29 Live Yeast and Yeast Extracts with and Without Pharmacological Levels of Zinc on Nursery Pig Growth Performance and Fecal Escherichia coli Antimicrobial Resistance.

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A total of 360 barrows (DNA 200×400; initially 5.6 kg) were used to evaluate yeast-based probiotics (Phileo by Lesaffre, Milwaukee, WI) in diets with or without pharmacological levels of Zn on growth and fecal Escherichia coli antimicrobial resistance (AMR). There were 5 pigs/pen and 18 pens/treatment. Dietary treatments were arranged in a 2×2 factorial with main effects of yeast pre- and probiotics (0 vs. 0.10% Actisaf Sc 47 HR+, 0.05% SafMannan, and 0.05% Nucleosaf in phase 1 then concentrations were lowered by 50% in phase 2) and pharmacological levels of Zn (110 vs. 3,000 mg/kg in phase 1 and 2,000 mg/kg in phase 2 provided by zinc oxide). Treatments were fed in two phases from d 0 to 7 and 7 to 21 with a common diet fed from d 21 to 42 post-weaning. There were no probiotics×Zn interactions. From d 0 to 21, pigs fed pharmacological Zn had increased ($P < 0.001$) ADG and ADFI; however, there were no effects of added pre- and probiotics. Fecal samples were collected on d 4, 21, and 42 from the same three pigs/pen for AMR profiles and fecal dry matter (DM). On d 4, pigs fed pharmacological Zn had greater fecal DM ($P = 0.043$); however, no differences were observed on d 21 or 42. E. coli was isolated from fecal samples and species confirmation was accomplished by PCR detection of uidA and clpB genes. Microbroth dilution method using Sensititre™ CMV3AGNF panel was used to determine antimicrobial susceptibilities of E. coli isolates to 14 different antimicrobials. There was no evidence for differences in AMR of fecal E. coli isolates to antibiotics by added pre- and probiotics or Zn. Results suggest that pharmacological levels of Zn stimulate intake and growth and improve fecal consistency in the nursery with no statistical response from added pre- and probiotics.

Table 1. Interactive effects of yeast pre- and probiotics; ZnO on nursery pig performance

	No yeast probiotics		Yeast probiotics			Probability, *P* =		
Item	No ZnO	ZnO	No ZnO	ZnO	SEM	Yeast	ZnO	Yeast × ZnO
Experimental period (d 0 to 21)								
ADG, g	244	281	258	282	7.6	0.288	<0.001	0.400
ADFI, g	314	356	328	356	9.8	0.461	<0.001	0.456
Gain:feed, g/kg	776	787	788	795	9.4	0.247	0.282	0.672
Fecal dry matter,%								
d 4	18.0	19.8	17.5	20.1	1.13	0.955	0.043	0.708
d 21	22.8	21.3	22.5	23.4	1.10	0.397	0.786	0.281
d 42	24.5	24.6	23.5	23.8	1.20	0.437	0.891	0.909

Keywords: growth, nursery, yeast probiotics