

New trends in market pig production

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Abstract

The aim of this study was to investigate the effect of castration on performance, carcass traits and meat quality of the terminal cross breed (BUXL)x(PNXH) and (BUXL)x(PNXD) on the organic system. From the results of the comparative study conducted under realistic conditions on a certified organic farm, it can be deduced that the trend of boar fattening towards improved production parameters is also manifested under an organic management system. If this system of fattening is implemented on a large scale, it can be expected that it could eventually generate fairly significant economic profits.

Castration, boar, boar taint, performance, carcass traits, meat quality

Introduction

One option for increasing pork production without any extra investments, merely by exploiting the biological capabilities of the pig's organism, is to fatten non-castrated boars.

Hybrid pig breeding programmes designed to produce final hybrids of a distinctly meat type characterized by high intensity of growth, nutrient conversion and carcass value cannot be implemented in their entirety because approximately half of all the pigs finished in the Czech Republic are destined for higher fat production as a result of their castration. For this reason, researchers have increasingly turned their attention to a non-traditional approach aiming to maximize the production of lean meat under economically favourable conditions. Fattening of young boars essentially represents a non-traditional type of lean pork production with just one problem that is still debated, namely the risk of boar taint caused by higher concentrations of testosterone and its metabolites, particularly in adipose tissues.

Reports from the UK claim that the cumulative results of boar fattening, characterized by better feed conversion, higher intensity of growth and lean meat production, are up to 30% better compared with the finishing of castrated pigs.

Research results from Italy clearly indicate that the most profitable pork production is the fattening of boars to slaughter at the age of 180 days.

Canadian studies examining issues of the final product quality showed that boar meat contained more proteins and water while containing less fat than, for example, the meat of castrated pigs, and that boar taint should not pose a problem up to 100 kg live weight.

The conclusions of a large-scale research project in Poland stated that the fattening of young boars on a large scale would produce a considerable economic effect, particularly because boars demonstrably grow faster, contain less fat, and castration as a risk factor is excluded. The fattening of young boars would also lead to the better utilization of breeding boars culled for whatever reason and, therefore, to lowered neutering costs. If boars are slaughtered before they are 180 days old, the meat produced has no sexual odour.

The former German Democratic Republic dealt with the problem of fattening uncastrated boars in the sector norm TGL 823/02 which, among other things, included the category "selected young boars", i.e. boars not used for breeding and sold at the age of 180 to 200 days from central boar breeding facilities as slaughter pigs.

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In northern European countries (Sweden, Norway, Finland), tests are underway on methods designed to halt the development of the sex organs of young boars after the outstanding growth capabilities of male pigs have been exploited. It has been reported that fattened intact boars (Finnish Landrace) grow to slaughter weight at a rate 8% faster than castrated ones and consume 11% less feed while producing more lean tissue. To optimize weight gain, fattened boars require a higher content of crude protein in their diet.

It follows from Dutch findings that the best consumer response to boar meat came when it was processed to produce smoked meat, cooked ham and sausages. To optimize pork production economics, a number of EU member states are expanding the system of fattening young boars linked to export opportunities, particularly of sausages and salamis.

From the consumers' point of view, the most important factors are the organoleptic properties of the meat. Prevailing conservative attitudes are a considerable hindrance to any increase in the consumption of young male pig meat for culinary use, in spite of the unquestionable effects that their fattening might produce.

The results of a market survey of young boar meat sales conducted in the UK among 2,500 consumer households showed that it is difficult to distinguish between meat from intact and castrated male pigs. The characteristic faint odour was recognized by approx. 13% of respondents, which only confirms the subjective nature of people's olfactory sensitivity and odour identification.

The results of Dutch research into the economics of production of market pigs showed that production of meat from slaughtered boars was on the increase for the following reasons:

1. Boars produce 37% less fat than castrated male pigs and their feed conversion is better by approximately 7.5%.
2. They reach the same slaughter weight significantly sooner than castrated pigs.
3. Most women prefer meat from boars when they inspect meat visually.
4. Castration itself is costly and time consuming. Some authors report that the characteristic tainted meat is produced by 80% of boars. If the odour is mild, it can be reduced (diluted) if the meat in question is mixed with other cuts and used in processed meat products.

Polish research studies point out certain biochemical advantages, as boar lard has been found to contain higher concentrations of unsaturated fatty acids, which are more suitable for human nutrition. It also follows from the results of boar taint evaluation in meat based on weight categories that no odour was demonstrated in the 110 kg slaughter weight category, and only sporadic odour occurrence in the 120 to 130 kg weight category.

The results of research conducted at the Institute of Animal Science (IAS) for several years have shown that this approach to pig fattening can be implemented in two directions. The fundamental issue is to make sure that, starting from weaning, the fattening of male and female pigs is carried out separately, which makes it possible to exploit differences in the growth capabilities of the two sexes.

1. Because the economics of pig production is one of the decisive criteria in animal production, a number of European countries have started implementing this type of pig fattening. The cardinal point in favour of implementing this system is the fact that the aggregate effects of faster growth rate, lower feed consumption per unit of production and higher ratio of lean tissue give fattened boars an approximately 30% advantage over castrated boars.
2. Cumulative findings from previous experiments at the IAS Uhřetíněves can also be used as an alternative in animal breeding practice. Selection processes capitalizing on the performance of boars as such would allow for faster genetic progress while achieving higher production volumes of breeding boars. The possibility of practical implementation may at present seem realistic in breeding stocks of maternal breeds, where it would extend

the selection base of breeding boars necessary primarily to secure sires for breeding and insemination stations.

