

Main causes of mortality in growth farms of commercial pullets of the bovans white line

Abstract

The type of housing as other factors such as handling during vaccination, weekly weighing and beak trimming, can increase mortality in replacement pullets during their rearing. The aim was to register the causes of macroscopic mortality in pullet farms during the rearing phase from week 1 to 16. The data was obtained from six farms with an average of 766,574 pullets per breeding cycle. The mortality records were captured during a period of 12 months in Excel and later analyzed by frequency table using SPSS for Windows and the chi-square test. The results suggest that the main causes of farm mortality are non-diagnostic, and the second largest is retention of the yolk sac ($P < 0.05$). It is concluded that the mortality of the pullets during their breeding are problems in their greater percentage non-infectious causes attributable to the handling of the pullets and that identifying the cause of mortality it can take zootechnical measures to minimize them and increase the productive performance of the flock.

Keywords: pullet, cause of mortality, infectious problem, non-infectious problem, rearing

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Introduction

The rearing system of replacement pullets in Mexico is traditionally done on the floor due to its higher performance and resemblance to natural conditions to minimize stress compared to cage rearing.¹ However, the type of housing as other management factors (vaccination, weighing, and beak trimming) that is done in the field during the growth phase are important factors to consider in the amount of casualties and that could affect the accumulated mortality during this phase. The health problems of the flock are divided into infectious and non-infectious.² The causes of mortality due to infectious diseases are only one of a series of factors that can affect the performance of the flock. However, they are controlled based on prevention, strict hygiene programs in incubators, vaccination, the use of food additives and precautions in health.³ Mortality from non-infectious causes is reflected in the main causes of morbidity and mortality that are metabolic disorders or zootechnical management,⁴ however, the “good” interaction of management, plus health, nutrition and environment not always met, generating malfunctions in the metabolism, physiology and anatomy, all of the above may be associated with poor zootechnical management.^{5,6} It has an impact on production that is often not quantified in the poultry industry, mainly due to its low percentage and cause, compared with infectious diseases and their economic impact. Hence, the aim was to record the causes of macroscopic mortality in farms with replacement pullets of the Bovans White line from week 1 to 16. The results obtained will help producers to quantify the causes of higher incidence and rethink their strategies production in search of minimizing it.

Materials and methods

The data was obtained from six commercial farms, with an average of 766,574 replacement pullets of the Bovans White gene line per farm housed in the floor, during the months of January to December 2008. The farms are located in the state of Yucatan, Mexico, $20^{\circ} 57' 6.82''$ N and $89^{\circ} 56' 30.69''$ O at a height of 5 m about sea-level rise. The climate is of the Aw_0 type, the driest of the hot climates, sub-humid according to the Köppen classification modified by García,⁷ with an annual

temperature between 21.0 and 33.8 °C.² An accumulated total of 9,198,884 pullets were housed in the six farms during the period from January to December 2008. The total mortality of the farms during the same period was quantified. Mortality was classified macroscopically as: non-viable pullets, aspergillosis, enteritis, retention of the yolk sac, crushed, poorly vaccinated, slaughtered by supervisor criteria, it is important to mention that the pullets slaughtered by cervical dislocation based on the NOM-033-ZOO -1995, poorly sexed (male), coccidiosis, Marek's disease, sampling (birds that are sent to the laboratory for epidemiological monitoring and surveillance), beak retrimming (birds that receive a second beak trimming at week 9 of age) due to the bad cut), beak trimming (performed at 2 weeks of age), and not diagnosed (which did not show any previous characteristic). The causes of mortality were captured in Excel and analyzed using descriptive statistics and in SPSS for Windows using a table of mortality frequencies and the chi square test ($P < 0.05$).⁸

