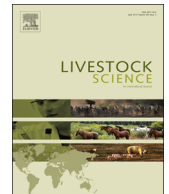




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Behavioural and physiological reactions of piglets to gentle tactile interactions vary according to their previous experience with humans



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ABSTRACT

Providing piglets with repeated stroking and brushing leads to behaviours of affinity towards their handler, but there is still no evidence of physiological modifications. In addition, other tactile stimulations like scratching have not yet been studied while there are used by pig-keepers. Thus, the present experiment aimed at determining the consequences of stroking and scratching weaned piglets on their later behavioural, cortisol and cardiac responses to human presence and gentle tactile interactions. Four groups of four piglets were weaned at 28 days of age (Day 0) and handled twice a day for 10 min, five days a week, from Day 1 to 28. Handling consisted in standing for 30 s, sitting for 1 min and then stroking and scratching each piglet for 2 min. Four groups of four piglets were used as controls and received only the minimal contact for routine husbandry practices. Behavioural reactions to the presence of the handler in the home pen (Day 25) and to her presence and departure in an arena test (Days 26–27) were observed. Behavioural and cardiac responses to the handler's presence and contact were compared in a test pen (Days 33–35). Salivary cortisol levels were measured in another test pen after 15-min of either contact with the handler or isolation (Days 40–43). In the home pen, handled piglets investigated sooner the handler ($P < 0.001$) and spent more time investigating her than control piglets ($P < 0.05$). In the arena test, handled piglets investigated sooner the handler ($P < 0.01$) and spent more time close to the handler than control ones ($P < 0.01$). Heart rate of the piglets during stroking and scratching did not differ between treatments but the root mean square of successive differences in heart beat intervals was lower in handled than in control piglets when the rear part of the body was scratched ($P < 0.01$). There was no effect of the previous experience with the handler on salivary cortisol levels ($P > 0.05$). Overall this study shows that scratching and stroking piglets during three weeks after weaning changed the way that they interacted with the handler, being more attracted than control piglets. However, there was no clear difference

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in cardiac reactions to scratching and stroking between handled and control piglets, suggesting that these contacts are perceived positively, regardless of the previous experience. The body region stimulated may be of importance but it needs further investigation.

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1. Introduction

Many studies showed that a positive human–animal relationship may develop in farm animals like pigs, cattle, sheep, horses or poultry (Waiblinger, 2009; Hemsworth and Coleman, 2011). A positive relationship is notably characterised by an absence of fear reactions to humans and an easiness to handle the animals (Waiblinger et al., 2006). It is favourable to animal welfare and also enhances performances (Boivin et al., 2003; Hemsworth, 2008) and may be a source of positive emotions for farm animals (e.g. Tallet et al., 2005; Schmied et al., 2008). Among the interactions with humans that can be perceived as positive, food provision is an efficient way of attracting animals (i.e. Hemsworth et al., 1996b; Jago et al., 1999; Sankey et al., 2010). Gentle tactile interactions have also been tested as a potential way to decrease fear of humans and to increase attraction to them. In farm animals, this has mainly been investigated in cattle, sheep and horses. Although some studies do not show a beneficial effect of gentle tactile stimulations on perception of humans (Boivin et al., 1998; Jago et al., 1999; Hausberger et al., 2008) most of them indicate that such stimulations are a source of positive reactions towards humans and induce a decrease of behavioural reactions of fear in human presence (e.g. Becker and Lobato, 1997; Tallet et al., 2005, 2011a, 2011b; Probst et al., 2012). Very few data are still available in farm animals regarding the consequences of gentle tactile stimulations on physiological indicators of stress like cortisol level and heart rate. In beef cattle, gentle touching in early age seems to dampen the cortisol release at slaughter (Probst et al., 2012) while the reduction is not always significant when applied only few weeks before slaughtering (Mattiello et al., 2010). Likewise, gentle stroking has been shown reduce heart rate increase during a veterinary procedure (Schmied et al., 2010) or in presence of the handler in an arena test (Raussi et al., 2003; Tallet et al., 2006) in cattle and sheep. To our knowledge, the influence of gentle contact on the physiological indicators of stress has been poorly investigated in pigs. The cortisol release of pigs after human exposure was analysed only in two studies (Hemsworth et al., 1986a; Paterson and Pearce, 1992) and both of them did not show clear effects but the numbers of pigs studied were very low (four or seven pigs in each group).

In the literature on farm species, different types of tactile contact were applied to the animals like stroking (i.e. Tallet et al., 2005 in sheep), brushing (i.e. Tanida et al., 1994 in pigs), simply touching (i.e. Breuer et al., 2003 in cattle) or holding the animals (Tallet et al., 2009 in sheep) but they were rarely compared. All these types of interactions may

be given by stockpeople, either at distinct moments or during a (usually short-lasting) sequence of interactions. Besides the quality of the interactions, the body region being touched is important for the animals as shown in cattle (Schmied et al., 2008) and rats (Grandin, 2010). In the study of Schmied et al. (2008), cows expressed more positive reactions (e.g. neck stretching) to stroking at the withers and neck ventral regions than at the lateral chest. This could be related to the intra-specific social behaviour since intra-specific physical interactions are directed to preferential parts of the body in cattle for instance (in cattle: Val-Laillet et al., 2009; Laister et al., 2011) and the human stimulation of the preferred area are more effective on relaxation postures and physiological indicators compared with other regions (Schmied et al., 2008).

The importance of the type of gentle tactile stimulations has been less investigated in pigs than in cattle or sheep. Yet pig-keepers also interact physically with their animals and pigs are social animals that may interact physically with their keeper as well (Hemsworth, 2008). At the intra-specific level, tactile contact (nosing, nibbling, huddling) are important and pigs are used to rest in close body contact (Hafez, 1975). Pigs perform soft contact with their nose (Camerlink and Turner, 2013) or more dynamic contact looking like udder massages around nursing (Torrey and Widowski, 2006). Thus an influence of tactile human contact on the subsequent reactions of pigs to humans is expected. In pig production, human gentle interactions may take the form of stroking, touching but also scratching (Tallet, personal observations). Stroking could mimic nosing while scratching that involves greater pressure than nosing would be close to massage. Pigs that are stroked whenever they approach a human during training sessions express subsequent contact seeking (Hemsworth et al., 1986a; Paterson and Pearce, 1992). To our knowledge, the influence of scratching has not been studied, while it is used by pig keepers and may have different consequences from stroking. Tanida et al. (1994) used brushing which is close to scratching but differs from it because of the presence of an object between the animal and the human. They observed that, after two weeks of treatment, pigs spent more time in contact with humans when they had been brushed than when they had been stroked. However, in this study, brushing lasted 15 min per week whereas the duration of stroking depended on the willingness of the pig to approach the human; the amount of stimulation could have thus influenced the behavioural response of pigs. In all reported experiments, the body region exposed to the stimulation was never specified suggesting that there was no target region, but that interactions were probably provided all along the pigs'

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