Evaluating the effects of probiotic supplementation

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Whereas research institute trials are essential to prove efficacy and for the purpose of gaining registrations, trials on commercial farms are also necessary because they allow additive treatments to be tested under the types of practical conditions which would be encountered in everyday usage.

In this trial on a commercial pig farm in Berkshire, England, careful planning and scientific principles were applied to yield statistically valid results.

Piglets fed the probiotic treatment gained significantly more weight and had improved feed conversion ratios than piglets fed untreated feed

Trial set-up

The purpose of the trial was to investigate the effect of a thermotolerant probiotic feed additive on piglet production and health status. The product tested, BioPlus® 2B, which is produced by Chr. Hansen, contains selected strains of spore forming probiotic bacteria.

Some 60 weaned piglets were allocated at random to each of two groups (120 piglets in total); one of which was fed untreated feed containing no additive and the other the same feed containing 400g BioPlus 2B per tonne.

Both groups were fed a creep ration before weaning and for 12 days post weaning followed by a starter ration until the end of the trial. Avilamycin and unspecified enzymes are normally included as growth promoters at this farm and were included in creep feed before the trial began.

These were removed from all feeds during the trial period. Similarly neomycin sulphate, which is usually added to the water for the first few days after weaning to prevent post weaning scour, was not administered in this trial.

Litters were split in an attempt to achieve as near as possible two similar groups in relation to weight, proportion of sexes and breed (pigs at this farm are a mixture of Landrace and Large White). This is essential to ensure that any differences observed in a trial are due to treatment and are not due to differences between the starting groups. Equal groups were achieved in this trial by:

- Weighing piglets individually in polystyrene boxes on an electronic balance before allocating them to groups.
- By splitting the piglets by sex and housing them in the same house in six pens of 20 piglets per pen, so that both groups comprised one boar pen, one gilt pen and one mixed pen. The trial ran from weaning at 21-27 days of age for three weeks.

The following measurements were made – pen starting weights on the day the trial began; pen finishing weights on the day the trial finished; total feed intake for each group; feed conversion ratios for each group; mortality within each group (with record of cause, if known); incidence of or days with diarrhoea within each group, veterinary or other treatments for each group.

Results

Piglets in the treated group gained significantly ($p<0.005$) more liveweight 6.47kg versus 5.11kg (+26.7%) than piglets in the untreated group (Fig. 1).

Feed intake was 9.3% less for the group supplemented with the probiotic than for the untreated group. Feed intake reduction was also found in two farm trials conducted by the manufacturer.

As a result of the increase in liveweight gain and the decrease in intake, the feed conversion ratio was significantly lower ($p<0.05$) for the treated group, 1.46 vs 1.05, representing a 28.1% improvement in efficiency over untreated piglets, as shown in Fig. 2. Feed conversion ratio is the most valuable parameter in terms of production efficiency for pig producers.

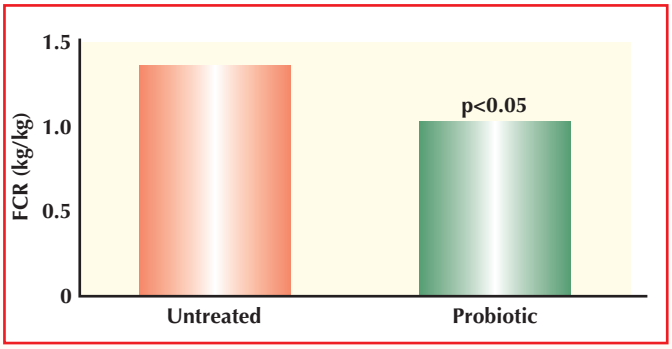


Fig. 2. Effect of the probiotic treatment on feed conversion.

As feed conversion ratios for the supplemented piglets were lower than for those of the control piglets, this means that less feed was required to reach a given weight. The extrapolation from this result is that the producer has invested less money per kilo of liveweight when the pig reaches slaughter weight.

No significant morbidity or mortality occurred in either group.

One gilt from the treated group was found dead, aetiology was not established. One gilt in the untreated group was noted to be suffering transient weight loss; cause was not established.

None of the piglets was observed to be scouring during the trial, and all appeared to be in good health throughout the three week period except the individuals mentioned above. Although the supplemented piglets in this trial showed no evidence of scours the control group were also scour free; this may indicate that the piglets were not exposed to an overwhelming bacterial challenge.

Other studies have highlighted the efficacy of probiotic supplementation in reducing post-weaning diarrhoea in piglets.

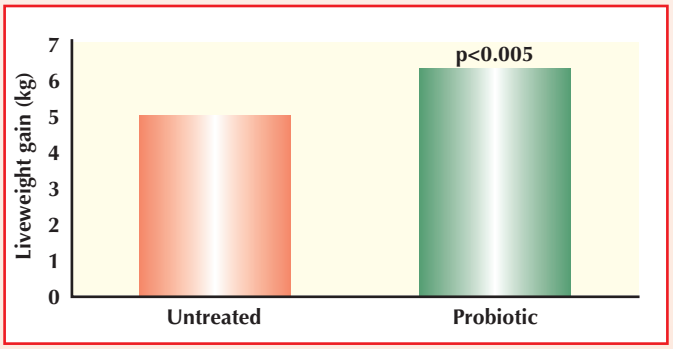
Improved production

Those piglets supplemented with BioPlus 2B showed an increase in daily liveweight gain, a decrease in feed intake and an improved feed conversion ratio in comparison with negative controls.

These results favour the use of the supplement as a means of improving weanling production performance and cost efficiency.

This trial also demonstrates that with proper planning and by making sure that starting groups are equal, it is entirely possible to carry out scientifically valid trials on commercial farms, from which the results can be statistically analysed, to yield meaningful results that apply directly to practical farm conditions. n

Fig. 1. Effect of the probiotic treatment on daily weight gain.



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References

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