Amul

KAIRA DISTRICT CO-OPERATIVE MILK PRODUCERS' UNION LTD.

1st February 2022

To Whom It May Concern

This letter is to certify that the study titled "Evaluation of Fauna SCC (Somatic Cell Count) Monitoring System for Mastitis and Sub-Clinical Mastitis detection" with protocol number SCC_FAUNA-AMUL-001_A was performed at Kaira District Co-operative Milk Producers' Union, Amul Dairy, Anand, from August 16th 2021 to August 19th 2021.

We have tested more than 300 samples at 3 farms during the period.

Sincerely,

Dr. Gopal Shukla
Dy. Manager
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1.2.2022

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Fauna SCC Test

Evaluation Protocol Number: SCC_FAUNA-AMUL-001_A

Intended Use
The Fauna SCC test is intended to be used for the quantitative measurement of the somatic cell count in cow milk samples. This system is intended to be used to ensure the high quality of milk being distributed in the market and to enable early on-farm mastitis detection.

Test Principle
The Fauna SCC test is based on the reaction between a dye embedded on the membrane of the test strip and an enzyme found on the cells in the milk. This reaction makes the reaction window of the test strip change from white to a blue color which is interpreted and estimated by the Fauna device using the principle of reflectance photometry. The higher the intensity of the blue color, the higher the SCC value of the milk sample.

Measuring Range: 100 to 1200 cells/µL

Test Time: 5 minutes

Operating Temperature: 7˚C to 35˚C

Sample volume: about 80 to 90 µL

Performance Summary
The Fauna SCC test was validated at many sites in India. The accuracy and precision achieved by the testing system are comparable to standard analyzers such as DeLaval Cell Counter.

Precision evaluation
The precision of the Fauna SCC Test at three different levels of somatic cell counts in cow milk samples was estimated as follows -

SCC category (cells/µL)	%CV
<200	12.6
200 to 1000	3.7
>1000	7.3

Accuracy evaluation during pilot at Anand, Gujarat

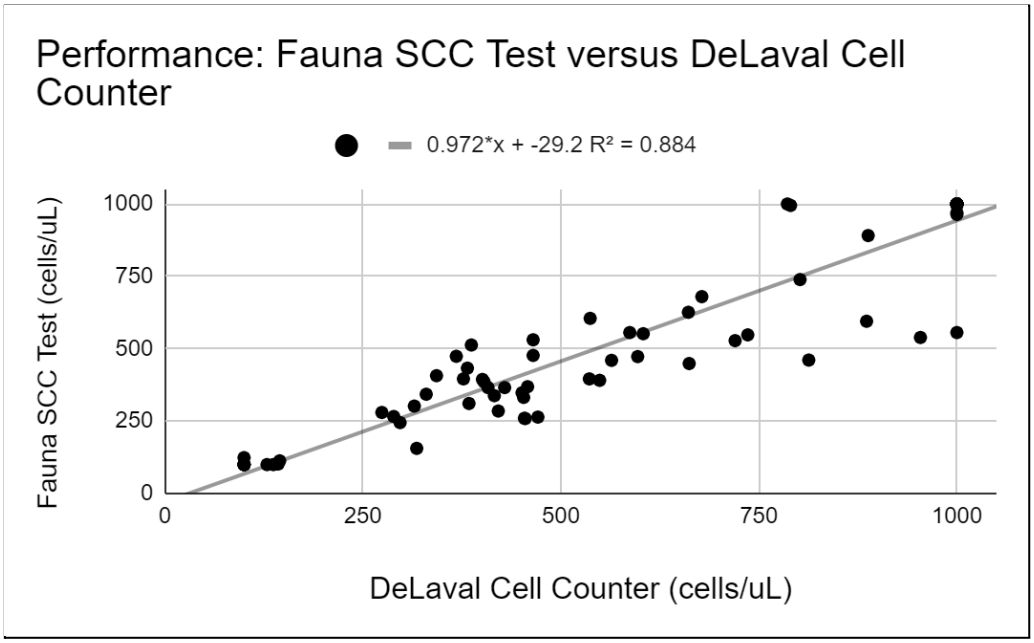
I. **Shree Sai Farms, Dairy Cooperative Society - Kasor, Abhimanyu Dairy Farm and AMUL Headquarters Office.**

Reference Analyzer: DeLaval Cell Counter

Number of samples: Out of the 210 samples tested, 78 samples were referenced on the DeLaval Cell Counter

Breeds present: Indigenous and Holstein Fresians

The samples were tested about three to six hours after milking from the cow. The Fauna SCC test showed good correlation versus the DeLaval Cell Counter with R^2=0.88 and 94% and 86% of the samples agreeing with the DeLaval Cell Counter measurements in the healthy and mastitis-infected categories, respectively. Overall, the Fauna SCC test has a sensitivity of 86% and specificity of 94% versus the DeLaval Cell Counter.



