

# Veepro dairy management



## Water and feed intake

**Water is essential for a cow, it is as important as feed. This fact is often ignored. Clean and fresh water are a determinant factor in the milk production, just as genetic disposition, health and the quality of feed. More than 80% of milk is water! Supplying good and healthy water in a proper way deserves particular attention.**

**T**he amount of feed and water that is taken up depends also on the accessibility of feed and water on the farm. From the point of view of effective feeding it is not only the ration, but also the manner in which it is given that matters. Water supply and feed supply must complement each other and be available at the right spot or spots. The intake of water strongly depends on its availability. It is important that animals need

not walk far. High productive animals with a high feed intake commonly drink water between each time they feed and the next. Therefore the watering points should be close to the feeding point. It happens quite often that animals interrupt feeding in order to drink and then do not return to their feed but go to their bedding area instead, even though their stomachs are not full. The reason is that the distance between feeding

point and watering point is too long. How frequently this happens depends on the housing system and the climatic conditions. Stock grazing young grass must not walk further than 200 metres to the trough. The drier the ration the higher the water intake and, also, the more frequent the drinking pattern. Depending on age and stage of production individual animals may drink as much as 150 litres per day.

In tropical conditions when facilities must provide shade at feeding places it is not desirable that animals have to walk more than 10 metres. At any time we must prevent animals from having to walk through the sun in order to drink. Concrete floors may be painful to walk on so that cows, after drinking, might rather go to the bedding area than back to the feed rack. The distance is the decisive factor here.

# The role of water

With rations containing > 50% dry matter, make certain that animals drink several times in between to get good rumen contents.

## Temperature

The temperature of the drinking water must not be too low. (Too) cold water will slow down the digestion in the rumen. Any sudden cooling down causes a reduction of the bacterial activity. The animal itself has to warm up the water to body temperature.

As an example, just assume the following. This is mere arithmetic.

A cow drinks 25 litres cold water of 4°C. This water has to be warmed up to 38°C. It takes 1 calorie to raise the temperature of 1 gram of liquid water by 1 degree. So, an increase of 34 degrees times 25 litres = 850 kcal = > 3,570 kJoule (factor 4.2). If we assume that a cow is capable of producing 1 kWatt of heat, then it will take one hour before the liquid has warmed up. (1 kWatt = 1 kJoule/sec => 3,600 k Joule/hour)

If 25 litres water of 4°C are added to a rumen containing a volume of 125 litres at 38°C, this volume will cool down to nearly 32°C. Consequently a lot of heat will be taken

## Intake normes

- 5 litres of water is necessary for 1 kg dry matter intake
- 3 litres of water is necessary to produce 1 kg milk

from the nearest tissues and organs. Therefore a cow has good reasons to drink small quantities at a time.

When supplying drinking-water it is important to keep the temperature at a sufficient level, say at 15°C. In colder areas where water supplies have to be protected from freezing over, it is strongly recommended to do more than frost protection. Insulating troughs and pipes and heating up the water as much as possible leads to a significantly higher feed intake and milk production. What is good water supply? Another option is the automatic waterer (one bowl per 5 cows).

The volume of these troughs is limited and the flow of the water makes them self-cleaning. The water inlet rate is between 15 and 20 litres each minute so a cow can go on drinking freely.



Cows like to drink fifteen till twenty litres water per minute

The role of water for the cow and the milk production So water intake is linked to feed intake. After feed intake the water balance in the

rumen goes down and instinct urges the animal to drink. When its thirst has been quenched the animal will again be able to take up feed.

## Different ways of watersupply



Waterer after milking parlor



Ball insulated trough



Trough with high flow of water



Trough for dry cow (5 litre/min)

# Quality of water

**D**rinking troughs in cowsheds are often large, mainly because large troughs can supply the animals with sufficient water in a short time (at least one trough for twenty cows). The large volume of the troughs

functions as buffer capacity. In particular after milking cows have a high water intake. But large troughs that are never completely emptied are sources of bacterial contamination. Feed that is spilled while cattle are

drinking forms a layer on the bottom that starts fermenting in the high oxygen content of the wet dregs. This causes a poor bacteriological quality of the water. Also smell and tastiness are affected. Then troughs have to be

cleaned! But prevention is always better! (Some people say that the farmer should not mind drinking from the trough himself.) There are tilting troughs that prevent pollution, but they cause much water to be wasted.

## Fish to clean waterers

Waterers are much cleaner if fishes (goldfishes) swim inside. They eat the rest of the feed and the faecales which fall in the waterers. In this case the waterers can be cleaned less frequently. The water level needs at least 5 cm. Waterers with lowpressure systems are good.



## Feed intake

Cattle eat with their nose, meaning that cattle manipulate their feed with their noses to find herbage that tastes or smells best. So the amount of feed that cattle take in depends strongly on the smell.

