

Probiotics and the Microbiome: Practical Applications

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Consumer interest in probiotics

- *A recent survey found that 73% of consumers are at least 'moderately aware' of probiotics.
- *More than one-half say they currently use probiotics.
- *Sales of probiotic-containing foods and beverages in the U.S. are expected to reach \$10 billion by 2018.

<http://www.nutraingredients-usa.com/Markets/Probiotics-on-the-verge-of-dramatic-second-growth-curve-expert-says>



What is driving the interest in probiotics?

- * Science showing benefits of specific strains
- * Desire to use food as medicine
- * Quest to prevent vs treat disease
- * Growth in personalized medicine

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There are still many unknowns

- How do dietary microbes impact human health?
 - Cancer
 - High BP
 - Obesity
 - Diabetes
 - Mental health
- How much is needed? How often?
- Are food sources better than supplements?
- How do combinations of probiotics work together?



What we do know...

- The microbiota changes with age, diet, environment, disease states
- The colonizing microbiota can be enhanced or stabilized through ingested probiotics
- There is very little risk associated with probiotics



What do MDs say?

“Probiotics are very promising and used quite often in practice. Many physicians, including myself, use them regularly for many gastrointestinal issues and other issues like infant colic, preventing diarrhea in patients taking antibiotics and for overall immune and respiratory health. ...it is clear that they are here to stay, and the research base is likely only going to lead to increased use in many other conditions in both preventing and treating diseases.”

– Dr. Daniel Merenstein, Family practice MD & Assoc Prof at Georgetown Univ Med Ctr



Supplements vs food sources?

Supplements:

- Appealing in that they are packaged, identified, labeled, quantified.
- Long shelf-life may adversely affect probiotic viability.
- Are not closely regulated and may not deliver what they promise.



Supplements vs food sources?

Foods:

- Can protect probiotic bacteria from high acid levels in the stomach.
- Refrigeration helps promote the stability of probiotics.
- Tempeh, miso and kimchi also provide beneficial bacteria
- Foods are a necessity; supplements are not – foods are an easier habit to adopt.



How much is enough?

- There's no recommended daily dose of probiotics.
- Research suggests aiming for 1 - 10 billion live bacteria cultures (measured in Colony Forming Units, or CFUs).
- Yogurt commonly contains 100 million - 10 billion CFU per serving.
- A cup of kefir or yogurt labeled "live and active cultures" will put you within the desired range.

http://www.eatingwell.com/nutrition_health/digestive_health/the_promi_se_of_probiotics



What diets are rich in probiotics?

Study analyzed three dietary patterns:

1. Average American Diet: focusing on convenience foods
2. USDA-recommended Diet: emphasizing F & V, lean meat, whole grains and dairy (including yogurt)
3. Vegan Diet: excluding all animal products

Results: the **USDA meal plan** had the highest total amount of

microbes (1.3×10^9 CFU per day)
... followed by the VEGAN diet (6×10^6)
... and the AMERICAN Diet (1.4×10^6)

Lang et al. (2014), *The microbes we eat: abundance and taxonomy of microbes consumed in a day's worth of meals for three diet types*. PeerJ 2:e659; DOI 10.7717/peerj.659



Who shouldn't take them?

Certain groups, due to their increased vulnerability and/or compromised immune status, should not take probiotics without consulting a doctor first:

- Infants
- Chemotherapy patients
- Others whose immune system is vulnerable to serious infection



Shopping tips

- Look for “live and active cultures” on the label or for the “Live & Active Cultures” seal from the National Yogurt Association
- Check expiration dates
- Refrigerate probiotic products
- Choose a probiotic that is made by a reputable company & has been tested for the desired effects



Take home messages

1. Recommend a diverse diet based on the USDA eating pattern (MyPlate).
2. Consume washed raw fruits and vegetables and the environmental microbes associated with them.
3. Eat a diverse array of fibers.
4. Recommend one serving of probiotic-containing foods or fermented foods per day.
 - To bolster gut barrier function
 - To improve lactose digestion
 - To minimize side effects of antibiotics and other intestinal conditions
5. Daily ingestion is needed.
6. Be familiar with probiotic products in the marketplace.



QUESTIONS?

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