

FOOD INTOLERANCE NETWORK FACTSHEET

Probiotics

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Introduction

The beneficial effects of probiotics have only recently been accepted in mainstream medicine, and are currently the subject of numerous studies.

Probiotics are live microorganisms – mostly bacteria - that are largely identical to the beneficial microorganisms found in the human gut. Some probiotic foods such as fermented foods and cultured milk products have been used for centuries. Probiotics are often lactic acid bacteria from the *Lactobacillus* or *Bifidobacterium* groups. Within each group, there are different species such as *Lactobacillus acidophilus* and *Bifidobacterium bifidus*, and within each species there are different strains or varieties. Less commonly, probiotics such as *Saccharomyces boulardii* are yeasts, which are different from bacteria.

It is becoming obvious in medical research that some strains are more beneficial than others, with effectiveness depending on a number of factors, so there is currently a great deal of confusion about which probiotics are best and whether they should be recommended for certain conditions.

With the recent discovery that antibiotics can have a much more devastating effect on friendly bacteria in the gut than previously realised (1) it seems likely that probiotics will soon become more widely used.

Although probiotics are generally thought to be safe, there are some concerns about the risk of infection from probiotics for people with compromised immune systems or integrity of the intestinal mucosa, and in the presence of a central venous catheter (2,3).

Probiotics and the elimination diet

Probiotics - as freeze dried capsules, in yoghurt, kefir or other fermented products - are not suitable for use during the strict elimination phase of the RPAH Elimination Diet as they are likely to contain biogenic amines (3). Note that yoghurt which was previously permitted on the strict elimination diet has recently been upgraded to moderate in amines.

Amine responders can trial probiotics as a challenge following the elimination diet, by using a diet and symptom diary and otherwise sticking to the diet. For people who need to avoid dairy products, it is essential to use a dairy-free source of probiotics.

Probiotics and Irritable bowel symptoms

There is strong evidence that probiotics may be beneficial for the prevention of antibiotic-associated diarrhoea (2,4,5) and traveller's diarrhoea (6), but studies regarding probiotics for IBS have produced contradictory results (7,8).

It is now understood that individual gut flora varies and that for a particular patient, effectiveness may depend on the strain, the size of the dose and the condition. Despite variable results, irritable bowel specialist and Manchester University Professor Peter Whorwell considers that probiotics are 'worth trying' due to their beneficial effect on bloating (9,10). Eating commercial yoghurt containing common live cultures appears to be less effective than taking probiotic capsules for the prevention of antibiotic-associated diarrhoea (11). Probiotics that have been useful for antibiotic associated and traveller's diarrhoea include *Lactobacillus GG*, *Bacillus coagulans*, *Lactobacillus plantarum*, *Saccharomyces boulardii* and a mixture of *Lactobacillus acidophilus* and *Bifidobacterium bifidum* (2,4,5,6).

Probiotics for the prevention or treatment of allergy

Early studies showing that childhood eczema could be reduced by probiotics (12,13) raised hopes of a cure for the current allergy epidemic and treatment of allergic conditions but a meta analysis of studies using a wide range of probiotics on a wide range of conditions failed to show clear preventive effects and there were no benefits for any other form of allergy than eczema (14). Most studies reporting significant benefits used probiotic supplements containing *Lactobacillus rhamnosus* (13, 14).

Reader reports

[981] Reflux and GI issues: dairy free probiotic made a huge difference (October 2010)

I was just reading in your newsletter a reference to probiotics and thought I would share my daughter's story briefly. In short, she was diagnosed with dairy allergy at 8 weeks, and was finally skin prick tested at 12 months (after Dr's said it would never show up). She had a huge reaction to the skin prick and was promptly issued with an epipen etc. She is also allergic to soy. Her very understanding and experienced gastroenterologist (she has reflux and GI issues as well) suggested that *Lactobacillus GG* (available in Aust in Vaalia Yoghurt only) had been shown to assist resolution to food allergy. We imported some from the US (called Culturelle there) and she tolerated it very poorly. Her Dr found out that there was a tiny trace of dairy and this reacted with my daughter.

