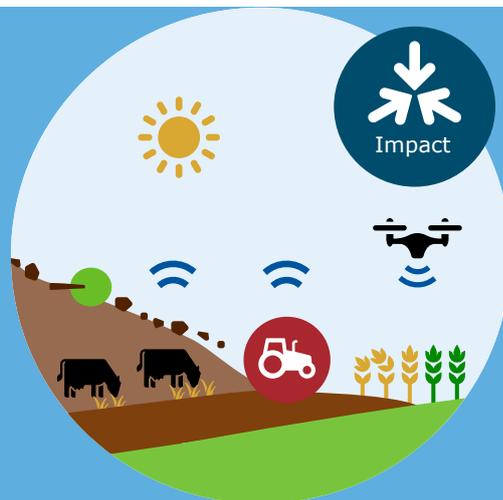


Heat stress reduction in broilers using sensor data

A study on the suitability of sensor data to detect heat stress in broilers

Emerging DS/AI methods



Data Driven Discoveries in a changing climate (D3C2)

Objective: This project aims to study whether data on individual broilers can be recorded automatically and can detect heat stress in broilers.

Activities and results

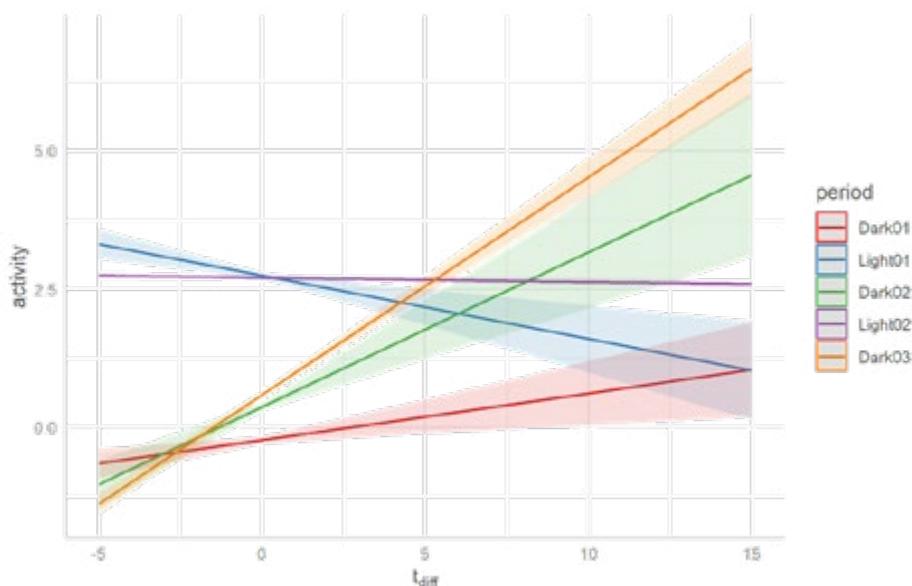
In this project we have performed a literature study focussing on behavioural indicators of heat stress in broilers that have potential to be recorded in an automated manner at the individual level. We have combined sensor data (RFID) and barn temperature data.

Using the data, we have analysed activity patterns under different temperatures and during different periods of the day. We found that activity changes during heat stress and that broilers became relatively more active during the night. We furthermore had meetings with Wageningen colleagues

that are working on heat stress in poultry and pigs, to share ideas and results. We also attended a conference (ISAE Benelux) where we presented our findings.

Achievement

The aim of this study was to link individual activity and location pattern to climate data, to investigate the impact of heat stress on individual behaviour, using a machine learning approach. Unfortunately, due to the limited dataset, we were not able to use this approach. Nevertheless, using statistical approaches, we found that activity



changes when birds are exposed to heat stress: during heat stress birds were less active. However, we noticed that during the generally cooler night, the birds became relatively more active. Due to this project, we now look at broiler activity data in a different way. Often, activity during the night is ignored, as birds are thought to be very inactive when it is dark. However, this project showed that activity patterns change when exposed to heat stress. This emphasizes the need to also monitor birds at night. Such insights might also help farmers in their management decisions.

Outlook

One proposal is submitted for the Wageningen Livestock Research Innovation Challenge. This proposal has been granted. Furthermore, we continued the discussion with WUR-colleagues that are working on heat stress in poultry and pigs.

Deliverables

Zetouni, L., van der Sluis, M., Duenk, P., de Jong, I. and Ellen, E.D. Impacts of heat stress on broiler activity – a pilot study. ISAE Benelux, 24 November 2022, Hilvarenbeek, the Netherlands.

Lessons learned

In this project, we combined two different data sources that have not been combined before for research into broilers: sensor and climate data. Combining these data gave a different view on the results obtained. Furthermore, new statistical methods were applied on the sensor data, where researchers with different expertise worked together to combine statistical and biological knowledge. We did not expect beforehand that we would find a clear change in behavioural pattern due to heat stress. The outcomes are very interesting and need follow-up research.

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