

The influence of feed on the fatty acid content and keeping quality of pork back fat.

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INTRODUCTION

It is well known that the diet of the pig influences the composition of the depot fat (1, 2, 3). In Sweden e.g. large differences were found in this respect between pigs on a diet high in barley and those on a diet high in oats (2).

The level of polyunsaturated acids is of special interest as they normally determine the keeping quality and consistency of the fat. Therefore, it is important to keep the fat content in the feed under strict control. Consequently more than 90 % of the pigs raised in Sweden are kept on a standardized diet giving the pork a high keeping quality.

But the feed producers are constantly working with different feed components to obtain products giving as high and as rapid a weight gain in the pigs as possible and at a price as low as possible without decreasing the quality of the pork.

This paper presents the results of analyses of the fatty acid composition and keeping quality of back fat from pigs taken from feeding experiments carried out by the Swedish Farmers Purchasing and Selling Association (SLR). It also shows that the linoleic acid content of the back fat could be used as an indication of low quality feed.

MATERIAL AND METHODS

The feeding experiments were carried out by SLR and will be described in detail elsewhere. Swedish Landrace pigs initially weighing about 25 kg were fed in groups of about 60–80 on different diets.

They were slaughtered at a live weight of about 90 kg.

For chemical analyses a 3 cm wide strip of the back fat was taken near and parallel to the back bone. The fat samples were prepared and analysed as described in the proceeding communication (4). For the separation of

the methyl esters by gas chromatography a 1/8"×6 feet column of 6 % DEGS and 4 % DBS on Chromosorb W was used.

To determine the keeping quality of the fat 100 ml of melted fat was held in a 150 ml erlenmeyer flask in the dark in a thermostat at 55°. The peroxide value was determined every day. The keeping quality was expressed as the time in days which passed until the content of active oxygen exceeded 100 mg O per g fat.

RESULTS AND DISCUSSION

Table 1 shows the amounts of some of the fatty acids in back fat of pork on this standardized diet. Altogether about 19 acids were identified most of them in small amounts. The mean keeping quality of fat with this composition was 7 days, but individual variations were large.

Table 1. *The amounts of some of the fatty acids in back fat of pork on a standardized feed.*

<i>Acid</i>	<i>%</i>
Palmitic	24,5
Palmitoleic	2,7
Stearic	45,4
Oleic	40,8
Linoleic	8,5
Gadoleic	1,5
Arachidonic	0,3

In a series of experiments the composition of the feed varied in respect of the proportions of the different cereals and of the contents and sources of fat and proteins (soya, fish meal, meat meal, hay meal etc.) The variations were accompanied only by small variations in the fatty acid composition of the back fat. Only the linoleic acid content of the feed was reflected in the back fat as shown in figure 1.

Table 2. *The influence of fish meal fat on the keeping quality of pork back fat.*

% fish meal fat in feed	1,0	0,2	0
keeping quality of back fat, days	5,8	6,6	6,9

The variations in the linoleic acid content were not followed by variations in the keeping quality. This may depend on the addition of antioxidants

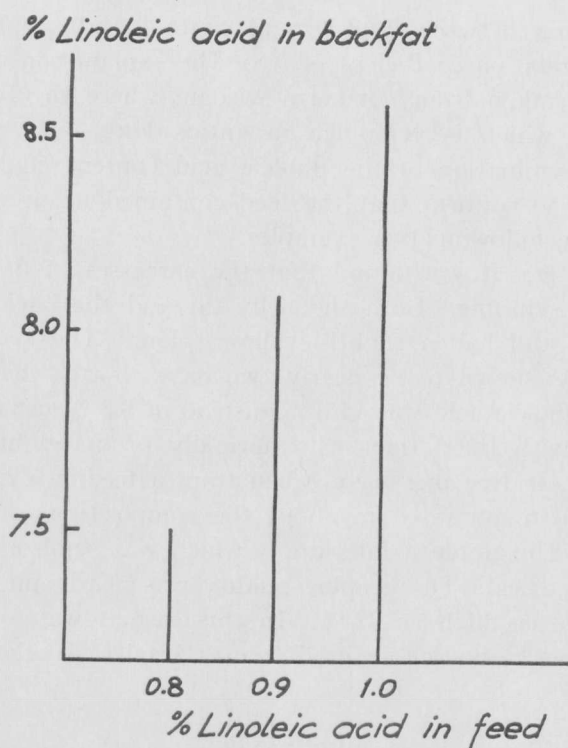


Fig. 1. Correlation between linoleic acid content of the feed and of the back fat.

to the feed in amounts large enough to compensate the small variations in the content of linoleic acid.

The only feed component found to influence the keeping quality was fish meal or rather the fat in it, as shown in table 2. The keeping quality of back fat decreased from 6,9 days to 5,8 days, when the content of fish meal increased from 0 % to 1 %.

Table 3. Linoleic acid content and keeping quality of back fat from pigs in the northern part of Sweden.

Linoleic acid content, %	6,8	7,0	7,3	7,4	7,5	8,1	8,5	9,1
Keeping quality, days	6,6	5,5	7,7	6,2	6,8	9,5	10,5	12,2

It is obvious that the quality of the fish meal is a very important factor in the feed. The less fat it contains the better.

It is often mentioned in literature that a fat rich in linoleic acid will become rancid easier than a fat poor in linoleic acid. Table 3 shows figures which are contradictory to this statement.

The correlation between linoleic acid content and keeping quality was good with a correlation coefficient of 0,8. The explanation is probably that these pigs were taken from northern Sweden, where the feed has a high content of oats which is very rich in antioxidants.

But the determination of the linoleic acid content could, to a certain extent, be used to confirm that the feed contained unsuitable components as shown by the following two examples.

In the first one, it was found that the carcasses of five pigs did not become rigid on chilling. Both the belly fat and the back fat were very soft even at 3° and had a slightly yellow colour. The keeping quality of the back fat was shown to be nearly two days shorter than expected and the content of linoleic acid was 11,5 % instead of 8,5 % usually to be found.

Discussions with the farmer who normally produced high quality pigs revealed that these five pigs were taken from a feeding experiment, but it was not possible to obtain data about the composition of the feed.

In the second example a fat sample which was semisolid at room temperature was analysed. The keeping quality was nearly nil and the linoleic acid content was as high as 22 %. In this case it was found that the pig was fed on a diet very rich in offal from a broiler slaughter house.

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