Engel F. Hessel, Göttingen, and Katrin Cordes and Herman Van den Weghe, Vechta

# Feed Level Controlled Mash Feeders versus Conventional Tube Mash Feeders

## Piglet Rearing Performance and Economic Evaluation

*The influence on rearing performance of a sensor-controlled mash feeder, compared to a tube mash feeder, was tested on two groups of 25 piglets. In one group, the sensor-controlled feeding system was used for the first 14 days; after the 15th day they were only fed with the tube mash feeder. In group 2 only the tube mash feeder was used. Piglets in group 1 had a significantly higher daily gain. This could also be proven statistically after five weeks of rearing. A 660 g higher weight gain in the first two test weeks coincided with a higher feed consumption rate of 815 g.*

The aim of a well-balanced piglet feeding is to tap the full growth potential of the piglets and to avoid piglet losses due to feeding until the end of the upbringing stage. Weaning of piglets is characterised by [1] as psychological stress. The main stressors at weaning are separation of the sow, transport, hierarchy conflicts, germinal impact in a new surroundings as well as food changing from sow's milk to dry food. According to [2] the weaning of piglets is associated with a higher risk for abnormal behaviour, susceptibility to diseases and growth depressions.

The feeding system with a capacitive feed level sensor for weaned piglets should reach a smooth transition from the sows' milk by ration out mash in time intervals. Thus weaning problems are supposed to be reduced. In the following influences of the sensor feeder on piglets' growth were investigated and economical viewed.

### Housing conditions

The investigations were carried out in a force ventilated compartment with two pens. The size of each pen was 5.8 $m^2$, the perforated part for the floor was made of plastic grid, the lying area with its size of 0.6 m • 2.4 m consisted of plastic plates. Each pen was equipped with one tube mash feeder. In one of those pens a feed level controlled mash feeder was installed also. In this test group the feed level controlled feeder was the exclusive feeding system in the first two weeks, the tube feeder was switched off. After the first two weeks the tube feeder was turned on, additionally the feed level controlled feeder remained in the pen for two more days before removal. The comparison group was fed with the tube feeder during the whole rearing period.

### Feeding technique

The storage tank of the feed level controlled feeder had a 30 l volumetric capacity, the diameter of the trough was 25 cm (*Fig. 1*). The capacitive feed level sensor within this trough protected the food against overflowing. When the sensor detected food in the trough, mixing cycles would stop until the food in the trough had been consumed. Three

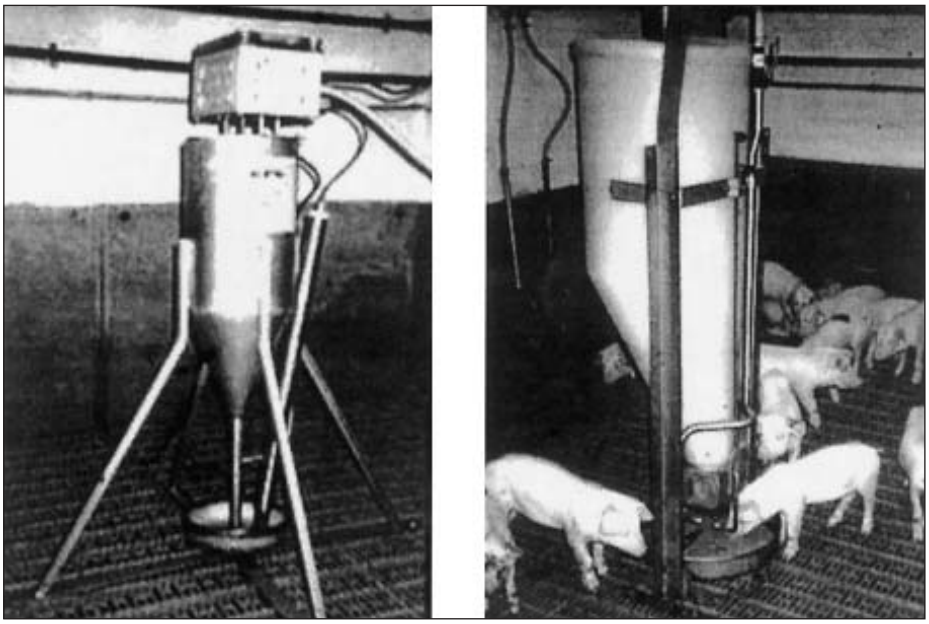

*Fig. 1: PreMixer (left) and Lean Machine (right)*

Dr. Engel F. Hessel ist wissenschaftliche Assistentin am Institut für Agrartechnik der Georg-August-Universität Göttingen, Gutenbergstr. 33, 37075 Göttingen; e-mail: *earkena@gwdg.de*.
Katrin Cordes war Masterstudentin am Forschungs- und Studienzentrum für Veredelungswirtschaft der Georg-August-Universität (Leitung: Prof. Dr. Ir. H. Van den Weghe), Driverstr. 22, 49377 Vechta.

