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Product Review: *Probiotics for Adults, Children and Pets*

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What They Are:

Probiotic products contain helpful, viable bacteria and/or yeasts that assist in balancing the levels of indigenous microorganisms in the human body. Probiotics are available in varied forms such as yogurt and other cultured milk foods, capsules, tablets, beverages, and powders. Probiotics should not be confused with *prebiotics*, which are complex sugars (such as inulin and other fructo-oligosaccharides) that are ingested as fuel for bacteria already present in the gastrointestinal tract. Prebiotics and probiotics are sometimes combined in the same product and termed *synbiotics*.

What They Do:

The normal human gastrointestinal tract contains hundreds of different species of bacteria, referred to as intestinal flora. When the normal balance of these bacteria is disturbed by illness or antibiotic treatment, the most common effect is diarrhea. Probiotics work by re-colonizing the small intestine and crowding out disease-causing bacteria, thereby restoring balance to the intestinal flora. They may also produce substances that inhibit disease-causing bacteria, compete for nutrients with them, and stimulate the body's own immune system.

A variety of probiotic organisms (alone or in combination) have been tested in clinical trials for a range of conditions. Here are some of the most notable findings by condition:

Irritable bowel syndrome (IBS) and abdominal pain

In adults:

Bifidobacterium infantis 35624 (used in Proctor & Gamble's *Align*) was found to improve symptoms (e.g., bloating, straining, gas) of **irritable bowel syndrome (IBS)** in women, although it did not change the frequency of stools ([Whorwell 2006](#)). An eight-strain combination of *Lactobacillus*, *Bifidobacterium* and *Streptococcus* (known as VSL#3) reduced abdominal bloating in patients with diarrhea-predominant IBS but had no effect on other symptoms such as abdominal pain, gas and urgency ([Kim 2003](#)). A multi-strain probiotic drink was found, in a 12-week study, to modestly reduce IBS symptoms in adult women and men ([Sisson Aliment Pharmacol Ther 2014](#)). Based on a 500-point symptom severity scale, there was a 63.3 point decline among those taking the probiotic compared to a 28.3 point decrease among those getting a placebo. The decline with the probiotic was largely due to decreases in pain and improvement in bowel habit satisfaction. There was no significant improvement in bloating or with overall quality of life. The probiotic (sold as *Symprove* in England) is a combination of *Lactobacillus rhamnosus* NCIMB30174, *Lactobacillus plantarum* NCIMB 30173, *Lactobacillus acidophilus* NCIMB 30175, and *Enterococcus faecium* NCIMB 30176 in a water-based suspension of barley extract with 10 billion live organisms per 50 mL dose which was kept refrigerated and taken each morning on an empty stomach 20 minutes before breakfast.

Some yogurts are now fortified with additional probiotic strains and have been marketed as promoting "digestive health," although it is not clear if they can help with IBS. *Bifidobacterium lactis* (BB-12) is added to *YoPlus* yogurt and *Bifidobacterium animalis* DN-173 010 (trade named "*Bifidus regularis*") is in Dannon's *Activia* yogurt. Clinical trials on both probiotic strains have shown that they shorten the transit time of food in the bowel; speeding up the time for food to pass through the bowel may benefit people with constipation, but it is not necessarily beneficial for people who complain of frequent or loose stools. A dosing study

with BB-12 showed looser stools with increasing probiotic dose (which ranged from 100 million to 100 billion cells per day) (Larsen 2006).

A study of yogurt containing *Bifidobacterium animalis* DN-173 010 (as in *Activia*) including yogurt starter cultures *S. thermophilus* and *L. bulgaricus* found that after 4 weeks of eating two cups (each 125 grams, non-flavored) daily, 57% of people with IBS involving constipation reported adequate symptom relief. However, among those in a control group eating a similar yogurt product which had been heated to kill the probiotic organisms, an almost equal amount of people (54%) reported relief, indicating no significant benefit of the probiotic over the non-probiotic. After eating the products for 8 weeks, 68% of those in the non-probiotic group reported adequate relief compared to just 46% of those who had taken the probiotic; and at 12 weeks this increased to 76% for the non-probiotic eaters and remained at 46% for the probiotic eaters. The researchers concluded that people with IBS may benefit from regular consumption of a fermented dairy product, like yogurt, but the addition of this particular probiotic would not be expected to provide further benefit (Roberts, *BMC Gastroent* 2013).

Advertising claims on *Activia* (as well as related *DanActive* drinks) indicating them to be "clinically proven" and "scientifically proven" to aid digestion have been (or are being) modified to read "clinical studies show..." as a result of lawsuits in the U.S. and Canada.

Some clinical studies suggest that prebiotics may improve symptoms of IBS, but results have been mixed. For more information about fructo-oligosaccharides and other Prebiotics see the article in the Encyclopedia on this website.

In children:

A study of **children** (aged 5 to 14) with IBS showed that taking *Lactobacillus* GG (a strain of *Lactobacillus casei* which is used in *Culturelle*) (3 billion cells twice per day for 8 weeks) significantly reduced the frequency and severity of **abdominal pain** (Ruggiero 2010). The number of episodes of pain per week decreased from 3.4 to 1.6 during treatment (a decrease of 4.0 to 3.2 was seen in the placebo-treated group). Episodes of pain fell even further during the follow-up period (8 weeks after therapy) to 0.9 per week in the probiotic group (1.6 in the placebo group). The treatment was well tolerated and no adverse effects were reported. A study of children (ages 6 to 16) with **functional abdominal pain** given *Lactobacillus reuteri* DSM 17938 (200 million cells per day) for 4 weeks showed reduced intensity of abdominal pain in the treated children compared to those given placebo (Romano 2010).

Lactobacillus reuteri DSM 17938 has also shown benefit in reducing **colic in some infants**. A 3-month study of healthy newborns given 100 million cells per day (from 5 drops of an oil formulation sold as *Gerber Soothe Colic Drops*) found that, compared to placebo, infants receiving the probiotic drops had a significant decrease in crying time (38 minutes vs. 71 minutes per day), regurgitation (2.9 vs. 4.6 times per day) and an increase in frequency of stools (4.2 vs. 3.6 times per day). The declines in crying time and regurgitation were significant within the first month of treatment. Treated infants also had significantly fewer visits to emergency rooms for colic, fewer lost working days among parents, and lower use of other treatments for abdominal discomfort (Indrio, *JAMA Pediatr* 2014). While this study showed benefit in *preventing* colic in newborns, a study in infants with colic severe enough for parents to seek emergency care found that the same probiotic, given for one month, provided no more benefit than placebo. Although crying and fussing time decreased in both the probiotic- and placebo-treated groups, among formula-fed infants "fussing" decreased more among those given placebo than among those given the probiotic (Sung, *BMJ* 2014). Additional studies are underway that may help determine which subgroups of infants are most likely to benefit from probiotics.

For additional information, see the Encyclopedia article on this site about [IBS](#).

Diverticular disease

A study in 210 people with symptomatic uncomplicated diverticular disease (SUDD) found that treatment with a probiotic (*Lactobacillus casei* subsp. DG, 24 billion organisms) was nearly as effective as treatment with the drug mesalazine (1.6 grams) in reducing recurrence of symptoms, and combined treatment was more effective than either alone. The treatments were given for 10 consecutive days each month for one year. Over the year, the percentage of patients with recurrence of symptoms (abdominal pain lasting at least 24 hours) was 46% among patients who received only placebo, 14.5% among those who received the probiotic, 13.7% among those who received mesalazine only, and 0% for those receiving combination treatment (Tursi, *Aliment Pharm Ther* 2013). Mesalazine is believed to work by controlling inflammation while the probiotic may restore organisms in the colon.

Diarrhea caused by antibiotics, viral infection, or chemotherapy

Antibiotics can disturb gastrointestinal organisms, and symptoms, such as diarrhea, may occur in as many as 30% of patients, particularly among older individuals. A 2012 review of over 60 published studies concluded that probiotic use was associated with an overall 42% lower risk of developing diarrhea due to antibiotic treatment (Hempel, *JAMA* 2012). There was a 36% lower risk of diarrhea across studies specifically using forms of *Lactobacillus* and a 52% lower risk of diarrhea across studies using the probiotic yeast *Saccharomyces*.

A subsequent review of 20 studies later in 2012 found a protective effect of probiotics in preventing *Clostridium difficile*-associated diarrhea, which is typically caused by exposure to broad-spectrum antibiotics and accounts for approximately one third of cases of antibiotic-associated diarrhea. The condition can be life-threatening and is most common in older, hospitalized individuals. Products with multiple species of probiotic organisms showed larger effects (75% risk reduction) than those using single species (50% risk reduction). People treated with probiotics reported fewer adverse events (e.g., cramping) than those who received placebo or no treatment, highlighting the safety of probiotics for this use. The review found a 66% reduction in the risk of developing this condition when probiotics were given as opposed to when they were not (Johnston, *Ann Int Med* 2012). The results were similar in trials of adults and children. Each of the trials used at least 10 billion organisms daily.

A more recent study of hospitalized patients age 65 and older in the U.K. who were receiving oral or parenteral antibiotics did not find such a benefit for antibiotic-associated diarrhea or *Clostridium difficile* diarrhea. The multicenter, randomized, double blind, placebo-controlled trial of nearly 3,000 participants found that taking a probiotic containing a blend of *Lactobacillus acidophilus* CUL60 (NCIMB 30157) and two strains of *Bifidobacterium bifidum* CUL20 (NCIMB 30153) (a total of 60 billion bacteria per day) daily for 21 days did not reduce the occurrence of antibiotic-associated diarrhea, including *Clostridium difficile* diarrhea, when compared to placebo (10.8% and 10.4%, respectively)(Allen, *Lancet* 2013).

Looking at specific strains, the probiotic yeast *Saccharomyces boulardii* (a strain found in *FloraStor* and *FloraStor Kids*) has been shown helpful in preventing antibiotic-induced diarrhea (Cremonini 2002). A probiotic drink (*Actimel* -- also sold as *DanActive*) containing *Lactobacillus casei*, *Lactobacillus bulgaricus*, and *Streptococcus thermophilus* consumed twice daily during antibiotic treatment and for a week thereafter, significantly decreased the risk of developing diarrhea, including *Clostridium difficile*-related diarrhea (Hickson, 2007). A study in China among hospitalized adults (aged 50 to 70) showed that capsules containing large doses of proprietary strains of *Lactobacillus acidophilus* and *Lactobacillus casei* significantly reduced antibiotic-associated diarrhea, including *Clostridium difficile*-related diarrhea (Gao, 2010).>

Another study in China showed greater overall efficacy with a higher dose of a probiotic than a lower dose. In this study of hospitalized adults aged 30 to 70, the incidence of antibiotic-associated diarrhea was reduced from 24.6% among those who received placebo to about half that amount (12.5%) among those receiving 17 billion probiotic bacteria per day. A group receiving only 4 billion bacteria per day had a non-significant decrease to 19.6%. The incidence specifically of *C. difficile*-associated diarrhea decreased from 4.8% in the placebo group to 1.8% in both treated groups. The higher dose probiotic treatment also significantly reduced the incidence of symptoms, particularly abdominal pain (19.2% placebo vs. 2.5% high-dose) (Ouweland, Vaccine 2013). A capsule containing the probiotic was taken 2 hours after breakfast (the antibiotic was taken with breakfast) on each day of antibiotic treatment and for 7 additional days. The probiotic used in the study consists of a combination of four bacteria in equal parts marketed as HOWARU Restore (found in Active D'Lites foods in the U.S. -- not yet tested by ConsumerLab.com). See [What to Consider When Using -- Dosage](#) for more about this probiotic.

