

# VET CHAT

Colostrum Test | Colostrum Storage | Trustitubers | Calf Electrolytes



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## HOW CLEAN IS YOUR COLOSTRUM?

Good quality colostrum helps protect calves against disease in the first 4–6 weeks of life by the provision of antibodies. Research has shown that the provision of an adequate volume of clean, good quality colostrum as soon as possible after birth has long-term benefits. These include reduced veterinary costs and increased milk production in the first and second lactations. However, colostrum can become heavily contaminated during the collection, handling and storage processes. Contaminated colostrum can not only be the source of some major infectious diseases, such as Salmonella, Bovine Johne's Disease and Mycoplasma, but the presence of these pathogens in colostrum can also inhibit the absorption of antibodies by the small intestine of the calf. Therefore, calves fed contaminated colostrum are at a higher risk of disease and failure of passive transfer of immunity.

Possible sources of contamination include the teat skin, milking cup liners, hoses or the bucket itself. Sub-optimal cleaning of collection buckets and feeding equipment such as teat or tube feeders will exacerbate this problem. If allowed to accumulate, colostrum residues can be difficult to remove allowing bacterial overgrowth in hard-to-reach areas. It is ideal to thoroughly wash all feeding equipment after each use, including the sanitisation of tube feeders between calves. A simple protocol for the cleaning of feeding equipment is outlined in this article.

As bacteria are microscopic organisms it is difficult to crudely assess the cleanliness of colostrum on-farm. However a simple and inexpensive test (called a Total Plate Count or MUC-Test) allows an objective and comparable assessment to be made. Samples of colostrum should be collected at all stages of the colostrum handling process. These include immediately after collection from the cow, colostrum from the test bucket and tube feeder and after colostrum has been stored in the fridge or thawed after freezing. The samples are processed in a lab and the bacteria from colostrum are grown over a 24 hour period in an incubator. This test will not differentiate the various species of bacteria but will give an overall objective assessment of how clean the colostrum is. The test is repeatable and comparable and allows monitoring of colostrum handling and storage during the calf rearing period. Speak with your veterinarian about this service.



### FOR ALL FEEDING PAILS AND TUBE FEEDERS AT THE END OF EVERY FEEDING

#### 1. RINSE

Rinse all equipment with lukewarm water, to remove milk residue, manure and dirt. Do not use hot water at this stage as it causes the milk proteins to coagulate and stick to the surfaces.

#### 2. WASH

Use water as hot as you can stand with gloves on. To a 20 litre bucket (~19 litres of water), add a squirt of liquid soap and 50mls of household bleach (150ppm)\*. Scrub all surfaces to loosen and remove remaining milk residue. Dump teats in solution. Water should remain >50°C.

#### 3. OPTIONAL RINSE

For large milk carts and tanks, rinse with dairy acid wash.

#### 4. DRY

Allow feeders to drain and dry (upside down on top of a pallet) before hanging on racks. Do not stack inside each other.

### FOR THE SANITISATION OF ALL TUBES OF TUBE FEEDERS IN BETWEEN CALVES

1. The tubes of tube feeders should be submerged in a sanitising solution of 160mls bleach in 19 litres of water (500ppm)\* in between calves.
2. Several tubes should be used at once and rotated between calves, to allow sufficient contact time of disinfectant.

\*Source: S. Leadley, Attica Veterinary Associates

# COLOSTRUM STORAGE: GET SOME IN THE BANK!



## WHY?

If colostrum is left at ambient temperature, the bacteria present rapidly overgrow and can be the source of infection for calf-scour pathogens, such as Salmonella and E.coli. Heavily contaminated colostrum can inhibit uptake of antibodies by the calf and increase the risk of failure of passive transfer (where calves do not have adequate antibodies to fight infection). If colostrum is not fed within 2 hours of collection, then it needs to be efficiently stored.

## WHEN?

In seasonal herds, first-milking colostrum is frequently fed to new-born calves as soon as it is collected. Good quality colostrum, measuring  $\geq 22\%$  using a Brix refractometer, is often in high demand and there is not usually excess to store. However, there may be periods where calf-drop is busy, followed by a quieter period before another busier period. This is common where synchrony programs have been used. In year-round herds and seasonal/split herds with a prolonged calving pattern, colostrum storage is an integral part of successful colostrum management.

Heifers can produce good quality colostrum but they generally produce low volumes and they often calve before the rest of the herd. A 'colostrum bank' consisting of good quality frozen colostrum collected from the previous calving period, allows adequate colostrum to be fed to calves born to heifers. This particularly beneficial for heifers in calf to sexed semen where good quality colostrum is required in large volumes for every calf born. Bull calves also require colostrum but the best quality colostrum ( $\geq 22\%$  Brix) should be preferentially fed to heifer calves.