Results and discussion

The results show that the causes of mortality on the farm during the rearing phase are diverse and are presented in Figure 1. It is observed that the highest percentage of mortality is found in not diagnosed pullets (28.38%), that is, that they do not present any macroscopic cause of the established classification. According to the line management guide, an accumulated mortality of 3% is established in the rearing phase,⁹ it is likely that some infectious problem increases the cause mentioned. The retention problem of the yolk sac is mainly attributed to poor management of the fertile egg, in the farm or incubator, deficiencies in egg disinfection or incubators.¹⁰ The yolk sac infection first begins with an infection of the navel and technically is called “omphalitis” which is caused by contamination by bacteria among which *E. coli* stands out. Many embryos die before hatching and others during or shortly after hatching, and mortality can extend to the third week of age.¹⁻¹⁰ This problem can be prevented with an adequate disinfection and storage of the fertilized egg. The non-viable pullets (5.58%) are those that mainly have a delay in their development and is generally due to the incubation of small eggs. The problems of enteritis (3.36%), are attributable to poor handling of

the food. Some cassette makers have the habit of serving food on the floor to stimulate the consumption of food during the first days of life, favoring that the pullets consume food contaminated with excreta.

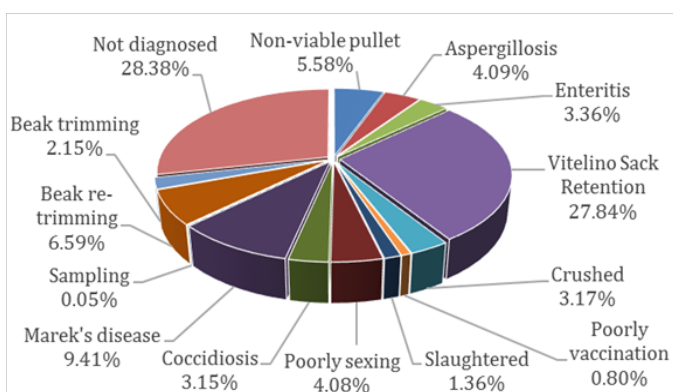


Figure 1 Percentage of mortality causes in replacement pullets from week 1 to 16.

Aspergillosis (4.09%) can become a serious problem on the farm if the necessary measures for its prevention are not taken. *Aspergillus fumigatus* is the species commonly isolated in nature due to its unique ability to grow at temperatures between 20 to 50°C and rapid growth, followed by *A. flavus* and *A. niger*.⁹ The study demonstrated that the pullets can arrive infected with *Aspergillus* to the farm and found in the same bird the presence of two different species of *Aspergillus* from one day of age. This supports the fact that embryos may be contaminated during incubation due to storage and inadequate disinfection of incubation facilities and equipment.¹¹ The lack of an adequate disinfection or a role of products in an incubator can lead to the presence of fungi in the facilities and transportation equipment, putting the chick at risk as shown by the results found. The beak trimming (2.15%) and the beak re-trimming (6.59%) are made to control and reduce cannibalism and other aggressive behaviors of the future layers,² the beak trimming represents two processes: 1) cut and 2) cauterization, this last one avoids possible bleeding of the pullet.¹² The infectious problems found as Marek's disease (9.41%) and Coccidiosis (3.15%), of the first its presentation was the classical or sciatic nerve involvement. The presence of pullets with the clinical picture was observed at the third week of age compared to that reported generally at the eighth week of age.¹³ Because it is not curable, the disease must be prevented by vaccination in the incubator. The coccidiosis is originated by a unicellular parasite; only the species *Eimeria tenella* causes serious injuries in the intestinal mucosa.¹³ The prevention of this disease must disinfect the facilities and equipment (feeders and drinkers), use of coccidiostats or vaccination on the first day of age, in addition to the immediate treatment of the pullets affected with an anticoccidiosis in the drinking water.¹³ The poorly sexed (4.08%) is generally attributed to the lack of training of the staff that performs the activity in the incubator. The remaining 5.38% of the causes (sampling, slaughtered, poorly vaccinated and crushed), with the exception of epidemiological surveillance sampling, are causes that should not be presented on the farm and are due to poor management of the same.

Conclusion

The results suggest that the main causes of farm mortality are not diagnosed, and the second major cause is retention of the yolk sac. The

main causes of mortality are problems in their greater percentage non-infectious attributable to the handling of pullets and that identifying the cause of mortality can be taken zootechnical measures to minimize them and increase the productive performance of the flock.

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Conflict of interest

The author declares no conflict of interest.

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