Biological Times

Volume No. 2 | Issue No. 12 | Pages 5

Importance of gut microbiota in poultry health and productivity

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ABSTRACT

Significant research has shed light on the critical importance of the gut microbiota in promoting poultry health and productivity. This thorough analysis methodically evaluates the current literature for clarity on the several activities performed by the gut bacteria. These roles include their contributions to poultry health, nutrient absorption, and immunological function, highlighting the possibility of modifying them to increase poultry productivity.

Keywords: Gut Microbiota, Poultry Health, Performance, Nutrition, Immunity, Disease Resistance, Gut Microbiota Manipulation

Introduction:

The gut microbiome is important for poultry health and productivity. Extensive study has highlighted its importance in several areas, including digestion, nutrition absorption, and immunological function. The ability of the gut microbiota to break down complex food components and interact with the host's immune system leads to optimal fowl health and disease resistance. Furthermore, specific microbial communities in the gut microbiome have an impact on productivity indices including feed conversion efficiency and growth rate. Manipulation of the gut microbiota by therapies such as probiotics and dietary changes shows potential for increasing poultry performance. The purpose of this review is to offer a complete overview of the functions of the gut microbiota in chicken, emphasizing the potential for targeted modification to improve productivity and contribute to sustainable poultry production.

Gut Microbiota: Composition and Establishment in Poultry

The gut microbiota of chicken is a highly sophisticated entity characterized by a great diversity of bacteria, fungi, viruses, and protozoa that occupy the intestinal system. The microbiota is essential for a variety of physiological processes, including immune system modulation, nutrition absorption, and gut wall integrity. The development and subsequent compositional changes of gut microbiota under variables such as age, nutrition, genetics, and host immune responses create a multidimensional environment critical to poultry health and performance [1].

The Gut Microbiota's Role in Nutrition and Growth

Gut microbiota is a major driver of nutritional metabolism in poultry, contributing to nutrient acquisition, complex carbohydrate digestion, protein degradation, and vitamin synthesis. In turn, these processes form the basis of overall health, growth, and development of poultry. The dynamic interplay between diet, gut microbiota, and the host significantly shapes the poultry's growth performance and feed efficiency, making it a critical area of study in optimizing poultry production [2].

The Impact of Gut Microbiota on Disease Resistance and Immunity

The first line of defense against invasive infections is the gut microbiota, which forms a symbiotic connection with the host. It influences immune responses, boosts immunological homeostasis, and stimulates the immune system, all of which contribute to disease resistance [3]. The health and production of chickens can be dramatically impacted by the gut microbiota's immune regulation.

Gut Microbiota's Effect on Poultry Productivity

The foundation for healthier chickens is a gut microbiome that is in balance, which directly affects productivity. Promoting a varied microbiota can increase productivity by increasing meat yield, egg production, and overall output. Antibiotic use, the environment, and dietary compositions all have the potential to upset this equilibrium, which would have a detrimental effect on productivity. Therefore, it is essential to comprehend how gut microbiota affect production for chicken farming to evolve sustainably [4].

Manipulation of Gut Microbiota

It is possible to manipulate the gut microbiota to enhance the health and production of poultry. These include supplementing with dietary fiber and taking probiotics, prebiotics, and synbiotics (probiotics and prebiotics together) [5]. If carefully chosen, these therapies can improve gut microbiota, boosting disease resistance, encouraging improved nutrition absorption, and improving growth efficiency.

Results

The body of research shows a clear connection between the gut microbiota and its effects on various aspects of poultry health. Fundamentally, the gut microbiota has a crucial role in nutrient absorption, which is connected to productivity and growth. Additionally, a recognized function in immunological control gives poultry the ability to resist disease.

Discussion

Research has highlighted the importance of gut bacteria in nutrient absorption and digestion, which is essential for chickens to grow and produce at their best levels. Furthermore, it has been discovered that gut microbiota plays a critical role in coordinating immunological responses, which influences disease resistance and overall poultry health [1]. Additionally, the potential for altering the gut microbiota with probiotics, prebiotics, and dietary changes offers significant opportunities for raising poultry health and production.

Conclusion

the critical role of the gut microbiota in promoting poultry health and productivity. The gut microbiota affects various aspects of poultry health, including nutrient absorption, immunological function, disease resistance, and overall productivity. Manipulation of the gut microbiota through therapeutic interventions such as probiotics, prebiotics, and dietary changes shows potential for enhancing poultry performance. Understanding the intricate relationship between the gut microbiota and poultry productivity is essential for sustainable and efficient poultry production. Further research and practical application of gut microbiota manipulation techniques can contribute to the development of strategies for improving poultry health and productivity in the future.

Acknowledgement

We express our gratitude the researchers whose work has contributed to this comprehensive review. We also thank our colleagues their valuable inputs and discussions that have greatly improved the manuscript.

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To cite this article: Shahid E, A Javed, S Tariq & K Hussain. 2023. Importance of gut microbiota in poultry health and productivity. Biological times, 2(12): 5