

Piggy in the middle



TEAGASC research, as part of the OptiPig project, is looking at the effects of artificial rearing on growth, production performance and welfare of pigs.

Context

Genetic selection in pigs has resulted in increasingly large litters, with the number of piglets often exceeding the number of teats. This presents significant welfare challenges for both the sow and piglets (Rutherford *et al.*, 2013); all piglets cannot obtain their own teat for the entire lactation (as they have evolved to do) causing increased fighting between piglets at the udder, injuries to the piglets and sow, and disturbed nursing behaviour. More importantly, piglets that fail to obtain their own teat have impaired growth and a higher risk of mortality before weaning.

The OptiPig project aims to identify management strategies to improve piglets' pre-weaning growth and survival, including alleviating competition at the udder. One such strategy involves taking seven-day-old piglets from their mother and rearing them artificially in a specialised enclosure called a 'Rescue Deck®' (Figure 1). This sow is then used as a foster mother for newborn piglets from large litters (no. piglets > no. teats), so that all of these younger piglets can obtain their own teat for the full lactation. However, artificial rearing presents several challenges to the seven-day-old piglets, as they are completely deprived of maternal contact. They are fed milk replacer through cups, which they can permanently access, and obtain fresh milk by manipulating the cup's lever with their snout/mouth, in contrast to feeding in synchronised discrete bouts at the udder. Furthermore, the space available per piglet is much lower than that in the pen with their mother. The aim of this study was to establish the effects of artificial rearing (AR) on the performance and welfare of pigs from seven days old to slaughter.

Experimental set-up

The experiment was conducted on a commercial farm. At seven days old, pairs of litters (11-12 pigs) of similar weights were selected (10 replicates). One litter remained with their mother (control), and the other was transferred to a Rescue Deck® (AR) in a separate room. At approximately four weeks of age, pigs were moved to larger pens and transitioned to solid feed (weaning), and monitored until slaughter (about 113 days).

Production performance

Control and AR piglets had the same survival rate to weaning (99.2% vs 99.5%; one piglet dead in each treatment), even though AR piglets experienced a growth check relative to control piglets between transfer and day 15, and were lighter at weaning. However, pigs from both treatments had a similar average daily gain (ADG) from weaning to slaughter, and weighed the same at slaughter (approx. 113.8kg). Weaning represents the most stressful period in a pig's life. It normally involves a simultaneous change in diet, separation from the mother, and exposure to a novel environment, and consequently a severe growth check. For AR piglets these stressors were separated, and thus it is not surprising that they experienced a growth check at an earlier time than the control piglets, but caught up later in the production cycle.

Pre-weaning behaviour

Prior to weaning AR piglets were less active than control piglets, as they played and explored the environment less (Figure 2). The latter is probably related to the small size of their enclosure. Play is an important developmental feature of young animals, so low levels of play are considered indicative of reduced welfare. The AR piglets also engaged in much more belly-nosing of other piglets, an abnormal behaviour thought to reflect difficulty in coping with suddenly being prevented from suckling.

Emotional state

The pre-weaning growth lag and behaviour patterns displayed by the AR piglets suggest that their welfare was poorer than the control piglets, with potentially long-lasting effects. Thus, we investigated the emotional state of the pigs both pre and post weaning using qualitative behavioural assessment (Welfare Quality® protocol). This is a relatively new scientific method used to evaluate the expressive quality of animal behaviour and emotions. Pre weaning, control piglets had a higher score indicating a better emotional state than AR piglets (Figure 3). Inversely, at both 68 and 100 days old, AR pigs had a better emotional state. These results are in line with the production data, with the AR pigs displaying evidence of compromised welfare relative to control pigs pre weaning, but coping better with their environment as they grew older.

