SUMMARY

An interdisciplinary research program on organic pig production, EKOPIG, was financed by FORMAS and by SLU. Part IV of EKOPIG was carried out at SLU-Alnarp and emphasis was on housing systems for organic growing-finishing pigs. In this part, an animal house for organic growing-finishing pigs was built. The planning and construction of the building is described in this report.

When planning the design of the animal house, a number of principles were taken into consideration. Among others, the pigs should be easy to control and monitor. It should also be easy to control feeding and production, to weigh the pigs, and to send them to slaughter. The labour requirement should be minimized by using automatic manure and feeding systems. The building construction should be simple, uninsulated, and self-ventilating, and to a major extent be constructed of locally available wooden material. In addition, dung contact between the animal groups should be avoided.

The house had room for 128 growing-finishing pigs distributed into 8 pens of 16 pigs each (Figure 8). There were two different pen types, of which one had deep straw bedding (Figure 15), and the other had slanted floors and the "straw-flow" system (Figures 12 and 16). The pens were designed according to the EU and KRAV regulations (with or without letting the animals go outside). The total pen area was 1.5 m² per pig inside and 1 m² per pig outside on the concrete area. The building was constructed at JBT’s research farm for pig studies at Odarslöv, and had bearing outer walls and framework roof trusses.

The animal house was located near the existing manure container (Figures 1 and 2). The concrete floor was poured on location (Figure 3) upon which walls were built up of cavity cement blocks.

The sides of the dung channel and the wall towards the animal area were also built of cavity cement blocks (Figure 4). The lower section of the wall was built of light-clinker blocks which were plastered on both sides, and above this section the wall was made of a wooden frame covered with wood panels (Figure 5). The roof consisted of cement fiber plates (Figure 6). There was natural ventilation due to the wooden slats on the walls and an open roof ridge with transparent covering. The roof ridge was furnished with a wind shield and was solid the first 4 m from each gable.

The pen with the straw flow system had a lying area which was covered and a floor profile slanting to the dung channel (Figure 16). All the pens were placed in a row with openings towards the north (Figure 13) facing the concrete area and pasture. An inspection passage was placed along one of the outside walls (Figure 9). The concrete outside lying area had the same design for all of the pens (Figure 14). The floor profile for the pens and concrete areas are shown in Figures 10 and 11.

The pigs were fed using an automatic dry feed system (Figure 18) in transverse troughs (Figure 17), and over the troughs water pipes with nose valves were placed so the pigs had the possibility of wetting the feed. Roughage was distributed in containers placed in the concrete area on the stable walls (Figures 19 and 20). The pigs had free access to water via a water cup located in the dung alley (Figure 21). The water installations were protected from frost using an electric heating cable inserted in the
water pipes in the animal house. Ordinary straw was used as bedding and it was handled in the form of big bales transported into the house using a tractor with a front loader (Figure 22).

The dung from the animal house was managed both as solid and liquid manure. The pens with deep straw bedding were cleaned using a front loader once per batch, and the dung transported to an area for solid dung located near the animal house. The pens which had slanted floors were kept clean via the activity of the animals. Straw was distributed to the lying area and much of the straw carried out to the pen floor. Due to the animals’ activity it ended up in the dung area (10% slant) at the lower end of the pen. There it was mixed with the dung and pressed down by the pigs through an opening between the floor and the pen wall (Figure 23). A dung alley/channel with concrete slats connected all the pens (Figure 24), and it was scraped daily using a cable driven scraper (Figure 25). The dung was moved to a pump well and then pumped over to a storage container. The manure was mixed before pumping by pumping it around (Figure 7) the dung channel on the outside area.

During the planning phase for the animal house, many calculations for the use of feed, water, straw and as well as the quantities of dung and urine which would be produced were carried out (Table 1).

An estimation of the building costs was carried out with the help of the data for cost estimation for farm production buildings obtained from the Swedish Board of Agriculture (Table 8). The present calculation was based on the prices for 2002, and the estimated cost for the animal house was 1,465,000 SKK, or 11,450 SKK per pig place. The building area per pig was 3.9 m² including the service areas. The cost of the manure containers and straw storage was not included in this estimation.

The size of the pasture areas was calculated and consideration was taken to the recommendations for maximum nitrogen and phosphorus loading (Tables 2 – 5) per ha for pigs on pasture. An estimation was made of the amount of the produced manure which would remain in the house or be on the outside areas. For 4 of the 8 pens (Figure 26) fenced lots were made (Figure 28) which the pigs had access to in the summer months. Special transport alleys (Figure 27) out to these lots were also built to maintain a good longevity for these hard used areas. The pasture lots were established with a wide range of grasses (Table 6) which were completed later with more diverse species (Table 7).