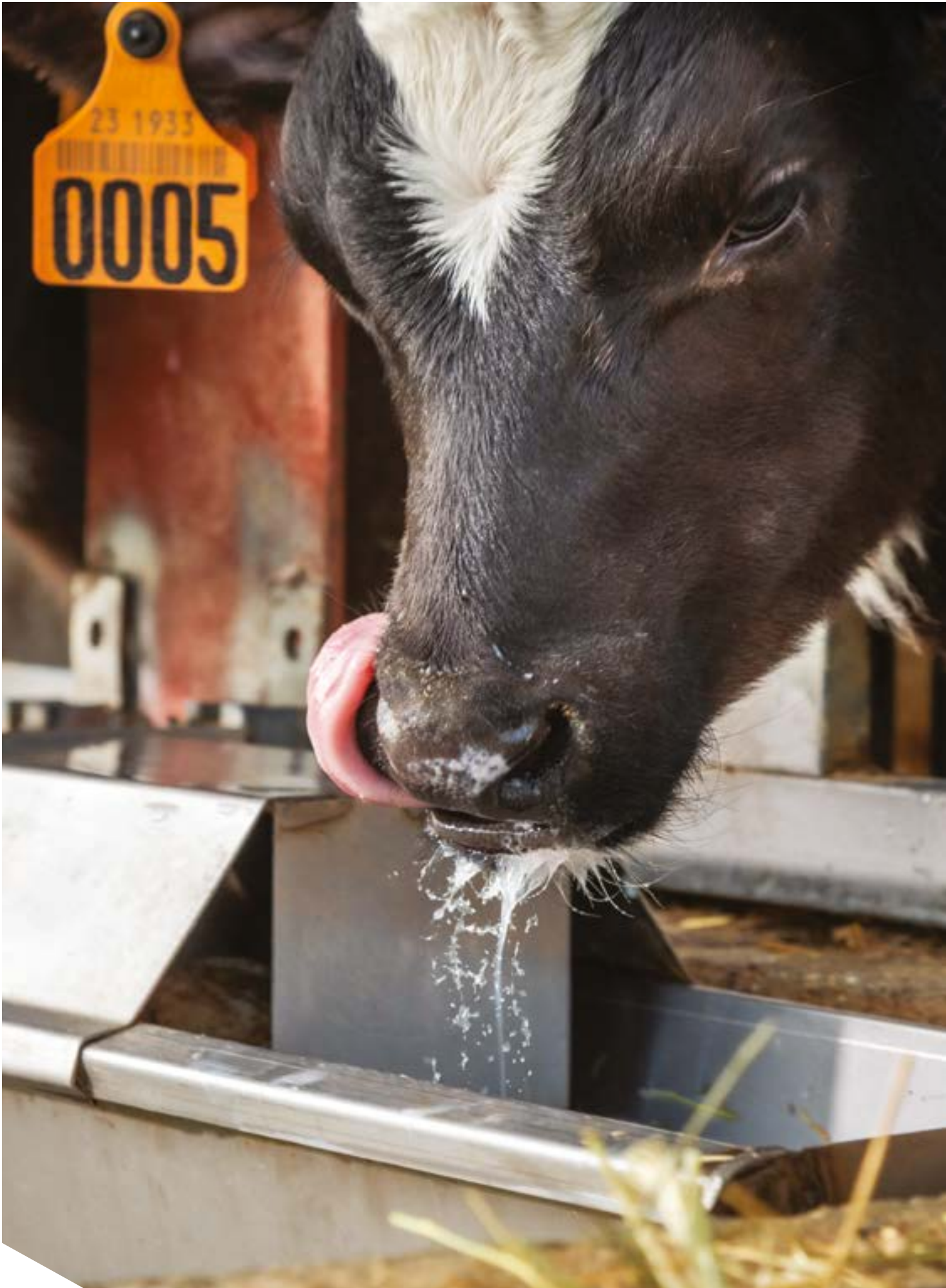




Sprayfo Hydration Control

Dehydration takes its toll on farms every single day





Water is the basic requirement for life

It is needed for the body to be able to function properly. If the hydration status of an animal is compromised, growth, development and performance are also compromised. Hydration of the animal is usually regulated by drinking and excreting water within normal (but very narrow) safety margins in which the body can function.

