



OneWelPig

Newsletter

November 2025

#5

Edited by Melissa Cupido

Welcome

Welcome to the fifth newsletter from the OneWelPig project! This edition contains updates from three further pieces of work covering three distinct aims of the project. First, Oscar Amponash describes the results of meat quality analysis that he carried out on samples taken from pigs that were reared in Moorepark. Half of the samples came from pigs in our standard, conventional pig unit, whereas the other half came from pigs that were reared in an alternative, high welfare/low emissions building - details of pig health and performance from this study will follow in the next newsletter!

[Click here](#) to visit the OneWelPig website

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Following this we have another update from work carried out in AFBI, Northern Ireland. This study covers an important topic for pig comfort - what are alternative options for bedding to straw, which is less available in Ireland than other countries?

The last article describes work looking at how pigs cope with weather conditions when they are managed outdoors. This work highlights the importance of adequate shelter for outdoor pigs.

We are currently developing an online map of outdoor pig-meat producers, which will be hosted on the Teagasc website, to support visibility of the sector. If you would like to include your business, and please get in touch!



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This project is funded by the Irish Department of Agriculture, Food and the Marine's Competitive Research Funding Programme (2021R600)

Can indoor systems affect meat quality?

Insights from a Factorial Study

Oscar Amponsah
Teagasc Moorepark

The study compared pigs housed in a conventional building with higher stocking density ($0.93\text{m}^2/\text{pig}$) versus an alternative building with more space per animal ($1.21\text{m}^2/\text{pig}$), and whether giving pigs access to play areas in each building had any effect on the pork quality.

Postmortem muscle pH and temperature decline shapes critical quality traits; too quickly, and appearance and processability could be compromised (PSE) while an inadequate pH drop could affect texture and reduce shelf life (DFD). Across both buildings, muscle pH and temperature profiles followed similar patterns, aligned with normal high-quality pork. The pH declined from initial values around 6.4-6.5 at 45 minutes postmortem to optimal ultimate values of 5.65-5.71 by 21 hours, indicative of quality pork with no signs of defects like pale, soft, exudative (PSE) or dark, firm, dry (DFD) condition.

Initially, the pH of pigs provided with more space was slightly lower, however, this evened out quickly and no differences in ultimate pH were detected, hence it did not appear to affect the final product.

No meaningful differences in water-holding capacity existed between groups, with consistent observations for centrifugal drip and cook losses across all treatments and buildings; this means meat will perform as predicted during processing. Similarly, neither housing nor play pen access led to colour changes in lightness or yellowness, but a trend for higher redness (a^*) was seen in the pork from the play pen treatment. Higher redness scores in pork loin are indicative of higher quality product and tend to be appreciated by consumers. These findings could provide reassurance to producers that welfare enhancements such as increased space allowance and environmental enrichment can be implemented without compromising pork quality, while emphasizing that consistent batch management, genetics, and nutrition remain the primary drivers of meat quality outcomes.



Conventional

- $0.87\text{m}^2/\text{pig}$ (excl. feeder)
- 12 pigs/pen
- 1 feeder / 12 pigs
- Controlled ventilation
- Fully slatted, concrete
- Fully indoor
- No canopy
- Rack with straw + 1 Luna Easyfix toys



Alternative

- $1.13\text{m}^2/\text{pig}$ (excl. feeder)
- 28 pigs/pen
- 1 feeder / 7 pigs
- Semi natural ventilation
- 80% solid flooring
- Outdoor area (67%)
- Indoor area (33%) + Canopy
- Rack with straw + 2 Luna Easyfix toys

Our study revealed that moderate welfare improvements have no negative impact on key meat quality traits in commercial pig production.



Straw is regarded by both scientists and pig producers as the 'gold standard' bedding material, as it encourages natural behaviours such as foraging and nest building, whilst at the same time reducing unwanted behaviours such as tail biting.

Unfortunately, across the island of Ireland, straw is not as cheap or accessible as in other European countries. However, Northern Ireland in particular, has a large number of sawmills, and the waste products of this extensive industry (sawdust and woodchips) have potential as suitable alternatives to straw for use as pig bedding.

At the AFBI Hillsborough site, we tested 96 undocked pigs from 8 to 19 weeks old, housed eight per pen on one of three beddings: straw (the control), sawdust, or woodchip. Dirty bedding was removed twice a week and topped up to keep a depth of 5 cm. This was a novel aspect to this study, as previous research on wood-based bedding has only used a very thin covering. The pigs were filmed over several weeks, and 22 behaviours (example.g. tail-in-mouth, fighting, playing, lying) recorded. We also scored tails, ears and bodies for injuries, checked for lameness, and rated how dirty each pig was.



