



# How safe are your liners?



Most people would not drive their car or tractor once the tread on the tyres becomes worn. They know that worn tyres are dangerous, increase the likelihood of having an accident and reduce the handling performance and efficiency of their vehicle.

However, there is another piece of rubber on a dairy farm that is often not treated with such respect. The milking liner, which is ultimately the final point of contact between the sensitive teat tissues of the cow and the milking machine is frequently not changed when worn and remains unchanged as the performance of the liner starts to decline.

In the EU, the recommendation is that liners should be changed every six months or after milking 2500 cows (whichever is sooner). This can be easily calculated by multiplying the number of milking cows by the milking frequency and then dividing this figure by the number of milking clusters. This gives the number of cows milked per liner per day. You can then divide 2500 milkings by this number to give you the recommended change frequency in days. For example: In a 200 cow herd milked twice daily with 16 milking points you will find that each liner milks 25 cows each day. Therefore the liner will require replacement every 100 days. In the USA, where the formulation of the rubber compound contains less carbon black, liners require changing after milking around 1200 cows.

## So what happens as a liner ages?

There has been considerable research carried out looking at what happens to the liner and its performance as it starts to age. Some of this research was carried out on US formulation liners while other studies examined EU formulation liners. Therefore, although the trends are similar, the actual number of milking where measurable differences in performance can be seen will vary between continents. Research at the University of Wisconsin, led by D.J.Reinemann, concluded that the aging liner produced a decreased peak milk flow rate, increased vacuum fluctuations, increased milking duration and decreased mouthpiece chamber vacuum. They also reported a small but consistent trend in decreased average milk flow rate as the liner aged. At a farm level, this

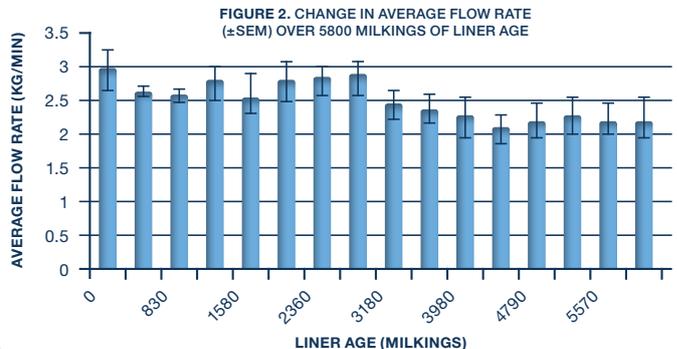
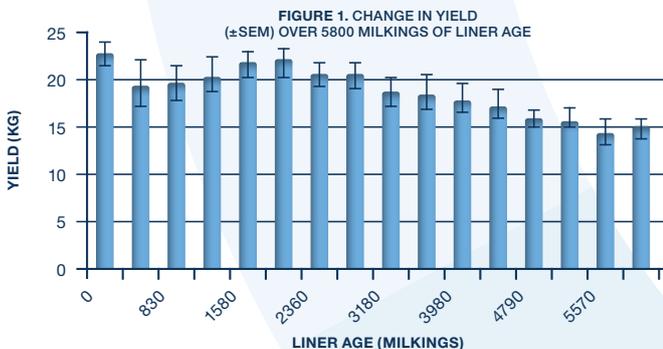
would manifest itself as slower milking, longer unit on time and increased liner slippage. Work carried out at the Institute of Animal Health in the UK, led by E. Hillerton, concluded that as the liner moves past 2500 milkings there is a reduction in the average and peak milk flow rates (see figure 2). They also identified that as well as the liner milking more slowly, which will extend milking, the aged liner is also less efficient at harvesting all the available milk (see figure 1). Strip yields, or milk remaining in the udder after completion of milking, increases as the liner moves beyond 2500 milkings. There was also an increase in liner slippage and an increase in the number of discoloured teats when the unit was removed.

Liner slippage is a known risk factor for new intramammary infections and every effort should be made to reduce the incidence. As well as a reduction in milking performance, there are subtle changes in the composition of the rubber. Butterfat tends to be absorbed into the rubber material and there is evidence that Calcium is deposited on the liner surface. The internal surface of the liner becomes rougher as the liner ages. The aggressive cleaning regimes in modern dairies use alkali and acid sanitisers and high temperature cleaning, all of which leads to denaturing of the rubber compound. The regular opening and closing of the liner during the pulsation cycle will result in the liner barrel becoming misshapen while the liner mouthpiece becomes distended leading to a less efficient seal and lower mouthpiece vacuum.