Lactobacillus GG and *Lactobacillus reuteri* have been shown to reduce the duration of diarrhea due to certain infections in infants and young children, but not adults. *Lactobacillus GG* has also been shown to reduce the risk of chemotherapy-induced diarrhea (Osterlund 2007). A dosing study (Saxelin 1991) using the bacteria in *Culturelle* (*Lactobacillus GG*) found that a daily dose of 1.5 billion cells was not able to colonize the gut, but a much larger dose, 15 billion cells, was. (*Culturelle* tested by ConsumerLab.com in this Review provides 10 billion cells in its suggested daily serving of one capsule.) *Lactobacillus reuteri* DSM 17938 (0.1 billion cells daily) given shortly after birth to preterm infants resulted in decreases in feeding intolerance and the duration of hospitalization compared to placebo, as well as a 40% (but not statistically significant) decrease in necrotizing enterocolitis (Rojas, Pediatrics 2012).

Traveler's diarrhea

Studies using oral probiotics have yielded both positive and negative results. *Lactobacillus GG* reduced the risk of traveler's diarrhea by 47% in a study involving 245 people who traveled to 14 world-wide geographic regions (Hilton, 1997). *Saccharomyces boulardii* reduced the likelihood of traveler's diarrhea by 13% (using 250 mg per day) to 26% (using 1 gram per day) in a study of 3,000 Austrian tourists who traveled in northern Africa, the Middle East and Far East. This study had a high drop-out rate of 34% (Kollaritsch, 1993). Three weeks of *Lactobacillus fermentum* KLD or *Lactobacillus acidophilus* failed to prevent traveler's diarrhea in a study of 282 British soldiers deployed to Belize (Katelaris, 1995). A combination of *Lactobacillus acidophilus* and *Lactobacillus bulgaricus* failed to prevent traveler's diarrhea in 50 travelers to Mexico (de dios Pozo-Olano, 1978). The effectiveness of individual probiotic species for traveler's diarrhea may vary depending on the probiotic species used and the travel destination.

Helicobacter pylori (H. pylori) infection

Successful clinical trials have also been conducted using *Lactobacillus* alone or in combination with *Bifidobacterium* and *Saccharomyces* species to treat symptoms of *H. pylori* infection (a causative agent of stomach ulcers), but probiotics do not seem to eradicate the infection.

Vaginal bacterial infections

A combination of *L. rhamnosus* GR-1 and *L. fermentum* RC-14 (as in Jarrow Formulas *fermophilus*) taken orally has been shown to reduce colonization of the vagina by potential pathogenic bacteria and yeast (Reid 2003). Vaginal suppositories (which are not considered supplements in the U.S.) containing *Lactobacillus* organisms have also shown therapeutic benefit.

Cold and flu

Among healthy adults given 1 billion viable cells daily of a combination of *Lactobacillus plantarum* HEAL 9 (DSM 15312) and *Lactobacillus paracasei* 8700:2 (DSM 13434) for 12 weeks, 55% experienced colds compared to 67% of those who received placebo (Berggren, 2011). The number of days with cold symptoms was also lower (6.2 days vs. 8.6 days for the placebo).

Giving children (aged 3 to 5) in China a combination of *Lactobacillus acidophilus* NCFM (5 billion cells per day) and *Bifidobacterium animalis* subsp *lactis* Bi-007 (5 billion cells per day) versus placebo for 6 months (November to May) was shown to reduce the incidence of fever by 73%, coughing by 62%, runny nose by 59%, and also reduced the duration of these symptoms by 48% (Leyer, 2009). *Lactobacillus acidophilus* alone (10 billion cells per day) was also effective but not as effective as the combination product.

Weight and fat loss

In a preliminary study of overweight Japanese adults with large amounts of abdominal fat, giving 100 billion cells of *Lactobacillus gasseri* SBT2055 (LG2055) in a fermented milk product daily for 12 weeks significantly reduced abdominal visceral fat by 4.6% and abdominal subcutaneous fat by 3.3% at the end of the study. Body mass index was also significantly decreased by 1.5% and waist size decreased by 1.8% at the end of the study (Kadooka, Eur J Clin Nutr 2010). In a similar study using the same product, but giving lower doses of about 1.4 billion or 16 billion viable cells daily, abdominal visceral fat was significantly reduced by about 8% with both doses after 12-weeks. Body mass index was also reduced by 1.6% and 1.1%, respectively and waist circumference reduced by 1.2% to 1.4% respectively at the end of the study. However, subcutaneous visceral fat was not significantly reduced with these lower doses (Kadooka, Br J Nutr 2013). In both studies, no significant improvements occurred in the placebo group, which was given regular fermented milk. (Note: The product used in these studies is not currently available in the U.S. Two products in this Review, however, contain *L. gasseri* — *Garden of Life RAW Probiotics Women* and *Phillips Colon Health*, although the strain of *L. gasseri* may be different from that in the study and the products contain additional organisms.)

A study in Canada found a greater decrease in body weight and fat mass among women taking a probiotic than among those taking placebo during a 12-week diet (500 Calorie reduction in daily intake). Women taking the probiotic lost an average 9.7 lbs, while those taking the placebo lost just 5.7 lbs. Women taking the probiotic continued to lose more weight (another 1.3 lbs) during a subsequent 12-week period of normal caloric intake, but those taking placebo had little further change in weight. The probiotic provided 162 million cells daily of *Lactobacillus rhamnosus* CGMCC1.3724 (also called LPR) along with 300 mg of a prebiotic mix of oligofructose and inulin. The dose was divided into two capsules -- one taken 30 minutes before breakfast and the other taken 30 minutes before dinner. The study included men, but those taking the probiotic lost no more weight than those who received placebo, with both groups losing 9 to 10 lbs, on average, during the calorie reduction phase and another 2 lbs over the subsequent 12 weeks. The researchers note that men tend to lose weight more easily than women and the findings suggest that this probiotic formulation helps obese women achieve sustainable weight loss (Sanchez, Br J Nutr 2013). The study was funded by Nestle, which does not yet market this formula in North America.

Hypertension

Probiotics may modestly lower diastolic and systolic blood pressure, especially when multiple strains are taken. A review of nine clinical trials found that among 534 adults, those who consumed 100 billion colony-forming units of probiotics (various strains from milk, cheese, yogurt or probiotic capsules) daily for two months had a significant reduction in systolic blood pressure (-3.56 mm Hg) and diastolic blood pressure (-2.38 mm Hg) compared to those who did not consume probiotics. The effect was greater in those who consumed multiple probiotic strains, and diastolic blood pressure was more improved in those who had elevated blood pressure (>130/85) before the treatment (Khalessi, Hypertension 2014). Blood pressure was not significantly improved in those who consumed fewer than 100 billion colony-forming units of probiotics per day, or who consumed probiotics for less than two months.

Cholesterol-lowering

Some probiotics may be helpful in modestly lowering cholesterol, particularly by lowering LDL cholesterol. A study with *Lactobacillus reuteri* NCIMB 30242 (sold as *CardioViva*) in men and women with high cholesterol showed that those who took a capsule containing 2 billion cells with breakfast and another with dinner for nine weeks had average reductions in both LDL and total cholesterol of about 6% while these levels increased by a few percent among people taking

placebo. There was no effect on HDL cholesterol nor triglycerides. (Jones, *Eur J Clin Nutr* 2012). A longer study (56 weeks) using a different probiotic, *E. faecium* M-74, found that giving 2 billion cells once daily lead to a 12% reduction in total cholesterol, with a 20% drop in LDL cholesterol -- although total cholesterol and LDL levels also fell in the placebo group by 5.5% and 8.3%, respectively, perhaps due to the fact that participants in both groups began eating healthier during the study (Hlivak, *Bratisl Lek Listy* 2005). *Lactobacillus reuteri* NCIMB 30242 may be the safer of the two probiotics as it is generally recognized as safe by the FDA, while *E. faecium* has not gained this status and some strains of this species are human pathogens (DiRienzo, *Nutrition Reviews* 2013).

Anxiety

Chronic gut disorders are associated with higher rates of anxiety and depression. A well-publicized study in mice suggested a possible role for probiotics in reducing anxiety associated with gut inflammation (Bercik, *Neurogastroenterol Motil* 2011). Mice in the study had a chemically-induced inflammation of their gut and exhibited anxiety-like behavior. Giving 1 billion cells of *Bifidobacterium longum* NCC3001 for 1 week normalized their behavior. The probiotic did not reduce inflammation in the gut but appeared to act by reducing the excitability of nerves in the gut which connect, through the vagus nerve, with the central nervous system. Similarly, French researchers evaluated a combination of *Bifidobacterium longum* R0175 and *Lactobacillus helveticus* R0052 (3 billion organisms total — sold in Canada by Jamieson as *Probiotic Sticks* with 1 billion cells per stick) taken during or just after breakfast for 30 days in healthy individuals, finding significant improvements in day-to-day depression, anger, anxiety, as well as lower levels of the stress hormone cortisol in those taking the probiotic compared to those taking placebo -- although some improvement also occurred in the placebo group (Messaoudi, *Br J Nutr* 2011).

Periodontitis

A lozenge containing probiotics may be helpful in treating chronic periodontitis - inflammation around the teeth caused by microbial infection, which can result in pockets between the teeth and gums. In a 12-week study in Turkey, 30 otherwise healthy individuals with adult chronic periodontitis dissolved a probiotic lozenge in their mouth twice a day following an initial dental scaling and disinfection with chlorhexidine solution. All patients, including those given placebo, experienced improvements, but those using the probiotic had significantly greater reduction in the depth of pockets around affected teeth and gain in tooth attachment to ligaments in moderate and deep pockets. The probiotic-treated group also had a greater reduction in several parts of the mouth of *Porphyromonas gingivalis*, a bacteria considered a keystone in the onset of chronic periodontitis. The probiotic treatment was most effective in patients with moderate to severe periodontitis. The lozenge contained 100 million cells of each of two strains of *Lactobacillus reuteri* DSM17938 and ATCC PTA5289 (*Prodentis* from BioGaia, Sweden, sold in the U.S. and Canada as GUM *PerioBalance*) (Teughels, *J Clin Periodont* 2013).

Throat Infection

There is evidence that certain probiotic strains may protect against some types of bacterial and viral throat infections. One small study found that children taking a daily probiotic lozenge containing 1 billion colony-forming units of *S. salivarius* K12 (Bactoblis®, now known as BLIS K12®) for 3 months had significantly fewer episodes of throat infection than children who were not given the lozenge. Incidence of viral oropharyngeal infections in treated children was reduced by 80%, and streptococcal infections by 96% (Pierro *Drug Healthc Patient Saf* 2014). A gum containing BLIS K12® (CulturedCare® *Probiotic Gum* by Prairie Naturals) has been approved and licensed to be sold in Canada with the allowable claim that it promotes oral health through recolonization of the oral cavity. Additionally, following oral antimicrobial rinsing, it helps reduce halitosis (bad breath) by reducing volatile sulfur compound levels.

