

## MASTITIS IN HEIFERS IN DANISH ORGANIC DAIRY HERDS: INFECTION PATTERN AND ASSOCIATIONS TO RISK FACTORS RELATED TO MANAGEMENT AND ENVIRONMENT

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*Au Danemark, les pratiques d'élevage en agriculture biologique sont caractérisées par la législation suivante : 1) la ration doit comporter des fourrages, 2) 85% de la nourriture doit être d'origine organique, 3) les animaux doivent avoir un exercice quotidien, 4) tous les animaux doivent bénéficier d'une litière paillée, 5) le temps d'attente des médicaments vétérinaires est trois fois plus long qu'en élevage conventionnel, et 6) la prévention médicale des maladies est prohibée. Un des principes fondamentaux est d'améliorer et d'assurer un haut niveau de bien-être aux animaux.*

*Les mammites atteignant les génisses sont un problème majeur dans les élevages danois en agriculture biologique. Une étude a été entreprise afin de décrire les possibilités de diminuer le risque de mammite chez les génisses en agriculture biologique, et, de la sorte, améliorer aussi leur bien-être. L'attention a particulièrement été portée sur les facteurs de risque environnementaux pendant le péripartum, et les pratiques d'élevage relatives à l'introduction des génisses dans le troupeau de vaches.*

*L'incidence des mammites des génisses et les germes en cause ont été suivis dans 9 élevages biologiques durant les hivers 1995-1996 et 1996-1997. Ces données ont été reliées à des observations détaillées des facteurs d'environnement et des pratiques d'élevage pendant la période allant de l'introduction dans le troupeau de vaches à 7 semaines après vêlage. Durant les 7 premières semaines de lactation, un technicien a observé les primipares et prélevé un échantillon de lait à 4 reprises. La réaction de chaque vache envers l'éleveur a été mesurée avec un test de réaction de peur. Le vêlage et la deuxième traite ont été décrits en détail par le trayeur. La prise en main de la génisse avant vêlage a été décrite en ce qui concerne le toucher de la mamelle avant vêlage et la période d'introduction dans le troupeau de vaches.*

*Les données sont décrites et discutées au moyen de statistiques descriptives, avec une attention particulière pour les pratiques d'élevage pendant la période d'introduction.*

### INTRODUCTION

Danish organic farming can be characterized by the following governmental legislation: 1) Roughage should be included in the feed ratio, 2) 85% of the food should be of organic origin, 3) daily exercise should be provided to all animals, 4) straw bedding should be provided to all animals, 5) withdrawal time after application of veterinary medicine is 3 times longer than in conventional farming systems, and 6) medical prevention of disease is prohibited. One of the fundamental goals for organic farming systems is to improve and ensure a high level of animal welfare.

Mastitis in heifers was reported as a major problem in Danish organic herds. A study was initiated with the objective to describe possibilities for decreasing the risk of mastitis in heifers, and - in this way - also improve the animal welfare among heifers in organic farming systems. All preventive strategies had to be non-medical as a consequence of the governmental legislation rules. Focus was therefore especially directed towards risk factors in the environment during the periparturient period of the heifer. In Danish organic herds, straw bedding and daily exercise should be provided to all animals. Heifers are consequently often kept in deep litter systems, because they meet the demands and are easy to build up and handle. In many older farms, the cows are kept in tied stall systems, and in such herds, the heifers will have to change environment from one housing system to another. Besides this 'dramatical change', the change from the flock of heifers to a cow herd can have negative impact on the welfare of the heifer. Management factors related to the introduction of the heifer to the cow herd were therefore found relevant.

### MATERIAL AND METHODS

The incidence and bacteriological pattern of mastitis in heifers were followed in 9 organic herds during the winter 1995-1996 and 1996-1997. Data collection will stop in May 1997. These findings are related to detailed recordings of factors in the environment and management during the period from introduction to the cow herd to 7 weeks after calving. From calving and during the first 7 weeks of the lactation, the 1st lactation cow was examined by a project technician 4 times, and a milk sample was taken at the same occasion. The reaction of each cow towards the stock-person was measured in a fear-reaction test. The calving and the second milking of the heifer were described in detail by the milker. The handling of the heifer before calving was described with regard to touching the udder before calving and time of introduction to the cow herd.

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The data will be described and discussed by means of descriptive statistics with focus on management routines during the introduction period. Risk factors for mastitis defined as increased somatic cell count and bacteriological findings will be analysed in generalized linear models.

## RESULTS

Since data collecting will be completed after the submission of this paper, the results are preliminary. Very few comments to health status (claw health, decubitus, decreased appetite) were present before calving. In four herds, the cows were not introduced to the lactation environment before calving. No stock-person carried through skin-care in order to make the heifer used to handling, as recommended. In the herds, where cows were introduced to the lactation environment, touching the udder in order to inspect it, teat dip with skin-care oil, and make the heifer familiar with handling. In two loose housed herds, heifers had the possibility to follow the cows through the milking environment during milking. In one herd, where heifers were not introduced to the milking environment before calving, severe problems with laying down milk were observed which explains a high positive association between accustomizing heifers to the milking environment and laying down behaviour. The same tendency appeared in another herd which had no introduction period.

A high correlation between the presence of udder edema and poor skin quality was found. Both findings seemed to be related to certain herds.

Fear-test of heifers did not show any clear pattern with regard to showing fear toward the stock-person. In almost 50% of the cases, there were comments with regard to poor teat skin quality (including wounds) during the 7 weeks period. Approximately one third of the 1st lactation cows had warts on the teats.

## DISCUSSION

The heifers seemed to be in a relatively good health condition before calving. The presence of an introduction period to the lactation environment before calving was mostly due to practical conditions, according to the stock-person, but must - nevertheless - be regarded as the most appropriate way with the lowest risk of developing the periparturient problems. The findings of failure in laying down milk during the first milkings in herds with no introduction period support this.

The clinical picture of the first lactation heifers udder health (skin quality) seemed surprisingly poor. A very high frequency of warts on the teats and a relatively poor skin quality must both be regarded as important risk factors for the development of intramammary infections and a vulnerable udder which is susceptible to infections. These results indicate a need for further investigations and development of strategies for a more systematic skin care during the ante partum period of the heifers.

Good descriptive statistics on herd level providing data about handling strategies of heifers could be made because of the width and depth of data. But the evaluation of risk factors must be seen as highly problematic and should be interpreted with caution, since most management routines are herd related and the number of herds in the study is very small (9 herds).

Including management routines into the evaluation of risk factors can furthermore be difficult, because these measures often represent a kind of 'soft data'. A factor like 'milker calming the cow during milking' evaluated by the milker him- or herself is a subjective statement. It seems as if the choice has to be made whether such factors should be included at all, and if they should, the nature of the data has to be accepted as 'soft'. The project veterinarian discussed the importance of the preciseness of the recordings and the criteria for each of the measures with the stock-person. This fact - together with the effort made in order to handle and interpret the data while taking into account the background of the data - was seen as the most sufficient way to meet the risk of including 'soft data' into epidemiological analyses this way.