

7. SUMMARY

Somatic cell count and udder health at two Brandenburg dairy enterprises

This field study examined correlations between the somatic cell count within and between the different lactations. The correlation of the somatic cell count with bacterial findings in the subclinical range and features of milk production were studied. Total milk count was compared with the quarter foremilk samples. The data for the Study I was collected at two different Brandenburg dairy enterprises. 1570 dairy cows belonging to different lactation were tested monthly between June 1992 and December 1995 from the official milk sample records. In the study II quarter foremilk samples were analysed weekly between day 5 and 90 and biweekly between day 91 and 240 of lactation. Milk samples were collected and cultured for bacteria every six weeks. The average 305 day milk production was 5476 kg (enterprise A) and 5547 kg (enterprise B) and the average somatic cell score was 3.86 (A) and 3.48 (B).

The somatic cell count was lowest in the first lactation and became larger with later lactations. The greatest difference was found between first and second lactation. Within the lactation the somatic cell count was lowest during the early lactation and rose toward the end of lactation, especially after week 40 of lactation. The “Schwarzbunte Milchrind” had the highest somatic cell count compared to Holstein frisian (enterprise A) and “tschechisches Fleckvieh” and “tschechische Schwarzbunte” (enterprise B).

There was an inverse relationship between the cell count index and the daily milk yield. The phenotypic correlation was slightly negative with $r_p = -0.24$ and was calculated with the total milk count. This correlation was confirmed for later lactations as well as for the different parts of the lactation.

The phenotypic correlation between somatic cell count and the percentage of lactose showed similar values; $r_p = -0.37$. For later lactations as well as for the different stages of lactation the values were similar. Dairy cows with a cell count lower than 50,000/ml milk had a significant higher daily milk yield than cows with a cell count of more than 50,000/ml milk. For lactose: cows with a cell count of more than 150,000/ml milk had a significant lower daily milk yield compared to the cows with a cell count lower than 50,000/ml milk. The correlations between somatic cell count and the percentage of fat/protein were 0.

The correlation between the cell count index at the end of the first lactation and the beginning of the second lactation was slightly positive with $r_p=0.29$. A carry over effect on the influence of the cell count index on health was proven with cows that were healthy at the beginning of the second lactation; the somatic cell score, the daily milk yield and the percentage of the lactose were all affected. The carry over effect was not shown in cows with a higher somatic cell score at the beginning of the following lactation as the carry over effect was drowned by diseases.

The most frequent causes for mastitis were: Staphylococci, *Sc. Agalactiae* and other Streptococci. Pathogen levels were slightly lower in the rear quarter of the udder. Milk samples with positive bacterial cultures had a significantly higher cell count index than milk samples with negative bacterial cultures (SCS= 0.79). The highest cell count index was found in the milk samples with proof of Streptococci (SCS=3.74). It was slightly lower with proof of *Sc. Agalactiae* (SCS=3.1). Staphylococci caused a moderate increase in the cell count index (SCS=2.67). The percentage of lactose was substantially lower in the milk samples with positive bacteriological findings and higher (4.93%) in milk samples with negative bacteriological findings. In Streptococci positive samples the percentage of lactose was 4.75%, *Sc.agalactiae* 4.78% and in Staphylococci positive samples lactose was a little higher at 4.85%.

When quarter foremilk samples were compared with the total milk count, agreement was found when the limit of the somatic cell count was exceeded. The use of somatic cell count in the total milk count was only moderately suitable for the proof of quarters when the somatic cell count was higher than 100,000/ml milk. The higher somatic cell count in one quarter vs the analysis of the total milk count showed only a 59% sensitivity. The rest of the cows (unhealthy cows?) remain unidentified using only the total milk count. The specificity was 91%, which means that most of the healthy cows could be tested using the total milk count.