Biological Times

Volume No. 5 | Issue No. 7 | Pages 14-15

Probiotics in Poultry: Benefits, Sources, Applications, and Their Importance

Rabbia Sajjad[1*], Mubashir Naseer[2], Mudassir shafique[1], Muhammad Qasim[3] and Ali Naqi Hassan[4]

1. Faculty of Veterinary Sciences, University of Agriculture Faisalabad
2. College of Veterinary Sciences, Riphah International University Islamabad, Pakistan
3. Institute of Microbiology, Government College University Faisalabad
4. Faculty of Veterinary Sciences, Pmas Arid Agriculture University Rawalpindi

*Corresponding Author: **rabbiasajjad2342345@gmail.com**

ABSTRACT

Probiotics are essential microorganisms that play an important role in poultry health, productivity, and production efficiency. They assist in maintaining intestinal microbiota, support normal gastrointestinal function, and contribute to better flock performance. In recent years, probiotics have become increasingly important in poultry production, as natural alternatives to antibiotics and growth promoters. They are commonly used in poultry feed, drinking water, and commercial management programs to support healthy broiler, layer, and breeder flocks. It also emphasises the growing role of probiotics in modern poultry nutrition and management. Overall, probiotics represent a safe, natural, and efficient poultry production protocol for the future of poultry farming. This article explores the major sources, benefits, and importance in poultry production. This article discusses the growing adoption of probiotics as natural microbial supplements in commercial and antibiotic-free poultry farming.

Keywords: Probiotics, beneficial bacteria, poultry production, gut health, feed additives, feed efficiency

To cite this article: Sajjad R, M Naseer, M Shafique, M Qasim & AN Hassan. Probiotics in Poultry: Benefits, Sources, Applications, and Their Importance. Biological Times. 2026. July 5(7): 14-15.

Introduction

The gastrointestinal tract consists of trillions of microorganisms, collectively known as gut microbiota. These microorganisms include bacteria, fungi, and other microbes that play beneficial roles in the gastrointestinal system and overall health (Coella et al.,2023). A healthy gut population consists of essential microorganisms that defend the body from harmful pathogens. However, factors such as unhealthy diets, stress, infections, and overuse of antibiotics can disturb this balance (Dahiya et al.,2023). When this happens, gastrointestinal system problems and health issues can occur. Probiotics help re-establish the normal microbiota by growing the number of essential bacteria in the intestine (Karimi et al., 2024). As a result, probiotics provide good digestion, stronger immunity, and improved overall health (Mazziotta et al.,2023). Probiotics are living microorganisms that deliver health benefits when applied in adequate amounts. They are usually known as beneficial bacteria because they help maintain the microbial equilibrium in the human body, particularly in the digestive system (Gupta et al., 2024). Probiotics support improved digestion, bioavailability, and boost immunity (Mazziotta et al., 2023). In the recent past, Probiotics have received worldwide attention for their positive effects on health and disease prevention. Scientists proceed to study their role in preserving a healthy gut and enhancing overall well-being (Mehar et al.,2024). These days, probiotics are widely used in dietary supplements, fermented food, and skin care products, standardizing them as one of the most important findings in modern microbiology and nutrition (Shirkhan et al.2025).

The significance of probiotics extends beyond gastrointestinal health. Studies have shown that these beneficial microorganisms support the immune system, decrease the risk of certain intestinal infections, and improve the absorption of vitamins and minerals (Maftei et al.,2024). Many probiotic strains also help to decrease diarrhea, constipation, bloating, and symptoms associated with irritable bowel syndrome. Scientists are also examining the connection between probiotics, psychological health, and mental conditions through the gut-brain axis, recommending that a healthy gut may positively influence mood and cognitive function (Chowdhury et al.,2024). In addition, probiotics are more commonly used in functional foods, dietary supplements, and pharmaceutical products. Their growing popularity reflects the increasing awareness of avoidance healthcare and is essential for sustaining a healthy lifestyle through proper nourishment (Fatima et al.,2025). Probiotics are also widely used in veterinary medicine, animal husbandry, and the food industry. In animals, they improve gut health, enhance feed productivity, promote healthy development, and decrease the need for excessive antibiotic use (Bhogoju et al.,2022). In the dairy industry, probiotics play an important role in the manufacturing of fermented foods with improved nutritional value and quality. As client interest in natural and healthy products continues to grow, probiotics have become an essential part of modern nourishment and food technology (Kabir et al.,2023). Ongoing scientific research continues to express new health benefits and applications of these noticeable microorganisms. Due to their safety, actual, and wide range of uses, probiotics are now recognized as useful contributors to human health, animal care, and sustainable food production (Maftei et al.,2024).

