

Mastitis incidence and milk quality in organic dairy farms which use suckling systems in calf rearing

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Abstract

In order to identify important factors influencing animal health and general disease resistance, detailed qualitative and quantitative farm data were collected from 99 organic dairy farms in the Netherlands. Mastitis incidence and milk quality were focal points of the data collection. In this paper the results of a group of farms which rear dairy calves in suckling systems (n=11) are presented. It was found that compared to other farms in the study (n=88), suckling systems in calf rearing had no clear adverse effects on mastitis incidence and milk quality. In 2006 average clinical mastitis incidence on suckling farms was 14%, on other farms 20%. The percentage of cows with a somatic cell count less than 250,000 at drying-off was lower (60 vs. 66%) at suckling farms. Also immediately after calving the percentage of cows with a somatic cell count less than 250,000 was lower (65 vs. 75%) on suckling farms. Between other farms and suckling farms, but also within suckling farms, distinctively different attitudes to disease management prevailed. Most suckling farms recently introduced suckling systems in calf rearing. Only 1 or 2 generations of suckled heifers had been introduced into the herds up to now. In order to judge whether suckling systems have a potential to improve udder health in future dairy herds, evaluation should be carried out again once suckled heifers constitute the majority of the herd.

Introduction

Farmers consider mastitis and high somatic cell count (SCC) in milk the most important health related issues which cost them money in terms of production loss and rejection of marketable milk. Also in organic dairying, curative treatment with antibiotics is an important treatment of udder infections. In organic dairying the use of antibiotics is bound to strict regulations. Moreover, farmers are stimulated to decrease the use antibiotics.

The search for alternative strategies to improve udder health is important. Wagenaar and Langhout (2007a, 2007b) described how some farmers try to decrease mastitis incidence and high SCC by rearing calves in suckling systems. By exposing calves to farm specific germs in early life, farmers expect the calves to have fewer problems with mastitis and SCC once they become dairy cows. Besides, suckling calves frequently "milk" their mothers, which might have a direct positive effect on udder health.

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This paper describes mastitis incidence and milk quality in organic dairy farms which use a suckling system in calf rearing. The collected baseline information will be used for future evaluation of dairy cows raised in suckling systems.

Materials and methods

All 350 organic dairy farms in the Netherlands were approached to participate in a study on animal health and general disease resistance. One hundred and thirty farms responded and provided basic data, including data on calf rearing, mastitis incidence and milk quality. They also gave permission to access digital farm data e.g. production and milk quality records and breeding data. Out of 130 respondents, 32 farms indicated they allowed calves to suckle their dams or a nurse cow after birth. Out of these 32 farms only 11 qualified for the “suckling” group. Qualifying farms applied a suckling system which allowed calves to suckle for 75 to 105 days after birth (on average 3 months), started using the suckling system before 2005 and had digital farm data over the period 2004-2006 readily available. From the remaining responding farms, 88 qualified to serve as a reference group (“other”).

A questionnaire was developed to collect additional quantitative and qualitative information from the selected farms, e.g. information on animal health and treatments. The questionnaire was completed by a researcher during a 3 hours farm visit. Up to October 2007 fifty questionnaires (farms) were completed, including all 11 “suckling” farms. Available data and information were processed and analysed.

Results

No big differences in cow breed exist between the 2 groups of farms. In both groups the main breed is Holstein Frisian (75%), in the “suckling” group followed by Blaarkop (7%) and in the “other” group by MRY (7%). Jersey, Brown Swiss, Flekvieh, Belgian Blue and Montbeliarde are also present, but make up less than 4% of the herd.

In table 1 the average production performance in the period 2004-2006 is presented. There is a clear difference between the milk yield of “suckling” farms (n=11) and “other” farms (n=88). Because some farms use nurse cows in suckling, milk consumed by calves only partly explains the difference.

Tab. 1: Average lactation information: milk yield, fat and protein, 2004-2006

Farm type	N cow	Days	Kg Milk	Kg FPCM	% fat	% protein
Suckling	1301	399	6534	6481	4.44	3.53
Other	10989	351	7479	7146	4.36	3.43

In 2006 average clinical mastitis incidence in “suckling” farms was 14% \pm 6.3%. On “other” farms this was 20 \pm 13.9%. Farmers said they treat animals with clinical mastitis with antibiotics (30%), homeopathy (30%), frequent milking and/or manual milk removal (30%), mint cream (5%) or drying-off the infected quarter (5%).

Cows with a SCC of more than 250,000 cells per ml of milk are considered to have a high SCC. In the period 2004-2006 on average 28.1% (\pm 8.0%) of the cows on “suckling” farms had a high SCC. For “other” farms this was 22.5% (\pm 6.4%).

Table 2 presents the average SCC of cows in the last milk recording pre-drying and the first milk recording post-calving for the different SCC classes in the period 2004-2006. The data give an indication how animals from different SCC categories get through the dry period. Table 2 shows that a higher percentage of cows from “suckling” farms are found in the higher SCC classes (>250,000), both before and after the dry period. In the category 250,000-500,000 the dry period has a positive effect on SCC, in the category above 500,000 a negative effect.

Compared to cows, heifers had lower SCC in first milk recording post-calving: $84 \pm 12.4\%$ and $87 \pm 6.3\%$ for “suckling” and “other” respectively. At the “suckling” farms the difference between heifers and cows was larger than at “other” farms.

