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: Health and movement patterns in laying hens
STSM start 11/01/2020 and end date: 03/03/2020
Grantee name: Sarah-Lina Aa Schild

PURPOSE OF THE STSM:

(max.200 words)
The main aim of the STSM was for me to gain knowledge about state of the art ongoing poultry research and to get practical experience in assessment of keel bone fractures in laying hens. Dr Toscano and his group in Switzerland have extensive experience in applied research on poultry and Dr Toscano is a leading expert on keel bone fractures in poultry. I mainly joined two studies during the visit:

Study 1) According to Swiss (and EU) legislation layer hens must be provided access to perches to allow them to fulfill their motivation for resting in elevated places during the night. The aim of the following study was therefore to test five designs of perches and identify whether perch design influenced the occurrence and severity of keel bone fractures (KBF), which consitute a major welfare problem in modern aviary systems for laying hens.

Study 2) This study concerned different euthanasia procedures for broiler chickens. Currently carbon dioxide (CO_2) exposure, as a euthanasia method for poultry, is expanding, however its use is associated with pain and distress for the birds. Thus, the aim of the present study was to identify if euthanasia with low atmospheric pressure (LAPS) or nitrogen would be less aversive to the broilers when compared to CO_2 exposure.

DESCRIPTION OF WORK CARRIED OUT DURING THE STSMS

(max.500 words)
Both studies were conducted at the Center for Proper Housing: Poultry and Rabbits (ZTHZ), Bern, Switzerland.
Study 1) Five perch designs were tested: Metal Q-perch (46 x 45 mm), glass fiber strengthened square perch (rechteckige) (30 x 30 mm), plastic Q-perch (52 x 70 x 28 (bottom width) mm), plastic covered round metal perch (diameter 33 mm), and a round metal perch (diameter 33 mm). Data were collected from May 2019 until end of January 2020. Brown and white layer hybrids (LSL und LB) were used in the study. Animals were distributed in 15 compartments (3 x 4 m) with 20 layers per pen (N= 300). Distribution was made so that half the layers in each pen were white hybrids and the other half brown hybrids. Data collection included video recordings (behaviour, how did the layers move around in the pen, how did they use the perches), health evaluation (foodpad dermatitis, feather cover ect) and x-ray scoring of KBF. The latter was the main task carried out by me during the STSM. I conducted an online training course in KBF scoring (http://www.keelbonedamage.eu/activities/practical-information-for-stakeholders/online-tool-for-evaluating-fractures-from-radiographic-images/) and scored the x-rays from Study 1.

Study 2) This study was carried out from the end of October 2019 until mid-March 2020. Sixty Ross 308 broiler breeders were included in the study at an age of 41 weeks. To be able to later score the aversiveness of the euthanasia methods the broilers were trained each week.
The training sessions were conducted as individual sessions. During training the focal animal was placed inside a round chamber (first a cylindrical training chamber resembling the LAPS chamber and after arrival of the LAPS chamber training was conducted inside the actual chamber). A partial wooden separation was placed inside the training/LAPS chamber. On the left side of the separation a bowl of feed was placed and the right side was empty.
Two training sessions were conducted: 1) Basic training (associative learning): During these training sessions the latency of the focal animal to find the feed/start eating was recorded (learning criteria was met when the focal animal took <15 sec to reach the feed)
2) Negative association: While eating the focal animal was presented with a negative stimulus (air or water) and it then had to seek the compartment without feed (right side of the wooden seperation, associate this with 'safety') (learning criteria was met when the focal animal took <15 sec to seek the right compartment). We trained the broilers 1-3 times weekly and no more than once per week were the broilers trained with negative stimulation.
During actual testing the focal animal would be exposed to CO_2, LAPS or N_2. Due to their training the broilers were expected to seek the feed when no aversive stimulus was experienced and then leave the feed and seek 'safety' on the right side of the pen separation when the stimulus (CO_2, LAPS or N_2) was perceived as aversive. During testing the behaviour of the broilers was video recorded. Due to practical challenges the final testing of the broilers got postponed and unfortunately I was not able to be present during the final testing.

Besides working on the above mentioned projects I got to hear about - and assist on (e.g. conduct health assessment on layers and score footpad dermatitis in broilers for slaughter) - other ongoing projects in the group.

DESCRIPTION OF THE MAIN RESULTS OBTAINED

Data are still being collected but both studies should result in scientific publications where results can be found at a later date.

FUTURE COLLABORATIONS (if applicable)

As mentioned above two joint publications are planned.