

# Universal buildings for farming

## Possibilities and limits

*Despite their similar roles farm buildings are usually built according to individual plans making building costs higher than with standard designs. Here, a standard building 15 m wide and with 4.25 m eaves high is proposed for use in many roles (nine basic possibilities). Another plus for the standard building concept is that construction estimates are more comparable. The costs for standard farm buildings will sink, whilst variety in design has its price.*

For years, farm building design followed an almost unchanging tradition. Construction systems were related to the standard of handwork and the buildings were produced accordingly. Dairy cows and followers were kept in a byre with hay and straw stored in the loft. Functional building widths for this were 11 to 13 m. Regionally differentiated types of buildings emerged according to size of farm. These local versions were similar in their appearance and harmonised with one another to give a uniform village appearance. From experience the builder knew how the barn was to be erected, how masonry and timberwork were to be dimensioned. On transport grounds, locally available materials were used and this set limits on appearance variations.

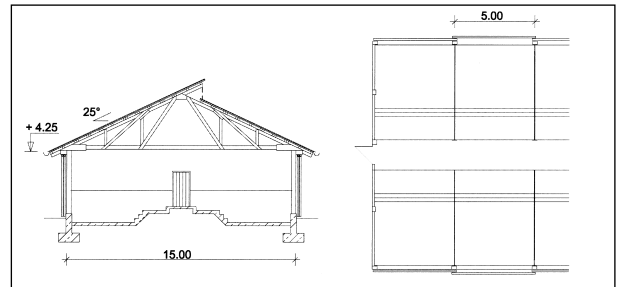


Fig. 2: Section and ground plan for keeping fattening pigs on deep litter

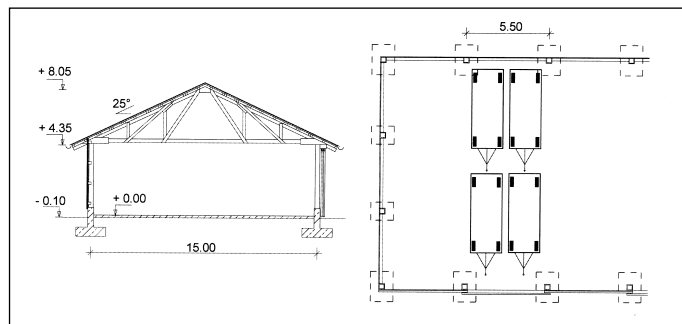


Fig. 1: Section and ground plan for machinery and harvested crops

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## Keywords

Farm buildings, standard types, universal buildings

This situation changed gradually as technology advanced to take over the sweat-producing labour or to replace personnel. For example, the construction of a hay elevator demanded a roof with a straight axis and good throughflow facilities.

A total break with building tradition was heralded by the ground-level housing of livestock with massive walls and rafters and later with transparent ridge gap covers in the roof construction. The introduction of cubicle loose housing reaching breadths of 22 to 24 m brought building dimensions right out of tradition. The three-row cubicle loose housing with a section for followers is in part still standard nowadays but despite this the progression of the years have brought no uniform measurements for the building breadth and for the locations of necessary supports which can be used as binding reference points for the planner and draughtsman who are not expert in farm requirements. Despite the similar roles for the buildings, every builder had his own personal measurements and a classification was unthinkable, not to

mention simplification.

It was a considerable relief for everyone involved in building when, for certain production situations, one was able to agree upon fixed static building breadths and heights. Construction firms then had the possibility of producing a certain type of building in advance during slack times with the knowledge that this was certainly marketable. From closer study of the building breadth required for specific uses, the 15 m breadth crystallised out as one that allowed a multiplicity of uses.

## Machinery and storage barns

Barns for machinery and general storage 15 m broad and 14.25 m at the eaves are developing increasingly into a universally used building shell (fig. 1). Classical use is for the parking of larger machines and implements. With supports at 6 or 6.25 m spacings, two trailers can be comfortably parked alongside each other in a single bay. They can also be parked coupled in tandem in a building that is 15 m wide which is especially valued on cereal farms which have to park fully loaded trailers indoors overnight.

15 m barns are also especially suitable for storage of hay and straw in round or rectangular bales. Fitting section walls allows on-floor storage of grain and bulk fertiliser. The building must be designed so that the increasing use of wheeled or telescopic loaders is not obstructed.

The building configuration allows the easy building-in of three rows of horseboxes. This breadth is also sufficient for a horse exercise

