



FLAVODAN

● FLAVODAN in feed mixtures for piglets

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The addition of FLAVODAN flavourings to piglet feed resulted in an increase in feed intake of approximately 8%. Piglet growth was also increased accordingly, whereas feed utilization was not affected.

The experiment involved piglets aged 2-7 weeks. They were weaned at the age of 4 weeks and fed ad libitum. Four diets

were used. A control diet without flavourings was compared with three similar diets containing 0.03% FLAVODAN of the following types: SW-785, SB-185 and MC-147.

There was no significant difference in the effect of these three products. However, FLAVODAN MC-147 had the greatest impact on feed intake.

● Introduction

One of the factors on which good growth in piglets depends is good feed intake. Normally, variations in feed intake are considerable, particularly before weaning and during the period immediately after weaning. Feed intake by piglets can be stimulated partly by choosing palatable feed ingredients and partly by adding suitable flavouring substances to feed.

In a previous experiment involving flavouring substances for piglet feed (Report no. 382), the results showed that "Suk-Aroma" increased the average intake of dry feed by

piglets aged 2-5 weeks from 0.60 to 0.76 FUp. The effect obtained was the same as that obtained when adding 2.5% sugar or 5% molasses. However, during the period after weaning at the age of 5 weeks "Suk-Aroma" had no effect. Since this experiment was completed in 1981, there has been considerable research and industrial development work in this field. As a result, special flavouring substances are now available for addition to piglet feed with a view to promoting feed intake.

FLAVODAN is the name given to a range

of flavouring substances designed for addition to animal feed. The FLAVODAN range is produced by Grindsted Products, Denmark.

In collaboration with Grindsted Products, an experiment has been carried out involving three types of FLAVODAN. The objective of this trial was to examine the effect of FLAVODAN flavourings on the feed intake, growth rate and feed utilization of piglets.

Material and Methods

A batch of feed with the composition shown in Table 1 was divided into four portions. One portion was used as a control, whereas the other three portions were supplemented with a dosage of 0.03% FLAVODAN SW-785, SB-185, and MC-147, respectively.

Table 1. Composition of feed mixture

<i>Percent</i>	
Barley	34.2
Wheat	34.2
Soya meal	10.0
Fish meal (Spec. A)	10.0
Skimmed milk powder	6.0
Animal fat	3.0
Dicalcium phosphate	1.6
Salt	0.3
Lysine-40	0.3
Vitamin/trace element mix	0.4
<i>Content</i>	
FUp per kg	1.13*
g digestible protein per FUp	164
g digestible lysine per FUp	10.2

* 1 FUp = 7.72 MJ NE

The diets were given to the piglets from the age of 14 days onwards. The piglets were weaned at the age of 28 days, and were then fed the diets until the age of 49 days. 15 litters, each divided into 4 groups of piglets, were used in the experiment. At the age of 2 weeks the size of each litter was standardized to 8 piglets, after which the piglets in each litter were divided into four groups (one group for each diet). Prior to weaning, the two piglets in each pen had

access to the feed during two periods of 70 minutes per day, and after weaning they were fed ad libitum. The feed intake and weight of the piglets were registered each week. The experimental method is shown in Table 2, after which the three FLAVODANs are described

Table 2. Experimental method

Group	1	2	3	4
FLAVODAN added	None	SW-785	SB-185	MC-147
No of litters	15	15	15	15
Piglets per litter	2	2	2	2
Total no. of piglets	30	30	30	30

FLAVODAN SW-785 is a powdered sweetener with a strawberry flavour. It consists of natural and nature-identical flavouring substances (primarily fatty acids, esters, aldehydes, lactones and alcohols), with maltodextrin as carrier. Sodium saccharinate and an anti-caking agent are added.

FLAVODAN SB-185 is a powdered substance with a strawberry flavour. It is identical to *FLAVODAN SW-785*, apart from the fact that it does not contain sodium saccharinate as a sweetener.

FLAVODAN MC-147 is a powdered substance with a cream flavour. It consists of natural and nature-identical flavouring substances (primarily aldehydes, esters, lactones, and fatty acids), with maltodextrin as carrier. An anti-caking agent has been added.

The recommended dosage of the three products is 200-300 grams per tonne of feed. Pre-mixes were prepared prior to the trial, containing 10% FLAVODAN. 0.3% of these pre-mixes was added to the feed mixtures, which were given to the piglets in meal form.

Results

All 120 piglets completed the experiment. Piglets in all groups were healthy.

Table 3 shows the results produced from weekly registration of piglet feed intake and live weight. In all weeks feed intake was greatest in the groups fed diets containing FLAVODAN, and from 28 days onwards these groups also had the highest weight.

Table 3. Weekly feed intake and weight of piglets

Group	1	2	3	4
Feed	Control	SW-785	SB-185	MC-147
<i>Feed per piglet (kg)</i>				
Week 3	0.03	0.06	0.05	0.05
Week 4	0.04	0.07	0.08	0.09
Week 5	1.6	1.6	1.8	1.9
Week 6	3.3	3.8	3.6	3.8
Week 7	5.4	5.5	5.5	5.6
Total	10.4	11.0	11.0	11.5
<i>Weight per piglet (kg)</i>				
At 14 days	5.2	5.2	5.2	5.2
At 21 days	6.9	7.0	6.9	6.9
At 28 days	8.4	8.7	8.6	8.6
At 35 days	9.3	9.7	9.8	9.9
At 42 days	12.0	12.8	12.7	12.7
At 49 day	15.7	16.6	16.4	16.4

Table 4 shows piglet feed intake and daily gain before and after weaning and during the entire period of the trial.

