



**Milk samples could give insights about a cow's level of heat load, offering an easy-to-access management tool to guide animal welfare decisions by dairy farmers.**

This would be a non-invasive alternative to testing through blood and saliva. There's also less room for error or subjectiveness compared to visually assessing a herd for heat load. Additionally, it has the potential for remote monitoring and could be a service offered by milk processors.

This project is investigating the potential to use the level of the 'heat shock protein' HSP70 in milk as an indicator of heat load in dairy cattle.

### Getting more from milk

Milk underpins the dairy industry. Getting more from the precious commodity has to potential to increase its value throughout the entire supply chain.

The Dairy UP team is investigating novel ways to get more value from milk.

There are three elements to this research:

P9a: Producing Milk with Less Lactose

P9b: Milk as an Indicator of Heat Load

P9c: Adding Value to Dairy Waste

**This document provides an overview of P9b.**

### Progress (December 2023)

Studies to date have confirmed that milk HSP70 levels could be used as an indicator of heat load.

Dairy UP researchers have modified and adapted an "in-house" ELISA test to detect HSP70 in milk, blood and saliva samples. The method was initially developed by Dr Indunil Pathirana in a collaboration with the Dairy Research Foundation.

ELISA is a laboratory testing technique that detects certain proteins, antibodies, hormones and much more. This ELISA test is cost effective and detects a broader range of HSP70 than commercial kits.

Findings so far show that the ELISA test can detect heat stress in milk, but levels are lower than in blood or saliva. The lower levels do not necessarily mean lower accuracy – and confirming this is the next step for the project.



Dairy UP research already showed that HSP70 can be detected in milk for up to 9 days if samples are stored in the fridge, with or without a preservative, or for up to 90 days if samples have been frozen.

## Next steps

The focus for the coming year will be on using HSP70 for early detection of heat stress. Further analysis will look at data across seasons and within herds' to assess the potential application of HSP70 as a tool to monitor heat load in dairy cattle.

Researchers will also investigate if HSP70 is affected by other factors such as mastitis and compare with other available methods used to monitor heat load such as climate data, visual observation and sensors.

## Collaborators

The P9b project is a collaboration between Dairy UP researchers at the University of Sydney and NSW DPI and the University of Ruhuna, Sri Lanka.

This project involves a PhD study being undertaken by Rezaul Rakib.

## Related work

Other DairyUP projects that are investigating heat load from different angles include P2d: Heat stress and P6: Cow response to climate extremes.

## More info

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### Delivery organisations



### Partner organisations




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### Additional program supporters, collaborations or partnerships

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