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Investment requirement for new feeding pig house

In recent years an important structural change has occurred in pig production. The farm expansion trend continues. Especially for pig feeding, increasingly large housing is being built for specialised farms. For successful pig feeding in such houses, large groups of homogenous piglets are required. This demand is met by increasing herd size in breeding and rearing units. In the context of the KTBL work programme „Calculation records" larger breeding houses [1] and feeding houses [2] were investigated and, to round this off, this report looks at the investment requirements for feeding houses.

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Keywords

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Production methods, herd size and building design have been decided together with specialists within a KTBL working group. Feeding place number is matched with the house variants [1,2] for piglet production and rearing. In this context the majority of new feeding pig buildings feature fully slatted pens and are insulated. In the main, large pens for around 40 pigs are built with normally four to six pens per compartment giving housing compartments for 120 to 240 head. While houses for up to 1 000 pigs tend to feature a one-side ridge-roofed design with a servicing passage along the outer wall, in larger facilities the pens are arranged along both sides of a service passage. Normally, sluice channels under the slats service manure withdrawal. Slurry storage is in silos outside the buildings. Mash or liquid feeding plants are used for feeding with feed components stored in outside silos.

Currently, straw litter does not feature in housing for larger herds and is therefore not considered in the following report.

No-straw systems have also established themselves for natural-ventilation housing, which are normally built for smaller or mid-sized enterprises because of the limited building breadth of maximum 15 m which cannot be exceeded because then the necessary air circulation from the sides could not be achieved [3]. Thus, only deep pens for large groups with feeding beds can be arranged along a single side of a servicing passage or, for smaller groups with lying boxes, two rows of pens. Not possible, therefore, is a compact design as with fully enclosed houses with air intake ducts and exhaust air technology. The result is long building design, and long working distances with the larger enterprises [4].

Figure 1 shows the ground plan of the featured housing design. Respective number of feeding places and compartments per house are also given.

Building description

Cost block: house

In all cases the foundation and underfloor are of steel reinforced concrete. The outer walls of the fully-enclosed houses feature a primary wall of lime-sandstone plate elements. Between this and the outer cladding of profiled sheet metal is an insulation layer. The interior wall is also of large-format lime-sandstone blocks. The rood bearers are of prefabricated timber trusses, each spanning half the house width – from the outer wall to an interior longitudinal wall. Roof cover is planned as sheet steel with plastic coating and hardfoam insulation fitted into the profiling. Additional insulation panels are fitted under the cross beams and repre-

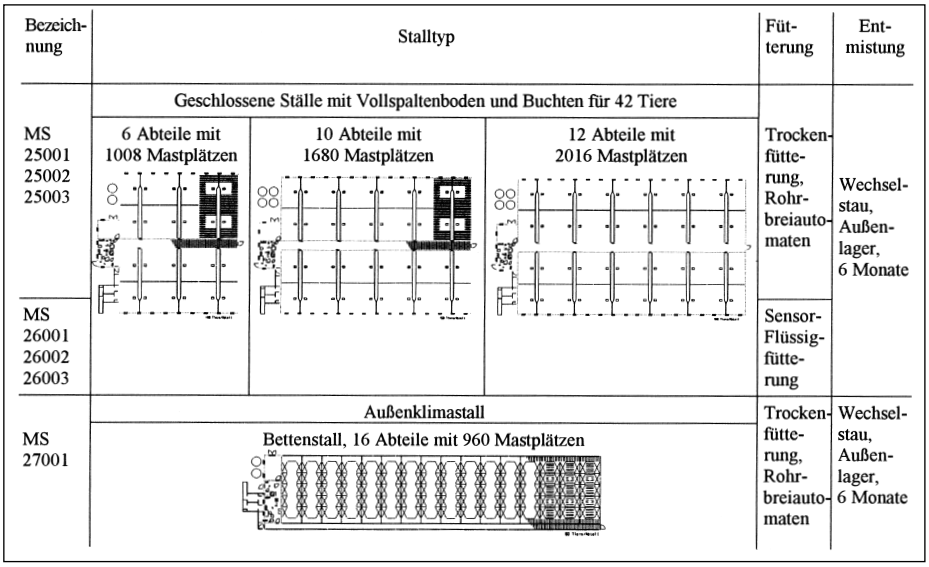


Fig. 1: Selected pig fattening houses

sent the barrier between interior and roof space.

Total house flooring is of prefabricated concrete elements resting on the concrete slurry channel walls. The lower portions of the pen partition walls are of plastic panels and the upper parts of steel tubing. Warm water central heating with delta heating pipes through the individual compartments give optimum temperatures in winter. Heat source is a gas wall heater fitted in the service passage. Exterior air comes through one of the gables into a central inlet air canal over the service passage and thus into the interior. From the service passage, the air is channelled into the respective house compartments via smaller inlet ducts with perforated surfaces. Fans and exhaust air ducts are situated in each compartment for air extraction. The technical equipment includes a control system for ventilation, sanitary and electrical installations.

