

Productive Performance of Weanling Pigs Fed with Different Fat Sources

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Abstract

A study was carried out at Chiang Mai University to determine the effect of five different fat sources on the productive performance of weanling pigs. 100 pigs were randomly selected at the age of 28 days, weaned and distributed into five groups. Each group consisted of 10 males and 10 females. In a complete randomized design (CRD) the pigs in each group were fed with one of the five experimental diets. All diets had the same nutritive composition and contained apart from the fat source the same ingredients. The fat sources in diet 1, 2, 3, 4 and 5 were tallow, lard, rice bran oil, soybean oil and palm fat powder, respectively. The productive performance of the pigs were determined from 9 ± 0.5 kg BW until 25 ± 0.5 kg BW. The pigs fed with palm fat powder (diet 5) needed more days than the others to reach the final weight ($p < 0.05$). Average daily gain (ADG) and feed conversion ration (FCR) of pigs fed with diet 1 to 5 were 530, 572, 520, 536 and 451 g/d and 1.617, 1.380, 1.615, 1.534 and 1.88, respectively. These results show that the pigs fed with lard (diet 2) had significant higher ADG ($p < 0.05$) than pigs fed with rice bran oil and palm fat powder diets (diet 3 and 5) and tendential higher ADG than the pigs fed tallow and soybean oil (diet 1 and 4). Also the FCR of the pigs fed with lard was significant better ($p < 0.05$) than the FCRs of the groups fed tallow, rice bran oil and palm fat powder diets (diet 1, 3 and 5) but not significant different ($p > 0.05$) to the FCR of the group fed soybean oil. It is concluded that the best fat sources for weanling pigs were lard and soybean oil. Lard, however, was difficult to mix into the diet due to the high melting point.

Keywords: Weanling pig, fat source, productive performance

Introduction

Weanling pig diets frequently contain a supplement of 3-10% fat as energy and essential fatty acids source. The results of research on utilization of various animal-fat or vegetable-fat sources by weanling pigs are different and conflicting. **Frobish et al. (1970)** found higher apparent digestibilities of fat in diets supplemented with lard than in diets supplemented with soybean oil or corn oil. In contrast, **Sewell and Miller (1965)** reported a higher digestibility for corn oil-supplemented than tallow-supplemented diets. The diversification of fatty acids composition and the ratio of saturated: unsaturated fatty acids (Table 1) in the fat sources cause these variations in the digestibilities (**Stahly, 1984**).

Table 1. Fatty acids composition (%) of fats.

Fat sources	Saturated Fatty Acids					Unsaturated Fatty Acids				
	C ₁₂	C ₁₄	C ₁₆	C ₁₈	total	C _{16:1}	C _{18:1}	C _{18:2}	C _{18:3}	total
Lard	-	2.0	27.0	13.0	42.0	3.0	44.0	10.0	1.0	58.0
Tallow	-	3.0	29.0	21.0	53.0	3.0	41.0	2.0	1.0	47.0
Rice bran oil	-	-	14.0	11.0	25.0	-	40.0	32.0	3.0	75.0
Soybean oil	-	-	12.0	4.0	16.0	-	24.0	53.0	7.0	84.0
Palm oil ¹	0.10	1.01	45.82	45.94	52.87	0.1	34.85	11.88	0.3	47.13

Subtosok (1988)

¹ Adjusted data from **Gurr (1984)** in percent of total listed fatty acids.

Table 2. Composition (%) of the experimental diet.

Ingredients	Percent in the diet
Corn	10.00
Broken rice	47.24
Rice bran	10.00
Soybean meal	17.61
Fish meal	8.00
Dicalciumphosphate	1.00
Normal salt	0.35
L-lysine	0.30
Vitamin-mineral mixes	0.50
Fat*	5.00

* Tallow, Lard, Rice bran oil, Soybean oil and Palm fat powder in diet 1, 2, 3, 4 and 5 respectively

Objective

To determine the effects of different fat sources as supplements to a total diet on the productive performance of weanling pigs.

Materials and Methods

The study was carried out at Chiang Mai University to determine the effect of five different fat sources on the productive performance of weanling pigs. 100 pigs were randomly selected at the age of 28 days, weaned and distributed into five groups. Each group consisted of 10 males and 10 females. In a complete randomized design (CRD) the pigs in each group were fed with one of the five experimental diets. All diets had the same nutritive composition and contained apart from the fat source the same ingredients. The fat sources in diet 1, 2, 3, 4 and 5 were tallow, lard, rice bran oil, soybean oil and palm fat powder, respectively. The productive performance of the pigs were determined from 9±0.5 kg BW until 25±0.5 kg BW.

Results

The results (Table 3) show that the pigs fed with palm fat powder (diet 5) needed more days to reach the final weight and also had a poorer feed conversion ratio than the others ($p < 0.05$).

The pigs fed with lard (diet 2) had significant higher ADG ($p < 0.05$) than the pigs fed with rice bran oil and palm fat powder (diet 3 and 5) whereas the differences to the pigs fed tallow and soybean oil (diet 1 and 4) were not statistically significant ($p > 0.05$). Also the FCR of the pigs fed with lard was significant better ($p < 0.05$) than FCRs of the groups fed tallow, rice bran oil and palm fat powder diets (diet 1, 3 and 5) but not significant different ($p > 0.05$) to the FCR of group fed soybean oil.

Table 3. Productive performance of weanling pigs fed the experimental diets

Items	Fat sources				
	Tallow	Lard	Rice bran Oil	Soybean Oil	Palm fat Powder
No. of animal	20	20	20	20	20
Initial weight, kg	9.39	9.03	8.74	9.18	9.43
Final weight, kg	25.29	25.25	24.70	25.11	24.63
Experimental day, d	30 ^b	28.4 ^b	30.7 ^b	29.7 ^b	33.7 ^a
Weight gain, kg	15.90	16.25	15.96	15.93	15.20
Feed intake, g/d	857 ^a	790 ^b	840 ^{ab}	823 ^{ab}	848 ^{ab}
Average daily gain, g/d	530 ^{ab}	572 ^a	520 ^b	536 ^{ab}	451 ^c
Feed conversion ratio	1.617 ^b	1.380 ^c	1.615 ^b	1.534 ^{bc}	1.880 ^a

Conclusion

A comparison of productive performances of weanling pig weaned at day 28 and fed with a basal diet supplemented with different fat sources from 9 - 25 kg BW, showed that the best fat source were lard and soybean oil. Lard, however, was difficult to mix into the diet due to the high melting point.

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