## HOW?

### Short-term

Colostrum can be stored in a refrigerator at 4°C for ~ 2 days. When excess is available, colostrum should be refrigerated as soon as possible after collection. Multiple small containers, such as bottles or Perfect Udder bags, are preferred as these will cool more rapidly than a single large volume of colostrum. If larger volumes in buckets are unavoidable, ensure these have a lid and are thoroughly cleaned after each use. Stainless steel collection buckets are preferred as they can be effectively cleaned.

The shelf-life of refrigerated colostrum can be prolonged to 5-7 days by adding a food preservative called potassium sorbate. This inhibits bacterial growth but "will not make contaminated colostrum clean again". When used with refrigeration, it can be very useful as it avoids the need for long-term storage. Contact our clinic for more information on where to source potassium sorbate.

### Long-term

Freezing colostrum is the most practical long-term storage method. Freeze good quality colostrum as soon as it is collected in small containers or Perfect Udder bags. Avoid using large containers as these will not thaw very rapidly. All colostrum should be stored in a deep freezer. The small freezer compartment included in some fridges will not suffice as colostrum is not cooled quickly enough to prevent bacterial overgrowth. Freezing colostrum does destroy the white blood cells but the benefits of this method out-weigh this negative effect. Avoid routinely freezing colostrum during the calving period as alternative, more convenient methods are available for short-term storage. Freezing is useful at the end of calving where supply often exceeds demand. In a deep freezer, colostrum will last approximately 10-12 months. Always write the date of collection on the container so that out-of-date colostrum can be discarded. This also applies to colostrum stored in the refrigerator.

## SERVICE PROGRAM

### COLOSTRUM FIRST

Managing colostrum successfully is fundamental to improving both the health of young calves and the long term productivity of the dairy herd. Our Colostrum First program includes:

- Review of current colostrum management
- Assessment of passive transfer and colostrum cleanliness
- Establishment of benchmarks
- Monitoring progress



CALL THE CLINIC  
TO BOOK YOUR  
COLOSTRUM  
FIRST CONSULT

# TEAT VS TUBE FEEDERS?

Research has shown that dairy calves should be actively fed good quality colostrum as soon as possible after birth in order to benefit in the short and long term. Active feeding involves providing colostrum by teat or tube feeder but the method of active feeding can affect colostral antibody absorption. Which method should you use?

## GETTING IN THE GROOVE

Adult cows have four functional stomachs: the rumen, the reticulum, the omasum and the abomasum. In the pre-weaned calf, milk and colostrum are digested in the fourth stomach, the abomasum. Calves are born with a muscular fold of tissue called the oesophageal groove which when closed, forms a channel allowing colostrum to bypass the first three stomachs. This enables colostrum to be deposited directly into the abomasum. The closure of the groove relies on a reflex triggered by the sights, sounds and smells of milk or colostrum. The action of sucking is a strong stimulus for closure of the oesophageal groove.

## TUBE VS TUBE

The major benefit of teat feeding is that it stimulates natural reflex closure of the oesophageal groove, depositing colostrum directly into the abomasum.

Tube feeding **does not** stimulate this reflex closure and colostrum is deposited into the first three stomachs before passage to the abomasum. This can result in a time delay for absorption of antibodies in calves fed colostrum with a tube feeder, especially if fed at low volumes (<2.5L).

However, calves fed a larger volume (2.5-3L) of colostrum with a tube feeder have no difference in absorption of antibodies when compared to teat feeding.

## WHICH TUBE FEEDER?

Surprisingly, most commercial tube feeders have a volume less than 2 litres. Low volume tube feeding increases the risk of delayed antibody absorption compared to calves fed the equivalent volume by teat. Volumes >2.5L need to be tube fed to overcome this. The Antahi Trusti Tuber is a multi-award winning tube feeder with a 4 litre capacity. Designed by veterinarians to combine a mouthpiece, soft flexible tube, specially designed safety tip and calf size markers, it ensures maximum calf wellbeing and usability during feeding. A small NZ trial showed that the Trusti Tuber had an 88% reduction in stress to calves compared to traditional rigid-tube feeders. The procedure time was almost halved because the tube feeding was smoother and easier. Our clinics are now stocking AntahiTrusti Tubers.



Method	Pros	Cons	Comments
<b>Teat</b>	<ul style="list-style-type: none"> <li>• More natural</li> <li>• Less invasive</li> <li>• Optimal antibody absorption even at low volumes (&lt;2 L)</li> </ul>	<ul style="list-style-type: none"> <li>• Time-consuming</li> <li>• Frustrating</li> <li>• Colostrum wastage</li> <li>• Requires calves to have a suck reflex</li> </ul>	<ul style="list-style-type: none"> <li>• Ideal when time permits and when feeding lower volumes eg. low birth weight calves</li> </ul>
<b>Tube</b>	<ul style="list-style-type: none"> <li>• Quick and efficient</li> <li>• No suck reflex required</li> <li>• Optimal antibody absorption when fed at higher volumes (2.5-3L)</li> </ul>	<ul style="list-style-type: none"> <li>• Specific training required</li> <li>• Sub-optimal antibody absorption when fed at low volumes (&lt;2 L)</li> <li>• More invasive; less natural</li> </ul>	<ul style="list-style-type: none"> <li>• Useful in seasonal herds as very time efficient.</li> <li>• Ideal when larger volumes can be fed in a single feed</li> </ul>

## SERVICE PROGRAM

### FLYING START

Ask about the Flying Start services for your farm.

