

# The Dietitian's Prebiotic Probiotic Toolbox

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## Introduction

We now accept that our bodies' residents are primarily microbial cells with the most plentiful population residing in our gut. Studies continue to proliferate that reveal how the microbes initiate positive changes, support, and sustain our health. Each day your clients, students, co-workers, and journalists are exposed to commentaries, articles, and press releases that report and discuss human microbiome studies and the use of prebiotics and probiotics. Then you, as a registered dietitian and nutrition expert, may be asked whether you endorse or recommend a specific microbe as a probiotic or whether you would recommend a particular food or ingredient as a prebiotic.

The purpose of this paper is to give you tools to use when advising, answering questions, and identifying probiotics and prebiotics.

## Probiotics

### Tool - Definition

In 2001 the FAO/WHO defined probiotics as "Live microorganisms, which when administered in adequate amounts, confer a health benefit on the host." (1)

The FAO/WHO definition for probiotics was updated with a minor grammatical correction in 2014 (2) to "live microorganisms **that**, when administered in adequate amounts, confer a health benefit on the host." But basically, the definition has been unchanged as to meaning since 2001. Take note of the phrase "*confer a health benefit*" because in order to qualify as a probiotic, its health benefit must be proven.

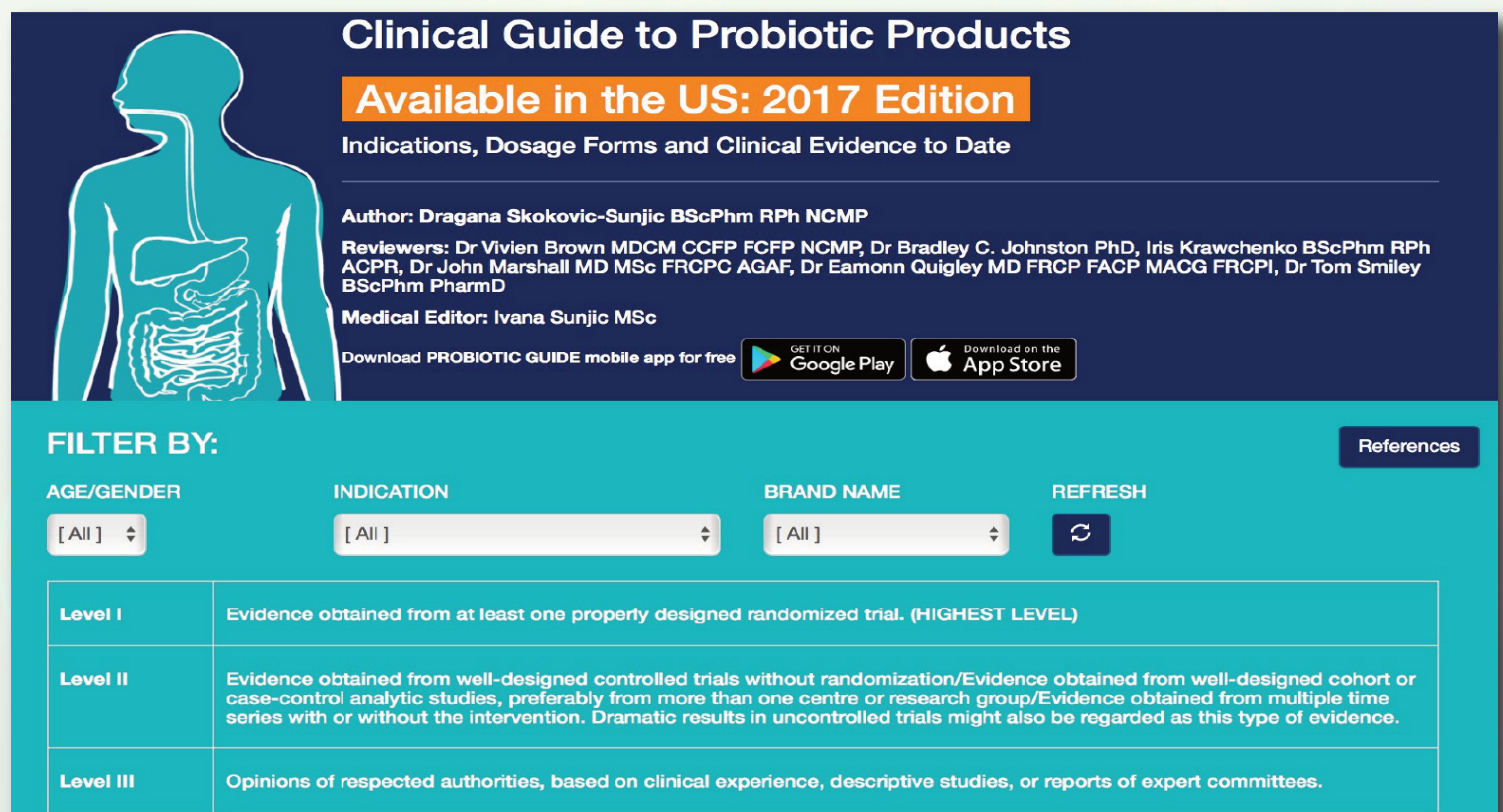
In December 2017, the International Probiotics Association (IPA) submitted a request to the Codex Committee of FAO/WHO to harmonize probiotic guidelines for use in foods and dietary supplements. The request asks for "harmonization on a broader scale, including the many modern aspects of probiotics manufacturing, in addition to establishing unambiguous identification, characterization, safety, and efficacy."

