Do cows in Southland get heat stressed?

Southern Dairy Hub Field day

11th October 2023

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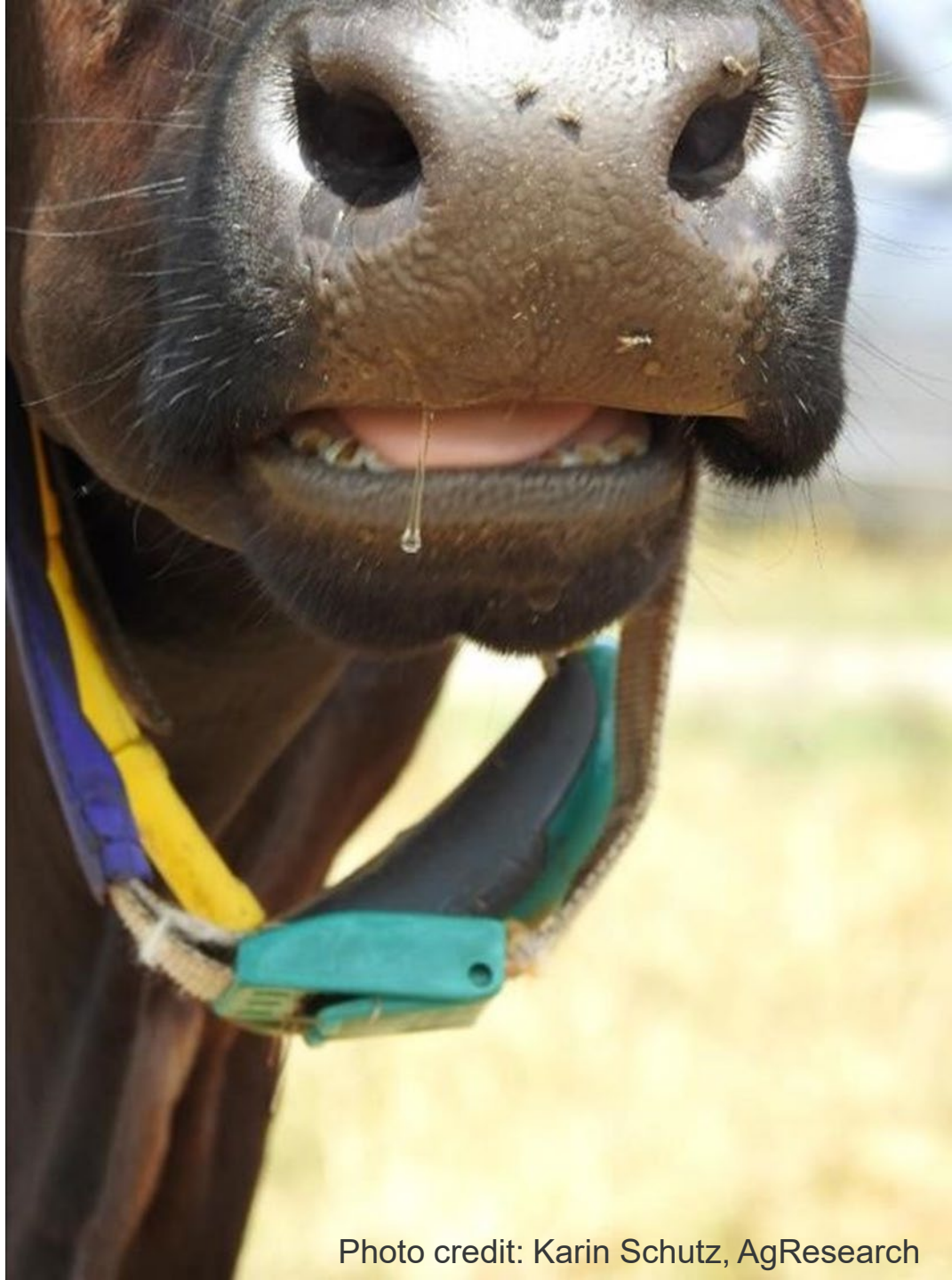
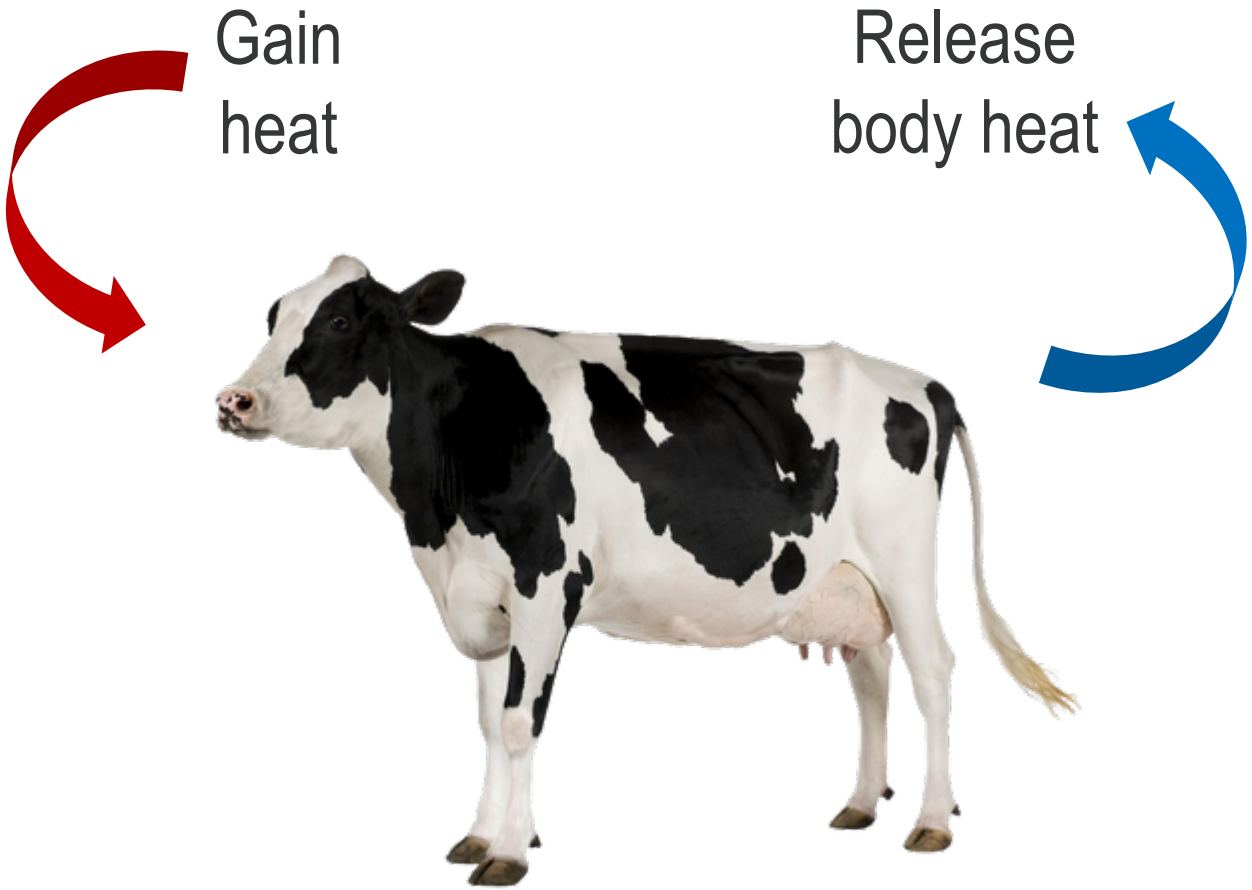


Photo credit: Karin Schutz, AgResearch

What is heat stress?

How do cows respond?