In summary, a reluctance to change milking liners at the appropriate interval can be false economy. It can lead to slower milking, longer milking sessions and increased liner slippage. The internal surface of the liner becomes harder to clean, increasing the risk of the transmission of mastitis pathogens and cleaning related quality problems.

Most sensible people would not put their family at risk by driving with worn tyres - perhaps we should give the dairy herd the same consideration!

Ian Ohnstad - Director of The Dairy Group. Ian Ohnstad is also Chairman of the British Mastitis Conference and is a Committee Chairman of the Teat Health Committee of the National Mastitis Council. He is an active member of the Central Mastitis Review Group.



# Do you know what clinical mastitis really costs?

There is a clear correlation between udder health and a proper milking routine. And as you read in Ian Ohnstad's article, complying with the recommended serviceable life of liners (2500 milkings) and setting the correct vacuum level are just as important to a successful milking process. The current milk price situation forces us to do everything possible to maintain a high-performance herd with the best udder health. In terms of revenue, every drop of milk delivered to the dairy counts.

So even a single case of clinical mastitis means a loss, because milk containing antibiotics cannot be sold. But is it really just about the loss of revenue? Evidently not: Bernd Lührmann, dairy herd specialist of the Agricultural Chamber of Lower Saxony, compiled an overview of the total cost of a case of clinical mastitis:

## Cost calculation of clinical mastitis in relation to the lactation period and weighted average

|                                                            | 1ST / THIRD OF LACTATION | 2ND / THIRD OF LACTATION | 3RD / THIRD OF LACTATION | AVERAGE LACTATION | PERCENTAGE |
|------------------------------------------------------------|--------------------------|--------------------------|--------------------------|-------------------|------------|
| <b>Distribution of mastitis diseases</b>                   | 67%                      | 22%                      | 11%                      |                   |            |
| <b>Loss of Milk quantity 1</b>                             | 296kg                    | 216kg                    | 152kg                    | 263kg             |            |
| <b>Loss of milk (during Therapy)<sup>2</sup></b>           | 104 €                    | 76 €                     | 53 €                     | 92 €              | 17%        |
| <b>"dent of Lactation performance" 1</b>                   | 423kg                    | 296kg                    | 169kg                    | 367kg             |            |
| <b>Loss of milk because of "dent of lactation perf." 2</b> | 148 €                    | 104 €                    | 59 €                     | 129 €             | 24%        |
| <b>Cost of Therapy (treatments, etc.)</b>                  | 90 €                     | 90 €                     | 90 €                     | 90 €              | 17%        |
| <b>Cost of check-up</b>                                    | 20 €                     | 20 €                     | 20 €                     | 20 €              | 4%         |
| <b>Additional workflow farmer</b>                          | 2.3AKH                   | 2.3AKH                   | 2.3AKH                   | 2.3AKH            |            |
| <b>Remuneration of additional workflow farmer 3</b>        | 34 €                     | 34 €                     | 34 €                     | 34 €              | 6%         |
| <b>Net cost of reproduction 4</b>                          | 167 €                    | 167 €                    | 167 €                    | 167 €             | 31%        |
| <b>Total loss of milk production (kg) 1</b>                | 719kg                    | 512kg                    | 321kg                    | 630kg             |            |
| <b>Total cost of clinical Mastitis</b>                     | 562 €                    | 490 €                    | 423 €                    | 531 €             |            |

1 = 8.466kg average milk production per lactation (Germany)

2 = milk price = 0.35€ / kg incl. tax and others (Germany)

3 = calculated remuneration 15€ / AKH

4 = heifer replacement (1900€) deducted by old cow (900€)

Bernd Lührmann (2013) - Germany

As his findings show, a single case costs around 531 Euro. The amount takes into consideration all factors relevant to calculation of the total cost. Lactation is divided into three phases. At 562 Euro per incident, a case during the first phase of lactation is the most costly. In contrast, a case during the last phase is the least expensive - 423 Euro.

Every dairy farmer understands this concept and is aware of the loss in revenue due to the administration of antibiotics to treat a diseased cow. But what dairy farmers often do not realize is that clinical mastitis causes less milk to be produced overall during the current lactation. And the cost of reproduction is impacted even more severely, as cows with mastitis will leave the herd earlier. As a conclusion dairy farmers should see a total loss in revenue in any mastitis case. The factors pointed out in Bernd Lührmann's overview have an even greater impact.

**So to save money, keep an eye on udder health, inspect your equipment regularly and change the liners as recommended!**

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