

## Evaluation of Commercial Probiotic Products

### How to Evaluate Commercial Probiotic Products

Many products claim to contain probiotics, live beneficial bacteria that play an important role in the health of pets and humans. Evaluation of product labels can give information about the potential efficacy, or lack of efficacy, of these products. The consumer should examine the following:

- Guaranteed analysis
- "Use by" or "Best Before" date
- Ingredient description
- Specific probiotic strain(s) included in the formula

### Guaranteed Analysis

The product should contain a guarantee of the number of live probiotic bacteria. Unprotected probiotic bacteria are very unstable during storage. Guarantees are typically stated as cfu/gram. CFU stands for colony forming units; one cfu represents one bacterial cell. The way this guarantee is stated can give additional information about the product.

Label Guarantee	Comment
No guarantee of bacterial levels	The manufacturer is not certifying that the product contains live probiotics. Regulation requires a guarantee.
Bacterial level guarantee states the bacterial levels "at time of manufacture"	The manufacturer is guaranteeing how many bacteria were in the product at manufacture, but is not guaranteeing how many will survive distribution and storage. The manufacturer is not guaranteeing that there will be any live bacteria at the time of consumption of the product.
Guaranteed total lactic acid producing bacteria, but not bacterial counts for individual strains	The manufacturer is not guaranteeing the bacterial count for individual strains, just the total for all strains added together. In this case, the ratio of the bacteria to each other can change from batch to batch. If the ratio changes, effectiveness of the product could be altered. <b>Regulation requires that each species be listed.</b>
No "best if used by" or "best before" (or similar wording) date	Even a stable, encapsulated probiotic cannot live forever. A "best before" or "use by" date should be indicated on the label.

### "Best Before" Date

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### Ingredient Description

The product should contain a specific list of the probiotic bacteria including genus and species. Some examples of ingredient descriptions follow.

Ingredient Description	Comment
<p>Label contains no list of specific probiotics. Instead product states (for example):</p> <ul style="list-style-type: none"> <li>• Contains probiotic cultures</li> <li>• Contains yogurt</li> <li>• Lactobacillus cultures</li> <li>• Dried lactobacillus</li> <li>• Infant probiotic blend</li> </ul>	<p>The specific probiotic bacteria and a guarantee of the level of each probiotic strain are required to be included on the label. Lack of this information indicates that the manufacturer is not guaranteeing a specific probiotic strain. Without specific probiotic species guarantees, efficacy is unknown</p>
<p>Direct-fed microbials (or microorganisms)</p>	<p>This is the official AAFCO term for live probiotic bacteria.</p>
<p>Dried <u>Name of probiotic</u> fermentation product</p>	<p>According to AAFCO, "Dried _____ Fermentation Product is the product derived by culturing _____ on appropriate nutrient media for the production of one or more of the following: enzymes, fermentation substances, or other microbial metabolites, and dried in accordance with approved methods and good manufacturing processes." <b>Comment:</b> This product may, but does not necessarily, contain live probiotic bacteria.</p>
<p>Dried <u>Name of probiotic</u> fermentation extract</p>	<p>According to AAFCO, "Dried _____ Fermentation Extract is the dried product resulting from extracting and precipitating by means of non-aqueous solvents or other suitable means, the water soluble materials from a fermentation conducted for maximum production of enzymes using a non-pathogenic strain of the microorganism _____ in accordance with good manufacturing practices." <b>Comment:</b> This product may, but does not necessarily, contain live probiotic bacteria.</p>
<p>Ingredient list contains name (genus and species) of a bacteria, for example, <i>Enterococcus faecium</i></p>	<p>The genus and species of all probiotic bacteria should be listed.</p>

**AAFCO  
Approved  
Microorganisms**

To be included in a product probiotics should be efficacious, stable, and approved by FDA. They must be on the AAFCO approved list.

