Sweeteners aid weanling feed intake

Bottom Line

with
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WEANING piglets, even at 21-24 days of age, represents a stressful event that generally results in reduced feed intake and, therefore, an inadequate supply of energy and other nutrients postweaning.

The unfamiliar method of feed acquisition and the unfamiliar source of feed (liquid milk via nursing versus dry feed) are generally considered the main causes for the reduced feed intake.

Feed palatability is commonly improved with the use of sweeteners such as sucrose, dried whole whey, artificial flavors and other highly palatable and digestible ingredients. The inclusion of these ingredients in weanling pig diets promotes feed intake, especially during the first week postweaning.

Dried whole whey that contains approximately 70% lactose is commonly used in diets for weanling piglets because previous research results have demonstrated increased feed intake and growth performance when dried whole whey was incorporated into postweaning diets.

A milk chocolate byproduct (MCP) from the food and candy industries containing approximately one-third each of whole milk, sucrose and cocoa has been substituted for a portion of dried whole whey in postweaning diets in various preference trials. The results showed that pigs preferred diets containing MCP over diets with dried whey, but the effect on growth performance has been inconsistent.

Swine researchers V.D. Naranjo, T.D. Bidner and L.L. Southern at Louisiana State University conducted three experiments to assess the effect of dried whey (70% lactose) or MCP (20% lactose and 60% sugars) on week 1 postweaning feed intake and growth performance of weanling pigs.

In all experiments, pigs were housed in an environmentally controlled nursery building. Each 0.97 m x 1.47 m pen had hard-plastic slotted flooring, one nipple waterer and a four-hole self-feeder. Feed was provided in meal form, and feed and water were provided *ad libitum*.

Weanling pigs were allotted to dietary treatments in a randomized block design, littermates were balanced across treatments and sex was equalized among pens within replicates. Pigs were fed in a four-phase feeding program: days 0-7, days 7-14, days 14-21 and days 21-35.

All pigs and feeders were weighed at the beginning and end of each phase to calculate average daily gain, average daily feed intake and gain:feed. All feeders were weighed daily starting at 7 a.m. during the first seven days postweaning to determine daily feed intake.

Table 1 provides a summary analysis of the two test ingredients.

The diets were formulated to contain 1.6%, 1.4%, 1.4% and 1.2% total lysine for phases 1, 2, 3 and 4, respectively, to meet or exceed the suggested amino acid ratios for 10-20 kg pigs. Diets were also formulated to be isocaloric and to provide equal sodium and chloride levels.

Experiments 1 and 2 were conducted to determine the effect of partially replacing dried whey with MCP on week 1 feed intake and growth performance of weanling pigs.

In experiment 1, 80 pigs weighing 6.5 kg at 24 days of age were allotted to the four treatments of four pigs per pen and were replicated with five pens per treatment.

In experiment 2, 120 pigs weighing 60 kg at 19 days of age were allotted to the four treatments of five pigs per treatment and were replicated with six pens per treatment.

Table 2 shows the four dietary treatments. During phase 4, all pigs were fed the same corn/soybean meal diet with no lactose added.

Table 3 summarizes the first seven days of postweaning feed intake data combined from experiments 1 and 2.

The researchers indicated that there were no differences in feed intake on any day among pigs fed treatments 2, 3 and 4. Also, these three treatments had higher daily feed intake than treatment 1.

Table 4 summarizes the combined growth performance combined data from experiments 1 and 2. The combined overall data indicated that treatments 2, 3 and 4 did not significantly differ in average daily gain, average daily feed intake or gain:feed. There was no difference in average daily gain or gain:feed between treatment 1 and treatments 2, 3 and 4. Final bodyweight at the end of the study was not significantly affected by dietary treatment.

Experiment 3

Experiment 3 was conducted to determine the effect of totally replacing the dietary level of dried whey with MCP. Eighty-four weanling pigs with an average bodyweight of 6.3 lb. at 21 days of age were allotted to treatments 1, 2 and 5. Each treatment was replicated with seven pens of four pigs each.

Table 5 summarizes the first seven days of postweaning feed intake from experiment 3. Naranjo et al. indicated that there were no significant differences in feed intake between pigs fed treatments 2 and 5.

Table 6 summarizes the growth performance data from experiment 3. The researchers reported that, compared to treatment 2, the total replacement of dried whey with MCP (treatment 5) did not significantly affect average daily gain, average daily feed intake or gain:feed during the 35-day experiment.

The data from these three experiments allowed the researchers to determine the efficacy of dried whey to increase growth performance of weanling pigs. Daily bodyweight gain, average daily feed intake and final bodyweight were increased for pigs on treatment 2 versus treatment 1. Table 7 summarizes the comparison of treatment 1 versus treatment 2 for all three experiments.

These data support previous research that baby pigs increase their daily feed intake when fed diets containing lactose or highly digestible carbohydrate sources (such as diet 2) compared to pigs fed diets with no sugars added (such as diet 1).

1. Analysis of the two test ingredients, %

	Dried whey	MCP
Crude protein	12.2	12.0
Crude fat	1.0	6.0
Lactose	70	20
Salt	3.0	1.5
Calcium	0.86	0.30
Phosphorus	0.76	0.30
Lysine	0.95	1.10
Methionine	0.21	0.22
Total sulfur amino acids	0.44	0.36
Threonine	0.73	0.55
Tryptophan	0.18	0.19
Isoleucine	0.64	0.56

2. Dietary treatments, %

	----Phase 1----		-----Phase 2-----		----Phase 3----	
Treatment	Dried whey	MCP	Dried whey	MCP	Dried whey	MCP
1	No lactose added					
2	20	0	10.0	0	5.0	0
3	15	5	7.5	2.5	3.75	1.25
4	10	10	5.0	5.0	2.50	2.50
5*	0	20	0	10	0	5

*Experiment 3 only.

3. Combined first seven days of postweaning feed intake (g/day) data from experiments 1 and 2

	----------Treatment----------			
Days postweaning	1	2	3	4
1	22	23	32	35
2	120	165	187	203
3	200	265	253	261
4	235	286	288	306
5	266	336	300	317
6	300	382	346	388
7	313	399	381	398

4. Growth performance data from experiments 1 and 2 combined

	----------Treatment----------			
	1	2	3	4
Initial bodyweight, kg	6.4	6.4	6.4	6.4
Final bodyweight, kg	21.3	21.9	21.6	22.0
Days 0-35				
Average daily gain, g	433	450	441	452
Average daily feed intake, g	716	762	737	759
Gain:feed	0.60	0.60	0.60	0.60

5. First seven days of postweaning feed intake (g/day) from experiment 3

	----------Treatment----------		
Days postweaning	1	2	5
1	14	20	37
2	146	243	274
3	261	337	321
4	308	379	345
5	386	486	418
6	444	502	485
7	490	523	488

6. Growth performance data from experiment 3

	----------Treatment----------		
Criteria	1	2	3
Initial bodyweight, kg	6.3	6.3	6.3
Final bodyweight, kg	20.8	21.5	21.3
Days 0-35			
Average daily gain, g	414	434	429
Average daily feed intake, g	742	785	761
Gain:feed	0.56	0.55	0.56

7. Comparison of treatment 1 versus treatment 2 for all three experiments for days 0-35

	----------Treatment----------	
Criteria	1	2
Average daily gain, g	414	434
Average daily feed intake, g	742	785
Gain:feed	0.56	0.55

The Bottom Line

The results of this study indicate that MCP can partially or totally replace dried whey. There was no difference between the two products in week 1 postweaning feed intake or growth performance of weanling pigs.

Reference

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