At the end of last year, in desperation because my daughter's quality of life was so poor, we thought we would give Inner Health Plus dairy free a go. It made an enormous difference to her- she started eating again and was not in constant pain. Today she was skin prick tested again with no reaction to dairy. We are about to do patch tests to look for non IG-E allergies- but this is at least a step in the right direction. As dairy allergy is largely outgrown by the age of four, it could just be a natural resolution, but I wonder if the probiotics helped, because it certainly made a huge difference to her life in many other ways. – Sara, by email

[980] Probiotics seemed to change son's behaviour and tolerance (October 2010)

The introduction of VSL#3 probiotic seems to have changed my 6 yo son's behaviour and tolerance. The teachers noticed the difference in his learning at school and we too noticed his improvement at home. - by email, NSW

[979] Couldn't tolerate probiotics due to amines (October 2010)

I am using the RPA diet for management of chronic UTI pain and have found I am extremely sensitive to everything. I used the VSL#3 (probiotic) again) and bammm - burning pain. I think I have learnt my lesson. Just the diet nothing else. - by email, Sydney

[978] Probiotics for antibiotic-associated diarrhoea (October 2010)

After a course of antibiotics I had diarrhoea for weeks but probiotics (Inner Health) sorted me out in a week. - by email, Qld

Probiotic strains in brands mentioned by readers (note contents may change with new formulations)

Inner Health Plus Dairy Free

Lactobacillus Acidophilus

Bifidobacterium Lactis

Inner Health for Kids

Lactobacillus Rhamnosus GG

Lactobacillus Acidophilus

Bifidobacterium Lactis

<http://innerhealth.com.au/content/product/inner-health-for-kids>

VSL#3

Bifidobacterium breve

Bifidobacterium longum

Bifidobacterium infantis

Lactobacillus acidophilus

Lactobacillus plantarum

Lactobacillus paracasei

Lactobacillus delbrueckii subspecies bulgaricus

Streptococcus thermophilus

Scientific references

1. Dethlefsen L, Relman DA. Microbes and Health Sackler Colloquium: Incomplete recovery and individualized responses of the human distal gut microbiota to repeated antibiotic perturbation. Proc Natl Acad Sci U S A. 2010 Sep 16.

In this study from Stanford University in California, more than 50 stool samples were collected from three healthy volunteers over a 10-month period that included two 5-day courses of the antibiotic ciprofloxacin (considered more bowel-friendly than most antibiotics). Microbial strains present in each sample were identified by gene sequencing. Researchers found that the unique set of microbial flora in each person was disrupted by each course of antibiotics despite a lack of symptoms such as diarrhoea and some strains were permanently altered by the end of the trial. Each round of antibiotics is a roll of the dice that could lead to lasting changes in a person's gut microbes, the full consequences of which remain unknown, say the researchers who recommend that antibiotics should be used only when truly necessary.

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2586385/?tool=pubmed>

2. Doron SI and others. Probiotics for prevention of antibiotic-associated diarrhea. *J Clin Gastroenterol.* 2008;42 Suppl 2:S58-63. Lactobacillus GG, Saccharomyces boulardii, and certain probiotic mixtures have been shown to be effective for prevention of AAD in adults. In children, Lactobacillus GG, Bacillus coagulans, and S. boulardii appeared to be most effective. Probiotics are generally thought to be safe, however, they should be used with caution in patients who have compromise of either the immune system or the integrity of the intestinal mucosa, and in the presence of a central venous catheter.
<http://www.ncbi.nlm.nih.gov/pubmed/18542041>
3. Mullan WMA. (2002) . Probiotic microorganisms in food. Properties, benefits, safety and enumeration - European Community Regulation no 1924/2006 and health and nutrition claims. [On-line]. Available from: <http://www.dairyscience.info/probiotics/50-probiotics.html?start=14>. Accessed: 8 November, 2010. last update December 2008. On page 8, this article discusses how some lactic acid bacteria can produce biogenic amines such as putrescine, cadaverine, histamine, tyramine and 2-phenylethylamine, which can cause reactions in people with reduced monoamine oxidase (MAO) activity like us or those taking MAO inhibitors. According to Mullan, if strains are screened properly biogenic amine formation should not be a problem.
4. Kale-Pradhan PB and others. Role of Lactobacillus in the prevention of antibiotic-associated diarrhea: a meta-analysis. *Pharmacotherapy.* 2010;30(2):119-26. The use of a Lactobacillus single-agent in varying doses throughout the entire antibiotic treatment (5-14 days) reduced the risk of developing antibiotic associated diarrhoea compared with placebo in adults but not children.
5. Lönnermark E and others. Intake of Lactobacillus plantarum reduces certain gastrointestinal symptoms during treatment with antibiotics. *J Clin Gastroenterol.* 2010;44(2):106-12. This study showed that intake of L. plantarum could have a preventive effect on milder gastrointestinal symptoms during treatment with antibiotics.
6. McFarland LV. Meta-analysis of probiotics for the prevention of traveler's diarrhea. *Travel Med Infect Dis.* 2007;5(2):97-105. Probiotics were found to significantly prevent traveller's diarrhoea, in particular Saccharomyces boulardii and a mixture of Lactobacillus acidophilus and Bifidobacterium bifidum.
7. McFarland LV, Dublin S. Meta-analysis of probiotics for the treatment of irritable bowel syndrome. *World J Gastroenterol.* 2008;14(17):2650-61. Studies of probiotics for IBS have yielded contradictory results, which may be due to a variety of factors: small sample size; variability in trial design; heterogeneity of probiotic strain, dose and treatment duration; and patient characteristics. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2709042/?tool=pubmed>
8. McFarland LV. Systematic review and meta-analysis of Saccharomyces boulardii in adult patients. *World J Gastroenterol.* 2010;16(18):2202-22. In adults, Saccharomyces boulardii (S. boulardii) can be strongly recommended for the prevention of antibiotic associated diarrhoea and traveler's diarrhea; S. boulardii also shows promise for the prevention of C. difficile disease recurrences; treatment of irritable bowel syndrome, acute adult diarrhea, Crohn's disease, giardiasis, and human immunodeficiency virus-related diarrhea.
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2868213/?tool=pubmed>
9. Agrawal A and others. Clinical trial: the effects of a fermented milk product containing Bifidobacterium lactis DN-173-010 on abdominal distension and gastrointestinal transit in irritable bowel syndrome with constipation. *Aliment Pharmacol Ther.* This study showed that this particular probiotic was helpful for symptoms of bloating and distension.
<http://www.ncbi.nlm.nih.gov/pubmed/18801055?dopt=Abstract&holding=ngp>

