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Mini Review

Postbiotics

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Abstract

Postbiotics, an emerging paradigm in the realm of nutritional science, have attracted considerable scholarly interest due to their potential implications for human and animal well-being. These bioactive constituents emanate from the metabolic processes of probiotics and exhibit a wide array of physiological effects. While postbiotics offer promising advantages in terms of gut health, immune modulation, and disease prevention, their utilization necessitates careful consideration of both positive and negative aspects.

Keywords: Biotic; Probiotic; Bioactive Substances; Gut Health; Gut Microbiota

Introduction

The study of gut microbiota has evolved beyond the realm of probiotics and prebiotics to include a new class of biologically active molecules known as postbiotics. The Greek words "post" (after) and "bios" (life) are the roots of the word "postbiotic." The names probiotics, prebiotics, synbiotics, and postbiotics all refer to bacteria (or their substrate) from the 'biotic' family [1]. Postbiotics have emerged as a potential bridge between the actions of probiotics and their substrates, the prebiotics. Postbiotics is used to describe metabolites/cell-free supernatants and soluble components produced by living bacteria [2]. These soluble components are produced during the fermentation process carried out by probiotic microorganisms, encompassing a range of metabolites such as Short-chain fatty acids (SCFAs), enzymes, peptides, teichoic acids, muropeptides generated from peptidoglycans, endo- and exopolysaccharides, cell surface proteins, vitamins, organic acids, and plasmalogens [3]. The interest in postbiotics arises from their potential to exert beneficial effects on host health, but their comprehensive impact remains an area of ongoing research.

These compounds often possess improved safe profile, shelf life, resistance to mammalian enzymes, and stability to digestive system conditions compared to live probiotics, making them more suitable for various applications, including functional foods and dietary supplements [3-5]. The production of postbiotics also presents an opportunity to harness the benefits of probiotic microorganisms without the concerns related to viability and colonization in the gut.

Benefits of postbiotics

Postbiotics have positive effects strengthen gut health and improve the balance and composition of intestinal microbiota [6,7]. In this way, improves influence nutrient absorption and bioavailability by enhancing gut barrier function and promoting the expression of nutrient transporters [7]. SCFAs, a salient subtype of postbiotics, assume a pivotal role in preserving gastrointestinal equilibrium via their role as an energy substrate for colonic epithelial cells and their pH-regulatory functions [8]. This engenders a milieu propitious for the proliferation of commensal microflora while concurrently suppressing the propagation of pathogenic organisms [6,9,10].

It has been reported that postbiotics may provide health benefits due to their anti-inflammatory, cardioprotective, antioxidant, neuroprotective, anti-cancer and estrogenic properties [5]. Postbiotics have evinced the capacity to modulate immune responsiveness, amplifying both the innate and adaptive immune systems [6]. This has the potential to engender diminished inflammation and heightened resilience against infections and immune-mediated maladies. Postbiotics showcase anti-inflammatory and antioxidative attributes, which hold the potential to mitigate the onset of chronic ailments such as inflammatory bowel disease [11,12], cardiovascular afflictions, and metabolic syndrome [5].

Harms and considerations

While the potential benefits of postbiotics are promising, there are certain considerations and potential drawbacks that warrant attention. The characterization and standardization of postbiotics are complex due to the diverse nature of these compounds, making it challenging to establish consistent therapeutic doses and guidelines. Some postbiotics may exhibit unintended effects, particularly in individuals with underlying health conditions. For instance, excessive SCFA production could contribute to metabolic acidosis in certain contexts. The production of postbiotics may involve genetic modifications of probiotics, raising ethical concerns regarding the manipulation of microorganisms and potential ecological impacts [5,13].

Conclusion

Incorporating postbiotics into human and animal nutrition holds significant promise for enhancing gut health, immune function, and disease prevention. These bioactive compounds, originating from the metabolic activities of probiotics, offer advantages in terms of stability and application versatility. However, due to the varied characteristics of postbiotics, cautious inquiry is required, including a careful evaluation of both potential benefits and drawbacks. Future research should focus on unraveling the mechanisms of action, optimizing production methods, and conducting well-controlled clinical trials to fully comprehend the multifaceted impact of postbiotics on human and animal well-being.

Conflict of Interest

No financial or conflict of interest.

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