Animals will cope with the lack of water by prioritizing the most important body functions as long as possible or until the state of hydration is restored. The extent to which this restoration is needed is dependent on the root cause of the dehydration and the animal itself. As the animal matures, relative body size decreases and water in the body will be held more inside the cells (intracellular fluid pool) rather than outside (extracellular fluid pool) due to reduction of metabolic rates. Water in this extracellular pool is more easily lost and quickly leads to impactful health issues, especially in younger calves.

Managing the hydration of animals in different life stages therefore means management of these different pools. Type, amount and ratio of electrolytes play an important role in this and should guide rehydration product choice.

Water is important for every living being

Drinking sufficient water is important even under normal circumstances. With increased exercise, physical strain/stress and especially when complications arise this becomes an even greater point of attention. Professionals and many amateur athletes seeking improved performance drink isotronic products to increase their endurance.

In case of digestive complications (diarrhoea), the World Health Organization has developed a hypotonic oral electrolyte solution (ORS) that is still helping millions of people globally every year since it was first developed in the 1960s.

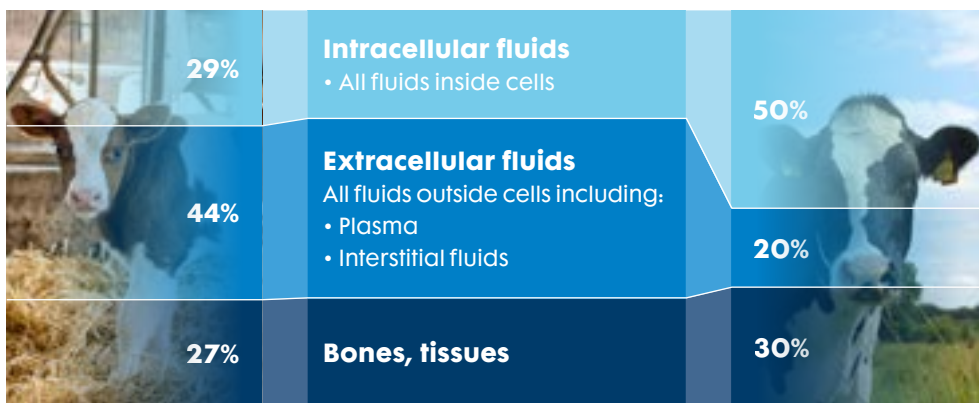
Dehydration is a significant problem in calf rearing

Calves dehydrate faster due to:

- Body size
- Increased metabolic rate
- Body composition

Body composition, %BW

Body composition, %BW



Neonatal calf (0-3 weeks)

Cattle

Dehydration resulting from diarrhoea is the cause of 55% of all calf deaths in their first stage of life.





Dehydration can be caused by excessive loss of water or by water deprivation

To be able to control the different hydration states of calves and cattle, two separate strategies are required aimed at the needs of the animal in a specific situation. Unless animals refuse to drink or are unable to drink by themselves, in which case veterinary intervention in the form of a saline infusion is necessary, these strategies should always imply the use of proper (re)hydration support.

