Research Notes S-97
Arm & Hammer Animal and Food Production

BG-MAX supplementation maintains reproductive performance of sows fed gestation diet containing zearalenone and deoxynivalenol.

BG-MAX™ combines the benefits of Refined Functional Carbohydrates™ (RFCs™) with a bentonite specifically processed to help improve flow properties.

INTRODUCTION

In recent years, presence of at least one mycotoxin in feed or feed raw material has been detected in up to 88% of samples, with prevalence of zearalenone and deoxynivalenol (DON or Vomitoxin) being 45% and 64% respectively[1]. Pigs are more susceptible to dietary mycotoxins compared to other livestock and poultry, with young pigs and breeding animals being most sensitive.

The profitability of a swine farm is dependent on number of pigs weaned per sow per year, which in turn is dependent on sow reproductive performance and health. Zearalenone and DON mycotoxins play a major role in decreasing fertility and increasing mortality and still births in sows.

STUDY OVERVIEW

This trial[2] was conducted to evaluate the effect of BG-MAX supplementation from insemination to d112 on reproductive performance of sows receiving gestation diets containing zearalenone and DON. The study was conducted at a commercial sow farm with 1500 sows.

Three hundred and three sows (Landrace x Large White) with mean parity 3.85 were allocated to one of two treatments (control or BG-MAX, 0.2%). The study began when estrus was detected and sows were inseminated, to d112 of gestation.

Sows of both treatments were fed the same mycotoxin-contaminated gestation feed. The levels of mycotoxins in feed in this study and historical levels are compared in Table 1.

TABLE 1 Mycotoxin analysis of feed

Average mycotoxin level	Deoxynivalenol	Zearalenone
Gestation feed in this study	290 ppb	69 ppb
Median in ~18,000 samples worldwide[1]	294 ppb	41 ppb

Sow measurements collected were as follows:

- Percent fertility rate (calculated using ratio of number of pregnant sows and total sows bred)
- Percent farrowing rate (calculated using ratio of number of sows farrowed and total sows bred)
- Sow mortality
- Litter size (total, alive, still and mummified)

Piglet birth weight was also measured.

Data were analyzed using Minitab (version 17.0 for Windows), with sow as the experimental unit. Treatment effects were considered significant at $P \leq 0.05$ and showing a trend at $P < 0.10$.

RESULTS

The effects of BG-MAX™ on reproductive performance of sows are summarized in Table 2.

TABLE 2	Reproductive performance		
Reproductive parameters	**Control**	**BG-MAX**	***P*-value**
Fertility, %	87.50	93.40	0.082
Farrowing rate, %	79.60	89.40	**0.018**
Mortality, %	5.30	0.70	**0.018**
Total born, n	19.11	19.41	0.199
Born alive, n	16.00	16.98	0.657
Stillbirth, n	2.44	2.06	0.869
Mummies, n	0.33	0.37	0.648
Piglet BW at birth, kg	1.26	1.30	0.358

- Fertility, farrowing rate and mortality were affected by dietary treatment.
- Sows fed BG-MAX had 93.4% fertility rate compared to 87.5% in control-fed sows (Fig. 1).
- Sows fed BG-MAX had 89.4% farrowing rate compared to 79.6% in the control fed sows (Fig. 1).
- Sow mortality in BG-MAX group was 0.7% compared to 5.3% in control fed sows (Fig. 2).
- No significant treatment effects were noted for litter size. However, sows fed BG-MAX had numerically higher total pigs born and born alive and lower stillborn pigs.
- Birth weight of pigs born from sows fed BG-MAX was 1.30 kg compared to 1.26 kg for control fed sows, but this was not significant.

FIGURE 1: Reproductive performance.

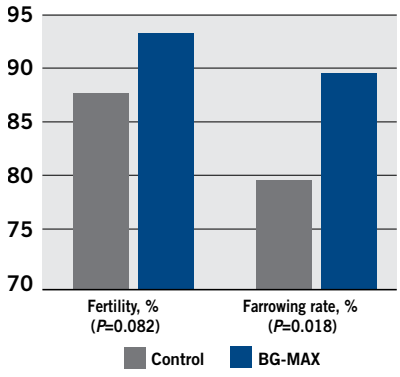
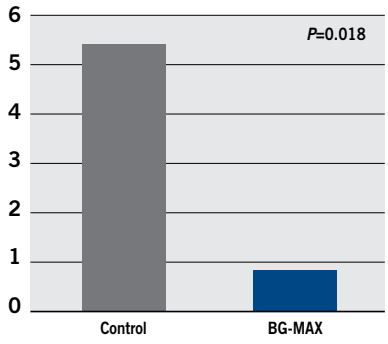


FIGURE 2: Sow mortality, %



CONCLUSION

This trial showed that BG-MAX supplementation in the sow diets supported increased fertility and farrowing rate and reduced mortality. Improvement in reproductive performance may lead to more pigs weaned per sow, decreased culling of non-productive sows and keep more sows in the herd.

The trend in improvement in sow fertility seen in this study could have significant implications for sow farmers.

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1 Global Mycotoxin Occurrence in Feed: A Ten-Year Survey. *Toxins* 2019;11:375.
2 Adapted from a study done at a private commercial pig research center in Spain. 2019. Data on file.