Allergy

A study in adults with grass pollen allergy who were taking a daily antihistamine (loratadine 10 mg), found that adding a daily probiotic to the regimen for 5 weeks resulted in a small, but statistically significant reduction in the impact of allergy symptoms on the quality of their lives. Without any medication, the subjects rated the impact of allergy symptoms on their lives a 3.25 (mean score) on scale of 0 to 6, with 6 being extreme. This fell to 1.65 with antihistamine treatment and to 1.40 when the probiotic was added. Ocular symptoms improved with the added probiotic but nasal symptoms did not (Costa, *Eur J Clin Nutr* 2014). The probiotic consisted of a capsule with 2 billion cells of *Lactobacillus paracasei* LP-33 which was taken with a meal. The study, which was company-sponsored, included a later phase during which only the probiotic was given, but results of this phase were not reported. Interestingly, a submission to make an allergy health claim for this probiotic in Europe was retracted without explanation.

Mastitis

Certain probiotic strains have been found to be helpful in the treatment of mastitis, a bacterial infection which can cause painful breast inflammation and redness in nursing mothers, and a common cause of premature weaning. A study of 352 breastfeeding mothers with mastitis found that those who took a daily probiotic (a capsule containing 90 billion cells of either *Lactobacillus fermentum* CECT5716 or *Lactobacillus salivarius* CECT5713 — both being strains found in breast milk) for 21 days had significantly less breast pain, lower total bacterial counts and greater rates of complete recovery (88% and 85%, respectively) than women taking an antibiotic (29%) (Arroyo *Clin Infect Dis* 2010). Women taking either strain of probiotic also had lower rates of recurrence of infection (10.5% and 7.1%, respectively) compared to women who took an antibiotic (30.7%).

Other conditions

Although the evidence is not clear-cut, probiotics have been studied as a treatment for many other conditions and their symptoms including: lactose intolerance, respiratory and GI problems resulting from cystic fibrosis, HIV-related diarrhea, Crohn's disease, ulcerative colitis, pouchitis, cancer prevention, high blood cholesterol, tuberculosis, eczema, acne, canker sores, dental cavities, milk allergies, hay fever, and the prevention of respiratory infections in children. See [ConsumerTips: What to Consider When Using](#) for dosage information and, for more information, see the article about [Probiotics](#) in the Natural Product Encyclopedia on this website.

Summary of Evidence for Probiotics:

To help you choose an appropriate probiotic, the clinical importance of each type of probiotic is summarized below. In general, *Lactobacillus* strains have the widest range of applications, while *Streptococcus* strains have the most limited positive evidence for diarrhea when combined with other probiotics. Examples of products that contain certain probiotic organisms are included in parentheses.

Uses of Probiotics in People — The Current Evidence (✓ = Effective; ½✓ = Partially Effective; X = Not effective; ? = No definitive results)

	Irritable Bowel Syndrome or Abdominal Pain	Diarrhea from Antibiotics, Viral Infection, or Chemotherapy	Traveler's Diarrhea	Weight Loss/Management	H. pylori Infection	Cold and Flu	Cholesterol-lowerers	Anxiety	Mouth and Throat Infections	Allergy	Other Infections

Bifido-bacterium	½√ - <i>B. infantis</i> 35624 (Align) ½√ - Combination (VSL#3) ? - <i>B. lactis</i> BB-12 (YoPlus, USANA Probiotic); <i>B. animalis</i> ("regularis" Activia)	√ - <i>B. lactis</i> Bi-07 and <i>B. lactis</i> Bi-04 in combination with 2 strains of <i>lactobacillus</i> (HOWARU Restore)	?	-	√ - With <i>Lactobacillus</i> and <i>Saccharomyces</i>	-	-	√ - <i>B. longum</i> R0175 with <i>Lactobacillus helveticus</i> R0052	-	-	-
Lacto-bacillus	√ In children - <i>L. GG</i> (Culturelle) √ In infants and children - <i>L. reuteri</i> DSM 17938 √ In adults with diverticular disease - <i>L. casei</i> DG X - In adults with IBS - <i>L. rhamnosus</i> NCIMB 30174, <i>L. plantarum</i> NCIMB 30173, <i>L. acidophilus</i> NCIMB 30175, with <i>Enterococcus faecium</i> NCIMB 30176	√ In children - <i>L. GG</i> (Culturelle); <i>L. reuteri</i> √ <i>L. casei</i> with <i>L. bulgaricus</i> , and <i>S. thermophilus</i> (Actimel) √ - <i>L. acidophilus</i> with <i>L. casei</i> √ - <i>L. acidophilus</i> NCFM and <i>L. paracasei</i> Lpc-37 with 2 strains of <i>B. lactis</i> (HOWARU Restore)	√ - <i>L. GG</i> (Culturelle) X - <i>L. acid-ophilic</i> , <i>L. bulgaricus</i> , <i>L. fermentum</i>	√ - <i>L. gasseri</i> SBT2055 (LG2055) √ - In women - <i>L. rham-nosus</i> CGMCC 1.3724	√ - Alone or with <i>Bifido-bacterium</i> and <i>Saccharomyces</i>	√ - <i>L. plantarum</i> HEAL 9 (DSM 15312) and <i>L. paracasei</i> 8700:2 (DSM 13434) √ - <i>L. acid-ophilus</i> NCFM alone or, preferably, with <i>B. animalis</i> subsp <i>lactis</i> Bi-007 (Metagenic Ultra Flora Plus DF)	√ - <i>L. reuteri</i> NCIMB 30242 (Cardio-viva™) and <i>E. faecium</i> M-74 (an Enterococcus)	√ - <i>L. helveticus</i> R0052 with <i>B. longum</i> R0175	√ - For periodontitis: <i>L. reuteri</i> DSM-17938 and ATCC PTA 5289 (Pro-dentis/ Perio-Balance) along with dental scaling/ cleaning	½√ - <i>L. para-casei</i> LP-33 with anti-histamine	√ - For vaginal infection: <i>L. rhamnosus</i> GR-1 and <i>L. fermentum</i> RC-14 (Jarrow Fem-dophilus and RepHresh Pro-B) √ - For mastitis: either <i>L. fermentum</i> CECT5716 or <i>L. salivarius</i> CECT5713
Strepto-coccus	-	√ <i>S. thermophilus</i> with, <i>L. casei</i> and, <i>L. bulgaricus</i> (Actimel)	?	-	-	-	-	-	?- For throat infection: <i>S. salivarius</i> K12	-	-
Saccha-romyces (yeast)	-	√ <i>S. boulardii</i> (FloraStor)	√ <i>S. boulardii</i> (FloraStor)	-	√ With <i>Bifido-bacterium</i> and <i>Lacto-bacillus</i>	-	-	-	-	-	-

For pets (small animals)

Studies in dogs and cats have shown that the addition of probiotics to the diet can stimulate measures of immune function, although the significance of this in preventing or treating specific diseases has not been demonstrated. *Enterococcus faecium* (SF68) has been shown to stimulate immune function in puppies fed 0.5 billion cells per day (Benyacoub 2003) and immune stimulation has also been seen in cats fed 0.2 billion cells per day of *Lactobacillus acidophilus* DSM13241 (Marshall-Jones 2006).

Quality Concerns and What CL Tested for:

Neither the FDA nor any other federal or state agency routinely tests probiotics for quality prior to sale. However, quality issues for probiotic supplements can include the following:

- The viability of organisms in the product: How many organisms are alive (in the case of active cultures) or can "come alive" from their inactive and often

freeze-dried state when purchased and used? Some products make no claim at all and others only claim the amount at the time of manufacture.

- Lack of contaminating organisms: The product should contain the bacteria and/or yeast strains that it claims on the label while potentially pathogenic microorganisms and other microbial contaminants should not be present. (This is of particular concern with enteric-coated products, as the coating may protect contaminating pathogens from being naturally destroyed in your stomach.)
- Ability of pill to break apart properly: Tablets and caplets which are not chewable must be able to properly break apart to release their ingredients.
- Protection of organisms from stomach: Some types of bacteria cannot survive as they pass through stomach acid and into the small and large intestines where the bacteria would grow (see [ConsumerTips: What to Consider When Buying](#) for more information). Ideally a product should contain bacteria that research shows can survive passage through the stomach or, if its bacteria cannot survive stomach acid, it should be enteric coated or use some other protective formula (e.g., microencapsulation).

ConsumerLab.com, as part of its mission to independently evaluate products that affect health, wellness, and nutrition, purchased many leading probiotic products sold in the U.S. and tested them to determine whether they 1) possessed the claimed amount of viable bacteria listed on the label and at least 1 billion live organisms per suggested daily adult serving, 2) were free of contamination from mold or types of bacteria with disease-causing potential, and 3) disintegrated properly (if in tablet form) so that their contents would be released, or if enteric-coated or delayed release, their contents would be released, respectively, after passing through the stomach. (See [Testing Methods and Passing Score](#) for more information).

When purchasing products labeled as requiring refrigeration (not just after opening), ConsumerLab.com had them shipped in refrigerated packaging and they were maintained under refrigerated conditions throughout testing. ConsumerLab.com tested all products prior their "best by" date.

What CL Found:

Products for human use:

ConsumerLab.com selected nineteen probiotic products sold in the U.S. Only fourteen of these passed ConsumerLab.com's tests -- providing the amounts of probiotics listed on the labels and being free of contamination from common "bad" bacteria and mold. An additional nineteen products passed the same testing in CL's [Quality Certification Program](#).

Among the products selected by CL for testing, the following five supplements did not contain the number of cells (also referred to as "colony forming units (CFUs)" or "live organisms") listed on their labels:

- *21st Century High Potency Acidophilus Probiotic Blend* contained only 179 million cells per 1 capsule serving, just 17.9% of its claimed amount of "over 1 billion."
- *Accuflora Advanced CD Probiotic* contained only 191 to 383 million cells per 2 caplet serving, just 19.2% of its listed 1 billion cells as of the time of manufacture. The label on the bottle, although not on the box (which is all you can see before purchasing the product), notes that "bacteria count will vary after time of manufacture". ConsumerLab.com tested all products prior their "best by" date.
- *Vitacost Probiotic 15-35* contained 5.7 billion cells per 2 capsule serving. While this is a significant amount, it is only 16.3% of the 35 billion listed on the front of label, although footnoted in the Supplement Facts panel to be "At the time of manufacture."
- *Nature's Answer For Kids Probiotics*, a powder, contained 1.25 billion cells per ¼ teaspoon. While this is a significant amount for children, it is only 24.9% of the 5 billion cells listed, although footnoted to be "...at time of manufacture."
- *Nature's Plus Animal Parade AcidophiKidz — Berry Flavor* contained only 558 million cells per chewable tablet. This is 55.8% of the 1 billion cells listed in its Supplement Facts panel, although footnoted to be "At time of manufacture."

As noted above, some of these products indicated that their listed cell counts were based on the time the product was manufactured, i.e., not through the "best by" (a term which has replaced the expiration date on supplements). Although many supplement companies include this "at time of manufacture" disclaimer on labels, it is not consistent with FDA labeling requirements and can mislead consumers when a diminished amount is actually in the product. All dietary supplements, including probiotics, must meet their label claims throughout their shelf-life.

Interestingly, when ConsumerLab.com tested probiotics in 2009, a much larger percentage of the reviewed products did not contain their claimed amounts (11 out of 13), but when tested again in early 2012, only 2 out 12 failed, suggesting that manufacturers had improved their products and/or improved the conditions under which the products are shipped and stored prior to purchase. These latest findings, which are worse than last time but nowhere as bad as in 2009, may have been influenced by record heat waves in parts of the country, particularly the Northeast, occurring in the summer of 2013 during which products may not have been properly transported to retailers or warehoused (although any product which suggests refrigeration on its label was shipped "cold" when ordered by ConsumerLab.com, per our instructions, and then maintained at proper temperatures).

