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There are a number of cereal grain by-products that are used as feed ingredients in livestock diets. Dried Brewers Grains is a barley by-product that has not been used to any extent in swine diets because of its relatively high fiber content and lack of palatability. This product contains about 26% protein and, when other sources of protein increased in price, it was an economical source of protein. The two experiments reported here were conducted to determine the value of dried brewers grains as an ingredient in diets for gestating swine.

Experimental Procedure

Forty-eight sows in three groups of 16 sows each in trial 1 and 42 sows in three groups of 14 each in trial 2 were allotted on the basis of age, weight and ancestry to three dietary treatments. Trial 1 was a winter trial and trial 2 a summer trial. Boars were rotated between groups to equalize the number of sows bred to each boar within each group. Seven days after breeding the sows were placed on their respective dietary treatments containing 0, 20 or 40% dried brewers grains. Sows were fed once daily in individual feeding stalls at levels of 4.0, 4.4 and 4.9 pounds. These feed levels were calculated to supply an equal level of energy daily per sow.

The composition of the diets is shown in table 1. The diets were formulated to contain equal levels of lysine and minerals and the same level of vitamin supplement was added to each diet. Sows were kept in dry lots having colony type houses with wooden floors which were bedded with straw during the winter trial and left bare for the summer trial. Approximately 4 days before a sow was due to farrow, she was brought into the farrowing house where she was washed, weighed and placed in a farrowing crate. Pig birth weight, litter weight and litter size were recorded at birth and at 21 days. All groups received the same lactation diet which is also shown in table 1.

Results

Table 2 summarizes the data obtained on weight gain during gestation and sow production and pig performance to a weaning age of 3 weeks. Five of the 48 sows in trial 1 did not conceive. Three of these were in the control group and one in each of the groups fed 20 and 40% dried brewers grains. Four of the 42 sows in trial 2 did not conceive. Three were in the control group and one in the group fed 40% dried brewers grains. Feed was consumed readily in all treatments.

Gestation weight gains differed significantly among treatments and were lowest for sows fed the 40% dried brewers grains diet in trial 1. These sows gained 34 lb. compared to 67 and 90 lb. gain for sows fed the 0 and 20% levels of dried

brewers grains, respectively. In trial 2 sows receiving the 20% level of dried brewers grains gained more than sows receiving the 0 or 20% levels. The number of live pigs farrowed was high in all groups, although some variation existed among treatments. Average litter sizes for both trials were 11.1, 11.9 and 11.3 pigs for sows fed 0, 20 and 40% dried brewers grains. Average number of pigs weaned at 3 weeks for both trials was 7.9, 8.4 and 8.2 for sows fed 0, 20 and 40% dried brewers grains.

Average litter weights and average pig weights at birth were similar among treatments. When weaned at 21 days, litter and pig weights were still similar indicating no adverse effects due to dietary treatment upon sow lactation performance. A significant difference in sow weight change during lactation was observed due to trial. In the winter trial the sows receiving 20% dried brewers grains lost weight at the same time that the other two treatment groups maintained their weight. In the summer trial the basal group of sows receiving no dried brewers grains gained considerably more weight during lactation than the two groups receiving dried brewers grains as part of their diet.

Summary

Feeding diets containing 0, 20 or 40% dried brewers grains to gestating sows resulted in satisfactory (above average) pig production in all groups, although sows fed the highest level of dried brewers grains gained less during gestation in the winter trial. It would appear that dried brewers grains can be used with success in swine gestation diets.

Table 1. Composition of Diets (Percent)

Ingredients	Gestation A	Gestation B	Gestation C	Lactation
Ground yellow corn	87.2	71.8	57.0	68.5
Soybean meal[a]	9.5	5.0	--	18.0
Dried brewers grains	--	20.0	40.0	--
Dried beet pulp	--	--	--	10.0
Dicalcium phosphate	2.0	1.9	1.7	2.0
Ground limestone	0.8	0.8	0.8	0.8
Trace mineral salt	0.5	0.5	0.5	0.5
Vitamin premix[b]	+	+	+	+

[a] Forty-four percent protein soybean meal in gestation diets, 50% protein soybean meal in lactation diet.

[b] Provided per lb. of diet: vitamin A, 2000 IU; vitamin D, 200 IU; riboflavin, 1.25 mg; pantothenic acid, 5 mg; niacin, 10 mg; choline, 50 mg and vitamin B_{12}, 7.5 micrograms.

Table 2. Effect of Dried Brewers Grains on Reproductive Performance of Sows

	Level of dried brewers grains, %		
	0	20	40
No. of sows			
Trial 1	12	15	15
Trial 2	11	14	12
Total	23	29	27
Avg. initial wt., lb.[b,d]			
Trial 1	432	431	429
Trial 2	383	365	344
Mean	408	398	387
Avg. gestation wt. gain, lb.[a,b,d]			
Trial 1	67	90	34
Trial 2	106	119	110
Mean	87	105	72
Avg. no. live pigs farrowed[d,g]			
Trial 1	12.9	13.5	11.4
Trial 2	9.4	10.3	11.1
Mean	11.1	11.9	11.3
Avg. no. stillborn pigs			
Trial 1	1.35	0.95	0.95
Trial 2	0.42	0.99	0.54
Mean	0.89	0.97	0.74
Avg. litter wt. farrowed, lb.[c,g]			
Trial 1	35.0	35.1	32.5
Trial 2	29.3	29.9	31.0
Mean	32.1	32.5	31.7
Avg. pig birth weight, lb.[c]			
Trial 1	2.9	2.9	2.8
Trial 2	3.0	2.6	3.0
Mean	2.9	2.7	2.9
Avg. no. pigs weaned, 21 days[f,h]			
Trial 1	9.2	9.0	7.7
Trial 2	6.6	8.0	8.8
Mean	7.9	8.4	8.2
Avg. 21-day litter wt., lb.			
Trial 1	103.6	94.1	89.0
Trial 2	74.1	83.7	92.5
Mean	88.9	88.9	90.8
Avg. 21-day pig wt., lb.			
Trial 1	11.1	10.6	11.6
Trial 2	11.1	10.5	10.6
Mean	11.1	10.6	11.1
Avg. sow wt. change in lactation, lb.[b]			
Trial 1	0.5	-13.8	0.8
Trial 2	24.1	10.8	11.5
Mean	+12.3	-1.5	+6.1

[a] Significant treatment difference (P<.005).
[b] Significant trial difference (P<.005).
[c] Significant trial difference (P<.05).
[d] Significant replication difference (P<.005).
[e] Significant treatment x trial difference (P<.005).
[f] Significant treatment x trial difference (P<.05).
[g] Significant replication x trial difference (P<.005).
[h] Significant replication x trial difference (P<.05).