Benefits of Probiotics in Poultry Production

One of the major benefits is that helps in maintaining healthy intestinal microbiota. essential microbiotas colonize the gastrointestinal (GIT) tract and prevent the growth of the harmful pathogens such as *Salmonella*, *Escherichia coli*, and *Clostridium perfringens*. And improve the intestinal health and reduce the incidence of digestive disease (Wang et al.,2023). Probiotics also help poultry birds cope with environmental and management stress, including heat stress, vaccination, transportation, and dietary changes. Birds receiving probiotics recover more quickly from stress and maintain improved health and production performance (Idowu et al.,2025). Another important benefit is better feed digestion and nutrient utilization. Probiotics produce the digestive enzymes and beneficial metabolites that help birds digest the feed more efficiently (Bedford et al.,2022). Probiotics also decreased dependence on antibiotic growth promoters (AGPS), naturally inhibiting the harmful bacteria and maintaining gut health, lowering antibiotic use, and helping in resisting antimicrobial resistance. This results in safer poultry meat and eggs (Sachdeve et al.,2025).

Sources of probiotics in poultry production

Probiotics are used in poultry production and are collected from natural microbial strains that are carefully selected for your poultry's safety, stability, and beneficial effects on the birds. These microorganisms are isolated from the healthy poultry intestines, fermented foods, and environmental sources before being cultured for industrial use (Zhao et al.,2025). One of the primary sources is commercial probiotics feed additives. These products are available as powders, granules, pellets, or liquid formulations and are mixed with the poultry feed during manufacturing or on the farm. They contain live essential microorganisms that remain active during storage and feeding (Mattehews et al.,2025). Another important source of probiotics is water-soluble probiotic preparation. These are commonly used during vaccination, brooding, heat stress, and transportation. They are dissolved in drinking water. They provide an easy method of probiotics administration in industrial poultry farms. Many commercial poultry premixes also contain probiotics joined with vitamins, minerals, and enzymes (Rafeeq et al.,2025). The most common probiotic microorganisms used in poultry include species of Lactobacillus, Bacillus, Enterococcus, yeast, and Saccharomyces cerevisiae. These microorganisms are chosen because they survive in the gastrointestinal (GIT) tract and support the normal intensive poultry production (Fathima et al.,2022). Overall, probiotics for poultry are mainly supplied through commercial feed additives, drinking water supplements, nutritional premixes, and multi-strain microbial formulations.

Application of probiotics in poultry production

Probiotics are widely incorporated in different areas of poultry production to improve flock management and support efficient farming practices. They are incorporated into poultry production systems from the hatchery stage to commercial broiler, layer, and breeder operations, and their scientific application has become an important component of modern poultry management (Castro et al.,2023). Probiotics are used in the broiler production programs throughout the rearing period. They are incorporated into starter, grower, and finisher rations to support efficient flock management and maintain bird performance under the intensive management system (Ogunnusi et al.,2023). Another important application of probiotics is in organic and antibiotic-free poultry farming. Probiotics are used in natural-based biological products that already fit the standard of organic poultry production, and they allow producers to raise healthy birds because consumers demand antibiotic-free poultry products (Palve et al.,2022). Furthermore, probiotics are used in commercial poultry research and precision nutrition programs, where multiple probiotic strains are developed to improve feeding strategies for broilers, layers, breeders, and native poultry breeds (Ngene et al.,2026). Overall, probiotics have diverse applications in hatcheries, layer farms, broiler farms, and feed manufacturing, as well as in organic poultry production.

