

# Veepro dairy management



New building in Mexico

## Building or extending a cow house requires a lot of foresight

Housing takes up a prominent place in modern dairy farming. Through the years its importance has done nothing but increase. Bigger herds and a higher production per cow, as well as mechanisation and automation in feeding and milking are speeding up the development of modern housing systems. Now we are aiming toward options that reduce costs but provide higher animal welfare.

The seventies and eighties saw a radical change in housing. The old system of cows tied up underwent a transformation when loose housing with cubicles was introduced. This is a cubicle house in which the

cows can move about freely or lie down in a cubicle and start feeding at the feed rack. These cubicle houses were a new phenomenon inspired by the need for faster milking with less effort. This way of milking took place in an open

milking parlour, a system that did not go together very well with the tie-stalls. During less than thirty years almost all of the Dutch farms changed from tying stalls to loose housing. But the new way of milking was not the only change. A

different way of feeding also played an important part in the arrival of the cubicle house. Grass silage and maize silage took the place of hay as a roughage. These products, often stored outside the cow shed, were now taken to the feed racks by a tractor with front end loader or a feeding mechanism. This simple way of feeding requires a passage with easy tractor access. All over the world free stalls have now become a main type of housing. In temperate zones with capital-intensive farms the most common type is cubicle housing. Deep litter housing is a well-known type of free stall, too.

# Criteria for the type of housing

A key factor in the 'modern' farming set-up is labour efficiency. This requires a compact and well thought-out type of housing. From the aspect of hygiene and prevention of infections it is important to have two operational routes, one clean and the other dirty.

Several factors determine the dairy farmer's choice of housing. These factors are always typical of the farm and therefore they will lead to a particular type of housing with renovations for the farm. The factors are the following:

- Size
- Method of milking
- Method of feeding
- Labour
- Grazing

- Individual preference
- Space available

## Made-to-measure

The farmer who is going to build a completely new farm or modernize all cow houses must look ahead and work out the whole outline. Every one of his decisions is going to determine the labour organisation of the farm for the next twenty years or more. There is the matter of the housing for the different groups of animals, the feed storage, the machine shed, manure storage, the milking plant, milk tank and the office. Even the place of the house may affect the farm's efficiency. Fixing these places is precise measurement! The building plan of the farm next

door will not suit your own farm.

It is important to keep paying attention to the farm objectives. Consider the (restrictions of) present factors, but also think of the position of the farm in ten years time. If there are plans, for example, to switch over to a milking robot or feeding robot, then you will have to anticipate these plans when constructing the housing.

## Anticipation

When building completely new, all requirements that are specific for the farm can be taken into account. When renovating existing housing this is a lot more difficult because the farmer will usually alter only part

of the buildings. But in these situations, too, it is important to have a perspective on the future so that later modernizations will not be overlooked.

When building work is done the housing is usually expanded. That must be easy to do. A farmer should apply the rule that he must be able to extend a building without any hindrance to other buildings. For example, site the feed storage next to the cattle housing so that it is always possible to extend the cattle housing lengthwise. And set up the milking parlour in a separate extension so that any alteration of the milking parlour has no direct effect on the cattle housing.



Prevent that water or rainfall can enter the stalls

## Cow house must always be located higher

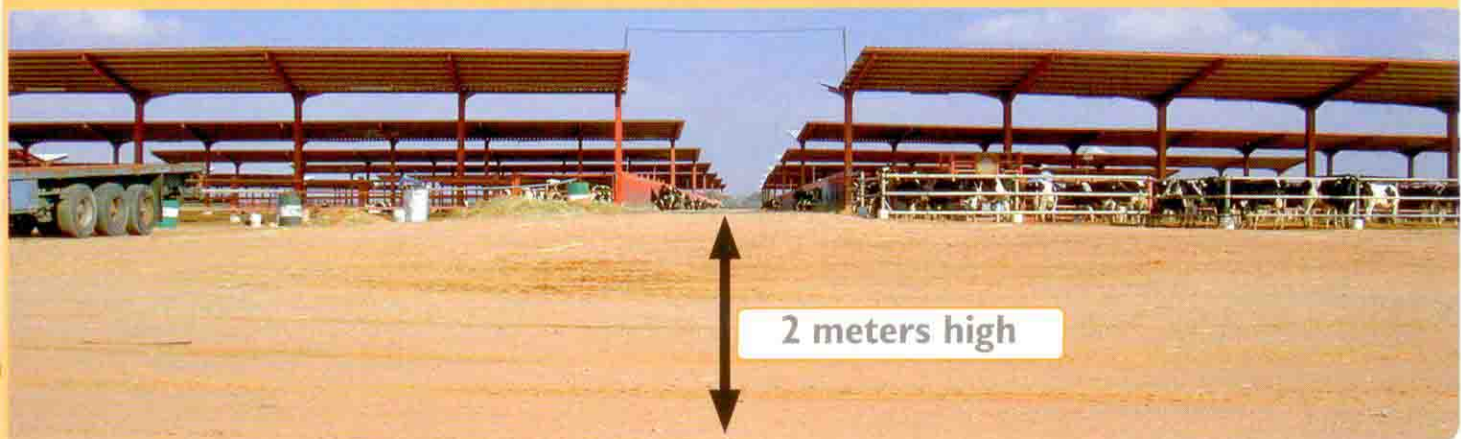
A cow house must always be located higher than its near surroundings. For farms in regions with much rainfall or for farms