How to Choose a Probiotic:

There is such a variety of probiotic products available for purchase that choosing one can be difficult. To help, we suggest the following 3 steps:

- *Choose a product that contains the type(s) of probiotic organism(s) shown to work for your condition.* See the table above for the type of probiotic that suits your needs and then check the results [table](#) below for products that contain that/those organism(s).
- *Make sure the product provides an adequate number of cells per daily dose, i.e., an amount that has been shown to work.* There can be huge variation from product to product. Among products tested, the total number of cells per daily serving ranged from 100 million (*CVS/pharmacy Probiotic Acidophilus* and *Rexall Probiotic Acidophilus*) to 900 billion (*VSL#3*) nearly a 900,000% difference!
- *Compare prices.* The last column in the table below shows the daily cost based on suggested serving sizes. The most expensive products per daily dose tended to provide larger amounts of organisms: *VSL#3* at \$1.63 to \$6.53 per day (2 to 8 capsules providing 225 to 900 billion cells) and *USANA Probiotic* at \$1.98 per packet (providing 12 billion cells). Lower cost products tended to provide smaller amounts of cells: *CVS/pharmacy Acidophilus* cost only 5 cents for one capsule (containing just 100 million cells) and *Spring Valley Probiotic Acidophilus* cost only 16 cents for one caplet (1 billion cells). The

average price per day was 77 cents.

Considering the large variation in the number of organisms provided in products, you can also compare the cost of obtaining from each an equal number of probiotic organisms. As shown in the last column below, the cost to obtain 1 billion cells ranged from as much as \$1.00 from *Align* down to only pennies for products providing tens or hundreds of billions of cells per serving, such as *Lee Swanson Genetic Designed Nutrition Ultimate Probiotic Formula* (under 1 cent), *VSL#3* (under 1 cent), *Dr. Mercola Complete Probiotics* (1 cent), *Garden of Life Raw Probiotics Ultimate Care* (1 cent), *Nutrition Now PB 8* (1 cent), *Jarrow Formulas Senior Jarro-Dophilus* (2 cents), *Nature's Bounty Advanced Probiotic 10* (3 cents) and the three *Renew Life Ultimate Flora* products (2 to 4 cents).

If you have a milk allergy, be aware that trace amounts of milk proteins may occur in some probiotics. Some products carry a cautionary note about this on the labels, but, to be extra careful, assume it to be the case with any probiotic made with *Lactobacilli* or *Bifidobacterium* (even those claiming to be free of milk or dairy), as they are grown on media that includes milk proteins.

If you are looking for a probiotic for a child, note that, in addition to the four products listed in the Children's section of the table below, the following products for adults also provide serving suggestions for children: *Culturelle*, *Kyo-Dophilus*, *Nutri-Health Flora Source Multi Probiotic*, *Phillips Colon Health*, and *TruBiotics*.

All tablet products disintegrated properly so that their organisms could be released in the body. Jarrow Formulas Jarro-Dophilus EPS and NOW Gr8-Dophilus, which are "enteric-coated" (designed to protect the bacteria during passage through the stomach) passed a special test of enteric-coatings. (Note: *Enzymatic Therapy Acidophilus Pearls* claims the capsules feature "TrueDelivery™ Technology which guarantees the active cultures survive stomach acids," although it is not actually listed as enteric-coated. For some types of probiotic organisms, enteric coatings may not be necessary (See [Withstanding Stomach Acid](#) below).

Pet probiotics

ConsumerLab.com selected three probiotic products for dogs and/or cats. Although it is difficult to know what amount and type of probiotics are best for animals, the amounts found in these products, as well as listed, are fairly low compared to the 1 billion or more in most products for people. In fact none of the products provides even 100 million cells at their maximum dose for the largest animals. Here's what we found:

- *Best Pet Health Probiotics with Wild Alaskan Salmon Oil for Dogs and Cats* contained only 3.5 million cells per 2 teaspoon serving (the labeled daily serving for a 20 lb animal). Although the product actually made no claim regarding the number of cells it contained, this is an extremely small number of cells.
- *Petco Digestive Enzymes & Probiotics For Dogs* contained 20 million cells per ½ chewable tablet (the labeled serving for a dog up to 20 lbs), which is only 42.9% of the claimed amount 47.5 million cells, although noted to be "at time of manufacture."
- *Only Natural Pet Probiotic Blend* contained the listed amounts of cells (0.625 million to 15 million) in ¼ to 6 capsules, despite it noting that these were the amounts at time of manufacture. However, as with the other products, this seems a rather small amount of cells. *Oddly, when this product was previously tested by ConsumerLab.com for its last review of probiotics, published in February 2012, it was listed as containing much higher amounts of cells, which testing found to be correct. Each capsule in the previous formula was listed as containing 1.6 billion cells, as opposed to the newer formula with just 2.5 million cells, which is less than 2% of what it used to contain.* The list of organisms has remained the same, although, surprisingly, the milligram amount of this probiotic blend is actually higher (500 mg) than previously (300 mg), despite containing far fewer cells.

Although ConsumerLab.com chose these products in order to get a diversity of pet products, in retrospect, the inclusion of some products listing higher amounts of probiotic cells would have been useful. If you are interested in pet products listing higher amounts, the following brands were tested by ConsumerLab.com in its last review of probiotics (February 2012). At that time, each was found to contain its listed amount of cells and, unlike the *Only Natural Pet* product mentioned above, the labeled contents of the currently marketed versions have not changed: *Vetri-Probiotic Everyday SoftChews* (1 billion per softchew) and, tested through CL's [Quality Certification Program](#), *Nutramax Pet Bactaquin* (1 billion per capsule). However, as neither of these products was tested in the current review, we do not know if they continue to meet their label claims.

Due to the relatively small amounts of cells in the pet products tested in the current review, the cost of obtaining 1 billion cells from these products was much higher than for the products for people (which was as little as 1 cent): For the pet products the cost per billion cells ranged from \$1.89 for *Petco Digestive Enzymes & Probiotics for Dogs* to as much as \$120.74 for *Best Pet Health Probiotics with Wild Alaskan Salmon Oil for Dogs and Cats*.

Test Results by Product:








Listed alphabetically below are the test results for forty-one supplements -- thirty-eight marketed for human use and three for use by pets. ConsumerLab.com selected twenty-two of the products. Nineteen others (each indicated with a CL flask icon) were tested at the request of their manufacturers/distributors through CL's [Quality Certification Program](#) and are included for having passed testing. Also listed are two products which are the same as one that passed testing but are sold under different brand names.










Shown for each product are the labeled types of probiotic organisms per unit (such as a capsule) and the labeled amount of viable organisms per suggested daily serving. If a product did not list an amount of viable organisms, the amount found is shown. Cost comparisons are provided in the last column. The full list of ingredients is available for each product by clicking on the word "Ingredients" in the first column. Be sure to check refrigeration requirements (if any), which appear in the fourth column and in detail in the "Ingredients" list for each product.








RESULTS OF CONSUMERLAB.COM TESTING OF PROBIOTIC SUPPLEMENTS
 Click on **\$ Price Check** beneath a product name to find a vendor that sells it.
 To find retailers that sell some of the listed products [click here](#).





Product Name and Suggested Daily Use Manufacturer or Distributor Click on "Ingredients" for Full List	Listed Amount of Probiotic Organisms in the Suggested Daily Serving Types of Organisms Listed Per Unit (and Amount of Each, if Listed) ❄️ = Refrigeration Suggested on Label	Contained Listed Amount of Probiotic Organisms in the Suggested Daily Serving	Provided At Least 1 Billion Organisms Per Daily Serving (or Less if Clinically Proven Effective)	Free of Microbial Contamination	Disintegrated Properly (NA= Not Applicable)	Cost Per Day Based on Suggested Daily Serving [Cost Per 1 Billion Organisms]¹⁹ Other Notable Ingredients/Features¹ Price Paid
General Adult Products:						
21 st Century® High Potency Acidophilus Probiotic Blend (1 capsule daily) Mfd. by 21 st Century HealthCare, Inc. Ingredients	Over 1 billion <i>Lactobacillus acidophilus, Lactobacillus salivarius, Bifidobacterium bifidum, Streptococcus thermophilus</i>	Found only 179 million (17.9%)	No	✓	NA	\$0.05 [\$0.05 based on amount claimed] [\$0.26 based on amount found] Contains milk Gluten free \$7.09/150 capsules
Accuflora® Advanced CD Probiotic Acidophilus (2 to 4 caplets daily) Dist. by Northwest Natural Products® Ingredients	1 to 2 billion ^{2,3} <i>Lactobacillus acidophilus, Lactobacillus rhamnosus, Bifidobacterium bifidum, Lactobacillus salivarius, Streptococcus thermophilus</i> ❄️ ⁴	Found only 191 to 383 million (19.2%)	No	✓	NA	\$0.33-\$0.67 [\$0.33 based on amount claimed] [\$1.74 based on amount found] Contains no wheat, gluten free \$9.99/60 caplets
Align® Probiotic Supplement (1 capsule daily) Dist. by Procter & Gamble Ingredients \$ Price Check	1 billion ² <i>Bifidobacterium infantis</i> 35624 1 billion	✓	✓	✓	NA	\$1.00 [\$1.00] Contains milk \$41.99/42 capsules
Culturelle® (1 to 2 capsule daily) Dist. by i-Health, Inc. Ingredients \$ Price Check	10 to 20 billion <i>Lactobacillus GG</i> ❄️ ⁵	✓	✓	✓	NA	\$0.80-\$1.60 [\$0.08] Inulin Contains no wheat, gluten free, yeast free \$39.99/50 capsules
CVS/pharmacy® Probiotic Acidophilus (1 capsule daily)  Dist. by CVS/pharmacy, Inc. Ingredients	Over 100 million ² <i>Lactobacillus acidophilus</i> ❄️ ⁴	✓	No ¹⁵	✓	NA	\$0.05 [\$0.53] ¹⁶ Contains no milk, contains no wheat, gluten free, yeast free \$5.29/100 capsules
Dr. David Williams Probiotic Advantage® (1 to 2 caplets)  Dist. by Healthy Directions Ingredients	2 to 4 billion <i>Lactobacillus fermentum, Lactobacillus plantarum, Lactobacillus acidophilus, Lactobacillus rhamnosus, Lactobacillus salivarius, Bifidobacterium bifidum, Bifidobacterium longum</i>	✓	✓	✓	NA	\$0.83-\$1.67 [\$0.42] Fructooligosaccharides Contains milk \$24.99/30 caplets

