

## Comparison of Electrical Conductivity Method of Identifying the Subclinical Mastitis with Somatic Cell Count and California Mastitis Test

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### Abstract

Subclinical Mastitis (SCM) is a major problem in Sri Lankan dairy industry. California Mastitis Test (CMT) and Somatic Cell Count (SCC) are major diagnostic tools used in subclinical mastitis. The objective of study was to determine the effectiveness of the electrical conductivity (EC) method on the diagnosis of subclinical mastitis in dairy cows comparing with somatic cell count (SCC) and California mastitis test (CMT). EC method is simple and easy to be used in the field itself, than SCC and CMT method, in large scale production, using EC meter without having any complicated laboratory process. A total of 259 milk samples were collected from quarters of 59 cows as 59 bulk samples and 205 teat samples at 5 different farms. CMT, SCC and EC were recorded from each sample and analyzed based on categories according to the results of CMT; SCM negative CMT (N) and SCM positive CMT (P). CMT (positive) samples were again divided in to 4 groups based on the severity of subclinical mastitis; CMT(+), CMT(++), CMT(+++) and CMT(+++). In teat milk, 50.73% CMT(N) and 49.27% CMT(P). In bulk milk 40.68% CMT(N) and 59.32% CMT(P). In CMT(P) teat samples, 28.71%, 12.87%, 14.85% and 43.56% are CMT(+), CMT(++), CMT(+++) and CMT(+++) respectively. In CMT(P) bulk samples, 34.29%, 2.86%, 8.57% and 54.29% are CMT(+), CMT(++), CMT(+++) and CMT(+++) respectively. There is a positive correlation between EC and CMT ( $R^2 = 0.444$ ) and EC and SCC ( $R^2 = 0.271$ ) in teat milk ( $P < 0.05$ ). Also there is a positive correlation between EC and CMT ( $R^2 = 0.413$ ) and EC and SCC ( $R^2 = 0.409$ ) in bulk milk ( $P < 0.05$ ). The mean of EC of teat milk shows a significant difference between groups ( $P < 0.05$ ) and values were  $4.74 \pm 0.07$ ,  $5.14 \pm 0.15$ ,  $5.60 \pm 0.28$ ,  $5.92 \pm 0.24$  and  $6.75 \pm 0.16$  in CMT(N), CMT(+), CMT(++), CMT(+++) and CMT(+++) respectively. Mean of SCC for teat milk were  $1.78 \times 10^5 \pm 3.71 \times 10^4$ ,  $3.46 \times 10^5 \pm 5.38 \times 10^4$ ,  $7.84 \times 10^5 \pm 2.19 \times 10^5$ ,  $9.66 \times 10^5 \pm 2.46 \times 10^5$  and  $3.67 \times 10^6 \pm 3.76 \times 10^5$  in CMT(N), CMT(+), CMT(++), CMT(+++) and CMT(+++) respectively. The mean of EC of bulk milk shows a significant difference between groups ( $P < 0.05$ ) and values are  $5.15 \pm 0.13$ ,  $5.61 \pm 0.074$ ,  $5.63 \pm 0.14$ ,  $5.93 \pm 0.27$  and  $6.30 \pm 0.16$  in CMT(N), CMT(+), CMT(++), CMT(+++) and CMT(+++) respectively. Mean of SCC for bulk milk are  $1.49 \times 10^5 \pm 3.82 \times 10^4$ ,  $6.65 \times 10^5 \pm 1.76 \times 10^5$ ,  $4.30 \times 10^5 \pm 1.74 \times 10^5$ ,  $9.27 \times 10^5 \pm 1.66 \times 10^5$  and  $3.06 \times 10^6 \pm 3.91 \times 10^5$  in CMT (N), CMT(+), CMT(++), CMT(+++) and CMT(+++) respectively. It has been concluded that EC showed similarity with the CMT and the SCC in the detection of subclinical mastitis and EC is an effective method in detection of subclinical mastitis.

**Keywords:** Subclinical mastitis, Electrical conductivity, California mastitis test, Somatic cell count

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