Jürgen Gartung and Kerstin Uminski, Braunschweig

Investment requirements for new piglet rearing houseing

Up until a few years ago the rearing of growers usually took place together with piglet production, in separate compartments, but in the same building. But through substantial increases in stock numbers in sow, as well as in feeding pig, enterprises separate piglet rearing houses are nowadays being built. Matched with the breeding sow housing investigated in the preceding year as part of the KTBL working programme „Calculation records" cost parameters for the erection of selected new rearing houses are here determined [1,2].

Dipl.-Ing. Architekt Jürgen Gartung is a member of the scientific staff (juergen.gartung@fal.de), Dipl.-Ing. Kerstin Uminski is scientific-technical staff member, at the Institute for Farm Technology and Building Research (IBB), FAL, Bundesallee 50, 38116 Brunswick

Keywords

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A great help in the determination of standard types and enterprise sizes was the selection from the BML model project 1999/2000 „Housing solutions for piglet rearing" from 61 plans submitted by KTBL. Around two thirds of farms decided to built enclosed houses with forced ventilation, one third naturally-ventilated housing.
The number of piglet rearing places was up to 4300.The majority represented housing with 1000 to 3000 places and this size appears to be the most likely for future building projects.

The number of rearing places depends on a whole series of factors. Alongside the labour management and financial possibilities, the production chain components play one of the most important roles.

Choice of system

Production system, unit size and design of the building to be investigated were established together with specialist from a KTBL working group.

The number of places is dependent on piglet production capacity in the supplying unit(s) and the costs for there were determined in the same way in the 1998/99 investigations. Only sow housing with a weekly weaning routine and weaning at 21 days was selected. With 240 productive sows (ZS 10001; ZS 10004) around 1000 piglet places are required, 320 breeding sows (ZS 11001; ZS 11003) require 1400 places and 640 sows (ZS 12001; ZS 12003) around 2800 places [1,2]

It was assumed that after 21 day weaning the piglets would move into a separate building to be reared, without further re-housing, up to a liveweight of 25 to 32 kg.

The penning and evacuation of the pigs took place in a one-week rhythm according to the department-based in-out-method. Before every new housing the respective house compartment was thoroughly cleaned and rested for a week. For this system, nine compartments are required.
According to the system described, the following factors were established *(fig. 1)*:

- 9 compartments, each for 120 head = 1080 places
- 9 compartments, each for 160 head = 1440 places
- 9 compartments, each for 320 head = 2880 places.

With four pens per compartment this means 30, 40 or 80 piglets per pen.

The compartments would be situated on each side of a service passage. Flooring is fully slatted of plastic elements. Fully-closed 50 cm high profile plastic walling topped by steel tubing is used for partitions between pens. Two different designs are used for manure management. In one, lateral sluice canals run into a deeper main longitudinal collection canal running under the service passage. In the other, shallow basins under the slats at first hold the slurry before it is released through a pipeline into a pre-storage pit. In both cases the slurry is then stored in above-ground silos outside the housing.

Two solutions have also been suggested for feeding so that they can be investigated with regard to building costs:

- wet feed tube automatic for ad. Lib. feeding (for all sizes of enterprise)
- round-trough interval feeding, rationed and sensor-controlled (for mid-sized enterprises)

In both cases dry feed is stored in Trevari silos in forward areas, being then transported into the wet feed tube automatics or round-troughs via cable and flight pipeline.

Naturally-ventilated housing was also built for piglet rearing. For the estimation of building costs it was decided to include a house with 1440 piglet places in the investigation. This was a „Nürtinger system" lying box house with 12 large group pens.

While the enclosed houses were in the main solidly built with blocks and cement, the outer walls of the naturally-ventilated houses is only built this way for the first 0.75 m and above this features Yorkshire boarding to facilitate lateral ventilation.

The roof-bearing framework of the naturally-ventilated housing comprises clear span steel frames. The roof area consists of metal panels insulated underneath with hard foam.

The inner shell of the insulated enclosed housing is of lime-sandstone, the outer cladding of profiled sheet metal. Between is an insulation layer.

