The Impact of Heat Stress during Transition on Milk Quality

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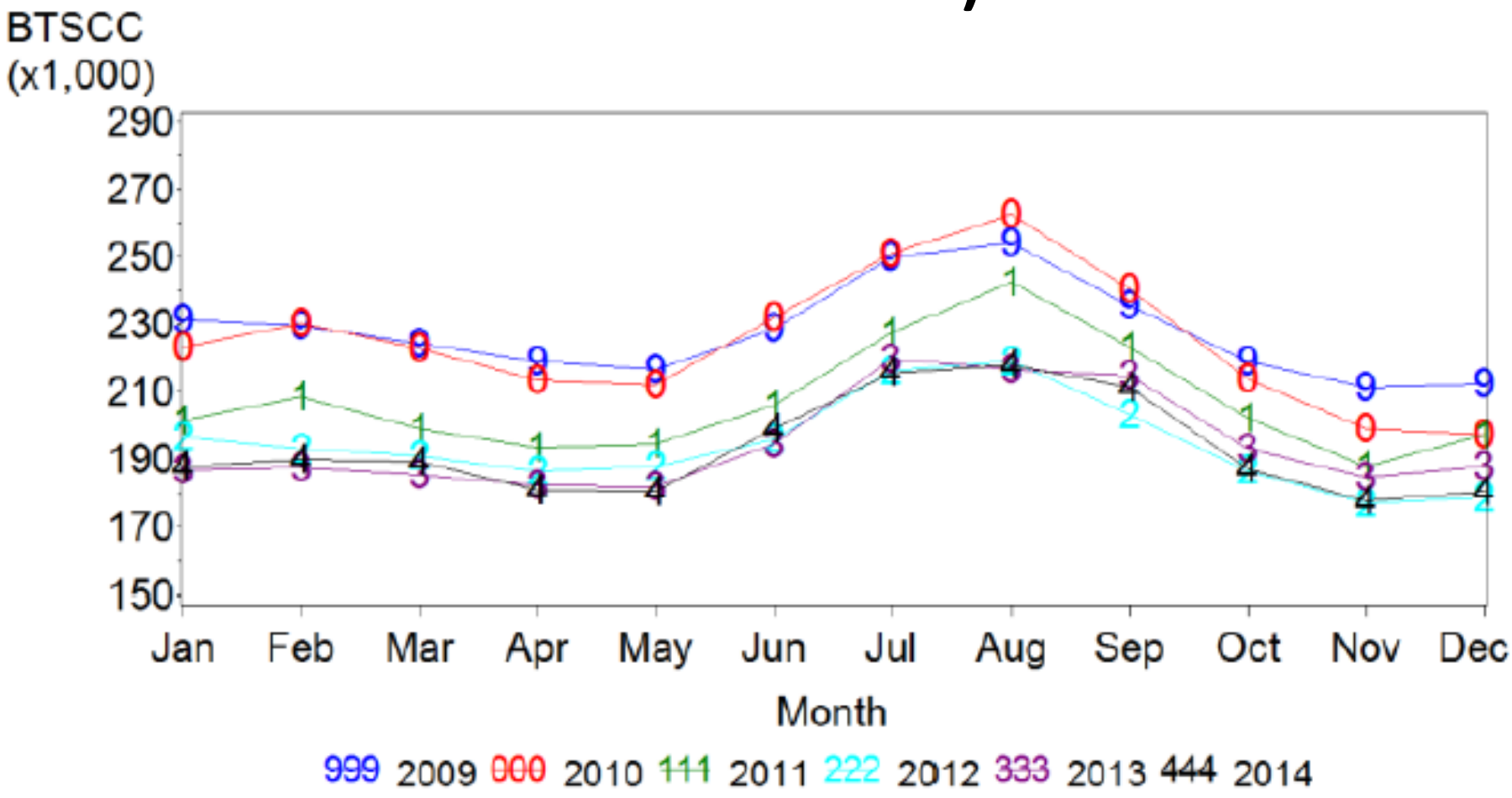
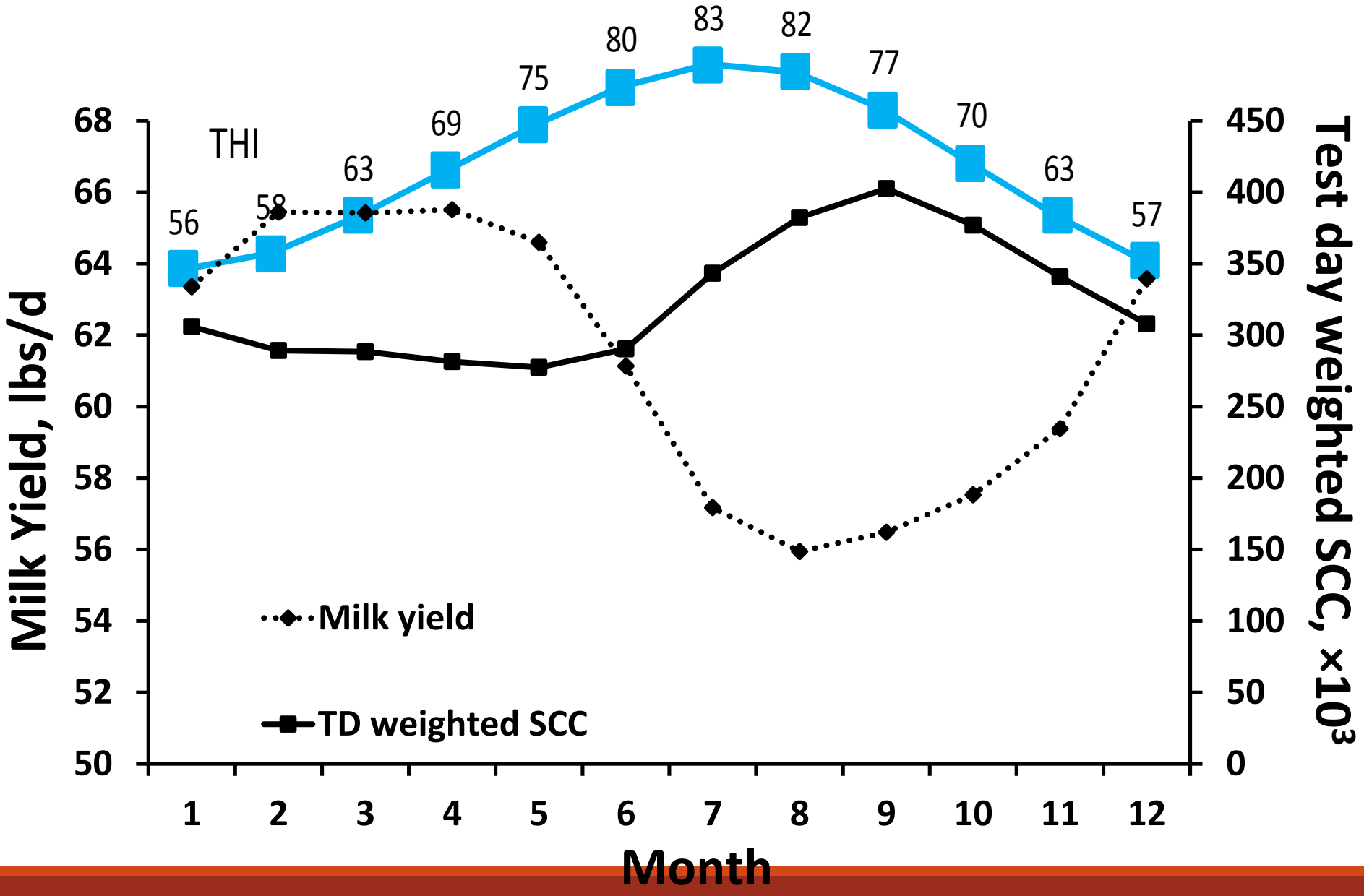
Seasonal effect on milk-weighted BTSCC for the four monitored FMOs (upper midwest, central, mideast, and southwest)