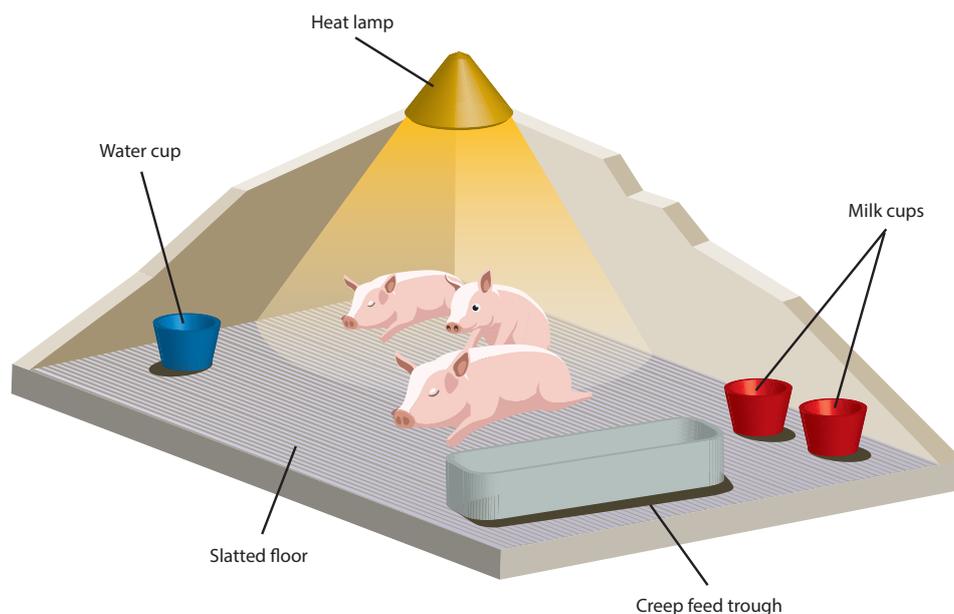


FIGURE 1: Schematic representation of the artificial rearing enclosure. About 60% of the area was covered with a canopy.

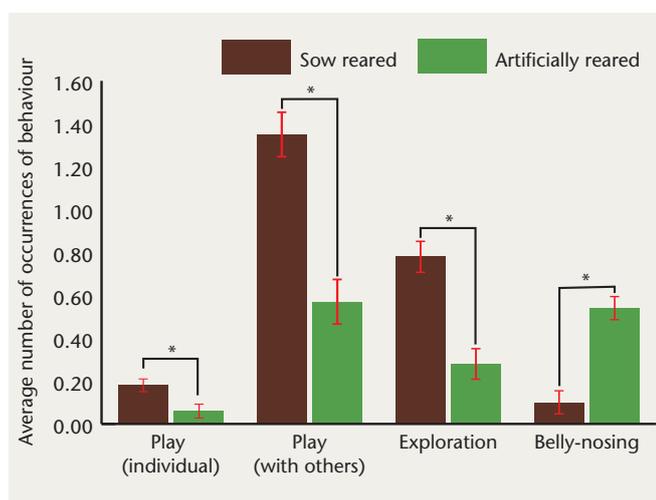


FIGURE 2: Pre-weaning behaviour of sow (i.e., control) or artificially reared piglets. *Indicates differences at $P < 0.005$.

Conclusions

- Prior to weaning AR pigs had poorer behavioural development and a growth lag compared with sow-reared pigs.
- However, AR pigs appeared to cope better than sow-reared pigs post weaning.
- There is potentially a link between emotional state and production performance in pigs.
- Artificial rearing did not appear to cause long-term poor welfare in pigs.

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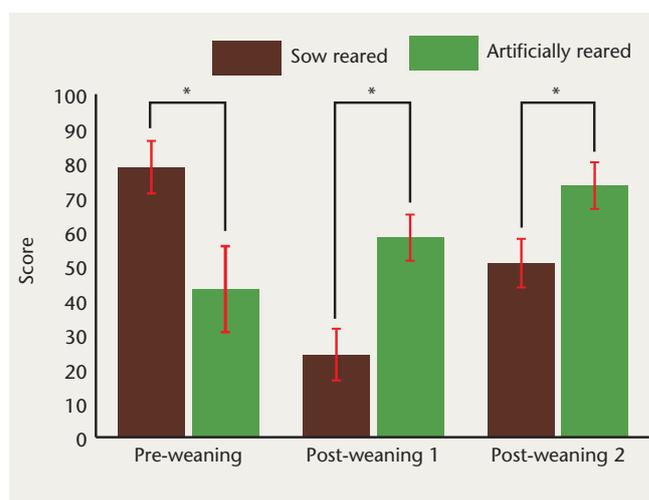


FIGURE 3: Emotional scores attributed to sow (i.e., control) or artificially reared piglets at pre-weaning (21 days old), post-weaning 1 (68 days old) and post-weaning 2 (100 days old) periods. Higher scores represent better emotional states. *Indicates differences at $P < 0.05$.

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