

Factors affecting bacterial score and bulk tank somatic cell count of dairy farms located in the central region of Thailand

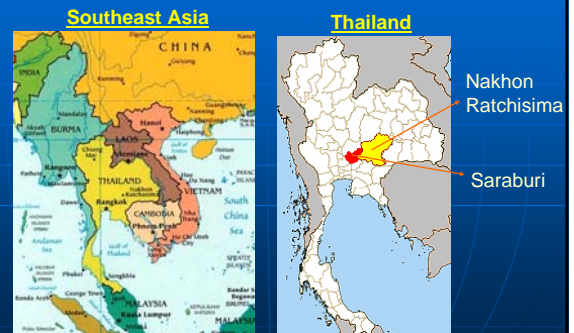
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Location



Background: Housing systems



- Farmers often but not always use tie-stall housing
- Many farmers also use free stall housing in Muaklek

D.C. Hall et al., 2004

Background: Milk collection



- Send milk to milk collection centers between
 - 6:30 to 8:30 am and 4:30 to 6:30 pm in the evening
- Farmers send milk themselves or pay a fee for the coop to pick it up

MCDL, 2005

Literature review



- Survey of 204 dairy farms in Thailand
- Total plate count :
 - 34.8% acceptable grade (10,001-250,000 CFU)
 - 54.9% poor grade (>250,000 CFU)

Yhoun-Aree , 1999

Literature Review



- Mud in cattle barns was associated with increased somatic cell count
- More farms had mud in barns during the rainy season than winter season

Suriyasathaporn et al. (2002)

Farms

- 1034 farms
- Located in two provinces and four districts
 1. Saraburi province
 - Muaklek district
 - Wang Muang district
 - Kaeng Khoi district
 2. Nakhon Ratchasima province
 - Pak Chong district
- Members of Muaklek Dairy Cooperative

Materials and Methods

Bacterial score

- 58,575 records
- From: Nov. 1, 2004 – Jun. 30, 2006
- Methylene blue reduction test
- Scores ranked from 1 to 4

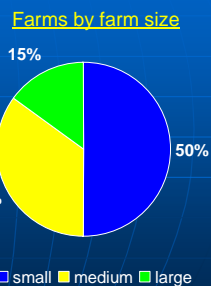
Bulk Tank Somatic Cell Count (BTSCC)

- 24,109 records
- From: Oct. 6, 2005 – Jun. 30, 2006

Materials and Methods

Data

- Season
 - Winter = Nov. – Feb.
 - Cool and dry
 - Summer = Mar. – May
 - Hot and dry
 - Rainy = Jun. Jul.
 - hot and humid
- Farm size: # cows milked per day
 - Small = 1-9
 - Medium = 10-19
 - Large > 20



Materials and Methods

Trait: bacterial score

- Poisson distribution
- GENMOD procedure of SAS

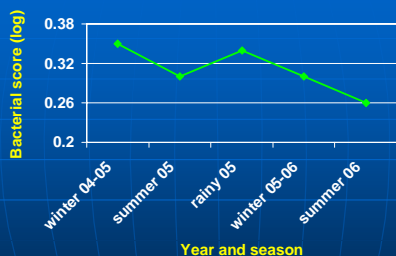
$\text{Log (mean bacterial score)} = \text{year-season} + \text{farm district} \times \text{farm size} + \text{residual}$

Trait: Bulk tank somatic cell count (BTSCC)

- Natural log
- Mixed procedure of SAS

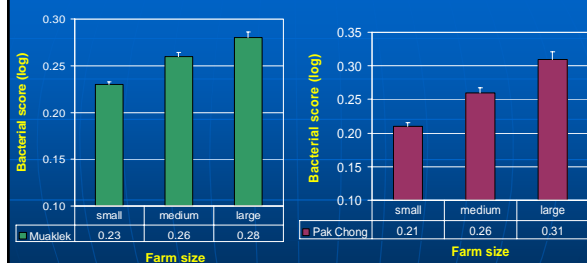
$\text{Log (BTSCC)} = \text{month-year} + \text{farm district} \times \text{farm size} + \text{residual}$

Results: Least square means for log of bacterial score across year-season



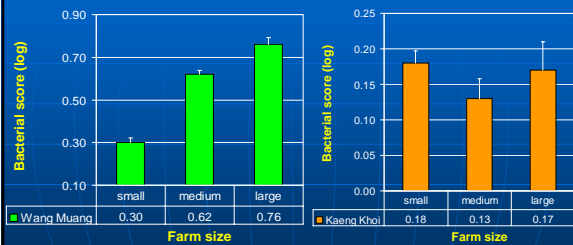
- Year-season affected bacterial score ($P < 0.0001$)
- Rainy season was higher ($P < 0.05$) than both adjacent year-seasons

Results: Least square means for log of bacterial score by farm size and district



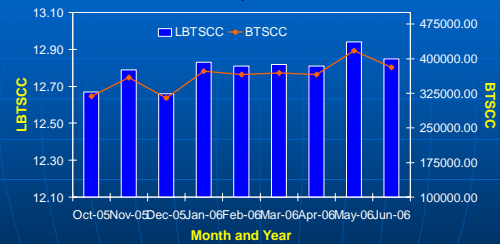
- No difference between farm sizes in Kaeng Khoi
- Small size farms were lower ($P < 0.05$) than medium and large in Muaklek

Results: Least square means for log of bacterial score by farm size and district



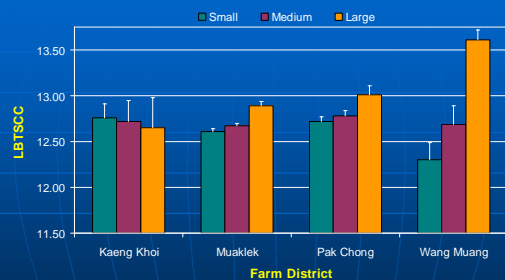
- All farm sizes in Pak Chong and Wang Muang were different from one another ($P < 0.05$).

Results: Least square means for log of bulk tank somatic cell count across month and year



- May and June were higher for LBTSCC than all other months ($P < 0.05$)

Results: Least square means for log of bulk tank somatic cell count by farm size and district



- Small farms in Muaklek, Pak Chong, and Wang Muang were lower ($P < 0.05$) for LBTSCC than large farms

Conclusions

- Small farms had lower bacterial scores and BTSCC than large farms
- Higher bacterial scores and BTSCC during the rainy season
- Bacterial score decreased while BTSCC increased over the time of the study

Implications

- ❑ High bacterial and BTSCC led to lower profits for medium and large size farms
- ❑ Need to identify specific factors causing high bacteria in milk and mastitis in cows
- ❑ The use of a more precise measurement of bacteria in milk (i.e. total plate count) is needed to improve quality of milk and the health of animals

Questions

