



Australasian Pork Research Institute Ltd **APRIL**

PROJECT SUMMARY

Project Number and Title: 6A-102 Hot and bothered! Long term impacts of late pregnancy heat stress on sows and progeny

Project Leader: Dr Kate Plush (SunPork Group)

Project Participants: Darryl D'Souza, Sally Tritton (SunPork Group, Eagle Farm, QLD); Jeremy Cottrell, Frank Dunshea (The University of Melbourne, Parkville, VIC)

Aims and Objectives:

This project investigated the hypothesis that heat stress at farrowing extends parturition duration by limiting the energy available for uterine contractions, and that this physiological disruption impairs sow reproductive health and neonatal piglet gut development. A secondary objective was to evaluate whether in-water supplementation with betaine or sanguinarine (an extract from *Macleaya cordata*) could ameliorate the negative effects of heat stress in a commercial farrowing setting.

Key Findings:

- Cyclic heat stress during late gestation and farrowing (30°C daytime, 28°C overnight) dramatically increased stillbirth rates in gilts (33.3% vs. 2.3% in controls), with heat stress attributable to 93% of all stillbirths observed
- Heat-stressed gilts showed elevated respiration rates, rectal and skin temperatures, substantially reduced feed intake, increased plasma cortisol, and altered acid-base balance. Umbilical cord rupture explained 55% of stillbirths, and for the first time, foetal hypoxia via reduced umbilical oxygen supply was identified as a key mechanism underlying heat stress-induced perinatal mortality
- Maternal heat stress reduced small intestinal length and absolute brain weight in piglets at 48 hours of age, with reduced jejunal crypt depth also observed
- Neither betaine nor sanguinarine supplementation delivered via in-water dosing improved farrowing performance or piglet survival in commercial experiments, most likely due to insufficient heat stress conditions at the experimental sites

Applications to Industry:

- Sows are highly susceptible to heat stress during parturition, with negative and lasting impacts on piglet morphology, survival and growth. Farrowing should be considered a priority period for thermal management interventions
- Farrowing houses should be climate controlled to maintain ambient temperatures below 24°C. In-water supplementation with betaine or sanguinarine was not effective under the commercial conditions tested however, the practicality of in-water delivery systems warrants continued investigation, particularly in naturally ventilated farrowing houses