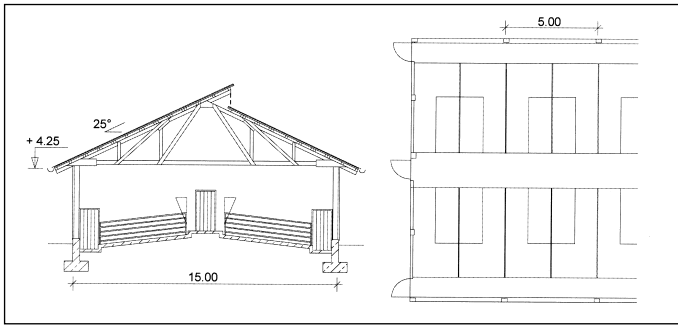


Fig. 3: Section and ground plan for keeping fattening pigs on sloped floor

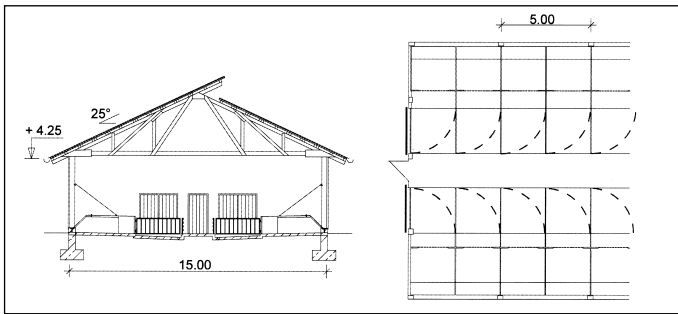


Fig. 4: Section and ground plan for keeping fattening pigs kennel housing with littered dunging area

building (building regulations) but not for a riding hall according to FN measurements.

### Feeding pigs on straw

Producing feeding pigs on deep straw has developed into a niche enterprise with individual marketing channels, and this system can fit well into a 15 m broad building. Two groups of pigs can be housed in an all-in-all-out system per building section. Bedding with big bales and dunging is possible with front or wheeled loader via sliding side doors (fig. 2).

### Feeding pigs on sloping floors

Natural climate housing is not only for cattle, it is causing increasing pleasure in feeding pig production too in that it offers enormous cost advantages as far as investment is concerned and is far superior to the classic insulated building for emission control. The sloping floor pens arranged in two rows with a middle passage, feeding area, sloping area with movement and roofed lying section and with additional scraped slatted and roofed dung passage on the side has the functional measurements that fit exactly into the 15 m breadth (fig. 3).

### Feeding pigs in kennels with bedded movement passages

Fitting well into a 15 m wide building as a further variant of feeding pig production in natural climate housing is the kennel system with solid flooring and bedded concrete areas (fig. 4). The middle passage is a little broader and this allows the transport of round bales which is then pulled into the

dunging area by the pigs themselves when the litter already there is used up. 2.50 m should be the minimum breadth of dung passage so that there's not too much hindrance for the drive through of tractor and scraper.

### Four row cubicle loose housing with feeding on the side

Up to 90% of new dairy cow buildings nowadays are naturally ventilated and are usually for at least 60 cows. A model for this which fits well into 15 m breadth is a four row cubicle loose housing concept (fig. 5). The feeding area with around 3.50 m breadth and the feeding table can be constructed as a

partially-roofed lean-to on the side of the building. This design has the advantage that the main building is thus saved from appearing to dominating and so fits better into its surroundings. At a gable end, parlour and other technical offices can be situated in a bricks and mortar frost-free building. The four-row cubicle design is very compact and when used for an automatic milking system has the advantage that the cow traffic can be relatively easily controlled.

### Suckler cow housing with straw flow and straw storage

It is recognised that suckler production cannot carry too much investment. And old buildings suitable for housing with relatively little conversion stand mostly in the wrong location so there's often nothing for it but to erect a new building beside the grazing location. Within a 15 m wide building shell, the straw storage area, the sloping lying area and the manure passage and the feeding area all fit in. The feeding table fits into the side of the building and can be protected by a jutting 2.50 to 3.00 m roof. With an eaves height of 4.25 m enough air volume is available as long as the feed table side is kept open (fig. 6).

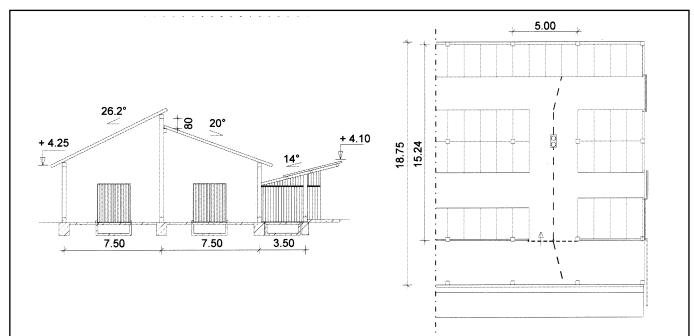


Fig. 5: Section and ground plan for an four row cubicle housing system outside feeding passage

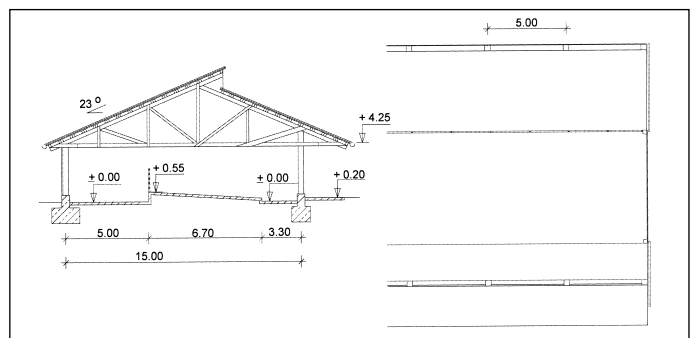


Fig. 6: Section and ground plan for an sloped floor house for suckling cows and straw storage