Surgical castration can reduce weaning weight and increase mortality

Traditionally, male piglets have been surgically castrated to eliminate the risk of boar taint, an unpleasant odour that can occur when cooking meat from entire male pigs.

Limiting boar taint is critical to maintaining consumer acceptance of pig meat, but new research shows that castration reduces weight gain and increases mortality in piglets, reinforcing the need for non-surgical alternatives.

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Surgical castration is both painful and stressful for the animal during and for some time after the treatment. It also leaves an open wound, which may become infected or lead to other complications that reduce performance and, in some cases, increase mortality.

In fact, an analysis of 15 experiments in 2009 showed that male piglets that had been castrated had significantly higher mortality rates than their intact littermates.

At that time, it is unlikely that the castrated pigs received any painkilling medication prior to or after the surgery, as this was neither a legal requirement nor a usual procedure in commercial production. Because the details were not noted in the original studies, we do not know the timing and causes of mortality or what treatments were administered to any sick piglets.

Evolving trends

Between the publication of that analysis and now, public interest in food production and animal welfare has grown considerably. Particularly in Europe, pressure from consumers and animal-welfare groups has driven a growing number of pork-industry stakeholders to call for a ban on surgical castration and other mutilations, while investigating potential impacts on the pig-meat market and possible alternatives.

Among the other options are full anaesthesia before surgery, administration of a local anaesthetic, vaccination against boar taint, measurement of boar taint in the slaughterhouse and removal of tainted carcases, slaughtering boars at an earlier age, breeding for reduced boar taint and simply accepting the problems caused by boar taint.

Several European Union countries intend to ban surgical castration eventually, but currently it is still permitted, provided that it is carried out during the first week of the pig's life and local anaesthetic is administered according to the manufacturers' recommendations.

However, these conditions are not easy to implement or enforce in a commercial farm environment: a 2012 survey of 160 European pig farmers revealed that surgical castration without anaesthesia was the most popular strategy for mitigating boar taint. Surgical castration with anaesthesia was among the least acceptable options, mainly due to the additional labour required.

The efficacy of currently available and licensed pain-reducing medications for young piglets has also been questioned, particularly in the absence of a reliable method to study pain in pigs of this age.

Reviewing the US National Pork Board's published evidence in 2014, a panel of international experts was able only to weakly recommend the use of non-steroidal anti-inflammatory drugs (NSAIDs) and lidocaine for pain mitigation during the castration of young piglets, citing limited low-quality evidence and wide variation in stakeholder preferences.

Increased castrate mortality

While previous studies on surgical castration have focused on pain management and practicality, there has

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Fig. 1. Total pre-weaning mortality and main causes of death in surgically castrated and intact male piglets.

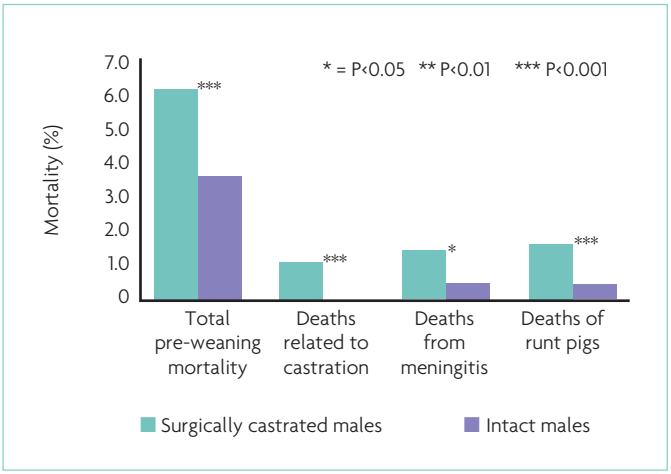
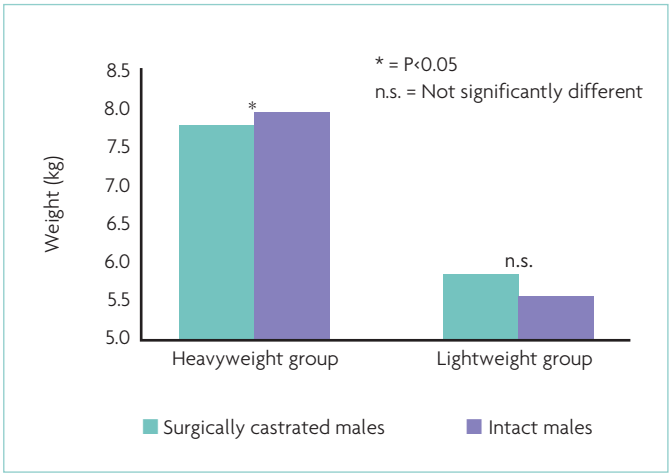


Fig. 2. Effect of surgical castration on average weaning weights of light and heavy birthweight piglets.



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until now been very little research quantifying the health and performance impact that castration may have on male piglets.

However, a new study from Spain shows that the surgery – even when pain-killing medication is applied – reduces growth and increases mortality in male pigs up to weaning at around 27 days of age.

Furthermore, the piglets that suffer most are those with lower birthweights – which is especially concerning as litter sizes continue to increase.

The research team at PigChamp, led by Dr Joaquin Morales and sponsored by Zoetis, studied a group of almost 3,700 male pigs from more than 700 litters on two farms.

Within each litter, half the male pigs were surgically castrated following treatment with a non-steroidal anti-inflammatory drug, and the others were untreated.

All the piglets were weighed at birth and at weaning, and any mortalities and antibiotic treatment were noted.

The data were analysed for the effects of treatment and also for the lightest 25% and heaviest 25% of piglets at birth.

While surgical castration did not significantly affect the growth rate or average daily gain of the pigs overall, it did increase mortality rate to weaning: castrate mortality was 6.3% compared with 3.6% for the intact males (Fig. 1).

Castration disadvantage

The data indicate that the lightweight group was more disadvantaged by castration than the heavyweight group.

For example, 1.5% of the lightweight group died from complications directly resulting from castration, while castration did not cause direct mortalities in any of the heavyweight pigs.

On the other hand, the weaning weights of the heavyweight group were negatively affected by castration (intact males were 2.0% heavier than castrates; P=0.05; Fig. 2).

In this study, it was not possible to make a firm conclusion about the impact of surgical castration on the antibiotic treatment rate.

No statistical difference was seen but it remains an area of interest as some impact might be expected.

Economically detrimental

This study has important implications for pig producers.

First and foremost, this is the first experiment looking at the effects of surgical castration of male pigs carried out under controlled conditions on commercial farms in which painkilling medication was correctly applied prior to castration, and in sufficient animals to reveal any statistically significant effects. The results of this Spanish study show that surgical castration – even with the appropriate pain medication – is economically detrimental to pig production.

In addition to the negative image surgical castration presents for pig welfare, this study shows that the use of pain relief is not a good argument for continuing the surgical castration of male pigs.

Clear adverse impacts of surgical castration on lightweight pigs are a particular concern.

Hyper-prolific sow lines

Hyper-prolific sow lines from Denmark and France are becoming ever more popular with producers because of their larger litter sizes of up to 20 piglets.

However, limited capacity of the sow's uterus means that the average piglet birthweight from these lines may well be lower and there may be more lightweight piglets.

A very high level of care is required for the smallest pigs to survive and thrive, bringing into question the desirability of carrying out surgical castration on these at-risk animals. ■

References are available from the author on request