

Weaner rearing in large groups

Sensor feeding, animal behaviour and biological performance

The behaviour and feeding performance of weaners reared in large groups with sensor controlled liquid feeding was investigated. Special attention was paid to the animal feeding place relationship. The results confirm that the investigated method enabled high performance with very low losses. But results also offered evidence that modern feeding technology on its own cannot guarantee a consistently good development of weaners even where stocking density is increased.

Investigated within the project reported here were behaviour and feeding performance of weaners reared in large groups with sensor controlled liquid feeding. Particular attention was paid to the effect of stocking intensity.

Method

Housing system

The investigation took place in a windowless ridge-roof house with seven compartments and eight pens (11.68 m²) per compartment. Pens were part-slatted. The system featured all-in all-out simultaneously-applied for pairs of compartments.

Feeding system: fully-automatic sensor-controlled liquid into short troughs (1.2 m) integrated into pen partitions so that two pens shared a trough (eight feeding places) with two sensors per trough. Sensors were electronically checked 16 times between 6 am and 4 pm with a drop in feed level leading to the mixer being activated and the required amount of fresh feed delivered.

Trial set-up

Two compartments over two feeding cycles took part in the trial. Pens had only one sex in them and two group sizes were used (40

and 48 animals). The selected trial method meant the differences in group size were of the same significance with differing animal-feeding place relationships (5:1 and 6:1) and space per animal (0.292 and 0.243 m²/animal). These three factors were subsequently brought together under the term stocking intensity.

Two weaner groups were penned per compartment and feeding cycle for every combination of stocking rate and sex. Performance data were recorded in both compartments but ethological observations occurred in only one.

Recording animal behaviour

Direct observations were conducted weekly on two consecutive days and manually recorded. Anonymous data on feeding behaviour was collected by scan sampling. On Wednesday from 10 am to 2 pm and from 6 pm to 10 pm and on Thursday from 6 am to 10 am and 2 pm to 6 pm the number of animals feeding at the trough and the number attempting to feed were recorded.

Wednesdays from 3 pm to 5 pm and Thursdays from 11 am to 1 pm a supplemental focus animal observation was conducted. The following data were recorded:

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Keywords

Weaner production, weaner rearing, large groups, sensor feeding

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Table 1: Rearing performance according to sex and stocking rate ¹⁾

Trail animals	m		w	
	40	48	40	48
<i>total</i> ²⁾				
Weight at housing [kg/pig] LSM	6,18	6,35	6,29	6,11
Weight at end of period [kg/pig] ³⁾ LSM	26,75	26,24	27,08	26,26
Dlwg [g/pig] ⁴⁾ LSM	446	435	453	435
Feed conversion [kg] ³⁾ LSM	1,54	1,54	1,59	1,57
Losses [n] ⁴⁾	2	4	3	4
<i>Focus pigs</i> ⁵⁾				
Weight at housing [kg/pig] LSM	6,18 ^a	6,51 ^b	6,18 ^a	5,90 ^a
Weight at end of period [kg/pig] ³⁾ LSM	26,63	26,02	26,56	25,91
Dlwg [g/pig] ⁴⁾ LSM	444	431	443	428

1) Values differ significantly in a line with no identical upper letters (p<0.5). If no upper letter is shown, no significant difference is present.

2) Calculation took place according to „ventil“ method, n=16

3) Only animals still in the pen at the end of the rearing period were evaluated. The necessary corrections for dlwg or feed conversion were conducted with the averages of penning mass, dlwg and feed conversion used as basis.

4) Reports refer to mortalities; additionally, 3, 4, 3 and 9 still living animals were taken out of pens in the progress of the rearing period.

5) Calculations on individual animal basis, n = 159

Table 2: The number of observed piglets at feeding and attempts to feed according to sex and stocking rate, differentiated according to observation period length¹⁾

Observation period block	m		w	
	40	48	40	48
Feeding				
06 - 10 Uhr	184,9 ^b	170,4 ^a	182,9 ^{ab}	186,6 ^b
10 - 14 Uhr	146,3 ^b	107,3 ^a	121,1 ^a	148,8 ^b
14 - 18 Uhr	156,0 ^a	152,3 ^a	173,1 ^b	176,1 ^b
18 - 22 Uhr	133,5 ^{ab}	149,4 ^c	143,7 ^{bc}	128,3 ^a
Attempts to feed				
06 - 10 Uhr	141,1 ^b	105,8 ^a	125,4 ^b	139,1 ^b
10 - 14 Uhr	75,6 ^b	38,6 ^a	41,6 ^a	68,6 ^b
14 - 18 Uhr	72,8 ^{ab}	65,6 ^a	75,4 ^{ab}	84,4 ^b
18 - 22 Uhr	69,9	79,5	73,5	77,2

¹⁾ From LSM, values differ significantly in a line with no identical upper letters (p<0.5). If no upper letter is shown, no significant difference is present. Calculations took place separately within observation period blocks, n=112.