APHIS., 2014

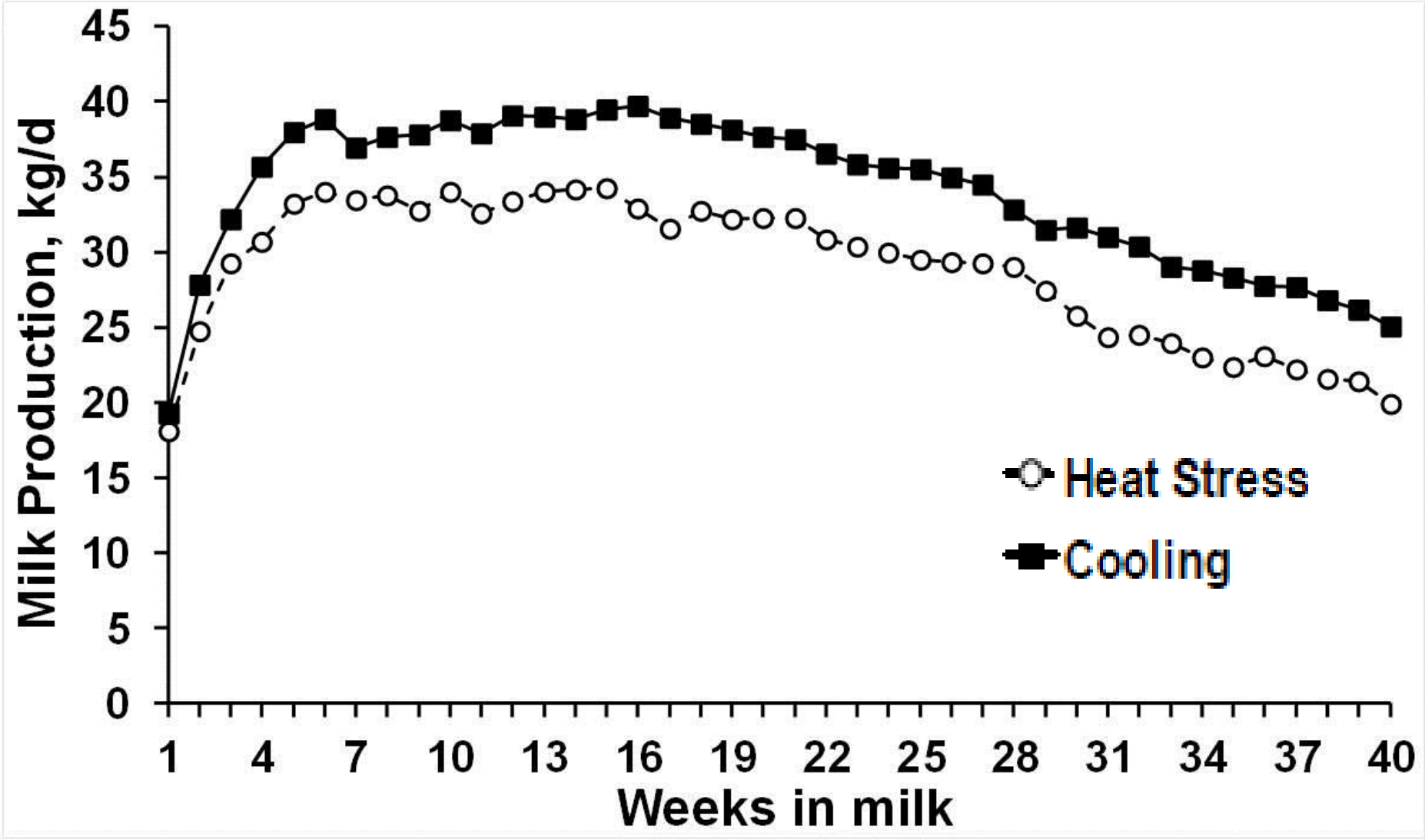
Seasonal effect on milk SCC in GA (DHIA data, 2015)



OUTLINE

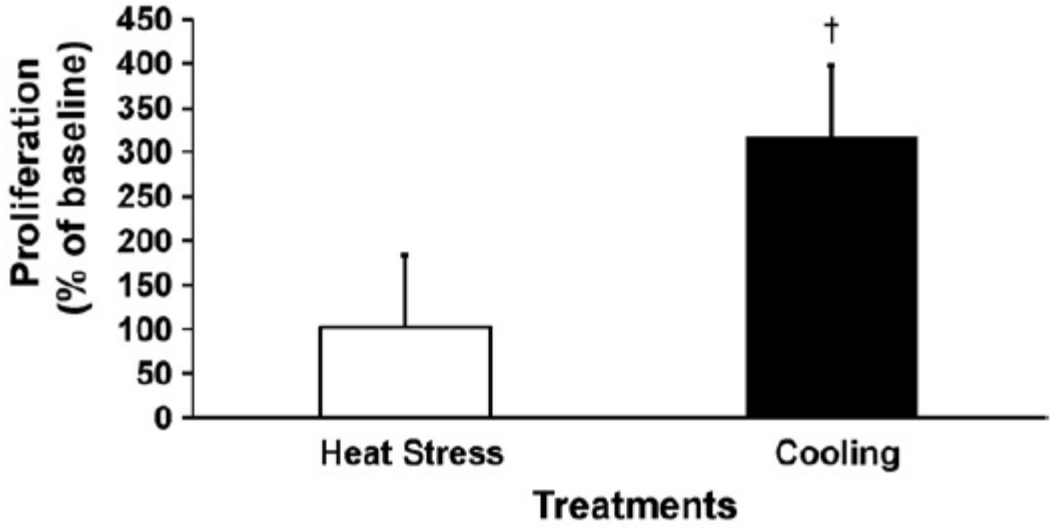
- Dry period heat stress on milk quality
- Heat stress in lactation on milk quality
- Georgia examples

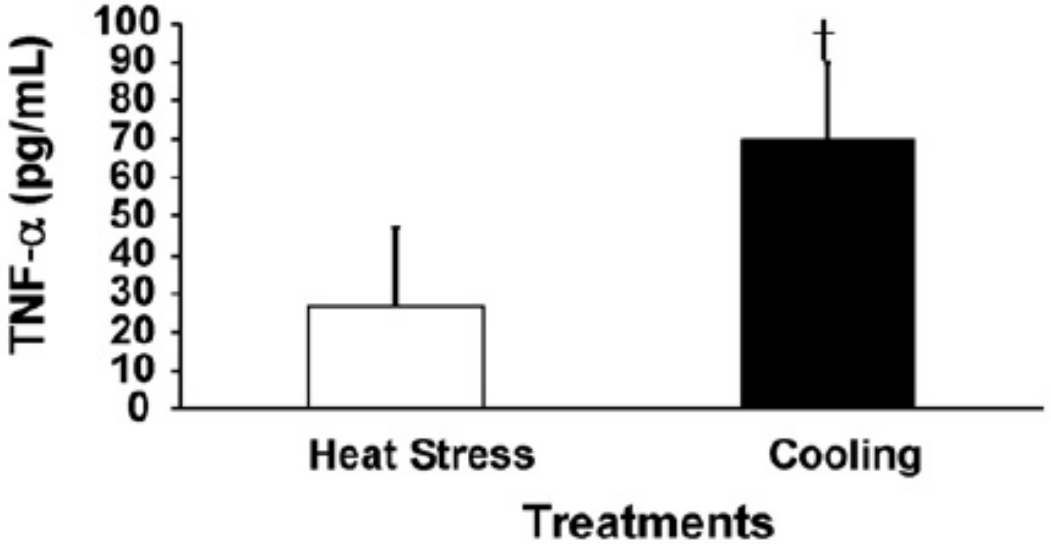
Dry period heat stress decreases MY



Tao et al., 2011

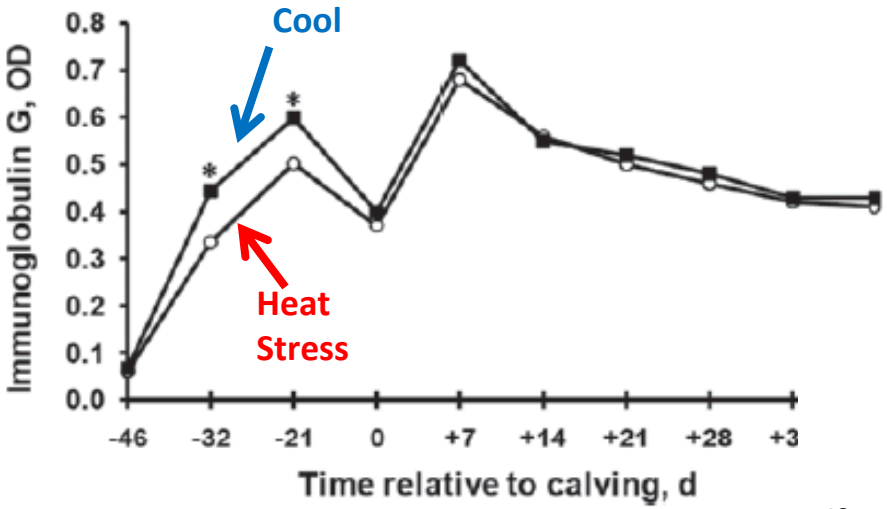
Dry period heat stress impairs lymphocyte function in early lactation