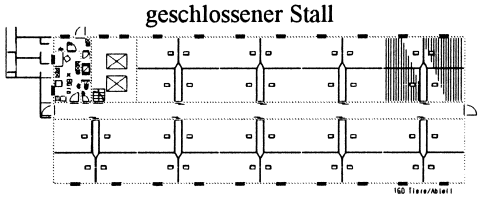
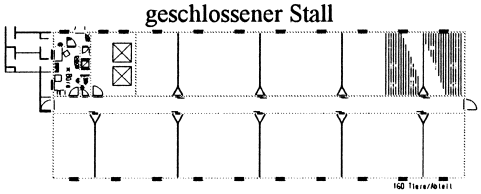
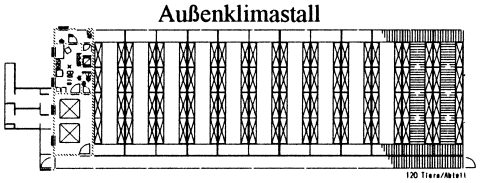
Bezeichnung	Stalltyp	Tierplätze	Fütterung	Entmistung
FA 01001	geschlossener Stall 	1.080	Rohr-Brei-automaten	Wechselstau
01002		1.440		
01002R		1.440		Rohrentmistung
01003		2.880		Wechselstau
FA 02001	geschlossener Stall 	1.440	Rundtrog, sensorgesteuert	Wechselstau
FA 03001	Außenklimastall 	1.440	Rohr-Brei-automaten	Wechselstau

Fig. 1: Selected piglet rearing houses

In this case, the roof-bearing frame comprises prefabricated timber trusses. On the under trusses or rafters, insulating panels of hard foam are attached and form the upper surface to each compartment.

Regarding the necessary ancillary rooms there is a feed store in all housing, an office, a changing room and a shower room. Positioning of these within each building was forced into a gable side. Here, the arrangements for loading the animals were also best created. In fig. 1 are demonstrated the selected examples in the plan elevation.

Method

The building cost data were determined at the Institute for Farm Technology and Building Research (BB) according to the Building Cost Compound System [3]. The data were collected 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. Additionally, the buildings costs were separated according to cost blocks.

Cost blocks are function-related building components or building component groups. The cost blocks with piglet rearing housing comprise housing, feed, manure and ancillary plant. To the ancillary plant belong office, bio-security arrangements and loading facilities.

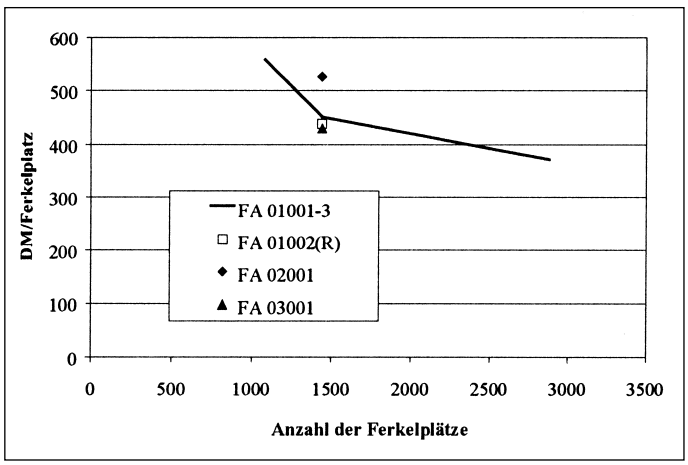
The cost values are given gross and inclusive of purchase tax.

Investment requirement

The investment requirement per piglet place with new housing was between 560 DM for 1080 places and 370 DM for 2880 places *(fig. 2)*. These results applied to the enclosed housing with wet feed tube automatics and manure sluice canals (FA 01001-03). A cost digression from smaller to larger enterprises was clearly seen.

Round-trough feeding with sensor control required, with the mid-sized units with 1440 places (FA 02001) around 75 DM/place more investment than for the same housing with wet feed tube automatics.

Fig. 2: Investment requirements for piglet rearing houses



Comparing the manure management systems – sluice canals with pipeline drainage – also based on 1440 piglet place housing, a cost advantage for the pipeline drainage of 13 DM/place was shown because the collection canal was not required and the basins under the pens were only 40 cm deep instead of the 80 cm deep sluice canals.

The naturally-ventilated housing (FA 03001) for 1440 piglets was around 21 DM per place cheaper as the same size of enclosed housing with wet feed tube automatic (FA 01002).

Summary

The trend in German pig production towards larger units leads, in piglet rearing too, to enterprise expansion and thus to the construction of separate piglet rearing housing with increasing piglet group size.

With good groundplan design and a rational approach to building it is possible to build for 550 DM/piglet place in larger units of around 1000 piglet places and for around 350 DM/place where there are 3000 places. The naturally-ventilated housing investigated was slightly cheaper.

The solution chosen by respective farms depends mainly on the management.

Literature

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