# STUDIES REGARDING THE IMPORTANCE OF CORRELATION THE GENETIC POTENTIAL WITH THE PARAMETERS OF MICROCLIMATE AND SANITATION IN THE POULTRY FARMS WITH PARENT REPRODUCERS

### Roşan Cristina Adriana\*

## \*University of Oradea, Faculty of Environmental Protection, 26 Gen. Magheru St., 410048 Oradea, Romania, e-mail: crosan@uoradea.ro

#### Abstract

The assurance of the food quality in the context of globalizing the food markets is vital for the consumer. The obtaining of chicken carcasses of upper quality in conditions of food safety imposes the tracing of the alimentary product. The importance of assuring the parameters of macroclimate, sanitation and the nutritional one to obtain a number of parent reproducers from the commercial hybrid for Ross 308 meat represents the objective of this study. In this context the main indicators were followed that are used for the tracing of the chicken meat product of which: the weight, the health condition of the reproducers, the production of eggs, the weight and quality of the incubation eggs and the hygiene from the shed. The results obtained following the analysis of the indicators demonstrate that the number of reproducers assured optimum conditions of micro climate, feed that corresponded to the nutritional requirements of the reproducers so that the increase in weight was made according to the standard, did not jeopardize the reproductive life of the two sexes laying at the end of the production period 89.49 % eggs that can be incubated. The bio security of the parent reproducers was made according to the program of sanitation and monitoring the health condition, performing periodical controls from which there were not identified pathogen agents.

Key words: genetic potential, hybrid, Ross 308, poultry chain, pathogen agents

## **INTRODUCTION**

The main purpose of the reproduction farms is represented by reaching a genetic potential given by the companies of improvement by reaching some important parameters: the ratio meat/bones, the percentage of the chicken breast in the carcass, the percentage of fat in the carcass, the parameters that are determined genetically in a great extent (Apostol, 2009; Lazar, 2008).

The accomplishment of genetic performances in the reproduction farms (parents) is made by respecting the management of shed assuring the parameters of microclimate and sanitation that could influence the reproducers and the quality of the incubation eggs and later the one-day baby chickens expressed by vitality and future performances (Apostu, 2009).

In this regard, on the level of each chain from the poultry industry, the control of quality and hygiene has to begin with the control of the inputs on the level of each stage of production (raw materials, the quality of the egg, the quality of the chicken, the quality of the feed etc.) and has to be maintained during the entire production process (Balş, 2010).

Many researchers (Cox et al, 1991; Weaton,, 2002; Corry J. et al, 2002; Marin et al, 2009) have demonstrated that the incubation represents an important chain from the poultry chain. Disrespecting the conditions of hygiene and sanitation determine the transmitting of microorganisms in the other chains, influencing the quality of the meat by their specificity that finally can lead to the improvement or the depreciation of the meat

quality (Tudorache, 2006). Bailey et al in 1994 and 1996 demonstrated that a single egg contaminated with *Salmonella sp.* can contaminate obviously the other eggs from the incubator.

Each unit of reproduction and production has to select and implement the specific technologies to accomplish the basic criteria. Guide of good practices is a voluntary application of the operator and has to contain preventive measures that concern the conditions of internal and external organization of the company administered for the decreasing of the probability of contamination of the product from internal or external sources (Tinker et al, 1996; Chereji I., 2004; Raspor et al, 2008).

Any program of sanitation has to be complementary with the demands of the HACCP system, to provide a fast evaluation of the hygiene condition, to reduce the time of stopping the installations and the technological areas and to create the premises of a fast intervention for the correction of the deficiencies (Arnold et al, 2003; Del Río et al, 2008; Dinçer et al, 2004).

## MATERIAL AND METHODS

The study was made at a chicken reproducing farm (parents) called S.C. "P.V.M. Trans" situated in Pausa in Bihor county, for a total number of 21548 birds from the commercial hybrid of hen for the meat production ROSS 308 of which 18740 hens and 2808 roosters.