In general, feed intake was low before weaning, but Table 4 also reveals that feed intake was nonetheless greatest in the groups fed diets containing FLAVODAN. The difference in feed intake did not affect daily gain significantly, but the average weight at weaning was 0.2-0.3 kg higher for piglets fed FLAVODAN than for the control group (see Table 3).

After weaning, feed intake was also greatest for the FLAVODAN groups, and the difference in daily gain meant that piglets fed FLAVODAN were on average 0.7-0.9 kg heavier than piglets fed control feed. Feed utilization, expressed as FUp per kg of gain, was almost identical in all four groups.

The results for the entire period reveal that piglets fed FLAVODAN consumed 0.7,

0.8 and 1.3 FUp more, respectively, than piglets in the control group. In addition, the daily gain of piglets fed FLAVODAN was significantly improved by 25, 21, and 24 grams, respectively.

Table 4. Feed intake, daily gain and feed utilization

Group	1	2	3	4
Feed	Control	SW-785	SB-185	MC-147
<i>Before weaning</i>				
FUp/piglet	0.09 ^a	0.14 ^{ab}	0.14 ^{ab}	0.15 ^b
Daily gain, g	231 ^a	254 ^a	246 ^a	240 ^a
<i>After weaning</i>				
FUp/piglet	11.6 ^a	12.3 ^{ab}	12.3 ^{ab}	12.8 ^b
Daily gain, g	348 ^a	373 ^{ab}	373 ^{ab}	381 ^b
FUp/kg gain	1.59 ^a	1.57 ^a	1.57 ^a	1.60 ^a
<i>Entire period</i>				
FUp/piglet	11.7 ^a	12.4 ^{ab}	12.5 ^{ab}	13.0 ^b
Daily gain, g	301 ^a	326 ^b	322 ^b	325 ^b

a-b: Values on the same line with unlike superscript letters are significantly different ($p < 0.05$).

A comparison of feed intake per piglet both before and after weaning and for the period as a whole reveals that group 4 was the only group to deviate significantly from the control group. However, it seems highly likely that groups 2 and 3 consumed more feed than the control group, since a statistical analysis produced p-values of between 0.06 and 0.10.

No differences were registered between

Table 5. Comparison of control group and all FLAVODAN groups, using contrast analysis

	Control group average	Impact of FLAVODAN	p-value
<i>FUp per piglet</i>			
14-28 days	0.09	0.06	0.02
28-49 days	11.64	0.83	0.02
14-49 days	11.73	0.89	0.01
<i>Daily gain, g</i>			
14-28 days	231	15	0.16
28-49 days	348	29	0.02
14-49 days	301	23	<0.01

the three FLAVODAN groups with regard to feed intake or daily gain. Consequently, a contrast analysis was carried out between the FLAVODAN groups and the control group. The results, contained in Table 5, show that FLAVODAN had a favourable effect on both feed intake and daily gain - an improvement of approximately 8% in both respects.

The results of the experiment were used as the basis of some supplementary calculations of the connection between piglet feed intake and growth. Using all the experimental data, the following average, standard deviation (SD), and variation areas (Min.-Max.) were determined with regard to feed intake:

	Average, kg/piglet	SD	Min.-Max.
Before weaning	0.12	0.13	0.03- 0.75
After weaning	10.85	1.75	7.10-15.90

Based on the material as a whole, a significant positive correlation was found between feed intake and daily gain during both periods. For the periods before and after weaning the correlation coefficients were 0.40 ($P=0.002$) and 0.90 ($P=0.0001$), respectively.

Discussion

The influence of FLAVODAN flavourings on piglet feed intake was greater than in the previous experiment mentioned above ("Suk-Aroma", sugar and molasses). FLAVODAN resembled these products in stimulating feed intake before weaning, but differed from them in continuing its favourable influence after weaning. It should be remem-

bered that good, versatile control diets were used in both experiments.

The stimulation of feed intake by FLAVODAN led to a significant increase in growth. On average throughout the trial period, an increase in feed intake of 0.9 FUp per piglet produced an increase in growth of 0.8 kg. This is the equivalent of a marginal feed utilization of 1.1 FUp per kg of growth, which shows that the utilization of the extra feed intake was good.

The standard deviations and variation areas for piglet feed intake revealed in the experiment are based on an average of two piglets per pen. Similar calculations based on individual feed intake must be expected to show even greater deviation. The correlation found between feed intake and growth shows, as expected, that feed intake is less significant prior to weaning ($r=0.40$) than after weaning ($r=0.90$). However, the results indicate that increased intake of dry feed prior to weaning has an impact on piglet growth.

Conclusion

The addition of FLAVODAN to piglet feed stimulated feed intake and growth, resulting in an improvement of approx. 8%. Feed utilization was not affected. No statistically significant difference was found between the three FLAVODAN products, but FLAVODAN MC-147 had the greatest impact on feed intake.

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