

Title : Use of Multi-Spectrum Light Sensor to Evaluate Microbiological Quality of Goat's milk

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ABSTRACT

In Thailand, there is a lack of a system to control the quality control for raw goat's milk, particularly microbiological quality. This study aimed to investigate the potential of utilising a resazurin test to assess microbiological quality and to develop a predictive model for milk quality. Raw goat's milk samples underwent a colourimetric resazurin test, with the resulting colours analysed using a multi-spectrum sensor alongside microbial counts. A database of these values was established to develop a predictive model for milk quality. Sub-samples of raw goat's milk from five dairy goat farms were prepared from 17 original samples to achieve microbial counts between 3 and 14 log cfu/mL. A total of 100 datasets comprising digital values and microbial counts were utilised for training a decision tree classifier model, while 20 datasets were employed for model validation. The classifications for milk are divided into three categories: high-quality milk (low microbial loads; ≤ 5.30 log cfu/mL), medium-quality milk (moderate microbial loads; $> 5.3-7.0$ log cfu/mL), and low-quality milk (high microbial loads; > 7 log cfu/mL). The model demonstrates accuracy rates of 25%, 66.7%, and 100% for high-, medium-, and low-quality milk samples, respectively. This indicates its potential utility for the rapid assessment of low-quality goat's milk with elevated microbial loads.