- Pre-calving cow care
- Calf environment and nutrition
- Colostrum management



# CALF ELECTROLYTES: WHAT'S NEW?

Oral rehydration solutions, commonly known as electrolytes, are considered the mainstay of treatment for calf diarrhoea or any dehydration due to disease. There is a vast array of products on the market, each with their own 'special recipe' which comes at a varying degree of cost.



## WHAT DO ELECTROLYTES DO?

The aim of electrolyte treatment is to rehydrate the calf, restore the pH of the blood and provide some energy. Calves with diarrhoea will be dehydrated due to ongoing fluid losses. Diarrhoea also results in the loss of alkaline salts causing an imbalance in blood pH, which becomes more acidic. This acidity (called "metabolic acidosis") can be exacerbated further by accumulation of other acids due to impaired digestion and absorption of nutrients. In healthy animals, blood pH is tightly regulated and even a small change can result in depression, collapse and death. It should be noted that the energy provided by electrolyte treatments is insufficient to maintain a calf for any period of time. Resumption of milk feeding is essential to provide the energy required for gut regeneration, recovery and growth.

## THE ESSENTIAL INGREDIENTS

### 1. Water

Calves with early onset mild diarrhoea will increase their water intake, helping replace lost fluid. Clean, fresh water should be available to all calves from birth and it is often surprising how much water a newborn calf will consume if it is readily accessible. Electrolyte treatment in the form of oral rehydration solutions actively replaces the fluid lost with diarrhoea. Commercially available electrolyte gels and pastes will not actively provide water and rely on voluntary ingestion which can be compromised in calves with moderate to severe diarrhoea.

### 2. Sodium

Sodium facilitates the passive absorption of water from the small intestine, promoting rehydration. Commercially available electrolytes often contain sodium chloride for this purpose. However, sodium is tightly regulated within the body and problems can arise if too much or too little are present in the blood.

### 3. An alkalinising agent

The majority of electrolyte treatments contain bicarbonate (in the form of sodium bicarbonate) which directly alkalinises and restores blood pH. However, bicarbonate (and citrate) inhibits the formation of the casein curd or

'milk clot' in the abomasum. Therefore electrolyte products containing bicarbonate or citrate should be fed 3-4 hours either side of a milk feed. Other alkalinising agents include acetate and propionate which also act as an energy source. Acetate is the most easily metabolised and does not interfere with milk digestion. When treating calves with mild metabolic acidosis, acetate and propionate are the preferred alkalinising agents. In addition to their alkalinising effect, they also promote the absorption of sodium and water from the small intestine. Acetate and propionate do not alkalinise the abomasum and intestine which reduces the risk of bacterial proliferation in these organs.

### 4. Glucose

Glucose (or dextrose) acts as an energy source but also helps in the absorption of sodium, which in-turn promotes water absorption and rehydration. As with sodium, the level of glucose in the blood is finely controlled and an oral electrolyte treatment which contains too much glucose or is incorrectly mixed can exacerbate diarrhoea.

### 5. Potassium and chloride

Both potassium and chloride are required to help maintain the pH of the blood once the dehydration and acidosis have been corrected. They are also essential for skeletal and cardiac muscle function.

Our clinic is now stocking VetreLYTE ZB, a zero-bicarbonate premium oral electrolyte for calves. This electrolyte meets all the criteria required of a calf electrolyte and has been specifically formulated by veterinary researchers to contain acetate as the alkalinising agent. This means it provides a source of energy for calves with diarrhoea; aids in the absorption of water and sodium; will not alkalinise the abomasum which can lead to undesirable bacterial overgrowth; and, will not interfere with milk digestion.

**Please contact the clinic or speak with one of our veterinarians for more information.**

## APIAM DAIRY SERVICES CLINIC NETWORK

Border Veterinary Clinic: Cohuna, Leitchville, Barham, Kerang  
Deniliquin Veterinary Clinic  
Echuca Veterinary Clinic  
Finley Veterinary Clinic  
Gippsland Veterinary Hospital: Maffra, Sale

Gympie Veterinary Services: Gympie, Tin Can Bay  
Kyabram Veterinary Clinic: Kyabram, Nathalia  
Scottsdale Veterinary Services  
Smithton Veterinary Service  
Terang & Mortlake Veterinary Clinic: Terang, Mortlake  
Warrnambool Veterinary: Warrnambool, Nullawarre, Koroit, Port Fairy



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Local knowhow.  
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