Trying to maintain body temperature



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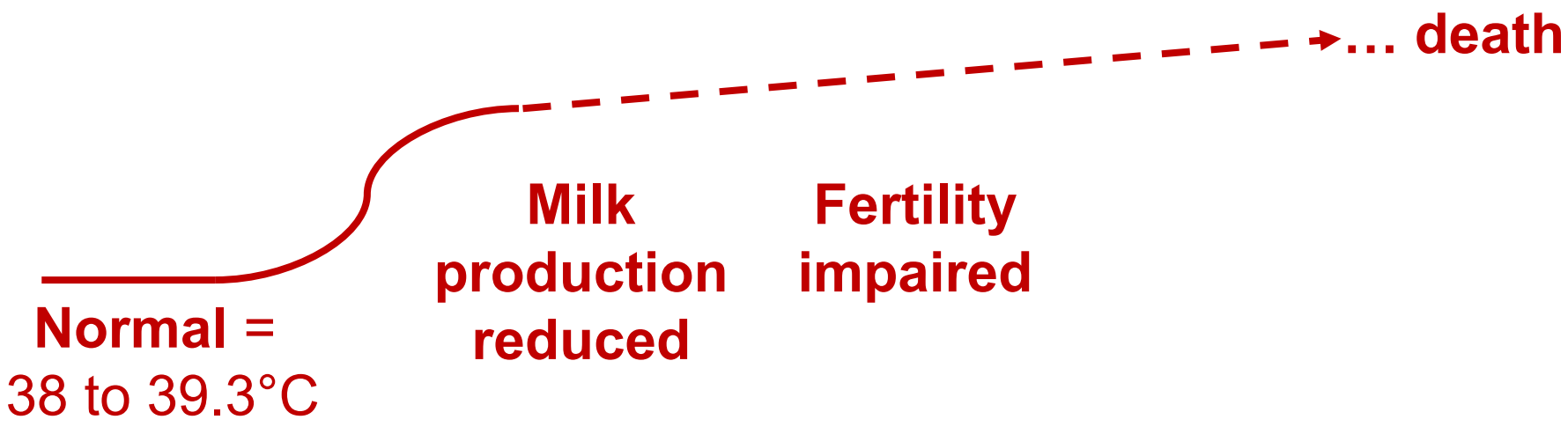
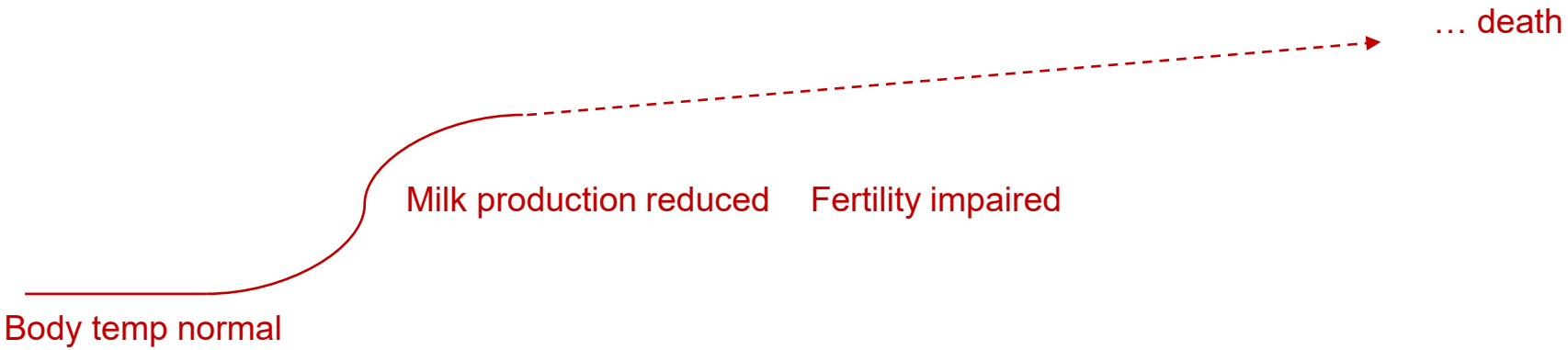
Trying to maintain body temperature

