



PREVALENCE AND PRELIMINARY ANALYSIS OF SEVERE UDDER EDEMA OCCURRENCE IN ITALIAN FRIESIAN COWS

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Abstract

Udder edema is caused by an excessive accumulation of lymphatic fluid in the interstitial spaces of udder, leading to alterations of appearance, consistency and flexibility and increasing the risk of physical damage. The present study aimed to investigate the prevalence of severe udder edema in Italian Friesian cows and to analyse the relevance of some possible risk factors of its occurrence. Data were from a program currently running in cooperation with some breeder associations and aimed to control dairy cows for some functional and health traits. Udder edema was evaluated after calving on about 3500 cows herded in 35 dairy farms of northern Italy as alternatively severe (fluid accumulation interesting all quarters and navel and extending to the upper half of udder over the midline) or not severe. Overall prevalence of severe udder edema approached 12% and appeared higher in primiparous than in multiparous cows (14.21 vs 12.02%, respectively). Risk of occurrence of severe mammary edema was investigated using logistic regression analysis and considering the role of herd, calving year, calving season, parity, cow genetic merit, BCS at calving and the concurrent occurrence of retained placenta. To be in the first parity, to have a high genetic merit for milk yield and to retain placenta after parturition appeared associated with an increased risk of edema occurrence. Further research is needed for better understanding the genetic aspects of such disorder.

Introduction

Udder edema is a condition affecting cows during early lactation and it is characterized by an accumulation of lymph-like fluid in the udder. Fluid begins to pool at the base of the udder and, in more severe cases, the entire udder is affected. In extreme cases, swelling will also occur in navel, brisket, thighs and vulva. Udder edema is not considered to be a major problem, but rather an inconvenience for dairy producers. Most cows experience some degree of udder edema before calving and, under normal conditions, the edema will clear from the udder within a week or two post-calving. The goal for dairy producers is to control the seriousness of edema, because in severe cases the swelling can lead to a shortening of the length of the teats, making difficult the application of the milking machine. Moreover, accumulation of interstitial fluid reduces the space available for storage of milk in the udder (Tucker et al., 1992). It is also thought that the extra weight of the accumulated fluid can further overload the suspensory system of the udder, leading to a loss of flexibility and increasing the risk of a breakdown of the udder. Several authors found positive associations between pendulous udder and severe edema (Morrow and Schmidt, 1964; Dentine and McDaniel, 1984). The present study aimed to investigate the prevalence of severe udder edema in Italian Friesian cows and to analyse the relevance of some possible risk factors of its occurrence.

Materials and Methods

Origin of data

Data for this study were from a program currently running in cooperation with some breeders associations, which aims to control dairy cows for some functional and health traits (Cassandro et al., 1999).

Udder edema was evaluated after calving and was subjectively scored as *not severe*, if fluid accumulation interested only the lower half of udder, or as *severe*, if fluid accumulation interested also the upper half of udder over the midline

Udder edema was recorded throughout 4 years (from 1998 to 2001) on about 6200 Italian Holstein cows herded in 115 dairy farms of northern Italy.

Editing of data discarded records from:

- lactation of cows in herds with less than 70 records and less than 5 severe udder edema events over total time period considered;
- lactation with lack of information regarding BCS, genetic merit for milk yield, or incidence of retained placenta;

After editing, data were available on 5902 lactations of 3526 cows herded in 35 dairy farms, recorded during 4 years of study.

Statistical analysis

The severity of udder edema occurrence was investigated using logistic regression approach, according to the following design variables:

- herd (35 levels);
- calving year (from 1998 to 2001 → 4 levels);
- calving season (4 levels);
- BCS at parturition (<3.25, 3.25÷3.75, >3.75 → 3 levels);
- parity (primiparous and multiparous → 2 levels);
- genetic merit (EBV) for milk yield within parity (low, medium, high → 3 levels);
- retained placenta (present or not → 2 levels).

Results and Discussion

Descriptive statistics are summarized on table 1.

Table 1. Frequencies and means \pm s.d. of data

	Primiparous	Multiparous	Total
recorded calving, n°	894	5008	5902
severe udder edema, n°	127	602	729
retained placenta, n°	77	730	807
EBV for milk yield, Kg	544 \pm 458	290 \pm 541	329 \pm 537
BCS at calving, score (1÷5)	2.31 \pm 0.56	2.13 \pm 0.70	3.64 \pm 0.54

Prevalence of severe udder edema resulted 12,24% and it appeared higher in primiparous than in multiparous (14.21 vs 12.02% respectively) according to previous studies (Emery et al., 1969; Dentine and McDaniel, 1984).

