

## Fattening of entire male pigs under organic conditions – Influences of group composition on injuries and behaviour

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### Abstract

*Fattening of entire male pigs prevails as an alternative to castration of male piglets. Entire males show more agonistic and mounting behaviour than castrated males, which can be a cause for skin lesions and lameness. Here the question was investigated, how under organic housing conditions single-sex groups with entire males (EE) differ from mixed-sex groups with entire males and females (EF) and from mixed-sex groups with castrated males and females (CF) with regard to lesions, lameness, agonistic behaviour and mounting. Group size was 20 animals. On day 4, 51, and 110 after start of the fattening period, animals were assessed for injuries and 10 male focal animals per pen were observed via video. On day 51 and 110 there were slightly more skin lesions in the EE-groups compared to the CF-groups with no difference between EF and CF. Entire males showed clearly more agonistic and mounting behaviour than castrates. EE and EF did not differ, neither in terms of lesions nor in behaviour. This study indicates that under the investigated housing conditions single-sex groups with entire males and mixed groups are equivalent with regard to animal welfare. So far there are neither in organic nor in conventional animal husbandry specific regulations for fattening of entire male pigs. Our findings, however, give some indications that more generous housing conditions would allow entire males to show their natural behaviour without serious injuries.*

### Introduction

Fattening of entire male pigs prevails in many European countries as an alternative to castration of piglets. However, the problem of recognizing and processing tainted carcasses as well as a lack of knowledge in terms of housing, transport and slaughter of entire males remain obstacles for a broad implementation. Entire males show more agonistic and mounting behaviour than castrated males or females (Fredriksen et al. 2008) which can lead to more injuries and lame animals (Rydhmer et al. 2006). The aim is therefore to adapt housing and management in order to reduce stress and improve welfare of entire male pigs. So far little is known about the effects of organic housing conditions (litter, space allowances, outdoor run) on the behaviour of entire male pigs, most recent studies have been carried out under conventional housing conditions. In this study we investigated under organic housing conditions (according to the regulations of Bio Suisse in Switzerland) whether there occur more injuries and there is more agonistic and mounting behaviour in single-sex groups with entire males compared to mixed-sex groups with entire males and females and groups with castrated males and females.

### Material and methods

At an average age of 80 days pigs were grouped into the experimental group compositions (EE, EF and CF). This was repeated in six rounds. Group size was 20 animals. Space allowance was 1.3 m<sup>2</sup> until a weight of 60 kg, and 1.65 m<sup>2</sup> afterwards. On day 4, 51 and 110 skin injuries of all animals were assessed with a score from 0 to 3, described in Fredriksen et al. (2008). Scores of six body regions were summed up. Lame animals were recorded. On the following day video observations were conducted during one hour before the morning and afternoon feeding respectively as well as during 30 min in the evening. Focal animals were the 10 male animals in the mixed groups and 10 randomly selected males in the EE groups. The following behaviours were recorded: Head-knocking/biting, fighting and mounting. Statistical analyses were made by applying generalized linear mixed effect models with group composition and day of observation as fixed effects, and animal in group in round as nested random effect.

### Results and discussion

Because skin lesions on day 4 are probably mainly caused by fighting at regrouping this observation number was analysed separately. Significant differences among the group compositions were only found at later stages of the fattening period (on day 51 and 110; Table 1): animals in the EE groups had more skin lesions

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than those in the CF groups ( $\chi^2(2)=8.1$ ,  $p=0.02$ ). Females in groups with entire males did not have more lesions than those in groups with castrated males ( $\chi^2(1)=1.1$ ,  $p=0.28$ ). Consequentially, penning them together with entire males doesn't seem to impair their welfare. Totally 13 animals were assessed as lame, evenly distributed across groups mainly at the end of the fattening period. The findings which show only small differences in skin lesions among the groups and a low prevalence of lameness contradict previous studies (Fredriksen et al. 2008; Rydhmer et al. 2006). The higher space allowances and the outdoor run might serve as explanation, as suggested by Prunier et al. (2010). The lower percentage of slatted floors may have been favourable for leg health.

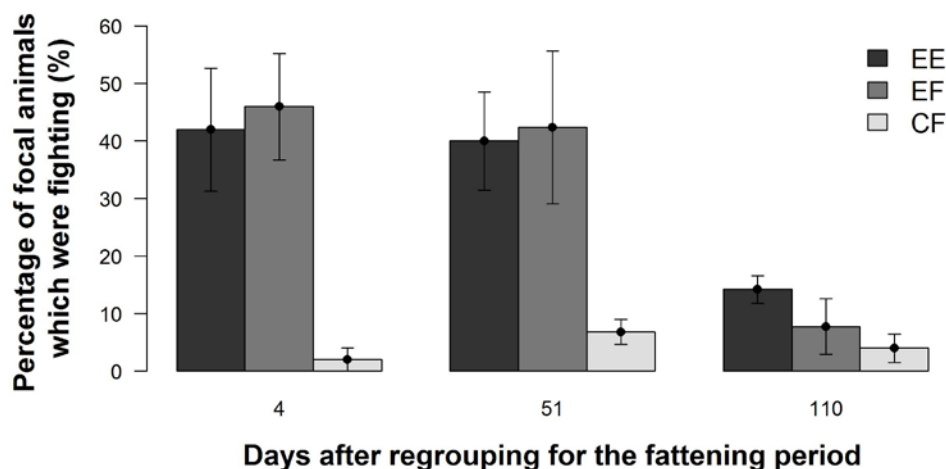
**Table 1: Prevalence of skin lesions and lameness**

	Group composition			p-values
	Only entire males (EE)	Entire males and females (EF)	Castrated males and females (CF)	
Skin lesions (day 4)	6.2 ± 3.3 <sup>1)</sup>	5.6 ± 3	5.7 ± 3	n.s.
Skin lesions (day 51 and 110)	3.9 <sup>a</sup> ± 2.3	3.4 ± 2.1	3.1 <sup>b</sup> ± 2.2	0.02
Skin lesions of females (day 51 and 110)	-	3.5 ± 2.2	3 ± 2.2	n.s.
Lame animals (all observations)	1.2% <sup>2)</sup>	1.6%	1.2%	-

<sup>1)</sup> Mean ± standard deviation

<sup>2)</sup> Percentage of animals which were observed at least once to be lame  
Means with different superscript letters differ significantly ( $p<0.05$ )

The behavioural observations revealed very clear results: The percentage of focal animals which showed head knocking/biting ( $\chi^2(2)=20.2$ ,  $p<0.001$ ), fighting ( $\chi^2(2)=39.2$ ,  $p=0.001$ ; Figure 1), and mounting ( $\chi^2(2)=17.2$ ,  $p<0.001$ ) was higher for entire than for castrated males. No difference was found between EE and EF groups. All behaviours decreased towards the end of the fattening period. Space allowances and feed provision seem to play an important role in the behaviour of entire male pigs: Thomsen et al. (2012) did not find differences in agonistic behaviour between entire males and females under organic housing conditions with min. 2 m<sup>2</sup> and ad libitum feed provision. In our study on the other hand with a space allowance of max. 1.65 m<sup>2</sup> and restricted feeding entire males were much more often involved in agonistic interactions than castrated males. Higher space allowance might offer escape opportunities for lower ranking animals. Ad libitum feed provision eliminates fights for this limited resource.



**Figure 1. Percentage of focal animals (entire and castrated males) which were observed fighting at least once depending on group composition and day of observation. (± standard error)**

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