

Associations between pig leg health and lean meat growth in commercial organic herds

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Implications

Sustainable development of organic pig production needs to include both animal welfare and productivity aspects. Knowledge about associations between animal welfare and productivity could be a key for constructive, long-term development of organic as well as conventional pig production systems. Poor leg health is considered a central animal welfare issue in organic pig production in Sweden. The preliminary results presented in this paper indicate that pigs in organic herds with more severe leg problems have poorer lean meat growth. However, the majority of the lame pigs had milder forms of leg problems, which were not found to be associated with lean meat growth.

Background and objectives

In Sweden, the proportion of pigs from organic herds with leg joint remarks at slaughter has increased from 4 to 8 % over the past decade (Heldmer and Lundeheim, 2010). The clinical leg health of live pigs has not yet been thoroughly investigated in organic herds. Poor leg health has been found to be associated with reduced slaughter weight and increased carcass leanness (Lundeheim, 2010), two economically important traits in pig production. The objective of this study was to investigate associations between lameness and swollen joints during the growing/finishing period, leg joint remarks at slaughter and lean meat growth.

Results and discussion

The proportion of lame pigs increased from 5.1% early in the growing/finishing period (approximately 30 kg live weight) to 21.0% at the late assessment performed just before slaughter. The corresponding increase in prevalence of swollen joints was from 0.1% to 8.5%. However, only 2.3% of the carcasses had leg joint remarks during routine recording at slaughter. This was a relatively low value compared with the average prevalence among pigs from organic herds in Sweden (varying from 4 to 8 % over the last 10 years). The purpose of the routine lesion recording at slaughter is to ensure food safety (Livsmedelsverket, 2006), but in addition the recorded data are often used for surveillance or description of animal health and welfare in production systems or specific herds (Heldmer and Lundeheim, 2010, Lundeheim and Holmgren, 2010, Keeling et al., 2012). This recording system provides important and valuable information, but the discrepancies between lameness, swollen joints and leg joint remarks at slaughter observed in this study emphasise the importance of additional, more detailed, observations on live animals.

Among the pigs included in the analyses, carcass weight, age at slaughter, percentage of lean meat in the carcass and lean meat growth rate were on average (mean±standard deviation) 89.5±6.84 kg, 202.1±26.23 days, 56.1±2.52 % meat and 252.5±4.14 g lean meat/day, respectively.

Pigs that were lame at the second assessment (at approximately 100 kg live weight) tended to have leaner carcasses than pigs that were not lame (least square mean±standard error: 56.2±0.14 and 55.8±0.21, respectively, $p=0.094$) but no other differences in growth or carcass leanness were observed between pigs with observed lameness and swollen joints and clinically healthy live animals. Pigs with leg joint remarks at slaughter had slower lean meat growth than pigs without leg joint remarks

(230.4±7.24 and 252.1±3.56 g lean meat/day respectively, $p < 0.001$). As the proportion of pigs with leg joint remarks was very low, the reliability of these results could be questioned. It is also important to remember that these are preliminary results based on the first batches of pigs slaughtered in the study (the last pigs will be slaughtered in March 2013). However, unless these results change substantially in the final analysis, the data indicate that some associations between leg problems and lean meat growth do exist. Taking all the results together, it appears as though lameness and swollen joint examination in live animals capture a larger range of leg problems among the pigs, while the leg joint remarks recorded at slaughter capture the more severe cases. It seems reasonable that the association between leg problems and growth is stronger when the leg problems are more severe.

In this study, both sire breeds available to pig producers in Sweden were included (56.1% of the pigs had a Hampshire sire and 43.9% a Duroc sire). However, there were no significant differences between offspring of the two breeds in terms of growth or carcass leanness when reared in organic herds. As expected (and the reason for adjusting for these effects in the statistical model), there were significant differences between herds for both lean meat growth and percentage meat in the carcass, with the latter parameter differing significantly also between the sexes.

On-farm study

Yorkshire x Landrace sows in organically certified commercial herds were inseminated with non-mixed semen from AI boars of Duroc and Hampshire breeds. The two sire breeds were evenly distributed among sows in each herd and production batch. All piglets were individually marked with electronic ear tags. Lameness and swollen joints were individually assessed (normal; yes or no) for all pigs at approximately 30 and 100 kg live weight. The protocol used was based on that formulated for breeding evaluation as described by Eliasson (2013). At slaughter, slaughter weight, carcass leanness (percentage meat in the carcass) and leg joint remarks were recorded for each individual pig. One trained person performed all the lameness and swollen joint assessments and all pigs were slaughtered at the same slaughter plant.

In total, 180 sows and their litters were included in this study and the last pigs born in this study will be slaughtered in March 2013. However, the preliminary results presented in this paper are based on information from 726 pigs from 86 litters, slaughtered from July 2012 to November 2012.

Analysis of variance was performed with procedure MIXED in the SAS package. The statistical model used included the fixed effects of a leg health variable (0/1 classes for lameness at 100 kg, swollen joint at 100 kg or leg joint remark at slaughter), sire breed, herd (3) and sex, and the random effect of litter nested within sire breed (86).

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