Importance of probiotics

Probiotics have become an essential component of modern poultry farming because they improve the birds' health, enhance productivity, and help preserve antibiotics and growth promoters. These essential microorganisms help to maintain a healthy balance of intestinal microflora, which is beneficial for efficient digestion and disease resistance. Their increasing use in poultry nutrition has led to healthier birds, better production performance, and more sustainable farming practices (Korver et al.,2023). Probiotics also play an important role in better feed efficiency and feed conversion ratio (FCR). They also help the poultry digest feed more efficiently and absorb nutrients efficiently, and birds gain more body weight with less feed. This reduces the feed costs and improves the economic profit of poultry farming. Another important application of probiotics is strengthening the immune system. In the case of broiler chickens, probiotics promote healthy growth, increase body weight gain, and improve the meat quality. In laying hens, they enhance the egg production, improve egg weight, and support eggshell quality, resulting in better productivity and higher_quality poultry products(Elsabrout et al.,2022). Probiotics are important because they decrease the need for antibiotics and growth promoters. Probiotics control the harmful microorganisms and maintain gut health(Chandrasekaran et al.,2024). Furthermore, probiotics support sustainable poultry production by improving the flock's performance, reducing disease outbreaks, reducing environmental stress, and enhancing overall productivity(Ayana et al.,2024).

Conclusion

Probiotics have become a modern part of the poultry production that play an important role in maintaining bird health, productivity, and sustainable farm practices. Overall, this article discusses that probiotics are not essential microorganisms, but they also play an important role in poultry management. They are further used in drinking water, feed commercial system, and poultry system has managed. Probiotics can support healthy microbiota, strengthen the immune system, and reduce reliance on growth promoters. Probiotics function to improve the health of birds and layers and further improve the quality of the meat and eggs, and supply consumers for safety products. In conclusion, probiotics provide a natural, safe approach to poultry farming. Their wide range of applications, benefits, and importance makes them an essential component of poultry production.

References

[1] Coella M, Charitos IA, Ballini A, Cafiero C, Topi S, Palmirotta R, Santacroce L. Microbiota revolution: How gut microbes regulate our lives. World journal of gastroenterology. 2023 Jul 28;29(28):4368.

[2] 2. Dahiya, D., & Nigam, P. S. (2023). Antibiotic-therapy-induced gut dysbiosis affecting gut microbiota—brain axis and cognition: restoration by intake of probiotics and synbiotics. International journal of molecular sciences, 24(4), 3074.

[3] 3.Karimi, R., & Hosseinzadeh, D. (2024). Probiotics and Gastro-Intestinal disorders: Augmentation, Enhancement, and strengthening of epithelial lining. In Probiotics (pp. 188-215).

[4] 4.Mazziotta, C., Tognon, M., Martini, F., Torreggiani, E., & Rotondo, J. C. (2023). The mechanism of action on immune cells and their beneficial effects on human health. Cells, 12(1), 184.

[5] 5. Colella M, Charitos IA, Ballini A, Cafiero C, Topi S, Palmirotta R, Santacroce L. Microbiota revolution: How gut microbes regulate our lives. World journal of gastroenterology. 2023 Jul 28;29(28).4368.

[6] 6.Mazziota C, Tognon M, Martini F, Torreggiani E, Rotondo JC. The mechanism of action on immune cells and their beneficial effects on human health. Cells. 2023 Jan;12(1):184.

[7] 7. Meher AK, Acharya B, Sahu PK. Probiotics: Bridging the interplay of a healthy gut and psychoneurological well-being. Food Bioengineering. 2024 Mar;3(1):126-47.

[8] 8. Shirkhan F, Safaei F, Mirdamadi S, Zandi M. The role of probiotics in skin care: advances, challenges, and future needs. Probiotics and Antimicrobial Proteins. 2024 Dec;16(6):2132-49.

[9] 9. Maftei NM, Raileanu CR, Balta AA, Ambrose L, Boev M, Marin DB, Lisa EL. The potential impact of probiotics on human health: an update on their health-promoting properties. Microorganisms. 2024 Feb;12(2):234.

[10] 10. Chowdhury SR. Psychobiotics and gut–brain axis—A new paradigm for improving mental health. In Probiotics 2024 Jul 1 (pp. 146-158).

[11] 11. Fatima G, Dalmadi I, Süllős G, Takács K, Halmy E. Dietary Patterns for Health-Span and Longevity: A Comprehensive Review of Nutritional Strategies Promoting Lifelong Wellness. Applied Sciences. 2025 Nov 12;15(22):12013.

[12] 12. Bhogoju S, Nahashon S. Recent advances in probiotic application in animal health and nutrition: A review. Agriculture. 2022 Feb 21;12(2):304.

