

Steffen Hoy, Gießen

# The Tipp-Feeder

## A New Feeding System for Weanlings

*The Tipp-feeder is a new animal-friendly feeding technique for weaner pigs. It transports dry feed, and after the weanling tips the dosator flap the feed is mixed with water to make the mash. The Tipp-feeder thus prevents hygiene problems and achieves high productivity through animal contentedness. Investigations repeated five times in two air-conditioned pig compartments showed that the piglets using the Tipp-feeder for the 37 day rearing period gained 26 g (468 g) more daily and had a lower coefficient of variation ( $s\% = 20.7$ ), than the control weanlings fed with tube feeders (442 g,  $s\% = 23.8\%$ ).*

The weaning of piglets is a critical moment in the development of the young animals. While the suckling piglets are nursed by the sows with a liquid feed (milk) synchronously in a hourly interval, they are fed very soon after weaning with a dry feed ad libitum under conditions of agonistic interactions with a animal-feeding place-relationship of 6 to 8 : 1 or more. At the beginning, the weaner pigs eat only small portions resulting in a deficit of energy. The piglets have a high need for warmth (28 to 30 °C room temperature necessary). The situation may become worse if piglets from different farms are kept together and if PMWS (Post-weaning Multisystemic Wasting Syndrome) caused by Circovirus infection in combination with PRRS (Porcine Respiratoric and Reproductive Syndrome) occurs. The piglet mortality may be increased and the daily gain may be decreased. Beside the separation of the weaner pigs from the sow herd and the isolated raising under the health care aspects, an animal-friendly feeding technique is of big importance. In general, the requirements on the raising of weaner pigs are characterized by the following criteria:

- rationed feeding of small feed portions because of prophylaxis of diarrhea soon after weaning distributed during the day, fol-

- lowing the species-specific feed intake behaviour and with an animal-feeding place-relationship of approximately 1 : 1 (synchronous feed uptake of piglets of the group using long trough feeding),
- transport of dry feed to the trough for feed hygienic reasons,
- offer of a dry-wet feed in the trough for nutrition-physiological reasons,
- continuous increase of the feed portion to ad lib feeding in the first two weeks after weaning,
- much water ad lib to drink,
- simple technique of feed transport und feed dosage as well as easy to be handle,
- mechanized and automated feeding,
- flexible to be used in different pig houses and pen structures,
- less wearing parts and longevity,
- high operational reliability and low costs per weaner place.

The Tipp-Feeder (Fig. 1) fulfilling these requirements will be shown for the first time at the EuroTier 2006 exhibition in Hanover.

### Principle and function of the Tipp-Feeder

The Tipp-Feeder consists of a wedge-shape storage vessel and a long trough. The piglets tip at a bidirectional double-walled feed chute to put the feed into the trough. The

Prof. Dr. agr. habil. Steffen Hoy is the head of the working group of Farm Animal Housing and Biology at the Institute for Animal Breeding and Genetics of the Justus Liebig University Giessen, D-35390 Giessen, Bismarckstraße 16; e-mail: [Steffen.Hoy@agrar.uni-giessen.de](mailto:Steffen.Hoy@agrar.uni-giessen.de)

### Keywords

Weanling, feeding technique, performance

Fig. 1: The Tipp-feeder for weanlings



storage vessel will be filled by hand or automatically via perpendicular tubes. Their height above the ground of the storage vessel can be changed so that small portions of feed can be supplied. Chains in the storage vessel prevent the arching of feed. From economical reasons the longitudinal trough was manufactured of plastic (so called KG tube), which proved after over one year's testing as stable material. A level valve waterer ensures that always water is available for free uptake in the trough. It is known that piglets after weaning first have to learn how to get water from nipple waterers and it can last some hours up to the first water uptake. Water is ad libitum available when using the level valve waterer. In order to prevent gluings of the outlet of the level waterer, a partition with a small opening is in the trough. One can prevent clogging the slot by a chain, which is set around the bar above the opening. The valve is adjusted in such a way that a water level is reached from 1.5 to 2 cm height. The feed is taken over a double-walled feed chute out of the storage vessel (Fig. 2). With each manipulation a small quantity of feed is proportioned into the trough. With pipes in the wedge-shape storage vessel the feed quantity per manipulation can be adjusted. It is prevented by the double wall of the feed chute so that the piglets can touch and stick the dosing mechanism together. A chain prevents adhering of feed in the chutes. Together with the water in the trough a feed mash is produced, which can be quickly eaten by the piglets. We recommend a piglet-feeding place-relationship of 1: 1 (at least in the period after weaning). The width of the feeding place of 15 cm per piglet offers approximately place for two weaned piglets, at least with a duration of the suckling period of three weeks.

