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Larry Hauser
South Dakota State University

Richard C. Wahlstrom

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A Study of Diet Preference by Early Weaned Pigs

Larry Hauser and Richard C. Wahlstrom

Palatability may be a problem when pigs are weaned at an early age. No matter how good a diet is economically and nutritionally, it is of no practical benefit if sufficient amounts are not consumed. Palatability is more difficult to measure than evaluation of other criteria of feedstuffs. Most palatability trials have been conducted by offering more than one diet at the same time. Using this method, some workers have found that baby pigs prefer a diet containing some form of sugar or sweetener. However, when these diets are fed as the only source of feed, consumption often is no greater than that of a diet that does not contain sugar.

The trial reported here was designed to compare the single-stimulus method of palatability testing with the free-choice selection method and to determine the effects of partially delactosed whey, with and without sugar, on the gain and feed efficiency of early weaned pigs.

Experimental Procedure

One hundred forty-four crossbred pigs averaging four weeks of age were used in this trial, which was started on October 7, 1969. The pigs were placed on test in two groups. Seventy-two pigs were stratified by weight and litter and randomly allotted into two replicates with six treatments per replicate and six pigs per treatment. The pigs in replicate one were slightly heavier, averaging 17.0 lb. while those in replicate two averaged 15.1 lb. Two weeks later, seventy-two additional pigs were stratified by weight and litter and randomly allotted into 12 lots for replicates three and four. The pigs in replicate three weighed an average of 16.7 lb. and those in replicate four had an average weight of 16.1 lb.

Diets A, B, and C described in table 1 were used in this trial. The treatments were as follows:

<u>Treatment</u>	<u>Diets</u>	<u>Method</u>
1	A and B	Single-stimulus
2	A and B	Free-choice
3	A and C	Single-stimulus
4	A and C	Free-choice
5	B and C	Single-stimulus
6	B and C	Free-choice

The single-stimulus method involved exposing the pigs to one diet at a time at four-hour intervals. The free-choice selection method involved exposing the pigs to both diets at all times with the feeders being rotated every four hours. The feeders were not changed during the eight-hour period from 12:00 p.m. to 8:00 a.m. This was done to prevent the same diet or the same feeder position from being available at the same time every day.

All feeders were weighed daily at 8:00 p.m. to determine daily feed consumption for each diet. The pigs were weighed weekly. Each replicate was on trial for a period of two weeks.

Results and Discussion

The results of this trial are presented in table 2. Average daily gains were similar when the same diets were offered either free-choice or by the single-stimulus method. Pigs receiving the basal and the whey diets gained 0.90 and 0.88 lb. for the single-stimulus and free-choice selection methods, respectively. The average daily gains for pigs receiving the basal and the whey plus sugar diets were 0.88 lb. for both selection methods. When the pigs were given a choice of the whey or whey plus sugar diets, average daily gains were 0.95 lb. for the single-stimulus method and 0.90 lb. for the free-choice selection method. These differences in average gains were not statistically significant due to feeding method or type of diets fed. Feed efficiency was very good and nearly the same for all treatments, varying from 1.95 to 2.16 lb. of feed per lb. of gain.

Palatability was tested using the single-stimulus method in treatments one, three, and five. Treatments two, four, and six included the same diets, but palatability was tested using the free-choice selection method.

When all the replicates in each treatment were averaged, the pigs showed a preference for the basal diet over either the diet containing 10% whey or the one containing 10% whey plus 5% sugar. When the two whey diets were compared, the pigs showed a preference for the diet containing 5% sugar. Those pigs on the single-stimulus method showed a more consistent preference throughout replicates than did those on the free-choice selection method, except for the comparison of the two whey diets. The pigs in each replicate of treatment six, the free-choice selection method, showed a large preference for the 10% whey plus 5% sugar diet compared to the 10% whey diet. When these two diets were fed by the single-stimulus method, three of the four replicated lots of pigs also preferred the whey plus sugar diet; but the difference in consumption was much less than when pigs were fed free-choice. Average daily feed consumption for all lots of pigs is shown in table 3.

The preference for the diet containing whey plus sugar shown by the pigs on the free-choice method of palatability testing would seem to indicate that young pigs will consume more of a diet containing sugar in preference to one which does not if both are available at all times. However, if only one diet is available at a time, the addition of sugar does not greatly increase consumption. This is in agreement with previous work done at this station and elsewhere.

