MILKRITE DAIRY SYMPOSIUM
“A PERFECT DAY FOR MILKING EXPERTS”

Together with the Organisation Knowledge Centre of Agriculture in Denmark, Milkrite hosted their first international dairy symposium held at the Koldkaergaard Conference Centre in Aarhus Denmark on October 23rd 2013.

Per Justesen, the Knowledge Centre of Agriculture Denmark, as well as Ghislain Coppejans and Martin Eistrup from Milkrite, welcomed over 70 participants and milking experts from all over Europe. A variety of people (vets, milking experts, consultants, product engineering, people of dairy processors etc) expressed a high level of interest in coming to the symposium.

UDDER HEALTH – MASSIVE IMPACT ON FARM MANAGEMENT

The topic of the event, “Udder Health – Focus on Teat End Condition”, is obviously a very important theme amongst dairy industry professionals. Udder health is one of the biggest management influences in worldwide dairy business. Dairy farmers around the globe are seeking better udder health which helps to avoid clinical & subclinical mastitis for higher milk volumes and therefore more money in the farmer’s pocket.

THE IDEA BEHIND

The idea of the symposium was to listen to worldwide experts of milking talking about mastitis control, liner performance and related technical aspects of milking and quality issues with consumers in mind.

A UK study says: 70% of all UK milking parlours are not set up to maximize performance and 26% of all mastitis cases caused by the wrong settings in the parlour.

So it is essential to start thinking about implementing the correct parlour settings.

Below is a list of our internationally known experts (in alphabetical order):

Jorgen Katholm, Certified Vet in Cattle Herd Health, DVM, Dip ECBHM, Denmark
Koen Lommelen, Institute of Farm Management, MCC – Vlaanderen, Belgium
Ian Ohnstad, The Dairy Group, United Kingdom
Carl Oskar Paulrud, MSc, PhD, Animal Science, Denmark
Morten Dam Rasmussen, Dept. of Engineering, Aarhus University, Denmark
Douglas J. Reinemann, Professor & Chair, Biological Systems Engineering, University of Madison, USA
Harm Wemmenhove, Wageningen UR Livestock Research, Lelystad, Netherlands

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MASTITIS
The first topic was the veterinarian and biological part “how and why to avoid Mastitis”.

Jorgen Katholm, explained the massive influence of mastitis and environmental impact on the dairy business. However the dairy farmers in Denmark do produce high milk quality standards and have one of the best udder health in Europe.

A so called “5 point plan” for good milking was proposed, including milking process of cow preparation (and maintenance of milking machine), teat disinfection (teat dipping), dry cow therapy, early treatment of mastitis and segregation and culling.

KERATIN AND TEAT CANAL
Carl Oskar Paulrud spoke about the teat canal being a defence mechanism. The teat canal plays a major role against mastitis as it prevents milk leakage and bacterial entrance. A very important result of good teat condition is the keratin status. So it is important that during pre-milking and milking, the keratin is removed properly so fresh keratin can build up again with different lipid compositions. So gentle milking is understandable for optimal keratin turnover in the teat canal.

THE MILKING PROCESS
The second topic: “functionality on milking performance with the correct settings” was a major theme of the symposium. Our further three guest speakers explained the newest research approaches to correct liner settings according to teat conditions. Morten Dam Rasmussen reported the interaction between machine milking and teat conditions. The complexity of mastitis is extremely wide, however wrong settings of milking are proven to have a massive effect. A direct cause of bad teat end condition is incorrect liner fit to teat sizes. Very often a short teat of less than 3cm length (normal condition of modern Holstein cows) and incorrect liner for the small teat size creates significant higher mouthpiece vacuum and as a consequence higher teat thickness (+10 kPa increased new infection rate with 8% of cows), so the right liner fit is essential.

In addition the overmilking process has a bad impact on udder health, as hyperkeratosis has a high correlation with over milking. Early removal of clusters will improve teat end condition. The threshold of cluster removal can be set up to 600grams per minute without any losses in yearly milk productions per cow. So overall Morten’s message was: “the right liner for the herd minimizes problems”.

