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Feeding Piglets Sex-Separated or Mixed?

Investigations on Sex-Separated and Mixed Keeping in Piglet Rearing with Comparisons between Dry and Liquid Feeding

At the Saxonian State Institute of Agriculture, the extent of varying weight gain performance in piglet rearing which can be attributed to the different stalling-up of the sexes as well as to the competitive situation at the trough caused by the feeding techniques was investigated. The results presented in the following indicate that the animal-feeding place ratio plays the decisive role.

Pigs have different feed intake behaviour depending on age, sex, and the individual animal, which can adapt to the housing conditions to a limited extent. In group housing and when competing for a feeding place, young pigs (30 to 40 kg LM) eat smaller meals more often and faster than in single housing or at a feeding place which is protected from the group members [1; 2]. Sex-dependent feed intake behaviour in fattening pigs is being discussed and can be an explanation for higher weight gain performance in mixed-sex stalls [3; 4]. When kept in separate-sex housing, castrated male fattening pigs eat larger quantities per meal as compared with their female time mates, though at different times. In the late afternoon and at night, they eat more than female pigs [2; 5; 6]. Directly after weaning, light piglets tend to eat more than heavy ones and females eat more than males, whereas competition for the feeding place does not play a role for the beginning and the quantity of feed intake [7]. Female piglets eat more slowly than males [8]. It is not clear whether the mentioned correlations also apply to the later rearing process. Here, less trough area per animal is required, while increasingly large feed quantities are consumed at the same time. For this reason, it is important to find out whether differences in weight gain performance can be determined if the sexes are stalled up separately and if feeding technology causes a competitive situation at the trough.

Material and Methods

On the experimental farm in Köllitsch, a total of eight series of experiments in piglet rearing were carried out in order to study the mentioned topics from the spring of 2004 until 2006. A total of 967 time mates, which were recruited from complete weaning groups of the herd managed in a three-week rhythm, were examined. Of these, 491 piglets were fed liquid feed, whereas dry feed was dispensed to 476 piglets. Each group was fed simultaneously in a specially equipped compartment. One half of one feeding group each was separated according to sexes (252 separate males, 258 separate females). The other half (457 piglets) was stalled up in mixed-sex groups. The litter siblings were grouped such that their origin and their indi-

Table 1: Comparing weight gain and feed intake in the rearing period

Parameter	dry feeding **				liquid feeding **			
	mixed-sex		separate-sex		mixed-sex		separate-sex	
	m.	f.	m.	f.	m.	f.	m.	f.
	(n = 116)	(n = 104)	(n = 129)	(n = 127)	(n = 126)	(n = 111)	(n = 124)	(n = 130)
stalling-up weight kg	8.8 (0.2)	8.4 (0.2)	8.5 (0.2)	8.3 (0.2)	8.4 (0.2)	8.3 (0.2)	8.6 (0.2)	8.2 (0.2)
TZ_21 g	247 (9)	231 (10)	240 (8)	247 (8)	257 (9)	264 (9)	255 (8)	269 (8)
TZ_21-42 g	612 (15)	568* (16)	615 (13)	612* (13)	554 (14)	535 (15)	540 (14)	557 (13)
TZ_42 g	421 (9)	398* (10)	412 (8)	428* (8)	399 (8)	394 (9)	386 (8)	408 (8)
TZ_42 g	410 (6)		417 (6)		401 (6)		400 (6)	

*The values differ significantly (error probability: 5%); statistical comparison of the sexes between the housing groups of a sex within one feeding technique
**in brackets – standard deviation of the estimated values

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Keywords

Piglet rearing, dry feeding, liquid feeding

Literature

Literature references can be called up under LT 07401 via internet http://www.landwirtschaftsverlag.com/landtec/local/literatur.htm.

vidual body weight were taken into account. After 21 and 42 trial days, the individual piglets were weighed. Feed consumption was determined and correlated with the individual observation periods.

Rearing with the aid of conventional tube feeders (automatic feed dispenser from the company Funki with a separate feed- and water pan) was supplemented with feeding at additional longitudinal plastic troughs until weighing on the 21st trial day. Thus, an animal/feeding place ratio of at least 1:1 corresponding to the conditions during liquid feeding was reached. According to the demand, the additional troughs were filled with small quantities of feed three to five times a day and removed from the pen after 21 days. The piglets were fed liquid feed at the so-called "baby mix feeder" (company Förster Technik), where warmed liquid feed (38°C) was dispensed, and at 1.5 m long stainless steel troughs accessible on both sides and equipped with trough sensor control. Liquid feed or mash were dispensed restrictively to the piglets in a period of one week immediately after weaning according to their feed intake capacity. After one week, ad-libitum feeding was striven for in both techniques. In all housing variants, purchased medicated commercial feed with a nutrient concentration common in practice (13.4 MJ ME, 1.18% lysine, 88% DM) was used. In the third trial week, the commercial feed was replaced with the non-medicated FA II produced on the farm, which according to the feed analysis contained 13.0 MJ ME and 1.24% lysine in half-dry feed with a dry matter content of 88%.