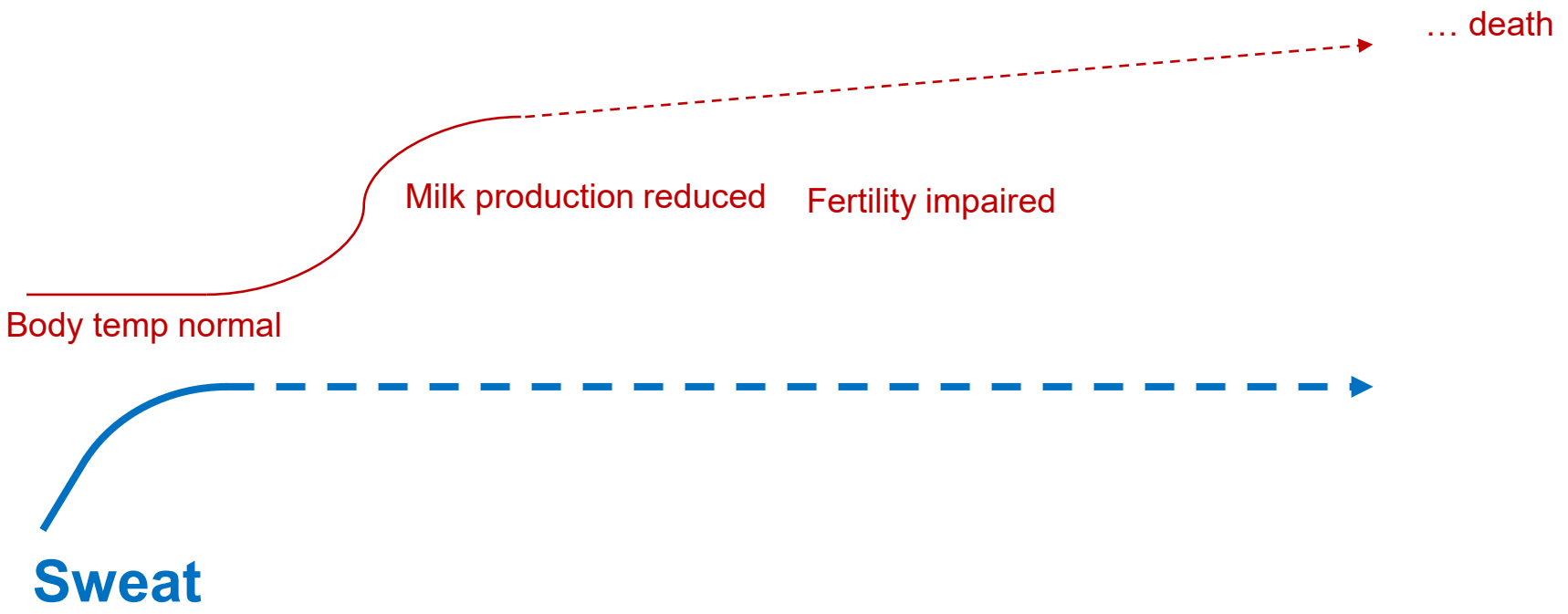


Avoid gaining heat by using shade



Seek shade

Release excess body heat through sweating



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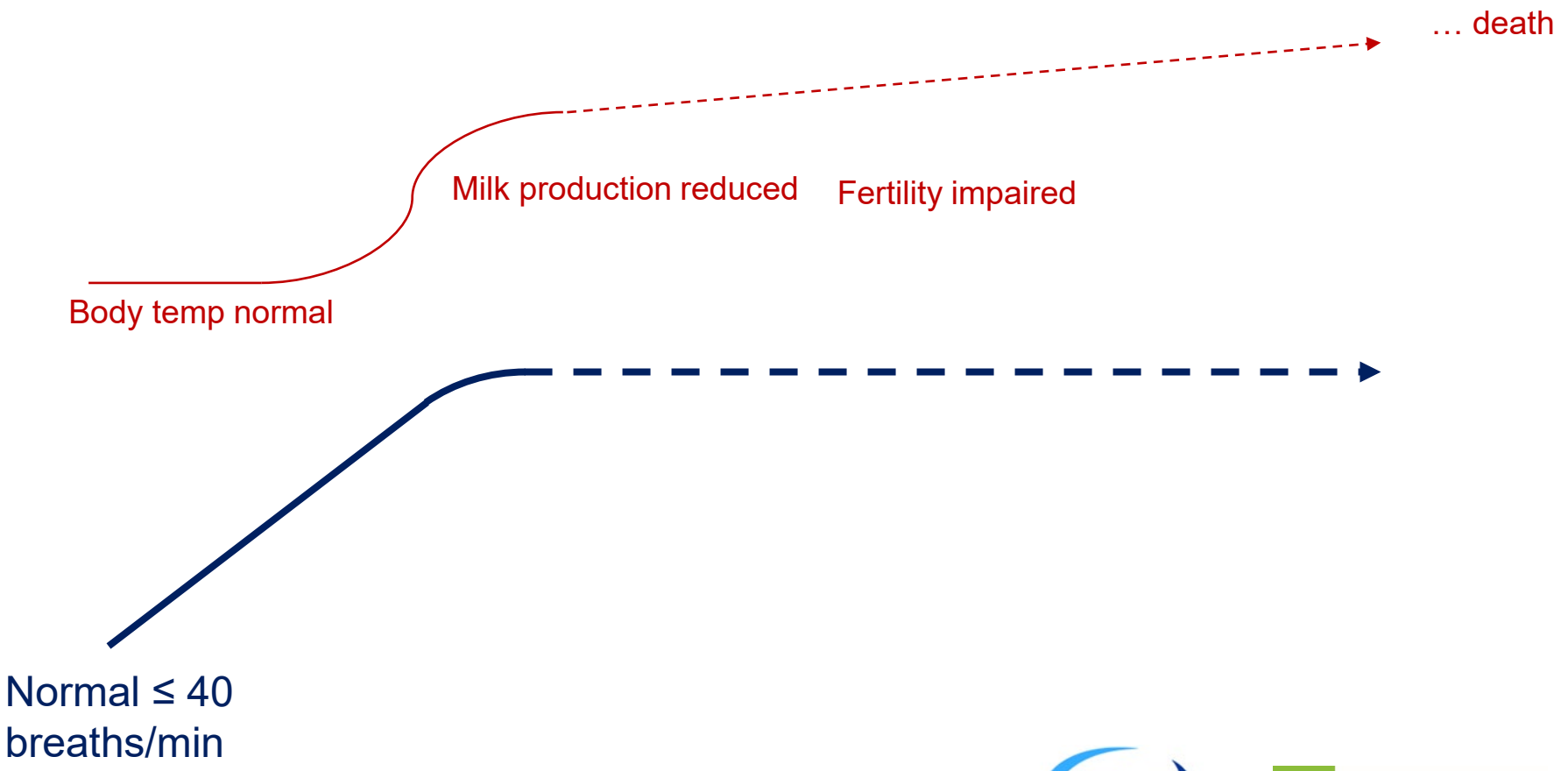
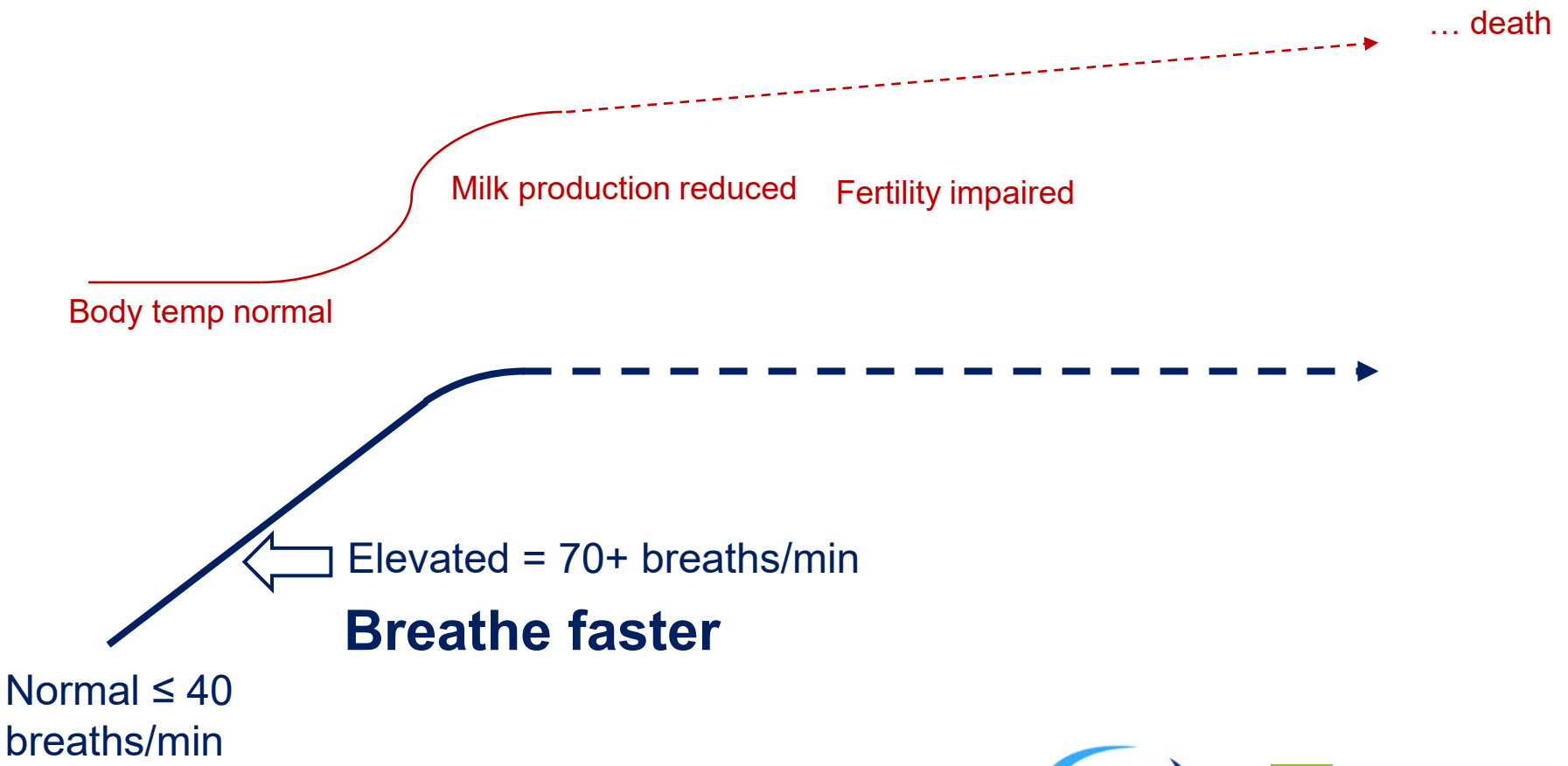
Release excess body heat by breathing faster