Tab. 2: Average percentage of cows per SCC class pre-drying and post-calving in the period 2004-2006

SCC-class	Period	N cow	<250,000		250,000-500,000		>500,000	
			Dry	Calving	Dry	Calving	Dry	Calving
Suckling		1301	61	66	28	16	11	18
Other		10989	66	75	22	11	12	14

Only 3 out of 11 “suckling” farmers said to treat animals with high SCC before drying-off. In 2006 they on average treated 8% of the cows before drying-off using antibiotics (35%), super mastidol (30%), milk removal (30%) and homeopathy (5%).

Figure 1 shows the average SCC in bulk tank milk of “suckling” and “other” farms. “Suckling” farms on average have a higher bulk tank milk SCC.

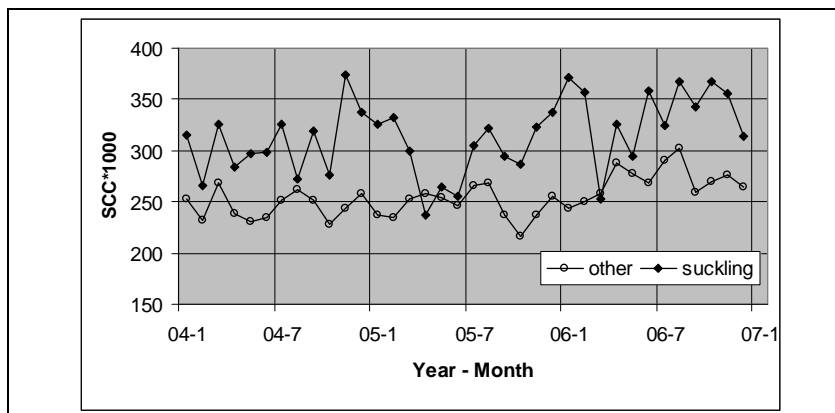


Figure 1: Average SCC in bulk tank milk

Discussion

Although attempts to come up with effective alternative treatments improve udder health are plentiful, progress is slow. In a Swiss study (Klocke *et al.*, 2006) two antibiotics reduction measures, a teat sealer and homeopathic treatment, were not found to effectively treat mastitis. Smolders (2007) described animal health and management on organic farms which do not use antibiotics in the Netherlands. He concluded that, depending on the farmer's attitude to preventive measures, housing and feeding, many farmers should be able to drastically reduce the use of antibiotics.

Because of the multi-factorial nature of mastitis, it is not easy to identify single factors determining mastitis incidence in a wide range of practical dairy farms. Also in this study it became clear that farmers use different strategies or different combinations of measures to avoid problems with mastitis and high SCC. While not all elements of a strategy might work, farmers always have 1 or 2 elements that do something towards controlling high SCC. Farmers and veterinarians should focus on these positive elements in further attempts to adjust the strategy to tackle high SCC.

It should be realised that farmers do not use one standard suckling system in calf rearing, but adapt a suckling system to their own need and situation. Compared to the attitude of farmers on "other" farms, the attitude of farmers on "suckling" farms towards animal health and welfare, preventive measures and treatment therapies could also be fundamentally different. But also between "suckling" farmers attitudes differ. This becomes clear if we look at the way "suckling" farmers treat mastitis or high SCC before drying-off. While some farmers are persistent in not using antibiotics, others consequently do use antibiotics. This complicates the evaluation of suckling systems.

Conclusions

Based on the results presented in this paper it is hard to judge whether suckling systems have a potential to improve udder health in future dairy herds. Udder health and milk quality on "suckling" farms are not as good as on "other" farms. It is however too early for evaluation. Most "suckling" farms started a suckling system between 2004 and 2005 and are now introducing second and third generations of heifers into their herds. The increasing number of cows raised in suckling systems over the next couple of years, will improve the circumstances to evaluate the full potential of suckling systems. While evaluating calf rearing systems, farmers' attitude towards dairy management in general and animal health in particular, should be included.

Acknowledgments

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References

- Klocke, P.; Ivemeyer, S.; Walkenhorst, M.; Maeschli, A. and Heil, F. (2006): Handling the dry-off problem in organic dairy herds by teat sealing or homeopathy compared to therapy omission. Paper presented at Joint Organic Congress, Odense, Denmark, May 30-31, 2006. <http://orgprints.org/7681>, (accessed 2007-10-23).
- Wagenaar, J.P. and Langhout (2007a): Practical implications of increasing 'natural living' through suckling systems in organic dairy calf rearing. *Netherlands Journal of Agricultural Systems* 54-4:375-386
- Wagenaar, J.P. and Langhout, J. (2007b): Suckling systems in calf rearing in organic dairy farming in the Netherlands. Paper presented at 3rd QLIF Congress: Improving Sustainability in

Organic and Low Input Food Production Systems, University of Hohenheim, Germany, March 20-23, 2007. <http://orgprints.org/9851>, (accessed 2007-10-23).

Smolders, G. (2007): Animal health and management on organic dairy farms which do not use antibiotics. Report 149, Animal Sciences Group of Wageningen University. <http://www.asg.wur.nl/NL/publicaties/Eigenpublicaties/Rapporten> (accessed 2007-10-23).