

BIOSECURITY PRACTICES IN ALGERIAN POULTRY FARMS

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ABSTRACT: *The objective of this study was to determine the level of adoption within the Algerian poultry farms (broiler chickens, laying hens) of a range of standard biosecurity practices (isolation, traffic control, decontamination, vaccination...). Quantitative and qualitative evaluation of the biosecurity in the poultry houses has been analyzed thanks using method developed by the French Food Safety Agency. Factorial analysis has permitted to determine four classes of poultry farms. Class 1 and 2 (55%) regroup poultry farms very badly maintained, with breeders which do not respect the elementary hygiene measures (precarious buildings, impure water, non respect of the sanitary vacuum, badly disinfection, presence of contamination vectors, bad elimination loose chickens...). The two classes are a score between, 0 - 100 points and UFC (faecal streptococci) > 25. Class 3 and 4 regroup 45% of poultry farms and demonstrates that the number of faecal streptococci colonies/25 cm² is the lowers (3<UFC<9) and (10<UFC<25) respectively. In these farms, the sanitary teams apply very rigorous barriers of security and decontamination. Visual score attributed for these classes represents unfortunately score between, 100-200 points. The decline of production performances (mortality, feed conversion, and laying rate) especially observed in the poultry farms, class 1 and 2, because of failings sanitary barriers in production period.*

Key words: Algeria, biosecurity, poultry farms, production performances

INTRODUCTION

The poultry production knows a real development since several years. Carried by the craze of the consumers for products of poultry origin, the production of broiler chicken and laying hens increased considerably due to the important investments granted by the private and public sectors.

However, the intensification of the poultry breeding does not evolve without problems. In fact, the majority of breeders do not master the application of the fundamental hygienic rules, which consequently favor the development of an unfavorable environment for the poultry, dragging the emergence of different pathologies. These last ones strike a blow at the profitability and at the quality of products. Sanitation measures, disinfection, vaccination and diagnostic control are great importance in diseases and pathogenic microflora control.

It is important to know the hygienic status in poultry houses, to identify points of risks that explain the continuity of pathological problems as for example the salmonellosis (WHO 1993, Nespeca et al 1997, Rose et al 2000) drag consequent economic losses of a high mortality rate in the breeding flock.

The objectives of this study is: 1) Quantitative evaluation of the biosecurity in the poultry houses by the systematic measures of the hygiene status due to the method developed by the French Food Safety Agency (Drouin and Toux, 2000). 2) Estimation of the effect hygienic status on production performances in poultry breeding.

MATERIALS AND METHODS

An investigation on 40 poultry farms realized in the East of Algeria. The passage in building made before the implementation of the breeding flock. For each breeding, a technical index card distributed to collect information (population density, vaccination, body weight, feed consumption, feed conversion, and rate of laying mortality, disinfection, rodent and pest control, and the period of sanitary vacuum...).

Poultry breeding concerned with this inquiry divides as follows 25 poultry farms of broiler chickens and 15 poultry farms of laying hens.

Bird's distribution in poultry houses vary between 5000-10.000 for broiler chickens and between 10.000-30.000 for laying hens.

Quantitative and qualitative evaluation of the biosecurity in the poultry houses has been analyzed thanks using method developed by the French Food Safety Agency (AFSSA) (Drouin and Toux, 2000), which consists in making two operations:

ORIGINAL ARTICLE



1-hygiénogramme: method based on the visual control of poultry house after decontamination (pest control, rat extermination, cleaning and disinfection). A score between 0–200 points, is attributed to the poultry houses according to the quality of the decontamination and traffic control in the various places.

2-bacteriological control: 16 contact limps of 25 cm² (*fecal streptococci*) are used for each poultry house (640 bacteriological samples for 40 buildings). Takings are realized after the decontamination of buildings and concern the following places: the door, cages, carpet of droppings, ventilation circuit, feeding dishes, watering places, floor and the walls.