on the waterfront or with a watercourse nearby, the difference should advisedly be two metres. This prevents water, during heavy rainfall

or floods, from entering the stalls. Also there should be sufficient space between the cow house and other buildings.

Furthermore, it is practical to site the cow house in such a direction that natural ventilation is possible.

Building or cow house two meter higher than surroundings



## Measuring and fitting

Efforts are made to construct completely new cow houses that are multifunctional. As a modular system, a

steelwork construction (all couver) will be erected that is acceptable for the basic needs of cows, e.g. the climate. Next the farmer can organize the

interior in accordance with his own wishes, making optimum use of the space available. These construction are made of a standard design and

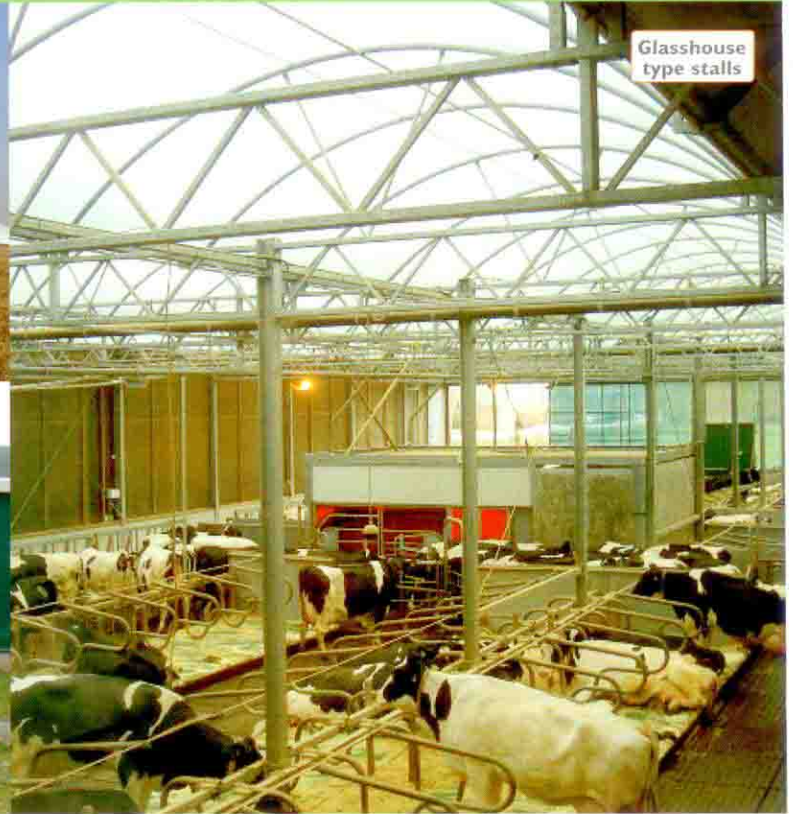
dimensions and therefore they are cheap. Alternatives to the traditionally built cubicle cow house are:



Tent stall  
Ukraine



Arch type  
stalls



Glasshouse  
type stalls

## Farm objectives

**C**ow and farmer will both make demands on the qualities of the new housing. These demands will partly determine the resulting structure and lay-out. But also the local regulations have their effect on dimensions and set-up.

The cow needs free access to feed and water, an escape route for low-ranking cows in the herd, comfortable bedding, much (day) light, hygiene, clean feed and a clean trough, good ventilation.

The farmer wants short daily working routes, ergonomic facilities, easy access to and supervision of the animals, laboursaving design and equipment, clean animals.

Regulations may refer to animal welfare, environment, sound and hindrance, prevention of overcrowding, manure storage, dimensions of the building and surface of outer walls.

### Housing climate

The emission of body heat by high productive animals is quite high.

As the surrounding temperature and the relative air humidity go up, cows have more difficulties coping with their own heat. The ideal situation for Holstein Friesian cows is a surrounding temperature of 5 till 15 degrees Celsius and a relative air humidity of 70 per cent.

When outside temperatures exceed 27 degrees a slight form of heat stress may occur as animals find it difficult to emit their heat. This will lead to a loss of production. In case of increasing temperatures that stress may eventually cause death.

Housing may help prevent or reduce that stress. Make sure that cows either in or near their housing are never right in the sun light. Make sure there is air circulation and ventilation. This will provide coolness. Air cooling makes dairy farming in hot regions possible.