According to AAFCO, the following microorganisms were reviewed by the Food and Drug Administration, Center for Veterinary Medicine and found to present no safety concerns when used in direct-fed microbial products:

*Aspergillus niger*  
*Aspergillus oryzae*  
*Bacillus coagulans*  
*Bacillus lentus*  
*Bacillus licheniformis*  
*Bacillus pumilus*  
*Bacillus subtilis*  
*Bacteroides amylophilus*  
*Bacteroides capillosus*  
*Bacteroides ruminicola*  
*Bacteroides suis*  
*Bifidobacterium adolescentis*  
*Bifidobacterium animalis*  
*Bifidobacterium bifidum*  
*Bifidobacterium infantis*  
*Bifidobacterium longum*  
*Bifidobacterium thermophilum*  
*Enterococcus cremoris*  
*Enterococcus diacetyllactis*  
*Enterococcus faecium*  
*Enterococcus intermedius*  
*Enterococcus lactis*  
*Enterococcus thermophilus*  
*Lactobacillus acidophilus*  
*Lactobacillus brevis*  
*Lactobacillus buchneri* (cattle only)  
*Lactobacillus bulgaricus*  
*Lactobacillus casei*  
*Lactobacillus farciminis* (swine only)  
*Lactobacillus cellobiosus*  
*Lactobacillus curvatus*  
*Lactobacillus delbruekii*  
*Lactobacillus fermentum*  
*Lactobacillus helveticus*  
*Lactobacillus lactis*  
*Lactobacillus plantarum*  
*Lactobacillus reuteri*  
*Leuconostoc mesenteroides*  
*Pediococcus acidilacticii*  
*Pediococcus cerevisiae* (damnosus)  
*Pediococcus pentosaceus*  
*Propionibacterium freudenreichii*  
*Propionibacterium shermanii*  
*Saccharomyces cerevisiae*

**Appearance on this AAFCO approval list does not imply efficacy as a probiotic.**

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**Probiotic  
Strain Efficacy**

Efficacy as a probiotic is dependent on:

- Ability to survive in the GI tract
- Stability during processing, distribution and storage
- Physiological effects

All of these properties are dependent not only on species of bacteria, but also specific strain. For example, not all *Lactobacillus acidophilus* strains are effective probiotics in humans. Some do not survive transit through the GI tract, many are not stable, and many do not have desirable physiological effects. Nestle researchers in Lausanne screened 75 lactobacillus strains and found 16 to have potential probiotic activity for dogs (Knorr et al 2003). In another study (Simmering et al 2001), only 2 of 50 lactic acid bacteria had the potential for the targeted probiotic benefits.

Most probiotics have never been evaluated in dogs or cats. A summary of probiotics tested in pets follows.

Strain	Published Feeding Tests With Dogs / Cats?	Comments
<i>Enterococcus faecium</i> SF68	Yes	SF68 (NCIMB10415) is an effective probiotic in dogs and cats. It has been shown to maintain intestinal balance. Nutritional studies with other strains of <i>E. faecium</i> have not been published.
<i>Lactobacillus acidophilus</i>	Yes	Strain NCFM (Rhodi) has been studied in dogs and strain DSM13241 (a proprietary Mars strain) has been studied in dogs and cats. Another study was conducted in India that found when dogs were fed <i>L. acidophilus</i> strain 15, fecal lactobacilli increased. The commercial availability of this strain was not mentioned. Because lactobacilli vary widely in physiological properties and survivability, results with these strains cannot be extrapolated to other strains.

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## Evaluation of Commercial Probiotic Products, Continued

### Probiotic Strain Efficacy (continued)

Strain	Published Feeding Tests With Dogs / Cats?	Comments
<i>Lactobacillus rhamnosus</i> GG	Yes - dogs	Shown to survive transit through the GI tract of the dog. It is one of the most widely studied probiotics for human use. While many veterinarians are recommending it for pets with diarrhea and/or skin conditions, dog and cat efficacy trials (i.e., trials showing beneficial effects) are lacking.
<i>Bacillus subtilis</i> CIP 5832	Yes - dogs	Survives through the GI tract of dogs; however, dog and cat efficacy trials have not been published.
<i>Lactobacillus fermentum</i> AD1	Yes - dogs	Shown to survive transit through the canine GI tract and alter microflora balance. Canine and feline studies with other strains have not been published.
Other probiotic strains	No	Canine and feline efficacy studies with other potential probiotics have not been published.

### External References

Scott Weese (U of Guelph) evaluated commercial probiotics for viability and accuracy in labeling. He found that most products were inaccurately labeled and did not meet their label guarantees.

Weese JS. 2002. Microbiologic evaluation of commercial probiotics. JAVMA 220(6):794-797

Weese JS. 2003. Evaluation of deficiencies in labeling of commercial probiotics. Can Vet J. 44:982-983.

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