After an incubation of 36 hours, the reading of colonies (UFC/25cm²) and results compared with the norms established by the AFSSA - CIDEF (Cable and Fargeas, 2000). All the data gathered in tables and a factorial analysis of multiple correspondences (AFCM) realized to determine different class of biosecurity (hygienic status, traffic control, sanitary barriers) in poultry farms. The differences were tested by analysis of variance (ANOVA), they are considered significant at P <0.05.

RESULTS AND DISCUSSION

Factorial analysis of multiple correspondences associated to a hierarchical ascending classification has permitted to determine four classes of poultry farms.

Visual control of decontamination and traffic control are weak for most breeding (Fig. 1). On 40 poultry farms, only two (class 4 and 3) have a satisfactory biosecurity procedures, score (150- 00) and (100-150) respectively. In the other poultry farms, biosecurity procedures are considered insufficient and the score is lower than 150 points.

The qualification of the staff in methods of decontamination plays a very big role in the success of the fight against vectors and contaminants.

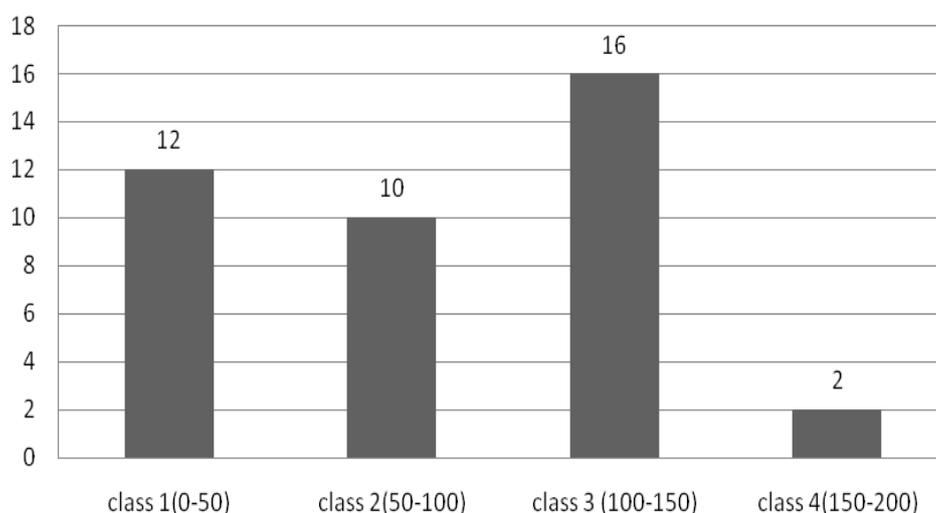


Figure 1. Visual score in poultry farms (n=40)

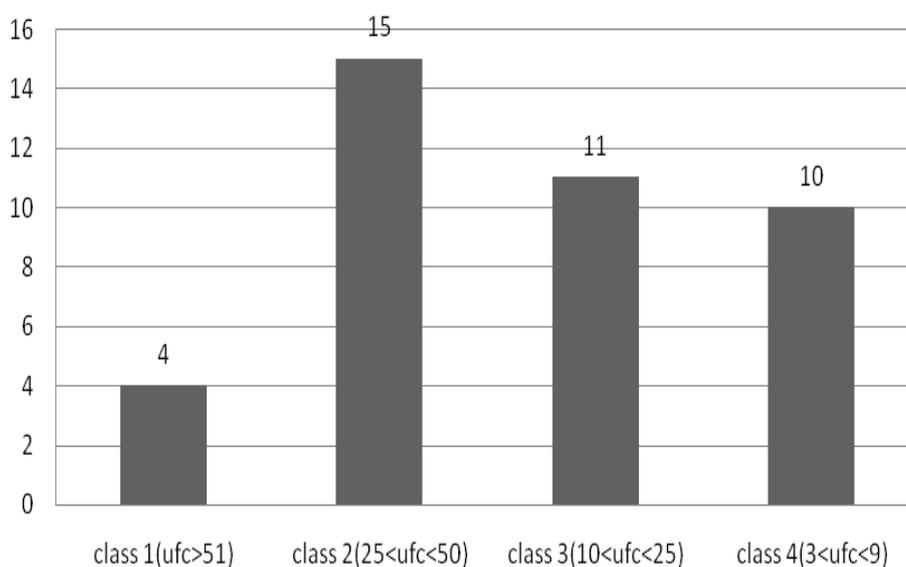


Figure 2. Bacteriological score in poultry farms (n=40)

