

REVIEW: PROBIOTIC SUPPLEMENTATION AND NCAA STUDENT ATHLETE CARE



Tucker Reiley, UW Nutritional Sciences Program, MS-Nutrition Student & Dietetic Intern
Preceptors: Ema Thake, MS, RD CSSD & Meredith Price, MS, RD, CSSD, UW Performance Nutrition

Probiotics in NCAA Programs

Probiotic supplements are popular, but NCAA programs need a doctor's approval to provide them to their athletes. What guidelines exist for their recommendations and use?

The microbiome have been linked to numerous disease states, providing a target for emerging therapies. Multiple intersecting factors make it difficult to produce guidelines for their use. Doctors' advice may be general. NCAA student athletes and others should work closely with their care teams when evaluating probiotic use.

AT A GLANCE: CLINICAL PROBIOTIC USE

- > The **microbiome** is an emerging therapeutic target.
- > **Probiotic supplements** are widely available and generally viewed as beneficial and benign.
- > **Guidelines** are lacking for clinical use, and nonexistent for elite athlete populations.
- > A therapy for **antibiotic-associated diarrhea** is most evidence-based application.
- > **Reducing infections** of the upper respiratory tract is a key area of interest for college athletics.
- > **Emerging research** suggests probiotics may not have a lasting impact on some microbiomes.



SUPPLEMENTATION

- > Supplementation includes **probiotics** (live cultures), **prebiotics** (substrates that promote growth of beneficial microbes), or **synbiotics** (a combination of both).
- > Recommendations from practitioners are often general and inconsistent and rely on small studies or expert opinion.
- > Recommendations are unlikely to account for strain-specific effects. High count, multi-strain brands may be used as a "shotgun approach" without supporting evidence.



Top of column: Probiotic supplements are widely available in various strains and forms. Image from probiotics.org.
Bottom of column: Many species that make up the intestinal microbiome cannot be cultured, presenting challenges to directly characterizing a the composition of a healthy gut biome. Photo by Michael Schiffer on Unsplash.

EVIDENCE-BASED PRACTICE

- > Evidence for probiotic therapy is strongest for antibiotic-associated diarrhea, but species and strains vary.
- > One review identified treatment of *Clostridium difficile*-related diarrhea and respiratory tract infections to be evidence-based but again lacked consistency.
- > Further studies are needed to evaluate use in irritable bowel syndrome, as a coadjuvant therapy for *Helicobacter pylori*, and other use cases with promising initial results.



Fermented foods, such as kimchi, sauerkraut, and kombucha (above) represent traditional sources of some probiotics in supplements without an indication of potency. Even fewer studies assess the impact of fermented food products on microbiome composition or function, yet they may be recommended to patients.

A CHANGING PARADIGM?

Probiotics are commonly perceived to alter the composition of the microbiome. Emerging research suggests the effects could be merely transitory for some people.

- > Persistent colonization may occur in less than 1/3 of people and may be determined by the microbiome's carbohydrate utilization, as well as human genetic factors.
- > Use of probiotics after antibiotics may actually delay microbiome recovery compared to controls.

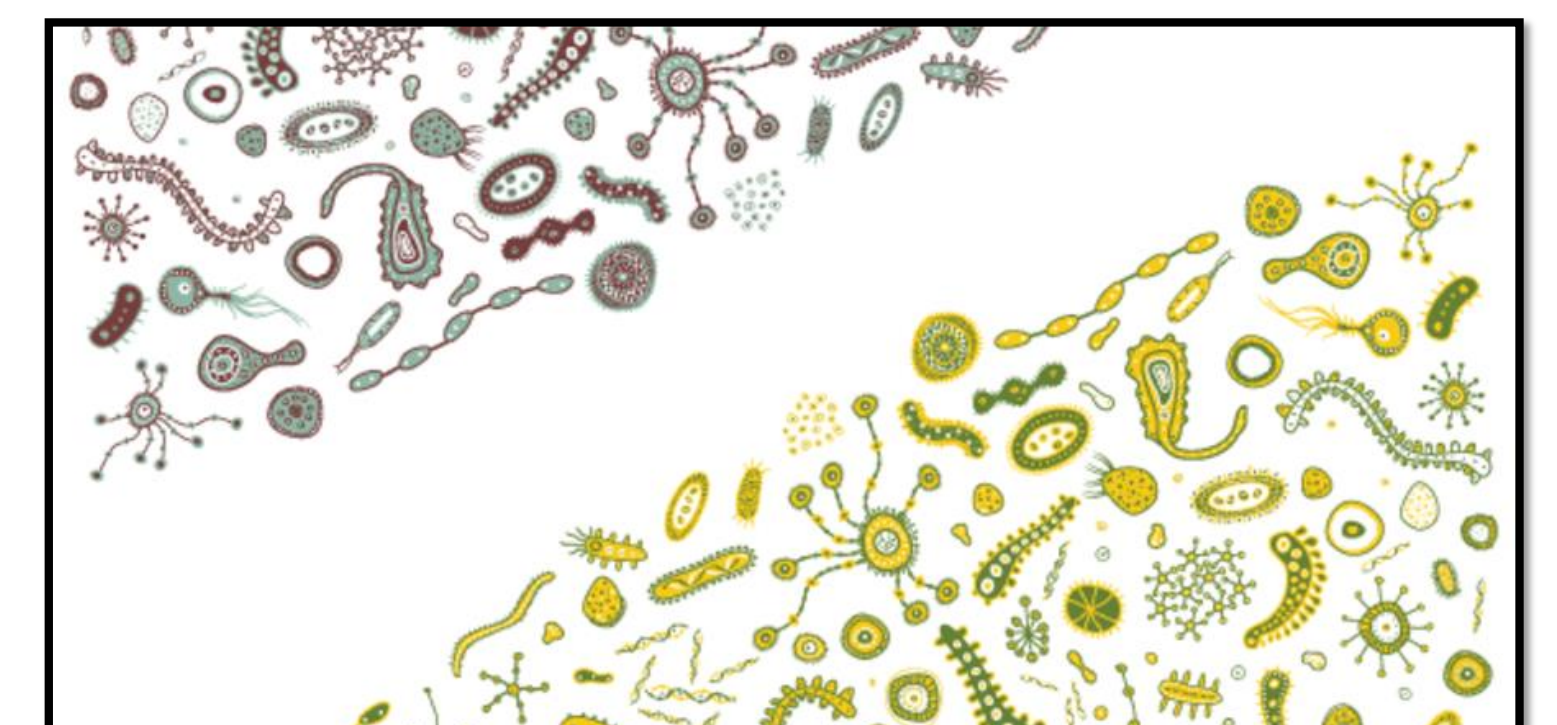
Here are some factors that make it challenging to reach generalizable conclusions about probiotics, despite their utility for excellent study design:

- Baseline microbiome composition and diet
- Sex and genetic factors
- History of antibiotic use
- Permissibility of gut to probiotic colonization
- Environmental factors
- Type of probiotic used (taxonomic specificity, concurrent use of prebiotics or other interventions, etc.)
- Dosage schedule
- Dosage strength

UTILIZATION IN ELITE ATHLETES

> Immune function, especially with upper respiratory tract infections, was commonly investigated. Multiple studies report positive effects but lack consistency.

- > Though evidence is not strong, some studies suggest the microbiome changes may modulate the immune system and some parameters of performance and recovery.
- > More rigorous studies are needed to assess the microbiome's influence on health and performance.



A gap in understanding exists concerning if, how, and to what extent probiotics modulate the continuum between a healthy and unhealthy microbiome. Image from vector4free.com.