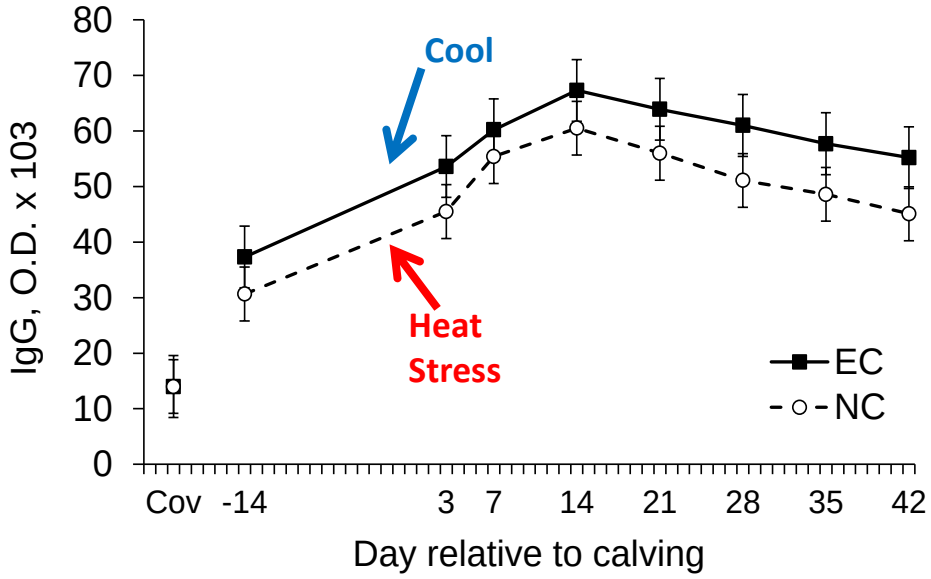


do Amaral et al., 2011

Dry period heat stress impairs IgG responses against ovalbumin challenge

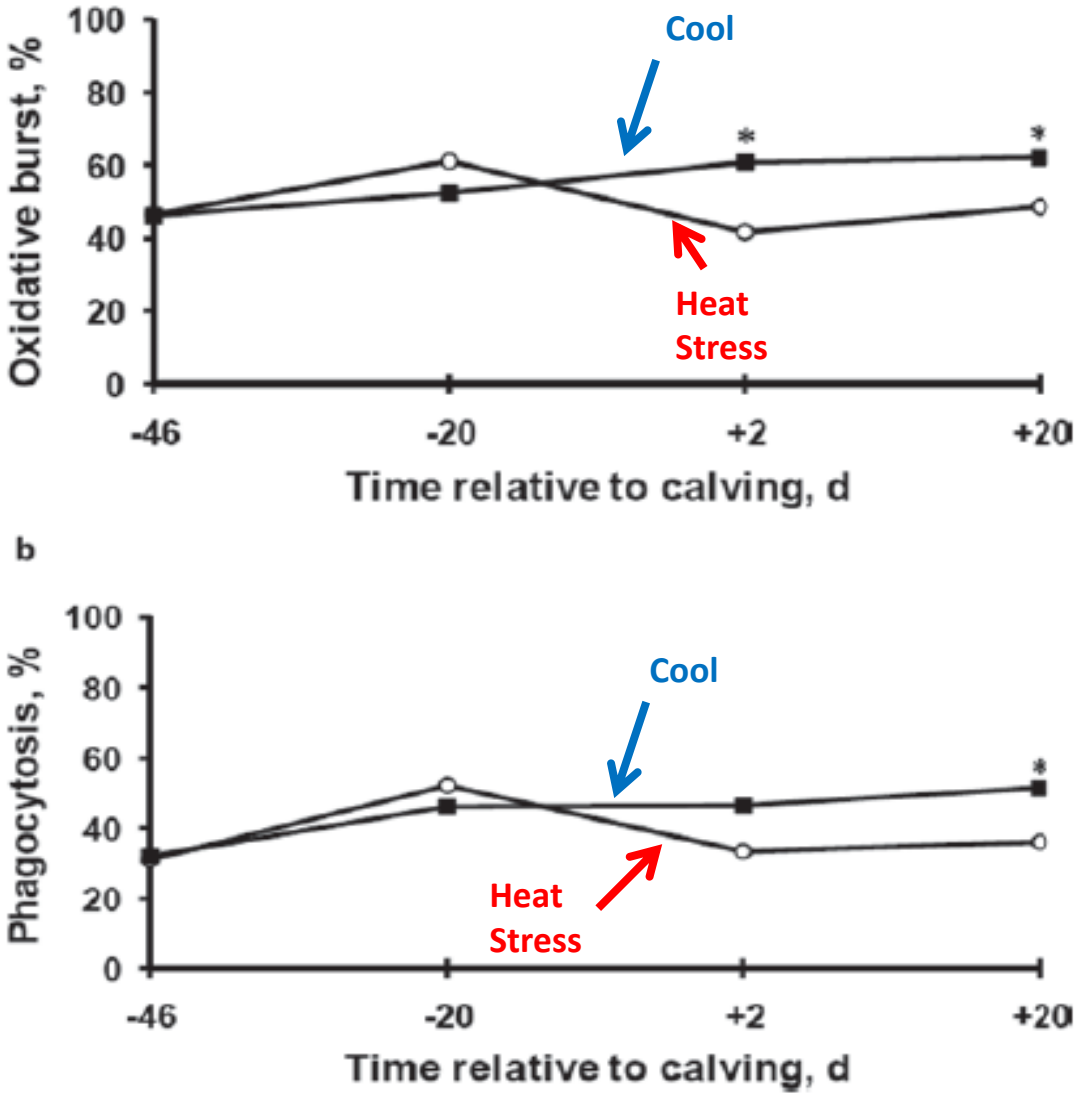


do Amaral et al., 2011



