

Effect of supplemental nutrition through an isotonic protein solution provided days 2 to 8 of life on pre-weaning mortality of piglets and their lifetime performance

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Introduction: Right after birth, the small intestine of the piglet goes through tremendous development. This period is described as a “window of opportunity” [1] for nutritional interventions to improve the development of intestinal structure and the maturation of the immune system, with lifelong effects. The aim of this study was to test if an isotonic protein solution provided in early life would increase farrowing survival and weaning weight, and if those improvements in weight would persist through harvest.

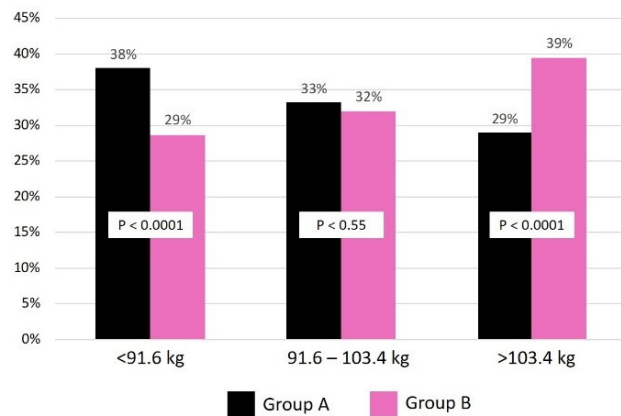
Materials and Methods: The study involved 3862 piglets farrowed from 353 gilts. Litters were allocated to one of 2 groups, control (Group A-1969 piglets) or supplementation with an isotonic protein drink (Group B-1893 piglets). All piglets were identified at day 2 with individual ear tags. Group A litters received only pelleted creep feed from birth to weaning. Group B litters were given 250 ml of a 3% isotonic protein solution on day 2 of age, and 500 ml from days 3-8 of age, once daily in an open pan. Group B also had access to pelleted creep feed before weaning. Group B litters also received the 3% solution three, two, and one days before weaning. Wean age was from 17 to 25 days. Pigs were moved to two separate nursery sites, where Group A pigs received the standard nursery diet in their feeder and free choice water. Group B pigs received the isotonic protein solutions in open feeding pans as follows: day of arrival - 7.5 litres per pen of 3% liquid (no feed added), day 1 - 7.5 litres per pen of 1.5% liquid mixed with feed, day 2 - 7.5 litres per pen of 0.75% liquid mixed with feed. Individual pig weights for all pigs were recorded at birth, weaning, end of nursery and 1 week pre-harvest. Mortality was recorded for each period.

Results: Pre-weaning mortality was reduced from 14.2% in Group A to 10.9% in Group B, a 22.8% reduction consistent with results observed in multiple previous

studies.

The mean birthweight of Group B pigs was 1.56 kg, and 1.49 kg for Group A ($P = 0.007$). For weaning and subsequent weight analysis, any variability due to age and birth weight were neutralized by including those factors as covariates in the model. The mean weaning weight was not significantly different between groups. At the end of nursery, Group B pigs were 0.41 kg (1.7%) heavier than Group A pigs ($P = 0.10$). At the end of the finisher stage, pigs from Group B were 3.08 kg (3.2%) heavier than Control pigs. This difference was highly significant at $P = 0.002$. Group B also had less pigs finishing at <91.6 kg, and more pigs finishing at >103.4 kg (Figure 1).

Figure 1. Comparison of Pig Finishing Weight



Conclusions: This new study further supports previous reports demonstrating the ability of the isotonic solution to stimulate the intestine in that early life window of opportunity and to provide the potential for reduced pre-weaning mortality and accelerated growth in the post nursery phase.

References:

[1] Torow N. et al., 2017. J. Immunol. 198:557-563