

Keep an early check on udder health

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Udder infections in pregnant heifers in South Africa are a much bigger challenge than most milk producers realise.

It is well-known that mastitis is the most costly disease of dairy cows, resulting in a considerable reduction in profitability for the dairy producer and industry.

Control of mastitis was in the past mostly driven by economic considerations. Currently, however, a growing consumer focus and demand for wholesome and safe milk and pressure through international supply chains are further increasing the need for quality milk.

Not much can be done to reverse damage to udder tissue in cases of chronic mastitis, despite the common belief among producers that antibiotic treatment will be a remedy for this problem. The fact is that the productivity of the animal is crippled.

When udder infection occurs in a heifer or young cow, her productive life is potentially shortened and she is prevented from reaching the target of six lactations set by the International Dairy Federation (IDF). Economic losses as a result of mastitis may

be higher in heifers than in cows due to the extensive damage done by pathogens to the developing secretory tissue.

A New Zealand study has shown that mastitis in heifers reduces milk production in the first and each of the following lactations by 8%. Other research shows that udder infection in heifers causes a long-term increase in somatic cell counts (SCC).

First calver udder health

But can heifers calve with mastitis or udder infections? Udder infection in heifers was until recently thought to occur infrequently. However, during the last two decades this has clearly been shown to be a myth and heifer udder infections are becoming a growing concern amongst producers who need to be addressed in a pro-active (preventative) udder health approach.

A study was done in South Africa on pasture-based dairy herds to evaluate the situation. Udder secretion samples were

Keep heifer pens clean and test heifers for udder infections if mastitis among first calvers is a problem.

taken from more than 5 600 dry cows and almost 2 100 late pregnant heifers to determine the presence of bacteria. Pregnant heifers used in this study were reared on fresh milk and were then housed in groups of five to ten as calves pre-weaning.

SA heifer udder status

The most important findings were that from 65% of heifer quarters no bacteria could be isolated. Coagulase negative *staphylococci* (CNS), also called environmental *staphylococci* or STE, were isolated from 27% of the quarters, *Streptococci* (not *agalactiae*) from 1,5%, *Staphylococcus aureus* (STA) from less than 1% and *Streptococcus agalactiae* (SAG) from 0,1%.

Internationally CNS is isolated from 8-90% of milk secretions of heifers indicating the unpredictability of heifer udder infections. This depends clearly on management and the challenges in their environment. The presence of CNS in the udder of heifers is not difficult to explain, as these bacteria are present on the skin and in the environment. (Please see more detailed information on CNS udder infections published in *The Dairy Mail*, June 2009, p80-83.)

Root of the problem

How do we account for the presence of STA and SAG in the udders of heifers as these bacteria are not known to survive for long periods in the environment?

Staphylococcus aureus and *Streptococcus agalactiae* are still frequently isolated from milk samples of dairy cows in South Africa, although much less in certain areas where herds are regularly tested for bacteria. STA and SAG are transmitted between udders during milking by the hands of milkers, teat liners and communal cloths. Factors associated with mastitis in heifers, however, are not completely understood. Studies indicated that calves housed together pre-



Clean feeding utensils from day one help the calf to grow into a healthy heifer.

weaning have a greater risk of becoming sick. It could not be proven that bacteria ingested by calves can spread via the digestive tract to udder tissue and it is much more likely that pre-weaned calves suckling or licking each other or their own udder and legs can be the source of infections for udder infections.

When they suckle on teats of fellow calves and the milk that they drink contain bacteria, these bacteria can enter the teat canals and remain in the udder tissue of that heifer until she calves down or even for life. It is not only milk from clinical mastitis cows that may contain bacteria, but also milk from cows with subclinical (negative on the strip cup) mastitis, although milk of mastitis cows usually contains much higher concentrations of bacteria. The STA quarter infections in the heifers were compared with these in dry cows in the same herds. Results of first, second and later lactation cows were grouped together to be compared with these found in the heifers (table 1).