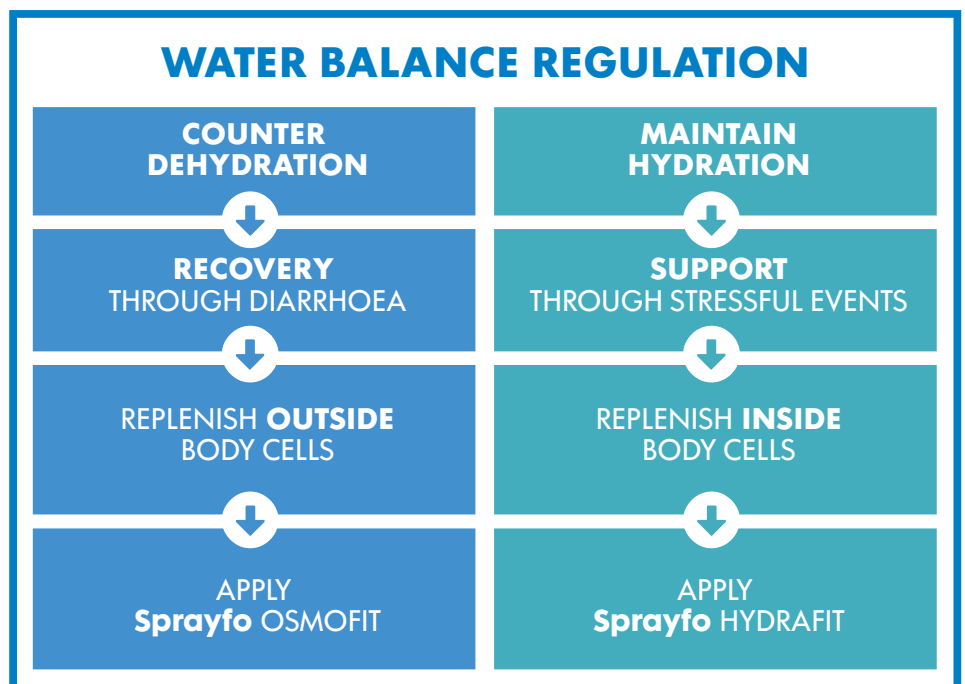
Excessive loss of water in calves is most often caused by diarrhoea and is accompanied by a loss of sodium via the feces and (severe) metabolic acidosis. This is considered an acute and potentially life threatening situation.

Water deprivation leads to a suboptimal hydration status of the animal, simply because water was unavailable, inaccessible or of low quality. This means that water is still lost due to transpiration, excretion and under stressful circumstances, this happens at an accelerated rate.

Without replenishment and/or if feed is also withheld, this will be accompanied by a loss of potassium and energy. Some of these situations can be caused by confinement, stress (heat/cold stress, vaccination, illness, feed changes) and in particular during or after transportation.



How to regulate and control hydration



Sprayfo OsmoFit

Sprayfo OsmoFit is a dietetic water-soluble calf rehydration product. It is able to stabilize the water and electrolyte balance of the extracellular fluid pool in cases of diarrhoea by providing the required salts and sugars in the right amounts and in the correct ratio. Therefore, OsmoFit is always provided in a fixed concentration in water.

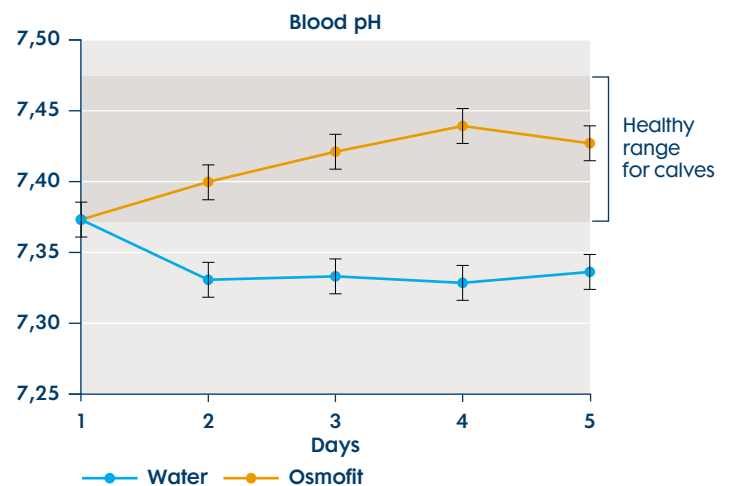
The composition of OsmoFit focuses on:

- Mainly sodium salts and to a lesser extent potassium salts to correct the losses of these electrolyte minerals, to enable water absorption and counter metabolic acidosis;
- Highly digestible components that provide energy and do not influence extra outflow of water. Solutions with a higher osmolality value than blood (being isotonic) will subtract water from the body: so called hypertonic solutions. For this reason, OsmoFit's patent pending formula has been designed to be a hypotonic solution with a low osmolality value;
- Buffering agents that counter - and prevent further occurrence of - metabolic acidosis.

Depending on whether the diarrhoea is caused by non-pathogenic or pathogenic causes, there is a need to change (feeding) management, buy the immune system time to overcome the infection or if really needed, provide veterinary treatment. Dehydration and the consequential metabolic acidosis thereof is what ultimately makes the calf succumb to an illness state that is commonly referred to as calf diarrhoea.