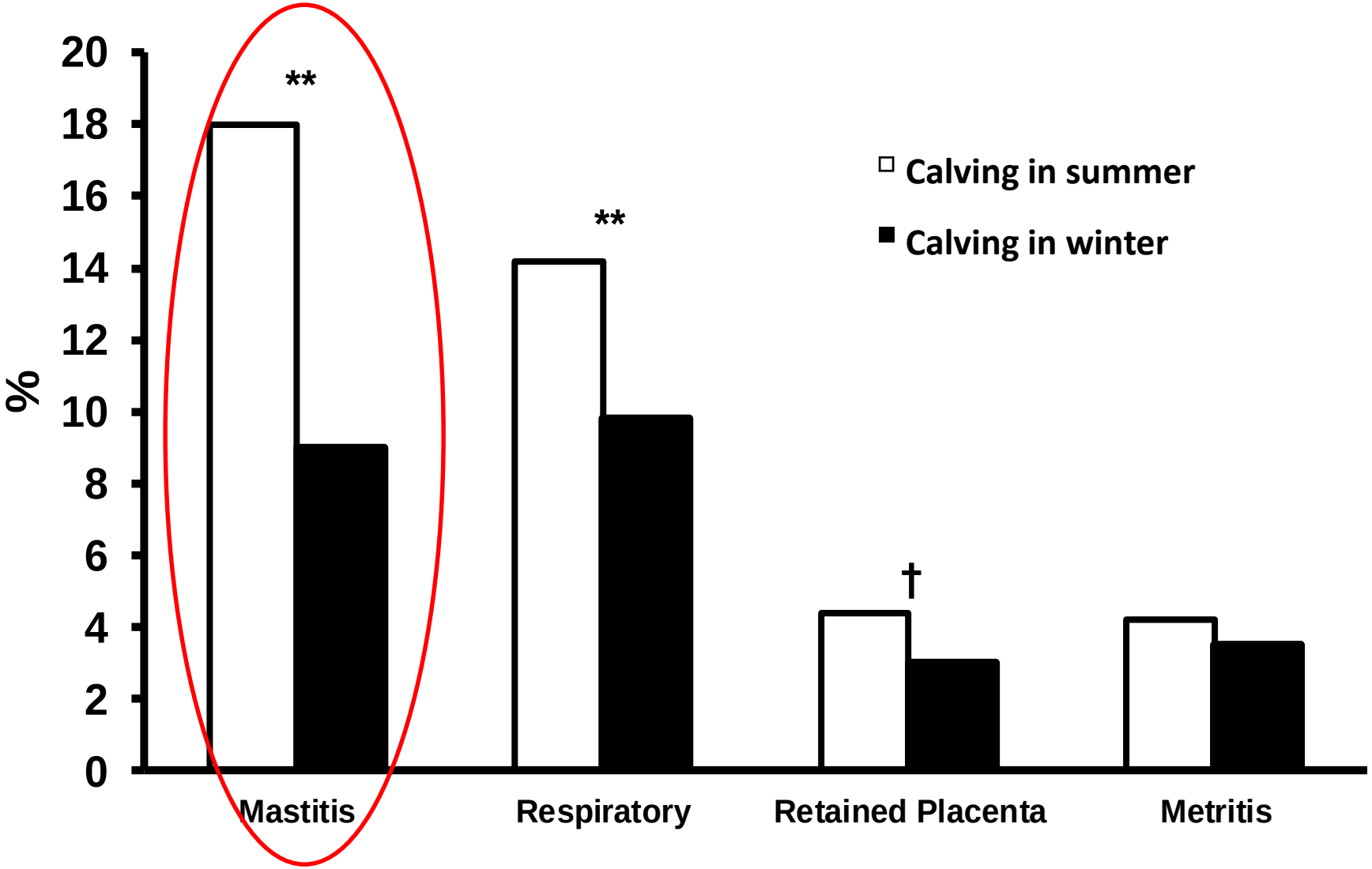
Gomes et al., 2014

Dry Period Heat stress impairs neutrophil function in early lactation



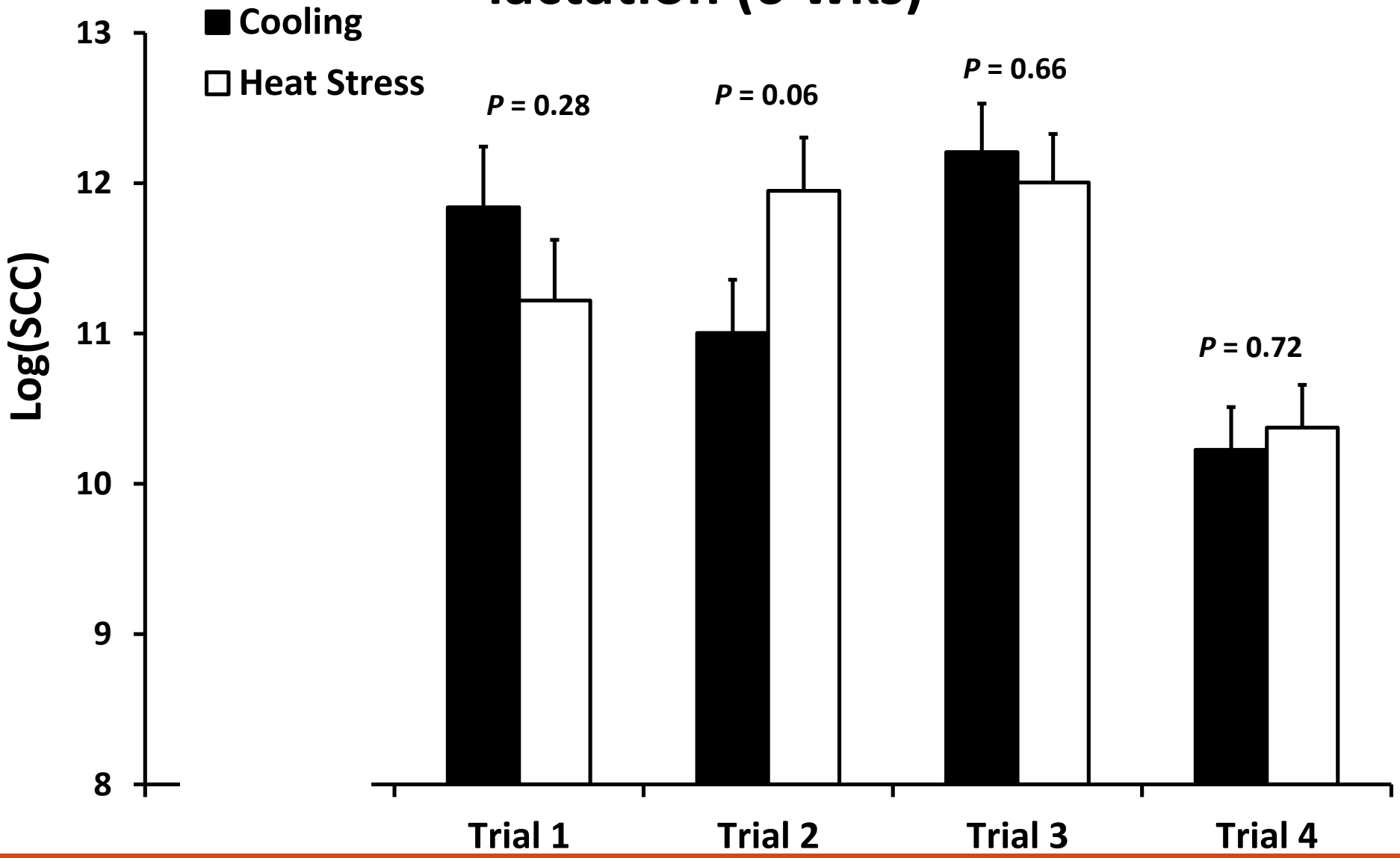
do Amaral et al., 2011

Calving season on cow health (up to 60 DIM)