The building framework for the naturally ventilated housing is of zinc-galvanised steel. The outer walls are of solid masonry to a height of 0.75 m, above which is Yorkshire boarding. Floors are concrete slatted. Under the roof surfaces, pens have lying boxes with insulated walls and lids and plastic curtains.

Cost block: feed
Outer silos and chain and flight feed pipes are featured in all alternatives. Planned for the alternatives 25001 to 25003 and 27001 are wet feed tube automatics. Liquid feeding with mixing vat, pipelines, short troughs and sensor feed level control are to be used in the alternatives 26001 to 26003.

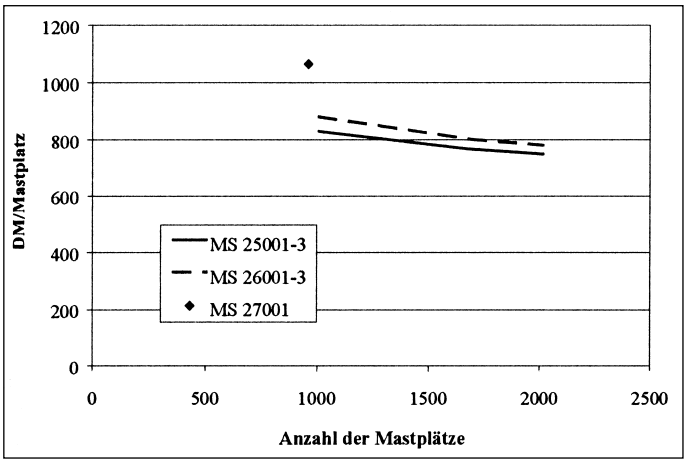
Cost block: manure
Under the slatted floor surfaces are 70 cm deep slurry sluice canals running into an 80 cm deep collection canal. Planned for storage are aboveground steel-reinforced concrete silos.

Cost block: ancillary plant
This includes loading ramps and ancillary rooms for office, shower, changing and toilet. In each case these are situated in a gable in the building middle.

Method

The building costs were determined at FAL according to the building cost-compound system [4], the data being taken from built and calculated building projects. The results including the elements with their performance positions are available – from the first classification level of DIN 276 „Costs in building“ through to the third and finest classification level.

Fig. 2: Investment requirements for pig fattening houses



Additionally, the distribution of building costs according to cost blocks follows. The cost blocks are based on function-related building parts or groups of buildings parts. For feeding pig houses, the cost blocks are house, feed, manure, and ancillary plant – as presented in the building description.

Investment requirement

The following cost parameters given in DM per feeding place are gross values and include purchase tax.

The investment requirement per feeding place for the insulated housing with dry feeding (MS25) is between 830 DM for 1008 feeding places and 750 DM for 2016 feeding places. The respective figures for housing with liquid feeding (MS26) are between 880 DM and 780 DM. The cost digression from the smaller to the larger enterprises is highlighted in *figure 2*. Liquid feeding costs per feeding place with the smaller herd size are 50 DM higher than mash feeding.

The cost for the 960-place naturally-ventilated housing was determined as 1065 DM/feeding place. This is around 200 DM/place more than for a fully-enclosed house of the same capacity. This difference features not only the increased space per pig in the naturally ventilated buildings. Through the simpler building shell compared with the solidly-built insulated houses, the extra cost per feeding space, despite the larger room per pig, only represents 40 DM. On the other hand the equipment in the naturally ventilated housing costs almost double because of the lying boxes which are not required in the insulated housing.

At this point it must be emphasised that the building cost data in question are based entirely on commercial builder charges. However, a large number of examples from practical work indicate that farmers apply a lot of farm labour in the building – especially with these types of housing.

The cost block „housing“ represents, according to the size of herd, between 50 and 55% of the building costs. The representative figures for the cost block „manure“ are 31 and 43%. „Feed“ represents between 8 to 13% and ancillary plant 2 to 4%.

Summary

Germany is among the countries where bigger pig houses are being built. The insulated house with solid walls and optimum ventilation technology and heating remains standard. Differences are reflected primarily in group size, feeding system and type of flooring. For housing with 1000 to 2000 pig places, building cost per place is between 830 and 750 DM.

Naturally-ventilated housing is suitable mainly for smaller to mid-sized enterprises. Running costs are saved through free air movement without technological help. The building costs, however, based on builder charges, are higher than those for insulated buildings. But because of the simple building shell they are especially suitable for building with farm labour. Examples in practical farming indicate that this can allow the naturally ventilated houses to be built for the same price.

Literature

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