Application of radio frequency identification technology on the management of dairy farm[1]

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Abstract

The study was made to investigate radio frequency identification (RFID) technology used for dairy herd electronic management include UHF RFID electronic ear tags, reader, data wireless transmission and information network. The selected RFID electronic ear tag is passive read and sealed by polyurethane material and is hang up at the inner part of right ear of dairy cow. Cow's ID is displayed on exterior of ear tag for herdsman visual identification. The hand-hold reader with Personal Digital Assistant (PDA) function can read cow's ID from RFID ear tag with over 80 cm distances. The dairy herdsman can use the hand-hold reader in the barn for looking into the current performance of the cows and collecting or editing data of dairy cow performance such as breeding, drying, calving, disease treatment, vaccine, type classification, body weight and body temperature. In milking parlor, a fixed reader with 4 sets of antenna was set up. At the entrance of each side in milking room, 2 antenna at different location and angle were installed to read ID from RFID ear-tag. After dairy cows pass through entrance one by one, the cow's ID, milk yield and quality of the cow last milking with different color to alert herdsman to notice special cow will be shown on a touch-panel monitor in the milking room. The herdsman could therefore improve the practices in time for these special cows. After all cows finish milking, the herdsman can input current milk yield by hand on the touch-panel monitor. All data of cow's ID and current data will be collected by hand only once. After collecting data at barn and milking parlor, data will be transmitted through wireless to the farm office computer and then through network to connect with Dairy Herd Improvement (DHI) records processing system. The DHI individual cows' performance information will be downloaded to farm computer and hand-hold reader. Applications of RFID technology on the dairy farm help herdsman to collecting data without time-consuming, using information in time, automatically, accurately and without any paper reports for dairy herd management. RFID technology could help dairy farmers to improve the efficiency of DHI and farm operation.

Key words: Electronic ear tag, Radio frequency identification, Dairy farm management.