Table 2: Housing-dependent weight gain performance and feed requirements for different feeding techniques over the course of the rearing period

	mixed-sex			separate-sex		
	m. (n=238)		**f. (n=210)**	**m. (n=243)**		**f. (n=252)**
TZ_42 g	407 n. s. (6)		395* (6)	400 n. s. (6)		414* (6)
VK % TZ	22		22	21		22
		dry feeding			liquid feeding	
	mixed-sex	separate m.	separate f.	mixed-sex	separate m.	separate f.
Feed-requirement 1:	2, 18	2,21	2,13	1,89	1,90	1,89

*The values differ significantly (error probability: 5%); statistical comparison of the sexes between the housing groups of a sex within both feeding techniques

Results and Discussion

During the eight rearing periods examined, the transitional effects typical in piglet feeding were observed, which were significant in some cases while animal health was relatively good (losses: 1.6%). After higher weight increase and less straggling in the second half of the rearing period (265 g liquid, 244 g dry), the weight gain performance of piglets which were fed liquid feed was slightly poorer (398 g) than the performance of time mates which were fed dry feed (415 g). The differences between the two parts, which are caused by the technique, can be secured statistically (5%) and confirm previous studies [9] as well as the judgement of the literature according to which liquid feed provides advantages in the period immediately (i.e. up to the 27th day) after weaning. However, this effect often gets "lost" during rearing [10]. In the technique applied here, the very short mixing times, which are due to feeding hygiene and promote the separation of feed phases in the trough, are probably one reason for unsatisfactory dry matter intake. Due to the use of the additional troughs, which is not really common in practice, the difference in the number of feeding places offered, which is a result of liquid feeding, is eliminated, and the effects of the technique during the time immediately after weaning are probably rather underestimated. During the later course of rearing, the differences in feed intake behaviour between male and female piglets [8], which are also a factor relevant for performance here, become noticeable in competition for the trough place. The female piglets, which more slowly consume larger quantities per meal [6] exhibit greater weight gain during dry feeding if they are separated from the castrated male piglets. In both techniques, however, the male piglets tend to profit from mixed-sex housing (based on weight increase), which has already been proven in pig fattening [3; 4]. In liquid feeding, where all piglets have a feeding place, this is not or virtually not the case.

During liquid feeding, the relative advantages and disadvantages of both sexes in mixed or separate-sex housing cancel each other out exactly. During dry feeding, the advantages of female animals kept in separate-sex housing tend to prevail. For both feeding techniques, a slight advantage of separate-sex housing for female piglets can be secured statistically (5%). Feed efficiency remains uninfluenced by housing. It follows the amount of the established weight gain and the feed losses, which are not insignificant in piglet rearing. During dry feeding, they were considerably higher because the piglets were more or less able to "walk in" the additional troughs.

Over the entire rearing period, the straggling of weight increase observed in the housing groups (almost 22%) was 1% lower in the groups separated according to sexes which were fed liquid feed. When the piglets were fed dry feed, it was the other way around. The unexpected, slightly higher weight increase of female piglets as compared with male animals in separate-sex housing is confirmed by observations described in the literature [7; 11; 12]. The authors of these publications assume that the castration of the boar piglets is a potential reason for this phenomenon. During the studies, the time when the boar piglets were castrated varied between the 3rd and the 10th day of their lives, which made the procedure more or less gentle for the animals. This variation neither proved nor disproved this thesis. Both early and late castrated boar piglets had higher weaning weights as compared with their female time mates and showed poorer weight gain during piglet rearing in separate-sex housing regardless of the feeding technique. High weaning weights correlate with high milk intake and probably with insufficient supplementary feed intake [11], which has consequences for weaning.

Conclusion

Given a feeding technique with a narrow animal/feeding place ratio, it does not make any difference with regard to weight increase performance whether the piglets are stalled up in mixed- or separate-sex groups. Female piglets kept under the conditions of a large animal/feeding place ratio and dry feeding, however, showed significantly higher weight increase if they were separated from the castrated male piglets. Conversely, the castrated male piglets tended to profit from mixed-sex housing given the conditions of both feeding techniques. If mash dispensers are used at a large animal/feeding place ratio, the advantages of sex separation prevail. However, this necessarily leads to a higher percentage of combined litters, which might be disadvantageous depending on the health level on the farm.