Assessment of Knee Flexion During Work Tasks of Dairy Farmers

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Introduction

- Dairy farmers have been identified as being at risk for developing knee osteoarthritis (OA) (Gomez et al., 2003; Holmberg et al., 2002).

- Activities that produce high knee moments and compressive forces (e.g. kneeling and squatting) may contribute to knee OA (Nagura et al, 2002; Felson et al., 1997).

- Little information exists on exposure awkward postures of the knee among dairy farmers.
Purpose

- Estimate the exposure to knee flexion among dairy farmers during milking and feeding tasks.

- Compare the knee flexion exposure across tasks and type of milking facility (stanchion and parlor).
Stanchion Milking
Parlor Milking
Stanchion Milking vs. Parlor Milking
Methods: Exposure Assessment Study

- Knee flexion was recorded during stanchion and parlor milking and feeding tasks for 23 dairy farmers.

- Time spent in knee flexion exposure categories of $\geq 70^\circ$ knee flexion and $\geq 110^\circ$ knee flexion using split plot repeated measures ANOVA.
## Results

<table>
<thead>
<tr>
<th>Facility by Task</th>
<th>Percent Time ≥ 70° Knee Flexion</th>
<th>Percent Time ≥ 110° Knee Flexion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Stanchion Milking (%)</td>
<td>22.0 (15)(^A)</td>
<td>17.7 (14.7)(^A, B)</td>
</tr>
<tr>
<td>Parlor Milking (%)</td>
<td>1.39 (1.8)(^A, B)</td>
<td>0.05 (0.15)(^A)</td>
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<tr>
<td>Stanchion Feeding (%)</td>
<td>17.3 (14.1)</td>
<td>2.3 (3.7)(^B)</td>
</tr>
<tr>
<td>Parlor Feeding (%)</td>
<td>19.9 (24.9)(^B)</td>
<td>1.0 (1.9)</td>
</tr>
</tbody>
</table>

\(^A\) p ≤ 0.05 across milking facilities; \(^B\) p ≤ 0.05 across milking and feeding tasks
Limitations

- Magnitude and duration of posture were the only estimates of exposure.
  - Other exposures may contribute to knee MSS were not measured (e.g. physical load).
- Only measured one knee
- Exposure misclassification
- Generalizability
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