Artificial rearing affects the emotional state and reactivity of pigs post-weaning

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Abstract

Artificial rearing involves removing piglets from their mother at seven days of age and feeding them milk replacer until weaning. Early-life rearing conditions can influence piglets’ mental development, as reflected by their emotional state and reactivity. This study compared the post-weaning emotional state and reactivity of pigs which were either sow-reared or artificially reared pre-weaning. Behavioural tests (startle test, novel object test, human-animal relationship test and open door test) were conducted one week post-weaning (weaner 1, 34 [± 0.6] days old), one week after movement to weaner 2 (69 [±1.2] days old) and to finisher (100 [± 1.3] days old) stages. Qualitative Behavioural Assessments (QBA) were conducted on the same days in weaner 2 and finisher stages. QBA descriptors were computed by PCA and all other data were analysed using linear models. Artificially reared pigs were less fearful of human contact in weaner 1 (45.1 [± 8.43] vs 81.3 [± 7.89]%) and finisher (25.8 [± 5.19] vs 45.7 [± 6.00]%) stages, but there was no difference in the other tests. Artificially reared pigs had a higher QBA score (more positive) than sow-reared pigs in weaner 2 (54.49 [± 10.102] vs 17.88 [± 9.94]) but not in finisher (70.71 [± 8.860] vs 52.76 [± 9.735]) stage. In conclusion, artificially reared pigs appeared to have a more positive emotional state transiently post-weaning and a lower fearfulness towards humans, which are likely mediated by their pre-weaning conditions. These data emphasise the need to consider the entire life of the animals to fully evaluate the long-term impacts of a rearing system.

Keywords: affective state, animal welfare, artificial rearing, human-animal relationship, pigs, Qualitative Behavioural Assessment

Introduction

Artificial rearing is a management strategy which involves removing piglets from their mother and transferring them to a specialised enclosure where they are fed milk replacer until weaning (Baxter et al 2013). Removing offspring from their mothers before the recommended weaning age at an early age, typically within the first seven days of life, raises ethical concerns (for further discussion, see Rutherford et al 2011). Artificial rearing is relevant because of the increased prevalence of large litters on pig farms and because it removes the need for several nurse sows in a ‘cascade fostering’ strategy (for more details, see Baxter et al 2013). Artificial rearing removes the risk of piglet mortality due to crushing by the sow and could potentially increase piglet growth rates because milk replacer is fed ad libitum. However, there are contradictory results about the effects of artificial rearing, with some studies reporting positive effects on growth (Cabrera et al 2010; van Beirendonck et al 2015) and others not (De Vos et al 2014; Schmitt et al 2019) prior to weaning. Where there are pre-weaning advantages in growth, artificially reared pigs seem to lose them post-weaning and have lower carcass quality than sow-reared pigs (Cabrera et al 2010; De Vos et al 2014). Other differences in artificially reared piglets include performance of more aggressive and biting behaviours pre-weaning (Rzezniczek et al 2015; Schmitt et al 2019), compared to sow-reared piglets. This behavioural difference potentially reflects a lower ability to cope with the system. Thus, artificially reared pigs might not cope with post-weaning conditions as well as their sow-reared counterparts, although this has not yet been investigated from a welfare perspective.

Artificial rearing involves maternal deprivation from a very young age, which is likely to impair the behavioural development of piglets. In particular, neurological consequences of stress might impair pigs’ cognitive abilities (learning and memory) and behavioural organisation processes (Poletto et al 2006), given the link between stress levels and cognitive abilities (Lupien et al 2009). A decreased expression of genes regulating glucocorticoid response in the