EFFECTIVENESS OF PLANS DESIGNED TO LOWER SOMATIC CELL COUNT OF MILK IN PROBLEM FARMS

R. Guatteo, H. Seegers*, F. Beaudeau

Unit of Animal Health Management, Veterinary School & INRA,
BP 40706, 44307 NANTES cedex 03, France;
seegers@vet-nantes.fr

Abstract

High somatic cell counts in tank-bulk-milk generate economic losses for dairy producers and control plans are therefore implemented or modified. Effectiveness of such plans was not so frequently assessed using objective criteria. Therefore, the study aimed at (1) describing the evolution of somatic cell counts (SCC) before and after implementation of these kind of plans and at (2) relating this evolution with the observance of the recommended corrective actions. 187 problem-farms were considered in Burgundy (central area of France). From the period [3 months before] to the period [18 to 24 months after the diagnosis phase], median SCC decreased from 390,000 to 300,000 cells/ml. Estimated prevalence was reduced by 16%, estimated incidence by 20% and estimated persistency by only 9%. There was only a small relationship between the level of observance of the main recommendations and the evolution of bulk-tank-milk SCC. Results suggested also that the intervention for diagnosis generates, first of all and at very short term, an effect consisting in going back to a better implementation of the pre-existing practices. Follow-up and assessment of the actual implementation of corrective measures is necessary to connect recommendations and consecutive observed improvements.

Key-words : Dairy Cow; Intramammary Infection; Somatic cell count; Control.

INTRODUCTION

High BTSCC (bulk-tank-milk somatic cell count) lead farmers to implement control strategies directed towards udder infection control. In problem-farms, when BTSCC comes close to or over the allowed legal limit (400,000 cells/ml in E.U.), interventions are made by veterinarians or extensionnists for diagnosis and redefinition of the actions included in the control plan. Efficiency of such kind of intervention schemes and of the recommended subsequent new control plans was very few studied. Most of the papers in the literature report only the identified risk factors or defective control actions (for example Østerås and Waage, 1995, in Norway or Fabre et al., 1996 in France).

Therefore, the present study aimed at describing the evolution of BTSCC before and after implementation of an intervention scheme for diagnosis and establishing new recommendations towards a better udder health in problem-farms of Central France. The study aimed also at assessing the relationship between the observance of the main new recommendations and the evolution of BTSCC.

MATERIAL AND METHODS

Data included in analysis came from the 187 farms where a Quarélait audit scheme was performed in 1996, 1997 or 1998, motivated by a high BTSCC (with or without high incidence of

clinical mastitis). Farms were located in Burgundy (Central France); average herd size was 31 cows for an average milk quotum of 225,000 l; 40% of farms had tied stalls and 60% loose housing; breeds were mainly Holstein and Montbéliarde. On-farm intervention was conducted by an extensionnist together with a veterinarian, applying a systematic procedure in order to identify possible defective control points in several fields: milking equipment, milking and milking hygiene routine, housing, and herd management. The intervention report contained not only the defective points, but also a series of recommendations for improving BTSCC. Data here analyzed were the initial reports, the monthly BTSCC, (for the 88 enrolled herds only) the milk recording data, and results of a check for observance of the 3 first recommendations made during a post-audit assessment farm visit (1one and half year till two years later). For the herds enrolled in the milk recording scheme, additional indicators were calculated from monthly individual SCC data:

- apparent prevalence (PREV): % cows >200,000 cells./ml at test day for the considered month;
- apparent incidence (INCID): % cows coming newly >200,000 cells./ml at test day for the considered month (among those being <200,000 cells/ml at previous test-day);
- apparent persistency (PERST): % cows >200 000 cells/ml 2 consecutive months after an elevation.