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## Keywords

Piglets, sensor feeding, performance

## Literature

Literature references can be called up under LT 03505 via internet http://www.landwirtschaftsverlag.com/landtech/local/literatur.htm.

| | Test Group (n=75) | | Reference Group (n=73) | |
|---|---|---|---|---|
| | LSM | SE | LSM | SE |
| Weight gain 1 | (kg) 2,59[a] | 0,10 | 1,87 [b] | 0,10 |
| Weight gain 2 | (kg) 9,41[a] | 0,27 | 8,76 [a] | 0,27 |
| Weight gain total | (kg) 12,00[a] | 0,33 | 10,66 [b] | 0,33 |

a,b,c: LSM with different letters are significantly different.

*Table 1: Least square means (LSM) and standard error (SE) of weight gain 1, weight gain 2 and total weight gain depending on feeding system*

| | Daily weight gain g/piglet | | | Amount of food g/piglet | | |
|---|---|---|---|---|---|---|
| | in week | | total | in week | | total |
| | 1 and 2 | 3 to 5 | | 1 and 2 | 3 to 5 | |
| Test group (n=75 piglets) | 182 | 448 | 341 | 339 | 1210 | 1549 |
| Reference group (n=75 piglets) | 135 | 421 | 307 | 257 | 1215 | 1472 |

*Table 2: Daily weight gain (g) and food consumption (g/piglet) in each section of the trial depending on the feeding system*

piglets could eat at the same time. Mixing time and mixing cycle of the feed level controlled feeder could each be set at intervals of one to ten minutes. Per minute mixing 27 g of food was transported to the trough by a feed auger. Shortly before the food emerged it was mixed up with warm water. In this trial the mixing time and mixing cycle was fixed at two minutes intervals.

The trough of the tube feeder had a diameter of 40 cm and the storage tank had a capacity of 80 l. By piglets moving the dosing lever, food fell into the trough in which piglets could mix it with water into mash. Piglets were fed ad libitum, up to six piglets could eat at the same time.

### Collecting data

Data were collected from three rearing periods. In both pens piglets were housed in groups of 25 animals and with a balanced gender ratio. The piglets were breeds of PIC sows, which were mated with a stress resistant Pietrain boar.

The weaning of the piglets and the placement to the rearing compartment took place 21 days after birth. The average weight of piglets in the test group was 5.31 kg (±0.79 kg). Also, the mean weight in the comparison group was 5.31 kg (±0.81). Each piglet was weighted and rated on the day it was brought into the stall, then after two weeks and after five weeks. The feed level controlled feeder as well as the tube feeder were filled manually. The amount of food consumed was registered. The first 14 days of the rearing period the piglets were fed "Prestarter" (17.5 CP, 15.0 MJ ME, 1.5 % Lysine). The piglets were changed to "Starter" food (18.03 CP, 13,52 MJ ME, 1.23 % Lysine) from the 15th day.

Analysis of variance of performance data was carried out with the procedure "glm" (SAS Institute Inc., 2001). The fixed effects weight, group, weighting day, repetition as well as the interaction weight • group were taken into consideration.

### Performance

Significantly higher weight gains could be detected with piglets housed in the test group compared to the group fed with the tube feeder (*table 1*). The Least Square Mean of 2.59 kg for weight gain 1 (after 14 days of rearing) was in test group significantly higher compared to the reference group with 1.87 kg. From the third to the fifth rearing week, piglets were fed with the same feeding technique. In this period no significant difference between both groups could be determined (weight gain 2).

Regarding to the total rearing period of five weeks an advantage of the test group versus the comparison group could be determined (total weight gain). The difference between the Least Square Means of those groups amounted 1,34 kg.

The piglets were subjected to the same housing conditions with the exception of the feeding technique in the first two weeks of rearing. Obviously, the reason for higher weight gain has to be due to the feed level controlled feeder. Food fed by the feed level controlled feeder was always freshly prepared and was served warmed in the trough. On one hand it could be possible, that piglets prefer warm food compared to cold food. One the other hand it could be feasible, that piglets take in more food, if the mash is always freshly provided compared to food, for which piglets have to "work" in order to dose it into the trough, and there mix it up by themselves.

### Economic Evaluation

In the first two weeks piglets of the test group gained daily 47 g and in week three to five daily 27g more than animals of the comparison group (*table 2*). In the test group each animal consumed 242 g of Prestarter food daily in the first two weeks of rearing, whereas each animal in the reference group consumed 183 g per day. In the following three weeks the test group consumed 77 g more food per piglet compared to the reference group.

The prize of the Prestarter amounts € 90 per 100 kg. After two weeks of rearing the piglets of the test group reached a higher weight gain of 660 g per animal, which corresponds with 34.92 %. In these two weeks each piglet of the test group consumed 815 g (34.92 %) Prestarter more then the piglets of the reference group. Consequently, € 0.73 more has to be spent on additionally consumed food. In the year 2002 the mean prize for a piglet of 8 kg was € 5.02 per kg in specialised piglet rearing [3]. The additional weight gain of 660 g of piglets in the test group denotes € 3.31. After deduction of the additional feed costs of € 0.73, an increment of € 2.58 remains per piglet in comparison to the reference group.

## Literature


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