### Own investigations

The investigations took place in two air-conditioned chambers of the Research station Oberer Hardthof of our institute. In each chamber one pen for 20 weanlings (0.30 m<sup>2</sup> per piglet) was established. In one chamber the Tipp-Feeder (1.50 m long trough, piglet-



Fig. 2: Detail: bidirectional double-walled feed chute at Tipp-Feeder

feeding place-relationship of 1 : 1), in the other chamber a tube feeder (AP-Swing, piglet-feeding place-relationship of 5 : 1) was installed. A total number of 200 weaner pigs equally distributed to both groups considering weaning weight, sex, genotype and litter were included in five repetitions. Different technical improvements were made from batch to batch. The room temperature at the beginning of the housing period was set at 28 °C . Additionally, infrared heating lamps for local heating were used in the first days after weaning. The room temperature was stepwise reduced to the end of the raising period with a duration of 5.5 weeks. The piglets were weighed individually after one and two weeks and at the end of the raising period. The concentrated feed for the piglets of both groups was weighed daily. The water intake was also measured daily (in each case with a measuring equipment for the level valve waterer in Tipp-Feeder, for the two waterers in the AP Swing tube feeder and the additional nipple waterer in both pens). The water consumption from the additional nipple waterers was low. All treatments due to a disease and possible losses were registered.

### Results

On average of the 100 piglets (5 • 20 piglets per round) the weaning weight was the same

(8.7 kg) in both groups (Table 1). The piglets fed at the Tipp-Feeder had a higher daily gain by 10 gram up to the end of first raising week. In the second week, the advantage of the piglets at the Tipp-Feeder concerning the gain per piglet and day was 29 gram compared with the piglets fed at tube feeder. The piglets fed at the new feeding technique reached a higher weight by approximately one kilogram at the end of the raising period with a mean duration of 37 days. The daily gain of piglets, fed at the Tipp-Feeder during the whole period, was about 26 grams higher on average of the five rounds compared with the control piglets at the tube feeder. The daily gain of piglets fed with the new feeding technique was higher in each of the five rounds reaching a difference between both groups of 51 and 54 gram in the last two rounds. Beyond that it has to be underlined that the coefficients of variation concerning the daily gain and the final weight were lower in the group of weaners fed at the Tipp-Feeder with a piglet-feeding place-relationship of 1 : 1. The coefficient of variation concerning the daily gain was 20.7 % in the group of the piglets fed at the Tipp-Feeder and 23.8 % of those fed at the tube feeder with a piglet-feeding place-relationship of 5 : 1. The reason for this results is to be seen in the equal chance for all piglets of the group at the Tipp-Feeder to eat synchronously at the same time.

| Parameter                                    | Tipp-Feeder<br>x ± s | Tube feeder<br>x ± s |
|--|----------------------|----------------------|
| weaning weight (kg)                          | 8,7 ± 1,6            | 8,7 ± 1,6            |
| daily gain in the 1st week after weaning (g) | 165 ± 93             | 155 ± 119            |
| daily gain in the 2nd week after weaning (g) | 266 ± 102            | 237 ± 101 *          |
| weight at the end of raising period (kg)     | 26,1 ± 4,6           | 25,1 ± 4,7           |
| duration of raising period (days)            | 36,8 ± 5,4           | 36,8 ± 5,4           |
| daily gain during the raising period (g)     | 468 ± 97             | 442 ± 105            |

\* p < 0.05

Table 1: Comparing experiments at the tipp feeder and the tube-wet feeder (five batches, 200 piglets)