



Heat stress in Australian dairy cattle

Heat stress is a profound issue in the New South Wales and the broader Australian dairy industry. Cows in hot, humid conditions eat less, resulting in reduced milk production and loss of bodyweight, potentially leading to health and reproductive challenges.

Australian dairy farmers use a range of [strategies to manage their herds](#) in hot, humid weather. These include fans, sprinklers and management adjustments to diet, mating and daily routine.

Dairy UP heat stress research

This project aims to uncover the most effective ways to prevent or minimise the effects of hot, humid weather on dairy cows.

It builds on existing heat stress knowledge, with information collected from an extended period of cow and herd monitoring.

Both pasture-based and intensive-housed cow dairy farms are included in this project which will also investigate the interaction between heat stress and a cow's diet.

The project has the potential to “break whole new ground” as the first Australian research into heat stress and its links with diet in dairy cattle.

Unlocking the potential of cows

Dairy UP's P2 project aims to unlock the potential of dairy cows to achieve their genetic potential under NSW conditions.

P2 is a suite of seven projects that collectively explore ways to profitably increase both productivity and wellbeing in commercial settings.

P2a: Cattle Longevity: Age and Parity & Intensive Herds

P2a: Longevity: Future

P2b: Early Alerts

P2c: Milk as a Diagnostic Tool

P2d: Facility Design for Cow Comfort

P2e: Calf Husbandry

P2f: Infectious Diseases ('Infectome')

P2g: Heifers Early Calving

This document provides an update on P2d: Facility Design for Cow Comfort.

Benefits

The findings will provide a clearer understanding of the acute and long-term “lag” effects of heat stress on dairy cattle.

This information will also better equip farmers to manage and plan for heat stress events, including the days following.

Better heat stress management will also improve dairy cow health, reproduction, production, and welfare. This will make a positive contribution to the profitability of NSW dairy businesses and reinforce NSW dairy farmers' social license to operate.



In addition, identifying the heat mitigation strategies which are best suited to specific dairy systems will support the development and improvement of management approaches and facility design.

On farm monitoring

This project is monitoring 15 intensive and 15 pasture-based dairy herds to measure the effects of heat mitigation strategies across an extended period to determine the best on-farm strategies to reduce heat stress within dairy herds.

Research approach

Different heat stress mitigation methods are used in all 30 herds and the cows' reaction are being recorded at various points in time.

This information will provide health, welfare, and production data from cows during a heat event and for the days after.

Time series analysis

This work relies heavily on time-series analysis on-farm to understand the causes, trends, and patterns of heat stress in dairy cows.

Time-series analysis for heat stress involves the collection of data at consecutive points in time to paint an accurate picture of the effect of a heat event.

Time-series information will enable researchers to pinpoint what happens and when to dairy cows. For example, researchers anticipate learning more about the effect of heat stress on fertility as any potential issues generally arise four days after a heat event.

Big data

Cow and herd information is also being added to data we collect on farm and climate data collected from nearby weather stations.

Previously published information from the USA is being used as a starting point to understand the link between heat stress and a cow's diet.

Progress update (October 23)

All 30 dairy herds have been enrolled in the heat stress research project.

Recording for information from onsite or nearby weather stations has started and observations of the cattle have also begun.

Next steps

Priorities for the coming year include monitoring the 30 herds and nearby weather stations, obtaining feed samples, collecting data and comparing the heat mitigation strategies.

Collaborators

The P2d project is a collaboration between Dairy UP, Scibus, Charles Sturt University, Leslie Manor Trust and Eagle Direct.

This project is closely linked with the following Dairy UP projects:

- P6a optimising on-farm energy use and cooling systems
- P6b Identifying and breeding dairy cattle with resilience to environmental extremes (drought)
- P9 Designer Milk.

Read more

Rossow HA, Golder HM, Lean IJ. Variation in milk production, fat, protein, and lactose responses to exogenous feed enzymes in dairy cows. [Applied Animal Science. 2020 Jun 1;36\(3\):292-307](#)

More info

Project lead

Dr Ian Lean, Scibus
email: ianl@scibus.com.au



Delivery organisations



Partner organisations



Additional program supporters, collaborations or partnerships

Charles Sturt University | DairyBio | DataGene | Eagle Direct | Entegra
Macquarie University | NSW EPA | smaXtec | UC Davis | University of Technology Sydney