Trials carried out at the Trouw Nutrition Calf & Beef Research Center demonstrated that Sprayfo OsmoFit is able to keep and/or restore blood pH of calves within the normal range whereas pure water and hypertonic solutions are not, or less able to do so. (This is illustrated in graph 1.)

Graph 1. OsmoFit effectively corrects metabolic acidosis



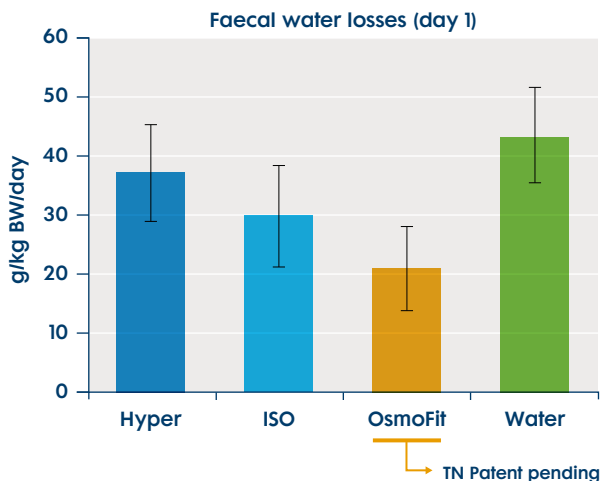


An effective approach against calf diarrhoea should demonstrate a relatively fast reduction of fecal water loss, which can truly be considered as less diarrhoea. Trials carried out at the Trouw Nutrition Calf & Beef Research Center demonstrated that Sprayfo OsmoFit is able to reduce fecal water loss on the first day of treatment compared to a control group provided with water only. Groups of animals that were offered hypertonic solutions instead would not have consistent or even any reduction of fecal water loss (This is illustrated in graph 2).

How to use

Sprayfo OsmoFit is to be used in case of risk of, during periods of, or recovery from diarrhoea. The ratio of components in OsmoFit has been optimized for water uptake and should therefore only be provided in the recommended application of 60 grams (1 sachet) / 2 L of lukewarm water (25-35°C). To avoid changing the ratios of minerals and sugars, OsmoFit should not be mixed in milk, but can be fed in between milk (replacer) feeding twice daily. It is highly recommended to always have access to fresh drinking water when providing products containing electrolytes.

Graph 2. Effect of products with different tonicity on fecal water loss



Sprayfo HydraFit

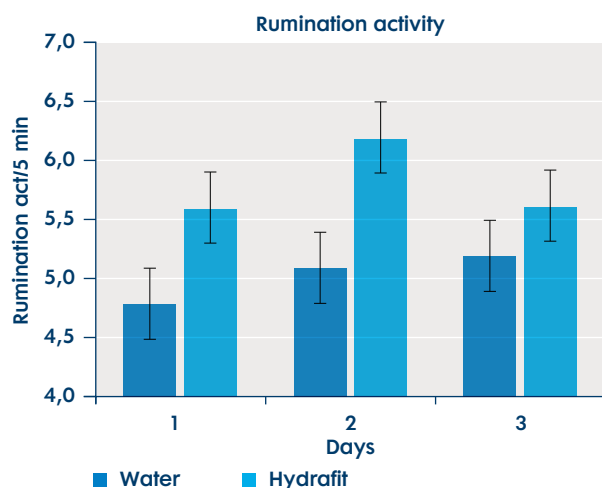
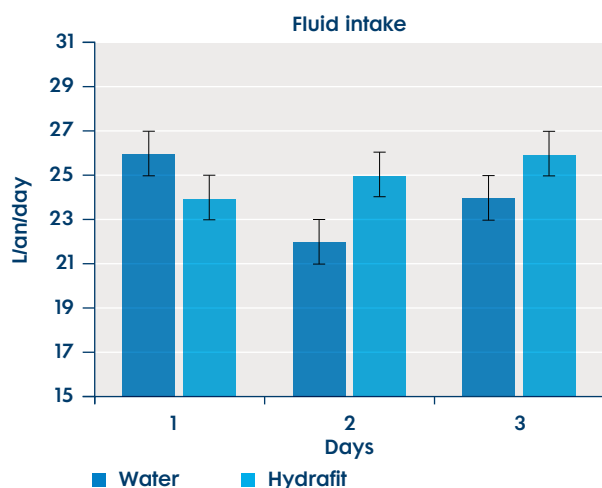
Sprayfo HydraFit is a liquid product that is able to provide intracellular fluid pool maintenance and health support before, through or after challenging conditions. It does this by providing the required salts and sugars in the right amounts and in the correct ratio. Therefore, HydraFit is always provided in a fixed concentration in water.

