# 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:** **KBD in free-range organic poultry farm – palpation and ultrasonography findings**
**STSM start and end date:** **17/08/2020 to 04/09/2020**
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**PURPOSE OF THE STSM:**

Organic egg and poultry production is increasingly developing worldwide. However, data on the rearing conditions and physical and health conditions of laying hens on these farms are not sufficiently known. As a part of this COST action, a previous study of the incidence of keel bone damage (KBD) in one organic farm was performed by palpation (Đukić Stojčić et al., 2017), and the presence of KBD was not found. It is well known that different rearing methods have different impact on the occurrence and severity of the KBD in laying hens. But still, the methodology for diagnostic and estimation of prevalence are the same all around the world.

Currently, the most commonly used test method on farms is sternal palpation and, eventually, inspection. These methods do not always allow for a definite assessment of the lesions. False-positive as well as false-negative findings are very common. The result of the research also depends on the individual experience of the researcher.

Using all those facts in mind, the main purpose of my STSM was to work on assessing the prevalence of KBD among hens on an organic farm. To eliminate or minimize the shortcomings, we decided to combine palpation with ultrasound, thus revealing possible errors and achieving a more accurate assessment at the flock level. The second goal of this STMS was to collect data on the farm management and housing conditions, and also on animal condition in aim to determine possible risk factors for KBD and laying hens welfare in general.

**DESCRIPTION OF WORK CARRIED OUT DURING THE STSMS**

The activities related to the implementation of the set goals were carried out in free range organic poultry farm with approximately 2,500 laying hens, located near Belgrade, Serbia. Totally 10 autochthonous and commercial breeds of laying hens are bred on the farm. First, talks were held on the management of the farm and data were collected on the conditions of rearing, feeding and treatment of hens against internal and external parasites. Then a physical examination of 180 hens of different breeds (Banat Naked Neck, Tetra SL, Hungarian yellow hen, Super Harco and Italiana) and age groups was performed. The examination included:

1. Conditional assessment of the individual, using common poultry welfare parameters (body weight; visible injuries and feather loss in certain body areas; plumage condition and presence of ectoparasites; comb, crop and feet condition; and signs of enteritis and respiratory infections). The results were entered in a checklist prepared by Prof. Dr Renata Relic for the purpose of the study.

2. Keel bone palpation in all examined birds and detection of its deviation and fractures. The changes of the keel bone were evidenced, and the location and severity of these changes were assigned, according to method we were practicing in Keel Bone Damage Training School, Novi Sad, Serbia, October 10th 2019.

3. Ultrasonographic examinations, performed by ultrasonograph MINDRAY M-6Vet with multifrequency micro convex transducer (5.5-9 MHz), suitable for both deeper and superficial lesions detection. The study was performed on the median line in the ventro-longitudinal plane, and the animals were placed in a spine position.

**DESCRIPTION OF THE MAIN RESULTS OBTAINED**

Preliminary analysis of the obtained data shows that differences in the studied indicators between birds of different breed and age groups exist. Detailed processing of the obtained results is forthcoming, as well as their statistical analysis.

In general, in all examined birds, the feather loss in the area of back, tail, and head is most often detected. There were a few birds with changes in feet and toes, sour crop, respiratory problems, or signs of enteritis. Most often minor comb injuries were noticed. Sternum damage was found in almost 50 percent of the birds examined. This percentage was highest in the Tetra-SL hybrid (73.33%), followed by the Naked Neck breed (63,33% at 129 weeks of age and 50% at 68 weeks of age). The mean percentage of birds with sternum fractures was 28,33%. Here again, the undisputed leader was Tetra hens (50%), again followed by the Naked Neck breed (36.66% at 129 weeks old). In third place on this indicator were the hens of the breed Italiana (33.33%). The lowest percentage of birds with fractures was found in the group of Super Harco hens (3.33%), and the lowest percentage of keel bone deviations in Hungarian yellow hens (3.33%). The results of the performed palpation of the sternum in different breeds and ages of laying hens are shown in the table.

| Breed | Age in weeks | n | Dev n/% | Fr n/% | N of birds with damages n/% |
|---|---|---|---|---|---|
| Naked Neck | 68 | 30 | 7/**23,33** | 8/**26,66** | 15/**50** |
| Naked Neck | 129 | 30 | 12/**40** | 11/**36,66** | 19*/**63,33** |
| Tetra | 61 | 30 | 17/**56,66** | 15/**50** | 22*/**73,33** |
| Hungarian yellow | 114 | 30 | 1/**3.33** | 6/**20** | 7/**23.33** |
| Super Harco | 25 | 30 | 9/**30** | 1/**3.33** | 10/**33.33** |
| Italiana | 63 | 30 | 7/**23.33** | 10/**33.33** | 13*/**43.33** |
| Total | | 180 | 53/**29,44** | 51/**28,33** | 86*/**47,77** |

* The difference between the sum of the number of birds in columns 5 and 6 and the total number of birds with damages is due to the simultaneous presence of both types of pathologies in some animals.

**FUTURE COLLABORATIONS (if applicable)**

This STSM, supported by the COST Action 15224, resulted in a new collaboration between the University of Belgrade, Serbia and Trakia University in Stara Zagora, Bulgaria. We hope that the results and experiences from these three weeks will be published in a form of common article and soon presented in one of the upcoming International Symposias.

The two universities are willing to extend the research collaboration, including students and lecturers. Also, through the COST action, we were talked about further opportunities for collaboration in the area of precision livestock farming and making bilateral projects.