Preliminary results of on-going research on calf feeding make essential reading for anyone wanting to rear the best heifer replacements they can.

The Milk Bar team say they have been startled by what they have found so far in testing the effect teat design has on rearing pre-weaned calves.

A trial conducted by an independent research facility started in March 2014 and will follow the same heifers through to the time they start milking in 2016. While Milk Bar commissioned the trial, it is important to note that they had no input once the trials commenced. Teat treatments were randomised and blinded to the technicians.

Interesting findings

The trial has revealed some interesting findings, particularly regarding cross suckling damage, and curdling and digestibility. This is an independent trial commissioned to study the influence teat flow rate in commercial milk feeding systems has on calf health and performance.

The brief was to feed six groups of calves from the same farm, fed the same rations and housed in the same facility. Three groups were fed using Milk Bar Teats to give a controlled feeding rate, while the other three groups were fed using a faster teat with an internal valve that feeds at a similar speed to teats that are commercially available in Europe, New Zealand and North America.

It has been shown in previous studies that the speed of milk flow influences post feeding cross suckling in groups of calves. The current trial confirmed that groups of calves fed on a faster teat with an internal valve will cross suck, while this behaviour is rare in calves fed from Milk Bar Teats.

The udder damage caused by calves cross sucking has been seen. It has long been suspected that cross sucking can lead to heifer mastitis. In fact, O.W. Schalm wrote “Calves suckling on each other can affect the development of the juvenile udder. This, in conjunction with the transmission of mastitis pathogens, is prone to lead to heifer mastitis. Milk Bar knew this was happening from observations farmers had reported, and were very concerned at the impact this has on the future production capabilities of that heifer when she comes into the herd.

It has been previously recorded that in artificially reared calves 78% of the cross sucking was directed at the inguinal region, while in calves suckled on cows, 81% of the cross sucking was directed at the mouths of other calves. It was noted during the 2014 trial that the calves suckled on Milk Bar Teats behaved like calves suckled on cows and mostly licked around the mouth area, while calves fed from faster teats with internal valves sucked the udders and navels of other calves.

In addition, the calves in the pens fed with the faster teats with internal valves tended to have red swollen teats, but of greater concern was that the teat canals appeared to be open, and the keratin plug had been removed. Potential implications for udder

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Squeeze a cow’s teat and the milk goes back into the udder (left). Squeeze a milk bar teat the and the milk goes back into the feeder (centre). Squeeze a teat with an internal valve and the milk squirts out.
development, adult milking performance and heifer mastitis are concerning for those calves fed from a fast teat. This is a serious problem for farmers but it is encouraging to see that this problem can be avoided through using well designed equipment.

**Curding and digestibility**

As part of the trial, calves fed from each type of teat were euthanised to investigate the effects of different feeding speeds within the digestive tract.

The difference of the curd structure in the abomasum was very noticeable two hours after feeding. Calves in the faster teat with an internal valve group had large lumps of curd floating in a watery fluid while the calves in the Milk Bar Teat group had even, porridge like curding. Further to this, the results from the digestibility analysis showed huge differences in the absorption of lactose in 14 day old calves. Tests were conducted two hours after feeding and showed there was significantly more lactose remaining in abomasum of calves fed with a faster teat with an internal valve than there was in calves fed with the slower feeding Milk Bar Teats. A great deal more lactose had also passed through the digestive system and as far as the rectum in calves fed with a faster teat with an internal valve than in calves fed with Milk Bat Teats. This indicates there is significantly more lactose present in the intestines of calves fed with a faster teat with an internal valve. Lactose is a sugar, and an ideal medium for the growth of bacteria.

**Milk Bar teat differences**

Milk Bar Teats have an internal web that controls the flow rate, stopping calves gulping and encouraging the correct suckling action and saliva production required for better curding, higher weight gain and less cross suckling. Calves must suckle on a Milk Bar Teat, just like they do from a cow. If you squeeze a cow’s teat the milk goes back into the udder. To milk a cow you must strip downwards, squeezing the teat between thumb and fingers. When a calf is on a cow it must suckle to obtain milk. If you squeeze a Milk Bar Teat, you will get the same result, the milk goes back into the feeder. To get milk from a Milk Bar Teat a calf must suckle in exactly the same way as it does from a cow. This is the natural way for a calf to feed and the digestive system will stay healthy and the calf will be heavier as a result.

If you squeeze a teat with an internal valve the milk squirts out. To get milk from a teat with an internal valve a calf will pump the teat. This is not the natural way for the calf to obtain milk and their digestive system cannot cope with the volume of milk, hence the problems farmers are seeing with calves cross suckling, getting nutritional scours and generally not thriving.

The trial calves will continue to be monitored as they mature and these preliminary findings will be updated as the project evolves. Milk Bar are very committed and passionate about rearing healthy calves. It is one of their priorities to continue research and development so that farmers can make informed decisions and enjoy the best results from their investment in replacement heifers.

**Calves in the faster teat with an internal valve group had large lumps of curd floating in a watery fluid (above), while the calves in the Milk Bar Teat group had even, porridge like curding (below).**