FITTER FORT COLLINS
YOUR HEALTH MATTERS

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About Prebiotics and Probiotics

The importance of digestive health and the role of prebiotics and probiotics in the body has been ignored until just recently. The following information will give readers a basic understanding on the subject.

What are probiotics?
Probiotics are beneficial microorganisms residing in your intestinal tract. They manufacture vitamins and empower enzymes that maximize food assimilation and digestion. Probiotics are an amazing fighting force by depriving undesirable bacteria of nourishment thus preventing their growth. Probiotics attack specific pathogens by changing your body's alkaline balance.

Probiotic organisms prevent disease; even treat infections by restoring micro-organisms in your intestinal tract. For optimal health your body must maintain an ecological balance of these bacteria's. Our modern lifestyle often destroys normal body balance. Many health experts say most people have around 15% "good" bacteria and 85% "bad" bacteria and it should be the other way around for optimal health.

What probiotics can do for you:
- Boost immune response
- Detoxify the intestinal tract by protecting intestinal mucosa levels
- Develop a barrier to food-born allergies
- Neutralize antibiotic-resistant strains of bacteria
- Reduce cancer risk
- Reduce risks of inflammatory diseases like: irritable bowel syndrome (IBS), leaky gut, diverticulitis, Crohn's disease, and colitis
- Prevents diarrhea by improving digestion of proteins and fats.

Probiotic or fermented foods include: sauerkraut, kimchi, kombucha, blue green algae, spirulina, chlorella, miso, tempeh, kefir (I recommend dairy free), and superior probiotic supplements.

What are prebiotics?
Prebiotics are foods that support probiotics, that are the beneficial bacteria in the intestines. Prebiotics are classified as fiber compounds that are found in certain foods called oligosaccharides, fructo-oligosaccharides, inulin and polysaccharides.

Prebiotic foods include: high fiber foods such as whole grains, fruits, vegetables, nuts, seeds, herbs, and spices.

How do prebiotics work together with probiotics to improve health?
While probiotic benefits have become more widely known in recent years, especially with the growing popularity of fermented foods like sauerkraut, kombucha and kimchi; prebiotics still remain under the radar. All types of fiber that we get from eating whole plant foods play a major role in nutrient absorption, gut, and digestive health. Prebiotics, together with probiotics and open the door for heightened levels of better health.

How does it work exactly?
As prebiotics (fiber compounds) make their way through the stomach without being broken down by either gastric acids or digestive enzymes, they bring about positive changes in the digestive tract and organs. Essentially, prebiotic compounds become nutrient sources, or "fuel" for the beneficial bacteria that live within your gut. Prebiotics work together with probiotics (selectively fermented ingredients that produce beneficial bacteria) to allow specific changes to take place, both in the composition and activity of the gastrointestinal system. They play a fundamental role in preserving health by maintaining the balance and diversity of intestinal bacteria, especially increasing the presence of "good bacteria." Because the health of our gut is closely tied to many other bodily functions, prebiotics and probiotics together are important for battling inflammation and lowering overall disease risk.

Higher intakes of prebiotics are linked to benefits including:
- Lower risk for cardiovascular disease
- Healthier cholesterol levels
- Better gut health
- Improved digestion
- Lower stress response
- Better hormonal balance
- Higher immune function
- Lower risk for obesity and weight gain
- Lower inflammation and autoimmune reactions

What are NOT probiotics? Fermented Foods and here's why.
The early definitions of probiotics were inclusive of traditional fermented foods such as yogurt, sauerkraut, and kefir, but the most recent interpretation of the definition has, somewhat controversially, excluded these traditional ferments. These are now considered food sources of "live and active cultures", but not probiotics.

The reasoning behind this decision, largely in part due to supplement marketing, is that these foods are of undefined microbial content. Species, strains and strain composition can differ from batch to batch, as can bacterial counts. It is for these reasons that traditional fermented foods (wild ferments) cannot be relied upon for specific therapeutic effects in the same way that probiotic preparations containing defined strains, with characterized clinical effects, and tested doses can.

How much fermented food do you need?
Not much. Most serving labels on sauerkrauts, kimchi, relishes or other ferments are two tablespoons. Most healthy cultures take a small amount of fermented food at each meal.

What are the measurement standards of probiotics?
Probiotics are measured in colony forming units (CFU). CFUs are generally measured in the millions or billions per serving. Probiotics are most commonly beneficial bacteria, but can also be friendly fungal or other organisms, that are typically freeze dried to stabilize them in an inert state during storage and production. Then their continued stability and viability, as measured by CFU counts when cultured, is dependent on limiting their exposure to stimulating environmental conditions such as warmth and moisture. Besides refrigeration, this protection can be done by packaging in glass, as well as by adding freshness packets that help to absorb and reduce moisture in the package.

