



# Australasian Pork Research Institute Ltd APRIL

## PROJECT SUMMARY

**Project Number and Title:** 5A-104 Low dose dietary strategies in late gestation to enhance born alive and piglet survival and performance

**Project Leader:** Dr Jessica Craig (Rivalea)

**Project Participants:** Dr Rob Smits (Australian Pork Limited, formerly Rivalea), Mr Chris Brewster (Rivalea), Dr Rebecca Morrison (Rivalea), Dr Roger Campbell (RG Campbell Advisory)

### **Aims and Objectives:**

The main objective of this project was to investigate the effects of dietary supplementation of 0.15%  $\beta$ -hydroxy  $\beta$ -methyl butyrate (HMB), 0.15% N-carbamylglutamate (NCG) and 0.1%  $\text{Ca}(\text{NO}_3)_2$  (calcium nitrate) to sows in late gestation on their litter performance and subsequent reproductive performance in order to evaluate their suitability as alternatives to L-arginine supplementation, which is often expensive, requires high inclusion rates, has a short half-life, and may reduce sow feed intake. It was hypothesised that supplementation of these additives would increase piglet vitality at birth and therefore their overall performance to weaning, increasing the number and/or proportion of live piglets born and weaned.

### **Experimental design:**

The experiment was conducted at Rivalea's R&I/Module 1 facility from February to May 2020. A total of  $n = 537$  sows were allocated to 1 of 5 dietary treatments at day 90 of gestation balanced for sow parity (multiparous sows, parities 2-7) and body weight at day 90. The five diets consisted of:

- CON - A basal (control) diet (common gestation diet with no supplemental arginine;  $n = 108$ );
- ARG - The basal diet + 0.5% added arginine ( $n = 101$ );
- HMB - The basal diet + 0.15% added  $\beta$ -hydroxy  $\beta$ -methyl butyrate ( $n = 107$ );
- NCG - The basal diet + 0.15% N-carbamylglutamate ( $n = 113$ ); or,
- CAN – The basal diet + 0.1%  $\text{Ca}(\text{NO}_3)_2$  ( $n = 108$ ).

Sows entered the farrowing house at approximately day 108 of gestation and continued on their experimental diets until the day of farrowing. Sow body weight, P2 backfat, feed intake, total piglets born (TB) and born alive (BA), stillbirth percentage, individual birth weights, and litter weights at birth, day 7 and day 25 of lactation were measured for each litter. Subsequent sow reproductive performance was also assessed.

### **Key Findings:**

The main outcomes of the study were:

- Supplementation of CAN improved birth weights of piglets and reduced the proportion of piglets born < 1.1 kg;
- Piglets born to sows supplemented with CAN had a higher pre-weaning survival chance;

- Supplementation of HMB improved the growth performance of suckling piglets from birth to weaning;
- Subsequent sow reproductive performance was not impacted.

**Applications to Industry:**

Calcium nitrate and HMB showed promise as feed additives for sows in late gestation, as they may improve birth weight of piglets and their survival chance to weaning in the case of CAN. Therefore, these additives may represent a cost-effective alternative to L-arginine in late gestating sow diets. Further research is required to confirm the optimal feeding time and inclusion rates of these additives. From these improvements it was shown from a cost-benefit analysis that HMB and CAN were the most cost effective of the additives investigated.