FRACTION OF CATTLE BREEDS and Their Influence on Milk Production of Thai Dairy Cattle

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Dairy Cattle in Thailand

Multibreed Dairy Cattle Population in Thailand

Objective
Distribution and Structure of Breed Fraction in Thai Dairy Cattle
Breed Effect on Milk Production under Thai Topical Condition

Fraction of Cattle Breeds

1
2
3

Holstein
Red Sindhi
Sahiwal
Brown Swiss
Jersey
Brahman

Fraction of Cattle Breeds

92 31/32%HF,
3 1/8%JER,
2 11/32%RS,
25/32%BRA,
25/32%NA

87 1/2%HF,
6 1/4%BRA,
6 1/4%NA

84 3/8%HF,
3 1/8%RD,
9/16%BS,
3 1/8%RS,
6 1/4%SW,
1 9/16%NA
**Materials & Methods**

**Pedigree**
- Animal ID
- Date of birth
- Breed Fraction
- Calving Age

**Performance**
- Monthly test-day milk sample
- Collecting date

**DATASET**
5,692 Data of first lactation cows
601 farms Calving from 1989 to 2012

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**Data Preparation**
- Seasons were classified as cold (November to February), warm (March to June) and rainy (July to October)
- Contemporary groups were defined as calving herd-year-season
- Breed presented in the current dataset consisted of Holstein, Brahman, Jersey, Red Dane, Red Sindhi, Sahiwal, Thai Native and Brown Swiss
- Calculate the accumulated 305-d milk yield from monthly test-day milk samples for the individual cows using the Test Interval Method

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**Statistical Model**

\[ y = \mu + \text{HYS} + \text{Cage} + \text{Breed} + \text{Animal} + \epsilon \]

**Fixed Effects**
- Hard-year-season (HYS)
- Calving age (Cage)
- Breed

**Random effects**
- Animal
- Residual

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**Results & Discussion**

**Number of animals, percentage and least squares means of 305-day milk Yield by number of breeds in Thai multibreed dairy population**

<table>
<thead>
<tr>
<th>Number of Breeds</th>
<th>Number of animals</th>
<th>Percentage</th>
<th>Mean 305-day MY ± SE (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>504</td>
<td>9.00</td>
<td>4,442.81 ± 78.25</td>
</tr>
<tr>
<td>2</td>
<td>1,497</td>
<td>26.72</td>
<td>4,412.67 ± 66.83</td>
</tr>
<tr>
<td>3</td>
<td>886</td>
<td>15.85</td>
<td>4,422.45 ± 71.44</td>
</tr>
<tr>
<td>4</td>
<td>7,368</td>
<td>24.42</td>
<td>4,454.98 ± 67.93</td>
</tr>
<tr>
<td>5</td>
<td>948</td>
<td>16.92</td>
<td>4,455.25 ± 69.92</td>
</tr>
<tr>
<td>≥ 6</td>
<td>397</td>
<td>7.09</td>
<td>4,325.33 ± 84.47</td>
</tr>
</tbody>
</table>

Number breeds did not associate with MY (P = 0.43)

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**Descriptive statistics for breed fraction appeared in Thai dairy population**

<table>
<thead>
<tr>
<th>Breeds</th>
<th>Number of animals</th>
<th>Percentage</th>
<th>Mean 305-day MY ± SE (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holstein</td>
<td>5,692</td>
<td>100.00</td>
<td>4,442.81 ± 78.25</td>
</tr>
<tr>
<td>Thai Native</td>
<td>3,195</td>
<td>57.03</td>
<td>4,412.67 ± 66.83</td>
</tr>
<tr>
<td>Sahiwal</td>
<td>2,875</td>
<td>47.75</td>
<td>4,422.45 ± 71.44</td>
</tr>
<tr>
<td>Red Dane</td>
<td>2,568</td>
<td>45.84</td>
<td>4,454.98 ± 67.93</td>
</tr>
<tr>
<td>Red Sindhi</td>
<td>2,352</td>
<td>41.99</td>
<td>4,455.25 ± 69.92</td>
</tr>
<tr>
<td>Brahman</td>
<td>1,095</td>
<td>19.55</td>
<td>4,325.33 ± 84.47</td>
</tr>
<tr>
<td>Brown Swiss</td>
<td>823</td>
<td>14.69</td>
<td>4,412.67 ± 66.83</td>
</tr>
<tr>
<td>Jersey</td>
<td>514</td>
<td>9.18</td>
<td>4,422.45 ± 71.44</td>
</tr>
</tbody>
</table>

Number breeds did not associate with MY (P = 0.43)
**Regression coefficients for 305-day milk yield of dairy breeds**

<table>
<thead>
<tr>
<th>Breed Fraction (%)</th>
<th>Reg. Coef. ± SE (kg)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holstein</td>
<td>3.95 ± 1.64</td>
<td>0.02</td>
</tr>
<tr>
<td>Thai Native</td>
<td>-21.56 ± 6.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Sahwal</td>
<td>-3.02 ± 2.05</td>
<td>0.29</td>
</tr>
<tr>
<td>Red Dane</td>
<td>-3.14 ± 3.76</td>
<td>0.40</td>
</tr>
<tr>
<td>Red Sindo</td>
<td>3.94 ± 4.46</td>
<td>0.39</td>
</tr>
<tr>
<td>Brahman</td>
<td>-6.35 ± 8.33</td>
<td>0.32</td>
</tr>
<tr>
<td>Brown Swiss</td>
<td>-2.53 ± 4.31</td>
<td>0.56</td>
</tr>
<tr>
<td>Jersey</td>
<td>-7.36 ± 3.58</td>
<td>0.04</td>
</tr>
</tbody>
</table>

**CONCLUSIONS**

- Most cow raised in Thailand (91%) were crossbred which had 3 different presented breeds in average (1 to 8 breeds)
- Number of presented breeds did not associate with MY in Thai dairy population
- Fraction of Holstein, Thai native and Jersey had significantly influenced on MY (P < 0.05)

**Acknowledgement**

Thai Dairy Farmers, Dairy Farming Promotion Organization of Thailand, Kasetsart University

**THANK YOU!**
FOR YOUR ATTENTION