FOWL TYPHOID IN TABLE EGG FARM IN PROCESS OF CERTIFICATION FOR ORGANIC PRODUCTION IN THE SOUTH OF BRAZIL

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ABSTRACT

Fowl Typhoid is a septicemic disease that affects several bird species, including chicken and turkey. This disease has a worldwide distribution, with sporadic cases in European and North American countries and having a higher frequency in South America, Africa and India. Its presence has been reported in several production systems, such as table egg and broiler farms. This study reports a case of Fowl Typhoid in a table egg farm which was undergoing the certification process to start its organic production. *Salmonella Gallinarum* was isolated from samples collected at the necropsy of chicks from an outbreak with a mortality rate of 33.7% at the 9th day after birth. The suspect colonies of *Salmonella spp.* were isolated from a pool of organs (liver, spleen, heart and yolk sac). In the biochemical and serological tests, the colonies were consistent with *Salmonella Gallinarum*. The confirmation of serotype was made by antigenic characterization for *Salmonella spp.* and by Premi® Test. The Fowl Typhoid impacts severely the development and the production of the poultry industry. In Brazil, the National Poultry Health Plan established procedures to avoid the entry and spread of this disease in poultry farms, strengthening aspects as biosecurity and vaccination programs in poultry farms, ensuring better competitiveness in marketing of these products.

KEYWORDS: *Salmonella Gallinarum*; Eggs; Organic production..

INTRODUCTION

Fowl typhoid (FT) caused by *Salmonella Gallinarum* (SG) is a severe and septicemic disease affecting primarily mature hen and turkey flocks; however there are reports of high mortality in young chicks ‘Shivaprasad et al., 2008’. This disease was identified as one of the factors causing serious economic losses in poultry farms especially in table egg productions; however it may happen in breeders farms sporadically ‘Berchieri Júnior et al., 2009’. In the Brazilian poultry industry the attempts to eliminate this disease in positive flocks in the 1990s caused the elimination of positives flocks as result of the implementation of the National Poultry Health Plan (PNSA), this plan authorized the use of inactivated vaccines in breeders flocks ‘Brazil (2003).

Similar to poultry industry, the birds in organic farms may get infected with FT, then, this disease can be a serious problem in alternative productions, too. Lampkin (1997) related that the concept of organic farms emerged in Europe in the late 1990s in response to the demands of consumers who asked for a nutritious, safe and with a production that respect animal welfare. Lately in the 1980s the cage systems for layers was questioned for consumers worried about animal welfare and the producers began to consider the use of alternative husbandry systems for laying hens as the ‘enriched’ cage and the ‘free range’ system.
However, the production in these systems has the risk to get infected with bacteria, virus or suffer toxic and physical and chemical injury.

Fowl typhoid is a common cause of serious economic losses; both morbidity and mortality are highly variable with mortality from 10 to 80%. The main source of infection could be the infected bird that acts as reactor or carrier, this situation is considered as the most important way of perpetuation and spread of the organism. ‘Shivaprasad et al., 2008; ‘Berchieri Júnior et al., 2009. The quickly horizontal transmission may occur as a result of eating feces, contaminated feed, water and litter; the cannibalism and eating of infected eggs can also be an important source of SG. This disease can be transmitted through the eggs; this transmission may result from the contamination of the ovum following ovulation ‘Shivaprasad et al., 2008.

This case report shows a FT outbreak in a table egg production that was undergoing the certification process as an organic farm. It is also done a description about the measures of control applied in order to avoid the disease dissemination.

MATERIALS AND METHODS

In December 2010, the Avian Pathology Diagnostic and Research Center (CDPA, for its acronym in Portuguese) of the Federal University of Rio Grande do Sul, received three birds, 5 days old, Isa Brown strain, from a flock of 267 birds. The pullets were evaluated seeking clinical and pathological changes. The samples collected were liver, spleen, heart and yolk sac of birds in order to conduct bacterial isolation, characterization and confirmation of the suspected agent.

For the necropsy was used an individual electrocution, according to the instructions recommended by the OIE for animal sacrifice with prophylactic purposes ‘OIE (2011). The samples were processed by conventional microbiological techniques for bacterial isolation and identification of the suspected agent by biochemical and antigenic characterization for Salmonella. Serotype confirmation was performed using the DNA microarray system for Salmonella - Premi® Test.