During the entire period of breeding, the health of the reproducers was monitored by assuring the parameters of climate underlined by the performances accomplished expressed by the evolution of the body weight and the productive performances and of quality by: the number of eggs deposited, their weight and the sanitary veterinary actions accomplished by the programs of health monitoring. The growth of the reproducers was made separately on sexes up to the age of 22 weeks receiving the same feed, the males and the females respecting the period of growth in which they are, and from the age of 22 weeks the females and the males were combined, from that moment being given the feed according to the sex. The breeding of the reproducers (parents) was made on permanent bedding respecting the density according to "The technological guide of breeding".

For the feeding of the reproducers, more recipes of combined fodder were used respectively: starter I (0-20 days), starter II (21-42 days, growth (43-104 days), pre laid egg feed up to 5% eggs (up to 23 weeks), egg laid feed over 5% eggs (23 weeks-depopulation). We should also mention that, beginning with week 18 the roosters received separate feed, named feed for roosters.

The program of hygiene and the monitoring for most of the diseases from the group were scheduled to detect a prevalence of at least 5%, with a trust margin of 98%. For our group of broiler parents (>500 birds), approximately 60 tests were collected. At the age of 140-154 days (20-22 weeks), a higher level of monitoring in the groups of parents was made, especially for the micro plasmas and *Salmonella*. In this critical period 10% were tested.

The results were statistically processed and interpreted by the test Fisher and Tukey tests.

## **RESULTS AND DISCUSSION**

The determination of the average body weight was made by weekly weighing of 100 hens and 50 roosters on a period of 434 days (62 weeks). From the obtained data (fig. 1), we could say that in the first 22 weeks, significant differences reported to the standard



curve of growth were underlined, but beginning with the 23<sup>rd</sup> week we could observe differences of weight for both sexes.

Fig. 1 Dynamic of the evolution of weight at reproductors (parents)

As a result, the hens registered constantly variations ranging between 1-3.5% and the coefficient of variability registered differences from one week to another of 3-8.86%. The curve of growth in weight accomplished for the study group, doesn't present significant deviations being situated near the standard curve of growth for this hybrid, the results being favorable for the obtaining of some significant qualitative and quantitative performances in the birds' reproduction. In absolute values, these differences are of approximately 0.23g/day cumulating additionally at the end of the reproduction period 94.40g compared to the standard weight (3985g). The male reproducers had a parallel development with the standard curve, without significant oscillations. At the end of the reproduction period, the males cumulated a body weight greater with 83g compared to the maximum limit that is 5000g.

During the 39 weeks of production daily recordings of the number of eggs deposited were made. Regarding the production of eggs we can affirm the following: a number of 2.666.640 eggs was deposited out of which 2.386.300 eggs were incubated and 280.340 minus variants. Of the total laid eggs up to 5% deposit, period characteristic for the first 1-3 weeks of production, a decreased percentage was observed or it was even absent in the first two weeks of eggs deposit that could be submitted to incubation. From the fourth week, we can observe that the percentage of incubation eggs increases significantly reaching to 31 weeks at 96.75%. This can be observed also from figure 2.



Fig. 2 Dynamics of the evolution of egg production

In order to determine the average weight of the eggs during the 39 weeks of production, daily 200 eggs were weighed. From the data obtained (fig.3), we could say that the weight of the eggs in the first weeks from the beginning of the egg deposit up to 5% was smaller being situated under the standard curve of eggs' weight, and beginning with the week 27 of life and respectively the fifth of production, it began to increase being over the standard weight reaching at the end of the reproduction period ( $62^{nd}$  week) to 73.64kg, this being favorable to the increase of the percentage of eggs admitted on incubation on one side, and on the other side, is retrieved in the weight of the one-day baby chicken.

The program of hygiene and monitoring of health was essential to obtain a good health of the groups of parents and a maximum productivity.



Fig. 3 Dynamics of the evolution of eggs weight

It also had as objective the identification of the presence of the disease in an early stage, so that it could be implemented correctional measures to minimize the negative effects on the group of reproducers or on their descendants. The disinfection was made with ECOCID 1%, after which samples were taken from the shed, from the walls and the paving for the staphylococcus test and mycological test. The samples were sent to D.S.V.S.A. Bihor Sanitary Veterinary Department for the Health of Food and the result was negative. At approximately 14 weeks since population, the tests of sanitation were repeated and the result obtained was negative.

