

Organic meat must be different in order to qualify as high-value products

Organic meat production has the potential to develop into a more trustworthy high-value production based on local resources and free-range animals. However, eating quality and relatively low prices must still be a major concern in order to increase the market share.

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Organic meat costs significantly more than conventionally without the consumer necessarily experience the great quality difference. The purpose of the research project SUMMER was to examine whether it can be an advantage for organic meat producers to go for meat products that differ more from the conventional. Is it e.g. possible to produce meat with better flavor and other physical qualities while simultaneous prioritizing intangible qualities like free-range production and feeding based on local feed resources?

A series of experiments with young cattle, broilers and pigs on pasture have been performed in the Organic RDD project SUMMER. Additionally, interviews with key players in the marketing of high value meat products were carried out.

Finishing on forbs/herbs

For beef production it has been shown that male calves of dairy breeds in relation to product quality may well be fed entirely on grass-clover or a mixture of forbs/herbs. Using the mixture instead of pure clover-grass the last two months before slaughter improves vitamin content and fatty acid composition. This production may thus be an appropriate high value rosé veal production based on more local resources.

Furthermore, it is shown that it is possible to produce young bulls on grass pasture over two seasons and slaughtered at an age of about 16 months. Crossbred bulls (Danish Holstein x Limousine) grew faster than heifers of the same cross combination and tended to have a higher rate than the bulls of pure Danish Holstein. The handling of the bulls on grassland went well, but a higher level of aggression compared to heifers around slaughter influenced meat quality negatively.

Especially bulls of Danish Holstein showed a higher stress level assessed by a much higher neutrophil/lymphocyte ratio and a higher concentration of acute phase proteins in the blood. In addition, carcasses from bulls of both genotypes were too lean. For the production of young cattle it is therefore a safer choice in relation to tenderness and meat quality to finish heifers and steers on pasture rather than bulls.

Danish feed for broilers

For broilers, we found a significant interaction between genotype and feeding on the incidence of leg problems. A typical compound feed for broilers and a diet of Danish-produced protein crops were used in the experiments, in both cases supplemented with whole grains. Feed intake of the Danish protein diet was significantly lower than the normal feed mixture while foraging activity in

the outdoor area conversely was increased. There were significant differences in growth between slow-growing chickens (Sussex SU51 and Sasso T851) and the broiler that are typically used in Denmark (JA757). In contrast to the slow-growing genotypes, JA757 showed clear movement problems, especially when they were fed the 'normal' feed mixture.

Feeding with the 'local' compound feed, however, led to a lower tenderness of the meat and feed consumption per kg gain was higher. Tenderness is a key quality parameter for buyers, chefs and consumers, so it is risky to compromise on this (although in some other countries actually seen the reverse, 'meat with character'). While it was possible to compensate for lack of tenderness of the leg meat by post-mortem handling, this this was not the case for the breast meat.

To sum up the results of broilers, the best strategy would be to have a low feeding intensity in the early rearing period - for example, through a relatively larger proportion of whole grains in the mixture - followed by a strong feeding in the last two weeks before slaughter. This improves leg health and welfare, and results in approximately the same tenderness and feed consumption compared to high feeding intensity throughout the period.

Slowly growing and robust animals

The project found differences in immune functions between lineages of broilers. The genotype with the lowest growth potential (SU51) seems to have more monocytes and lymphocytes and antibodies than the descent with the highest growth potential (JA757) - and the difference was especially evident when JA757 had a high feed intake and growth rate. This is consistent with the hypothesis that lower growth rate makes it possible to develop a more robust immune system.

Slow growing broilers generally have higher feed consumption per kg gain, and it was not possible to fully compensate for this by foraging, but the protein requirement per kg gain was not increased. A challenge with the slower growing broilers is a lower proportion of breast meat and larger share of leg meat, which may affect the value of the carcass. In an attempt to provide thigh meat a greater value, exciting recipes has been developed as inspiration for the preparation of such chickens (see recipes on the project website).

Pigs on grass-clover and Jerusalem artichokes

For finishing pigs, the results show that direct foraging e.g. on grass clover and Jerusalem artichokes can contribute significantly to the animals' supply of energy, protein and minerals and vitamins, and that it is possible to achieve a high lean meat percentage in pigs on pasture. It is also demonstrated that this type of production is associated with some intangible qualities demonstrated by the interest shown by the customers of the meat produced through Friland A/S.

However, there are also some production challenges. To achieve a high uptake by foraging it is necessary to reduce the allocation of supplementary feed. If this reduction becomes too large, the daily gain is markedly reduced and the meat becomes less tender. It is expected, however, that the negative effect on tenderness can partly be compensated by another handling of carcasses such as gentle cooling.

The nutritional contribution from foraging are by and large offset by higher energy requirements (but not protein) because of the pig's energy needs for foraging activities. This means that there is

only limited savings on feed costs compared to current practice where finishers are housed indoors. In summary, this means that foraging on pasture crops primarily represents an opportunity to save protein. In order to save feed units the foraging should be based on more carbohydrate rich resources like Jerusalem artichokes.

The typically used crossbred in Denmark, DYL (Duroc, Yorkshire, Landrace) was compared to a crossbreed between the traditional English breed Tamworth and YL. Contrary to expectations, the traditional cross did not show significantly higher foraging activity than the 'usual' crossbreed. Further the traditional crossbred achieved significantly lower gain and poorer feed conversion and there were only small differences between genotypes in terms of meat sensory properties. Finally, no differences in the robustness of the genotypes were found. There are thus no clear advantages of using this traditional crossbreed in relation to the measured properties that can offset the poorer production results.

What do consumers say?

In relation to the development of market strategies, focus-group interviews with consumers, chefs and meat buyers pointed to; availability, animal welfare and information as basic priorities while at the same time focus should be on eating quality, i.e. flavor, tenderness and juiciness. Based on the production strategies used in this project, consumer surveys showed that they were positive about the tested production methods, but it was nevertheless still the perception that it would be generally difficult to obtain a higher price premium than currently paid for organic meat due to the already high price premium compared to non-organic meat.

It is most likely that it is the consumers who already frequently buy organic meat that will be willing to respond to the here tested new production methods. Thus, it is doubtful whether these production methods can effectively help to expand the market simply because of the product's intangible qualities. This underlines the importance that the biological factors that can be used to reduce production costs and in particular feed costs is important. Finally, it is important to focus on factors that enhance the sensory quality.

Trustworthiness on several fronts

In summary, the results from the SUMMER project show a number of development paths in relation to a trustworthy high-value organic meat production, which is more based on free-range production, and locally produced food than at present. However, it is vital to have a continued focus on product eating quality and not least price (and hence cost of primary production), if the market share should be substantially increased.

Read more

Homepage of the project: <http://agro.au.dk/forskning/faciliteter/oekologisk-forskningsplatform/forskning-i-oekologi-husdyr/summer-organic-rdd/>

Publications: <http://orgprints.org/view/projects/Organic-RDD-summer.html>