Effects of the supplementation of Essential on the mortality and average daily gain of antibiotic-free nursery pigs

Introduction

The nursery period is one of the most challenging periods in the life of a pig. Challenges include stressors such as change in diet from liquid to solid; susceptibility to changes in environment in regard to temperature and possible air drafts; and lack of immunity against disease. Therefore, it is imperative that pork producers have tools available to decrease the impact of these losses. Essential, a proprietary mix of two functional oils (castor bean oil and cashew nut shell liquid), has been shown to increase the microbiome diversity in nursery pigs and decrease the amount of challenge due to gram positive bacteria such as *Clostridium perfringens*. It was therefore hypothesized that the supplementation of Essential would increase the average daily gain and decrease the mortality of nursery pigs.

Materials and Methods

The trial was done on a commercial farm. A total of 2,100 pigs were evenly divided into two treatments of 1,050 animals. Both treatments were fed a corn/soybean meal diet without antibiotics. The Essential treatment was fed Essential at a rate of 3 lbs/ton. Mortality and its causes were recorded daily. The experiment lasted for 56 days. Animals were grouped weighed at the beginning and at the end of the experiment. As the pigs in each treatment could not be weighed in just one load, it was possible to use these weights to statistically compare both treatments (11 and 13 lbs average weights for the control and Essential treatments, respectively) with a boostrapping technique using Monte Carlo permutations. The model was iterated 100,000 times, using a program written in Python, to obtain and compare the mean of the final weight of both treatments. The mortality, as well as its causes were analyzed using a Chi-square.

Results and Discussion

The final weight (Table 1) of the pigs supplemented with Essential was higher than the controls (69.85 vs. 65.81 lbs, $P = 0.09$). The total mortality was also lower for the pigs supplemented with Essential (8.86 vs 6%, $P = 0.01$). The main cause for the difference was a decrease in the deaths due to *Streptococcus suis* (4.95% for the control versus 0.76% for the Essential supplemented pigs, $P < 0.001$). These results agree with previous research in other species showing that Essential controls pathogenic gram positive bacteria. Although it was not possible to run any statistics for either the feed intake or the feed:gain ratio, the control pigs ate more (1.97 versus 1. 80 lbs) and converted worse than the ones supplemented with Essential (1.67 vs 1.44), which would have great economic implications.

Conclusion

The supplementation of 3 lb/ton in nursery diets for piglets decreased mortality, especially due to Streptococcus suis, improved average daily gain and feed:gain ratios.

Table 1. *Effects of the supplementation of Essential on nursery pigs.*

Item	Control	Essential
Initial weight, lbs	13.45	13.41
Final weight, lbs*	65.81	69.85
Average daily gain, lbs	1.18	1.25
Feed intake, lbs/day	1.97	1.80
Feed: gain, lb/lb	1.67	1.44
Mortality:		
Total, %¶	8.86	6.00
Streptococcus suis, %¶	4.95	0.76

*Treatments are different at $P = 0.09$.
¶Treatments are different at $P < 0.05$.