RESULTS

The flock history reported the starts of the signs immediately after placement of the pullets in the chicken house, with increased mortality up to the sixth day of life. At the seventh day there was a reduction in the number of dead birds, but the clinic signs as weakness, abnormal feathering and bad corporal condition continued. The cumulative mortality at the ninth day was 33.7%. In the day ten, the farmer decided to sacrifice the flock in order to avoid the spread to other chicken houses.

The findings at necropsy showed splenomegaly and hepatomegaly; liver had yellow areas and the yolk sac was not completely absorbed. With the history, clinical data reported and the observed lesions, it was made a tentative diagnosis of Salmonella spp. It was made the isolation of small, smooth, blue-gray and circular colonies from a pool of heart, liver and spleen. The biochemical and antigenic characterization established Salmonella Gallinarum as the etiological agent of the problem. This serotype was also confirmed through the use of the Premi® Test, which allows typify Salmonella spp. using a DNA microarray system

DISCUSSION

The intensification of poultry production, using high densities, can cause failures in the health management, producing the emergence of diseases ‘Salle et al., 2008. This situation cause important economic losses to poultry industry and a negative impact on public health. Because of the indiscriminate use of antibiotics and the absence of animal welfare in some poultry productions, it was caused the emergence of a niche of consumers who choose to consume food produced in an unconventional way, such as products from organic systems. In the 1980s, due to pressure from the no use of cage systems, animal welfare and with the demand for differentiated products, there was...
introduced the concept of egg production in free-range and organic systems, which today is widespread worldwide ‘EFSA, (2008); Lampkin, (1997).

This report shows a case of FT in a property that was in the certification process for the production of organic eggs. SG was isolated from a flock of pullets, which showed mortality as early as they placement and with the clinical manifestations showed an inadequate body condition for the age and lineage of birds, as well as weakness and abnormal feathering. ‘Shivaprasad et al., 2008; ‘Berchieri Júnior et al., 2009, showed that these clinical signs were described in reported the birds contamination with SG. The mortality observed in this case got 33.7% in the first nine days of birds life. This is within the framework described by other authors who reported a mortality rate ranging from 10 to 80% in affected flocks in different countries, in addition to production losses ranging in the order of 30 to 50% in the affected flocks ‘Pulido et al., 2008.

Due to inadequate development of the chickens and the suspicion of contagious infectious disease, the farmer decided to eliminate the flock, favoring the biosecurity of the farm ‘Berchieri Júnior et al., 2009. The hens affected by this disease can not get the standard egg production and will not have a performance as standard strains, since degenerative lesions of ovarian follicles, posture intra-abdominal peritonitis and fibrinous perihepatitis, (with or without involvement of the reproductive tract) can be observed in sick birds ‘Shivaprasad et al., 2008.

Prevention programs adopted are based on the principle of cleanliness, hygiene and disinfection ‘Berchieri Júnior et al., 2009, however it is necessary consider other conditions as diseases vertical transmission in order to prevent the entry of pathogens to one farm. For this reason is strongly recommended to obtain the birds of optimal quality without the presence of pathogenic agents. The creation of physical barriers, which aim to control access of vehicles, people and domestic and wild animals are also recommended ‘Andreatti Filho, 2006. These programs must be carefully planned and executed to cover the largest possible number of microorganisms.

In Brazil, the PNSA regulates the criteria for reducing the number of cases of avian salmonellosis. One criteria is that the breeders must be free of Salmonella Gallinarum and Salmonella Pullorum, and controlled or free of Salmonella Typhimurium and Salmonella Enteritidis, seeking to ensure food safety ‘Berchieri Júnior et al., 2000; Brazil, 2003.

This case report highlights the potential risk that exists in organic farms in relation to infectious diseases and the possibility of these sites harboring pathogens that can be disseminated later. The introduction of preventive health work in organic farms, along with a general management and adequate follow the biosecurity rules, assist in the prevention of disease and provide optimal flocks performance.

REFERENCES


EFSA-European Food Safety Authority. (2008)