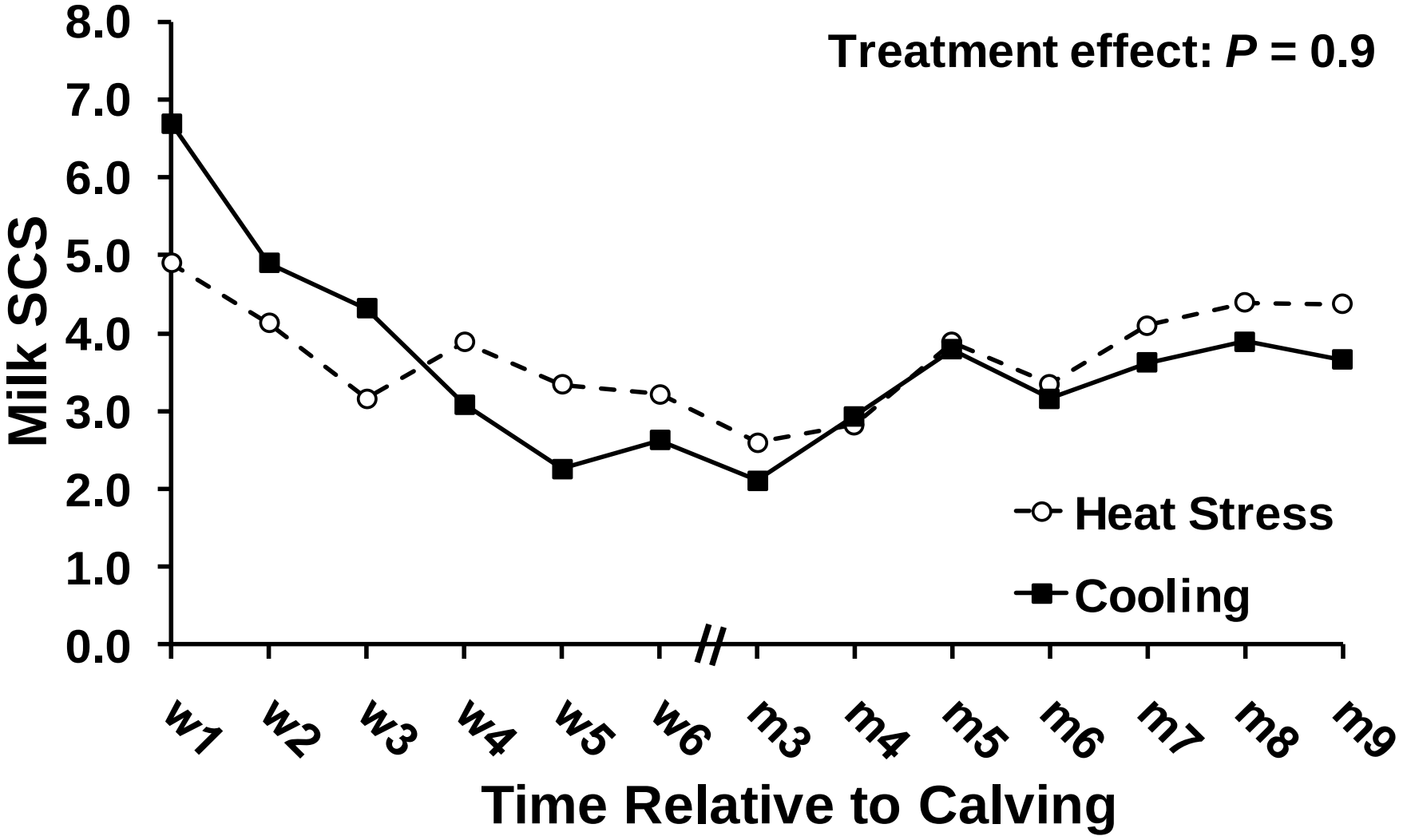
Adapted from Thompson and Dahl., 2012

Dry period heat stress has no impact on SCC in early lactation (6 wks)



Adapted from do Amaral et al., 2009; 2011; Tao et al., 2010; 2012

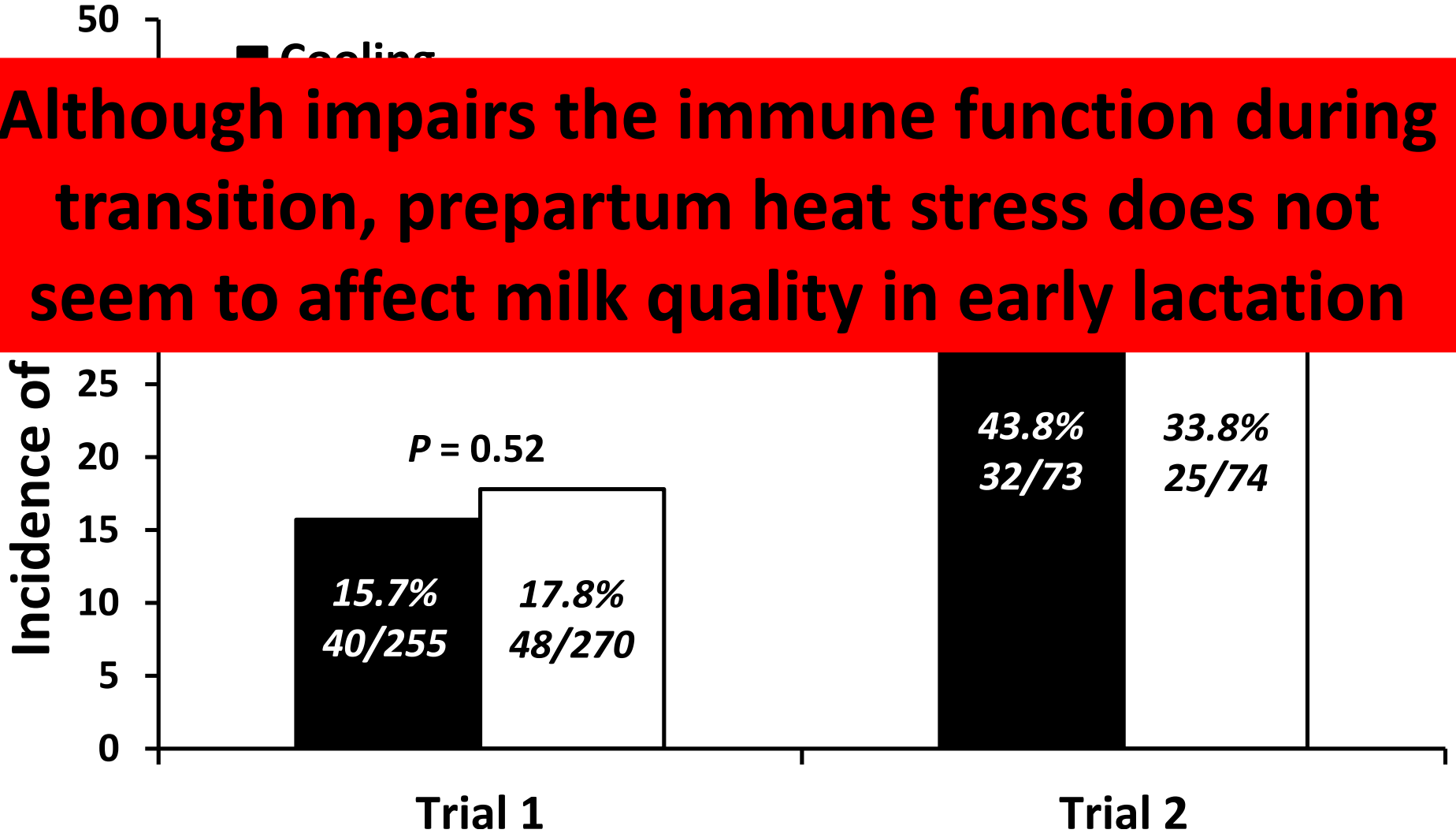
Dry period heat stress has no impact on SCC during the entire following lactation