<p>Dr. Mercola® Complete Probiotics (2 capsules daily)</p> <p>Dist. by Mercola Health Resources, LLC</p> <p>Ingredients</p> <p>\$ Price Check</p>	<p>70 billion²</p> <p><i>Lactobacillus acidophilus DDS®-1, Bifidobacterium lactis, Lactobacillus plantarum, Lactobacillus casei, Lactobacillus rhamnosus, Lactobacillus brevis, Bifidobacterium longum, Lactobacillus salivarius, Streptococcus thermophilus, Bifidobacterium bifidum</i></p> <p>18</p>	✓	✓	✓	NA	<p>\$1.00</p> <p>[\$0.01]</p> <p>Contains no dairy, contains no wheat, gluten free, yeast free</p> <p>\$29.99/60 capsules</p>
<p>Enzymatic Therapy® Acidophilus Pearls™ (1 capsule daily) </p> <p>Dist. by Enzymatic Therapy, LLC</p> <p>Ingredients</p> <p>\$ Price Check</p>	<p>1 billion</p> <p><i>Lactobacillus acidophilus, Bifidobacterium longum</i></p>	✓	✓	✓	NA	<p>\$0.33</p> <p>[\$0.33]</p> <p>Contains milk</p> <p>Contains no wheat, gluten free, yeast free</p> <p>\$9.99/30 capsules</p>
<p>Garden of Life® Raw Probiotics™ Ultimate Care (1 capsule daily) </p> <p>Dist. by Garden of Life, LLC</p> <p>Ingredients</p> <p>\$ Price Check</p>	<p>100 billion</p> <p><i>Bifidobacterium lactis, Bifidobacterium longum, Lactobacillus acidophilus, Lactobacillus brevis, Lactobacillus bulgaricus, Lactobacillus casei, Lactobacillus fermentum, Lactobacillus helveticus, Lactobacillus kefiranofaciens, Lactobacillus kefirgranum, Lactobacillus rhamnosus, Lactococcus lactis, Lactococcus cremoris, Streptococcus thermophilus, Lactobacillus kefir, Lactobacillus parakefir, Lactobacillus plantarum, Lactococcus lactis biovar diacetylactis, Leuconostoc lactis, Leuconostoc mesenteroides, Leuconostoc cremoris, Leuconostoc dextranicum, Kluyveromyces marxianus, Brettanomyces anomalus, Debaryomyces hansenii, Saccharomyces unisporus, Saccharomyces turicensis, Saccharomyces cerevisiae, Saccharomyces exiguus, Torulaspora delbrueckii</i></p> <p>18</p>	✓	✓	✓	NA	<p>\$1.17</p> <p>[\$0.01]</p> <p>Protein-digesting enzyme blend, Eastern European RAW fruit and veggie blend</p> <p>GMO free, gluten free</p> <p>\$34.97/30 vegetarian capsules</p>
<p>Jarrow Formulas® Jarro-Dophilus EPS® (1 to 4 vegetarian capsules) </p> <p>Dist. by Jarrow Formulas®</p> <p>Ingredients</p> <p>\$ Price Check</p>	<p>5 to 20 billion</p> <p><i>Lactobacillus rhamnosus R0011, Lactobacillus helveticus (Lactobacillus acidophilus) R0052, Pediococcus acidilactici R1001, Lactobacillus casei R0215, Bifidobacterium longum BB536, Lactobacillus plantarum R1012, Bifidobacterium breve R0070, Lactococcus lactis ssp. Lactis R1058</i></p> <p>20</p>	✓	✓	✓	✓ Enteric coated capsule	<p>\$0.27-\$1.07</p> <p>[\$0.05]</p> <p>Enteric-coated</p> <p>Contains milk</p> <p>Suitable for vegetarians, gluten free</p> <p>\$16.07/60 vegetarian capsules</p>
<p>Kyo-Dophilus® (½ to 2 capsules daily) </p> <p>Mfd. by Wakunaga Of America Co, LTD.</p> <p>Ingredients</p> <p>\$ Price Check</p>	<p>750 million to 3 billion</p> <p><i>Lactobacillus gasseri (formerly Lactobacillus acidophilus), Bifidobacterium bifidum, Bifidobacterium longum</i></p>	✓	✓	✓	NA	<p>\$0.06-\$0.26</p> <p>[\$0.09]</p> <p>Contains no dairy, gluten free, yeast free</p> <p>\$22.99/180 capsules</p>
<p>Lee Swanson Genetic Designed</p>	<p>66 billion</p>	✓	✓	✓	NA	<p>\$0.33</p>

<p>Nutrition™ Ultimate Probiotic Formula (1 veggie capsules daily) </p> <p>Dist. by Swanson Health Products Ingredients \$ Price Check</p>	<p><i>Bifidobacterium lactis</i> 20 billion, <i>Lactobacillus acidophilus</i> 20 billion, <i>Bifidobacterium longum</i> 6 billion, <i>Bifidobacterium bifidum</i> 5 billion, <i>Lactobacillus casei</i> 5 billion, <i>Lactobacillus plantarum</i> 5 billion, <i>Lactobacillus gasseri</i>, <i>Lactobacillus salivarius</i> 1 billion, <i>Lactobacillus rhamnosus</i> 1 billion, <i>Lactobacillus bulgaricus</i> 1 billion, <i>Lactospore Lactobacillus sporogenes</i> 1 billion</p>					<p>[\$0.01]²¹</p> <p>NutraFlora® scFOS® (fructooligosaccharides)</p> <p>Contains no dairy</p> <p>\$9.99/30 veggie capsules</p>
<p>Metagenics® UltraFlora® Advanced (¼ to ½ tsp. daily)</p> <p>Dist. by Metagenics Ingredients \$ Price Check</p>	<p>15 to 30 billion</p> <p><i>Lactobacillus acidophilus</i> NCFM 7.5 billion, <i>Bifidobacterium lactis</i> Bi-07 7.5 billion</p> <p></p>	✓	✓	✓	NA	<p>\$0.55-\$1.10</p> <p>[\$0.04]</p> <p>Globulin protein concentrate</p> <p>Contains no wheat, gluten free</p> <p>\$36.95/1.76 oz. (50 g) container (approx. 67 servings)</p>
<p>Nature Made® Digestive Health Probiotic (1 capsule daily) </p> <p>Dist. by Nature Made Nutritional Products Ingredients \$ Price Check</p>	<p>10 billion</p> <p><i>Lactobacillus plantarum</i> 299v 10 billion</p>	✓	✓	✓	NA	<p>\$0.73</p> <p>[\$0.07]</p> <p>Suitable for vegetarians contains no dairy, gluten free, yeast free</p> <p>\$21.99/30 capsules</p>
<p>Nature's Bounty® Advanced Probiotic 10 (2 capsule daily) </p> <p>Mfd. by Nature's Bounty, Inc. Ingredients \$ Price Check</p>	<p>20 billion²</p> <p><i>Lactobacillus plantarum</i>, <i>Bifidobacterium bifidum</i>, <i>Lactobacillus rhamnosus</i>, <i>Lactobacillus bulgaricus</i>, <i>Lactobacillus salivarius</i>, <i>Lactobacillus brevis</i>, <i>Lactobacillus acidophilus</i>, <i>Bifidobacterium lactis</i>, <i>Lactobacillus paracasei</i>, <i>Lactobacillus casei</i></p>	✓	✓	✓	NA	<p>\$0.70</p> <p>[\$0.03]</p> <p>Inulin</p> <p>Contains milk</p> <p>Contains no wheat, gluten free, yeast free</p> <p>\$20.99/60 capsules</p>
<p>NOW® Gr8-Dophilus™ (1 to 3 Vcaps® daily)</p> <p>Mfd. by NOW FOODS Ingredients \$ Price Check</p>	<p>4 to 12 billion</p> <p><i>Lactobacillus acidophilus</i> 1.2 billion, <i>Lactobacillus casei</i> 600 million, <i>Lactobacillus rhamnosus</i> 600 million, <i>Lactobacillus salivarius</i> 600 million, <i>Streptococcus thermophilus</i> 400 million, <i>Bifidobacterium bifidum</i> 200 million, <i>Bifidobacterium longum</i> 200 million, <i>Bifidobacterium lactis</i> 200 million</p> <p></p>	✓	✓	✓	✓ Enteric coated capsule	<p>\$0.16-\$0.47</p> <p>[\$0.04]</p> <p>Enteric Coated</p> <p>Contains no milk, contains no wheat</p> <p>\$9.49/60 Vcaps®</p>
<p>Nutri-Health® Flora Source Multi Probiotic® Capsules with Bif Relief 24-7™ (1 to 2 vegetarian capsules daily) </p> <p>Dist. by Nutri-Health Supplements Ingredients</p>	<p>16 to 32 billion²</p> <p><i>Bifidobacterium bifidum</i>, <i>Bifidobacterium breve</i>, <i>Bifidobacterium lactis</i>, <i>Bifidobacterium longum</i>, <i>Lactobacillus acidophilus</i>, <i>Lactobacillus brevis</i>, <i>Lactobacillus bulgaricus</i>, <i>Lactobacillus casei</i>, <i>Lactobacillus gasseri</i>, <i>Lactobacillus paracasei</i>, <i>Lactobacillus plantarum</i>, <i>Lactobacillus rhamnosus</i>, <i>Lactobacillus salivarius</i>, <i>Lactococcus lactis</i>, <i>Streptococcus thermophilus</i></p> <p></p>	✓	✓	✓	NA	<p>\$0.67-\$1.33</p> <p>[\$0.04]</p> <p>NutraFlora® scFOS® (fructooligosaccharides)</p> <p>\$39.95/60 vegetarian capsules</p>

<p>Nutrition Now® PB 8® (2 capsules daily)</p> <p>Dist. by Nutrition Now® Inc. Ingredients \$ Price Check</p>	<p>14 billion²</p> <p><i>Lactobacillus acidophilus, Bifidobacterium lactis, Lactobacillus plantarum, Lactobacillus salivarius, Bifidobacterium bifidum, Bifidobacterium longum, Lactobacillus rhamnosus, Lactobacillus casei</i></p> <p></p>	✓	✓	✓	NA	<p>\$0.20</p> <p>[\$0.01]</p> <p>Contains no milk, contains no wheat, gluten free, yeast free</p> <p>\$11.99/120 capsules</p>
<p>Phillips® Colon Health® Probiotic Caps (1 capsule daily)</p> <p>Dist. by Bayer HealthCare LLC Ingredients \$ Price Check</p>	<p>1.5 billion</p> <p><i>Lactobacillus gasseri KS-13, Bifidobacterium bifidum G9-1 and Bifidobacterium longum MM-2</i></p>	✓	✓	✓	NA	<p>\$0.62</p> <p>[\$0.41]</p> <p>\$18.49/30 capsules</p>
<p>Renew Life® Ultimate Flora™ (1 vegetarian capsule daily) </p> <p>Dist. by ReNew Life Formulas® Ingredients \$ Price Check</p>	<p>30 billion</p> <p><i>Bifidobacterium lactis, Bifidobacterium breve, Bifidobacterium longum, Lactobacillus acidophilus, Lactobacillus casei, Lactobacillus plantarum, Lactobacillus paracasei, Lactobacillus salivarius, Lactobacillus rhamnosus, Lactobacillus bulgaricus</i></p> <p></p>	✓	✓	✓	NA	<p>\$0.68</p> <p>[\$0.02]</p> <p>Delayed release</p> <p>Contains no dairy, contains no wheat, gluten free</p> <p>\$20.49/30 vegetarian capsules</p>
<p>Renew Life® Ultimate Flora Adult Formula (1 vegetable capsule daily) </p> <p>Dist. by ReNew Life Formulas® Ingredients \$ Price Check</p>	<p>15 billion</p> <p><i>Bifidobacterium lactis, Bifidobacterium breve, Bifidobacterium longum, Lactobacillus acidophilus, Lactobacillus casei, Lactobacillus plantarum, Lactobacillus paracasei, Lactobacillus salivarius, Lactobacillus rhamnosus, Lactobacillus bulgaricus</i></p> <p></p>	✓	✓	✓	NA	<p>\$0.65</p> <p>[\$0.04]</p> <p>Delayed release</p> <p>Contains no dairy, contains no wheat, gluten free</p> <p>\$19.54/30 vegetable capsules</p>
<p>Renew Life® Ultimate Flora Critical Care (1 vegetable capsule daily) </p> <p>Dist. by ReNew Life Formulas® Ingredients \$ Price Check</p>	<p>50 billion</p> <p><i>Bifidobacterium lactis, Bifidobacterium breve, Bifidobacterium longum, Lactobacillus acidophilus, Lactobacillus casei, Lactobacillus plantarum, Lactobacillus paracasei, Lactobacillus salivarius, Lactobacillus rhamnosus, Lactobacillus bulgaricus</i></p> <p></p>	✓	✓	✓	NA	<p>\$1.13</p> <p>[\$0.02]</p> <p>Delayed release</p> <p>Contains no dairy, contains no wheat, gluten free</p> <p>\$33.99/30 vegetable capsules</p>
<p>Rexall® Probiotic Acidophilus (1 capsule daily) </p> <p>Mfd. by Rexall, Inc. Ingredients</p>	<p>Over 100 million²</p> <p><i>Lactobacillus acidophilus</i></p> <p></p>	✓	No ¹⁵	✓	NA	<p>\$0.08</p> <p>[\$0.83]¹⁶</p> <p>Contains no dairy, contains no wheat, gluten free, yeast free</p> <p>\$5.00/60 capsules</p>
<p>Schiff® Digestive Advantage® Daily Probiotic (1 capsule daily)</p> <p>Dist. by Schiff Nutrition Group, Inc. Ingredients</p>	<p>2 billion²</p> <p>BC30 <i>Bacillus coagulans</i> GBI-30, 6086</p>	✓	✓	✓	NA	<p>\$0.60</p> <p>[\$0.30]</p> <p>Calcium</p> <p>Contains no wheat, gluten free, yeast free</p>

