Effect of supplementing late gestation sows with *Saccharomyces cerevisiae* on piglet growth performance

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Introduction Increasing concerns over antibiotic resistance led to a 2006 EU ban on the routine use of sub-therapeutic antibiotics as growth promoting agents and rising interest in alternative growth promoters. Probiotics have been reported to have numerous beneficial effects on growth including improved weight gains and feed:gain ratios as well as reduced morbidity and mortality (Bertin *et al*., 1997a; Bertin *et al*., 1997b; Alexopoulos *et al.*, 2004). However some studies report no effect (Estienne e*t al.*, 2005), and others show adverse effects (Ratcliffe *et al*., 1986). Close (2000) notes that when results are averaged across several studies, the effect of probiotics on pig growth appears to be an improvement in growth and in feed efficiency, but that the results are highly variable. The present study examined the effect of supplementing late gestation sows with a commercial preparation of *Saccharomyces cerevisiae* on suckling piglets' growth performance pre-weaning.

Materials and methods 28 sows in a commercial system were blocked according to parity and randomly assigned to one of two treatments: (i) no extra supplement (C; n=14) or (ii) probiotic supplement (T; n=14). Sows in the treatment group received the probiotic (Levucell SB Sow) for 3 weeks prior to farrowing. Measurements of piglet body weight in kilograms, crown-to-rump length (C2R), limb length (LL), heart girth (HG) and abdominal circumference (AC) were recorded weekly from farrowing until weaning. Weaning weights were also recorded. Data were analyzed using GLM ANOVA in Minitab version 15.0. Sow was included as a random factor in the model to account for fluctuations in litter size. Age at weaning varied between litters and was therefore used as a covariate in subsequent statistical analysis.

Results At day 1 there were no statistical differences between treatment groups (Table 1). By day 7 treated piglets were lighter, and had smaller C2R and LL measurements ($P<0.05$). At day 14 treated piglets were smaller for all measurements, except weight. LL was again lower in treated piglets at day 21. At weaning there was no statistical difference in weight between the groups.

Table 1 Effect of treatment on piglet weight, crown to rump length, limb length, heart girth and abdominal circumference

	Weight		C2R		LL		HG		AC	
	C	T	C	T	C	T	C	T	C	T
Day 1	2.03± 0.05	1.93± 0.05	30.68	30.11	18.28	17.95	26.48	26.67	21.39	21.35
Day 7	3.57± 0.10^{a}	3.28± 0.11^{a}	36.28^{b}	34.95^{b}	22.02^{c}	21.21^{c}	33.61	32.89	26.94	26.63
Day 14	5.41± 0.16	5.10± 0.17	41.86^{a}	40.81^{a}	25.29^{b}	24.55^{b}	38.65^{c}	37.23^{c}	32.02^{d}	30.70^{d}
Day 21	6.83± 0.20	6.64± 0.24	45.67	44.71	25.29^{a}	24.55^{a}	41.01	40.77	34.38	33.50
Weaning	8.15± 0.23	7.36± 0.22								

Values are presented as means, with weights as means ± SEM. Values within a row with shared superscripts $^{a\ b\ c\ d}$ are statistically different at a 95% confidence interval.

Conclusions In contrast to much of the published literature (Bertin *et al.,* 1997a; Bertin *et al*., 1997b), dietary supplementation of *S. cerevisiae* to late gestation sows did not improve piglet growth performance at weaning, and may adversely affect growth in the first weeks of life. A number of factors may have affected the efficacy of the probiotics, including supplementation length and the cleanliness of the production environment. The differences in sizes but not in weight suggest a possible alteration in body composition in the probiotically treated group with treated piglets being leaner than those in the control group. Further work is currently being completed to see if there are any treatment effects at slaughter.

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