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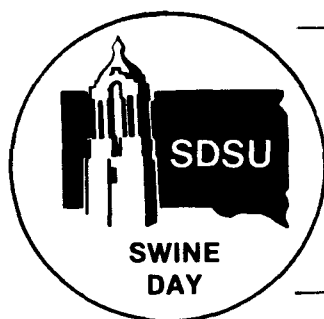
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EFFECT OF A LACTOBACILLUS CULTURE IN
DIETS OF GROWING-FINISHING SWINE
R. C. Wahlstrom And G. W. Libal
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Lactobacillus cultures have been used in the preservation of human foods for centuries. More recently it has been shown that feeding lactobacillus to pigs can influence the bacterial flora of the intestinal tract. A reduction in enteritis and also an improvement in weight gain have been reported, although the results with lactobacillus cultures as feed supplements have been variable.

The objective of this study was to evaluate a dried viable culture mixture of lactobacillus in diets of different protein content for growing-finishing swine.

Experimental Procedure

Ninety-six pigs averaging approximately 45 pounds were allotted into four replications of six treatments. Thus, each of the 24 pens contained four pigs, two barrows and two gilts. Pigs were fed ad libitum in a slotted floor confinement building. The three diets used contained 16, 15 or 14% protein to an average live weight of 100 pounds and 14, 13 and 12% from 100 to approximately 220 pounds. Composition of the diets is shown in table 1.

TABLE 1. COMPOSITION OF DIETS (PERCENT)

Ingredient	Protein level				
	16	15	14	13	12
Ground yellow corn	76.4	79.15	82.0	84.9	87.7
Soybean meal, 44%	21.3	18.5	15.6	12.7	9.85
Dicalcium phosphate	1.1	1.15	1.2	1.25	1.3
Ground limestone	.7	.7	.7	.65	.65
Trace mineralized salt	.3	.3	.3	.3	.3
Premix ^a	.2	.2	.2	.2	.2

^aTo supply per pound: vitamin A, 1500 IU; vitamin D, 150 IU; vitamin E, 2.5 IU; vitamin K, 1 mg; riboflavin, 1.25 mg; pantothenic acid, 5 mg; niacin, 8 mg; choline, 25 mg; vitamin B₁₂, 5 mcg and selenium, .04 milligrams.

The dried viable culture of lactobacillus (Salac-454) was added at a level of .5 pound per ton of feed. The six treatments were:

- Treatment 1 -- 16-14% protein diet
- Treatment 2 -- 16-14% protein diet plus Salac-454
- Treatment 3 -- 15-13% protein diet
- Treatment 4 -- 15-13% protein diet plus Salac-454
- Treatment 5 -- 14-12% protein diet
- Treatment 6 -- 14-12% protein diet plus Salac-454

Results

Daily gain, feed consumption and feed efficiency data are presented in table 2. There were no significant differences in performance among treatments due to the inclusion of the lactobacillus culture in any of the diets. When all pens receiving the additive are combined and compared with those that received the diets without the product, the overall average daily gains were the same (1.46 pounds per day). Feed/gain was 3.40 for pigs receiving lactobacillus and 3.45 for those fed the diets without the additive. These results are shown in table 3.

TABLE 2. EFFECT OF LACTOBACILLUS IN DIETS OF GROWING-FINISHING SWINE^a

Dietary protein levels, % Lactobacillus	16-14		15-13		14-12	
	0	+	0	+	0	+
Avg initial wt, lb	45.6	45.5	45.4	45.9	45.8	45.6
Avg mid-wt, lb	99.8	100.1	100.8	103.6	102.6	96.8
Avg final wt, lb	218.3	222.9	220.1	222.0	219.6	215.1
Avg daily gain, lb						
45-100 lb ^b	1.37	1.47	1.39	1.41	1.38	1.24
100-220 lb ^c	1.56	1.60	1.52	1.45	1.42	1.49
45-220 lb ^c	1.50	1.55	1.47	1.43	1.40	1.40
Avg daily feed, lb						
45-100 lb	3.75	3.82	3.83	4.07	3.95	3.81
100-220 lb	5.36	5.44	5.94	5.61	5.47	5.45
45-220 lb	4.80	4.88	5.23	5.10	4.97	4.88
Feed/gain						
45-100 lb ^c	2.75	2.60	2.76	2.87	2.87	3.08
100-220 lb	3.42	3.41	3.97	3.91	3.88	3.66
45-225 lb ^c	3.21	3.14	3.59	3.58	3.56	3.48

^aFour lots of four pigs each per treatment.

^bSignificant protein effect (P<.10).

^cSignificant protein effect (P<.05).

TABLE 3. MAIN EFFECTS OF LACTOBACILLUS AND PROTEIN LEVEL

Item	Lactobacillus		Protein level, %		
	0	+	16-14	15-13	14-12
No. of pigs	48 ^a	48 ^a	32 ^b	32 ^b	32 ^b
Avg daily gain, lb					
45-100 lb	1.38	1.37	1.42	1.40	1.31
100-220 lb	1.50	1.51	1.58	1.48	1.45
45-220 lb	1.46	1.46	1.52	1.45	1.40
Feed/gain					
45-100 lb	2.79	2.85	2.67	2.82	2.98
100-220 lb	3.76	3.66	3.42	3.94	3.90
45-220 lb	3.45	3.40	3.17	3.58	3.52

^aTwelve lots of four pigs each.

^bEight lots of four pigs each.

There were significant differences in daily gains among dietary protein levels during all periods. Pigs fed the 16-14% protein sequence gained at the fastest rate and those fed the 14-12% protein sequence gained the slowest. Feed efficiency also differed ($P < .05$) among protein levels during the initial and overall periods. Feed per gain was 2.67, 2.82 and 2.98 pounds for pigs fed 16, 15 and 14% protein diets, respectively, during the initial period and 3.17, 3.58 and 3.58 pounds for pigs receiving 16-14, 15-13 and 14-12% protein diets, respectively, for the overall period.

Summary

Ninety-six pigs averaging 45 pounds were used to study the effect of a dried viable culture of lactobacillus in diets different in protein content. Diets contained 16, 15 or 14% protein to 100 pounds and 14, 13 and 12% from 100 to 220 pounds.

Including the lactobacillus product in the diets at .5 pound per ton did not affect average daily gain, feed consumption or feed per gain. Decreasing dietary protein resulted in a reduction in daily gains and increased feed required per unit of gain. Lactobacillus did not have a protein sparing effect.