						\$17.99/30 capsules
<p>\$ Price Check</p> <p>Sedona Labs® iFlora® Multi-Probiotics® (2 to 4 capsules daily)</p> <p>Dist. by Sedona Labs</p> <p>Ingredients</p> <p>\$ Price Check</p>	<p>32 to 64 billion²</p> <p><i>Bifidobacterium bifidum</i>, <i>Bifidobacterium breve</i>, <i>Bifidobacterium lactis (infantis)</i>, <i>Bifidobacterium lactis</i> HN019, <i>Bifidobacterium longum</i>, <i>Lactobacillus acidophilus</i>, <i>Lactobacillus brevis</i>, <i>Lactobacillus bulgaricus</i>, <i>Lactobacillus casei</i>, <i>Lactobacillus gasseri</i>, <i>Lactobacillus paracasei</i>, <i>Lactobacillus plantarum</i>, <i>Lactobacillus rhamnosus</i>, <i>Lactobacillus salivarius</i>, <i>Lactobacillus lactis</i>, <i>Streptococcus thermophilus</i></p>	✓	✓	✓	NA	<p>\$1.32-\$2.64</p> <p>[\$0.04]</p> <p>NutraFlora® scFOS® (fructooligosaccharides)</p> <p>\$19.79/30 capsules</p>
<p>Solgar® Advanced Multi-Billion Dophilus® (1 vegetable capsule daily) </p> <p>Mfd. by Solgar, Inc.</p> <p>Ingredients</p> <p>\$ Price Check</p>	<p>5 billion</p> <p><i>L. acidophilus</i>, LA-5 1.25 billion, <i>B. lactis</i>, BB-12 1.25 billion, <i>L. paracasei</i>, L. CASEI 431 1.25 billion, <i>L. rhamnosus</i> GG, LGG 1.25 billion</p> <p></p>	✓	✓	✓	NA	<p>\$0.28</p> <p>[\$0.06]</p> <p>Contains no dairy, contains no wheat, gluten free, yeast free</p> <p>\$16.99/60 vegetable capsules</p>
<p>Spring Valley® Probiotic Acidophilus (1 caplet daily) </p> <p>Mfd. by Wal-Mart Stores, Inc.</p> <p>Ingredients</p>	<p>1 billion</p> <p><i>Lactobacillus acidophilus</i></p> <p>⁴</p>	✓	✓	✓	✓	<p>\$0.16</p> <p>[\$0.16]</p> <p>Contains no dairy, contains no wheat, gluten free, yeast free</p> <p>\$4.94/30 caplets</p>
<p>TruBiotics™ (1 capsule daily)</p> <p>Dist. by Bayer HealthCare LLC</p> <p>Ingredients</p> <p>\$ Price Check</p>	<p>1.5 billion²</p> <p><i>Lactobacillus acidophilus</i> LA-5®, <i>Bifidobacterium animalis</i> BB-12®</p>	✓	✓	✓	NA	<p>\$0.57</p> <p>[\$0.38]</p> <p>Contains milk</p> <p>\$16.99/30 capsules</p>
<p>UAS Laboratories DDS® Plus 3 (2 veg. caps. daily) </p> <p>Dist. by UAS Laboratories, LLC</p> <p>Ingredients</p> <p>\$ Price Check</p>	<p>6 billion²</p> <p><i>L. acidophilus</i> DDS-1, <i>B. bifidum</i>, <i>B. longum</i>, <i>B. lactis</i></p> <p>⁴</p>	✓	✓	✓	NA	<p>\$0.44</p> <p>[\$0.07]</p> <p>Suitable for vegans, contains no wheat, gluten free, yeast free</p> <p>\$21.99/100 veg. caps.</p>
<p>USANA® Probiotic (1 packet (1 g) daily)⁹ </p> <p>Dist. by USANA Associates</p> <p>Ingredients</p>	<p>12 billion²</p> <p><i>Lactobacillus rhamnosus</i> GG, LGG®, <i>Bifidobacterium</i>, BB-12</p>	✓	✓	✓	NA	<p>\$1.98</p> <p>[\$0.17]¹⁷</p> <p>Contains milk</p> <p>\$27.72/14 packets</p>
<p>Vitacost® Probiotic 15-35 (2 vegetarian capsules daily)</p> <p>Dist. by Vitacost®</p> <p>Ingredients</p>	<p>35 billion²</p> <p><i>L. acidophilus</i>, <i>L. casei</i>, <i>L. rhamnosus</i>, <i>L. plantarum</i>, <i>B. bifidum</i>, <i>B. breve</i>, <i>B. infantis</i>, <i>B. longum</i>, <i>L. paracasei</i>, <i>L. salivarius</i>, <i>L. brevis</i>, <i>L. fermentum</i>, <i>L. helveticus</i>, <i>L. lactis</i>, <i>S. thermophilus</i></p>	Found only 5.7 billion (16.3%)	✓	✓	NA	<p>\$0.53</p> <p>[\$0.02 based on amount claimed]</p> <p>[\$0.09 based on amount found]</p> <p>FOS NutraFlora® (fructooligosaccharides)</p> <p>Contains milk</p> <p>Gluten free</p> <p>\$15.99/60 vegetarian capsules</p>

VSL#3® (2 to 8 capsules daily) ¹⁰ Dist. by Sigma-Tau Pharmaceuticals, Inc. Ingredients	225 to 900 billion <i>Streptococcus thermophilus, Bifidobacterium breve, Bifidobacterium longum, Bifidobacterium infantis, Lactobacillus acidophilus, Lactobacillus plantarum, Lactobacillus paracasei, Lactobacillus delbrueckii subsp. Bulgaricus</i> 	✓	✓	✓	NA	\$1.63-\$6.53 [\$0.01] ²¹ \$48.99/60 capsules
Similar To Approved Product:*						
Puritan's Pride® Probiotic 10 (2 capsules daily) Mfd. by Puritan's Pride, Inc. Ingredients	Similar to Nature's Bounty® Advanced Probiotic 10.					
Vitamin World® Probiotic 10 (2 capsules daily) Mfd. by Vitamin World, Inc. Ingredients	Similar to Nature's Bounty® Advanced Probiotic 10.					
Women's Products:						
RepHresh® Pro-B™ (1 capsule daily) Dist. by Lil' Drug Store Products, Inc. Ingredients \$ Price Check	5 billion ² <i>L. rhamnosus</i> GR-1 2.5 billion, <i>L. reuteri</i> RC-14 2.5 billion	✓	✓	✓	NA	\$1.00 [\$0.20] Contains milk. \$29.99/30 capsules
Senior's Products:						
Jarrow Formulas® Senior Jarro-Dophilus (1 capsule daily)  Dist. by Jarrow Formulas® Ingredients \$ Price Check	20 billion <i>B. longum</i> BB536, <i>B. lactis</i> BI-04, <i>L. acidophilus</i> La-14, <i>L. plantarum</i> Lp-115, <i>L. rhamnosus</i> R0011 	✓	✓	✓	NA	\$0.32 [\$0.02] Contains no dairy, contains no wheat, gluten free \$18.99/60 capsules
Children's Products:						
Florastor® Kids (2 packets daily) Dist. by Biocodex, Inc. Ingredients \$ Price Check	250 mg (number of organisms not stated) <i>Saccharomyces boulardii lyo</i>	Found 10.5 billion per daily serving	✓	✓	NA	\$1.61 [\$0.15 based on amount found] Fructose, lactose Suitable for vegetarians, gluten free \$16.09/20 packets
Nature's Answer® For Kids Probiotics (1/4 teaspoon (1.5 g) daily) Dist. by Nature's Answer® Inc. Ingredients	5 billion ² <i>L. plantarum, L. acidophilus, B. lactis, B. bifidum, B. infantis, L. salvarious, L. paracasei, L. casei, B. breve, B. longum, S. thermophilus, L. rhamnosus</i> 	Found only 1.25 billion (24.9%)	✓	✓	NA	\$0.53 [\$0.11 based on amount claimed] [\$0.42 based on amount found] Organic Super Fruit Blend \$19.99/2 oz. (57 g) container (approx. 38 servings)

<p>Nature's Plus® Animal Parade® AcidophiKidz® - Berry Flavor (1 chewable tablet)</p> <p>Dist. by Natural Organics Laboratories, Inc. Ingredients</p>	<p>1 billion²</p> <p><i>Bifidobacterium infantis, Bifidobacterium adolescentis, Bifidobacterium longum, Bifidobacterium bifidum, B. coagulans</i></p>	<p>Found only 558 million (55.8%)</p>	<p>No</p>	<p>✓</p>	<p>NA</p>	<p>\$0.13</p> <p>[\$0.13 based on amount claimed] [\$0.24 based on amount found]</p> <p>HerbaFlor</p> <p>Contains no dairy, contains no wheat, gluten free, yeast free</p> <p>\$11.99/90 chewable tablets</p>
<p>Trunature® (Costco) Chewable Probiotic (1 chewable tablet daily)</p> <p>Dist. by Costco Wholesale Corporation Ingredients</p>	<p>1.5 billion²</p> <p><i>Lactobacillus Acidophilus, Bifidobacterium Lactis</i></p>	<p>✓</p>	<p>✓</p>	<p>✓</p>	<p>NA</p>	<p>\$0.28</p> <p>[\$0.19]</p> <p>Contains no dairy, gluten free</p> <p>\$16.99/60 chewable tablets</p>
<p>Pet Products:</p>						
<p>Best Pet Health™ Probiotics with Wild Alaskan Salmon Oil for Dogs and Cats (2 or more teaspoons daily)¹¹</p> <p>Dist. by Best Pet Health Ingredients</p>	<p>Not Stated</p> <p><i>Bacillus subtilis</i></p>	<p>Found just 3.5 million¹²</p>	<p>N/A</p>	<p>✓</p>	<p>NA</p>	<p>\$0.42¹²</p> <p>[\$120.74 based on amount found]</p> <p>Omega-3, DHA, EPA</p> <p>\$39.99/32 fl. oz. (946 mL) bottle (approx. 96 servings)</p>
<p>Only Natural Pet™ Probiotic Blend (1/4 to 6 capsules daily)¹³</p> <p>Dist. by Only Natural Pet Store Ingredients</p>	<p>0.625 to 15 million²</p> <p><i>Lactobacillus acidophilus, Bifidobacterium bifidum, Bifidobacterium infantis, Bifidobacterium longum, Lactobacillus bulgaricus, Lactobacillus casei, Lactobacillus salivarius, Streptococcus thermophilus</i></p>	<p>✓ (Note: Each capsule contains just 2.5 million. Previous formula contained 1.6 billion)</p>	<p>N/A</p>	<p>✓</p>	<p>NA</p>	<p>\$0.05-\$1.27</p> <p>[\$84.40]</p> <p>FOS (fructooligosaccharides)</p> <p>\$18.99/90 capsules</p>
<p>Petco Digestive Enzymes & Probiotics For Dogs (1/2 to 2 chewable tablets daily)¹⁴</p> <p>Mfd. by Garmon Corporation Ingredients</p>	<p>47.5 to 190 million²</p> <p><i>Bacillus coagulans</i></p>	<p>Found only 20 to 81 million (42.9%)</p>	<p>N/A</p>	<p>✓</p>	<p>NA</p>	<p>\$0.09-\$0.36</p> <p>[\$1.89]</p> <p>Alpha-amylase, lipase, cellulose, protease</p> <p>\$16.14/90 chewable tablets</p>