Bacteriological control (Fig. 2) revealed the following results in the different classes:

Class 4 regroups for the greater part poultry breeding and demonstrates that the number of *fecal streptococci* colonies is the weakest ($3 < UFC < 9$). In these farms, the sanitary teams apply very rigorous sanitary barriers. This class represents unfortunately that 25% of poultry farms.

Class 3 constituted partially by 27.5% poultry farms. Bacteriological score of the decontamination and traffic control can be considered as acceptable ($10 < UFC < 25$). In this group, breeders are much more aware by the problem of hygiene measures they strictly apply the orders of their veterinarian advice (medical prevention, rigorous decontamination, under floor space, access to the strictly regulated poultry houses).

Class 2 ($25 < UFC < 50$) and 1 ($UFC > 51$) regroup breeding very badly maintained, with breeders which do not respect the elementary hygiene measures (absence of footbath, precarious buildings, non respect of the sanitary vacuum, auto medication, badly made disinfection, presence of contamination vectors, corpses of animals on the site..). These two classes represent 47.5 % of poultry farms.

The bad management of the cleaning, disinfection operation and the sanitary barriers failings in breeding period can be causes according to Drouin (1988), Rokicki and Kolbuszewski (1996) and East (2007).

The breeders that respect the biosecurity measures obtain best performances in broiler farms (Table 1). Mortality rates are generally weak in breeding where hygienic status ranged in the class 3 and 4. Weight gain and feed conversion are slightly weak in badly maintained breeding. These results confirm studies made by the other authors, Drouin (1988) and Cardinal et al. (2001).

Laying hens performances (Table 2), notably the laying rate of and the egg mass are slightly more favorable in poultry farms where hygiene and traffic control are well-applied (class 4). The analysis of the variance allowed to confirm significant differences ($P < 0.05$) especially between the classes of poultry farms for the mortality rate and the laying rate (class 2 and 4). The decline of performances especially observed in the poultry flock deprived because of the failings of the sanitary barriers in production period (Drouin et al., 2000; Valancony et al., 2001).

Class	4	3	2	1	Total (n =25)
Feed conversion	2.46*	2.59	2.97*	2.70	2.68±0.18
weight (g)	1895*	1690	1700	1786*	1767±116
Mortality (%)	3.9	3.2	6.7*	7.9*	5.42±0.8

*Data in a row with no common superscript differ significantly $P < 0.05$

Class	4	3	2	1	Total (n =15)
Feed conversion	2.36	2.29	2.47*	2.60	2.43±0.02
Laying (%)	80*	78	81*	72	77.75±0.9
Egg mass (g)	63.23	60.10	62.54*	61.58	61.86±1.3
Mortality (%)	4.5*	4.92	3.96*	6.58	4.99±0.05

*Data in a row with no common superscript differ significantly $P < 0.05$

CONCLUSION

Results of this study show that the biosecurity of poultry houses is below standards recommended by AFSSA (French Food Safety Agency). However, we note that some breeders apply the elementary hygiene measures, which allows obtaining good production performances. It is important to intensify preventive measures to limit the poultry environment microflora to a lower level, to limit his impact on the breeding production and poultry health.

The decontamination of poultry houses is a delicate operation. It must be obligatory and regulated to avoid any contagion of the breeding flock. It must be also made by a qualified and competent team. The excellent efficacy of the decontamination of poultry houses can be mainly explained by using an HACCP team, supervision of cleanliness, a sanitation including all of buildings, equipment and approaches; moreover a biosecurity program to remove risk factors, was carried out. The sanitary responsible has to convince the breeders of the importance of hygiene measures and disease prevention in the fight against pathologies and the improvement of production performances.

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