Until the committee codifies the standards, we are still working with the following criteria. We know that microorganisms meet probiotic criteria when they:

- Are not harmful (pathogenic)
- Remain viable during processing and shelf life
- Survive digestion
- Are able to bring about a response in the gut
- Are associated with health benefits<sup>(3)</sup>

### Tool - Clinical Guide to Probiotic Products for the US

This is a useful tool for recommending probiotic use presently available for dietitians. It is focused on specific health conditions. You can use it to identify probiotics which have been studied and have met the criteria of providing a health benefit. It is essential for evaluating and identifying a probiotic and more specifically the individual strain. It is available on the internet and as a smartphone app. <http://usprobioticguide.com>.



**Clinical Guide to Probiotic Products**

**Available in the US: 2017 Edition**

Indications, Dosage Forms and Clinical Evidence to Date

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References

<b>Level I</b>	Evidence obtained from at least one properly designed randomized trial. (HIGHEST LEVEL)
<b>Level II</b>	Evidence obtained from well-designed controlled trials without randomization/Evidence obtained from well-designed cohort or case-control analytic studies, preferably from more than one centre or research group/Evidence obtained from multiple time series with or without the intervention. Dramatic results in uncontrolled trials might also be regarded as this type of evidence.
<b>Level III</b>	Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees.

You will need to take some time to become familiar with the tool before you use it with clients.

*Scenario: You are a practicing dietitian who receives an inquiry from a young mother whose main concern is her preschool child's diarrhea due to antibiotic use. She inquires if you can recommend a therapy that will reduce the incidence and allow her to take her child to preschool.*

Select Age and choose *Children* then select Indication and choose *Antibiotic associated diarrhea*. Probiotics and functional foods with added probiotics will display. The table shows brand name, strain, dosage form, CFU/dose, number of doses per day, and indications with reference links that support the probiotic's use. The references appear in a pop-up window when you click on the link. Displayed below is one of the many products, to illustrate how the table works:

INDICATION FOR PEDIATRIC HEALTH																		
Brand Name	Probiotic Strain	Dosage Form	CFU/Dose	No. of Doses/Day	Regurg/GI Mot	Colic	ID	AAD	CDAD	IBD-UC	HP	C	FAP	IBS	CID	NI	CE/AD	OH
Culturelle® Kids Chewables (>3 years of age)	<i>L. rhamnosus</i> GG	Chewable tablet	5B/chew. tablet	1-2 chew. tablets			85-90	91,92					93,94	93,94		95	96-102	

\* - Product requires refrigeration

### Tool - Probiotics for Healthy People

Humans have the opportunity to support a large, diverse gut ecosystem for the better by what they eat. For clients who do not have a clinical condition, a new tool for counseling healthy people has been developed by the International Scientific Association for Probiotics and Prebiotics (ISAPP). Importantly, it contains good advice for clients on using food sources for probiotics and prebiotics. Recommending these foods as a part of

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The infographic advises:

“Consuming live microbes may help your immune system develop properly and help sustain a robust microbiota as you age. Include as part of your healthy diet:

- Fermented foods that contain live microbes
- Probiotic-containing foods
- Prebiotics and fiber, which can feed your microbes.”

The infographic is available at: <http://bit.ly/2CkFVxk>.

