Book of Abstracts of the 74th Annual Meeting of the European Federation of Animal Science

Book of abstracts No. 29 (2023)
Lyon, France
26 August – 1 September, 2023

Social network analysis of cattle and horses inferred from sensor ear tag (SET) and GPS based data

U. Heikkilä[1], K. Ueda[1], N. Gobbo Oliveira Erünlü[2], M. Baumgartner[3], M. Cockburn[3], I. Bachmann[3], M. Roig-Pons[3] and S. Rieder[1]

[1]Identitas AG, Staffacherstrasse 130A, 3014 Bern, Switzerland, [2]Agroscope, Posieux, 1725 Posieux, Switzerland, [3]Agroscope, Avanches, 1580 Avenches, Switzerland; ulla.heikkilae@identitas.ch

Solar powered sensor ear tags (SET) have been applied on cattle and horses within an accompanying study. Animal social networks give insights of an individual's social integrity within a herd and thus give indications on its welfare state. As energy supply is a limiting factor in animal sensors, it is of interest to see whether social networks can be detected with the low temporal reporting frequency data of the SET. This study thus attempts to analyse the social structures of the herd by building a contact network of the animals by using the location data delivered by the SET (up to 4 data points per day). We define a 'contact' where two animals have dwelled within 5 meters of each other within 1 hour. These constrictions are fairly loose, being restricted by the data transfer frequency of the ear tags. These contacts are then assessed over the period of 3 months and a network is built. Most contacts occur on feeding at a shared haystack and could be coincidental. We therefore conduct a verification study on horses that are equipped with both the SET and a GPS tracker with a recording frequency of 10 s during a period of one month. The feeding spots are ignored in the verification step. Furthermore, we observe the animals in both studies in the field to compare the theoretical networks with the actual behaviour. The main features of the contact network can be confirmed and show that the social contacts in the herd follow a fairly fixed structure.

Modelling adaptation strategies to climate change in Mediterranean small ruminant systems

A. Lurette[1], S. Lobón[2], F. Douhard[3], M. Blanco-Alibes[2], D. Martin-Collado[2], A. Madrid[4], M. Curtil-Dit-Galin[1] and F. Stark[1]

[1]UMR SELMET, INRAE, Campus de La Gaillarde, 2 place Pierre Viala, 34060 Montpellier, France, [2]CITA, Avda. Montañana 930, 50059 Zaragoza, Spain, [3]UMR GENPHYSE INRAE, 24, chemin de Borde-Rouge - Auzeville Tolosane, 31321 Castanet Tolosan, France, [4]IDELE, CS 52637, 31321 Castanet Tolosan, France; amandine.lurette@inrae.fr

Mediterranean livestock farming systems have specific characteristics, such as heterogeneity of animals, diversity in land use and flock mobility, that make them particularly sensitive but also adaptive to climatic hazards. Combining resilient herds and an efficient use of various feed resources is central to develop adapted livestock farming systems to climate change. In the PRIMA AdaptHerd project, this study aims at evaluating the multi-level implications of adaptation levers that can be mobilized by Mediterranean small ruminant farmers. An approach which combined a participatory design of adaptation strategies and a simulation of these strategies on four Mediterranean French and Spanish farm types was used. The farm types differed in their level of herd intensification and in their feeding practices. For the four contrasting situations, groups of experts were consulted to design: (1) the projected impact of climate change on vegetation; and (2) several adaptation strategies. The resulted adaptation levers to climate change were different between farm types and flock management (sedentary or transhumant). We therefore tested the effects of three levers: (1) increasing the part of pastoral area; (2) shifting the grazing periods; and (3) decreasing the number of lambings or the age at first mating to better match with resources availability. The assessment of the effect of adaptation levers on livestock systems was based on their forage autonomy, grazing rate and the number of days when needs are not covered. The simulation of the designed adaption levers showed that they allowed the impacts of climate change to be mitigated, but they did not allow a return to an initial situation with needs covered all year round and a high autonomy and grazing rate.