

## A comparison of meat quality attributes between intensively and extensively finished pigs.

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This project aimed to determine the impacts of finishing housing system type (indoor conventional system *versus* eco-shelter system) on meat quality attributes including 24-hour post-mortem pH, glycogen and lactate content, and colour. Finisher pigs from two different housing systems were sent from Narrogin to the Perth Pork Centre (Wooroloo, WA) for slaughter between April and August 2012. Muscle samples as well as pH and colour measurements were taken from the carcasses of 704 pigs at 24 hours after slaughter over 15 kill days throughout this time. Unfortunately, and due to unforeseen complications involved in sample collection, no effect of housing system on pork quality characteristics could be established due to the confounding effects of the kill day. The confounding influence of housing type within kill day highlighted the difficulty in obtaining meaningful commercial data in this area for industry, namely that keeping on-farm, pre-slaughter handling and abattoir processes consistent from day to day is difficult and may cause product inconsistency.

Numerous factors affect meat quality attributes. There are factors that affect stored energy as glycogen in the animal before slaughter, and those that affect the accumulation of lactate and depletion of glycogen stores during post-mortem glycolysis. It is impossible to ensure that every pig is raised, handled, and interacts with others exactly the same prior to slaughter, therefore, inconsistencies are inevitable. Housing and management systems that aid in keeping environments, climate and transport systems consistent, that enhance pig identification in lairage and at ushering to slaughter, as well as mechanisms that ensure carcasses undergo the same processing and chilling times and treatments post-slaughter, may ensure a more consistent product and improve quality.

Although no significant effect of housing could be established in the study, other interactions between meat quality characteristics were examined. A difference in meat quality attributes could be associated with sex, as males had a higher pH 24 hours post-slaughter and a lower lactate level 24 hours post-slaughter than females. Additionally, significant negative correlations existed between pH and lactate and total glycogen and pH, and positive correlations existed between total glycogen and lactate, and residual glycogen and lactate. These findings largely conform to current understandings of pork quality and also develop further the notion implicating muscle glycogen stores as a contributor in determining the rate of post-mortem glycolysis.

By strengthening existing understanding of the relationships between meat quality attributes in an industry applicable setting, characteristics such as pH can be further highlighted as a simple measure of meat quality. This would enable industry to presume high or low levels of lactate and glycogen based on these measures, a useful outcome for processors interested in improving meat quality. Furthermore, the amount of glycogen present in muscle tissue post-slaughter appeared related to the rate of lactate production post-slaughter, whereby the more glycogen there was present in muscle tissue at slaughter then the faster lactate was produced post-slaughter. With the knowledge that pale soft and exudative (PSE) pork is associated with rapid lactate production post-mortem, techniques to control the amount of stored glycogen prior to slaughter could be developed to reduce the incidence of PSE pork. This is another outcome of the research undertaken, however, these findings should be investigated further for corroboration and development before utilisation in the pork industry.