Stability of Probiotics
Temperature plays a role in the stability of probiotics. Colder air holds less moisture and is not in the ideal temperature range for bacteria to commonly grow and thrive, thus inhibiting reactivation of the dormant organisms by depriving them of the warmth and moisture that represent their ideal growing conditions. High heat can also degrade the viability of these organisms.

Even under ideal storage conditions, the number of colony forming units will slowly decline as months go on. A typical decline is a drop of 5% per month when packed in glass and not refrigerated. Refrigeration will prolong the potency and viability of most probiotics to maintain higher counts over a longer period of time.

Maintaining Potency

In order to meet label claims for probiotic CFU numbers, manufacturers generally add an overage to allow for the natural decline in numbers over time. Manufacturers test to assure that the product meets specifications and label claims in terms of potency (CFUs) at the time of manufacturing. Stability studies utilizing the strains, potencies, and designated packaging for a specific product are also done as needed to generate data to calculate an experimental stability curve that predicts changing CFU counts throughout the shelf life of the product. However, the actual rate of change depends on the environment that the product is exposed to, especially if not kept refrigerated. The rate of decline in viable CFU numbers can increase if a probiotic product is held in conditions that are very warm or moist, especially after opening when moisture can more easily get into the package. Because of the extreme variability of the seasonal weather and environmental conditions that a product may experience, and duration of these exposures, it's not possible to precisely predict potency and shelf life accurately for every person's situation across a wide geographical area. In some cases, it could happen that adverse conditions may lower probiotic counts below label claim. Refrigeration is ideal for storing probiotics. But if that is not possible, it is best to keep the package in a cool, dry place to maintain good stability. Unfortunately, many people tend to keep their supplements in the kitchen or bathroom, which are notorious for being warm and moist and known to shorten the shelf life of many kinds of supplements. Those conditions are ideal for bacterial and mold growth; which means that the probiotics will first tend to activate but then die off more quickly than expected since they are not yet in the human body where they have a chance to live, grow, and thrive. In these adverse conditions, probiotics may lose potency more rapidly than anticipated and thus may not meet label claims for CFU counts that are calculated based on a cool, dry place. On the other hand, refrigerating probiotic products will enhance viability and shelf life.

Testing of Probiotics

In testing designed to mimic exposures during transportation in a hot climate, a sealed probiotic formula exposed to a temperature of over 122° F for 24 hours still met label claim for CFU content. This indicates that this level of heat over that time period was not enough to kill many of the organisms in the package, so it would take even harsher conditions to rapidly degrade the potency of this specific probiotic product.

The stability of a probiotic formula tested at the time of manufacture will depend on a combination of factors. Variations in packaging, temperature, and humidity will affect the viability of probiotic products before they are taken. Protective factors that help to preserve the freshness and viability of the probiotic strains in a supplement include refrigeration, resistant packaging, and storage in a cool, dry place.

What exactly are probiotic organisms?

To better understand probiotic strains, it is important to first be clear on how bacteria are named. *Genus* is the first name of a bacterium (e.g., Lactobacillus). It is somewhat general and refers to a grouping of organisms based on similarity of qualities, such as physical characteristics, metabolic end-products and metabolic requirements. *Species* is a bacterium's second name (e.g., rhamnosus). It is a much more narrow classification based on shared common features that distinguish them from other species with that genus. *Strain* is an even more specific classification that distributes members of the same species into subgroups based on one or more properties that these bacteria have that are distinct from other members of the species.

An analogy that helps to conceptualize this bacterial classification system is that of dogs. Strains of bacteria within a given species can be likened to different breeds of dogs. All dogs belong to the *genus* Canis and the *species* familiaris. But as we know, within this one species there is great diversity

in shape, size, strength, fur length, and other physical characteristics; ranging from the two extremes – the Irish wolfhound and the Chihuahua. A similar division occurs within species of bacteria, where there will be a multitude of strains in any given species.

Can probiotics bloat you?
Some people are more sensitive to probiotics. This can be a sign of a leaky gut problem. Make sure the probiotic is free of dairy, gluten and soy. Try going with a lower dose of probiotic and upping the dose every 4 - 6 weeks to build up a tolerance.

