ANALYSIS OF SOMATIC CELLS IN COW'S MILK

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Abstract: *One of them the hygiene requirement of raw milk is the normal value of somatic cell count. General agreement rests on the values of less than 100,000 cells/ml for uninfected cows and greater than 400,000 for cows infected with significant pathogens. In our study we analysed with the data of milk recording of a dairy farm in Hódmezővásárhely. We analised four parameters (year of milking,number of lactation, long of lactation, avarage milk production) with regard the somatic cell counts. The strongest correaltion can be observed in case of the milk production and lactation number. Our results show that the improvement of udder health condition is especially important to milk producer.*

Key words*: somatic cells, lactation, milk yield, cow, mastitis*

INTRODUCTION

Mastitis in dairy cows producing a number of reasons. Causes include the industrial environmental conditions, such as high animal density, the use of machine milking and negative effect of high milk production for metabolism [4]. The somatic cell count is related most closely to mastitis. The mastitis impose significant economic loss to the breeder. The largest share of the average annual medicine cost constitutes the drugs used to treat udder diseases [3]. The frequency of mastitis and somatic cell count increases with age progresses and after the calving both infected and non-infected udder quarters of somatic cell count is high [1]. The somatic cell count is influenced by several factors, which may be ambient or biological factors. The number of cells is also influenced by the age and stage of lactation as well [2].

MATERIAL AND METHOD

During our study we analysed the data of four dairy farm in Hódmezővásárhely. We analysed the correlation between the SCC and four parameters such as the milking year, the number of lactation, the length of lactation (day) and the average milk production. The groups and within groups the number of animals was the follows (table 1.):

Table 1

The groups and within groups the number of animals

Year of milking	N	number of lactation	n	length of lactation (day)	n	average milk production (kg)	n
1996-2000	87518	1	121976	<50	30498	<10	17057
2001-2005	87883	2	76850	51-100	44721	10-20	51373
2006-2010	71844	3	44791	101-150	42496	20-30	95840
2011-2014	49484	4	25996	151-200	40476	30-40	91032
		5	13932	201-250	38378	40-50	34708
		6	7090	>250	10016	>50	6719
		>6	6094				

The groups of SCC are divided according to data of Newsletter of Hungarian milk Recording.

The first figure shows that the status of udder health is unfavourable in Hungary, because the over 400.000 SCC was noticeable in the 27 % of tested milk (figure 1.)

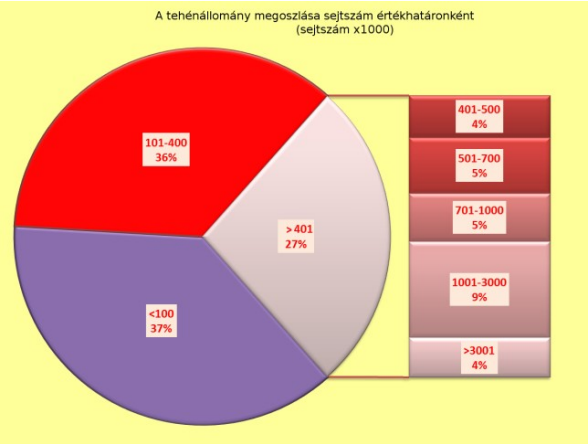

Figure 1: The percentage of SCC in Hungary

In our study we analysed the percentage of the SCC (<100.000; 101.000-400.000; >400.000) within the groups (milking year, number of lactation, length of lactation (day) and the average milk production). The data were processed with Chi^2 method.

RESULTS

We examined the data of milk recording from 1996 to 2014.We shows the relationship between SCC and the groups of the years.

The relationship between the years of milking and the SCC was illustrated in Figure 2. It can be observed that with the increasing milking years the somatic cell number is also increasing.

The percentage of 100.000 decreased, while in case of milk with higher SCC than 400.000 the percentage increased. The statistical analysis proved a significant difference between the groups (Chi^2=1662; P<1%).

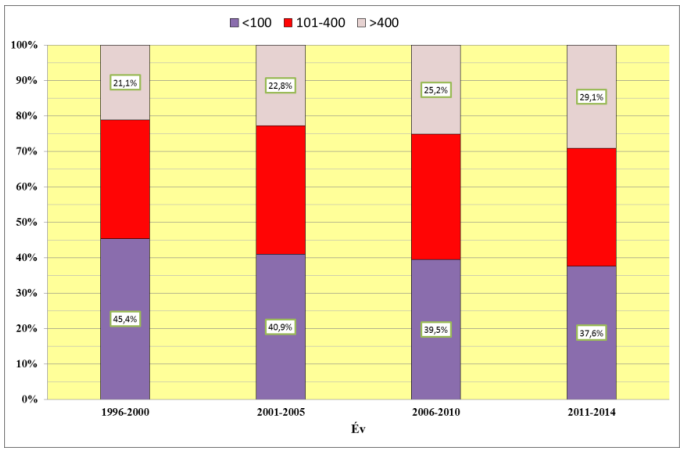

Figure 2: The percentage between the groups of years with regard to the SCC.

As the lifetime proceeds, the body strength of the cows is decreasing. This status is negatively influenced by the SCC contents of milk (Figure 3).