Release excess body heat by breathing faster



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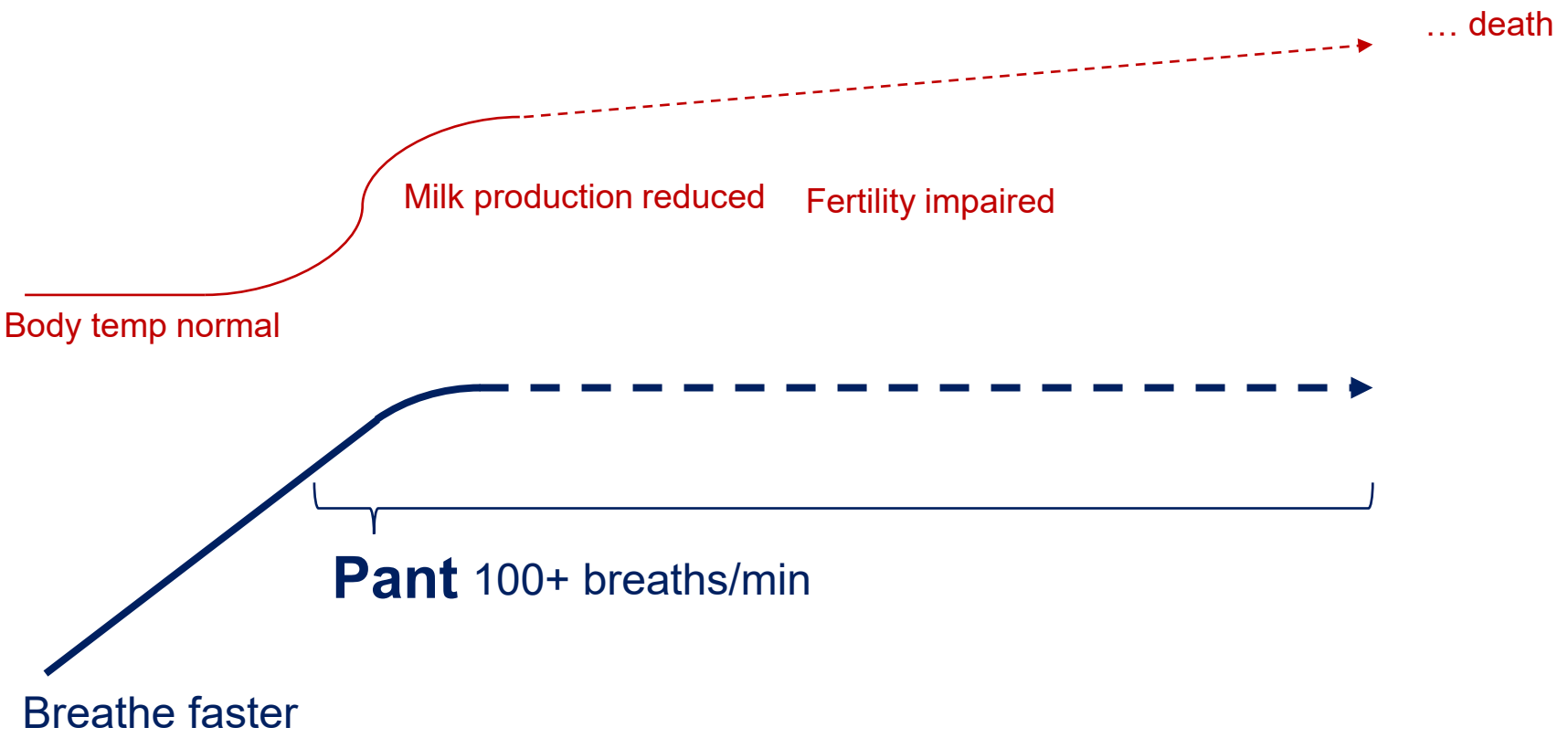
Release excess body heat by panting



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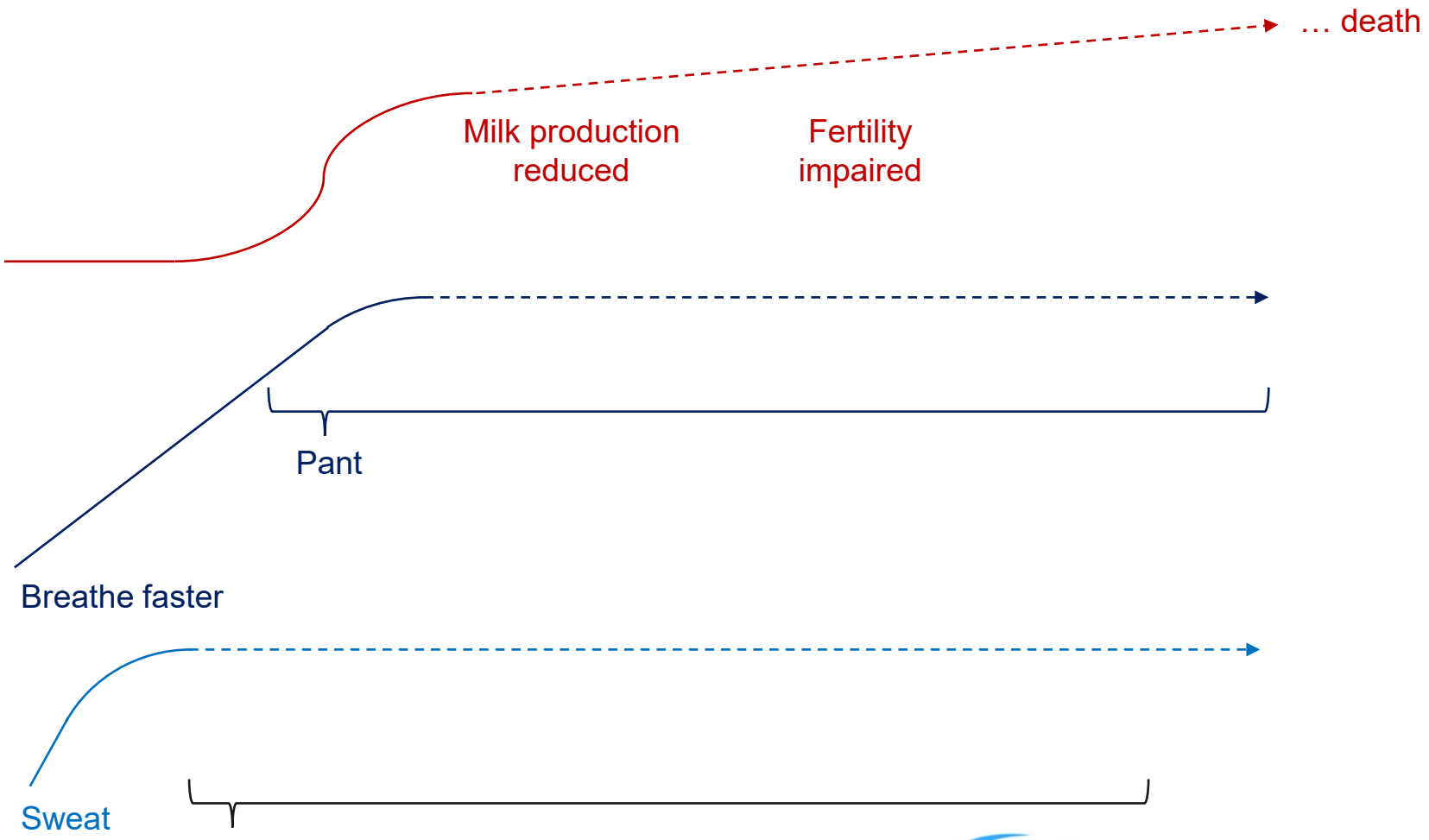
How to identify panting

