A Non-invasive Phenol Based Estrus Detection Kit for Dairy Animals

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Determination of estrus is very crucial for increasing fertility and milk production of dairy herds. Methods and techniques presently used are cumbersome and painful. A non-invasive phenol-based method for detecting estrus in dairy animals has been developed. Urine samples of Bos taurus indicus-(n=11) and Bos taurus taurus-(n=4) in estrus and non-estrus phases were collected and analyzed in Gas Chromatography and Mass Spectroscopy on SHIMADZU TQ8040. Phenolic compounds (phenol, p-Cresol, m-Cresol, o-Cresol, propyl-phenol, ethyl-phenol) were present only in estrus urine samples. A simple kit using Tyrosinase and MBTH was developed. Urine samples turned red) when treated with tyrosinase (300 µl) followed by addition of 600 µl MBTH (10mM). In order to facilitate easy handling and to overcome visual bias, a simple device was designed to differentiate between estrus and non-estrus on basis of difference in absorbance of samples. A white light is passed from one end through the sample and the light sensor (LDR) on the other end detects the amount of light absorbed. The continuous analog data from the sensor is fed to a micro controller which identifies the result of the sample by referring a range of pre-defined data and is indicated by LEDs. This device has been tested across 480 samples to validate its functionality and is found to give hundred percent accurate results. This low cost, portable, easy to handle, effective, non-invasive method and devise is an innovative devise that can be used for estrus detection. The prototype kit is a boon to the dairy industry especially for the marginal and sub-marginal dairy farmers.