Apart from the feed quality the cowshed is important, too. Feed troughs that are not cleaned daily (broom clean is good enough) usually contain feed rests that stink. The stink is possibly worse in troughs affected by acids that have bitten into the surface. Moist and organic waste start rotting and they spoil the smell of the fresh feed on top. When fitting out a cowshed the feed trough is a point of special interest. Easy access to the feed is improved by a rack that is adjusted to a height convenient for the cow. When the trough is 10 cm higher than the floor on which the cows are standing we can prevent the animals turning their front legs out while feeding (the so-called French position). Legs turned out may cause claw problems that lead to lameness.

### Guidelines adjustment feed rack;

- Height of trough + 10 – 15 cm with respect to the floor the cows are on.
- Bottom bar feed rack + 55 – 60 cm with respect to the floor the cows are on
- Distance in the feed rack between top of bottom bar and bottom of top bar, depending on breed: till about 90 cm.

## Rules of water

- **Dry cows:** individual water supply possible
- **Milking cows:** water provider per 15 – 25 cows or individual water supply with high water inlet between 15 and 20 litres each minute. Cows may consume 30 to 50 percent of their daily water intake within 1 hour after milking. For confinement operations, waterers should be allocated at milking parlor exit and at every crossover in freestallbarns
- **Normal temp water:** 7 – 15°C moderate temperature
- **Temp. water:** 30 – 33°C increase intake dry matter with 3.4 – 6%
- Fresh cow just after calving: supply water with 33 – 35°C (minimum 35 litres) increase appetite and body-temperature.
- 40% less water intake for cow reduction of 25 % milkyield

Necessary amount of water for different categories of animals:

Dry cows	30 - 60 lt/day
Cow 10 kg milk	30 - 70 lt/day
Cow 30 kg milk	90 - 150 lt/day
Cow 50 kg milk	100 - 200 lt/day
Calves < 1 year	5 - 15 lt/day
Calves 1 - 2 year	15 - 25 lt/day
Bull for meat	20 - 6 lt/day
Sheep/goats	1.5 - 6 lt/day

## Water quality in the Netherlands

Often drinking water doesn't have a good quality. Poor quality (water from dirty ditches or cannels) reduces the milkyield with 0.9 kg milk per cow/day.

A test in the Netherlands shows that 20% of the water quality is too bad and not good for drinking

Water quality for cattle %

- Good 54
- Moderate 26
- Poor 20

Source: Gezondheidsdienst Dieren 2004



# Good light is necessity



High producing calves need 'good light' during the dark evening

**For young stock to develop properly and for a good production of cows the light supply in the barn is essential. During a substantial part of the day a minimum of 150 lux is required.**

To experience daylight is an unconscious process. Science has shown that cattle feel most comfortable during the daytime when the light has a certain intensity. This is 150 to 200 lux. Exposing cows to this intensity during 14 to 16 hours of the day will raise the milk production. Also sufficient light is promotive for the fertility and it has an overall positive effect on the cow's general health. Feeding during the evening with good light increases milk production by 10%. Not all cattle require the same quantity of light. A day length of eight hours will do for dry cows. For lactating cows that period is much longer. They will benefit from a day length

of fourteen to sixteen hours. Young stock too will perform better when the day length is longer. But cattle also need a period of darkness. Its function is to rest the body.

## Artificial light

Depending on the season and the location of the farm there is a natural variety in day length. The barn too plays a part in the quantity of light that is available to the cow. Sufficient entry of daylight combined with artificial light guarantees a good "day length". For artificial light there are some hints that you may take:

- There must be so much artificial light over the feed

rack that the farmer can easily read the paper.

- As lamps and lamp holders must be cleaned twice every year in order to keep up the intensity it is wise to hang fluorescent lamps never too high over the feed rack.

## Warmth from sunlight

In the hotter parts of the year sunlight has a problematic side effect: heat. When the sun enters through transparent parts of the roof, it also brings in unwelcome heat. A construction that has the light enter from the side solves this problem. However, the consequence is that in the winter months, when a good light supply is a must, there is a short day length and a low light intensity.

Normally three sources of light are used;

- TL lighting (luminous intensity: 80-85 lumen per watt),
- Metal halide (luminous intensity: 95 lumen per watt),

## Some rules

- Daylight: more than 5 - 10% of the floor surface area in the barn must catch daylight.
- Artificial lighting: 60 watts of fluorescent lighting per 5 cows.

- High-pressure sodium (luminous intensity: 132 lumen per watt)
- These sources of light are mostly used in combination with night lighting by "normal" bulbs.

## Long life

TL light is the oldest and most common type of lighting in the cowhouse. But more recent sources of light beat the intensity of TL. The purchasing cost of TL may be lower, but the electricity consumption is higher. Metal halide and high-pressure sodium lamps have a high light output and a very long life. By using high wattage lamps you need fewer fixtures to produce the quantity of light desired. Clever reflector systems in the fixtures secure the most efficient light spread. Suppliers of the lamps can provide a made-to-measure lighting plan for any given situation, so that you will get optimum light production. Comparing similar levels of lighting has shown that the high-pressure sodium lamp is the best buy in the matter of investment and electricity use. There may be one drawback of these lamps: not everyone likes their slightly orange colour.

Night lighting ensures that the herd will spend the night well and that the farmer has sufficient light to carry out inspections.



## VEEPRO HOLLAND

Information centre for Dutch cattle

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