[13] 13. Kabir SL, Islam SS, Akhter AT. Production, cost analysis, and marketing of probiotics. InFood Microbiology Based Entrepreneurship: Making Money From Microbes 2023 Jan 1 (pp. 305-326). Singapore: Springer Nature Singapore.

[14] 14. Maftei NM, Raileanu CR, Balta AA, Ambrose L, Boev M, Marin DB, Lisa EL. The potential impact of probiotics on human health: an update on their health-promoting properties. Microorganisms. 2024 Feb;12(2):234.

[15] 15. Wang Y, Huang Y, Chase RC, Li T, Ramai D, Li S, Huang X, Antwi SO, Keaveny AP, Pang M. Global burden of digestive diseases: a systematic analysis of the global burden of diseases study, 1990 to 2019. Gastroenterology. 2023 Sep 1;165(3):773-83.

[16] 16. Idowu PA, Mpofu TJ, Magoro AM, Modiba MC, Nephawe KA, Mtileni B. Impact of probiotics on chicken gut microbiota, immunity, behavior, and productive performance—a systematic review. Frontiers in Animal Science. 2025 Mar 31;6:1562527.

[17] 17. Bedford MR, Apajalahti JH. The role of feed enzymes in maintaining poultry intestinal health. Journal of the Science of Food and Agriculture. 2022 Mar 30;102(5):1759-70.

[18] 18. Sachdeva A, Tomar T, Malik T, Bains A, Karnwal A. Exploring probiotics as a sustainable alternative to antimicrobial growth promoters: mechanisms and benefits in animal health. Frontiers in Sustainable Food Systems. 2025 Jan 3;8:1523678.

[19] 19. Zhao H, Comer L, Akram MZ, Corion M, Li Y, Everaert N. Recent advances in the application of microbiota transplantation in chickens. Journal of Animal Science and Biotechnology. 2025 Jun 27;16(1):91.

[20] 20. Matthews KR, Kniel KE, Critzer FJ. Food microbiology: an introduction. John Wiley & Sons; 2025 Jan 2.

[21] 21. Rafeeq H, Zia MA, Shahid M, Khan MS. Biochemical characterization and cost–benefit analysis of multi-enzyme premix for poultry feeding applications. Journal of Applied Animal Research. 2025 Dec 31;53(1):2598682.

[22] 22. Fathima S, Shanmugasundaram R, Adams D, Selvaraj RK. Gastrointestinal microbiota and their manipulation for improved growth and performance in chickens. Foods. 2022 May 12;11(10):1401.

[23] 23. Castro FL, Chai L, Arango J, Owens CM, Smith PA, Reichelt S, DuBois C, Menconi A. Poultry industry paradigms: connecting the dots. Journal of Applied Poultry Research. 2023 Mar 1;32(1):100310.

[24] 24.Ogunnusi OJ, Toye CO, Akinwemoye AA. Feed management as a paradigm for profitable poultry enterprise. Animal Research International. 2023 Apr 1;20(1):4684.

[25] 25.PALVE KV. EXPLORING ORGANOMETALLIC CHEMISTRY AND GRIGNARD REAGENTS. Contemporary Trends in Chemical, Pharmaceutical and Life Sciences Volume IV Editors: Dr. Bassa Satyannarayana and Mr. Mukul Machhindra Barwant ISBN: 978-93-95847-77-3.:73.

[26] 26. Ngene AC, Azi HY, Dashen MM, Egbere OJ. Indigenous probiotics in African poultry production: potentials, mechanisms, and policy directions for combating antimicrobial resistance. World's Poultry Science Journal. 2026 Apr 10:1-46

[27] 27. Upadhayay UP, Vishwa PC. Growth promoters and novel feed additives improving poultry production and health, bioactive principles and beneficial applications: the trends and advances-a review. Int. J. Pharmacol. 2014;10(3):129-59.

[28] 28. El-Sabrout K, Aggag S, Mishra B. Advanced practical strategies to enhance table egg production. Scientifica. 2022;2022(1):1393392.

[29] 29. Chandrasekaran P, Weiskirchen S, Weiskirchen R. Effects of probiotics on gut microbiota: an overview. International journal of molecular sciences. 2024 May 30;25(11):6022.

[30] 30. Ayana GU, Kamutambuko R. Probiotics in disease management for sustainable poultry production. Advanced Gut & Microbiome Research. 2024;2024(1):4326438.