

**THE ASSESSMENT OF HEALTH AND WELFARE OF PIGS IN
A FARROW-TO-FINISH HOUSING SYSTEM****E. D. Ekkel****Summary**

In practice in many countries, pigs are generally housed in two site systems; piglets are born in farrowing pens at a multiplier farm and at a certain age (10 weeks 25 kg live weight) they are relocated to finishing pens at a finishing farm. To this concept, there are many variations; many farmers also relocate the piglets at weaning to a rearing pen, and in some countries, pigs are reared not at the farrowing farm, but at a special rearing farm. In the Netherlands, there is a strong tendency to finish pigs at the same farm where they are produced, but even then, they are relocated to finishing pens and often mixed. So, pigs are transported and/or regrouped once or several times. To this procedure, pigs have to adapt, and if they fail, stress is the consequence.

From the present experiments it is clear that mixing and transportation are stressful events to pigs. They can lead to decreased clinical health, disturbed behaviour, a higher susceptibility to diseases and a reduction in production performance. Apparently, the degree to which growth is affected, strongly depends on what pigs have experienced in the past; the effects of transporting and mixing at 25 kg is more harmful for finishing pigs when they are mixed at weaning too than when they are not, for the differences between both groups is bigger in the first experiment in comparison with the second experiments. It is therefore the more striking that the pigs that were mixed in the second experiment only once, showed a higher level of mutual aggressivity one month later, indicating that it is questionable whether pigs have fully adapted.

In conclusion, health, welfare and production performance are improved in the farrow-to-finish system, which is the basic idea of the SSF system.

Introduction

In practice in many countries, pigs are generally housed in two site systems; piglets are born in farrowing pens at a multiplier farm and at a certain

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age (10 weeks 25 kg live weight) they are relocated to finishing pens at a finishing farm. To this concept, there are many variations; many farmers also relocate the piglets at weaning to a rearing pen, and in some countries, pigs are reared not at the farrowing farm, but at a special rearing farm. In the Netherlands, there is a strong tendency to finish pigs at the same farm where they are produced, but even then, they are relocated to finishing pens and often mixed. So, pigs are transported and/or regrouped once or several times. To this procedure, pigs have to adapt, and, if they fail, stress is the consequence (Friend et al., 1983; Rushen, 1987; Rundgren, 1988).

In addition to these management factors, many other stimuli can induce a biological response in pigs in order to maintain the internal balance that is threatened by the stimulus; suboptimal climate (Scheepens, 1991), stocking density, pen-size and pen-design (Meunier-Salaun et al., 1987; McGlone and Curtis, 1985), suboptimal feeding practices (Fraser, 1984) and wrong handling (Hemsworth et al., 1989) are only some examples of stimuli that pigs are exposed to from birth to slaughter.

The "Specific Stress Free" (SSF) housing system for pigs (Scheepens et al., 1990) is a housing system for pigs aimed at minimizing stress. The basic idea behind this SSF system is to raise pigs from birth to slaughter in the same pen, under optimal climatic conditions. This farrow-to-finish idea was proposed earlier (Charlick et al., 1968), but in the SSF system, beside the absence of transporting and regrouping, pigs are prevented from climate -, handling -, and feeding stress and their pen is fully tuned to the pigs' requirements.

This paper presents the results of two experiments that studied the positive effects of this farrow-to-finish idea of the SSF system, in order to assess health and welfare of the pigs.

Description of the experiments

In experiment 1, the SSF system was compared with a control-group of pigs that was housed in a so-called three-site system; in this system, pigs were mixed at weaning, they were reared on a fully slatted floor with restricted space and they were transported at 25 kg and mixed at arrival at the finishing farm. In experiment 2, control pigs were not mixed at weaning; they were reared in the farrowing pen and only exposed to the stress of transportation and mixing at 25 kg. The experiments were carried out in a climate controlled pigs house (Tielen, 1986), so climate was optimal for both experimental groups and for the whole experimental period. For a detailed description of the experiment see Ekkel et al. (1995 and 1996).

Results

Clinical health of pigs is improved when pigs are housed in a system where they are not mixed; more injuries were observed in groups of mixed pigs in both experiments, most likely as a consequence of fighting to establish a new social rank. As fighting involves mainly bites directed at the head, the ears and the shoulder, most injuries were seen here.