IT’S ALL ABOUT TEAT SIZES
In following Professor Doug Reinenann, presented from his office in Madison, USA via Skype, the role of liner dimension, shape, and venting on milking performance. The new research on teat dimensions indicate: there is no real significant difference between modern US Holstein cows and the rest of all Holstein cows around the globe. So a perfect liner for Holstein cows in the US should automatically fit in every other modern Holstein dairy worldwide as well. Doug also explained the influence of liner compression, as the dynamic over pressure measurement is a good predictor of liner compression. A higher overpressure for a liner has a more negative impact on teat end condition. The triangular liner sets trends to have a lower kPa value (overpressure) compare to the round liner. As well as Morten, Doug informed about the negative influence of high mouthpiece vacuum and teat end congestion (blue colour or ring). It indicates a mouthpiece vented liner is less likely to cause negative impacts compared to high vacuum, short teats and higher milking duration.

The primary machine factors that affect teat end condition are:
1) Liner dimensions compared to teat dimensions, or the fit of the liner to the teats
2) Type of liner including shape, material, and venting
3) Milking vacuum level, in both the peak and flow periods of milking
4) Degree of over milking
5) Pulsation settings
All these factors are interactive. Doug’s take home points are easy and simple but very effective:

1) Size (Liner Dimensions) Matter!

2) Use teat condition to assess the adequacy of the milking vacuum level (Mouthpiece chamber vacuum can be used to assess liner fit)

3) The most important measurements of milking performance are average claw vacuum at peak and low flow. Also measure pulsation phases (a,b,c,d) in ms and not in %.

LINER PERFORMANCE MAP – THE NEW TOOL FOR THE RIGHT SETTING

Finally Ian Ohnstad, reported about the direct liner performances and teat health. The milking process is simple; it should go quickly, gently and completely. As already explained Ian also reported that excessive liner compression will increase teat end hyperkeratosis and excessive keratin removal from the teat canal. As dairy farmers do require milking speed and he also should seek for good teat condition, it is important to find the most effective active optimum in milk flow during milking, which can be measured during the b-phase (measured in ms) at milking.

According to vacuum and the length of b-phase:

1) As the b-phase in ms increase the average milk flow (AMF) increases

2) As vacuum increases, the “optimal” b-phase reduces

So as an application of this knowledge it is important to understand the relationship between vacuum and pulsation which can be shown into the “liner map”. The liner map shows the length of b-phase in ms and claw vacuum at peak flow. Based on teat measurements the percentage of max average flow rate of the specific liner is shown in the columns of the liner map. So as too high b-phases in ms and high vacuum kPa causes teat end damages the optimum levels are coloured in low and medium levels, measured for teats longer than 3 cm. So as an example, a 400 ms b-phase and 42kPa is at 88% of max AMF and is located in the medium range. So as a conclusion the liner performance map is the best tool to set up milking in an optimal range.

VENTED LINER – LESS TEAT BARREL CONGESTION

Ian furthermore explained the effect of mouthpiece vacuum (vented liner). During several test analysis the vented liner show a controlled air admission, it manages chamber vacuum and reduces congestion and has additional benefit of moving milk away from liner (avoiding Respray effect). The vented liners do show both at peak flow and low flow a significant lower Mouthpiece vacuum, which causes a positive impact. Triangular vented liners do show the lower rate of teat barrel congestions (swollen ring and blue teats). So as a combination the triangular vented liners do show a lower liner compression which is positive for teat end congestion and also the vented liner provides a lower Mouthpiece vacuum at peak and low flow, with a positive impact of teat barrel congestion.