RESULTS

1. Udder health before intervention

On the whole sample, udder heath became poorer progressively (Table 1 and Figure 1). 40% of the farms were persistently above the threshold of 400,000 cells/ml. The highest BTSCC were observed in very small herds (<20 cows) or in herds with tied stalls. For the herds enrolled in the milk recording scheme, the average PREV reached finally 49%, resulting from an average monthly INCID of 20 % et an average monthly PERST of 58 % (Table 1 and Figure 2).

Table 1. *Average situations before intervention*

Period	BTSCC (1)	PREV (2)	INCID (2)	PERST (2)
12 mo before	417	46.4	20.1	60.6
6 mo before	446	47.9	20.1	59.5
3 mo before	455	48.9	20.4	58.7

(1): x1000 cells/ml,
(2): in %, see text for definition

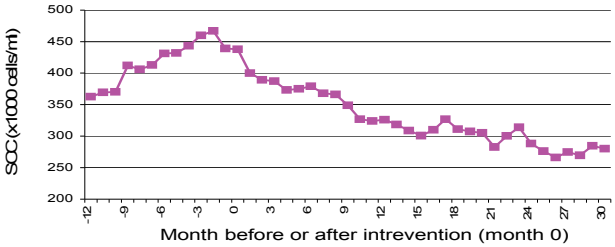

Figure 1. *Evolution of average BTSCC*

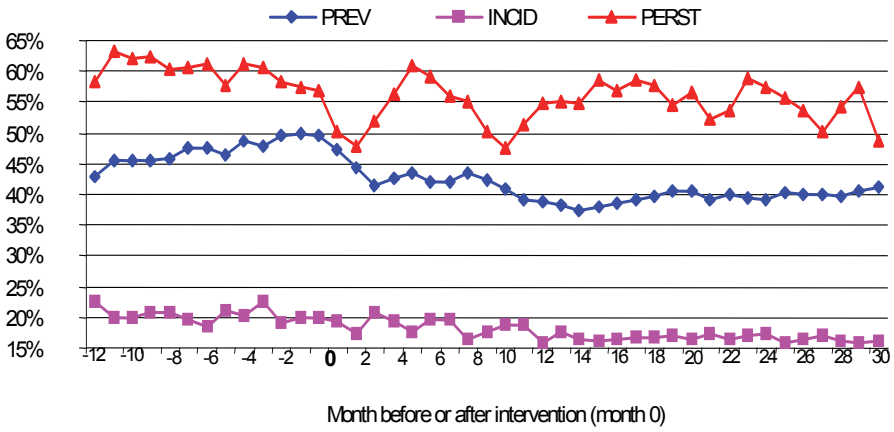

Figure 2. *Evolution of average prevalence (PREV), incidence (INCID) and persistency (PERST)*

2. Defective points diagnosed and areas of recommendations

The main reported points are given in table 2. Recommendations were in close relationship with the reported errors or risky practices. The 3 first recommendations were dealing with milking technique and hygiene, milking equipment, herd management and housing in 88%, 61%, 57% and 76% of the farms, respectively.

Table 2. *Main defective points reported at intervention (187 farms)*

Defect or risky practice	Frequency
Equipment	
• General equipment defect (s)	43
• Pulsation defect. Vacuum level too high	58
• Inadapted clusters	71
• Non adequate replacement of rubber parts	25
• Inadequate cleansing	71
• Absence of recent equipment check	39
Milking technique and hygiene	
• Insufficient number of cloths	63
• Insufficient wiping of teats	51
• Other Insufficient points in udder preparation hygiene	71
• No first stream examination	93
• Too long delay before attaching cluster	89
• Air inlet at cluster attaching	52
• Overmilking and late cluster removal	100
• Absence of post-milking disinfection	20
• Absence of specific cluster and no milking order for mastitic cows	21
Herd management and treatments	
• Insufficient elimination of infections (treatment, culling,…)	141
• Cow can lie down just after milking	53
• No sufficient separation for dry cows	61
• Teat lesions and poor udder morphology	48

• Suckling problem in heifers	23
• Inadequate drying-off management	39
Housing	
• Low frequency of bedding renewal	89
• Insufficient ventilation	126
• Inadequate size of yards, stalls or cubicles	123
• Inappropriate location of drinkers	61

3. Udder health after intervention

Just after and also already, the month before the on-farm intervention, the average BTSCC decreased slightly for 5 to 6 months, as shown in Figure 1. Decrease was very slow after this 1st phase and average BTSCC fall under 300,000 only around month 20. Estimated prevalence was reduced by 16%, estimated incidence by 20% and estimated persistency by only 9% (Figure 2).

