2023
GREECE
May 31 - June 2

ESPHM
14th EUROPEAN SYMPOSIUM
OF PORCINE HEALTH MANAGEMENT

Thessaloniki Greece

THE UNCHARTED LAND – THE FUTURE OF AN ANTIBIOTIC FREE NURSERY

H. LEE[1], S. KIRWAN[2], N. SMEETS[2], A. DE LEON[1], A. TAECHAVASONYOO[1], R. CARTER[1], K. IN HO[3]

[1]Kemin Industries (Asia) Pte Ltd, [2]Kemin Europa NV, [3]Department of Animal Resource and Science, Dankook University, Cheonan-si, South Korea

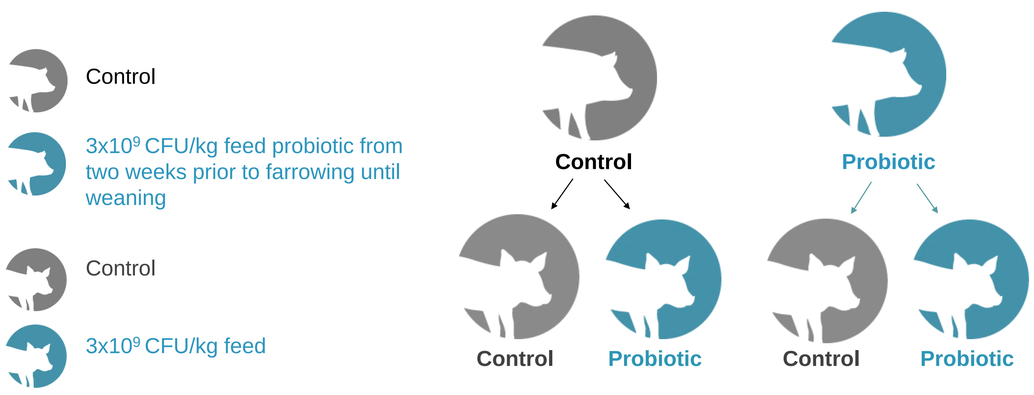
INTRODUCTION

With piglets during pre-and post-weaning as the main users of antibiotics in the pig cycle, finding tools for managing piglet health in this phase remains crucial for sustainable pig production. The present trial evaluated whether a new *Bacillus*-based probiotic, strains present: ATCC PTA-6737 (PB6), ATCC PTA-127113 (FXA), ATCC PTA-127114 (G3), had the potential to support piglet health and performance in the phase up to weaning and during the first period past weaning.

MATERIALS AND METHODS

Twenty Duroc mated Landrace x Yorkshire sows with parities from 1 to 4, were housed in farrowing crates from 2 weeks prior to farrowing until weaning at 21 days and were split into 2 equal groups fed as follows (Diagram 1):

Diagram 1: Visual illustration of trial design and treatment groups



(T1) Control diet

(T2) Diet supplemented with *Bacillus* spp. probiotic at 3 x 10^9 CFU/kg feed (ATCC PTA-6737, PTA-127113, PTA-127114)

All-in-all-out, temperature-regulated, slatted floor accommodation that had not been occupied with pigs for approximately 1 month prior to the trial was used to house the weaned pigs. The facility was disinfected with a multi-purpose disinfectant prior to the trial and neither the sow diets nor the weanling diet contained antibiotics or other antimicrobial additives.

Weaned piglets were assigned to 4 treatments (40 piglets/group):

(1) no probiotic fed to sows or weanlings

(2) no probiotic fed to sows but fed to weanlings

(3) probiotic fed to sows but not to weanlings

(4) probiotic fed to both sows and the weaned piglets

Weanling pigs received feed and untreated water ad libitum throughout the 42-day post-weaning period.

RESULTS

Probiotic inclusion significantly increased lactation diet dry matter -, nitrogen -, and energy digestibility and significantly increased the number of pigs born alive (not depicted) and the piglet weaning weight (Table 1) . There was a consistent trend for improved nutrient digestibility of weanling feed for all treatments including the probiotic, with a significant increase in dry matter digestibility for the treatment including the probiotic in both sow and weaner feed (Table 2). The improved digestibility resulted in a significant increase in average daily gain when the probiotic was given to the piglets.

Table 1: The probiotic effect on growth performance of weanling pigs

Parameter	Sow w/o probiotic		Sow with probiotic		SEM[1]
	Weanling - control	Weanling + probiotic	Weanling - control	Weanling + probiotic	
Av. BW					
3 weeks, kg	6.39[b]	6.39[b]	6.48[a]	6.48[a]	0.01
5 weeks, kg	10.74[b]	10.98[ab]	10.92[ab]	11.09[a]	0.08
9 weeks, kg	25.79[c]	26.68[ab]	26.22[bc]	27.16[a]	0.08
ADG					
3 - 5 weeks, g	311	327	317	330	6
5 - 9 weeks, g	537[b]	561[ab]	547[b]	574[a]	9
3 - 9 weeks, g	462[c]	483[ab]	470[bc]	492[a]	6

[1] Standard error of means; [a,b] Means in rows with different superscripts differ significantly (P<0.05)

Table 2: Feed digestibility 6 weeks after weaning

Parameter	Sow w/o probiotic		Sow with probiotic		SEM[1]
	Weanling - control	Weanling + probiotic	Weanling - control	Weanling + probiotic	
Dry Matter	80.08[b]	82.34[ab]	81.34[ab]	82.59[a]	0.76
Nitrogen	78.34[b]	79.31[ab]	78.90[ab]	79.86[a]	0.33
Energy	81.10	81.48	81.36	81.65	0.76

[1] Standard error of means; [a,b] Means in rows with different superscripts differ significantly (P<0.05)

DISCUSSION and CONCLUSIONS

Fecal scores measured each week after weaning were all score 3 (soft, moist stools that retained shape) with no significant treatment differences. These scores suggest no evidence of post-weaning diarrhea, thus the growth rate benefits derived from the probiotic in this trial occurred in the apparent absence of clinically observable enteric disease.

The significantly increased weaning weight resulted from probiotic inclusion in late gestation and lactating sow diets, whereas the significant increase in post-weaning growth rate required an inclusion in the post-weaning feed regardless of its inclusion in the sow diets. In conclusion, the probiotic was able to successfully support piglet performance in the absence of in-feed antimicrobial use.

Further work: A separate group of weaned pigs from this trial were orally dosed with E.coli K88 to assess the probiotic effects of under a higher pathogen load than in the present study (Oral presentation BBD-OP-01 – Thursday, June 01, 15:00 – 15:20).

KEMIN®