Generally, behaviour looked remarkably similar across all three materials. The time pigs spent exploring the floor, lying down, eating, and interacting with each other did not differ between straw, sawdust or woodchip bedding. There was also no increased risk of lameness with any of the bedding materials. For tail damage and cleanliness, three clear messages emerged. Firstly, tail biting was rare throughout the trial, even though pigs weren't docked. Secondly, pigs on sawdust and woodchip had fewer signs of tail damage than pigs on straw. The small risk having any tail damage (even minor scratches) was 1.7 times greater for straw than for sawdust—so it's a nudge in the right direction, although not a cure-all. Thirdly, pigs on sawdust were noticeably cleaner than those on either straw or woodchip, which impacts positively on both welfare and meat quality.



In previous studies where only thin layers of sawdust were used, straw has generally been rated better than wood-based products. It seems that the greater depth of bedding used in this study is the key to its success. Sawdust and woodchip look like solid, workable alternatives to straw in grower/finisher systems, when maintained at a depth of at least 5 cm. They promoted normal behaviour just as well as straw, sawdust helped keep pigs cleaner, and both wood substrates were linked to slightly fewer tail problems. Given the limited and sometimes costly supply of straw in the island of Ireland, and the ready availability of sawmill by-products, these findings suggest producers could switch to sawdust or woodchip, without expecting an increase in tail biting.

Season and weather conditions affect body temperature and shelter use of outdoor pigs

Ophélie Menant
Teagasc Moorepark



The main benefit of raising pigs outdoors is that animals can express their natural behaviours; however, they are exposed to weather, sometimes extreme, that can lead to thermal discomfort. To overcome this, mammals have two thermoregulation mechanisms:

- 1.) Behavioural responses such as looking for shelter (Figure 1.A), and
- 2.) A physiological response, such as the constriction or dilation of blood vessels, that can be assessed using an infrared thermal camera (Figure 1.B).

The aim of this study was to determine the effect of season and prevailing weather conditions on pig welfare as evidenced by thermoregulation capacity and shelter use.

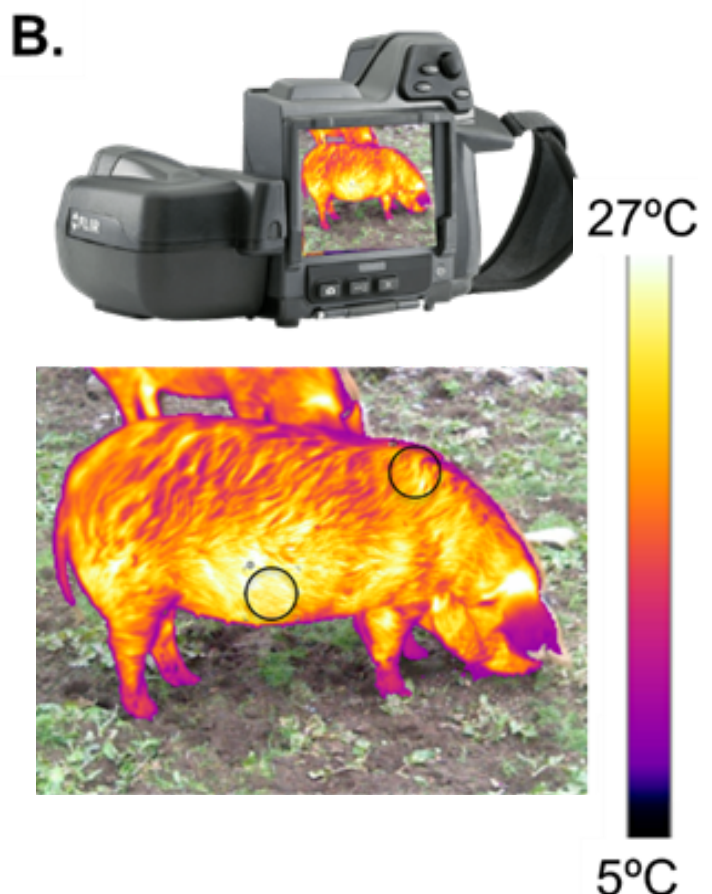


Figure 1. Photos of 6 pigs using a shelter (A.) and of an infrared camera enabling assessing the cutaneous temperature of the pigs (B.)