 Tested through CL's [Quality Certification Program](#) prior to, or after initial posting of this Product Review.

* Product identical in formulation and manufacture to a product that has passed testing but sold under a different brand. For more information see CL's [Multi-Label Testing Program](#).

NA = Not applicable

¹ Not tested but claimed on label.

² Claimed as of time of manufacture.

³ Claims at least 10 million by "best by" date.

⁴ Label: Refrigerate after opening.

⁵ Label: Must not exceed 75F.

⁶ Label: Avoid temperatures above 77F.

⁷ Label: Half a capsule is daily dosage for infants.

⁸ Label : Serving size is 2 per day for adults and 1 to 2 daily for children.

⁹ Directions say to "Take one stick pack every 1-2 days, or as needed to promote digestive health."

¹⁰ Product is a medical food.

¹¹ Label: "One (1) teaspoon [per] 20 lbs. body weight twice daily."

¹² Based on minimum serving size.

¹³ Label: "Cats: to capsules 1 to 3 times per day. Dogs: to 2 capsules 1 to 3 times per day".

¹⁴ Label: "Up to 20 lbs. tablet, 21-40 lbs. 1 tablet, 41-80 lbs. 1 tablet, 81 lbs. + 2 tablets".

¹⁵ Product did not claim to contain over 1 billion per daily serving.

¹⁶ Based on 100 million.

¹⁷ Based on taking one daily.

¹⁸ Label: Best if refrigerated.

¹⁹ Based on claimed amount, unless noted otherwise.

²⁰ Label: Refrigerate or keep at room temperature

²¹ Cost for 1 billion is under \$0.01.

##TABLE_UNLESS_TEXT##

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ConsumerTips:

What to Consider When Buying:

Properly labeled probiotic supplements will list the types of bacteria and/or yeast that are present. Names of the organisms should be listed in italics, with the genus name capitalized and listed first. The genus name may also be abbreviated with its first letter (e.g., *Lactobacillus acidophilus* or *L. acidophilus*). Some products will include the specific sub-strain (e.g. *Bifidobacterium lactis* BB-12, *Lactobacillus rhamnosus* GR-1). There are slight differences between sub-strains of bacteria, and much of the research has been done on these specific sub-strains. Keep in mind that products using more general strains may not have the same intended benefit as products with specific, researched strains.

Some research suggests that it may be more effective to take a probiotic supplement that contains a mixture of bacterial strains rather than a single bacterial species. Conversely, it is possible that some combinations of strains may not work well together, affecting the ability of the organisms to remain viable. Many products on the market contain untested combinations.

Claimed amounts of cells — Don't get misled by the numbers

It is not uncommon for the amount of active ingredient in a supplement to decrease over time. Typically manufacturers factor in the expected loss and display the amount you should expect at the "Best by" date, i.e., the expiration date. For example, it is not unusual for companies to produce probiotics which, at the time of manufacture, contain double the amount listed as of the "Best by" date on the assumption that 50% of the cells die before the product reaches that date -- particularly if the product is not maintained under ideal conditions.

Due to this potentially large loss, some products display the number of cells "at the time of manufacture" which may be very different from what you'll actually get. ConsumerLab.com frowns upon this practice as it is against FDA regulations, often exaggerates what is in a product, and does not guarantee what the product provides. It also makes it difficult for a consumer to make a fair comparison among products or to gauge the dose that works best. It is best for products to label the amount of viable organisms expected to be present through an expiration or "Best By" date. Consumers should try to purchase products that are well within their expiration date to ensure a higher number of viable cells.

To gain probiotic benefits from yogurt or other dairy foods, look for products labeled "contains live cultures" or "active cultures." Some yogurts will state the species of bacteria they contain.

Withstanding stomach acid

Some products have an enteric coating or use a protective formulation because certain probiotic organisms are unable to survive exposure to stomach acid. In general, most *Lactobacillus*, *Bifidobacterium*, and *Streptococcus* species do not need enteric coating as they can survive passage through the stomach, although the percentage which survive may be, according to one study, only 10 to 20% of the original amount when taken without food, while several times more will survive when enterically coated (Del Piano, *Gut Microbes* 2011; Del Piano, *J Clin Gastroenterol* 2010). A study in a digestive tract model suggested that survival of non-enterically-coated *Lactobacillus* and *Bifidobacterium* in stomach acid can be improved by taking with a meal containing some fat, or shortly before such a meal, as opposed to after a meal (Tompkins, *Benef Microbes* 2011).

A potential downside to an enteric coating is that if the product happens to be contaminated with unwanted bacteria, yeast, or mold, these are also protected from your natural defenses. This is another reason why ConsumerLab.com tests all probiotics for microbial contaminants, which can occur if a product is not properly made.

Some bacteria naturally sporulate ("hibernate" within a protective coating) when they are exposed to harsh conditions, and some researchers postulate that sporulated bacteria are more resistant to the harsh conditions found in the GI tract. Consequently, another delivery method is to manufacture probiotics in the form of bacterial spores. This is most often used for bacteria of the genus *Bacillus* including *B. coagulans* (previously called *Lactobacillus sporogenes*).

L. bulgaricus and *S. thermophilus*, as well as *Leuconostoc* and *Lactococcus* species are commonly found in yogurt because they are used as starters for dairy products. It was once believed that these microorganisms could not survive passage through the stomach, though new research suggests otherwise (Mater, 2005; Elli 2006). In addition to surviving gastrointestinal transit, these strains produce large quantities of lactic acid which may limit the growth of unfriendly bacteria and help in the prevention and treatment of diarrhea. In addition, by converting the lactose in dairy products into lactic acid, *S. thermophilus* and *L. bulgaricus* help make dairy food more tolerable for people with lactose intolerance. As noted earlier, yogurts and other dairy products specifically marketed as probiotics are often fortified with additional species to provide additional benefit.

Color of probiotics

Most probiotic material in powders, capsules, and tablets, is white or off-white. A pink color can be seen in some *Lactobacillus*-containing probiotics, likely due to a chemical reaction with a preservative, such as sodium ascorbate (Kurtmann, Cryobio 2008). This is not harmful and may be seen in products like *TruBiotics* and *Solgar Advanced Multi-Billion Acidophilus*, both of which contain *L. acidophilus* LA-5 with which this coloration has been described.

Prebiotics

As mentioned in the [What They Are](#) section of this review, prebiotics are plant-based complex sugars that promote the growth of probiotic bacteria in the gastrointestinal tract. They are not fully digested by the human body but are used as "food" by the bacteria in the colon. The most common prebiotic ingredients you will see listed on supplements are inulin and fructo-oligosaccharides (FOS or oligofructose). Inulin is not one molecule but a blend of molecules, many of which can be hydrolyzed to yield to FOS. Both FOS and inulin have similar effects in the body. (See the Encyclopedia [article](#) for more information about inulin and FOS.)

Although inulin and FOS are sometimes promoted for improving cholesterol levels, the evidence is mixed. Several short term studies using high doses (10 — 20 grams) found a modest reduction in total and LDL-cholesterol; however, other studies, including a longer-term, 6-month study, have not found a cholesterol-lowering effect (Williams, Br J Nutr 2002; Forcheron, Metabolism 2007).

There is some evidence that a daily dose of 10 grams of inulin can improve measures of glycemic control in women with type 2 diabetes (Gargari, Diabetes Metab J 2013).

Prebiotics are sold in powder, tablet and capsule form, typically providing 2 to 4 grams of inulin or FOS per daily serving — the amount shown to support the growth of healthy bacteria in the gastrointestinal tract (Bouhnik, Nutr Res 2007; Dehghan, Health Promot Perspect 2013). However, because this is more ingredient than can fit in a single pill, it is necessary to take several pills to get this amount of inulin or FOS. Prebiotics are sometimes added as ingredients in probiotic supplements, but usually in low doses (less than a quarter of a gram per pill), or as part of a "blend" in which the exact amount of prebiotic is not even listed.

Be aware that doses of 10 grams or more of inulin or FOS can produce gastrointestinal discomfort, gas and bloating.

(See the [Results](#) section of this review for tests of probiotic products that also contain prebiotics — this is usually listed in the last column, Other Notable Ingredients).

The prebiotic ingredient found in supplements is usually derived from chicory root, which is extremely rich in inulin. A variety of foods, in addition to chicory, can provide good amounts of FOS, or more broadly, inulin. For example, as shown in the chart below, 100 grams of banana (a small banana) provides 500 mg of inulin (all of which is FOS). Similar sized servings (100 grams) of some other foods, like wheat flour or wheat bran, can provide several times that amount. Inulin and FOS are sometimes also added to processed foods to improve taste (they are slightly sweet) and texture. In all, the average American diet provides about 2.6 g of inulin (2.5 g of FOS) daily -- most of which comes from wheat (70%) and onions (25%), so the foods you eat may already provide all the prebiotics you need (Moshfegh, J Nutr 99).

Food sources of prebiotics: amounts of inulin* and oligofructose (in grams) per 100 grams serving.

Food Source	Inulin* g/100 g	Oligofructose (FOS) g/100 g
Banana (raw)	0.5	0.5
Asparagus (boiled)	1.7	1.7
Chicory root	41.6	22.9
Dandelion greens	13.5	10.8
Garlic (raw)	12.5	5.0
Garlic (dried)	28.2	11.3
Jerusalem artichoke	18.0	13.5
Leeks (raw)	6.5	5.2
Onions (raw)	4.3	4.3
Onions (cooked)	3.0	3.0
Wheat (bran — raw)	2.5	2.5
Wheat (flour — baked)	2.4	2.4

*Inulin amounts include oligofructose (FOS) and other prebiotic compounds

Source: [Presence of Inulin and Oligofructose in the Diets of Americans, Ju Nutr 1999](#)

What to Consider When Using:

Probiotics are measured in terms of the number of viable (i.e., living or hibernating) organisms per dose and stated as "units" or "colony forming units" (CFU). The recommended intake for probiotic supplements varies by strain and use, but tends to be about 1 billion to 10 billion cells (or CFUs) per day. These amounts may be written on the label as 1×10^9 or 10^9 for one billion units, and 1×10^{10} or 10^{10} for ten billion units. Although less common, some strains are effective at as little as 50 million viable cells per day, while you may need more than 1 trillion cells of other strains to receive clinical benefit (O'Mahony 2005).

