Cows come first in housing designs

COVERED PADS and barns are specially built facilities where animals can be contained off pasture for lengthy times.

According to DairyNZ, they are often combined with feeding facilities where supplementary feed is brought to the animal on the pad.

There are food safety, district and regional council regulatory requirements for pads and barns. A huge number of factors must be considered when designing, building and managing a covered pad or barn. The following points discuss the main requirements for the cow.

A dry, comfortable place to lie down.

A cow needs at least 8 hours of lying every day. It needs a dry, comfortable place. The longer the confinement, the better the surface must be. A 'drop test' is a good way to assess if the surface is well cushioned: drop straight onto the surface on your knees. If the surface is so hard it hurts you, it's too hard for your cows. There are a number of surfaces available including wood product, rubber and straw.

A roof increases the life of bedding material, allowing the use of more absorbent materials such as straw. Cows shouldn't spend any longer than 12 hours on a concrete surface if they do not also have access to a soft area to lie on.

Feeding areas must be designed for easy access; young cows should not be denied access by the more dominant ones. Where feed is freely available, space allowance at the feed table or bin can be 300-500mm/cow. If cows are fed all together simultaneously, this should increase to at least 700mm/cow.

For easy access the level of the feed table or bottom of the feed bin should be 200mm above the level of the cow's front feet. Individual stanchions may reduce competition, but post and rail systems give better access.

The area per cow and the comfort of the surface are very important. The area per cow requirement depends on the size of the cows and the length of time they will spend in the facility. Cows without adequate space will become increasingly 'agonistic' (aggression caused by having to compete for food and space). Lactating cows will need more space allowance than dry cows as they need to lie down longer and have a greater need than dry cows to keep their udders clean.

Non-slip surfaces must be provided in high-traffic areas such as feed alleys and walking passages, and potential wet areas, such as around water troughs. Stamping, scrabbling or grooving concrete will help achieve non-slip surfaces, but should be done in a way that does not increase hoof wear. Rubber mats can improve walking surfaces, as long as they aren't slippery.

On hard-surface pads, effluent should be removed at least once a day. For bedding and soft surfaces, regular bedding changes will minimise hygiene and mastitis risk. Cows should not have to stand in effluent deeper than their hooves. Standing in effluent for long periods can lead to lameness from softened hooves, getting stones caught between toes, and skin infections. Cows lying in effluent and mud are at high risk of environmental mastitis. Good effluent drainage is important and clean rainwater needs to be diverted away from the facility to reduce effluent volumes.

Effluent management systems must be designed to cope with the additional volume of effluent generated from pads and barns. The longer the cows spend in the facility, the greater the effluent volume generated. During the design stage, thought needs to go into how effluent solids will be captured and utilised. There is a variety of ways of capturing, storing and applying solids.

Take care when applying solids to land that the district and regional council rules are met, particularly the location of solids application and the high nutrient content of effluent solids.


Many factors must be considered when building a barn.

TOP VENTILATION AND LIGHT ESSENTIAL

Ventilation in barns should be good enough that condensation does not drip from the roof. A temperate climate means that barns can be open on three or four sides. Wind or shade curtains can be used if weather protection is needed and air vents should be built into the roof structure. For light levels, a good 'test' is that there is enough light to allow reading anywhere in the facility during daylight hours. Providing a night light may stimulate cows to eat more, and will reduce panic in response to sudden noises. Covered shelters can help to control heat stress during hot summer months, and provide shelter in cold weather. Providing shade and shelter can help reduce the energy spent by the cow for thermo-regulation, therefore optimising milk production or weight gain.

Slatted floor barns are a slight variation on the traditional freestall and loose housed pad or barn. They have concrete panels which allow effluent to fall through, and be collected in an underground bunker. The roof should be made of plastic or clear polythene that allows light onto the pad, which helps kill bacteria.

The roof design should allow for plenty of ventilation, which reduces odour and moderates temperature.

Slatted floor shelters are not suitable to calve on, as calves' feet can become trapped. If they are required for calving, then matting should be placed over the slatted area to prevent calves' feet from injury, or install narrower slatted concrete in the calving area.