- Typically starts at 100+ breaths/min

- **Mouth open**
- Tongue may be out
- May be drooling

Need to replenish water lost through evaporation



Drink water

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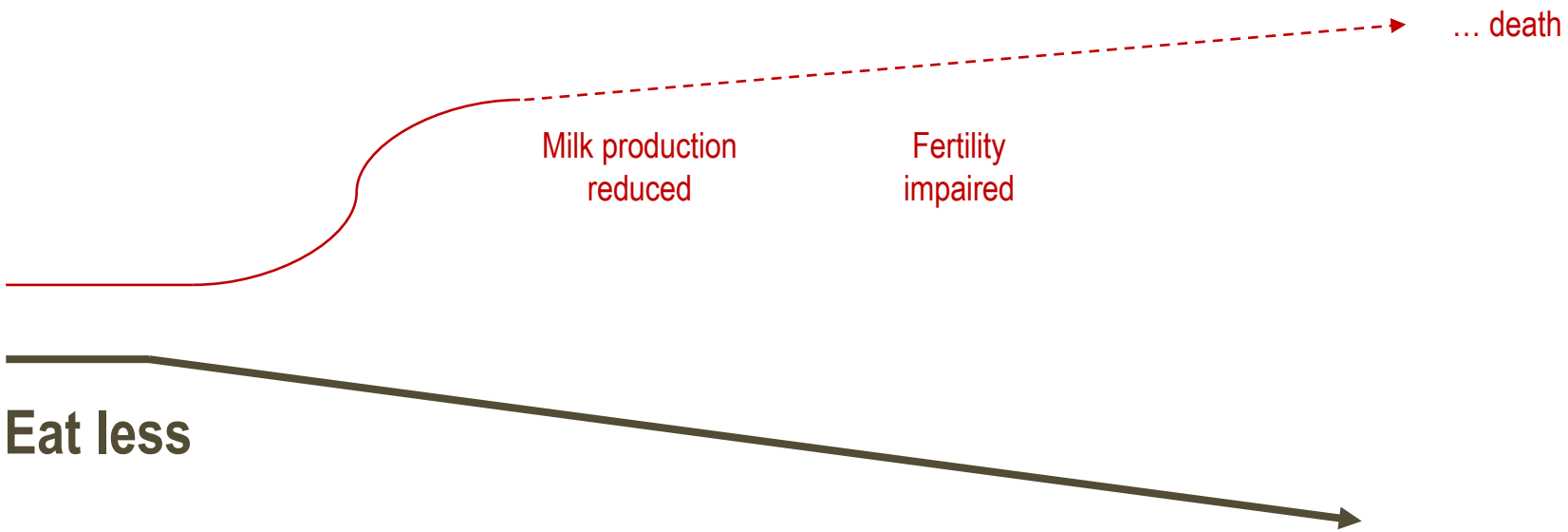
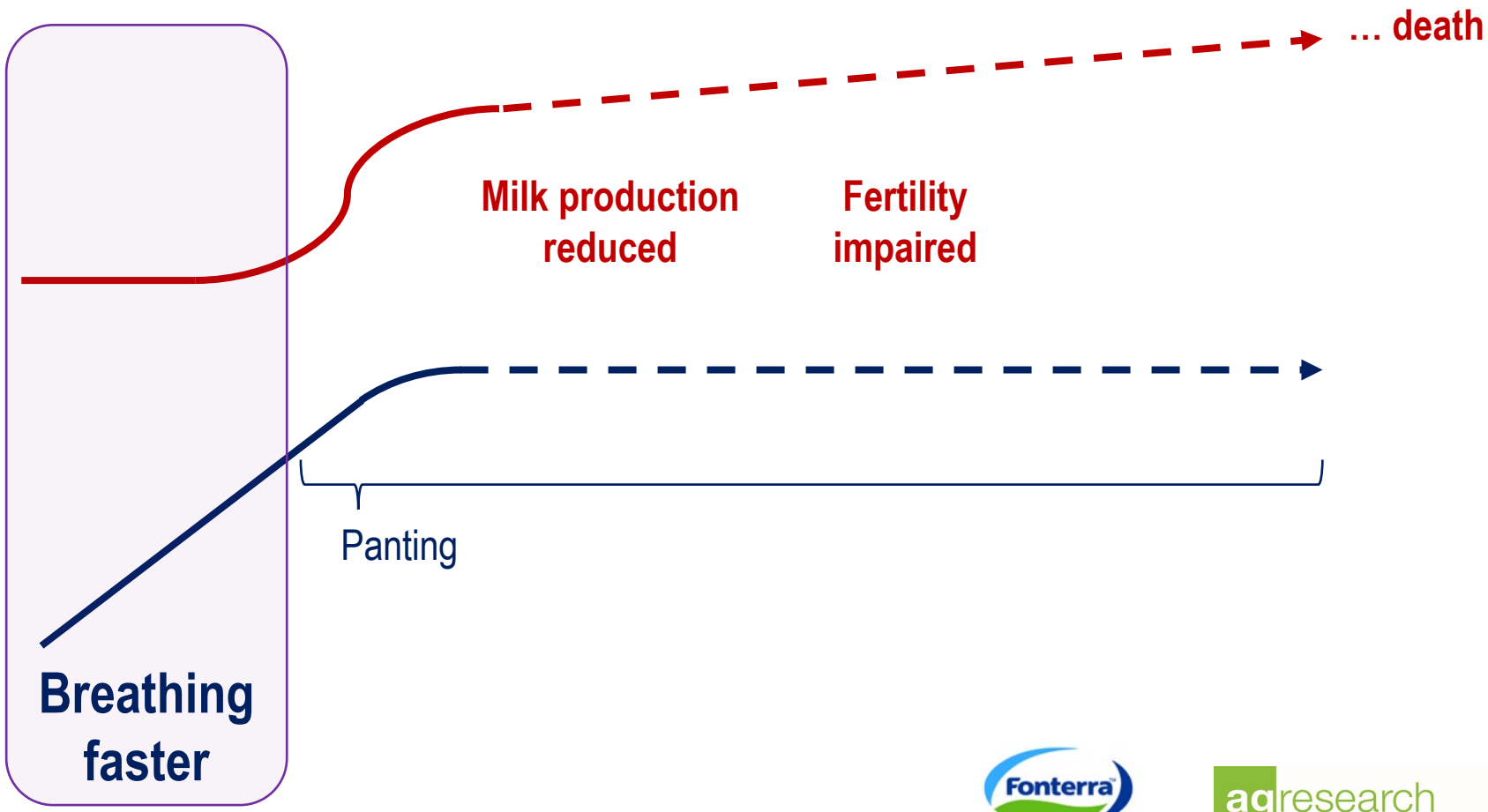
Avoid gaining heat by eating less