So Ian concluded with the three points:

1) It is essential to understand the relationship between vacuum and pulsation

2) Carefully monitor changes made to either parameter

3) Look closely at post milking teat condition as an indicator of system success

CONSUMERS MIND

The last topic of the dairy symposium was the “importance of high milk quality for dairy processors and consumers. Harm Wemmenhove, made several very interesting comments about milk quality. As consumers are requesting high quality, safety, good taste and nowadays more and more “how is the milk produced” the dairy industry must provide always high quality standards. For example the Netherlands export 70% of their milk therefore they must have an even closer look on quality.
Within the EU certain standards are set, however the Netherlands also checks for Butyric acid, FFA (Free Fatty Acid) and Chloroform. As the Netherlands do set very high standards within the EU, it is interesting to see 40% of all dairy farmers in the Netherlands will have one or more penalties every year (among those cases almost 40% is Somatic Cell Count, followed by 22% Bacteria count and third is FFA with 16%).

THE NETHERLANDS PROJECT

The Dutch dairy industry have made a massive investment into “Farm Risk Analysis and Management”. Within the Farm Risk Analysis, the milking procedure and related audits on farm are included as well. All yearly audits are organized by KOM “Kwaliteitszorg Onderheud Melkinstallaties”. This is controlled by an external organisation. So dairy farmers will receive several times during the year a so called maintenance report.

However, the challenge of the whole milk chain is a smooth “cooperation” of all processing steps, starting at

SUPPLIERS ON FARM ➔ FARMER’S GATE ➔ PROCESSORS ➔ RETAIL ➔ CONSUMERS

The related project of sustainability dairy chain started in 2011 in the Netherlands and will be finished by year 2020. The goal is: sustainability for dairy, considering animal welfare, animal health, environment and society (but also the farmer must have a good income). Organization & companies of dairy industries (NZO) cooperates with farmer’s organization (LTO). They also focus on climate, greenhouse gas, reduced energy intake and more green energy, to make it short: towards a climate neutral housing system with optimal cow welfare and highest quality of milk.

IMPULSE AIR – POSITIVE IMPACT ON UDDER HEALTH

The final presentation was presented by Koen Lommelen. He reported about the Belgium dairy industry and also showed the results of the “Veepeiler” project. This independent project contents the field trial of a comparison of commercial round liner vs. vented triangular liners in praxis of Belgium dairy farmers.

For the project 20 Belgium dairy farmers were selected randomly. As a usual “before and after” approach, the project was prepared as follows:

1) Dynamic test milking equipment before installation of vented triangular liners,
2) Dynamic test milking equipment after installation of triangular vented liners,
3) Observation of teat conditions before and after installation of triangular vented liners,
4) Recording clinical mastitis
5) Recording milk quality (cell count, lipolysis, dairy herd control).

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The individual test results were presented earlier this year, so to summarize the most important points. Somatic Cell Count, before 198tsd, after 188tsd, currently at 155tsd, Clinical mastitis cases were settled and indicated in more, same, less, dairy farms with increase clinical mastitis = 0, dairy farms with no difference of clinical mastitis = 8, Dairy farms with less clinical mastitis = 12.

For Lipolysis (1mmol/100ml fat) = high values indicates higher free acids in milk and lower level of good taste of milk; before 0.29, after 0.24, currently 0.23.

The observation of teat condition had a significant impact, so after the trend is: strongly improved teat condition.

As a technical consequence and what we did learn at the dairy symposium the mouthpiece vacuum before was at 19kPa and after at 11kPa (so significant lower).

So in conclusion Koen said:
1) Numbers of dairy farmers who are using triangular vented liners increased significantly in Belgium
2) Clearly positive impact on teat condition
3) General udder health improved
4) Adjustments for milking’s and technical support are important!

SYMPOSIUM FINISHED WITH ALL QUESTIONS ANSWERED

The symposium finished with a very intensive panel discussion of all the questions from the audience to the speakers. All speakers gave very useful feedback to the audience.

Overall the symposium was a powerful day full of worldwide expert’s opinions on direct aspects of teat end condition according to udder health.

THANKS TO THE ORGANISERS

Finally Milkrite greatly appreciated working together with the Danish Knowledge Centre of Agriculture, Team of Per Justesen, in correspondence with the great hospitality of the Koldkaergaard Conference Centre in Aarhus, Denmark.

Martin Eistrup

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