

**Report for**

**Short Term**

**Scientific Mission**

CA15224

Applicant: Michael Toscano

Home Institution: University of Bern, Switzerland

Host/Host Institution: Michigan State University

Start and End of STSM: April 2, 2018 to April 7, 2018

1. Purpose of the STSM:

Many systems are currently available to track location and activity patterns of animals, though few are suitable for commercial poultry given the size of the animal and consequent limits on logger size as well as the harsh environmental conditions of the poultry house. Dr. Siegford has been working to integrate technology into her research and successfully developed several tracking devices as well as associated software to identify relevant behaviours. Dr. Toscano visited the site in order to evaluate the possibility of utilizing the technology developed by Dr. Siegford in combination with his own system which is more suitable for commercial conditions. Following an evaluation of the two technologies and associated discussion, Drs. Toscano and Siegford visited a commercial farm to determine the feasibility of testing the tracking components in a commercial US system. It is envisioned that tracking technology, if successfully deployed, can be used to determine how a hen's mobility is affected by keel bone fracture.

2. Description of the work carried out during the STSM:

Dr. Siegford demonstrated the tracking technology used by her group and the full apparatus required for assessment, including the devices worn by the hens and base stations required to record information. Following the viewing of equipment, a visit was paid to several farms of Egg Innovations, a company that is the largest provider of free-range eggs in the United States. The visit was conducted by the president of Egg Innovations, Mr. John Brunnquell, whom was eager to have his facilities be used for research collaborations. During the visit, Drs. Toscano and Siegford discussed how tracking equipment could be installed for future projects, the type of physical changes that would be required, and areas that Mr. Brunnquell could assist in data collection.

3. Description of the main results obtained:

The visit proved fruitful and Dr. Siegford was eager to pursue collaboration with Dr. Toscano. It was determined that Dr. Siegford's behavioural identification system was most likely unsuitable with Dr. Toscano's tracking system, though future work incorporating accelerometer technology into the

latter would provide potential for this type of work. The visit to Mr. Brunquell's facility also proved helpful as the different facilities are similar in nature (e.g. size, internal furnishings and equipment) and thus offer easier ability to adapt the envisioned tracking system to multiple barns once the initial is completed.

4. Future collaboration with the host institution (if applicable):

Dr. Siegford is exploring submission of a large USDA-AFRI grant (~5 million USD) focusing on technology within agricultural systems for which Dr. Toscano would be one partner. They also agreed to develop a smaller application for funding from the US Poultry and Egg Association focusing on changes to mobility following keel bone fracture.

5. Foreseen publications/articles resulting from the STSM (if applicable):

No publications are currently foreseen.