Early sign: breathing rate goes up before problems start



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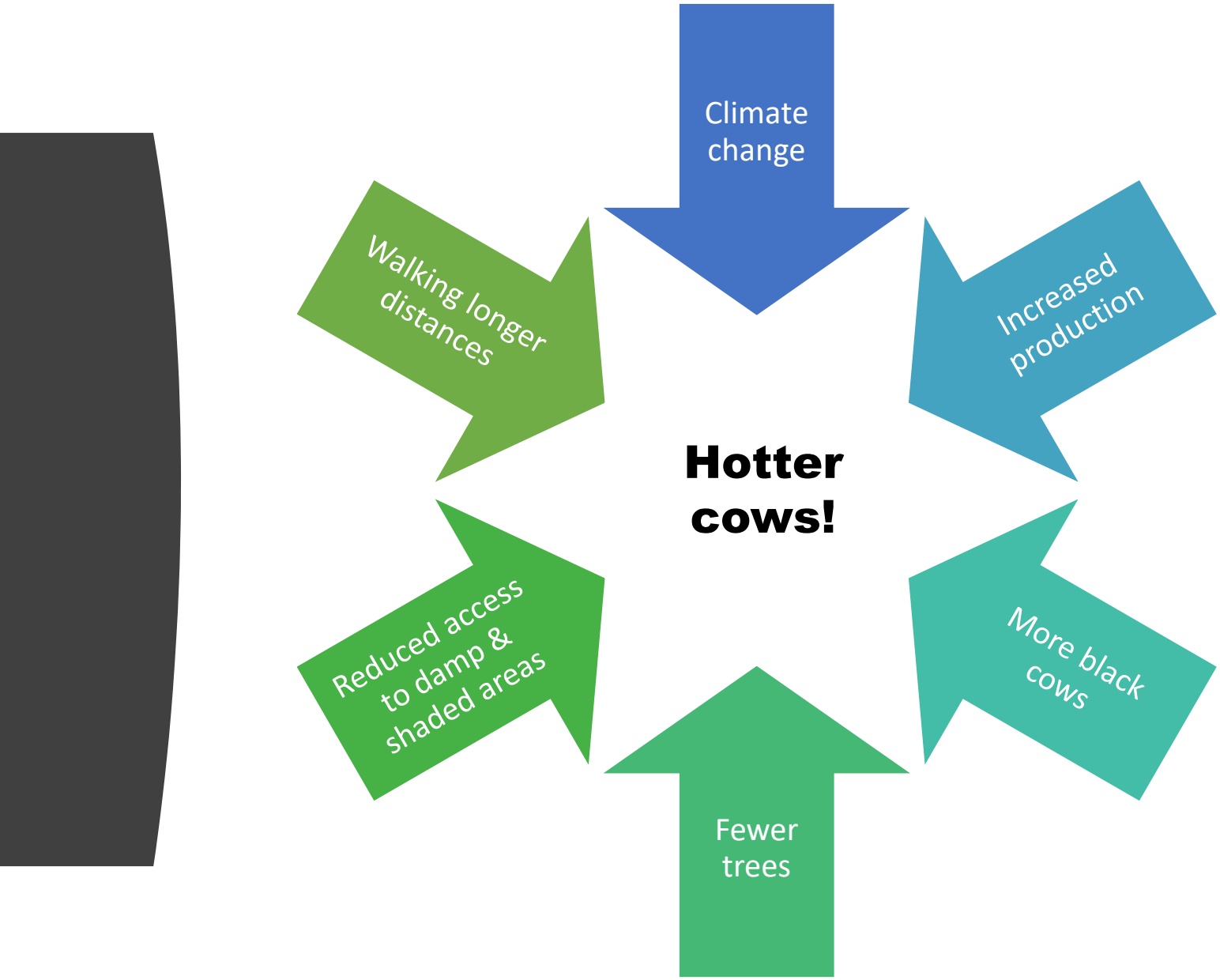
Why are we interested?

1) Potential welfare risk
2) Productivity concerns

Increasing risk



No stream no problem!

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Farmer insights

Most concerned about

- Cow comfort
- Milk production losses
- Providing sufficient water on hot days

What we heard farmers would like

- Dashboards, txts or App showing heat risks and forecasts
- To know what mitigation is needed
- Cost/benefit tool for planning
- Access to data from cows in the district

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New Zealand Research

Heat stress indexes

Heat stress impacts and mitigations

Different measures of heat load

- Animal-based measures
- Air temperature
- Temperature Humidity Index (THI) combines air temperature and humidity
- Heat Load Index (HLI) incorporates air temperature, humidity, solar radiation and wind speed

Heat stress in Southland -2023 study

Updating the Grazing Heat Load Index

Implications for farmer information

Exploring potential of animal sensors (e.g. rumen temperature, panting)

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2023 Heat stress study

FARM	TYPE	LOCATION	MANUAL OBS[1]	# OBSERVATIONS	SMAXTEC[3]	AFICOLLAR[4]	AFIMILK	MILK DATA[5]
Farm 1	Commercial	Northland	Yes	2641	No	n = 80	No	BULK milk
Farm 2	Commercial	Auckland	Yes	2336	No	n = 80	No	BULK milk
Farm 3	Commercial	Waikato	Yes	2980	No	n = 80	No	BULK milk
Farm 4	Research	Northland	Yes	2604	n= 80	No	No	BULK milk
Farm 5	Research	Waikato	Yes	721	n = 30	No	No	Individual milk data
Farm 6	Research	Canterbury	Yes	3696	n = 40	n = 76	n = 76	Individual milk data
Farm 7	Research	Canterbury	Yes	2993	n = 78	No	No	Individual milk data
Farm 8	Research	Southland	Yes	4771	n = 40	No	No	Individual milk data

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What we did - Respiration rate

Checking breathing rate

The earliest indicator of heat stress is increased breathing rate. Ideally, observe 10 cows on a warm summer afternoon, but you could start with just one – a high producing black cow will be most at risk.

1. Get your eye in - watch nostrils or flank

2. Set a timer for 10 seconds

3. Count full breaths

Sourced from DairyNZ www.dairynz.co.nz

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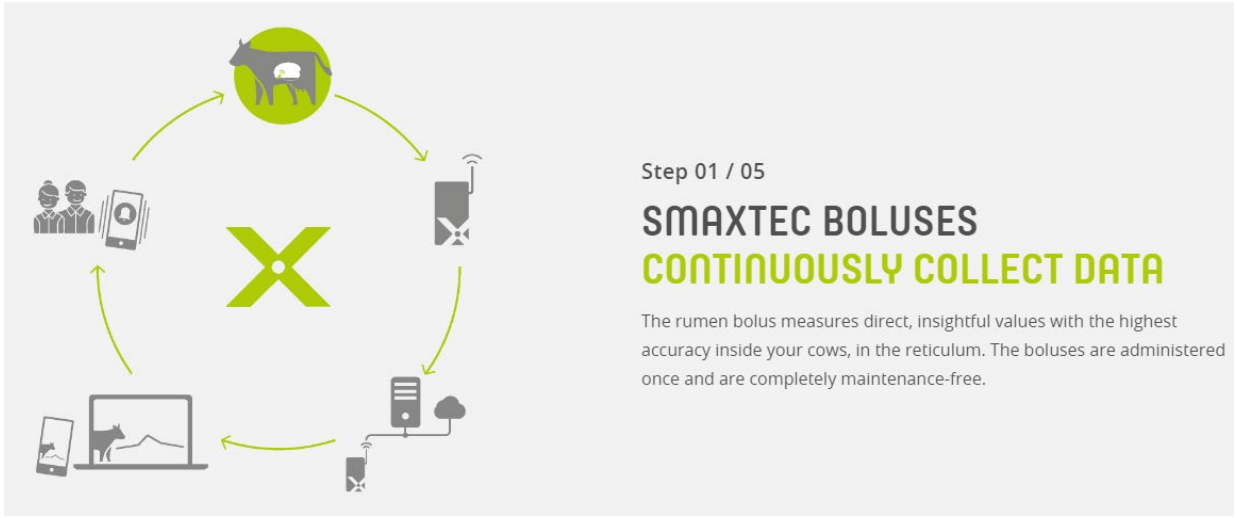
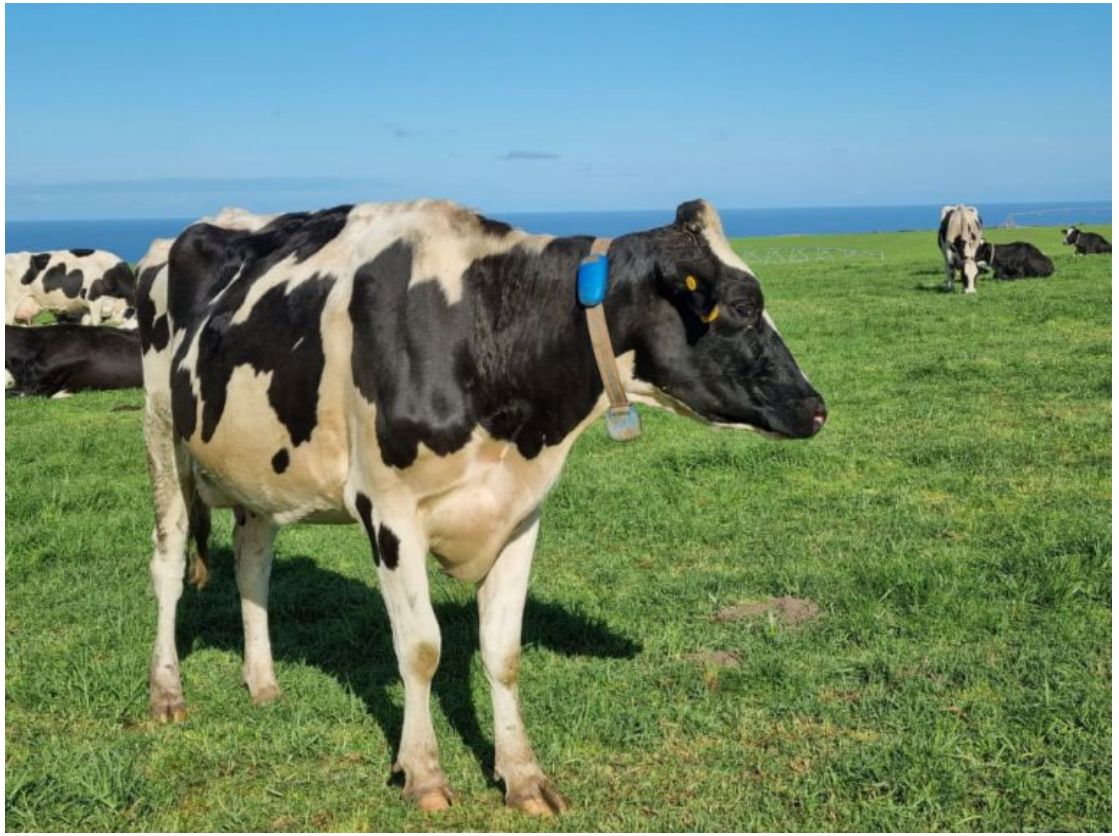
What we did - Sensor technology





