Teat affections caused by the milking machine

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Introduction

The Animal Health Service in The Netherlands employs certified specialists in the field of mastitis management, especially trained in the evaluation of the functioning of the milking machine and milking procedures. They visit, on a yearly basis, around 300 dairy farms with mastitis or problems related to the milking machine at the request of the farmer and/or local veterinary practitioner. They report their findings always to the farmer and the local veterinarian.

The teat canal is the first defence mechanism against invading bacteria in the udder (Hamann, 1987). Therefore it is essential that the teat orifice and the teat canal are in good condition. Teat affections are caused by infectious diseases but also teat trampling, chemicals, weather changes and mechanical damage by the milking machine.

The Teat Club International suggested a range of teat condition scores for the evaluation of field data and divided them into short- (single milkings), medium- (few days or weeks) and long term effects (several weeks) (Rasmussen, 2003). In this article examples of short- , medium- and long term teat tissue reactions to machine milking are described.

Hardened red or blue teats

A disturbed blood circulation in the teat can cause hardened, red and even blue teats immediately after milking. Possible causes are: vacuum too high, too short massage phases, too long or too short liners and too long blind milking (Hamann, 1987, Mein 2003). Side effects of a disturbed blood circulation are: open teat orifices; damage of the epithelium and a diminished cell bound resistance (Zecconi & Hamann, 2004). The risk of new infections increases if the swelling of the teat during milking is over 5% (Zecconi et al., 1992). There is a herd problem if this teat affection is seen in more than 20% of the herd (Rasmussen et al., 2003).

Swelling at the base of the teat

A high vacuum in the mouthpiece of the liner causes a swelling, which looks like a ring, at the base of the teat also immediately after milking. This is more pronounced if the vacuum in the mouthpiece of the liner is concurrently too high at the beginning or in the middle of the milking above 20 kPa. In these cases udder health will deteriorate (Rasmussen,

1997). During milking the teat will rest against the liner if the diameter of the liner is about the same as the diameter of the teat. In such a situation the vacuum in the liner will be low and the blood circulation in the teat will be sufficient. At the end of a milking the teat diameter will diminish and in this case the teat will not follow the movements of the liner. This causes an increase in vacuum at the mouthpiece of the liner. The liner will move up on the udder and the liner will tighten the teat canal. Milking out will then be more difficult. A high vacuum in the liner will happen sooner with wide liners. A wet preparation of the teats before attaching the milking cluster will have the same effect. The air inlet in the liner will be insufficient if there is water residue between the liner and the teat.

Teat lesions

Teat lesions caused by the milking machine are defined as medium-term teat changes. There are open lesions and vascular damages observed as petechial or extensive haemorrhages. We had a problem in a herd with 60 cows where nearly half of the herd had fissures at the base of the hind teats. This was caused by wrong adjustment of the automatic cluster removal. The clusters where removed under vacuum and pulled to the front of the cow. As a consequence, the teats where bended, especially in the hind teats. This resulted in fissures at the base of the teat.

Lesions of the teat skin leads to colonisation with bacteria. Les than 5% of the cows should have open lesions (Rasmussen, 2003).

Teat end callosity

Teat end callosity is a long term effect. Too high pressure on the teat end causes teat end callosity (Mein et al., 1987). Machine milking risk factors are: long machine on time in combination with a low milking flow, pulsation c phases too short, too high vacuum, too slow detachment of the cluster and too tight liners (Mein et al., 2003; Neijenhuis, 2004). Cows with pointed teats show more teat end callosity rings than cows with inverted or flat teat ends (Neijenhuis, 2001). Neijenhuis et al. (2000) developed a teat end scoring system. An increase in the risk of clinical mastitis was observed when thickness and/or roughness of the teat end callosity increased (Neijenhuis, 2004). It is considered a herd problem if more than 20% of the cows have roughened rings extending 1-3 mm from the orifice and that more than 10% of the cows have rings extending > 4 mm (Rasmussen, 2003).

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