The coefficient of variation was determined for the daily feed consumption of each diet in each treatment and replicate. The average coefficient of variation for all the single-stimulus treatments was 51.94%, while that for the free-choice method was 94.86%. There was also a wider range of variation among replicates and diets in the free-choice selection method than in the single-stimulus method.

Summary

One hundred forty-four pigs were used in this study to compare the free-choice selection method and the single-stimulus method of palatability testing.

Three diets were used in this trial. They were the basal diet, a 10% whey diet, and the whey plus sugar diet. The pigs in each treatment were given a choice of two diets. Each diet containing whey was compared to the basal diet and the two whey diets were also compared. Each combination of diets was tested using both methods of palatability testing. There were no significant differences among treatments in average daily gain or feed efficiency.

The pigs on the single-stimulus method showed less variation in diet preference and there was less difference in the amounts of each diet consumed. The pigs on the free-choice selection method showed much variation in preference, with the pigs in some replicates within the treatment showing a definite preference for the other diet. When all the replicates were averaged, however, the pigs on both methods showed a preference for the same diet in each comparison.

The single-stimulus method of testing palatability appears to be a better method than the free-choice selection method, especially if a small number of pigs and replicates is used. With the single-stimulus method the pigs show a more consistent pattern of preference. The coefficient of variation was reduced from 94.86% for the free-choice method to 51.94% for the single-stimulus method. It also appears that a simple corn-soybean meal-rolled oats diet is quite satisfactory for pigs weaned at three to four weeks of age and is not improved by including 10% whey or 10% whey and 5% sugar.

Table 1. Composition of Diets (Percent)

Ingredients	Diets		
	A	B	C
	Basal	10% whey	10% whey + 5% sugar
Ground yellow corn	63.9	57.0	50.5
Soybean meal (48.5%)	22.2	20.0	21.5
Rolled oats	10.0	10.0	10.0
Sugar	--	--	5.0
Delactosed whey	--	10.0	10.0
Dicalcium phosphate	1.9	1.5	1.5
Ground limestone	0.5	0.3	0.3
Trace mineral salt	0.5	0.2	0.2
Vitamin-antibiotic premix ^a	1.0	1.0	1.0

^a Provided 1,827 I.U. vitamin A, 340 I.U. vitamin D, 4 mg. riboflavin, 8 mg. calcium pantothenate, 18 mg. niacin, 10 mcg. vitamin B₁₂, 50 mg. chlortetracycline, 50 mg. sulfamethazine and 25 mg. penicillin per pound of diet.

Table 2. A Comparison of Basal (Diet A), Whey (Diet B) and Whey Plus Sugar (Diet C) Fed by Free-Choice or Single-Stimulus Methods

Treatment	1	2	3	4	5	6
Diets	A+B	A+B	A+C	A+C	B+C	B+C
Method	SS ^a	FC ^b	SS	FC	SS	FC
No. of pigs ^c	22	24	23	23	24	24
Avg. init. wt., lb.	16.3	16.3	16.3	16.3	16.3	16.3
Avg. final wt., lb.	54.0	52.7	53.4	52.5	56.0	54.7
Avg. daily gain, lb.	0.90	0.88	0.88	0.88	0.95	0.90
Avg. daily feed, lb.	1.94	1.74	1.68	1.74	1.90	1.79
Avg. feed/lb. gain, lb.	2.16	2.01	2.01	2.00	2.00	1.95

^a Single-stimulus method.

^b Free-choice selection method.

^c Four pigs died, data not included.

Table 3. Average Daily Feed Consumption (Pounds)

Rep	Treatment 1		Treatment 2	
	Diet A	Diet B	Diet A	Diet B
1	0.91	0.83	1.44	0.09
2	0.75	0.84	0.56	0.75
3	1.44	0.98	1.64	0.60
4	1.23	0.75	0.61	1.37
Avg.	1.08	0.85	1.06	0.70
	Treatment 3		Treatment 4	
	Diet A	Diet C	Diet A	Diet C
1	0.89	0.84	1.55	0.06
2	0.87	0.69	1.24	0.37
3	1.00	1.00	0.48	1.54
4	0.87	0.73	0.29	1.38
Avg.	0.91	0.82	0.89	0.84
	Treatment 5		Treatment 6	
	Diet B	Diet C	Diet B	Diet C
1	0.77	1.07	0.18	1.63
2	0.65	0.83	0.44	1.05
3	1.05	1.24	0.41	1.62
4	1.18	0.80	0.40	1.39
Avg.	0.91	0.99	0.36	1.42