Cow wearing AfiCollar. Sourced from: https://www.afimilk.com/how-to-detect-and-manage-heat-stress-in-cows

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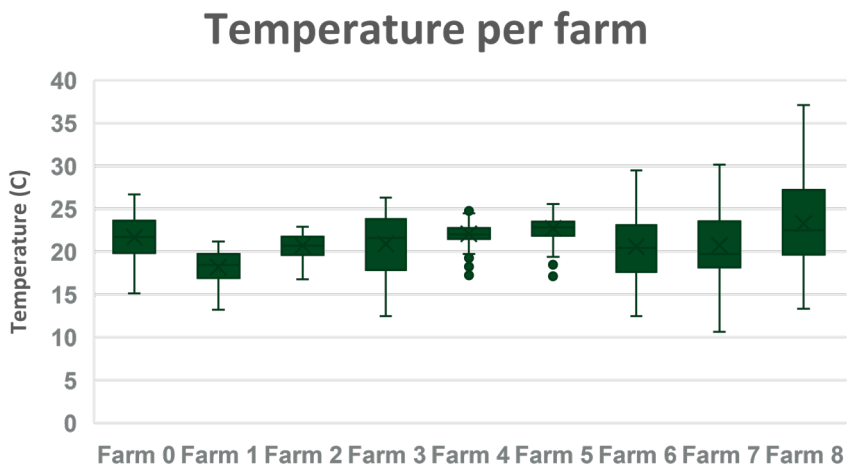
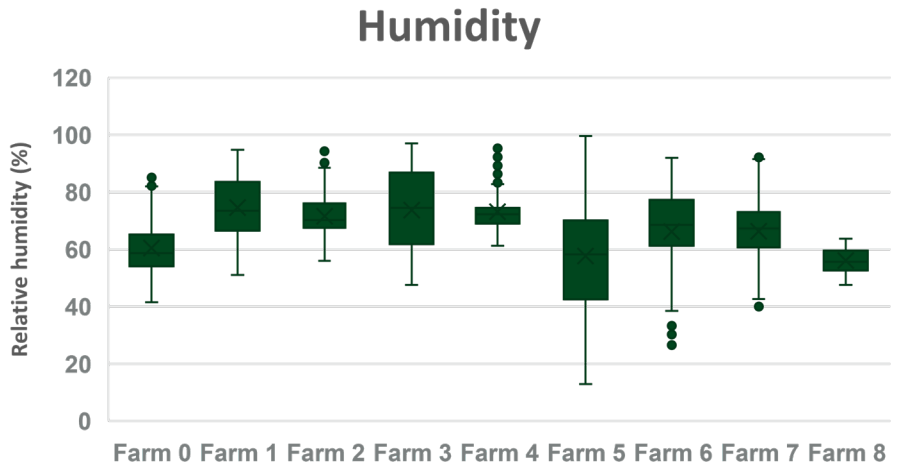
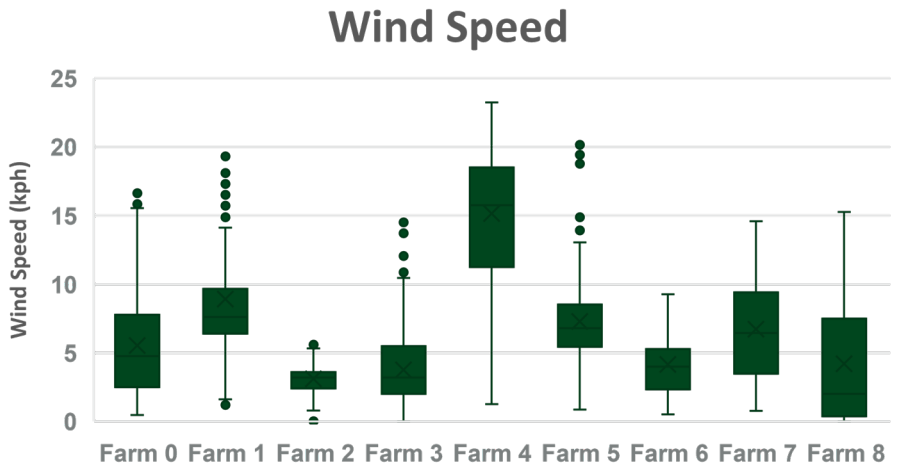
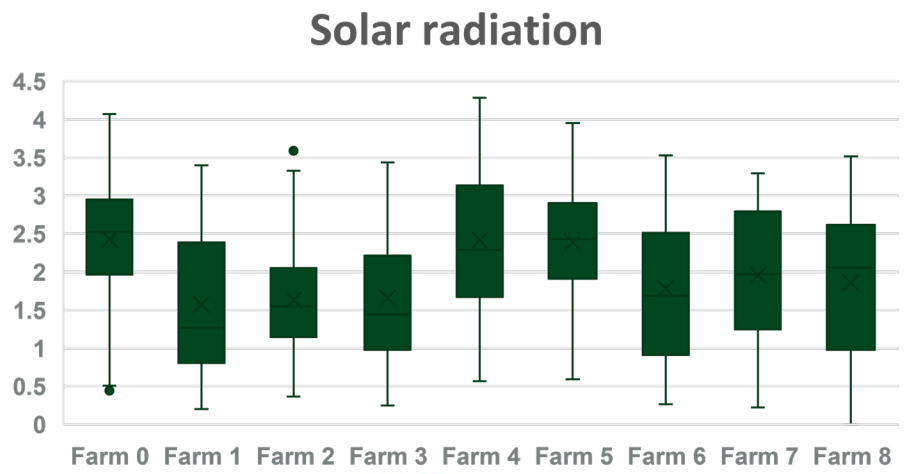
What we found – range in conditions