#### CONCLUSIONS

In order to assure a meat of superior quality, the monitoring and the control of all the parameters of quality even from the first chains of chicken production are imposed. A decisive role in obtaining some maximum performances has also the genetic potential of the hybrid that suffers permanent modifications and which imposes periodical re evaluations of the nutritional demands. The paper is placed in the context of the total quality management and proposed to study the first chain of the chicken industry. From the data obtained we could say that the evolution of the body weight of the young reproducers in the first weeks of growth accomplished constantly small variations in weight between 1-3.5% in the cases of females and up to 2% in the cases of the males. The curve of increase in weight for the females and males was parallel with the standard curve for this commercial hybrid of meat leading to favorable results for obtaining some significant quantitative and qualitative performances in birds' reproduction.

Thus, we could say that the production of eggs in the 39 weeks recorded a total of 2.666.640 eggs deposited out of which 89.49% were incubated and the difference of 10.51% were eggs that were eliminated for different reasons. The weight of the eggs at the beginning of the egg depositing was smaller being situated under the standard curve but from the fifth week of production this begun to increase being over the standard curve reaching 73.64g at the end of the egg deposit period. The program of hygiene and monitoring of health was developed according to the pre-established plan, after the periodical controls there were no records of morbidity with pathogen agents, the conditions of micro climate and the necessary feed were providede, thus assuring the health of the reproduction lot for the accomplishment of the bio productive potential.

# REFERENCES

- 1. Apostu, S., 2009, Managementul calității totale, Ed. Risoprint, Cluj-Napoca.
- Apostol, L.V., 2009, Contribuții la îmbunătățirea performanțelor de incubație a ouălor de găină prin sanitație, Teză de doctorat, Iași.
- Arnold, J.W., 2003, Advances in food sanitation: Use of intervention strategies, in Food Saferty Handbook, H., S.R., E., R.G., Editors. John Wiley and Sons, New York, 337-351.
- Bailey J.S., Cox N.A. & Berrang M.E., 1994, Hatchery-acquired Salmonella in broiler chicks. Poultry Sci. 73:1153-1157.
- 5. Bailey, J.S., Stan, J. & Nelson A. Cocs, 1996, Methods to reduce hatchery, breeder flock contamination. Poultry Digest. Sept., pg.12-16.
- Balş C., 2010, Merkeri de calitate şi trasabilitate pe filiera cărnii de pasăre, Teză de doctorat, Cluj-Napoca.
- 7. Chereji I., 2004, Tehnologia creșterii animalelor, Editura Universității din Oradea.
- 8. Cox, N.A., Bailey, J.S., 1991, Effect of chemical treatments to eliminate Salmonella on hatching eggs. Poultry Science 70 (Supp. 1):154.
- Corry, J.E.L., Alien, V.M., Hudson, W.R., Breslin, M.F., Davies, R.H., 2002, Sources of Salmonella on broiler carcasses during transportation and processing: Modes of contamination and methods of control. Journal of Applied Microbiology, 92 (3): 424-432.
- Del Río, E., Gonzalez de Caso, B., Prieto, M., Alonso-Calleja, C., Capita, R., Effect of poultry decontamination concentration on growth kinetics for patogenic and spoilage bacteria. Food Microbiology, 30 (3): 197-204.
- 11. Dincer, A.H., Baysal, T., 2004, Decontamination techniques of pathogen bacteria in meat and poultry. Critical Revuews in Microbiology, 25 (7): 888-894.
- 12. Lazar A. N., 2008, Genetică, Editura Universității din Oradea.
- 13. Marin, C., Lainez, M., 2009, Salmonella detection infectes during broiler rearing and after

live transport to the slaughterhouse. Poultry Science, 88 (9): 1999-2005.

- 14. Raspor, P., Jevšnik, M., 2008, Good nutritional producer to consumer. Critical Riviews in Food Scince and Nutrition, 48 (3): 276-292.
- 15. Tinker, D.B., Gibson, C., Hinton, M.H., Allen, V.M., Wathers, C.M., 1996, Reduction of cross-contamination in defeathering machinery. Misset Word Poultry, 12(9): 13-16. 16. Tudorache M., 2006, Filiera avicolă, Editura Ceres, București.
- 17. Wheaton, F.W., 2002, Evaluation of chemical disinfectants for the elimination of Salmonella biofilms from poultry transport containers. Poultry Science, 81(6): 904-910.