Mooooo! A comparison of dairy parlor milking tasks: Pilot data

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ABSTRACT

Introduction: The process of milking cows in dairy farms has become heavily mechanized as dairy farms move to large mega herd operations for increased milk production. Milking has become an assembly line procedure with five distinct tasks, predipping, stripping, wiping, attaching milk clusters, and postdipping, performed at high speed repetitively over an eight hour shift. These conditions have been associated with development of musculoskeletal disorders. However, the individual tasks need to be further investigated to develop proper interventions.

Purpose: To examine surface electromyography (sEMG) data to ascertain descriptive characteristics of each milking task and compare tasks.

Methods: sEMG sensors were placed on subjects to collect data from the upper trapezius, anterior deltoid, long head of the biceps brachii, and wrist flexors and extensors. Subjects performed maximum voluntary contractions (MVC) for each muscle group. Data were then collected for all muscle groups for the first pen of the shift. sEMG data were normalized using MVC contractions for root mean square (RMS) analysis and amplitude probability distribution analysis (APDF).

Results: Brief visual analysis of RMS data reveals that the wiping task has highest mean RMS across all muscle groups and predip has lowest mean RMS across all muscle groups. APDF may reveal further differences between milking tasks.

Conclusion: Brief overview of processed sEMG data suggests that cleaning off the cow teats by wiping them down is more strenuous than the other tasks. Visually wiping and stripping seem to have similar activation patterns for the wrist flexors and extensors. More in depth analysis may reveal further differences or similarities among dairy tasks.