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# Gardening Your Microbiome

## Fertilizing the Beneficial & Removing the Weeds

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### Gut = Garden: A Complex Ecosystem

I often use the analogy that the intestinal microbiome is like your backyard garden. When tended properly and regularly, it provides health and abundance. When tended to poorly or not at all, it becomes depleted, overrun and incapable of providing value. The flowers, herbs and/or vegetables you intend to grow are analogous to your beneficial bacteria a.k.a. your probiotics. Commensal bacteria and yeast, on the other hand, are best described as “weeds”. Weeds in the garden are always present to some degree and that is normal and a fact of life, but these weeds will completely take over if the garden & its soil is not tended to properly because they are opportunistic - and this creates a big problem within the garden. While some weeds have some peripheral benefit or purpose, an overgrowth of weeds will interfere with the growth of the vegetables and flowers you are trying to cultivate. To ensure a great return from their garden, a gardener must pay attention to the nutrient density of his/her soil as well as the plants’ access to sunlight and quality water. In our “internal garden”, we must tend similarly to our intestinal landscape: promote integrity of the intestinal lining, ensure it has the nutrients it needs to maintain & repair its cells, avoid/resolve inflammation within the gut, ensure hydration, increase fiber intake as “fertilizer”, and avoid threats to the ecosystem like antibiotics, antacids, prolonged stress, additives and preservatives, concentrated sugars, toxins, etc.

The name for an imbalance between the vegetables and the weeds when it pertains to the intestinal microbiome is called “dysbiosis”. This is different from an acute infection which is caused by the presence of a microbe or toxin that doesn’t belong in the gut and produces intense amounts of acute inflammation that overwhelms the gut and leads to severe responses by the body to purge the offending agent through vomiting and diarrhea. While a huge amount of certain toxins or bacteria will cause almost any intestinal tract to become overwhelmed and sick (think of drinking water contaminated with cholera), many people in modern days develop severe acute infections from *lower* amounts of *milder* toxins, viruses or bacteria that they might have been able to handle/ manage well without intervention had the

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intestinal tract and microbiome been healthy at the time of infection. In these cases, there was often dysbiosis present in the intestinal tract *before the infection occurred* and rendered the intestinal tract less capable of maintaining balance and integrity in the face of the acute stressor. In equal measure, a massive stressor to the gut of any kind (like a hefty round of antibiotics, an acute emotional stressor, childbirth, surgery, etc.) can also temporarily weaken the intestinal tract and make it vulnerable to dysbiosis. Just like the ecology of the garden (or any natural environment), the intestinal landscape is constantly shifting and changing and is affected by so many factors.

When you develop a microbial shift in your intestinal tract, sometimes your body can recover from that on its own with simply your attention and care. Other times, we may need to treat medically to reduce or eradicate an overgrowth, calm the immune system, and repair the gut barrier in order for things to return to normal. But, if the environmental and lifestyle factors that made the gut vulnerable to dysbiosis in the first place are not corrected, the dysbiosis may recur. There are numerous ways that we address intestinal health medically in the office, but the one that we will focus on here is: growing good bacteria and avoiding overgrowth of harmful or commensal/opportunistic bacteria/yeast. Probiotic/beneficial bacteria are essential for human health because they maintain a barrier between the world and the inside of the body, they regulate the immune system, they produce and assimilate various nutrients, they help us detoxify and eliminate waste products, they regulate our metabolism, they turn off inflammation, and allow us to feel good and strong.

Growing good bacteria and avoiding overgrowth of other microbes requires *adding things into the system* that help cultivate desired strains of bacteria and *avoiding things* that will harm them or weaken them.

## Factors that Harm

When discussing the factors that wreak the most havoc on the intestinal ecosystem a.k.a. our “internal garden”, we want to think about them in two categories: the first category is comprised of the things that we do regularly that act as smaller insults to the gut but degrade the health of the ecosystem over time because they are insults that are repeated often. The second category is comprised of major insults that may come out of the blue and occur once, but have a significant impact and really test the garden’s strength and resilience.

Lifestyle Factors that Harm		Triggering Events that Harm
A low-fiber diet	Insulin resistance	Trauma or surgery
A diet low in phytochemicals	Chronic Medication use (prescription & over-the-counter)	Any and every Antibiotic exposure is its own distinct trigger
High stress	Exposure to non-food additives & chemicals in food	Major stressor (emotional or physical)
Inflammation	Lack of adequate, restorative sleep	Acute “stomach bug” or gut infection

## Foods, Supplements & Practices that Fertilize or Weed

Happily, there are many ways we can tend to the “internal garden” both for maintenance as well as to help repair and regrow after a stressor has come through and caused disruption. I have broken these helpful agents into categories of foods, supplements and lifestyle therapies. I have also separated the relevant groups into the agents that *promote growth* of good bacteria versus the agents that may help to *reduce overgrowth* of harmful microbes.

Foods that Fertilize		Foods that Weed	
Berries & other fruits due to their polyphenol content	All plant foods due to their mixed fiber content. Fruits, Veg, Beans/legumes, nuts/seeds	Green tea appears to reduce overgrowth of various harmful or opportunistic bacteria	Pomegranate rind/husk selectively inhibits bad bacteria while not affecting good bacteria
Garlic & onion due to their thiol compounds	Naturally fermented foods like sauerkraut and kimchi due to their probiotic content	Garlic appears to reduce overgrowth of various harmful or opportunistic bacteria	
Green tea due to its catechin content	Beans & legumes, soy, due to their flavinoids		
Mushrooms due to their glucan content	Foods fresh from the garden contain molecules from the Earth that nourish the intestinal microbiome		

Supplements that Fertilize or Support		Supplements that Weed	
Probiotics literally provide a dose of healthy bacteria that may presently be missing	Extracts from certain herbs act as “pre-biotics” which are fertilizing to good bacteria - like Triphala, slippery elm,	Garlic/ allicin may be prescribed to reduce overgrowth	Tannins are compounds in certain herbs that may reduce certain types of overgrowth
Fiber supplements, as long as there aren’t harmful additives and food colorings added	Extracts from herbs like Turmeric & Ginseng provide regulating and nourishing compounds	Essential oil extracts from herbs like oregano, thyme, clove	Berberine compounds from plants like Mahonia, Coptis & Hydrastis
...and more!		...and more!	

Lifestyle Practices that Support a Healthy Microbiome	
“Pyrogenic therapy” that induces a therapeutic fever like sauna therapy, hydrotherapy and intense exercise. This practice improves your immune’s system surveillance of microbial balance in its ecosystem and helps it remove/prevent overgrowth.	Eating meals instead of grazing. Eating while calm and relaxed, chewing food thoroughly before swallowing, eating slowly, and avoiding drinking fluids while eating.
Adequate restorative sleep improves immune system function and surveillance over microbial ecosystem balance.	Attention to stress management and encouraging vagal tone through deep breathing exercises, exercising, singing, humming & chanting