In general, probiotics will only survive a few days to about 3 weeks in your system after you stop taking them (Raish, Appl Environ Microbiol 2006; Martin, J Nutr 1997), and so should be taken on an ongoing basis for general benefits, or for the period of time indicated by clinical studies for a specific use (see dosage

information below).

Dosage The types and number of organisms taken as probiotics depend on the use for which they are intended:

- For irritable bowel syndrome (IBS) and functional abdominal pain
In adult women, one hundred million to 1 billion cells daily of *Bifidobacterium infantis* 35624 has been shown to reduce abdominal pain, bloating, and bowel movement difficulty, but it does not reduce the frequency of bowel movements (Whorwell 2006). In adult men and women, a 4-strain combination product (sold as *Symprove* in England) of *Lactobacillus rhamnosus* NCIMB30174, *Lactobacillus plantarum* NCIMB 30173, *Lactobacillus acidophilus* NCIMB 30175, and *Enterococcus faecium* NCIMB 30176 in a water-based suspension of barley extract with 10 billion live organisms per 50 mL daily reduced pain and improved bowel habits but not bloating or overall quality of life (Sisson *Aliment Pharmacol Ther* 2014). An 8-strain combination product of 450 billion live organisms from *Bifidobacterium*, *Lactobacillus*, and *Streptococcus* genera has also helped with IBS (Kim 2003) but this medical food provided 450 billion cells daily -- much more than products tested in this Review. In children, 3 billion cells of *Lactobacillus* GG twice per day reduced frequency and severity of pain (Ruggiero 2010). Intensity of pain in children with functional abdominal pain was reduced with 200 million cells daily of *Lactobacillus reuteri* DSM 17938 (Romano 2010). Frequency of colic in some infants was also reduced with drops containing 100 million cells daily of the same strain (sold as *Gerber Soothe Colic Drops*) (Indrio, *JAMA Pediatr* 2014), Sung, *BMJ* 2014).
- For the treatment of antibiotic-related diarrhea
Although it has been recommended to start taking probiotic supplements as soon as symptoms appear, more recent studies show that probiotics can be taken starting the first day of oral antibiotic treatment and continued for 1 to 2 weeks after the completion of antibiotic therapy. It may be advisable to take probiotics and antibiotics at least 2 hours apart to reduce the possibility of the antibiotic killing the probiotic organisms. Ten to 20 billion cells of *Lactobacillus* GG (*Culturelle*) daily (Osterlund 2007), and 50 to 100 billion cells of a combination of *Lactobacillus acidophilus* CL1285 and *Lactobacillus casei* LBC80R (Gao, 2010) have been shown to reduce the incidence of antibiotic-related diarrhea, as have 17 billion cells daily of a combination of *L. acidophilus* NCFM, *L. paracasei* Lpc-37, *B. lactis* Bi-07 and *B. lactis* Bi-04 in equal parts (HOWARU *Restore*, sold as *Active D'Lites*) (Ouweland, *Vaccine* 2013). Products containing *multiple species* of organisms may be somewhat more effective than those with a single species (Johnston, *Ann Int Med* 2012). If diarrhea symptoms persist for several days, see a physician.
- For rotaviral diarrhea in infants and children up to age 3
Doses of up to 10 billion cells of *Lactobacillus* GG and *Lactobacillus reuteri* may significantly reduce the diarrheal phase of infection.
- For chemotherapy-induced diarrhea
Ten to twenty billion cells of *Lactobacillus* GG (*Culturelle*) daily has shown to be effective (Osterlund 2007).
- For traveler's diarrhea
Two billion viable cells of *Lactobacillus* GG taken by mouth daily starting 2 days before travel and continuing throughout the trip may reduce the likelihood of traveler's diarrhea (Hilton 1997). *Saccharomyces boulardii* 250 mg (as in *FloraStor* and *FloraStor Kids*) to 1 gram by mouth daily begun 5 days before travel and continued for the duration may reduce traveler's diarrhea, with the larger dose possibly more effective (Kollaritsch 1993).
- For vaginal bacterial infections
One capsule daily containing over one billion viable cells of both *L. rhamnosus* GR-1 and *L. fermentum* RC-14, respectively, (as in *Jarrow Formulas femdophilus*) has been taken orally and shown to reduce colonization of the vagina by potential pathogenic bacteria and yeast (Reid 2003). Vaginal suppositories (which are not considered supplements in the U.S.) containing approximately 1 billion *Lactobacillus* organisms have also shown therapeutic benefit.
- For reducing cold and flu symptoms
- Adults: One billion viable cells of a combination of *Lactobacillus plantarum* HEAL 9 (DSM 15312) and *Lactobacillus paracasei* 8700:2 (DSM 13434) by mouth daily for 12 weeks during cold season (Berggren 2011).
- Children: A combination of *Lactobacillus acidophilus* NCFM (2.5 billion cells and *Bifidobacterium animalis* subsp *lactis* Bi-007 (2.5 billion cells) taken as a powder mixed with milk twice a day during colder months (Leyer 2009).
- For reducing anxiety
3 billion cells of *B. longum* R0175 with *Lactobacillus helveticus* R0052 taken daily with breakfast has been shown effective in a 30-day study (Messaudi, *Br J Nutr* 2011).
- For weight and fat loss
Doses of 1.4, 16, or 100 billion cells daily of *Lactobacillus gasseri* SBT2055 (LG2055) in a fermented milk product have been used in preliminary research. These doses appear to have similar effects, except that the lower doses of 1.4 or 16 billion cells do not appear to provide the same subcutaneous fat loss as the higher dose (Kadooka, *Eur J Clin Nutr* 2010; Kadooka, *Br J Nutr* 2013). In obese women, a probiotic providing 162 million cells daily of *Lactobacillus rhamnosus* CGMCC1.3724 (also called LPR) along with 300 mg of a prebiotic mix of oligofructose and inulin divided into two capsules has been successfully used (Sanchez, *Br J Nutr* 2013).
- For treating periodontitis
A lozenge containing 100 million cells of each of two strains of *Lactobacillus reuteri*, DSM17938 and ATCC PTA5289 (*Prodentis* from BioGaia, Sweden, sold in the U.S. and Canada as GUM *PerioBalance*) taken twice daily after a dental scaling and disinfection may be helpful in patients with moderate to severe periodontitis (Teughels, *J Clin Periodont* 2013).
- For throat infection
In children, a lozenge containing 1 billion cells of *S. salivarius* K12 taken daily for three months has been shown to significantly reduce the occurrence of streptococcal and viral throat infections (Pierro *Drug Healthc Patient Saf* 2014).
- For treating allergy
2 billion cells of *Lactobacillus paracasei* LP-33 daily may further reduce the impact of allergy symptoms on the quality of life in people with grass pollen allergy already taking an antihistamine (loratadine 10 mg) (Costa, *Eur J Clin Nutr* 2014).
- For mastitis
90 billion cells of either *Lactobacillus fermentum* CECT5716 or *Lactobacillus salivarius* CECT57132 taken daily for 21 days has been shown to reduce breast pain and resolve infection in nursing mothers with mastitis, as well as reduce the rate of recurrence (Arroyo *Clin Infect Dis* 2010).

- **For small pets (dogs and cats)**

Probiotics may help stimulate immune function. Typical amounts shown in studies for immune stimulation in cats and puppies tend to range in the hundreds of millions. To colonize the gut with a probiotic, or when treating bigger dogs, larger doses may be appropriate.

Storage

It is advisable to keep probiotics out of heat and light. After being opened, they should also be kept away from moisture to prevent organisms from becoming activated and then dying. Although not always a requirement, labels on some probiotic products suggest that they be refrigerated to prolong their shelf life. These requirements depend on the organism, the formulation and pill type, and the packaging, such as bottled capsules as opposed to blister packs. Check the specific storage recommendations on each product, (shown in the [Ingredients](#) listings) as they may vary.

Concerns and Cautions:

There are no known safety issues with most probiotic bacteria at appropriate doses in healthy people but some people occasionally notice a temporary increase in digestive gas. However, *Bacillus subtilis* and *Enterococcus faecium* are potentially pathogenic in humans.

In a relatively small number of cases (mainly among individuals who were severely ill, immunocompromised, enterically fed and/or with central venous lines) probiotic use has caused bacteremia or fungemia (presence of bacteria or fungi in the blood) or pathological infections resulting in severe illness. There have been at least 60 reports, for example, of fungemia associated with the use of probiotic capsules containing the yeast *Saccharomyces cerevisiae* (*S. cerevisiae*) ([Munoz 2005](#)). Cases have also been reported with *S. boulardii* (a member of the species *S. cerevisiae*) ([Herbrecht 2005](#)). However, HIV-positive adults have taken probiotics for up to 3 weeks without side effects.

Individuals with milk allergies should be aware that probiotics contain lactose fermenting bacteria (e.g., *Lactobacilli* and *Bifidobacterium*), and are typically grown on media containing milk-derived nutrients. Such products may potentially contain residual milk proteins, even if they claim to be free of milk or dairy. Some, but not all, products note this on their labels. It may be prudent to assume that any lactose fermenting probiotic can potentially contain residual milk proteins and be allergenic.

In 2012, two cases of severe eosinophilic syndrome (an autoimmune disease) occurring in the same month and city were associated with the use of a probiotic supplement between two and four weeks prior to symptom onset ([Mendoza, Case Reports Rheum 2012](#)). The patients did not remember the name of the product, but both recalled use of a "new brand of probiotics described as an 'extra strength concentration' in a boxed blister pack, purchased over-the-counter in a Philadelphia metropolitan area pharmacy." In both cases, symptoms were sudden in onset and included malaise, weakness in the arms or legs, and numbness. Both patients required treatment with IV corticosteroids followed by immunosuppressive therapy for several months. Although general symptoms abated, both patients suffered permanent motor and sensory deficits in the lower extremities.

After ConsumerLab.com mentioned the above cases in its newsletter (January 20, 2013), it received reports from other individuals who experienced reactions after taking probiotics. One woman developed eosinophilic esophagitis in April 2012, several weeks after beginning to take the enteric-coated probiotic *Pearls IC* (a "triple-strength formula" sold in a boxed blister pack). Another consumer reported hives and itching for over a month after taking *MD PureBiotic*, which are vegetarian capsules sold in a bottle. These conditions could have been triggered by exposure to allergens. As noted earlier, milk allergens can be present in probiotics. Yeasts and molds may also occur in contaminated probiotics, representing other potential allergens (ConsumerLab.com tests probiotics for these and other microbial contaminants). Although there is not enough information to know the causes of the cases above and these reactions appear to be uncommon -- it may be wise to use probiotics with some caution, watching for potential allergic or other immune reactions. (If you have a reaction to a probiotic, [let us know — and please provide details.](#))

To further assist consumers, ConsumerLab.com is licensing its flask-shaped CL Seal of Approved Quality (see [The CL Seal](#)) to manufacturers for use on labels of products that have passed its testing. ConsumerLab.com will periodically re-evaluate these products to ensure their compliance with ConsumerLab.com's standards.

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