Performance of the Fauna SCC test versus DeLaval Cell Counter

Agreement with DeLaval Cell Counter (%)	
Healthy	94
Subclinical Mastitis	50
Clinical Mastitis	81

< = 500 cells/µL: Healthy
500 to 700 cells/µL: Sub-Clinical Mastitis
>700 cells/µL: Clinical Mastitis

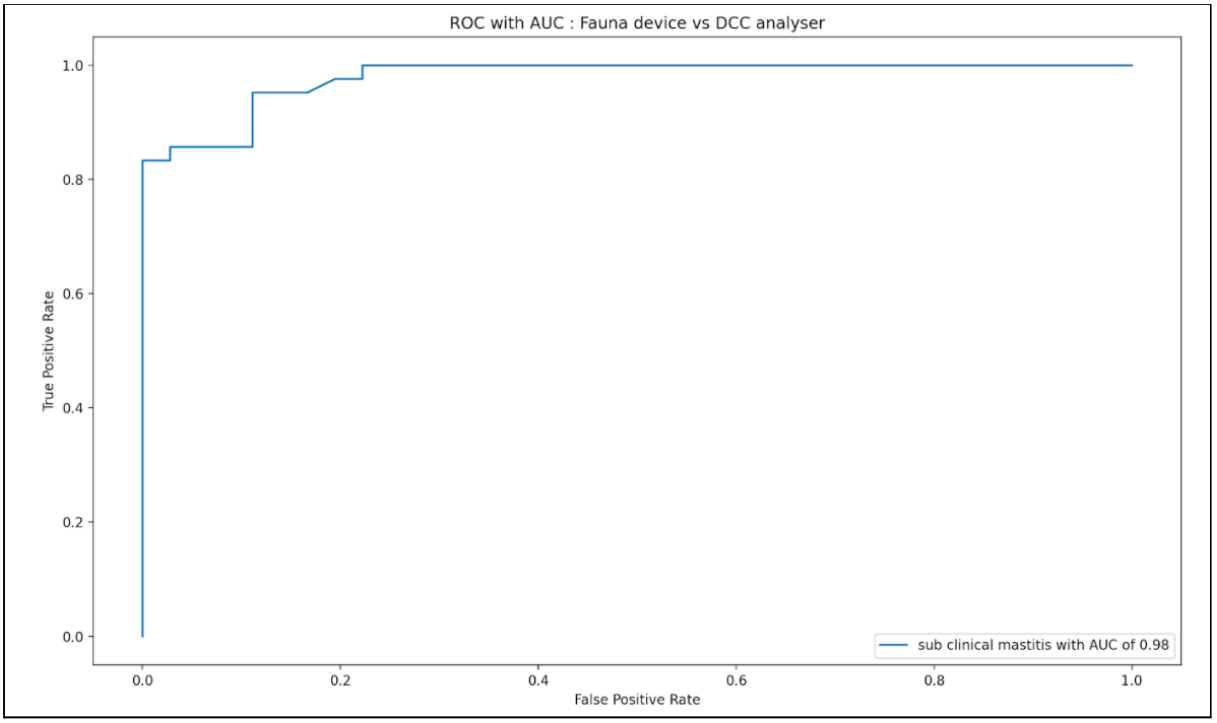
Agreement of the SCC values binned correctly by Fauna SCC test versus DeLaval Cell Counter at different stages of the mastitis

Agreement with DeLaval Cell Counter (%)	
Healthy	94
Infected	86
< = 500 cells/µL: Healthy >500 cells/µL: Infected	

Agreement of the SCC values binned correctly by Fauna SCC test versus DeLaval Cell Counter. 'Infected' includes both subclinical and clinical mastitis - infected cows

Sensitivity and Specificity of Fauna SCC test	
Sensitivity	86
Specificity	94
Positive event	Infected cow (>500 cells/µL)
Negative event	Healthy cow (< = 500 cells/µL)

Sensitivity and specificity statistics for Fauna SCC test for the samples processed at the sites



Receiver Operating Characteristic (ROC) curve for Fauna SCC test versus DeLaval Cell Counter (AUC of 0.98 for subclinical mastitis)