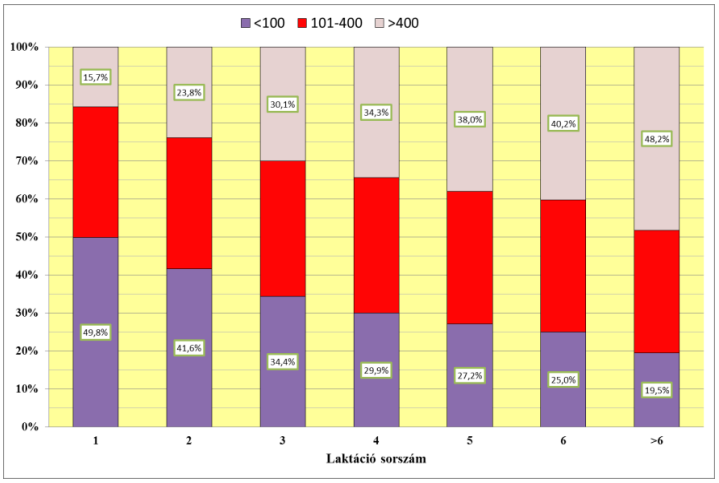

Figure 3: The percentage between the groups of lactation number with regard to the SCC.

We can observed lower than 100.000 SCC in case of the 49.8 % of the first-lactation cows

This results in the last group (> 6) was only 19.5%. The statistical test, P <1% level showed significant difference between the groups (Chi 2 = 14,089).

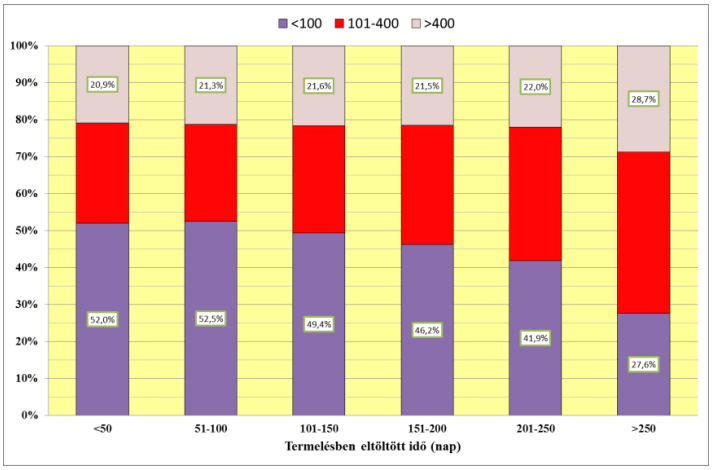

Figure 4: The change of SCC percent according to the number of days of lactation

On the figure 4 we examined the change of SCC percent according to the number of days of lactation. Here we can observed a negative trend too, but we experienced worse results only in the last group (> 250). Also in this case,the results of the statistical test confirmed the significant difference (Chi 2 = 13,381, P <1%)

Finally, we examined the change of SCC percent according to the daily milk yield.

The results are shown in Figure 5. We found the biggest differences here. It can be concluded that the decrease in milk yield negatively influence the somatic cell count (Chi 2 = 29,672, P <1%). When the milk is reduced, then the SCC increased.

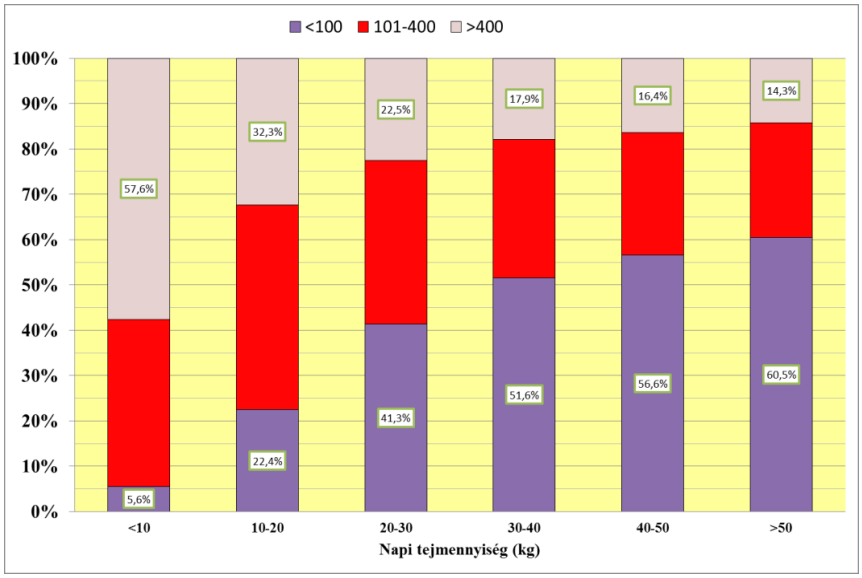

Figure 5: The change of SCC percent according to daily milk yield

CONCLUSIONS

In summary, we have concluded that the changes in the number of somatic cells influenced by many factors. Between four parameters which were examined the closest relationship were between the lactation number and the milk yield. According to national data and our results should improve the udder health condition of cows by the breeders.

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