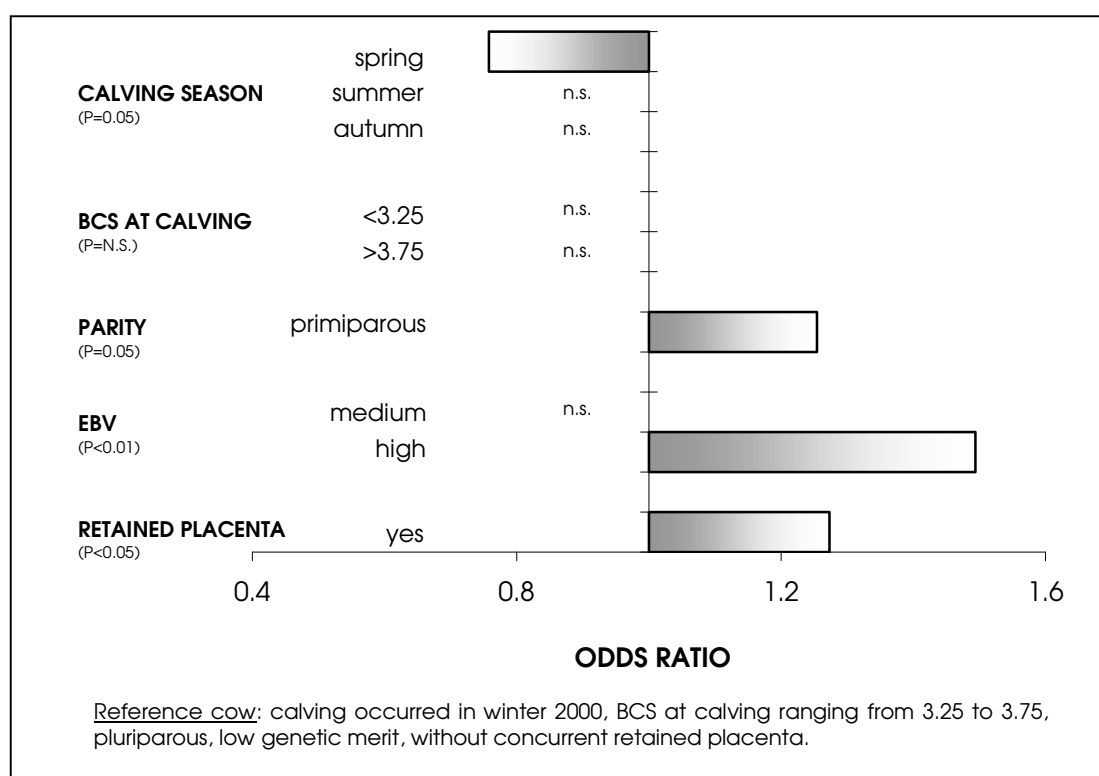
Appeared significant risk factors for udder edema occurrence: herd, calving season, parity, cow genetic merit for milk yield and concurrent occurrence of retained placenta as shown in table 2.

Table 2. Type III analysis of effects of logistic regression

Effect	Pr > χ^2
herd	< 0.0001
calving year	n.s.
calving season	0.05
BCS at calving	n.s.
parity	0.05
EBV	< 0.01
retained placenta occurrence	< 0.05

Odds Ratio for severe udder edema occurrence are reported in figure 1. Calving in summer season reduced the risk of edema occurrence of 25%, whereas to be in the first parity raised the risk of 25%; having an high production potential increased the risk of about 50% and concurrent occurrence of retained placenta caused a rise of risk of 30%.

Figure 1. Odds Ratio (O.R.) for severe udder edema occurrence



Conclusions

Prevalence of severe udder edema in Italian Friesian cows approached 12% and appeared higher in primiparous than in multiparous.

The main risk factors for edema occurrence concerned parity, production potential and concurrent disorders at calving. In particular, being primiparous, having a high EBV for milk yield and being retained placenta increased the risk of developing severe mammary edema.

Further research is needed for investigating genetic parameters of mammary edema and for better understanding genetic relationship with milk yield traits.

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