

## Impact of Automated Milking Systems on Productivity, Milk Composition, and Udder Health: A Case Study in Subtropical Taiwan

Liao Hsiao Han<sup>[1]</sup>, Wang Szu Han<sup>[1]</sup>, Shiao Jen wen<sup>[1]</sup>, Huang Jeng Fang<sup>\*[2]</sup>

[1] North District Branch, Taiwan Livestock Research Institute, Ministry of Agriculture, Miaoli, Taiwan, [2] Taiwan Livestock Research Institute, Ministry of Agriculture, Hsinhua, Tainan, Taiwan

To quantify changes in productivity, udder-health indicators, and seasonal resilience after adopting an automated milking system (AMS) in a subtropical dairy herd in Taiwan using DHI test-day records.

A single-herd before–after case study was conducted using official DHI test-day records. The farm installed two AMS units (January and July 2020). To ensure stable operation, we compared the pre-AMS year (Jan–Dec 2019; from 210 cows) with a stabilized post-AMS year (Jan–Dec 2022; from 189 cows). Hot season was defined as Jun–Sep and cool season as Dec–Mar (season used as a proxy for heat load). High SCC events were defined as  $SCC > 2.0 \times 10^5$  and  $SCC > 5.0 \times 10^5$  cells/mL. Milk yield was compared using unpaired two-tailed Student's t-tests, and high-SCC proportions were compared using chi-square tests (two-sided,  $P < 0.05$ ).

Milk yield increased after AMS adoption ( $25.60 \pm 7.82$  vs  $31.88 \pm 9.82$  kg/d). Seasonal resilience improved, with hot-season milk-yield depression relative to the cool season decreasing from 12.5% (2019) to 1.6% (2022). However, high-SCC test days increased post-AMS ( $SCC > 2.0 \times 10^5$ : 16.6% to 23.9%;  $SCC > 5.0 \times 10^5$ : 6.4% to 11.9%). In this subtropical herd, AMS adoption was associated with higher productivity and a flatter seasonal yield profile, but with more frequent high-SCC episodes, highlighting the need for strengthened udder-health monitoring and protocols during AMS implementation.