

HOT TOPIC

Postbiotics in pet foods



In focus

The gut microbiome has a significant impact on gastrointestinal health as well as host health, and diet can have a marked influence on the microbiome. Postbiotics are an example of a dietary intervention that may improve microbiome, gastrointestinal, and host health.

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What are postbiotics?

Postbiotics are preparations of inanimate (non-living) microorganisms and/or their components (such as parts of the cell wall, enzymes, proteins, vitamins, short-chain fatty acids, and polysaccharides) that confer a health benefit.^{1,2} They can be produced by beneficial commensal microorganisms in the gut or provided through dietary supplementation with probiotics or postbiotics.

Postbiotic is the currently accepted term according to the International Scientific Association for Probiotics and Prebiotics (ISAPP); terms that have been used in the past to describe postbiotics include paraprobiotics, ghost probiotics, inactivated probiotics, non-viable probiotics, metabiotics, and Tyndallized probiotics.^{1,3}

Examples of postbiotic components

Short-chain fatty acids	B Vitamins	Vitamin K	Peptidoglycans
Polysaccharides	Urolithin A and B	Phytoestrogens	Pili-type structures
Bacteriocins	Phospholipids	Teichoic and lipoteichoic acids	Cell fractions/cell walls

How do postbiotics differ from probiotics or prebiotics?

Probiotics are living microorganisms, whereas postbiotics do not contain live cells. Some, but not all, postbiotics are derived from probiotics;⁴ however, a postbiotic is not simply a dead probiotic and the efficacy of an inanimate microorganism cannot be predicted by the efficacy of its live form.⁵ Some of the benefits of probiotics may actually be due to the metabolites they produce; therefore, postbiotics may provide these same benefits without the need for living microorganisms.^{4,6-8}

Prebiotics are dietary fibers that help nourish and feed the beneficial bacteria in the gut. Postbiotics do not serve as food sources for the bacteria; instead, they exert their actions through cell-produced molecules, metabolites, and activation of receptors on intestinal and immune cells.

How do postbiotics work?

The exact mechanisms by which postbiotics work are not fully understood, and are expected to vary with the postbiotic. To date, research suggests postbiotics may have the following beneficial functions:^{1-3,5,7-13}

- Antimicrobial activity to suppress harmful microorganisms (pathogens)
- Antioxidant activity to reduce free radical damage and oxidative stress
- Anti-inflammatory activity via reduced production of inflammatory mediators
- Provide a supportive environment for beneficial bacteria
- Improve the health of the gut barrier by enhancing tight junctions and promoting growth of intestinal epithelial cells
- Immunomodulation through interactions with the gut-associated lymphoid tissue (GALT)
- Metabolic support through microbiome modulation and increased energy expenditure

What benefits might postbiotics offer pets?

Because postbiotics do not contain living microorganisms, they are very stable and have a long shelf-life.^{1,2} Similar to probiotics, postbiotics vary in their activity and their selection should be based on proven efficacy and safety in the same species and for the condition being addressed.

Postbiotics' specific benefits for pets are the subject of ongoing investigation, but benefits observed in humans and other animals include:

- Anti-diarrheal properties^{1,3,5,8,11,14}
- Improved nutrient absorption^{1,3,14-16}
- Improved gut barrier function^{7,8}
- Improved immune function^{5,8,15}
- Improved weight gain and/or production in production animals^{14,16-18}
- Reduced physiologic stress⁷
- Facilitated weight management⁸
- Improved muscle strength, exercise performance, and mitochondrial health¹⁹

Postbiotics may also be promising alternatives to antibiotics because they have been shown to reduce GI pathogens.^{7,11,17,18}



Postbiotics are an emerging area of research for dogs and cats, with many potential benefits.

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