Twenty outdoor farms were visited, twice for most of them, from February to December 2023, during which:

- Environmental temperature (°C), the relative humidity (%) and wind speed (m/s) were measured,
- The number of pigs using the shelter was recorded every 5 min for 1.5 hours, over 52 paddocks (1 - 35 animals/paddock),
- Skin temperature was assessed on a total of 315 pigs.

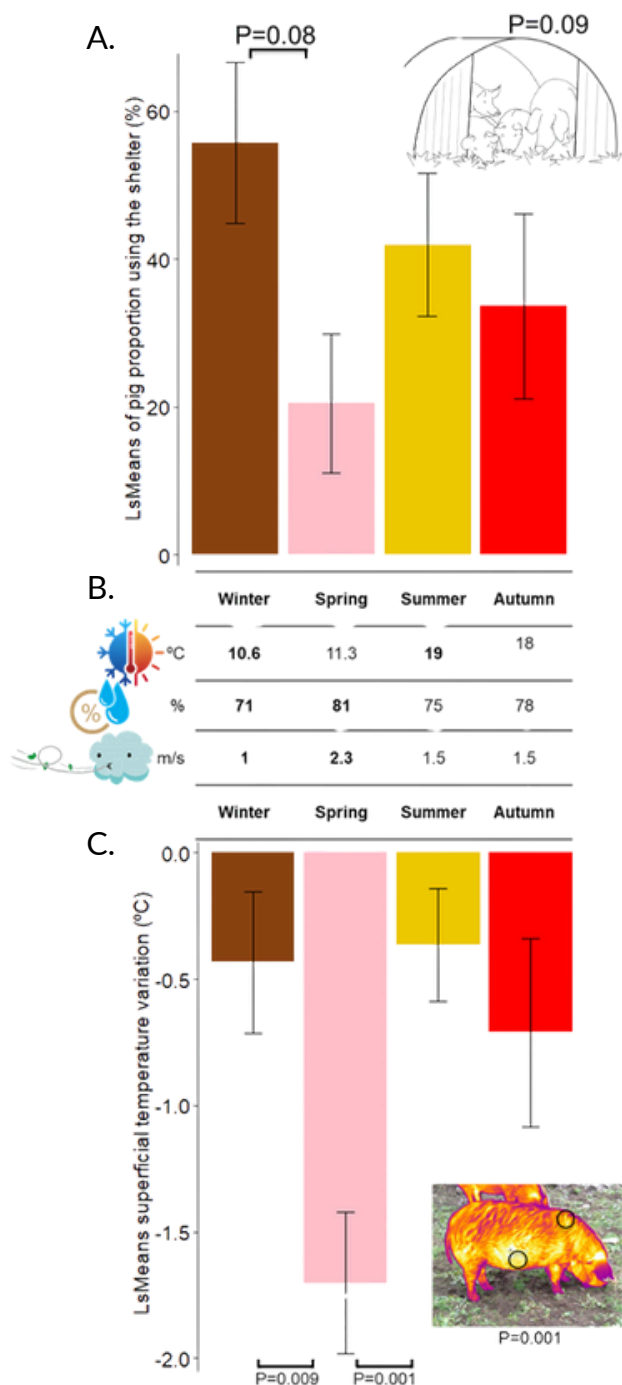


Figure 2. Proportion of pigs of pigs in the shelter (A.), environmental temperature, relative humidity, and wind speed across seasons (B.), and the cutaneous temperature variation of the pigs (C.) by season

Pigs were traditional breeds (e.g. Oxford sandy and black, Gloucester old spot, Tamworth), aged from 3 months to 6.5 years. The proportion of pigs that were in the shelter was calculated by dividing the average number of pigs in the shelter over all scans by the number of pigs in paddock. We estimated thermoregulation capacity by subtracting the average temperature of the belly from the shoulder, a negative value representing cold stress, and termed 'thermal difference'.

The proportion of pigs in the shelter tended to be higher in winter than in spring (Figure 2.A). Spring was the windiest and most humid season, winter the coldest season, and summer the warmest season (Figure 2.B). Thermal difference was also significantly greater in spring than summer and winter (Figure 2.C).

Regardless of season, the higher the relative humidity, the greater the proportion of pigs in the shelter. The higher the temperature, the lower the thermal difference, whereas the higher the relative humidity and wind speed, the higher the thermal difference.

Both season and weather conditions influenced pigs' cutaneous temperature variation, and thus their choice to use a shelter. This highlights the importance of offering shelter to pigs kept in outdoor farms.