Adapted from Tao et al., 2010

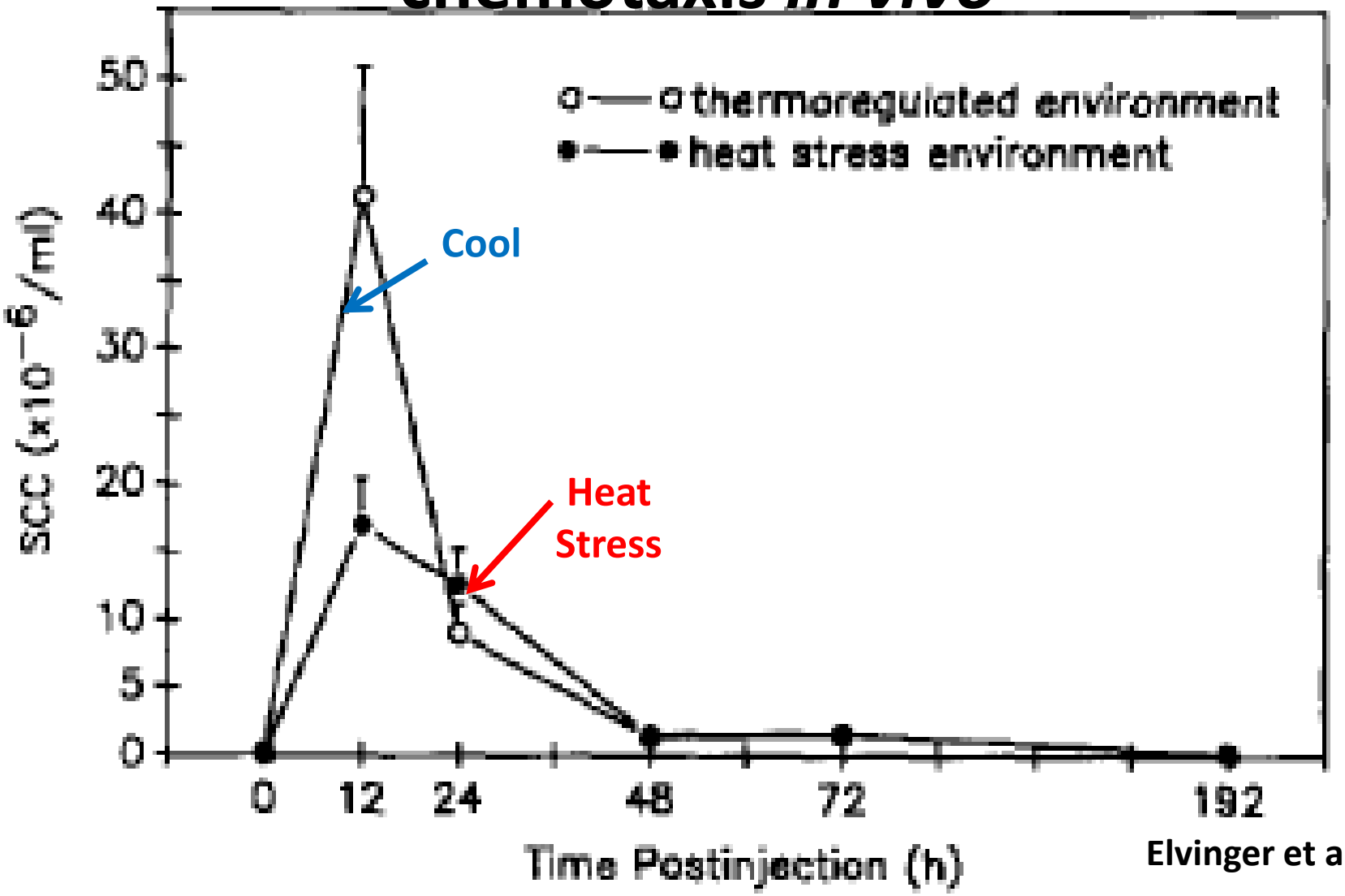
Dry period heat stress has no impact on incidence of mastitis in the first 60 d in lactation

Although impairs the immune function during transition, prepartum heat stress does not seem to affect milk quality in early lactation



Thompson et al., 2016

Heat stress in lactation reduces neutrophil chemotaxis *in vivo*



Elvinger et al., 1992

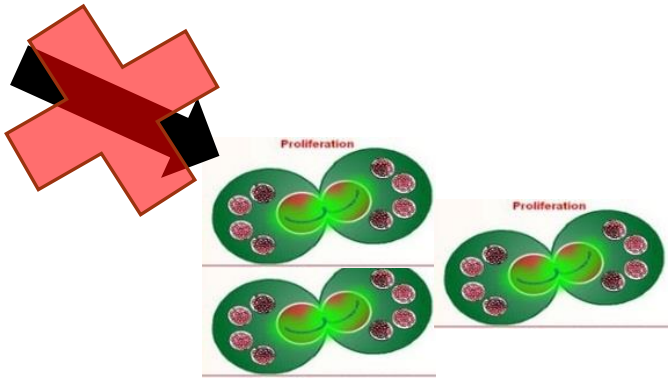
Heat stress in lactation has no impact on SCC

Similar results are observed in
Chan et al., 1997
Tarazon-Herrera et al., 1999
Wheelock et al., 2010, etc