## Prebiotics

### Tool - Prebiotic Definition

In 2017, ISAPP published a consensus statement on the definition and scope of prebiotics.<sup>(4)</sup> The panel led by Dr. Glenn Gibson updated the definition of a prebiotic: a substrate that is selectively utilized by host microorganisms conferring a health benefit. The new concept developed by the ISAPP allows for more substances that are being studied and identified as having a prebiotic function. This means in the future you may see the inclusion of non-carbohydrate substances and diverse categories other than food. A review of the paper is recommended to understand what this means for the future. The paper also includes a history of the evolution of the definition since 1995.<sup>(5)</sup>

Prebiotic fibers are not digested by human digestive enzymes in the upper small intestine; thus, they travel down to the large intestine where they are primarily fermented by the colonic microbes. This process stimulates and promotes activity of beneficial gut bacteria. Ingesting prebiotics is a practical way of manipulating the microbiota since they increase the beneficial bacteria population in the gut, especially bifidobacteria.

Prebiotic non-digestible fibers are components of the healthiest foods on the planet — natural plant foods. However, in order to reach prebiotic status, the food needs to have been either analyzed for prebiotic content, for example inulin, or studied in humans where they demonstrated a prebiotic effect. The prebiotic effect most commonly measured is an increase in the healthful bacteria.

### Tool - Gut Insight's Prebiotic Food Sources

You will often see web articles with listings of prebiotic foods with no scientific documentation of prebiotic function. *Gut Insight* includes a listing of prebiotic food sources that have supporting scientific articles. In addition, the book's website has an updated list of foods with their references. Common foods on the list are bananas, onions, garlic, and artichokes. Less common foods are Jerusalem artichokes, burdock, and salsify. See the Resources link on GutInsight.com. (<http://www.gutinsight.com/resources.html>)<sup>(3)</sup>

### Tool - Prebiotic Fiber as a Functional Ingredient in Foods and Supplements

Prebiotic intake can be augmented with supplements or eating foods with prebiotic fiber added as a functional ingredient. When recommending prebiotic supplements, for example inulin, advise beginning with a small dose and increasing to tolerance, aiming for a total of 5gm/day. Signs of intolerance are primarily flatulence and bloating. The daily total should include the inulin added to foods as a functional ingredient.

Look for this nomenclature in the ingredient listing of foods and supplements: Inulin, Chicory fiber, Agave fiber, Yacon fiber, Oligofructose (OF), Galacto-oligosaccharides (GOS), and Fructo-oligosaccharides (FOS).



## Summary

The use of the above tools will fortify your knowledge and enhance your counseling and communication skills. But stay tuned since the study of probiotics and prebiotics is a dynamic field of research.

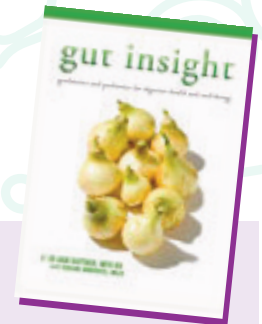
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## Focus on Resources

Hattner JAT, Anderes S. *Gut Insight: probiotics and prebiotics for digestive health and well-being*. San Francisco: Hattner Nutrition; 2009. <http://www.gutinsight.com>, [facebook.com/Gut-Insight](https://www.facebook.com/Gut-Insight), and [twitter.com/GutInsight](https://twitter.com/GutInsight).

The book provides a unique scientifically-based guide on the use of food for digestive health. A well referenced book, it is enjoyed by consumers and used as a reference by health professionals.



**Jo Ann Tatum Hattner MPH, RDN** is a skilled communicator of science-based information. As the author of *Gut Insight: Probiotics & Prebiotics for Digestive Health and Well-Being* she provides a scientifically-based, user-friendly guide for both the consumer and the health professional. As an invited speaker at national and state meetings of nutritionists, physicians, nurse practitioners and other professionals, she focuses her presentations on Gut Health, Pre- and Probiotic topics best suited for her audience.

Having worked as a clinical dietitian at Stanford Medical Center, her specialty interests include digestive health, the science and application of probiotics and prebiotics throughout the life cycle, and maternal and child health. Her expertise in gut health has resulted in numerous interviews and published articles on the subject, as well as regular presentations at scientific meetings. As the owner of Hattner Nutrition, a nutrition consulting business, she provides science-based nutrition services to agricultural and food



**Susan Anderes, MLIS**, combines a life-long interest in nutrition with professional experience in library research. Having worked in Stanford University's medical library, she relishes the hunt for nutrition information. Her work history includes developing and managing websites for online nutrition courses at Stanford Medical School.