The composition of HydraFit focuses on:

- Mainly potassium salts and to a smaller extent sodium salts to correct the losses of these electrolyte minerals and to enable water absorption;
- Magnesium salts to correct the losses and to support muscular activity, which is especially necessary in the case of animals on transport, which have been (counter) balancing whilst being in the truck;
- Osmoregulation components like glycerol that allow water to be fixated inside the cells. This contributes to maintaining intracellular fluid pools.

Upon arrival it can be seen that transported animals - regardless of the journey time - show a significant body fluid loss compared to animals that have not been on transport. As a reaction to compensate for this, body cells decrease in size, translating into body weight loss. The loss of body mass because of water loss is commonly referred to as 'shrinkage'. Luckily, this physiological reaction is also a trigger for the animal to become thirsty and start drinking. Surveys among beef and veal farmers indicate that after transport calves and cattle if provided water will indeed drink, and drink more if the water provided has been reinforced with the required nutrients.

Increased water intake and rumination activity

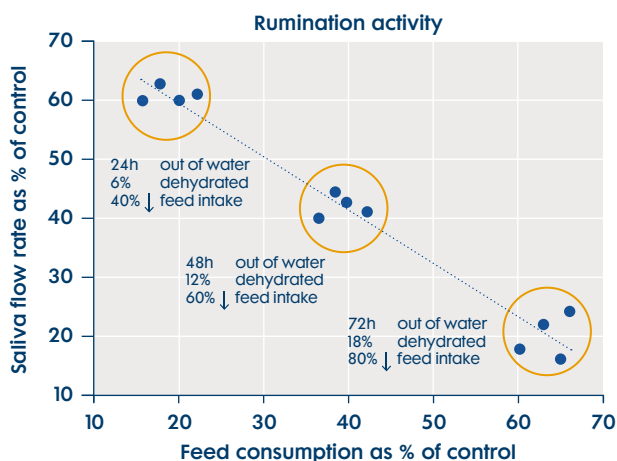




Field trials done with animals either drinking water with HydraFit or without showed increased water intake and rumination activity. Both are indicators of increased welfare and supportive of increased feed intake.

Many factors influence the wellbeing and the performance of animals on transport. Confinement, water/feed deprivation, climate, strain, health challenges will all demand resources such as energy and minerals in order for the animal to cope with the situation. If resources are limited, transport time is prolonged and hydration is not managed properly; results in a drop in feed intake upon arrival and performance in the following weeks. (This is illustrated in graph 3).

Hydration status and feed intake



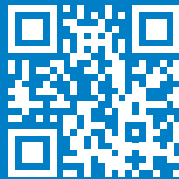
How to use

Sprayfo HydraFit is used to increase water intake and the supply of electrolytes to animals exposed (or expected to be) to stressful environmental situations such as, but not limited to, extended periods of yarding, transport, high temperatures and after periods of lack of access to feed and water).

The ratio of components in HydraFit has been optimized for water uptake and should therefore only be provided in the recommended application of 4% inclusion in a clean and accessible water source. This patent pending method can be provided either ad libitum (cattle) or in a fixed volume (younger calves). To avoid changing the ratios of minerals and sugars in HydraFit it should not be mixed in milk. Discontinue inclusion of HydraFit in the drinking water if water consumption exceeds 10% of the body weight.



**For more information
about Sprayfo visit:**
www.sprayfo.com



Sprayfo is a brand of Trouw Nutrition, a global leader in animal nutrition, specialising in the development of innovative feed technologies, premixes and unique software solutions. Quality, innovation and sustainability are the guiding principles behind what we do – from research and raw material procurement, to the delivery of cutting-edge products and services designed to increase animal production efficiencies.