At the time when research into these issues was being conducted, the then acting top ministerial officials did not attach any practical importance to these questions. In the mean time, the rest of the world has moved forward: in the EU (Denmark, United Kingdom, Spain) a system allowing a young boar fattened up to 80 kg live weight to be marketed is already being introduced. With exploitation of the existing gene pool in mind, it would be desirable, on the basis of the research data already collected, to finally resolve these issues and thereby take advantage of the existing biological reserves, this also in connection with the introduction of a welfare system in pig raising.

For the above reasons, the IAS Uhřetíněves carried out a comparative study whose aim was to evaluate the suitability of boar fattening under the conditions of the organic management system on the Sasov organic farm near Jihlava.

The benefits of this type of fattening on a conventional farm have been tested in previous years. The reason for tests being conducted on an organic farm were substantial differences in rearing and nutrition process specifications.

In organic farming – as compared with conventional systems – two distinct factors that significantly influence the occurrence of boar taint in the final product, namely nutrition and the environment. This primarily includes, with respect to market pig nutrition, the use of feeds with higher fibre content, which positively influences the lower incidence of boar taint in pork, and the types of housing and the general environment in which the animals are raised.

The aim of this study was investigate the effect of castration on performance, carcass traits and meat quality of the terminal cross breed (BUxL)x(PnxH) and (BUxL)x(PnxD) on the organic system.

Materials and Methods

The comparative study was conducted on an organic farm where piglets have been raised for a long time in family groups (until 90 days of age). Half of pig males have been castrated the second week after birth. After weaning they were divided into two separated group of 20 animals with bedded pens with solid floor and outdoor area.

Animals were fed ad lib with a uniform diet based mainly on grain and legume mixes with a higher percentage of N substances, and forage crops were used as a feed supplement. The experimental animals were slaughtered at 6 months of age, when level of boar taint should be below the limit.

Pigs were slaughtered according to industry-accepted procedures. After the 24-h chilling period the individual carcass weight was recorded and carcass analysis were provided on the right side of each carcass. Meat quality characteristics were measured in the *musculus longissimus dorsi* (MLD).

Results and Discussion

Fattening of boars under an organic system of management – a comparative study

Table 1. Effect of castration on performance

		castrates	boars
Life weight at slaughter	kg	104	105
Average daily weight gain	g	730	750
INDEX	%	100	103
Feed conversion	kg/kg	3.67	3.14

From the point of view of selected technical and nutritional parameters of quality, boars were characterized by lower drip loss. Colour values of the two sets of meat were comparable. Higher dry matter and fat content were found in the meat of castrated males than in the meat of entire males. No significant differences between the sets compared were demonstrated in the content of N-substances.

Sensory evaluations showed no major differences between meat from young boars

Table 2. Effect of castration on carcass characteristics

		castrates	boars
Percentage of main cuts (neck, loin, shoulder, ham) in carcass	%	46	51
Percentage of separable fat in carcass	%	18	13
Meat-to-fat ratio		1:0.39	1:0.26

Table 3. Effect of castration on meat quality characteristics

		castrates	boars
Dry matter	g/kg	256.2	247.7
N substances	g/kg	223.1	221.3
Intramuscular fat	g/kg	14.6	9.6
Index	%	100	66
Colour L		59.2	59.1
Drip loss	%	6.6	6.30
Added water	%	52.0	36.9

Key to abbreviations: N substances – nitrogenous substances

the other hand, were significantly lower than in castrated pigs.

The above facts are logically reflected in higher prices paid for boar carcasses, particularly because of their demonstrably higher muscle content and the lower fat content in the carcasses.

The final evaluation included consumer testing of the sensory properties of smoked meat products (organic ham, Hungarian organic salami, and organic sausage) made of the meat of castrated pigs and boars. In a blind comparison of presented samples, a lay panel of 55 panellists expressed preference in over 80% of cases for products made from the meat of young boars, thereby corroborating the above information from abroad.

and castrated males. The only difference at a level of significance was a lower value of boar meat juiciness, which is mainly due to a lower fat content in loin samples as well as a lower dry matter content in the meat.

Under an organic system of management, boars' daily weight gains were 3% higher than those of castrated pigs. This difference was statistically significant. Similarly, individual economically important meat cuts from boars, i.e. the ham, neck and loin, showed significant differences when compared with the same main cuts from castrated pigs. The percentages of separable fat on carcasses and back fat thickness in boars, on

Conclusions

From the results of the comparative study conducted under realistic conditions on a certified organic farm, it can be deduced that the trend of boar fattening towards improved production parameters are also manifested under an organic management system. If this

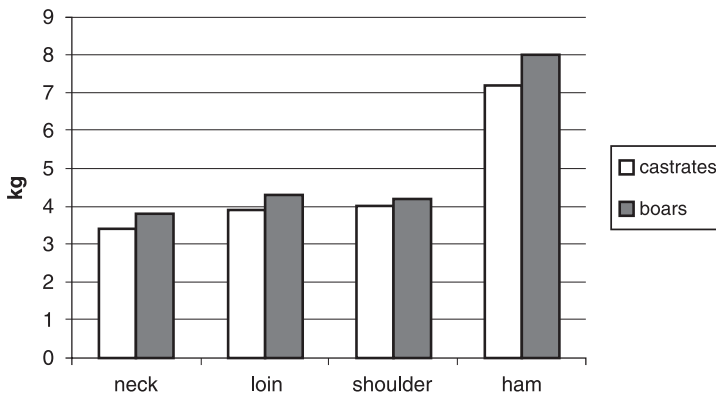


Fig. 1. Effect of castration on average weight of main cuts (the right side of carcass)

system of fattening is implemented on a large scale, it can be expected that it could eventually generate fairly significant economic profits.

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