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Advancing Science for Pet Health

HOT TOPIC

Probiotic Taxonomy and Taxonomic Changes

In focus

Probiotic taxonomy can seem daunting to veterinary health care teams and pet owners alike. Understanding taxonomic changes, or changes to the genus and/or species name of a probiotic, can help improve communication with owners about supplements.

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What is taxonomy?

Microbial taxonomy is the classification, nomenclature, and identification of microorganisms including algae, protozoa, slime molds, fungi, bacteria, archaea, and viruses. For example, for *Bifidobacterium longum* BL999 NCC3001, '*Bifidobacterium*' is the genus name. Within the genus there are many different species; in this case the species is denoted as '*Bifidobacterium* ***longum***'. There are also variations within species known as strains. In this case, 'BL999 NCC3001' refers to the specific strain of *B. longum*.

Different strains of any bacterial species may have very different effects to the point where one strain within a bacterial species can have positive health effects and another have pathogenic effects.[1] For this reason, it is important to consider the specific strain(s) included in the supplement when evaluating probiotics.

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Taxonomic changes

Taxonomic changes occur regularly in microbiology. A change may affect the genus, the species, or both. Changes have become more common in recent years driven by the development of new and more robust technologies, in particular advances in genomic techniques, for strain identification and classification.[2] With the genomic era and the availability of whole genome sequencing techniques, taxonomy is now evolving at very high speed with an increasing number of new taxon descriptions and reclassifications.

The bacterium *Enterococcus faecium* SF68 (NCIMB 10415 4b1705) recently had a taxonomic change and was renamed to *Enterococcus lactis* SF68 (NCIMB 10415 4b1705). In this example, the species was renamed from *faecium* to *lactis*, but the genus and strain names were not changed.

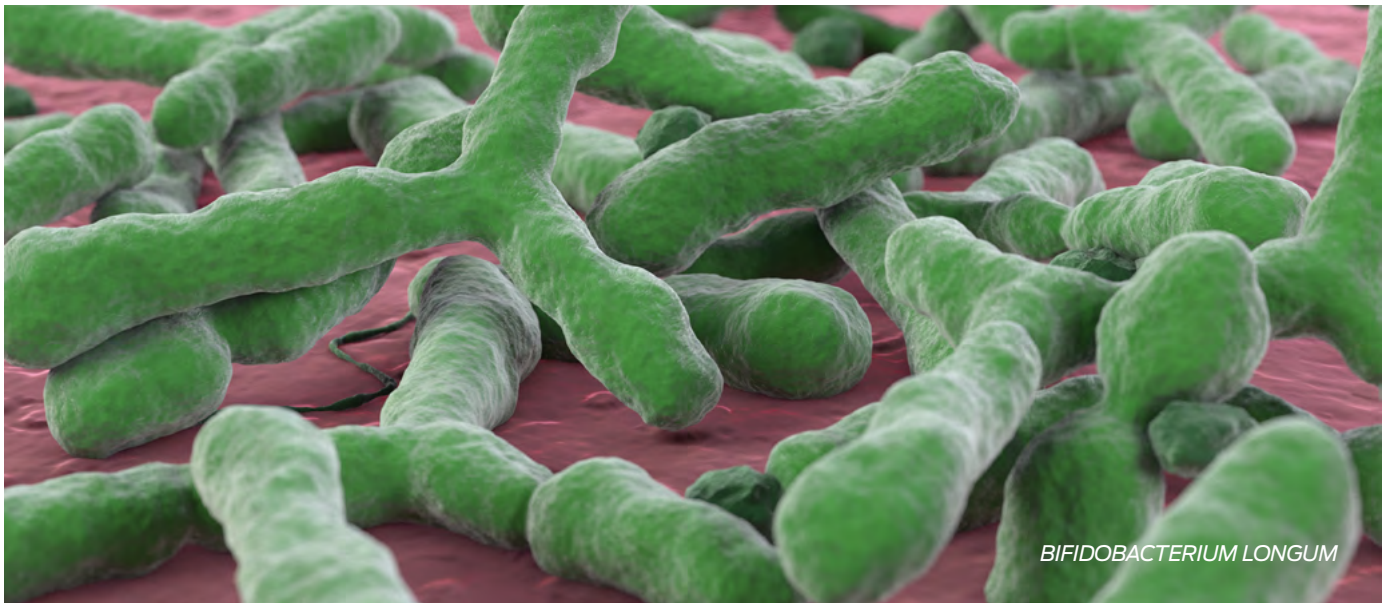
After the taxonomy of a bacterium changes there is often a long lag period before label changes are required. This delay can occur even if the taxonomic change is part of the public record or published in a scientific paper as it gives manufacturers time to update packaging and allows for regulations on the probiotic to be updated. Changes in regulation can often take years to occur, so manufacturers can continue to label a probiotic with the old nomenclature even if scientifically the taxonomy has changed. Taxonomic changes can create questions from owners and veterinary health care teams and can be quite confusing. Eventually, however, a taxonomic change will require a packaging change to the new nomenclature.

What is the impact of a taxonomic change on veterinary health care teams?

The impact a taxonomic change will have on veterinary health care professionals is usually related to probiotic products or when accessing research studies. Companies that manufacture probiotic products undergoing a taxonomic change will often alert veterinary health care teams about an upcoming product label change.

For probiotics, taxonomic changes have no impact on previous safety or efficacy studies carried out and do not indicate a probiotic has different functions than previously understood. Therefore, when a probiotic bacterium's taxonomy is changed, it does not affect indications or uses of the probiotic.

Changing probiotic product labels to reflect taxonomic changes ensures current product labels match scientific publications. When a veterinary health care professional wants to access or publish a research study, it is important to be aware of any changes in taxonomy. Knowing when changes occur also helps improve communication with pet owners and allows veterinary teams to effectively answer questions about probiotic supplements.



References

1. van der Hooft, J. J. J., Goldstone, R. J., Harris, S., Burgess, K. E. V., & Smith, D. G. E. (2019). Substantial extracellular metabolic differences found between phylogenetically closely related probiotic and pathogenic strains of *Escherichia coli*. *Frontiers in Microbiology, 10*, 252.
2. Ferraz Helene, L. C., Klepa, M. S., & Hungria, M. (2022). New insights into the taxonomy of bacteria in the genomic era and a case study with Rhizobia. *International Journal of Microbiology, 2022*, 4623713.