There was no significant difference between STA quarter infections in heifers

Table 1: The percentage of quarters infected with *Staphylococcus aureus* in heifers and dry cows of eight dairy herds

Herd	No. of quarters examined Heifers: cows	% STA in heifers	% STA in cows				Prevalence ratio between heifer and cow intra-mammary infection
			1st lactation cows	2nd lactation cows	2nd lactation plus cows	All lactation cows	
A	1 248:1 884	0,48	0,49	0,33	0,83	0,51	0,94
B	1 404:4 008	1,07	1,18	1,60	1,65	1,33	0,80
C	804:2 548	0,00	1,29	1,70	1,29	1,04	0,00
D	1 756:3 245	2,16	2,63	1,85	3,42	2,42	0,90
E	640:2 320	2,19	0,30	1,37	0,68	1,05	2,08
F	1 123:2 716	0,36	0,90	0,87	1,29	0,89	0,40
G	936:2 656	0,75	1,10	1,56	1,62	1,25	0,60
H	352:2 072	0,28	0,82	0,00	0,70	0,58	0,49
Total	8 263: 21 447	1,03%	1,20%	1,39%	1,40%	1,24%	

and these in first, second and later lactation cows. This finding came as a surprise, as heifers should not only be free of STA, let alone have similar or higher infection rates than cows in the same herd!

“Economic losses as a result of mastitis may be higher in heifers than in cows due to the extensive damage done by pathogens to the developing secretory tissue”

The ratio in five of the eight herds between heifers and cows was above 0,50, meaning that there were at least more than half as many heifers infected with STA than

cows. In one herd this figure was 2,08 (table 1, herd E), meaning that the STA infection rate in heifers was two times more than in the cows of that herd. This was, to say the least, unexpected!

Staphylococcus aureus is known for its chronic nature and is therefore especially detrimental to the udder health of heifers at the beginning of their productive lives.

SAG udder infections

We did not expect at all to isolate SAG from the udders of heifers. Only two papers reported on the isolation of SAG from udders of heifers. The one was written in 1942 by Schwam, who developed the California milk-cell test. During that period SAG was the most prominent mastitis-

causing bacteria in dairy cows. The other report of SAG on udders of heifers prior to calving was written in 1998 in Norway.

In three of the five herds that were positive for SAG udder infections in cows, SAG was also isolated from udder infections in heifers. The ratios between heifers and cows were 0,6, 1,0 and 1,8, meaning that heifers had more than half, the same and 1,8 times more SAG infections than cows in the herds respectively.

These SAG infections also occurred in the same manner as STA by calves suckling on each other's teats after being fed infected milk.

Finding *Streptococcus agalactiae* in udder secretions of pregnant heifers should not be ignored, but should be considered when managing a SAG-positive herd.

Newly calved heifers may be a source of infection and a risk for the re-introduction of *Streptococcus agalactiae* into the lactating herd.

Coping with CNS

Most CNS infections during the dry period are eliminated spontaneously or with antibiotic treatment during early lactation. Studies showed that udder quarters of heifers which were infected with CNS before calving were more susceptible to new infections by other bacteria. But, what do we know about coping with coagulase negative staphylococci (CNS) in practice?

It was found that cows that received dry-cow intra-udder antibiotics had almost no CNS when sampled just after the milk-withholding period for that antibiotic. When these cows were sampled a week or two later close to calving, they were again positive for CNS udder infections. Whether treatment is therefore economically viable, remains doubtful. In lactating cows the same picture of frequent new CNS udder infections is well-known by producers who regularly test their herds for bacteria.



A healthy udder gives heifers a good platform for a productive life in the dairy herd.

Udder health management

The prevention of udder infections in heifers should be based on reducing their exposure to bacteria and improving their immune systems.

- Early segregation of calves from their mothers.
- Using of individual pens pre-weaning.
- Culling of calves that persist in suckling others.
- Pasteurisation of discarded milk.
- Effective fly control should be practiced.

International studies vary in their approach towards heifer udder infections and they recommend the following:

- Blanket intra-mammary treatment with a lactating cow preparation was used in cases 14 days before the expected calving in herds where the environment was a big challenge (wet and muddy).
- Systemic antibiotics administered to heifers were found not to be effective in reducing the occurrence of mastitis after they calved.

Whether or not a producer decides to treat heifers prior to calving should depend on the level of the problem in his or her herd, the risk in the environment and the specific bacteria involved. In the end it should be cost-effective and beneficial for the long-term udder health of the animal. **TDM**