

Benefits Of Lactotherapy In The Palliative Treatment Of Avian Pox In Backyard Chicken

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Abstract

Bird pox is a viral disease that severely affects the health of birds and poses a challenge to poultry farming, especially in backyard production systems. This disease not only compromises the welfare of chickens, but also negatively impacts the economy of rural communities that depend on poultry farming. The main objective of the study was to determine the benefits of lactotherapy as a treatment for this disease, seeking to minimize economic losses. A quasi-experimental study was carried out on farms of affected chickens, with two groups: an experimental group that received lactotherapy using fermented dairy products, and a control group that maintained its usual diet. Mortality rate, recovery from clinical symptoms, and food and water intake were assessed using statistical analyses. The findings revealed a 20% reduction in mortality in the lactotherapy group (30% in control vs. 10% in experimental), as well as a 30% improvement in symptom recovery and a 30% increase in feed and water intake. In addition, a 50% increase in the profitability of the group that received lactotherapy was observed. In conclusion, lactotherapy proved to be effective in improving the health of infected chickens and contributing to the economic sustainability of producers, suggesting that this intervention could be a viable strategy in the management of avian pox.

Keywords: Avian pox; lactotherapy; colostrum; milk; immunomodulation.

INTRODUCTION

Poultry pox, caused by the fowl pox virus, poses a significant threat to poultry farming, especially in backyard production systems where resources are limited. This viral disease not only affects the health of birds, but also has a considerable economic impact on rural communities that depend on chicken farming for their livelihood, in this context, it is essential to explore innovative and accessible approaches to the management of this disease, with lactotherapy being a prominent option.

Lactotherapy, which involves the use of dairy products or derivatives in the diet of birds, has been shown to have multiple benefits on animal health. Recent studies indicate that the inclusion of probiotics and prebiotics in poultry feed can improve the immune response and increase resistance to diseases, including viral infections. For example, research by Rentería et al. (2022) reveals that dairy-derived probiotics can modulate the gut microbiota, which in turn strengthens the immune response of birds (1).

In addition, lactotherapy can contribute to improving the quality of life of infected chickens by reducing clinical symptoms and speeding up recovery. According to a study by López et al. (2023), the administration of fermented dairy products in the diet of chickens affected by avian pox showed a significant reduction in mortality and a faster recovery from clinical symptoms (2). This suggests that lactotherapy not only acts as a complementary treatment, but can also be an effective strategy in the palliative management of this disease.

In countries such as the United States and Mexico, fowl pox has had a significant impact before the development of the vaccine, which was used in turkeys as a control strategy (3). This vaccine, licensed by the U.S. Department of Agriculture, has expanded to Mexico and other countries, where each one develops its

own versions. However, many backyard poultry producers still do not use the vaccine and face the risk of disease once it spreads among their animals.

In Ecuador, infectious diseases are a serious problem for poultry farming, but the situation is different in backyard poultry farming, where preventive measures are not implemented. This research is crucial, as there are currently no specific studies on this topic. The development of the project will provide useful analysis for producers and researchers, contributing to improved public health and poultry production.

Development

Lactotherapy is a treatment based on the inoculation of the elements present in the milk, such as proteins and immunological agents of the animal from which it was obtained, the purpose is to increase or at the same time promote the creation of necessary antibodies in a certain organism that by itself has not managed to fight a certain infection (4).

Immunomodulatory effect

Lactotherapy has a direct relationship with basophilic leukocytes and mast cells, the main effectors of hypersensitivity mediated by type I immunoglobulins E, which actively participate in the body's defense against viral infections (5). By stimulating the immune system of an infected animal, antibodies can counteract the effects of the infection until the end of the life cycle of the etiological agent (6).

Immunostimulation has become a very effective alternative by inducing the production of interferon to prevent and combat various types of diseases in animals, many of which are considered to have a high impact and great devastation, under the principle of immunology and through treatments such as lactotherapy, a certain animal is helped to receive the necessary stimulus to promote the effectiveness of its immune system in order to avoid death while the cycle of a viral agent comes to an end (7). On the contrary, as long as birds are immunosuppressed, infectious diseases represent an extremely high risk (8).

Avian pox, with the passage of history shows how in the eighteenth century, smallpox had a great impact, since it caused the death of approximately 400,000 people each year, but when the time came, this deadly disease could be controlled from the analysis of Edward Jenner, who observed how cattle milkers who suffered from cowpox, they developed only a few pustules on their hands and were protected against smallpox, and so under this principle the first vaccine in history was later developed (9).

Image 1: Avipoxvirus



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Poultrypox has significantly affected the U.S. and Mexico, where vaccines were developed, however, many backyard poultry producers do not use them, facing disease risks. In Ecuador, the lack of preventive measures aggravates the situation (10). In addition, it has an incubation period for fowl pox ranging from 4 to 10 days. The symptoms of avian pox include lesions in the corner of the mouth, tongue, throat, esophagus and trachea, which reduces feeding and breathing, causing stress. It manifests itself in three forms: cutaneous, diphtheria, and cutaneous diphtheria. The cutaneous one has crusts in bare areas, the diphtheria shows yellowish ulcerative lesions, and the diphtheria cutaneous combines both, generating asphyxiation and difficulty ingesting food or water (11).

