SHORT TERM SCIENTIFIC MISSION (STSM)
SCIENTIFIC REPORT

This report is submitted for approval by the STSM applicant to the STSM coordinator

Action number: CA15224
STSM title: The influence of different production systems on keel bone damage (KBD) in laying hens in Greece
STSM start and end date: 02/03/2020 to 13/03/2020
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Host institution: Veterinary Research Institute, Hellenic Agricultural Organization Demeter, Thessaloniki, Greece

PURPOSE OF THE STSM

The purpose of this STSM was to get introduced with keel bone damage (KBD) in laying hens and with methods for the assessment of KBD, such as visual observation and palpation. Additional, other behavioral parameters should be evaluated according to Welfare Quality Assessment protocol for poultry (2009).
STSM was also a great opportunity to get more knowledge about poultry behavior and welfare and its influence on health and production of laying hens. All these knowledge and experiences are expected to add a great value for my future work and research.

Due to the 1st Scientific Animal Welfare Conference of RAWC (Regional Animal Welfare Centre), from March 10-11, 2020, a part of the STSM will be great and unique opportunity to meet and network with international and regional specialists and experts to exchange and share views in order to promote animal welfare.

DESCRIPTION OF WORK CARRIED OUT DURING THE STSM

The first meeting took place at the Veterinary Research Institute (Greece), a research unit of the Hellenic Agricultural Organization Demeter. The meeting was attended by dr Evangelia Sossidou, dr Anna Dedousi and myself (Slobodan Knežević). During the meeting dr Evangelia Sossidou and dr Anna Dedousi gave a presentation about the Veterinary Research Institute as well as a tour in Institute's departments, labs and equipment. I met research staff and discussed with them the on going projects and activities. We also established tasks and priorities of the STSM, due to the topic of KBD in laying hens and other behavioral problems of poultry.

During my STSM at the Veterinary Research Institute of Thessaloniki we visited one of the local layer industries named "Tsakiris family AE" sited in Neochorouda, Thessaloniki. This family company was founded in 1963. After foundation the main scope of the firm was the production and the distribution of fresh eggs in the market of Thessaloniki. Today, the company possess special breeding eggs (organic farming, free-range, Omega-3 eggs), with distribution network all over Greece. The farm consists of different production systems (enriched cages, floor system, free range, aviary and organic system). In the visited facilities present hybrids of laying hens were Isa Brown and Isa White.

The KBD and behavioral problems were evaluated on 28 weeks old laying hens from floor system and 65 weeks old laying hens from enriched cages. The flock from the floor systems has the ability to go outside the facility in the free range system.
The KBD were evaluated, after observation and palpation, according to Li et al. (2016) method as following:
0: keel bone was intact with no deformation;
1: keel bone was slightly deformed, the extent of deformation was less then 10%;
2: keel bone was deformed, the extent of deformation was 10% to 50%;
3: keel bone was deformed, the extent of deformation was more than 50%.

Other welfare parameters evaluated were plumage damage, comb pecking wounds and comb abnormalities, skin lesions, foot pad dermatitis and claws length according to Welfare Quality Assessment protocol for poultry (2009) and Applied scoring of integument and health in laying hens (Tauson et al., 2005).
During my stay I got involved in the whole organization about RAWC Conference with Veterinary Research Institute of the Hellenic Agricultural Organization Demeter.
Sadly, since the Greek government announced special measures to fight the coronavirus on 8th March 2020, and prohibited all international conferences, the 1st Scientific Animal Welfare Conference of RAWC has been postponed until further.

DESCRIPTION OF THE MAIN RESULTS OBTAINED

The observation and palpation of keel bone of laying hens from the floor system, at the age of 28 weeks, showed, in most, intact keel bone with no deformation (score 0). Only a few of examinated laying hens had slightly deformed keel bone, with extent deformation less than 10% (score 1). All observed laying hens were with entire feather coverage. Comb pecking wounds and comb abnormalities were found in a small number of examined and observed laying hens. There were also a few laying hens with skin lesions. No dermatitis was present on examined foot pads. On the other hand, some of examined hens had dirt on the foot pads, with no lesions. This indicates possible future occurance of foot pad dermatitis. Claws had normal length in all examined and observed laying hens.

The situation regarding the KBD, in enriched cages with 65 weeks old laying hens, was different comparing to the floor system. Here, the KBD was present in almost all examined birds, while a small number of birds had intact keel bone with no deformation. All birds with recorded KBD had slightly deformed keel bone. However, the extent of deformation was less than 10%, with no fracture.

The plumage was scored using a 1-4 point scale on six body parts (neck, breast, cloaca/vent, back, wings and tail) and pooling them to a total. The *higher* the score is the *better* the status of the integument. Individual scores of < 2 and total score of < 10-12 indicates a severe damage to the plumage cover. While, an individual score of > 3 and a total score of > 18-20 indicates a good feather cover. Mostly, the observed birds had total scores between 12 and 18. The best scores were observed for back and tail, while the lowest were for vent and breast area. Comb pecking wounds and comb abnormalities were found in almost all examined birds, while only few of birds had skin lesions. As in floor system, no foot pad dermatitis was present. However, some of the birds had dirt on the foot pads. All observed birds had long claws.

The results showed a significant effect of housing system and age of laying hens on welfare problems.

FUTURE COLLABORATIONS (if applicable)

This STSM gave me the opportunity to gain knowledge about keel bone damage and behavioral observations and measeures. Besides, I got the opppurtunity and the honor to meet and work with dr Evangelia Sossidou, and dr Anna Dedousi. Due to this, I hope for future collaboration between Veterinary Research Institute, Hellenic Agricultural Organization-Demeter, Thessaloniki, and Scientific Veterinary Institute “Novi Sad”, Novi Sad.
The results of this STSM will be presented at national or international congresses, with acknowlegments to the COST Action 15224.

PHOTOGRAPHS

dr Antonios Zdragas (Director), dr Evangelia Sossidou (STSM Supervisor), dr Anna Dedousi and myself (Slobodan Knežević)

Evaluation of KBD, after observation and palpation

Evaluation of KBD, comb pecking wounds and comb abnormalities

Evaluation of plumage damage and KBD

Evaluation of plumage damage and foot pad dermatitis

Laying hens from the floor system