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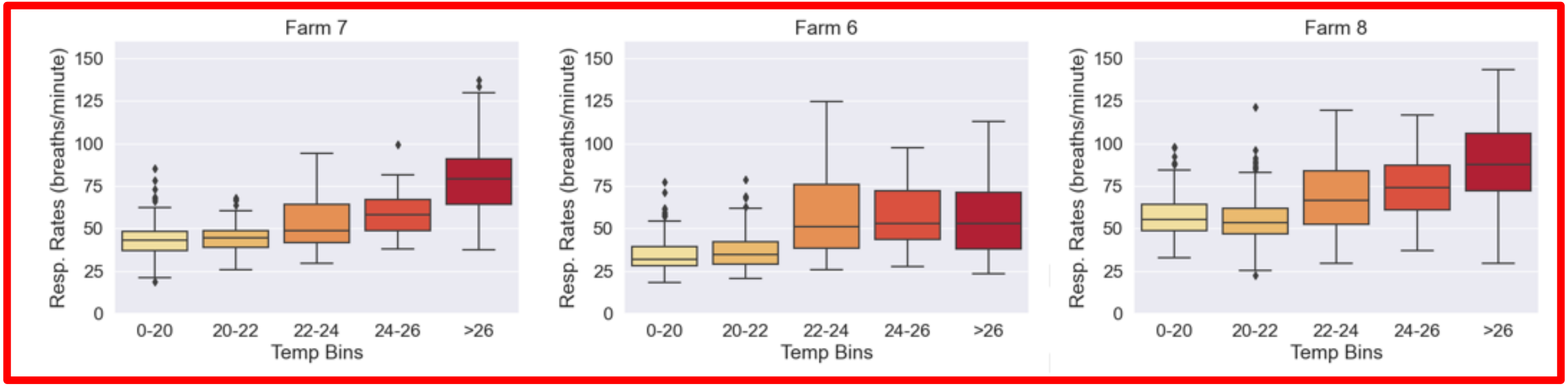
What we found – South Island



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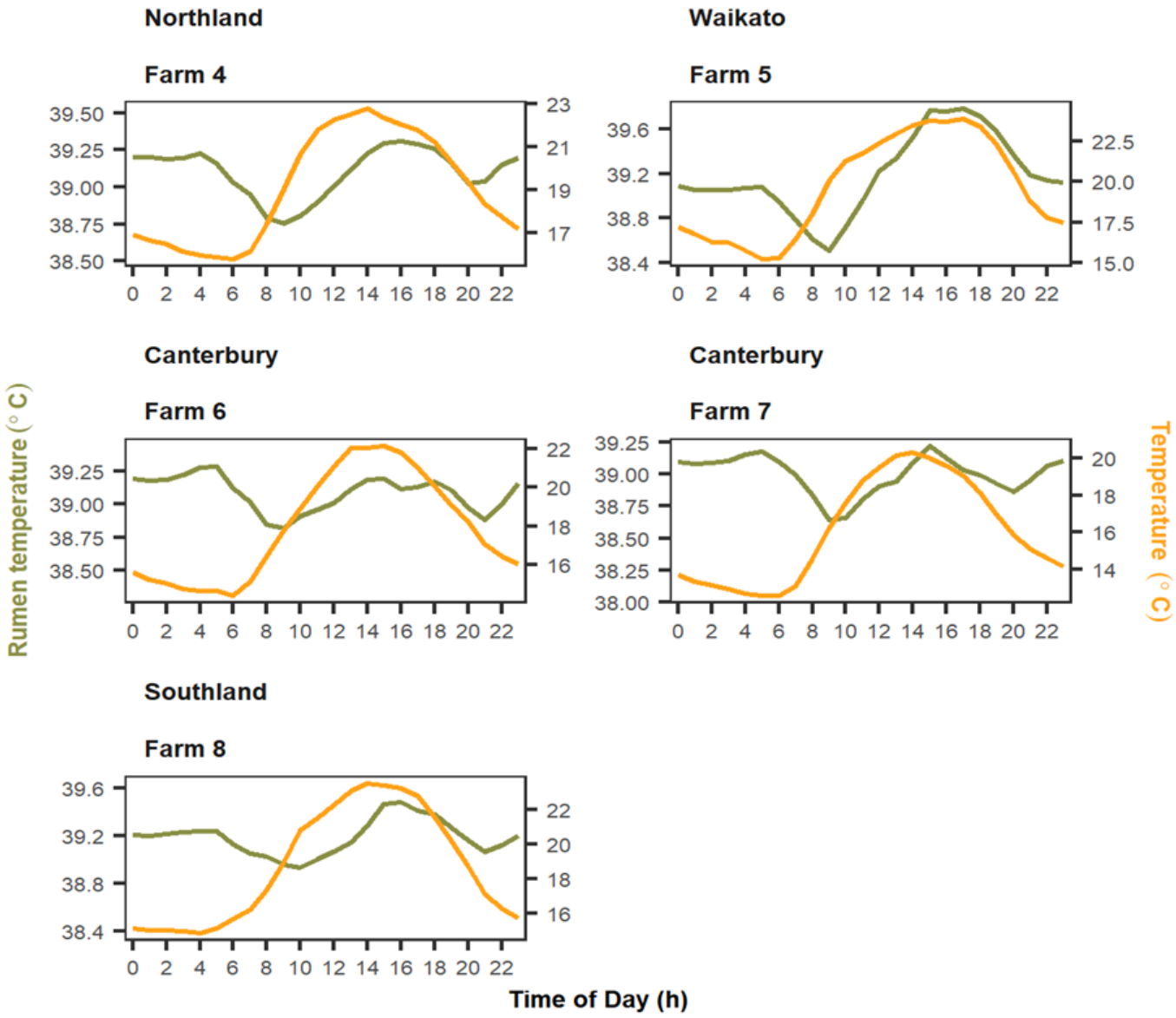
What we found – Ambient and rumen temperatures



What can I do?

Mitigation options

Farmer practices

- Shade (trees, covered area)
- Plenty of cool, clean drinking water
- Extra water troughs
- Sprinklers (and fans)
- OAD, 3 n 2, or altered milking times
- Reduce activity/walking distance
- Paddock selection

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What don’t we know

Ongoing work

- Animal variability and environment interactions
- Understanding animal response
- Updating industry information and guides
- Forecasting which regions will be impacted in the future
- Understanding how technology can play a role

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Conclusions

Conclusions

- Changes to the climate and the way we farm have increased the risk of heat stress for our cows
- To be aware of heat stress risks from >20°C, although this is dependent on farm-specific weather conditions
- Yes, cows in Southland are at risk of heat stress
- How can we provide cooling in a cost-efficient and practical way in pasture-based systems?

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Take home

1. Identify when your cows might be heat stressed.

2. Have strategies to deal with it.

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- Lincoln University Research Dairy Farm (LURDF)
- Southern Dairy Hub (SDH)
- Landcare Research
- Commercial Farmers based in Northland, Auckland and Waikato

Photo credit: Karin Schutz, AgResearch

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Ngā mihi nui
Thank you
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