Prebiotics:
Feeding Your Friendly Flora Naturally

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Dietary fiber is the most efficient food and energy source for the friendly bacteria native to the colon.

Thanks to better nutrition and better health care, a vast majority of the people the world over are enjoying better health and living longer. Despite these statistics, a sizeable portion of the population is affected with gastrointestinal problems without showing any distinct clinical symptoms. Increasing evidence suggests that this nondescript intestinal discomfort, and digestive problems associated with it, is due to an imbalance in the intestinal flora. The surfeit of over-the-counter digestive aids, mostly probiotics, bears testimony to this rather disturbing trend.

The human intestine is inhabited by billions of bacteria, both good or "benefiical" bacteria that promote intestinal health to humans, and harmful or "unfriendly" bacteria, which are detrimental to health. In the healthy intestine and functioning digestive system there is an intricate balance between friendly and unfriendly bacteria. When this balance is perturbed and the equilibrium shifts toward an excess of harmful bacteria, the red flag is raised. This imbalance in the intestinal ecology is referred to as dysbiosis.

There may be various reasons for dysbiosis. One of the most readily dicernible causes of dysbiosis is the use of antibiotics. Antibiotics are efficient "torpedoes" that specifically target microorganisms and other pathogens that invade the body in the wake of an infection. Antibiotics, however, are "equal opportunity" torpedoes. They not only destroy the offending microorganisms but they also eradicate beneficial bacteria with the same efficiency. By the time the antibiotic course is run, which ordinarily should last 10 days, people feel drained, exhausted and may have succumbed to antibiotic-associated diarrhea.

Children on antibiotics are particularly susceptible to antibiotic-associated diarrhea.[1] Diarrhea may resolve itself of its own accord, which it normally does especially in children, but the transient imbalance does exact a stiff toll. Left unto itself this imbalance could potentially disturb the intestinal "ecosystem" irrevocably. Epidemiological data suggest that many people do not complete the antibiotic regimen after their symptoms begin to relent. An incomplete antibiotic course in the long run becomes a two-edged sword. On the one hand the offending bacteria develop resistance to the antibiotics whereas the on the other, they colonize the intestine over time. In either case, it leads to undesirable consequences. Not only do antibiotic-resistant "Superbugs" develop thus, as is increasingly the case, but sub-acute dysbiosis also ensues. Aging individuals are much more likely to suffer from disturbance in the floral ecology and imbalance, which can eventually result in dysbiosis.

Persistent dysbiosis, even if it is sub-acute and therefore not clinically presented, can have serious consequences for health. For certain it causes digestive problems but it can

also lead to a weakened immune system. As the body loses its ability to cope with invading pathogens, a host of chronic conditions appear which on the surface have precious little to do with gastrointestinal disturbances. In other words, gastrointestinal health has far-reaching implications for general health.

Of late one of the approaches to anticipate and even prevent dysbiosis has been to supplement nutrition with products called probiotics. Probiotics are beneficial bacteria that are normally thought to inhabit the human intestine and the rationale of this remedy rests on the premise that ingestion of beneficial bacteria should maintain intestinal floral ecology. It is uncertain, however, whether live or attenuated bacteria can actually colonize the intestine. First it stands to reason that being live organisms, probiotics would not survive the rather harsh acidic environment in the stomach. Further, it has been argued that those organisms that do survive the stomach acid may have been sufficiently damaged, making it unlikely that they could possible colonize the intestine.[2]

What natural remedy may then support the intestinal flora? A more effective natural approach must be available which allows the body to restore intestinal balance naturally as a matter of course. In traditional societies of the Old World it has been known for generations that dietary measures can do wonders for intestinal health. Thus a more reliable approach to restore intestinal ecology is to provide the food and energy source as a dietary aid to stimulate growth and multiplication of beneficial bacterial indigenous to the intestine.[3] These dietary food and energy sources for the bacteria are called prebiotics. Prebiotics travel to the large intestine where they trigger the multiplication of beneficial bacteria already resident in the colon.

Dietary fiber is the most efficient food and energy source for the friendly bacteria native to the colon. Not all dietary fibers however, fit this bill. Specifically inulin is the most efficient food and energy source for the intestinal bacteria.

What is inulin, though? Inulin is a soluble fiber that cannot be digested by the human body. That is, it is absorbed intact and travels to the colon as fibrous material where it serves as the food source for the beneficial bacteria. Ordinarily bacteria are quite fastidious in their demands of food and energy sources. To initiate their growth and multiplication the beneficial bacteria require short-chain inulin. Initiation of their growth alone, however, is not nearly sufficient for the body to reap health benefits. The friendly bacteria must continue to multiply for a certain time in order for the beneficial chemicals, such as short-chain fatty acids and interferon-a, to be assimilated by the body.[4] Therefore, sustenance of bacterial multiplication requires medium and long-chain inulins as well. Further, not al linulins are created equal. Recently a proprietary blend of inulins isolated from Jerusalem artichoke, called InuFlora, has been formulated that not only improves digestive health but also restores floral balance in the intestine in addition to conferring long-term beneficial effects.[5] This is what makes inulins isolated from Jerusalem artichoke unique. A specialized manufacturing process allows recovery of inulins as randomly coiled chains. It is this structural property of inulins in InuFlora that not only distinguishes it from other inulins but also confers upon it the unique health benefits to be derived from it.

Among its unique properties is its pleasant and sweet taste. Since inulins are not metabolized, the glycemic index in the body is not affected. Hence unlike refined sugars that are metabolized, it does not change the insulin levels in the body. This has important implications for those suffering from high blood sugar, therefore it is perfectly safe for diabetics. Furthermore, structurally unique inulins from Jerusalem artichokes are ideal children's chewable nutritional supplements because they do not contribute to cavities while providing a superior taste. More important, since children are susceptible to contract a variety of infections in daycare centers and schools, these inulins are a healthy choice to overcome the deleterious effects of antibiotics. In addition, because they are not metabolized that do not have any caloric value. This is of considerable relevance, since there are concerns that our children are increasingly gaining weight and, disturbingly, are prone to developing symptoms of adult-type diabetes. Jerusalem artichoke inulins furnish the much-needed answer to keep our children healthy.

Inuflora is not just for children, however. As noted above, adults are just as much in need of a natural alternative to maintain the floral ecology and hold dysbiosis at bay. This unique mix of inulins with their specific structural properties make them a natural prebiotic that allows the body of use its own resources in restoration of the floral balance and a strengthened immune system. (*For a comprehensive review, see reference* [6])

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[6] Ahmed, A. *InuFlora: the Prebiotic of Choice,* Freedom Press, Topanga, California 1999.