Weng and Tao, Unpublished

With good management, hyperthermia <u>per se</u> may not influence the milk SCC

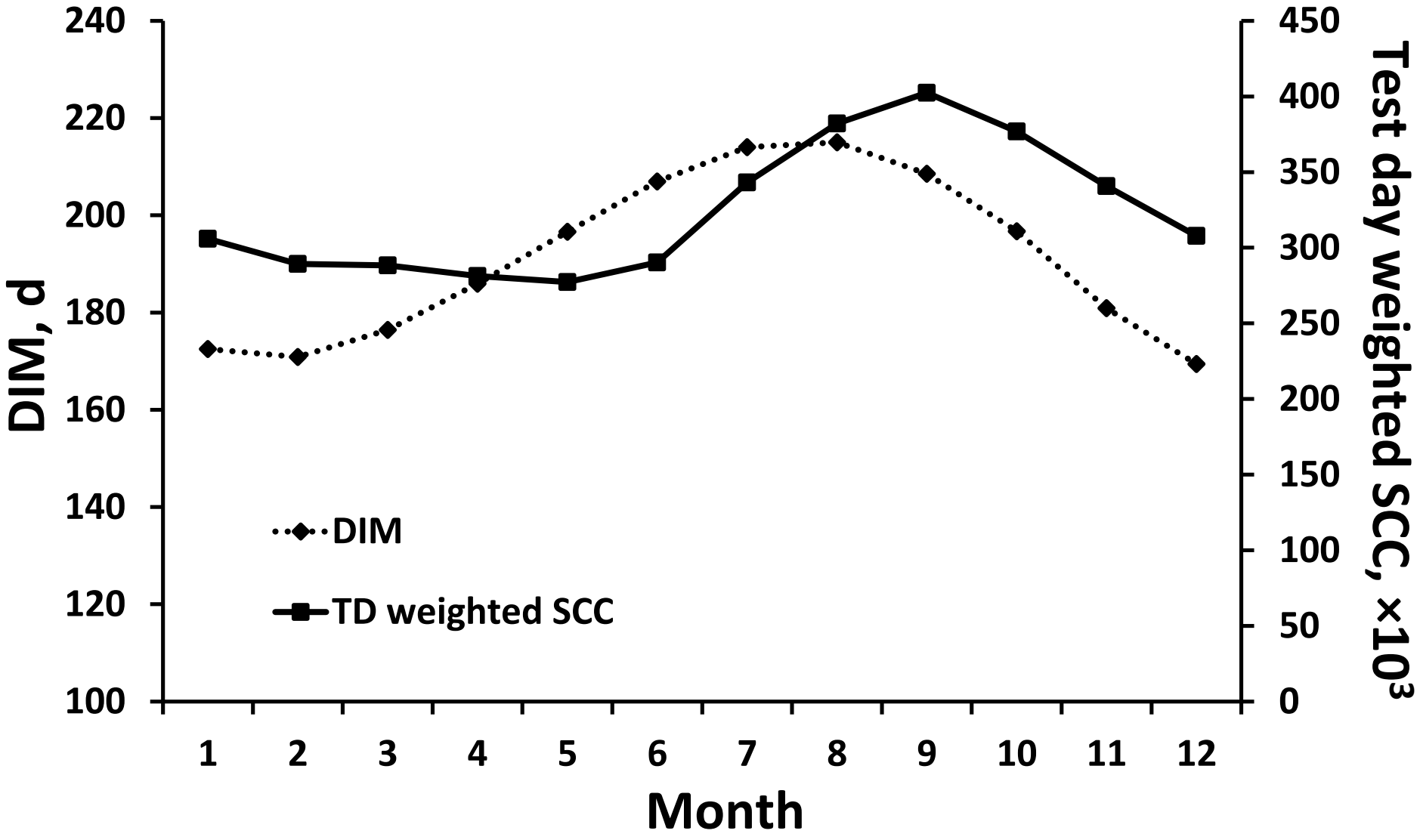
Milk Production



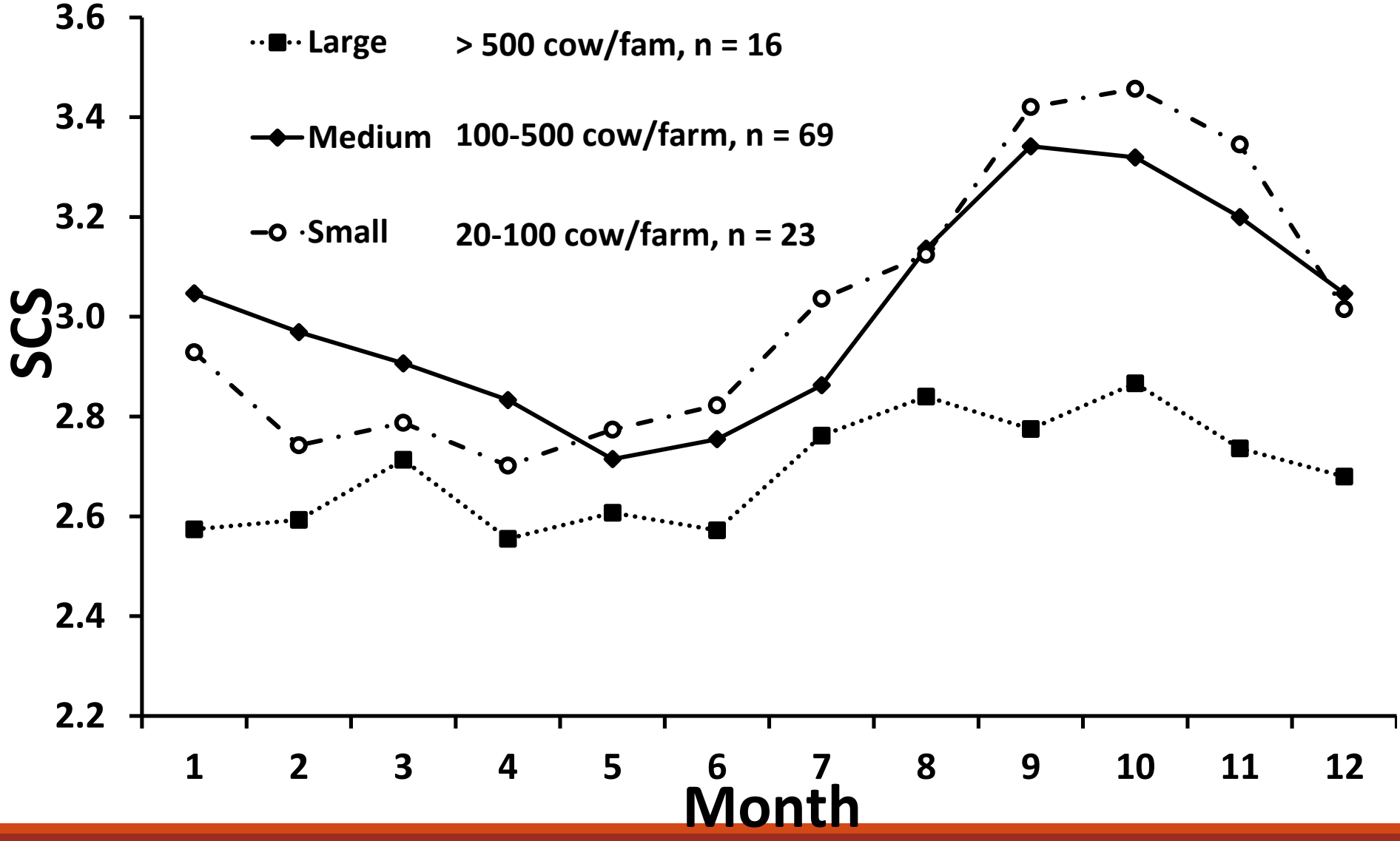
Immune Function

? SCC

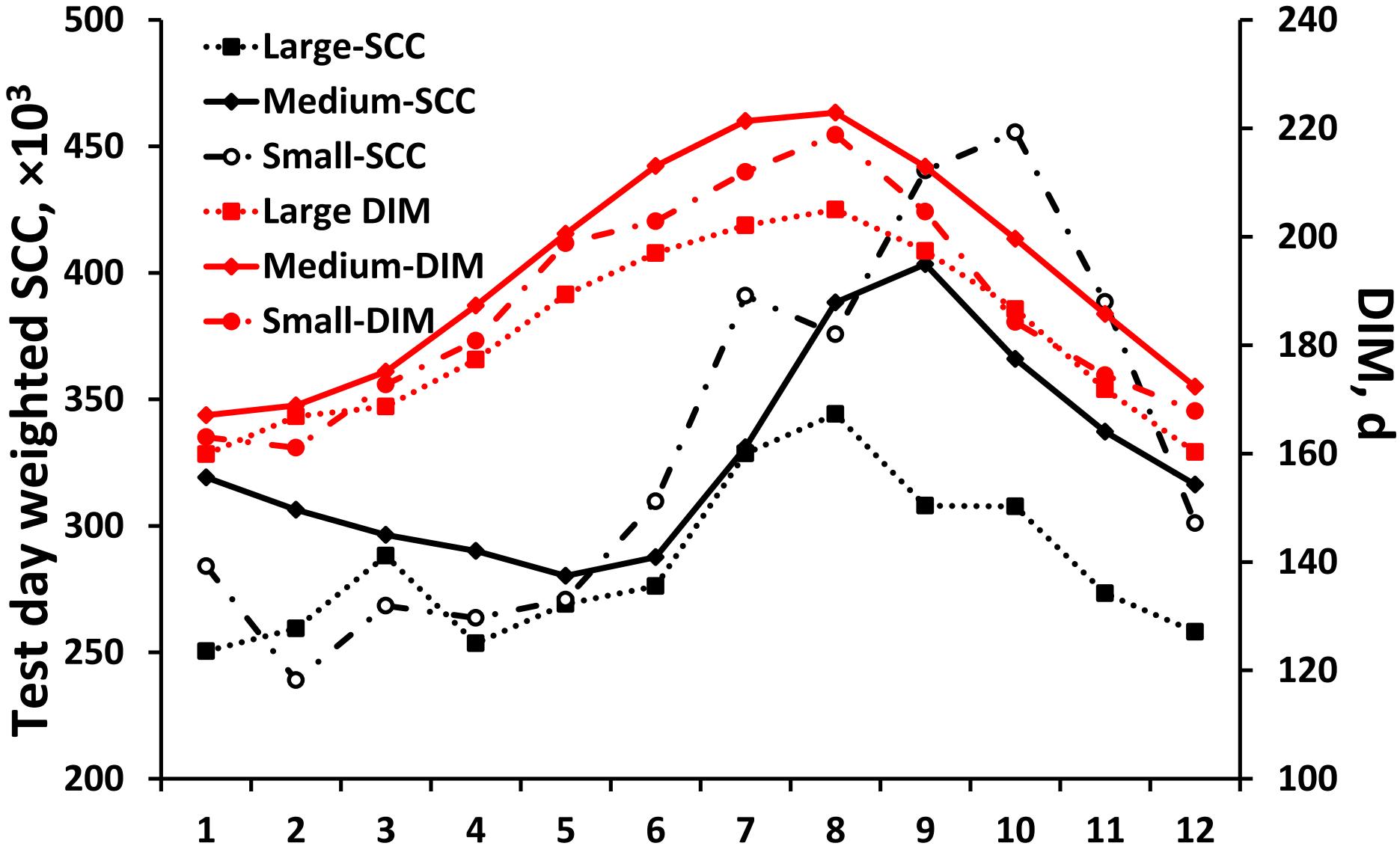
DIM vs. SCC in GA (DHIA data, 2015)



