

Probiotics, Prebiotics, Synbiotics, Postbiotics and Fermented Foods *DEFINED*

Many terms in the 'biotic' space have emerged. Although probiotics, prebiotics, and synbiotics have more than a 25 year history, other biotic terms are relatively new. These terms are widely used in both scientific literature and popular media, and while they are intended to be descriptive, they often are confusing and misused.

ISAPP has enlisted the help of global experts to provide multiple perspectives in formulating consensus definitions that reflect current science for many of these terms. The goal of the consensus panels (comprising 10 or more global experts) has been to describe clearly what these terms are in order to support their proper use by stakeholders.

In addition to the criteria stipulated below, all substances must be safe for their intended use. For substances required to have a demonstrated health benefit, all product formulations must deliver an efficacious level of substance and must be fully identified.

Probiotic

Consensus definition Live microorganisms that, when administered in adequate amounts, confer a health benefit on the host (Hill et al., 2014)

Simple way to conceptualize Live microbes that are good for your health

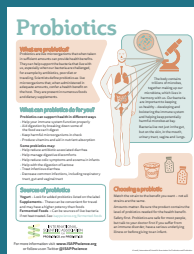
Live microbes present? Yes

Demonstrated health benefit required? Yes

Examples *Bifidobacterium animalis* subsp. *lactis* XYZ

Genus: *Bifidobacterium*
Species: *animalis*
Subspecies: *lactis*
Strain: XYZ

Keep in mind Identity must be confirmed through genome sequencing. Viability must be preserved through the end of shelf life.



Prebiotic

Consensus definition A substrate that is selectively utilized by host microorganisms conferring a health benefit on the host (Gibson et al., 2017)

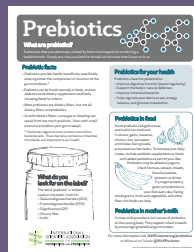
Simple way to conceptualize Food for beneficial microbes within the host

Live microbes present? No

Demonstrated health benefit required? Yes

Examples Inulin, galactooligosaccharides, fructooligosaccharides

Keep in mind New prebiotics emerging: Polyphenols, oligosaccharides based on xylose, maltose and other sugars



Synbiotic

Consensus definition A mixture comprising live microorganisms and substrate(s) selectively utilized by host microorganisms that confers a health benefit on the host (Swanson et al., 2020)

Simple way to conceptualize Complementary synbiotic is a mixture of probiotic + prebiotic

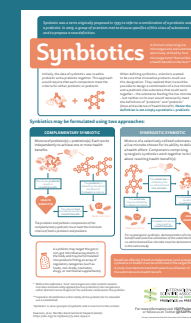
Synergistic synbiotic contains a live microbe and a substrate that it can use for growth

Live microbes present? Yes

Demonstrated health benefit required? Yes

Example Complementary synbiotic: inulin + *Bifidobacterium animalis* subsp. *lactis* XYZ

Keep in mind A health benefit must be shown for a synbiotic as combined, not just the probiotic alone and the prebiotic alone.



Postbiotic

Consensus definition Preparation of inanimate microorganisms and/or their components that confers a health benefit on the host (Salminen et al., 2021)

Simple way to conceptualize Non-viable microbes and/or cell components with or without metabolites

Live microbes present? No

Demonstrated health benefit required? Yes

Examples Some infant formulas, some bacterial lysates to prevent recurrent respiratory tract infections, yeast fermentates used in animal feeds

Keep in mind Purified metabolites do not qualify as postbiotics



Fermented Foods

Consensus definition Foods made through desired microbial growth and enzymatic conversions of food components (Marco et al., 2020)

Simple way to conceptualize Popular foods that are made through the growth of live microbes

Live microbes present? Sometimes yes, sometimes no. Live microbes not required in final product.

Demonstrated health benefit required? Not required

Examples Yogurt, kefir, sauerkraut, sourdough bread

Keep in mind Microbes present may be defined or undefined; live or dead



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