#2

BIOTICS FACTS

TRUE or FALSE?

There is no risk in administering live micro-organisms

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FALSE!

The efficacy and the safety of probiotics, or live micro-organisms administered for health benefits, are well established.[1,2] However, in certain vulnerable populations dosing with live micro-organisms may pose very real risks.[3-5]

POPULATIONS AT RISK[3,4]

Neonates

Critically ill patients

Immuno-compromised patients

Probiotics are associated with a higher risk of infection and morbidity in neonates, critically ill adult and paediatric patients, and in post-operative, hospitalised or immunocompromised patients.[6]

WHAT ARE THE RISKS WITH LIVE MICRO-ORGANISMS?

Infection

Live micro-organisms can cause bacteraemia or sepsis if they migrate into adjacent tissues or the blood.[3-5]

Modification of the microbiome

Live micro-organisms may cause undesirable effects in the gastrointestinal tract by affecting the intestinal physiology and function.[4,5] Colonisation in neonates may also hinder the development of the natural microbiome, which may affect immune system development.[3]

Transfer of antibiotic resistance

Bacteria are able to transfer antibiotic resistance from one cell to another. If such resistance is present in a probiotic it could be transferred to potential pathogens.[4,5]

BENEFITS OF MICRO-ORGANISM SUPPLEMENTATION:[3]

- Enhances the epithelial barrier
- Increases adhesion of protective molecules
- Provides anti-microbial substances
- Inhibits adherence of pathogens

These benefits are also delivered by heat-inactivated micro-organisms **without the associated risks of live bacteria.[3]**

INACTIVATED MICRO-ORGANISMS AND CULTURE SUPERNATANTS: BENEFITS OF PROBIOTICS WITHOUT THE RISKS

Particularly for high-risk patient groups, treatment with inactivated micro-organisms may offer:[3]

Efficacy :

- as effective, and in some cases more effective than probiotics, offering immunomodulation, protection against enteropathogens and maintenance of intestinal barrier integrity

Safety :

- no risk of infection, toxicity or antibiotic resistance transfer

Convenience :

- easier administration, storage and transport

Probiotics have established health benefits and have been safely used for decades, but should not be taken by vulnerable populations. Inactivated micro-organisms may provide a safe, effective and convenient alternative for a wide variety of patients, including vulnerable patients.[3]

1. Adams CA. The probiotic paradox: live and dead cells are biological response modifiers. *Nutr Res Rev.* 2010;23(1):37-46. 2. Hempel S, *et al.* Safety of probiotics used to reduce risk and prevent or treat disease. *Evid Rep Technol Assess* (Full Rep). 2011(200):1-645. 3. Piqué N, *et al.* Health benefits of heat-killed (tyndallized) probiotics: an overview. *Int J Mol Sci.* 2019;20(10). 4. Boyle RJ, *et al.* Probiotic use in clinical practice: what are the risks? *Am J Clin Nutr.* 2006;83(6):1256-64; quiz 446-7. 5. Snydman DR. The safety of probiotics. *Clin Infect Dis.* 2008;46 Suppl 2:S104-11; discussion S44-51. 6. Suez J, *et al.* The pros, cons, and many unknowns of probiotics. *Nat Med.* 2019;25(5):716-29.

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