Image 2: Cutaneous form of fowl pox



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There is no specific cure for the disease, only palliative treatments when the animals are already infected. In Ecuador, poultry farming has had a great impact during the last 30 years, this activity is carried out in 2 types of production systems, in the first instance there is the industrialized system, which is characterized by technified or semi-technical facilities, minimum spaces, use of balanced feed and sanitary control; and in second place is the family or backyard system. characterized by minimal technical handling, simple installations, and food based on corn and residues from family food.

Image 3: Backyard poultry farming



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In our country, according to INEC, backyard birds constitute 21.83%, 78.17% to technified production units and in the case of egg production, the backyard system constitutes 9.17%, in the case of the province of Tungurahua, egg production has a very high index since it represents 38.52% of total national production. with approximately 22.79 million eggs (12).

MATERIALS AND METHODS

A quasi-experimental study was carried out on backyard chicken farms affected by fowl pox. The design included a control group and an experimental group that will receive lactotherapy. This structure will allow the benefits of the intervention to be effectively evaluated. The target population was backyard chickens of various breeds affected by avian pox in three selected rural communities. Random sampling was used to select a total of 100 chickens, dividing them into two groups of 50. This sample allowed us to obtain representative and generalizable results.

The experimental group received lactotherapy, which consisted of the inclusion of fermented dairy products in their daily diet for a period of 30 days. The control group continued with the usual diet without the addition of dairy products. This comparison allowed us to identify the benefits of lactotherapy. For this study, the administration of lactotherapy was considered as independent variables, and as dependent variables, the

mortality rate, the recovery of clinical symptoms, the increase in the intake of food and water, and the economic evaluation.

In addition, daily observations were made to record clinical symptoms and eating behaviors. Blood samples were taken to assess the immune response at the start and end of the study. In addition, the costs associated with the intervention and the economic losses during the study period were recorded, which allowed a comprehensive analysis.

Quantitative data were analysed using descriptive statistics and hypothesis tests, such as Student's t-test, to compare differences between groups. Statistical software was used to facilitate the analysis and ensure the validity of the results. The consent of the farm owners was obtained before starting the study, and the welfare of the animals was guaranteed following local regulations on animal experimentation, ensuring that ethical principles are respected in the research.

RESULTS

This research was carried out in the province of Tungurahua, Ambato Canton, Totoras Parish, Santa Rita Neighborhood. in a small shed located on the property of the Oñate Villegas family, between the months of December 2021 and February 2022, the shed is located in an isolated space, which does not represent any type of biological risk during the development of this study, in accordance with the relevant biosecurity measures.

Tabla 1. Study Items

Variable	Control Group	Non-Control Group	Difference	Student's t-test (p-value)	Variance
Mortality Rate	10%	30%	20% reduction	$p < 0.01$	0.04
Recovery from Clinical Symptoms	80%	50%	30% improvement	$p < 0.05$	0.06
Feed and Water Intake	40% increase	10% increase	30% increase	$p < 0.01$	0.05
Economic Evaluation	Incremental costs	Mortality costs	50% increase in profitability	$p < 0.05$	0.03

Source: Results obtained from the study

The analysis of the results obtained between the control group and the non-control group reveals significant differences that may have important implications for clinical practice and decision-making. The mortality rate in the control group was 10%, while in the non-control group it reached 30%. The 20% reduction in mortality, with a p-value of less than 0.01, indicates that the intervention applied in the control group is highly effective, the variance of 0.04 indicates a consistency in the results, which reinforces confidence in the effectiveness of the intervention. This finding coincides with studies by Palacios et al., (2016), who demonstrated that specific interventions can drastically reduce mortality rates in similar populations (13).

The improvement in symptom recovery is remarkable, with 80% in the intervention group versus 50% in the non-control group, this 30% increase, with a p-value of 0.05, shows that the intervention is not only effective in reducing mortality, but also in improving the quality of life of the chickens. In this sense, the work of Torres Vinueza (2021) argues that interventions that address both mortality and clinical symptoms provide a more holistic and effective approach in the treatment of poultry diseases(14).

The increase in food and water intake is another key indicator, where the control group experienced an increase of 40% compared to 10% in the non-control group, adequate nutrition and hydration are fundamental pillars for recovery. Adequate nutrition and hydration are fundamental pillars for recovery, as argued by Medina et al, (2021), who highlight that adequate nutrition not only improves physical recovery,

but also positively impacts the psychological well-being of patients(15).

From an economic perspective, the results are also encouraging, with a 50% increase in profitability observed in the control group, compared to mortality costs in the non-control group. This finding is supported by research by Rubina et al. (2025), who conclude that interventions that improve patients' health also generate economic benefits by reducing the costs associated with prolonged treatments and complications(16).

CONCLUSION

Research on lactotherapy in the treatment of fowl pox shows that this intervention can be highly effective both in improving the health of infected chickens and in reducing economic losses for backyard producers. The results indicate a significant decrease in mortality and rapid recovery from clinical symptoms in chickens that received fermented dairy products, in addition, the increase in feed and water intake highlights the importance of adequate nutrition in the recovery of birds. It was shown that lactotherapy not only offers an innovative approach to the management of avian pox, but also contributes to the economic sustainability of rural communities. Therefore, it is recommended to consider the implementation of this strategy in animal health programs and in the education of poultry producers, in order to improve animal welfare and strengthen poultry farming in backyard systems.

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