

Probiotic Approaches: An Emerging Trend and Future Prospects to Improve Animal Production



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The broad category of “probiotic approaches” in the animal industry encompasses different types of microbes (bacteria or non-bacterial species) that have been used to improve performance, enhance animal health, and ensure food safety. The use of probiotic approaches in animal production has been increasing as an alternative to antibiotics due to the spread of antibiotic resistance and the ban of antibiotics use in animal production in many countries. However, the efficacy of probiotics in animal production has been highly variable depending on doses, strain specific effect, frequency of administration, health, and nutritional status of the animal. After administration of probiotics, interactions among the probiotics, host microbial ecosystem and the host animal physiology (such as epithelial cells, immune systems, hormones, enzyme activities and epigenetics) are needed to understand why some probiotics work but others do not. Thus, recent research focuses on how probiotic approaches change the microbial composition in the gut, maintain gut barrier integrity, nutrient digestibility, regulate of gut-lung axis and boost/regulate immune response against infections (such as intestinal diseases, respiratory diseases etc.) as well as animal performance (growth, production, and reproduction). In this context, we have utilized both in vitro and in vivo models to examine the effects of different probiotic strains for qualify them as effective probiotic agents in animal production. Collectively, the findings from our various studies indicated that probiotic effects are not limited to the simple mechanisms that have been traditionally hypothesized, and their efficacy remains variable. Future directions of probiotic research include exploring the specific effects of probiotic strains, addressing viability and stability and rationally design them to combat infections and improve immune system as well as animal performance.

Key words: probiotics, animal health, animal performance

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