



FIGURE 1: Pen layout for A) crate, and B) free treatments. In crate, sows are continuously crated. In free, the crate can be opened or closed; when opened, the sow can turn 360°.

# Free crates creating better outcomes

TEAGASC researchers examined if removing farrowing crates could improve piglet health and performance.

The farrowing crate was originally introduced as a management tool in pig farming in the 1960s. It is still widely used in Ireland to improve ease of management, allow higher stocking densities of sows, and to reduce piglet mortality. In crated systems the sow is confined from about seven days prior to farrowing until piglets are at least 28 days old. However,

concerns about animal welfare have meant that several European countries have introduced legislation restricting the use of farrowing crates, and 'free-farrowing' pens are being encouraged in many others. These allow sows to move around and perform normal mothering behaviour, and piglets to interact more with the sow. However, there is a greater risk of piglet crushing in these systems, particularly during the first three days after birth. An intermediate option is to confine the sow to a crate only from the onset of farrowing until three days afterwards. This system has potential to be more widely adopted in Ireland prior to conversion to entirely uncrated systems, as the risk of excessive mortality is reduced. This study compared the welfare and performance of both sows and piglets in conventional crated and 'free-lactation' systems.

## Experimental set-up

This study was carried out in the Moorepark Pig Development Department pig unit between September 2018 and August 2019. Sows (n=48) were assigned to either standard crates (crate) or crates that could be opened to allow the sow to turn around (free), approximately seven days prior to farrowing (**Figure 1**). Crate sows were confined until weaning, whereas in the free group, crates were open for the first five days, after which they were closed at night. The free sows were closed in continuously from approximately one day prior (onset of lactation), to three days post farrowing, then opened until weaning.

### Animal performance

Treatment did not affect sow liveweight, back fat, feed intake, or subsequent performance. There was no difference in piglet mortality percentage between treatments (crate =  $14.42 \pm 2.15$  %; free =  $15.95 \pm 2.31$  %). However, when it came to the causes of mortality, more piglets in free than in crate were crushed after day three (i.e., after the crate was opened;  $P < 0.05$ ). Numerically, more piglets in crate than free died from other causes (e.g., hunger;  $P = 0.14$ ). There tended to be an interaction between treatment and day ( $P = 0.08$ ) for pre-weaning weights, with piglets from free numerically heavier than crate on days 14 and 21, and tending to be heavier at weaning ( $P = 0.1$ ; **Figure 2**). Post weaning, pigs from the free treatment had a higher average daily gain to finish ( $P < 0.05$ ), took fewer days to reach slaughter weight ( $P < 0.05$ ), and had a heavier final weight ( $P < 0.05$ ) than pigs from crate.

### Animal behaviour

In free, sows increasingly utilised all orientations in the pen as the study progressed. Locomotory ability deteriorated more in crate sows than free between confinement and weaning ( $P < 0.01$ ), and as there was no difference in hoof condition between treatments, it is likely that the lack of movement could have caused stiffness. Even with additional movement in free, piglets were observed more often at the udder in this treatment than in crate ( $P < 0.05$ ). They also tended to perform less damaging behaviour (e.g., tail-biting;  $P = 0.07$ ), which is positive for welfare throughout life. These behaviours could have been a contributing factor to the increased lifetime performance of free piglets.

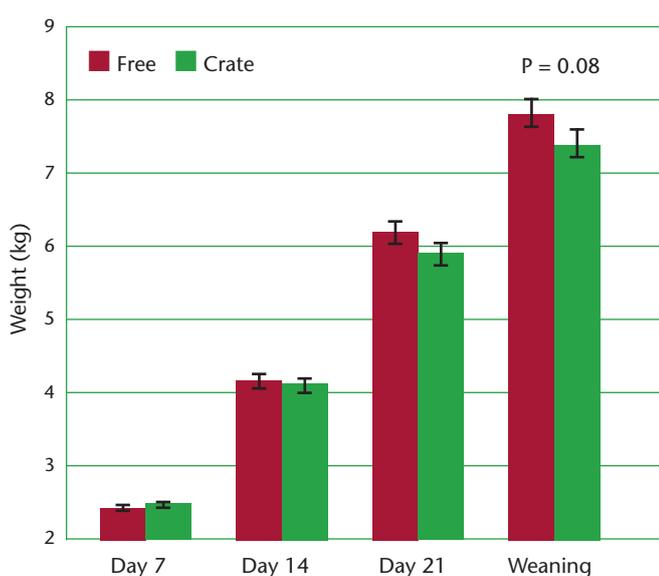


FIGURE 2: Piglet weights on days seven, 14 and 21 after birth and at weaning, for piglets born and reared in free lactation pens (free) or in pens with conventional farrowing crates (crate).

### Indicators of stress

At weaning, free sows had less tear staining around the left eye than control ( $P = 0.05$ ). Tear stain scoring has been adopted and validated in pigs from laboratory science as an indicator of chronic stress. However, salivary cortisol levels tended to be higher in free sows ( $P = 0.06$ ), particularly after initial confinement ( $P < 0.05$ ), and on day four after farrowing, when the crate was opened again ( $P = 0.09$ ). Although often associated with stress, cortisol can also rise with excitement or increased activity, which could explain this result. There was no overall effect of treatment on piglet faecal cortisol level, yet at seven days of age this also tended to be higher in piglets in free ( $P = 0.07$ ). This timing coincides with when the sows in free are first released, and could be reflective of injuries or increased movement.

### Conclusions

- Restricting movement of the sow for only three days post farrowing, compared to the entire lactation, did not result in additional mortality compared with crated sows.
- The free pens were associated with improved welfare, as indicated by reduced lameness in sows, reduced performance of damaging behaviour in their offspring, and a tendency for more time observed at the udder.
- Overall, free pens had significant benefits for sow output, with regard to growth rate and efficiency of their offspring.

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