

# 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 confused and misused.

ISAPP has enlisted the help of multiple global experts across disciplines to provide perspectives in formulating consensus definitions that reflect current science for many of these terms. The goal of the consensus panels 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 in the target host, all product formulations must deliver an efficacious level of substance and must be clearly 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

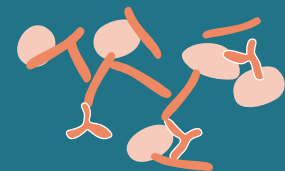
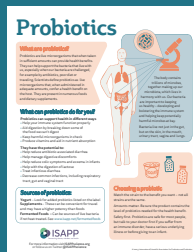
**Live microbes present?** Yes

**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. Sufficient viability to deliver the health benefit 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)

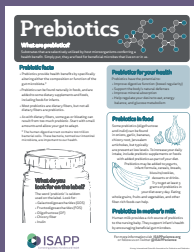
**Simple way to conceptualize** Food for beneficial microbes residing on or within the host

**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

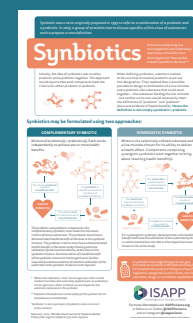
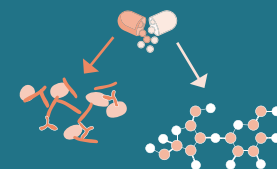
Synergistic synbiotic contains a live microbe and a substrate that it can use for growth

**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)

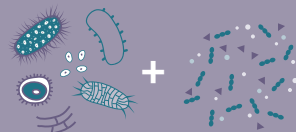
**Simple way to conceptualize** Non-viable microbes and/or cell components with or without metabolites

**Live microbes present?** No. Live microbes are the starting point to make a postbiotic, but they are intentionally inactivated

**Demonstrated health benefit required?** Yes

**Examples** Some infant formulas, therapeutic bacterial lysates and yeast fermentates used in animal feeds

**Keep in mind** Purified metabolites (e.g., butyric acid) 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** 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?** No

**Examples** Yogurt, kefir, sauerkraut, sourdough bread

**Keep in mind** Microbes present not required to be defined and may be live or dead



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