The Importance of Balanced Gut Flora
Inside our digestive tract, we have somewhere around 100 trillion bacteria happily living in us. We're like a giant high-rise building, and the bacteria are our tenants. About 7 pounds of "you" is really bacteria that live in your intestines, from your mouth to the other end. Keeping the resident population of bacteria and other microbes in our intestinal tract balanced and beneficial is essential for good health. Nutritional science is learning that our population of gut bacteria interacts with our body in many remarkable ways, from stimulating our immune system to producing neurotransmitter molecules that ride the bloodstream up to the brain and influence our very thoughts and moods. A healthy population of normal gut microbes helps to prevent unfriendly bacteria and yeast from injuring the intestinal wall, which can result in increased intestinal permeability – the so-called "leaky-gut syndrome." This can, in turn, lead to severe inflammation and autoimmune diseases that can damage vital organs and even threaten our lives.

Consequently, keeping our gut flora balanced and beneficial is essential and ingesting a preparation containing health-enhancing bacteria can be a timely strategy (along with a whole-food, plant-based diet).

The bacteria in our intestines are originally common soil bacteria. How do they get into our guts? Humans used to live Earth-connected lives, foraging for roots and tubers, digging them up covered with soil bacteria and usually eating them unwashed. We, too, drank from streams and rivers like other animals. Thus, we constantly refreshed our soil-born gut bacteria population. Our ancestors never swallowed probiotic capsules – Nature provided it free of charge. But modern life, far from replenishing and nourishing our gut flora, is an assault on our intestinal microbial populations.

What kills gut flora?
- Drinking water treated with chlorine. (I am not against chlorinating the water supply – I do not want to be treating cases of typhoid fever or cholera. But every drink of tap water contains chlorine – specifically added to kill bacteria. Our produce fruits and vegetables are washed in chlorinated water. Not "gut flora friendly," to say the least.
- Soft drinks (colas, etc.) are often made with phosphoric acid, which gives them their "bite" on the tongue. Phosphoric acid kills microbes – and gut wall cells.
- Coffee oils that give coffee its taste is quite harsh on bacteria
- Alcohol - the glass of wine, that mug of beer may taste good, but, think about it: in the hospital, we dip our surgical instruments into alcohol to kill bacteria – and, yet, people drink it as a recreational beverage. Alcohol in the concentrations that people commonly drink kills every cell – plant or animal – that it touches.
- Herbicides on plants foods - molecules intentionally designed to chemically injure plant cells. Most of the microbes in your gut share the same cell machinery as true plants - cell walls, chromosomes, etc. So, herbicides on foods can damage microbe balance too.
- Antibiotics from doctor's prescriptions – often requested by the patient and dispensed reluctantly by the doctor for viral infections not affected by antibiotics.
- Antimicrobials in the meats from factory-farmed animals is a problem, unbalancing our gut microbes and spawning antibiotic-resistant "super-bugs."
- High sugar or processed diet

- Low fiber diet
- High acid diet

Because of poor gut flora, the following can happen when the normal inhabitants are killed off:
- High Yeast
- Compromised immunity
- Unfriendly bacteria and other microbes

Unfriendly yeast, bacteria and other microbes can set up housekeeping along and within the intestinal wall and then proceed to damage that intestinal barrier, leading to the “leaky gut” syndrome and all the inflammatory conditions that arise from that condition.

How do I keep my gut flora healthy?
Maintain a plant based diet and at each meal have a small amount of fermented food. You will likely opt to purchase a high quality probiotic supplement and take it once or twice per day.

When to take probiotics
Debate on when to take probiotic supplements is ongoing. Many recommend taking it with food when the stomach is more alkaline, or at times in the day when body alkalinity is higher. The times of the day the body is most alkaline is mid-day and evening.

Fermented foods for centuries have been included in most cultures as a small part of each meal.

What if my gut flora gets disrupted?
Antibiotics, colonoscopy, surgery, a harsh illness, etc. Follow the 4 steps to heal leaky gut protocol. Follow the protocol for 90 days.

Digestive enzymes. These will help make sure your food is fully broken down, allowing for better nutrient absorption, but also for preventing undigested food particles slipping through your leaky gut and into your blood. 2 - 4 caplets before meals. Purchase dairy and gluten free enzymes.

L- Glutamine. 1,000 mg between meals. Helps heal and protect your gut lining from potential gut damaging foods.

Quercetin. 1,000 mg after meals 3 x per day. Helps improve gut barrier function by sealing the gut because it supports creation of tight junction proteins. It also stabilizes and reduces the release of histamine, which is common in food intolerance.

Licorice Root. 500 mg 2 x daily after morning and evening meal. Helps balance cortisol levels and improves acid production in the stomach. Helps maintain mucosal lining of the stomach.

Probiotics. At least 15 billion count. Choose companies that you trust and know that use higher quality ingredients. Choose multiple bacterial strains.