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Popular Article

The Contribution of Management Techniques and Diet in Increasing Poultry Fertility

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Abstract

Maximizing the broiler's immense development potential in order to produce birds with high body weights and abundant breast meat is the primary objective of broiler production. However, fertility is inversely associated with each of these goals. The performance of broiler breeders presents a significant challenge to geneticists because broiler breeder selection requires maintaining a delicate balance between optimising growth and preserving competitive level of reproduction. Male aggression and its detrimental effects on mating behaviour and fertility have been under considerable scrutiny since the development of strains with high breast output. The ability of males to reproduce varies. Some roosters in a flock are exceptionally fertile and produce sperm of the finest quality, whereas other roosters are sub-fertile. A rooster's quality might vary depending on management, the environment, nutrition, and genetics. It is commonly accepted that fertilisation will take place if the hen is able to lay eggs and the sperm is viable. Semen deficiency in the oviduct, typically as a result of issues with mating frequency or mating success, may be the cause of infertility. Numerous elements, including genetics, nutrition, environment, and behaviour have an impact on this. It is widely acknowledged that foods, such as protein and energy components, that affect general body size and body composition might affect female fertility. According to research, reducing the amount of crude protein in the diet from 16% to 14%, 12%, or 10%, respectively, significantly increases fertility from 91.6% to 95.4%. Additionally, for optimal semen generation in male diets, the crude protein ratio might be as low as 9-10%. Low protein diets, however, can increase fertility by up to 2-3 percent. Additionally, vitamins and trace minerals, especially vitamin E, carotenoids, and selenium, which function as natural antioxidants and protect the sperm and embryo, can have a significant impact on fertility and hatchability.

Keywords: Broiler, breeder, rooster, nutrition, crude protein, hatchability.

Introduction

In the dynamic world of poultry farming, reproductive success is a key factor in maintaining a profitable and sustainable operation. Achieving optimal fertility in poultry requires a comprehensive understanding of the intricate interplay between nutrition, management practices, and the physiological needs of the birds. This article explores the crucial



role of nutrition and various management practices in enhancing fertility in poultry, shedding light on the factors that influence reproductive success and outlining strategies to achieve better outcomes.

Nutritional Foundations for Fertility

Balanced Diet Composition: A fundamental aspect of promoting fertility in poultry is providing a well-balanced and nutritionally complete diet. Key nutrients include proteins, energy sources, vitamins, and minerals. Proteins are particularly crucial as they are essential for the synthesis of reproductive hormones and the development of reproductive organs. Additionally, energy sources like carbohydrates play a role in maintaining the energy balance required for reproductive activities.

Adequate Protein Levels: Proteins are the building blocks of life, and their role in poultry fertility cannot be overstated. A diet rich in high-quality protein sources, such as soybean meal and fishmeal, supports optimal egg production and fertility. A deficiency in essential amino acids, the building blocks of proteins, can lead to reduced fertility and hatchability.

Minerals and Vitamins: Micronutrients like calcium, phosphorus, and vitamins A, D, and E play pivotal roles in poultry reproductive health. Calcium, for instance, is crucial for the formation of eggshells, while vitamin D facilitates calcium absorption. Proper nutrition ensures that these essential elements are available in the right amounts, contributing to strong eggshells, healthy embryos, and improved fertility.

Water Quality: Often overlooked, water quality is a critical aspect of poultry nutrition. Clean and uncontaminated water is essential for maintaining the overall health of birds, influencing digestion, metabolism, and reproductive processes. Poor water quality can negatively impact fertility and hatchability.

Management Practices for Enhanced Fertility

Lighting Programs: The reproductive cycle in poultry is strongly influenced by photoperiod, or the duration of light exposure. Implementing controlled lighting programs can stimulate reproductive activities. Providing 14 to 16 hours of light per day encourages hormonal changes that trigger increased egg production and fertility. Timely adjustments to lighting schedules can mimic natural day-length changes and optimize reproductive performance.

Breeder Selection and Age: The genetic quality and age of breeder birds significantly impact fertility. Selecting robust and genetically superior breeds is essential for achieving high



reproductive efficiency. Additionally, managing the age of breeder birds is crucial, as fertility tends to decline with age. Maintaining an appropriate breeder replacement program ensures a consistent level of reproductive success.

Environmental Factors: The poultry environment plays a pivotal role in reproductive health. Maintaining optimal temperature, ventilation, and humidity levels is essential. Extreme conditions can induce stress, negatively affecting fertility. Adequate housing and proper management practices, such as effective waste removal and pest control, contribute to a stress-free environment conducive to reproductive success.

Biosecurity Measures: Disease prevention is paramount in maintaining fertility levels. Implementing rigorous biosecurity measures helps prevent the spread of diseases that can impact reproductive organs and overall bird health. Regular health checks, vaccinations, and strict hygiene practices contribute to a disease-free environment, fostering optimal fertility.

Nutrient Management: Beyond providing a balanced diet, effective nutrient management involves monitoring feed quality and ensuring that it meets the specific needs of the poultry flock. Regularly testing feed for contaminants and nutritional composition ensures that birds receive the necessary nutrients for optimal reproductive performance.

Strategic Lighting Programs: Beyond providing consistent lighting, strategic lighting programs that include dim periods can simulate natural conditions and stimulate reproductive hormones. This approach helps synchronize the reproductive cycles of birds, leading to more uniform egg production and improved fertility.

Challenges and Solutions

Nutritional Challenges: Ensuring optimal nutrition can be challenging, especially in extensive poultry operations. Limited access to high-quality feed ingredients, fluctuations in feed prices, and the need for continuous adjustment to meet the changing needs of the flock pose ongoing challenges. Collaborative efforts between nutritionists, veterinarians, and farmers are essential to address these challenges.

Disease Management: Disease outbreaks can have a devastating impact on fertility. The challenge lies in implementing effective biosecurity measures, vaccinations, and disease monitoring programs. Rapid response to potential health threats is crucial to prevent widespread outbreaks and minimize the negative effects on reproductive performance.

Economic Considerations: Implementing optimal nutrition and management practices may require initial investments in infrastructure, technology, and high-quality feed. Balancing these investments with the potential long-term benefits in terms of increased fertility,



hatchability, and overall productivity is a complex economic consideration for poultry farmers.

Conclusion

In the intricate web of factors influencing poultry fertility, a holistic approach that combines proper nutrition with effective management practices is key to success. Understanding the nutritional requirements of breeder birds and implementing strategies to meet these needs, along with adopting management practices that create a stress-free and disease-resistant environment, lays the foundation for improved fertility and hatchability. Poultry farmers must embrace a continuous learning mindset, staying abreast of advancements in nutrition, genetics, and management practices. By doing so, they can navigate the challenges, optimize fertility, and contribute to the sustainability and profitability of the poultry industry. In the ever-evolving landscape of poultry farming, the role of nutrition and effective management practices remains central to achieving reproductive success and ensuring the long-term viability of poultry operations.

