

SHORT TERM SCIENTIFIC MISSION (STSM) – SCIENTIFIC REPORT

The STSM applicant submits this report for approval to the STSM coordinator

Action number: CA15224

STSM title: KBD occurrence in different production systems in Greece (epidemiological study) (N°11)

STSM start and end date: 01/08/2018 to 15/08/2018

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PURPOSE OF THE STSM

Although keel-bone damages have a significant negative impact on welfare in laying hens, the extent of the problems in Greek commercial flocks of layers is still unknown. The purpose of this STSM was to define the occurrence of the keel bone damage (KBD) in live laying hens in different production systems in Greece.

Considering that I have been trained for palpation of keel bone at Research Centre for Proper Housing: Poultry and Rabbits Zollikofen, I showed my colleagues in Greece how to evaluate the state of KBD in their country.

Interested industrial partners in Greece (commercial farms with different production systems) were chosen to cooperate in this study. Each of these farms was chosen to match with others as comparable as possible (regarding hybrid type, rearing period, age of laying hens), and each flock was assessed for keel bone damage and other welfare parameters (foot lesions - hyperkeratosis, dermatitis, bumble feet, comb pecking wounds, skin lesion, claws and feather condition). The internal and external egg quality from two different housing systems was determined as well.

In Serbia, the change from the conventional cage system to the alternative systems is still in process, although it is certain that it will be the responsibility of producers by 2020. 80% of producers who have switched to alternative systems opt for enriched cages. So far there are only a few farms with enriched cages, but none with a floor system. Therefore, STSM was also a great opportunity to get more knowledge about alternative systems of rearing laying hens.

DESCRIPTION OF WORK CARRIED OUT DURING THE STSMS

During my stay at the Veterinary Research Institute, Hellenic Agricultural Organization-DEMETER, we visited three big laying hens farms with different production systems (enriched cages, floor system, and free range). In the first days of STSM we chose a sample size and final design of the research protocol, according to European Welfare Quality Assessment protocol for

Poultry.

There has been a lot discussion about poultry production in Serbia and Greece, where the situation in this sector was compared. We came to a conclusion that the table egg production in both countries is very similar. In Greece, in rural areas, eggs are still produced around the households for self purposes, not only from hens, but from geese, turkeys, and ducks. Of course, Greece is a member of EU, so there is no egg production in conventional cages. Starting from 01.01.2012, producers have switched to enriched cages and alternative systems. Most of the producers opted for enriched cages, floor system, and free range. The others chose aviary system and organic production. This was the reason for visiting three farms with three most used systems.

All three farms have a similar rearing system. Presented hybrid was Isa Brown, and the layers were on the start of production system. We made palpation of laying hens keel bone and breast (only the existence of KBD was recorded, both the fracture and only deviation). We measured other welfare parameters as well. We recorded/measured legs foot lesions - hyperkeratosis, dermatitis, bumble feet, comb pecking wounds, skin lesion, claws and feather scoring according Tauson et al., (2004) on all birds with the neck, breast, tail, wings, back and cloaca/vent being scored. Feather scoring ranged from 1 (severe feather damage) to 4 (perfect feather coverage).

Egg samples were taken from each farm, in order to investigate the internal and external quality (External egg quality traits: egg weight, shape index, cleanness of egg, shell color, shell breaking force, shell thickness, shell weight; internal egg quality traits: height of egg white, yolk color, HU, USDA and meat and blood spots).

During the last part of STSM, we analyzed and discussed the data that was recorded.

DESCRIPTION OF THE MAIN RESULTS OBTAINED

The first investigation showed that KBD were present in all three observed production system in Greece. The average range of keel damage observed in laying hens kept in enriched cages was 23,8%. The birds were 7 month old, and they had good plumage scoring (3,7), and they didn't have problems with foot lesions - hyperkeratosis, dermatitis, bumble feet, without comb pecking wounds, without skin lesion, and with claws of normal length.

According to welfare parameters, the similar results were found in layers kept in free range system. Plumage scoring was 3,23, without other welfare problems. But more layers with KBD problem was found (42,8%).

In floor system laying hens were 5,5 months old, with perfect feather coverage, and without other welfare problems. KBD was not recorded. Only a few hens had a slight deformity of keel bone.

The results showed a significant effect of housing system on the internal and external egg quality. The average weight of collected egg was between 49,40g and 60,73g. In floor system laying hens were 5,5 months old, and they had significantly lighter eggs and weight of egg shell, compared to egg from enriched cages and free range. In all three systems, statistically significant differences in shells colour were not found.

Housing system significantly influenced the cleanness of eggs. Free range egg shell were statistically more dirty than shells from the other two production systems, but had a higher shell breaking force (4,9kg). The eggs produced in floor system had thinner egg shells than the eggs produced in the cages and free range.

The Haugh unit observed in the eggs from all three production systems was between 85,5 and

86,5. But there was no statistically significant difference between the systems. Albumen height and Haugh Unit (HU) are a major determinant of internal egg quality. The Haugh Unit (HU) is calculated from the height of the inner albumen and the weight of egg. It is generally accepted that the higher the HU value than 70, the better freshness of eggs and egg quality are. According to USDA guidelines, eggs are graded and labeled as AA, A, and B. Grade AA are eggs of very good quality. The whites are thick and firm and the yolks are free from any defects. An AA quality egg has a HU greater than 72. In our research the eggs from all three systems had a very good quality of eggs.

The eggs produced in free range, compared with those laid in cages and floor system, presented significantly darker yolk color. The eggs produced in floor system had paler yolks than the eggs produced in the cages and free range.

Dr Sossidou, supervisor of the STSM at the Host Institution Veterinary Research Institute, Hellenic Agricultural Organization-DEMETER, will continue with her team to investigate keel bone problems and welfare parameters on the same farms, on a monthly basis, until the end of the production cycle. In the slaughterhouse, keel bone conditions of hens without feathers shall once more be examined, and scored by visual examination (after dissection). Collected bone with and without KBD shall be frozen, and sent to Serbia for further chemical analyses, for determination the levels of Ca and P.

FUTURE COLLABORATIONS (if applicable)

Future collaboration between both institutions: Veterinary Research Institute, Hellenic Agricultural Organization, Thessaloniki, and University of Novi Sad, Faculty of Agriculture Department of Animal Science, Novi Sad, will continue on finding causes and solutions for KBD in laying hens. This STSM training served only as a start of investigations in the field of KBD. Both research teams will continue the work on KBD problems in Serbia and in Greece. The database created during this STSM will be a good basis for future collaboration. Lot of work is still needed to vaporize the data.

The draft scientific paper will be written to present at some of the upcoming welfare national or international conferences, with acknowledgements to the KBD COST Action 15224.

STSM is a great opportunity for getting familiar with works and procedures in other institutions, for discussions about future cooperation, student exchange, research, and ways for applying for new projects funded by the European Union.

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