS ACIDOPHILUS*</u>: It improves the general symptoms of patients with Irritable Bowel Syndrome [55]. It helps to maintain an acidic environment in the intestinal tract by preventing the growth of harmful bacteria and reduces antibiotic-associated diarrhoea [56]. It reduces total plasma cholesterol and low-density lipoprotein (LDL) cholesterol [57-58]. 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 [59]. It helps to improve symptoms of allergic rhinitis [60], hay fever [61], and atopic dermatitis [62]. When used in combination with *B. bifidum*, it reduces the incidence of radiotherapy-induced diarrhoea in cervical cancer patients [63].

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 [64]. It also has microbicidal activity against various pathogens responsible for bacterial vaginosis and aerobic vaginitis [65]. Preliminary studies also indicate that it may promote kidney health [66]. Its effect on immunity by increasing IgG levels has also been studied [67]. 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* [68]. A recent study reveals that it may have benefits in the prevention of liver damage [69].

The six 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.

<u>*BIFIDOBACTERIUM LONGUM* SSP *LONGUM*</u>: A protein factor produced by *B. longum* inhibits the adhesion of the enterotoxigenic strain of *Escherichia coli* [70]. It has anti-inflammatory properties and is indicated for gastrointestinal complaints such as ulcerative colitis [71], antibiotic-associated diarrhoea [72,73], Irritable Bowel Syndrome [74], and seasonal allergies [75,76]. It aids the formation of lactic acid and formic acid, lowering the pH of the intestines and preventing the proliferation of harmful bacteria [77]. It is also a significant producer of B vitamins [78].

<u>*BIFIDOBACTERIUM INFANTIS* SSP. *INFANTIS*</u>: 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 [79] and is critical in adults for intestinal health and immune system function [80]. It is extremely good at surviving stomach and bile acids [81] and is generally able to adhere to intestinal tissues [82]. It produces acetic acid and inhibits pathogenic bacteria [83]. It produces bacteriocins, which act against *Salmonella*, *Shigella*, and *E. coli* [84,85]. It relieves many symptoms of Irritable Bowel Syndrome (e.g., pain, bloating), normalises bowel movements, and regulates the IL-10/IL-12 ratio [86-88]. 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 [90].

<u>*BIFIDOBACTERIUM BIFIDUM*</u>: 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 [91,92]. *B. bifidum* also provides antibacterial activity against *Helicobacter pylori* [93-94], reduces apoptosis in the intestinal epithelium of children with necrotising enterocolitis [95], regulates the immune system response [96-98], reduces the duration and severity of colds [97], provides anti-inflammatory activity in chronic diseases of the large intestine (e.g., irritable bowel syndrome) [99-100], and reduces the incidence of radiotherapy-induced diarrhoea associated in cervical cancer patients [101].

<u>*BIFIDOBACTERIUM BREVE*</u>: it maintains colonic homeostasis by reducing inflammation through induction of intestinal IL-10 producing Tr1 cells [102]. It protects colon function, relieves constipation, and reduces gas, bloating, and diarrhoea [102-103]. It improves ulcerative colitis symptoms [104]. In addition, it stimulates the immune system [103-105], inhibits *Escherichia coli* [106], and suppresses the Candida fungus [107]. It reduces fat, liver function, and systemic inflammation in people prone to obesity [108]. In neonates, it improves gastrointestinal problems by stabilising the intestinal flora [109] and reduces the incidence of necrotising enterocolitis [110]. In children with coeliac disease, it reduces the pro-inflammatory cytokine TNF-alpha [111]. It improves adverse effects in chemotherapy patients, such as fever, infections, and intestinal disorders [112].

BIFIDOBACTERIUM ANIMALIS SSP. *LACTIS:* It has an immunoregulatory effect, mitigating allergic rhinitis [113], strengthens the immune system [114-116], it can help prevent eczema in children [117], improve symptoms of the Irritable Bowel Syndrome [118], can help with dental health [119], intestinal transit [120] and in children it helps balance the intestinal flora [121], strengthen the immune response in newborns [122] and to reduce the symptoms of acute diarrhoea [123]. It can also help regulate lipids and inflammation in patients with metabolic syndrome and obesity [124,125].

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 [126-128]. 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 [129].

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 [130]. It is useful in fighting infections due to its ability to decrease bacterial adherence [131,132]. In addition, it lowers the intestinal pH and improves mineral absorption [132-135].

