IAFMM Fish Meal Flyer

international association of fish meal manufacturers

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FLUSHED WITH FEED*

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SUMMARY

Flushing is the name given to the technique of providing extra total feed or additional key nutrients to breeding female pigs up to the time of mating, with the aim of improving their reproductive performance. It remains a practice over which there is some debate, because of a variability in results.

In general, it could be said that more benefits have been obtained from flushing gilts than from sows, through a sudden and significant increase in daily feed allowance before mating. Canadian research, for example, has confirmed an increase in ovulation rates in gilts which have been flushed. Even then, however, embryo losses can reduce litter size to about the same as that from gilts given a more uniform feeding programme.

Against that, some evidence of gains from flushing are now reported from West Germany. Rather than the total amount of feed, it is suggested that the ingredient composition of the diet is influential, with good-quality fish meal being an essential constituent.

Profitability in producing weaned pigs depends to a large extent on the number of pigs raised per sow and year. Although this in turn is determined by factors which can almost entirely be attributed to the sow's fertility, such as number of farrowings per year and litter size at birth, poor feeding practices as well as sub-standard management and housing are known to keep breeding performance below its potential.

In West Germany, for example, producers aspire to a goal of at least 20 pigs reared per sow and year, but recently published figure suggest they remain far from that target. These show, based on records of 3403 herds belonging to so-called producer groups, that only a very few producers achieved this goal. On average, only 17.1 pigs were reared per sow/year.

*From Pig International, February 1987. Dr. Werner, an animal nutrition consultant, is manager of the Fischmehl Consulting (FMC) Office in Hamburg.

A breakdown of the data, however, indicates that the 'top' 25% of total operations analysed nearly reached the target, as on average they were able to rear as much as 19.7 piglets. On the other hand, the 25% of farmers at the bottom of the rank produced only 14.3 pigs. Although the rate of death losses was quite high in these herds (16%), it can be assumed that the main reason for their low performance was the poor fertility of their sows.

An improvement in sow performance is essential for these farms, as the present return per sow does not cover the production cost at this low performance level. Among various possibilities for achieving an improvement would be an increase in the ovulation rate, an improvement in the conception rate and a reduction in embryo losses.

There is no doubt, of course, that management has a very strong influence, as has housing. Feeding, however, seems to play an equally important role.

Already in the early 1960's American researchers were recommending the so-called 'flushing' of sows before mating in order to increase the number of live ova and thus litter size. At that time it was common opinion that taking the piglets away from the sow and leaving her on the high plane of nutrition until the first heat was an automatic flushing effect.

Flushing in those days seems to have involved a more or less abrupt increase or decrease of the energy and/or protein supply of the sow over a period of 5 to 20 days. But although flushing was widely accepted by farmers, not only in the USA but also in Europe, and practised over a number of years, the effect and value of this feeding technique was questioned because the results were often contradictory and inconsistent. Obviously a number of factors influencing the effect of flushing were overlooked, such as the age of the sows and the quality of the protein used in the rations.

When German researchers Welp and Holtz (1983) picked up the idea of flushing again, they came to the conclusion that the response to flushing depends on the age, the physical condition and the breed of the sow. In their trials carried out on 8 farms in Northern Germany, they found a greater response with young sows of a pure breed than with older crossbreds. Also, older sows seemed to show a good response to flushing if they were in a poorer condition.

During these trials, 3 farrowings were recorded per sow and the data of nearly 2000 litters were processed. Flushing resulted in an improvement of litter size by 0.5 piglets, average litter size being increased from 10.9 to 11.4.

These researchers at Göttingen University used a flushing ration containing the nutrients shown in Table 1. One kilogram of this mix was used to replace 1kg of the farm's own feed. The flushing was launched at the time of weaning and continued until the mating of the sows. The origin of the protein in this commercially mixed concentrate was not mentioned.

TABLE 1:

Analysis of flushing diet, University of Göttingen, West Germany.

Crude protein	38.04%
Crude fat	6.34%
Lysine	2.16%
Methionine	0.71%
Cystine	0.53%

At the same time, Dr. E. Fiedler of the Forchheim experimental station in West Germany

The compositions of the experimental diets are given in Table 2. These diets were formulated to contain 19.50% crude protein, 1673 kcal/lb digestible energy, 1.40% lysine, 0.72% methionine + cystine, 1.30% calcium, and 1.00% phosphorus. Treatments are formulated by substituting fish meal protein for soy protein. Levels of select menhaden fish meal inclusion were 0, 4, 8, 12, 16, and 20%. It should be noted that 20% SMFM totally replaced soybean meal in the diet. All treatments were formulated to contain the same levels of crude protein, digestible energy, lysine, methionine, cystine, calcium, phosphorus, and salt.

Pigs were blocked by weight and randomly assigned to pens, with 5 pigs/pen and 6 pens/treatment. Each pen was randomly assigned to a treatment. The study was conducted for 5 weeks. Criteria measured were ADG, ADFI and F/G. Pigs were fed ad libitum. Feeders were checked twice daily, and feed was weighed out and added or weighed back and recorded as necessary. Individual pig weights were collected at the end of each 7-day period. Animal health was excellent throughout the trial period.

Results and Discussion

Results are given in Table 3. Addition of a select menhaden fish meal did not affect ADG by the end of week 2 of the study. However, by the end of week 5, a quadratic (P=0.01) effect in ADG was observed with the 8% SMFM diet yielding maximum ADG of 0.92 lb/day. This represents an 11.5% increase in ADG over pigs on the basal diet, which were gaining 0.82 lb/day.

The 20% SMFM diet, in which all the soybean meal was replaced by SMFM, yielded ADG not different from the basal diet, which contained no SMFM and utilized soybean meal as the main protein component. This suggests that complete removal of soybean meal from the diet of the young pig did not improve pig performance.

Examining ADFI, again no differences between treatments were observed by the end of week 2. However, by the end of week 5, a quadratic effect (P=0.01) was observed in ADFI. Maximum ADFI of 1.31 lb/day was observed with the 12% SMFM diet. This represents approximately a 17% improvement in ADFI over the basal diet response of 1.12 lb/day.

Inclusion of SMFM at all levels yielded no differences in F/G at the end of 2 weeks. By the end of week 5, pigs on the basal diet were returning a very acceptable F/G of 1.34. Substitution of SMFM did not result in F/G different from the basal diet.

Table 3. Effect of SMFM Additions to Starter Diets for Pigs.

Item	% SMFM 0	4	8	12	16	20	SE
ADG, lb wk 0-2	0.45	0.46	0.52	0.46	0.52	0.45	0.026
ADG, lb wk 0-5[a]	0.82	0.89	0.92	0.90	0.89	0.88	0.022
ADFI, lb wk 0-2	0.52	0.52	0.52	0.52	0.56	0.47	0.023
ADFI, lb wk 0-5[a]	1.11	1.12	1.29	1.31	1.20	1.16	0.035
F/G wk 0-2	1.14	1.16	1.00	1.13	1.08	1.07	0.032
F/G wk 0-5	1.34	1.31	1.40	1.44	1.36	1.32	0.062

[a] Effect of SMFM quadratic (P=.01)