4. Observance of recommendations and link with evolution in udder health

Implementation of recommendations was unequal, with an average observance rate of 72% (Figure 3). Nevertheless, for some of them, a substantial delay was observed. For instance, large modifications in housing or milking equipment were only operational (in average) 14 months after intervention.

The slight initial decrease could not really be related in the dataset with the implementation of the first recommended actions found in the reports. Farms where the 3 main recommendations were consistently implemented got better average results 30 months later (BTSCC averaged 250 000 cells/ml), but the difference with farms with incomplete observance was low and not significant (BTSCC averaged 290 000 cells/ml). Large disparities within each group of farms were observed.

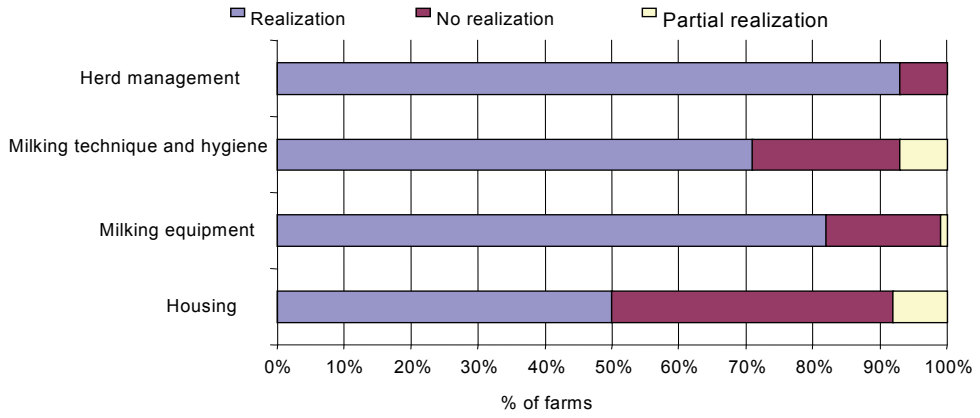

Figure 3. *Observance of main recommendations according to concerned field*

DISCUSSION AND CONCLUSION

The observed farms were problem-farms and levels of BTSCC and of prevalence of intramammary infection were not representative of the dairy farms in Burgundy during the study period.

Regarding methodological aspects, the "after vs. before" observation here performed can sometimes be biased because farmers may modify very often their practices in milking procedures and culling decisions, for example. Nevertheless, no other approach was found relevant.

BTSCC clearly decreased after implementation of the intervention. As already reported, the intervention was related to a very early decrease in BTSCC, very often already the month before or the month of intervention, what could almost not be explained by the corrective actions recommended in the reports. Results suggested that the intervention for diagnosis generates, first of all and at very short term, an effect consisting in going back to a better implementation of the pre-existing practices. Possibly, also some additional advices not written as a main recommendation were given during the on-farm interventions.

Persistency of udder infections was little affected and remained quite high after intervention. This explained, that despite of a significant decrease of incidence, prevalence remained also quite high. Globally, there was probably no substantial change in nature of pathogens involved in the infections and in type of risk factors present. An improvement was observed, but in non modified farming system with often continuation with the same practices. Such a low effect on farmer's attitudes was already reported in others studies on problem-farms (Heuchel et al., 1997, for example).

Follow-up and assessment of the actual implementation of corrective measures is necessary to connect recommendations and consecutive improvements in this kind of control plans.

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