References:
1) Ryan, Kieran A., et al. "Strain-specific inhibition of *Helicobacter pylori* by *Lactobacillus salivarius* and other lactobacilli." Journal of Antimicrobial Chemotherapy 61.4 (2008): 831-834.
2) Kabir, A. M., et al. "Prevention of *Helicobacter pylori* infection by lactobacilli in a gnotobiotic murine model." Gut 41.1 (1997): 49-55.
3) Riboulet-Bisson, Eliette, et al. "Effect of *Lactobacillus salivarius* bacteriocin Abp118 on the mouse and pig intestinal microbiota." PLoS One 7.2 (2012): e31113.
4) European Food Safety Authority (EFSA). "Scientific Opinion on the safety and efficacy of *Lactobacillus salivarius* (CNCM I-3238) n *Lactobacillus casei* (ATCC PTA-6135) as silage additives for all species." EFSA Journal 10.9 (2012): 2884.
5) Rajkumar, Hemalatha, et al. "Effect of probiotic *Lactobacillus salivarius* UBL S22 and prebiotic fructo-oligosaccharide on serum lipids, inflammatory markers, insulin sensitivity, and gut bacteria in healthy young volunteers: A randomized controlled single-blind pilot study." Journal of Cardiovascular Pharmacology and Therapeutics 20.3 (2015): 289-298.
6) Wu, K-G., T-H. Li, and H-J. Peng. "*Lactobacillus salivarius* plus fructo-oligosaccharide is superior to fructo-oligosaccharide alone for treating children with moderate to severe atopic dermatitis: a double-blind, randomized, clinical trial of efficacy and safety." British Journal of Dermatology 166.1 (2012): 129-136.
7) Drago, L., et al. "Effects of *Lactobacillus salivarius* LS01 (DSM 22775) treatment on adult atopic dermatitis: a randomized placebo-controlled study." International Journal of Immunopathology and Pharmacology 24.4 (2011): 1037-1048.
8) 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.
9) Lin, Ta-Chin, et al. "Improvement of Bacterial Vaginosis by Oral *Lactobacillus* Supplement: A Randomized, Double-Blinded Trial." Applied Sciences 11.3 (2021): 902.
10) 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.
11) 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.
12) 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.
13) 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.
14) 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.
15) 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.
16) Chen, Yue-Sheng, et al. "Randomized placebo-controlled trial of lactobacillus on asthmatic children with allergic rhinitis." Pediatric pulmonology 45.11 (2010): 1111-1120.
17) 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.
18) 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.
19) 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.
20) 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." FEMS Immunology & Medical Microbiology 35.2 (2003): 131-134.
21) Reid, Gregor, et al. "Oral probiotics can resolve urogenital infections." FEMS Immunology & Medical Microbiology 30.1 (2001): 49-52.
22) Reid, Gregor, et al. "Probiotic *Lactobacillus* dose required to restore and maintain a normal vaginal flora." FEMS Immunology & Medical Microbiology 32.1 (2001): 37-41.
23) Arroyo, Rebeca, et al. "Treatment of infectious mastitis during lactation: antibiotics versus oral administration of *Lactobacilli* isolated from breast milk." Clinical Infectious Diseases 50.12 (2010): 1551-1558.
24) Hurtado, José A., et al. "Oral administration to nursing women of *Lactobacillus fermentum* CECT5716 prevents lactational mastitis development: A randomized

