

# Excess temperatures found to cause low flocking concerns in Australia

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A sheep flock. Credit: Belinda Cay, AgCommunicators.

High temperatures during critical periods of the reproductive cycle of sheep result in 2.1 million fewer lambs produced in Australia each year, costing sheep farmers an estimated \$97 million annually.

Work conducted by a transdisciplinary team of researchers from the University of Adelaide and South Australian Research Development Institute (SARDI), found that days above 32°C during the week of mating caused the significant loss of potential lambs.

Published in [\*Nature Food\*](#), the study found annual losses of potential lambs would increase to 2.5 million if median global warming increased by 1°C, and 3.3 million if it increased by 3°C.

"This modeling is important as it demonstrates that heat events threaten the sustainability of sheep production, both within Australia and globally," says the University of Adelaide's Associate Professor William van Wettere, who led the study.

Not only does heat stress decrease the number of lambs born, but it can also reduce lamb birthweight by between 0.6–1.4kg.

"If the effects of birthweight are accounted for, economic losses could increase to \$168 million under our current climate, and \$203 million and \$278 million for the 1°C and 3°C temperature scenarios, respectively," Associate Professor van Wettere says.

The complex research underlying this paper was informed by climate data and modeling conducted by the University's Professor Seth Westra and Dr. Sam Culley, and with contributions from Dr. Kathy Gatford of the School of Medicine.

Associate Professor van Wettere and the University of Adelaide and SARDI team are continuing their research into how farmers can adapt their flocks to cope with heat stress.

The research, which is supported by the University's Davies Livestock Research Center and South Australian Sheep Industry Fund, showed

many sheep are not able to thermoregulate during periods of heat, leading to effects on the animal's fertility.

"We have identified readily available strategies to improve thermoregulation and improve sheep fertility during summer," says Associate Professor van Wettere.

"This work is underpinned by multiple years of animal heat stress trials conducted at SARDI's Turretfield Research Center in Rosedale and our Roseworthy campus."

This [collaborative research](#) was conducted by SARDI's Dr. Alice Weaver and Dr. Alyce Swinbourne, as well as a large group of early-career University of Adelaide researchers.

"Working alongside the SA Drought Resilience Adoption and Innovation Hub and Farming Systems Groups, validation of these outcomes is taking place within commercial flocks across South Australia," said Associate Professor van Wettere.

"An integral component of this project is also the work of SARDI's Drs Dane Thomas and Peter Hayman, who developed a tool that producers can use to understand and quantify the impact of [heat stress](#) on fertility of their flock."

The researchers are now investigating whether selectively breeding animals which thermoregulate more effectively can improve the climate resilience of sheep flocks, and how sheep thermoregulation and behavior affect fertility during periods of heat.

"We are interested to know whether sheep who seek shade or those who are more active during periods of heat are impact differently," says Associate Professor van Wettere.

"Ultimately, we seek to provide sheep farmers with strategies which they can easily implement to safeguard their enterprise from the impacts of current and future climate," says Associate Professor van Wettere.

Jane Kellock, a [sheep](#) farmer from Farrell Flat, participated in the study and has already implemented some of its findings.

"The use of melatonin to mitigate the impacts of heat has increased our reproduction rates, and just being aware of the heat sensitivity of animals and some of the different things that you can do to help with that," she says.

"It's really important that we support these research projects and make sure that some of them are done on farms so that we know it's practical and logistically viable to do these things."

Associate Professor van Wettere said the collaborative research was an exercise in cross-discipline cooperation and a credit to all involved.

"A project such as this, with such impact on our [agriculture sector](#), is confronting the realities of climate change for the industry," he said.

**More information:** William H. E. J. Van Wettere et al, Heat stress from current and predicted increases in temperature impairs lambing rates and birth weights in the Australian sheep flock, *Nature Food* (2024). [DOI: 10.1038/s43016-024-00935-w](https://doi.org/10.1038/s43016-024-00935-w)

Provided by University of Adelaide

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