1. Which focus animals fed during the observation?
 2. Which focus animals participated in aggressive acts? Here differences were made concerning:
 - Rank fighting
 - Pushing other animals away from feed
 - Being pushed away from feed
 - Rank pushing
 3. Which focus animals used the drinkers?
 4. Which other behavioural traits occurred?
- The model and test method used in the following work can be found in [1]. Further information is contained in the full-length version in LANDTECHNIK-NET.

Results and discussion

Biological performance

Table 1 shows rearing performance during the trial 1. The results of a „ventil“ calculation (double pen) is given in the upper section. Penning weights were not significantly influenced by any of the tested factors. End of period weights and dlwg were significantly affected by stocking rate. Reducing the intensity of this led to higher dlwg and end of period weights. These differences, however, were not able to be secured in multiple average value comparisons. Feed consumption for lwg could not be significantly explained by the selected statistical model.

The results from individually weighed focus animals are presented in another sector of the table. Penning weight was significantly influenced according to cycle and interaction sex • stocking rate as well as tendentially (p<0.10) by sex. The end of period weights and dlwg showed only one secured relationship to the penning weight. Table 1 shows remarkable differences between the stocking rates which, however could not be secured statistically.

Feed intake behaviour; observation of anonymous weaners

The results of weaner group observations are given in table 2. In all variants a daily rhythm of feed intake was observed. The two-phase activities of pigs, plus an inactivity phase around midday are described repeatedly in the literature [2, 3, 4]. It must be said that, to a certain extent, the daily rhythms observed here can also be skewed through feeding and observation intervals which is why the statistical evaluation was conducted only within the observation time block.

The variance analysis of feeding occurrences indicates a significant effect of trial feeding periods and the observation week in all time blocks. The stocking intensity had no secured influence. This is remarkable in so far as the higher stocking densities should have led to increased feeding activity because of the greater number of animals when stocking intensity had no influence of feeding behaviour.

A very similar picture was formed by the number of attempts at feeding.

Feed intake and social behaviour; observation of focus animals

The behaviour of focus animals is shown in table 3. Anonymous data without observing animal-individual traits is presented. These are dealt-with in the full-length version and presented in more detail by [1].

No notable differences were to be seen in the recorded characteristics. Only in a few cases did the influence of a factor present itself as significant. As expected the number of rank fights were significantly affected by the observation week. There were numerous fights in the first week which were greatly reduced in the following week and tended towards zero by the end of the trial. The number of focus animals pushed away during feeding was tendentially (p < 0.10) influenced by weight at penning and significantly by feeding cycle. Significant effects from

Table 3: Number of behavioural mannerisms for observed focus pigs in relation to sex and stocking rate 1)

	m		w	
	40	48	40	48
Feeding	12,8	12,4	13,0	12,1
Ranking fights	2,0	1,4	1,7	1,6
Pushing others away	0,8	0,6	0,8	0,6
Being pushed away	0,5	0,3	0,3	0,3
Flank pushing	1,6	1,1	1,0	0,9
Drinking	1,4	0,9	1,8	1,4

¹⁾ Observations for individual animals were totalled according to pen and week, n= 112. Presented are raw average values for this data set.

flank pushing were apparent in the observation week; the maximum occurred in the middle of the rearing period. Drinking was significantly affected by all tested factors with the exception of the cycle.

Conclusions

Summarised, the work here showed that housing in large groups with sensor feeding is a method which can be aimed for in weaner rearing, giving high performance with very low losses. The increased biological performance in association with anonymous behavioural observations in the weaner groups showed, however, that modern feeding technology alone is not a guarantee that, even with increased animal numbers per pen and associated increased animal: feeding place ratio, a consistently good development of the piglet takes place. The results of the focus animal observations delivered no evidence of ethologically or economically relevant stocking rate influences, but this could be because of the short observation period. Through collective observation of the results it became apparent that the tested stocking rates did not differ dramatically and therefore in many cases tendencies, and not sharply defined discoveries, were presented.

Literature

Books are identified by •

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