controlled trial." Breastfeeding Medicine 12.4 (2017): 202-209.
25) Thumu, Surya Chandra Rao, and Prakash M. Halami. "In vivo safety assessment of *Lactobacillus fermentum* strains, evaluation of their cholesterol-lowering ability and intestinal microbial modulation." Journal of the Science of Food and Agriculture 100.2 (2020): 705-713.
26) Kullisaar, Tiiu, et al. "The use of probiotic *L. fermentum* ME-3 containing Reg'Activ Cholesterol supplement for 4 weeks has a positive influence on blood lipoprotein profiles and inflammatory cytokines: an open-label preliminary study." Nutrition journal 15.1 (2016): 1-6.
27) Cruchet, Sylvia, et al. "Effect of the ingestion of a dietary product containing *Lactobacillus johnsonii* La1 on Helicobacter pylori colonization in children." Nutrition 19.9 (2003): 716-721.
28) Marcial, Guillermo E., et al. "*Lactobacillus johnsonii* N6. 2 modulates the host immune responses: a double-blind, randomized trial in healthy adults." Frontiers in immunology 8 (2017): 655.
29) Lau, Kenneth, et al. "Inhibition of type 1 diabetes correlated to a *Lactobacillus johnsonii* N6. 2-mediated Th17 bias." The Journal of Immunology 186.6 (2011): 3538-3546.
30) Joo, Hyun-Min, et al. "*Lactobacillus johnsonii* HY7042 ameliorates *Gardnerella vaginalis*-induced vaginosis by killing *Gardnerella vaginalis* and inhibiting NF-κB activation." International immunopharmacology 11.11 (2011): 1758-1765.
31) Lue, Ko-Haung, et al. "A trial of adding *Lactobacillus johnsonii* EM1 to levocetirizine for treatment of perennial allergic rhinitis in children aged 7–12 years." International journal of pediatric otorhinolaryngology 76.7 (2012): 994-1001.
32) 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.
33) 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.
34) Goldenberg, Joshua Z., et al. "Probiotics for the prevention of *Clostridium difficile*-associated diarrhea in adults and children." The Cochrane Library (2013).
35) 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.
36) Baharav, Ehud, et al. "*Lactobacillus* GG bacteria ameliorate arthritis in Lewis rats." The Journal of nutrition 134.8 (2004): 1964-1969.
37) Thomas, Debra J., et al. "*Lactobacillus rhamnosus* HN001 attenuates allergy development in a pig model." PLoS One 6.2 (2011): e16577.
38) 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.
39) 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.
40) 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.
41) 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.
42) 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.
43) 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.
44) 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.
45) 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.
46) 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.
47) Kalliomäki, Marko, et al. "Probiotics in primary prevention of atopic disease: a randomized placebo-controlled trial." The Lancet 357.9262 (2001): 1076-1079.
48) 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.
49) 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.
50) 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.
51) 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.
52) 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.
53) 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.
54) 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.
55) 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.
56) 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.
57) 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.
58) 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.
59) Bader J, et al. "Processing, consumption and effects of probiotic microorganisms." Encyclopedia of Life Support Systems. (2012).
60) 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.
61) 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.
62) 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.
63) 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.
64) 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.
65) 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.

66) 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.
67) 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.
68) 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.
69) Lv, Longxian, et al. "*Lactobacillus acidophilus* LA14 Alleviates Liver Injury." Msystems 6.3 (2021): e00384-21.
70) 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.
71) 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.
72) 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.
73) 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.
74) 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.
75) 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.
76) 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.
77) 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.
78) 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.
79) 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.
80) Ishibashi, N., T. Yaeshima, and H. Hayasawa. “Bifidobacteria: their significance in human intestinal health.” Malaysian Journal of Nutrition 3.2 (1997): 149-159.
81) 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.
82) 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.
83) 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.
84) 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.
85) 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.
86) 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.
87) 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.
88) 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.
89) Groeger, David, et al. “*Bifidobacterium infantis* 35624 modulates host inflammatory processes beyond the gut.” Gut microbes 4.4 (2013): 325-339.
90) 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.
91) 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.
92) 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.
93) 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.
94) 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.
95) 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.
96) Fu, Yu-Rong, et al. “Effects of *Bifidobacterium bifidum* on adaptive immune senescence in aging mice.” Microbiology and immunology 54.10 (2010): 578-583.
97) 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.
98) Park, Ji-Hee, et al. “Encapsulated *Bifidobacterium bifidum* potentiates intestinal IgA production.” Cellular immunology 219.1 (2002): 22-27.
99) 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.
100) 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.
101) 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.
102) Jeon, Seong Gyu, et al. “Probiotic *Bifidobacterium breve* induces IL-10-producing Tr1 cells in the colon.” PLoS pathogens 8.5 (2012): e1002714.
103) 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.
104) 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.
105) 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.
106) 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.
107) 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.
108) 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).

109) 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.
110) 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.
111) 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.
112) 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.
113) 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.
114) 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.
115) 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.
116) 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.
117) 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.
118) 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.
119) 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.
120) 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.
121) 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.
122) 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.
123) 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.
124) 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.
125) 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.
126) Institute of FoodTechnologists (IFT). What are fructooligosaccharides and how do theyprovidedigestive, immunity and bonehealthbenefits?. ScienceDaily (2013).
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) 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.
130) 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.
131) 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.
132) 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.
133) 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.
134) Niness, Kathy R. “Inulin and oligofructose: what are they?.” The Journal of nutrition 129.7 (1999): 1402S-1406s.
135) Rao, A. V. “Dose-response effects of inulin and oligofructose on intestinal bifidogenesis effects.” The Journal of nutrition 129.7 (1999): 1442S-1445s.