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An evaluation of liquid feeding immediately post-weaning to improve the performance of the lightest pigs within a nursery group

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Introduction

The normal variation in body weight of individual pigs within a group has a significant impact on the ability of all-in/all-out swine production systems to maximize throughput (increase profitability). This biological variation is the result of individual genetic differences and numerous environmental factors that influence the pig's development from the moment of conception onward.

The purpose of the following studies was to evaluate the potential for liquid feeding the lightest pigs within a group immediately post-weaning. Improving our understanding of this concept may improve our ability to manage variation within groups.

Materials and Methods

In the first experiment (Exp. 1), the lightest 180 pigs of 650 received at weaning were individually ear-tagged, weighed, and allotted to 1 of 3 treatments. The treatments consisted of 1) Controls (C), which were dry-fed a typical industry SEW diet/budget for this size pig; 2) Milk Replacer (MR) fed, which were fed a commercially available milk replacer as the sole diet (*ad-libitum*) for d 0 to 3; and 3) an experimental Liquid Feed (LF), that was also fed *ad-libitum* as the sole diet for d 0 to 3. The pigs selected for the trial averaged 9.33 lb at placement into the nursery. There were 30 pigs placed/pen and 2 pens/treatment (60 pigs/treatment). Individual pig, however, served as the experimental unit for the statistical evaluation of average daily gain (ADG), culls, and mortality in a completely randomized experimental design. The MR and LF diets were prepared fresh daily and administered via a Rotecna[®] Maxi Pan + Maxitainer for d 0 to 3 post-weaning. Afterwards, these pigs received the same diets/budget as the C group for the remaining 48 days in the nursery (51 total nursery days).

For the second experiment (Exp. 2), the lightest 150 pigs of 650 received at weaning were individually ear-tagged, weighed, and allotted to 1 of 5 treatments. The treatments consisted of a dry-fed control group (C) as in Exp. 1, and 4 commercially available milk replacers (MR1, MR2, MR3, and MR4). The pigs selected for this trial averaged 8.78 lb at placement. There were 30 pigs placed/pen/treatment. Experimental design, statistical analysis, and the protocol for feeding the MRs were similar to Exp. 1.

Results & Discussion

In Exp. 1, d 0 to 3 ADG was improved ($p < .05$) by feeding MR. This resulted from increased dry matter intake (per pen). From d 3 to 6, ADG of the C fed pigs was greater ($p < .05$) than MR or LF. Feed intake (per pen) was numerically similar, however, which suggests that much of the d 0 to 3 gains from MR and LF were the result of increased water intake. Overall (d 0 to 51), there were fewer pigs culled from the MR and LF treatments ($p < .10$; C = 6.67%, MR = 0.00%, and LF = 1.67%), and fewer combined dead and culls (C = 6.67%, MR = 1.67%, and LF = 3.33%). Overall ADG was greatest ($p < .01$) for the remaining C pigs, which resulted in heavier ($p < .01$) pigs on d 51 (LF = 48.42 lb, MR = 49.20 lb, and C = 51.74 lb).

As in Exp. 1, d 0 to 3 ADG was improved ($p < .05$) in Exp. 2 by feeding MR. The pigs became clinically sick with PRRS on d 3 to 4. From d 3 to 7, ADG of the C pigs was greater ($p < .05$) than MR1, MR2, and MR3, with MR4 having intermediate ADG. Feed intake (per pen) was numerically similar, as in Exp. 1. ADG of the MR4 pigs from d 7 to 14 was greater ($p < .05$) than MR1, MR2, and MR3, with C having intermediate ADG. Overall (d 0 to 58), as in Exp. 1, there were fewer dead and culled pigs from the MR treatments (C = 26.67%, MR1 = 13.33%, MR2 = 10.00%, MR3 = 16.67%, and MR4 = 13.33%). Overall ADG was greatest for the remaining MR4 pigs; followed by the C pigs, MR3 pigs, MR1 pigs, and MR2 pigs (0.82, 0.80, 0.77, 0.73, and 0.68, respectively; all differed $p < .05$). This resulted in significant differences in the average ending weights (C = 55.27 lb, MR1 = 51.46 lb, MR2 = 48.07 lb, MR3 = 53.64 lb, and MR4 = 56.24 lb; all differed $p < .05$).

These experiments demonstrate that offering liquid diets *ad-libitum* during the first 3 days post-weaning will reduce death loss and culls from the lightest pigs. However, only one MR resulted in an improvement in overall ADG of the lightest pigs in the nursery. This MR was the least expensive, and differed from the other MRs in that it contained less milk proteins and a significant amount of processed vegetable proteins. Further research needs to be conducted to identify the best liquid diet/formulation and targeted feeding strategies to improve health and performance, and assist with the management of within-group variation.