SUMMARY

Weaning brings about great changes for the pig that often results in reduced growth, an increase in the occurrence of diarrhoea, and an increase in mortality. The problem is due to, among other things, the pigs not being accustomed to regulating their feed intake by themselves, since the sow controls how much milk they get and how often they may nurse. In addition, the pigs are not accustomed to eating large amounts of dry feed, and the gastrointestinal system is not adapted to immediately managing this type of food. As a result, there is an intense multiplication in the amount of haemolytic E. coli bacteria in the gut. A division of the feed ration into many small portions distributed over a 24 h period should help to reduce the problems within all these areas.

In the studies presented here, the effects of three different feeding frequencies with dry feed (1, 8 and 16 feedings per day, respectively), for newly weaned pigs are compared. Within each feeding frequency, ad libitum access to feed was compared to a strategic feed reduction on days 3-8 post-weaning. The second part of these studies consisted of a comparison of 1 or 5 feedings per day to newly weaned animals under conventional conditions. The aim was to study the effect of dividing the daily feed ration to newly weaned pigs into several small portions, while also studying the effect of combining this with a strategic feed reduction.

The comparison of the 1, 8 and 16 feedings per day, respectively, was carried out in a special research animal unit with 8 pens, where pigs from two litters were placed with two littermates housed in each pen. In four of the pens (a total of 103 groups), the pigs were fed once a day using a free feed dispenser with 1-2 eating places. Using a specially developed feed dispensing technique, the pigs in two of the pens (a total of 46 groups) were fed 8 times per day, and 16 times a day in the remaining two pens (a total of 45 groups) (Figure 1). In half of the pens for each feeding frequency, the pigs were exposed to a strategic feed reduction on days 3-8 post weaning. The pigs were studied for two weeks after weaning.

A total of three pigs died of E. coli-associated postweaning diarrhoea (two with 1 feeding per day and one with 16 feedings per day; two pigs (both with one feeding per day) died due to other types of gastrointestinal disturbances (Table 1). The most common observation of disease was diarrhoea, but 85.3% of the pigs with 1 feeding per day did not have any
disease notations; nor did 93.5% of those with 8 feedings per day or 85.4% of those with 16 feedings per day (Table 2). The differences between feeding frequency groups with respect to morbidity and mortality were, however, not significant. The proportion of animals with diarrhoea scores of 2 or 3 did not differ significantly between these groups (Figure 2). On the other hand, pigs with 8 feedings per day had a tendency to have a lower proportion of animals with a dominance of haemolytic E. coli in the faecal samples (Figure 3).

Feed consumption during the first three days was highest for the pigs with 8 feedings per day, and lowest for those with 1 feeding per day. This difference was significant (Table 4). The trend was the same for growth during the first three days, but the differences were not significant. For the entire study period, no large differences were seen for the three feeding frequencies with respect to feed consumption, growth or feed conversion.

Behaviour studies showed that during the first 24 hours after weaning, the pigs with 1 feeding per day had the lowest total eating time and the fewest number of eating visits to the feed dispenser (Table 6). The trend was the same for the daytime during the remainder of the study period, but the differences were not significant.

No increase in the level of blood cortisol in the first days after weaning, which could indicate an increase in stress, could be detected in any of the pigs in any of the treatment groups (Table 8).

The use of a strategic feed reduction had a similar effect on all the feeding frequency groups, so only the total effect of the feed reduction (not per feeding frequency) has been reported here. The three pigs that died due to E. coli-associated postweaning diarrhoea had all ad lib access to feed, whereas the two that died due to other gastrointestinal disturbances had been fed restrictively. Both the number of days with severe diarrhoea and with the presence of a dominance of E. coli in the faecal samples were significantly lower for the pigs with a strategic feed reduction (Table 3). As expected, the animals with the strategic feed reduction had a significantly lower feed consumption and growth during the two weeks after weaning, while on the other hand, the feed conversion was significantly better (Table 5). The restrictive feeding also affected the eating behaviour of the animals on day 6. In all, the restrictively fed pigs had a significantly shorter eating time, whereas the number of feeding visits, however, was significantly more during the daytime period. No difference was seen for the night period (Table 7).
In the second part of the study with conventional pens, all the pigs had ad lib access to feed, and all feeding was done during the normal working day. The pens where the pigs were fed 1 time per day were supplied with an automatic feed dispenser with 2-3 eating places, while the pens with 5 feedings per day were equipped with a long trough where all the pigs could eat together. A total of 14 groups of 10 pigs each were studied in each system.

No significant differences in the observations of animal health could be detected between the two feeding systems. However, a total of three pigs died due to E. coli-associated postweaning diarrhoea, of which two had been fed 5 times daily and one 1 time daily. Two pigs from the group fed 5 times daily died due to other gastrointestinal disturbances (Table 9). The only observation of disease noted was that of diarrhoea. However, 98.6% of the pigs receiving feed 1 time daily and 96.2% of those receiving feed 5 times daily had no observations of disease (Table 10). There were no significant differences between feeding frequencies with respect to the number of days the pigs had diarrhoea scores of 2 or 3.

Feed consumption during the first three days postweaning was significantly higher for the pigs fed once daily in the feed automat. Even during the first week of the study their feed consumption was somewhat higher (nearly significantly so). In addition, both growth and feed conversion during the study period were significantly better for these pigs (Table 11). The better feed conversion could probably be due to the greater amount of feed spilled from the long trough than the automatic feed dispenser.

In summary, the results of the study indicated that a division of the feed ration to newly weaned pigs into several small portions could have a positive effect on animal health and production. Pigs fed 8 small meals per day had the fewest health problems and were faster to start eating dry feed directly after weaning. An additional division into 16 small rations per day did not have any further positive effects. As expected, the strategic feed reduction led to fewer E. coli-associated diarrhoea problems after weaning. As expected, feed consumption and growth was reduced; however, feed conversion was better, in comparison to that of the animals allowed ad lib access to the feed. The results of the studies under conventional conditions indicated that the division of the feed ration which the pig via its natural eating behaviour does when obtaining feed from an automatic dispenser with 2-3 eating places, appears to be just as positive for the animal as a
controlled manual division of the ration via free feeding into a long trough. If it is necessary to use a strategic feed reduction in the herd, it can only be carried out in systems where all pigs can eat together.