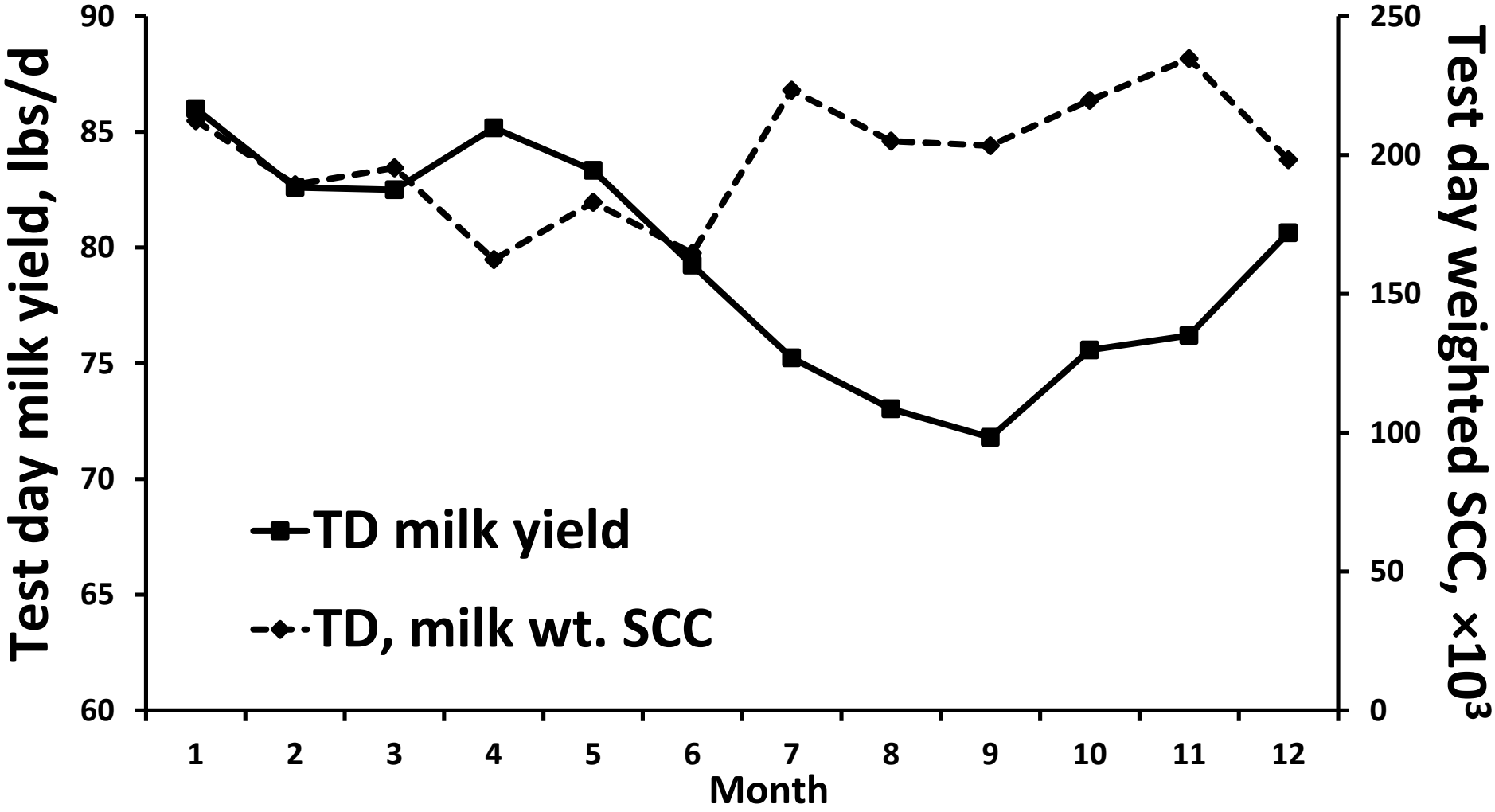
Seasonal effects on GA milk SCS (DHIA data from 2013-2015) – By farm size



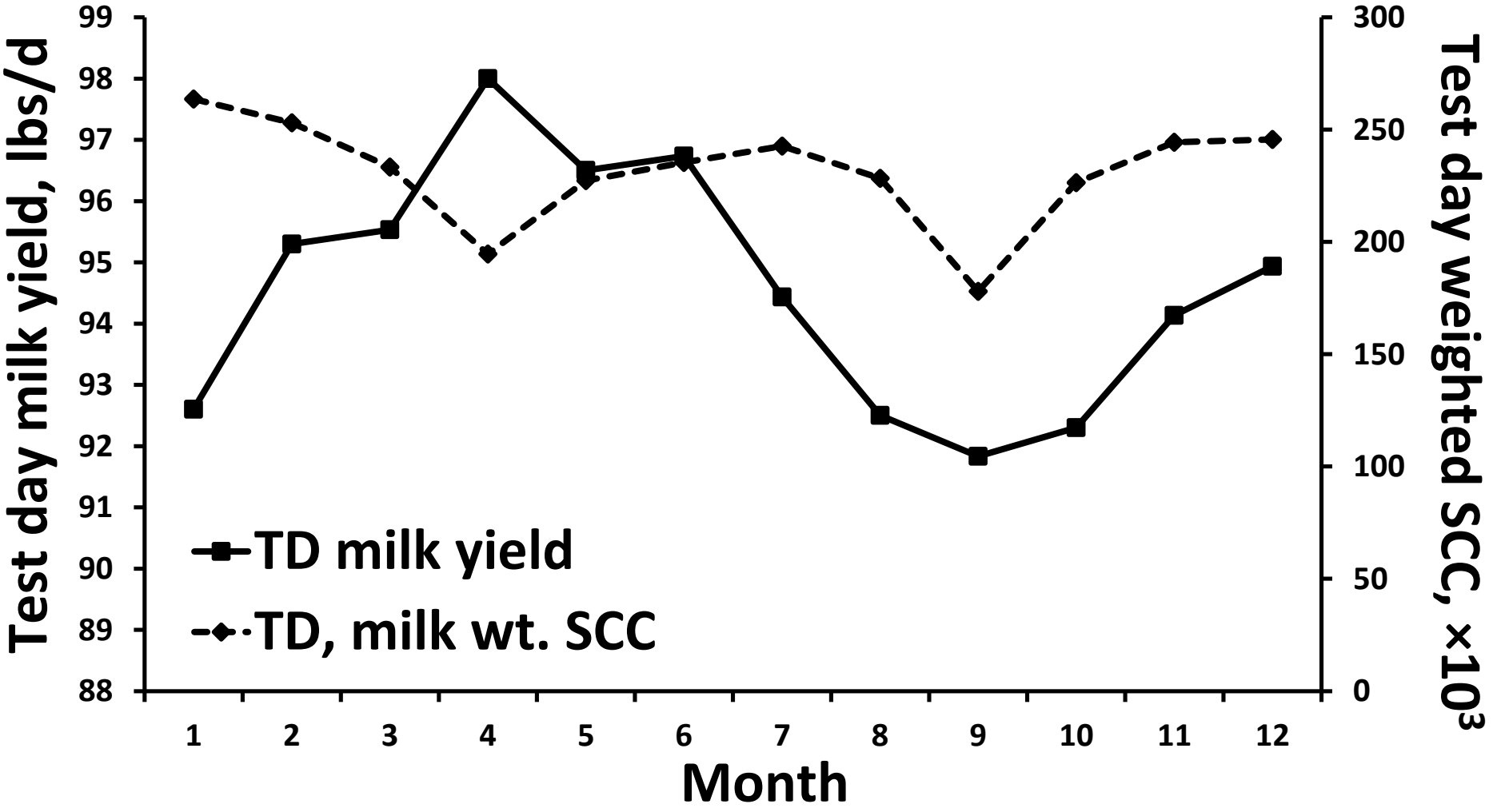
DIM vs. SCC (DHIA data from 2013-2015) – By farm size



Example farm 1 (DHIA data, 2013-15 average)
Herd size: 280, Milk rolling: ≈24,000 lbs;



Example farm 2 (DHIA data, 2013-15 average)
Herd size: 430, Milk rolling: ≈31,000 lbs;



Summary

- Heat stress impairs the immune function of cow at different stage of lactation;
- With good management, heat stress may not lead to reduced milk quality;
- Cooling is 100% important;
  - Alleviate hyperthermia;
  - Improve DMI – to boost immunity;
- Provide clean and dry environment ——

Cow comfort is the key

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