

The potential for external lesions measured during meat inspection to be used as an indicator for on-farm pig welfare

Discusses recent studies that have demonstrated the potential for external lesions measured during meat inspection to be used as an indicator for on-farm pig welfare.

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Introduction

Meat inspections have the potential to contribute to the surveillance of pig welfare (Harley et al. 2012). Abattoir-based assessment of welfare is beneficial as it avoids biosecurity risks associated with entering farms and eliminates the difficulty associated with having to assess animals in crowded or dirty environments (Carroll et al. 2016). Meat inspection provides an opportunity to assess the welfare status of individual pigs, by identifying welfare-related external lesions such as bruising, wounds and scratches. External lesions, particularly skin and tail lesions from conspecifics and infrastructure, are an important indicator of pig welfare status (European Food Safety Authority 2012).

External lesions are a welfare concern as they can be a reflection of poor social and physical environment (Carroll et al. 2016). Pigs are intrinsically motivated to perform particular behaviours, including tail-biting, manipulation of other pigs and manipulation of infrastructure, when environmental enrichment is inadequate (Velarde et al. 2015). External lesions result when pigs in commercial production systems perform a variety of undesirable behaviours such as nosing, biting, aggression and mounting, which poses risks to pig welfare (Teixeira & Boyle 2014). This is further supported by the findings of Carroll et al. (2016), which confirmed a positive correlation between severity of skin lesions and the number of aggressive interactions that pigs have been involved in. In addition to being an indication of inadequate environmental enrichment, aggressive interactions are also a welfare issue because they have been shown to cause hyperthermia in pigs (de Jong et al. 1999).

External lesions are also an animal welfare concern as they are a probable cause of pain to the animal. Furthermore, external lesions can be a reflection of other underlying health and welfare issues. For example, a relationship between tail lesions and secondary conditions, such as abscessation and pleuritic lesions of the lungs, has previously been reported (Carroll et al. 2016).

Skin lesions can also provide an indication of the welfare of pigs in different-sized groups and under different stocking densities. A study by Thomsen et al. (2016) found a significant effect of group size on numbers of skin lesions, with pigs in larger groups having more lesions. Additionally, Fu et al. (2015) found that pigs in higher stocking densities also had more lesions. In addition to increased lesions, further

evidence of compromised welfare of pigs in high stocking densities, such as increased time spent in negative social behaviour, less resting, more manure on the body and abnormally high body temperature, was also recorded by Fu et al. (2015).

Discussion

A 2015 study by van Staavaren et al. provided findings that validate meat inspection as a pig welfare surveillance tool, via identification of lesions on carcasses. The study involved 1000 finishing pigs. Van Staavaren et al. (2015) reported that skin and tail lesions measured on carcasses are correlated with lesions measured on-farm. It was concluded that lesions measured at meat inspection can be used as an indicator of on-farm pig welfare, despite the confounding effects of mixing of pigs, transport, slaughter and carcass handling (van Staavaren et al. 2015).

Meat inspection as a pig welfare surveillance tool had also been validated by the previous findings of Teixeira & Boyle (2014) who reported that assessment of skin lesions on the carcass is beneficial as it is a more sensitive indicator of aggressiveness and pig welfare, than assessment of skin lesions on the live animal.

To successfully utilise meat inspection as a pig welfare surveillance tool, it is important to define the stage of processing at which the carcass can most effectively be assessed for external lesions. Carroll et al. (2016) aimed to determine the most appropriate stage of pig carcass processing at which to assess welfare-related external lesions, including skin lesions, loin bruising and tail-biting damage. Carroll et al. (2016) compared the visibility of lesions on pig carcasses at two stages on the processing line: exsanguination and scalding and dehairing. The study was conducted on a total of 1889 finishing pigs processed at two abattoirs in Ireland. The results showed that scalding and dehairing carcasses improves visibility of lesions and therefore it was concluded that this is the most appropriate stage to assess welfare-related external lesions (Carroll et al. 2016). The removal of dirt and hair that is present at exsanguination could perhaps be the reason for the increased visibility following scalding and dehairing (Carroll et al. 2016). This is the first study to investigate the effect of slaughter processes on visibility of external lesions in a controlled way (Carroll et al. 2016).

Skin lesions have also been found to correlate with two key defects in the meat quality of pigs (Cobanovic et al. 2016). Cobanovic et al. (2016) assessed skin lesions on 480 pigs and found that carcasses with most severe skin lesions also had greater incidence of pale, soft and exudative (PSE) and dark, firm and dry (DFD) meat. This further confirms that skin lesions are also correlated with welfare-related physiological changes, as PSE and DFD caused by changes in pH which results in response to stress (Cobanovic et al. 2016). PSE occurs after pigs are exposed to acute stress and triggers low pH, whereas DFD occurs as a results of high pH following chronic stress to the animal (Cobanovic et al. 2016). These findings highlight the link between external lesions and other indicators of poor welfare in pigs.

Conclusion

In conclusion, meat inspection provides an opportunity to assess the welfare status of individual pigs, by identifying welfare-related external lesions, in particular skin and tail lesions. A number of recent studies provide evidence that validates meat inspections as pig welfare surveillance tool. Scalding and dehairing during carcass processing improves visibility of lesions and this is the stage at which external lesions should be assessed. External lesions are a welfare concern as they can represent evidence of poor social and physical environment, reliably reflect episodes of pain imposed on the animal and can be linked to other underlying health and welfare issues.

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