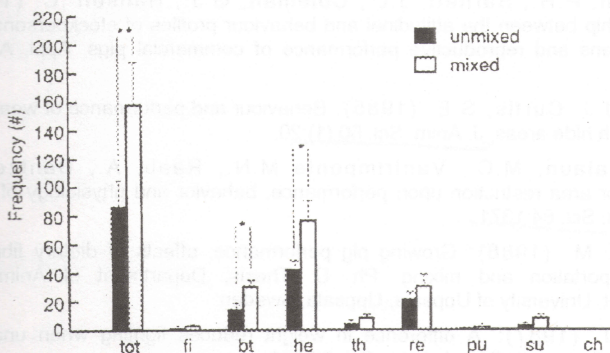
Production performance was better for SSF pigs. SSF pigs grew 849 and 840 g/d in experiment 1 and 2 respectively, whereas control pigs had an average growth of 771 ($P < 0.001$) and 812 ($P < 0.01$) g/d. The feed conversion rate only differed significantly in experiment. 1: 2.72 and 2.95 for SSF and control pigs ($P < 0.01$).

A pilot study in experiment 1 with the PHA skin test revealed a significant increased immunological reactivity of the SSF pigs. A more extensive study on this subject in experiment 2 made very clear that pigs that are not exposed to stress have a quicker and stronger reaction in this immunological test as pigs that are mixed and transported ($P < 0.001$).

A chronic elevated level of cortisol would indicate that pigs that are mixed have problems with adapting on the long term too (beside the adaptation of establishing a new social rank within 48 hours after mixing). However, one week and one month after mixing, no differences in concentration of cortisol could be detected. Moreover, the reactivity to an acute (nose-sling) challenge was unchanged.

In contradiction to what is generally accepted, pigs that are mixed have a higher level of mutual aggressivity than pigs that are housed in the SSF system, even one month after mixing. Pigs that are mixed bite more to penmates ($P < 0.05$) and they deal more headknocks ($P < 0.05$).

Figure 1. - AGONISTIC INTERACTIONS ONE MONTH AFTER PIGS IN THE CONTROL GROUP HAVE BEEN MIXED (TOTAL, FIGHTING, BITING, HEADKNOCKS, THREATENING, REPLACING, PUSHING, SUBMISSIVE BEHAVIOUR AND CHASING)



Conclusions

From the present experiments it is clear that mixing and transportation are stressful events to pigs. They can lead to decreased clinical health, disturbed behaviour, a higher susceptibility to diseases and a reduction in production performance. Apparently, the degree to which growth is affected, strongly depends on what pigs have experienced in the past; the effects of transporting and mixing at 25 kg is more harmful for finishing pigs when they are mixed at weaning too than when they are not, for the differences between both groups is bigger in the first experiment in comparison with the second experiments. It is therefore the more striking that the pigs that were mixed in the second experiment only once, showed a higher level of mutual aggressivity one month later, indicating that it is questionable whether pigs have fully adapted.

In conclusion, health, welfare and production performance are improved in the farrow-to-finish system, which is the basic idea of the SSF system.

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PROCJENA ZDRAVLJA I DOBROBITI ŽIVOTINJA U SISTEMU NASTAMBE PRASILIŠTE - TOVILIŠTE

Sažetak

U mnogim zemljama svinje se uglavnom drže na dva načina: prašćici se rađaju u prasilištu na rasplodnoj farmi i u određenoj dobi (10 tjedana - 25 kg žive vage) premještaju u tovilišta na farmi za tova. Postoje mnoge varijacije ovog sistema. Mnogi farmeri također premještaju prašćice kod odbića u obore za odgoj. U Nizozemskoj posotji izrazita tendencija dovršavanja tova na istoj farmi gdje su svinje proizvedene, ali čak i onda se premještaju u obore za dovršavanje tova a pri tome se četo miješaju. Tako se svinje prevoze i/ili razvrstavaju jedan ili više puta. Svinje se moraju prilagoditi ovakvom postupku i ako ne uspiju posljedica je stres.

Prema današnjem iskustvu jasno je da su miješanje i transport stresni događaji za svinje. Oni mogu dovesti do poremećaja zdravlja, poremećaja u ponašanju, veće sklonosti bolestima te smanjenja proizvodnje. Po svemu sudeći, stupanj stresa koji djeluje na rast uvelike ovisi o tome što su svinje doživjele u prošlosti. Djelovanje transpora i miješanja 25 kg teške prasadi štetnije je za svinje pri završetku tova, nego kađ se miješaju kod odbijanja.

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