10. Whorwell PJ and others. Efficacy of an encapsulated probiotic Bifidobacterium infantis 35624 in women with irritable bowel syndrome. Am J Gastroenterol. 2006 Jul;101(7):1581-90.

A four week trial of freeze dried Bifidobacterium infantis 35624 at three dose levels for 362 women with irritable bowel symptoms found that the middle dose (1 x 10⁸) cfu was significantly superior to placebo and the higher and lower bifidobacterium doses for abdominal pain, bloating, bowel dysfunction, incomplete evacuation, straining, and the passage of gas. These researchers say 'probiotics are worth a try' but note that not all species or dosage will necessarily have the same therapeutic potential in a particular condition.

11. Conway S and others, Does eating yogurt prevent antibiotic-associated diarrhoea? A placebo-controlled randomised controlled trial in general practice. Br J Gen Pract. 2007;57(545):953-9. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2084134/?tool=pubmed>

12. Weston S and others. Effects of probiotics on atopic dermatitis: a randomised controlled trial. Arch Dis Child. 2005;90(9):892-7. Fifty six children with moderate or severe atopic dermatitis were given a probiotic (1x10⁹) Lactobacillus fermentum VRI-033 PCC; Probiomix) or an equivalent volume of placebo, twice daily for 8 weeks. The probiotic supplement was found to be beneficial in improving the extent and severity in young children with moderate or severe atopic dermatitis.

13. Wickens K and others. A differential effect of 2 probiotics in the prevention of eczema and atopy: a double-blind, randomized, placebo-controlled trial. J Allergy Clin Immunol. 2008;122(4):788-94. This Wellington NZ based study was a double-blind, randomized placebo-controlled trial of nearly 500 infants at risk of allergic disease. Pregnant women were randomized to take Lactobacillus rhamnosus HN001 (L rhamnosus), Bifidobacterium animalis subsp lactis strain HN019 or placebo daily from 35 weeks gestation until 6 months if breast-feeding, and their infants were randomized to receive the same treatment from birth to 2 years. The researchers found that supplementation with L rhamnosus, but not B animalis subsp lactis, substantially reduced the cumulative prevalence of eczema, but not atopy, by the age of 2 years.

14. Osborn DA, Sinn JK. Probiotics in infants for prevention of allergic disease and food hypersensitivity. Cochrane Database Syst Rev. 2007;(4):CD006475. Meta-analysis of five studies reporting the outcomes of 1477 infants found a significant reduction in infant eczema. However, when the analysis was restricted to studies reporting atopic eczema (confirmed by skin prick test or specific IgE), the findings were no longer significant. All studies reporting significant benefits used probiotic supplements containing L. rhamnosus and enrolled infants at high risk of allergy. No other benefits were reported for any other allergic disease or food hypersensitivity outcome. <http://www.ncbi.nlm.nih.gov/pubmed/17943912>

More information

[Introduction to food intolerance](#)

Books by Sue Dengate: Fed Up and The Failsafe Cookbook by Sue Dengate, available in libraries and bookstores and at www.fedup.com.au

www.fedup.com.au

The information given is not intended as medical advice. Always consult with your doctor for underlying illness. Before beginning dietary investigation, consult a dietician with an interest in food intolerance. You can write for our list of supportive dietitians (confoodnet@ozemail.com.au)

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