Besides the different groups of animals the housing must accommodate a space for sick

animals, the calving pen and the milking parlour, for materials and equipment, for staff and office work etc.

### Take care of calving

Newly calved animals need a lot of extra care. Practice has shown that problems during their further lactation are considerably less when animals were given a lot of attention during the so-called transition period (around calving). By housing them as a separate group the farmer or cowman can look after them more easily. Sand or straw is the ideal bedding. Animals that need most attention should be at a place that the farmer or cowman passes frequently during his work.



# Preparing and designing the housing

When housing is going to be newly built the farmer has the opportunity to fit out the barn in accordance with his own needs. He will have to put down his requirements beforehand. They will refer to matters such as:

- How many animals do I want to house now and in the future?
- Are the cattle inside all year or part of the year?
- What groups do I want to divide them into?
- What are the different groups?
- How many young stock are there on the farm?
- What will be the next developments on the farm?
- What is the feeding method?
- What is the milking system?
- How much labour is available?
- Is the farmhouse in the farmyard near the cubicle house?
- What types of feed are stored and what does the storage look like?
- What is the best way of storing manure?
- Where are the farm fields with respect to the cubicle house?
- What is the maximum height of the housing with respect to the surrounding area/buildings?
- What is the location with respect to the wind?

Table 2 – Categories based on 13 months calving interval, 50 female calves, male calves sold at birth, 5% calves lost at birth and replacement of 25 pregnant heifers per 100 cows

herd size	40	80	150	200	500
<b>mature cows</b>					
cows in milk	16	33	62	83	208
dry cows	4	7	13	17	42
total mature cows	20	40	75	100	250
<b>mature cows</b>					
0-2 months	1	3	6	8	20
3-4 months	1	3	6	8	20
5-8 months	4	7	13	17	42
9-12 months	4	7	13	17	43
13-15 months	2	5	9	12	30
16-24 months	8	15	28	38	95
total young stock	20	40	75	100	250

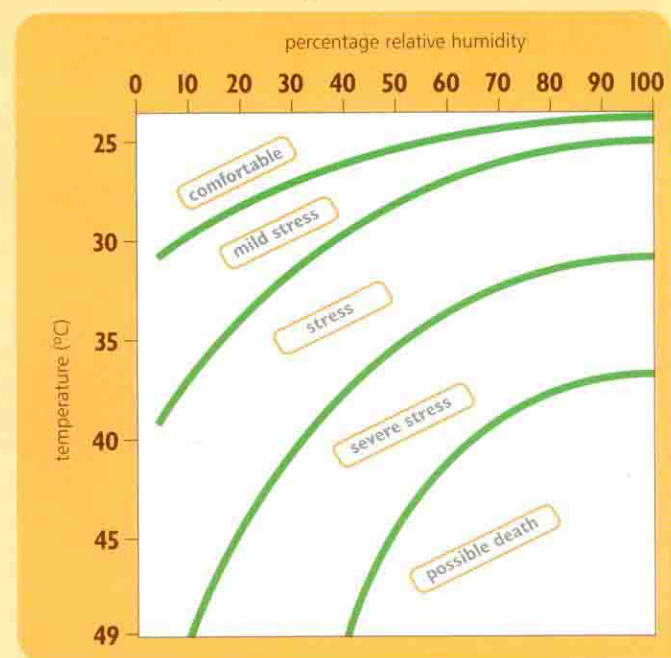
The farmer will have to answer all these questions before he can design a cow house that fits the specifics of his situation.

Diagram indicating individual numbers in herd sizes  
Categories based on 13 months calving interval, 50 % female calves, male calves sold at birth, 5 % calves lost at birth and replacement of 25 pregnant heifers per 100 cows

Table 1 – Heat production and ventilation capacity of different production levels (stable temperature: 20°C; temperature difference indoors-outdoors: 5°C)

milk production (in kg)	heat production (in Watt)	ventilation capacity (m <sup>3</sup> /hour)
6000	759	460
8000	865	524
10000	971	588

Figure 1 – Different stages of heat stress for dairy cows in relation to temperature (°C) and percentage of relative humidity



## VEEPRO HOLLAND

Information centre for Dutch cattle

Veepro Dairy Management is a supplement to the Veepro Magazine. It contains articles, tips and advice aimed at the management of dairy farms.

Fokko H. Tolsma, dairy farm management consultant Veepro Holland is responsible for the contents of Veepro Dairy Management.

**Publisher**  
Veepro Holland  
P.O. Box 454,  
6800 AL Arnhem,  
phone: 0031 26 3898740,

fax: 0031 26 3898744,  
e-mail: info@veepro.nl  
internet: www.veepro.nl

**Contribution**  
Willem van der Bent of  
PTC+ (Dairy Training  
Centre) Oenkerk

**Photos**  
Fokko H. Tolsma

Copyright © Veepro Holland