



Deutscher Tropentag, October 9-11, 2002, Witzenhausen  
“Challenges to Organic Farming and Sustainable Land Use  
in the Tropics and Subtropics”

## Heritability Estimates of Protein %, Fat %, Lactose %, Non Fat Solids and Total Solids of Dairy Cattle in Northern Thailand

NATTAPHON CHONGKASIKIT<sup>1</sup>, THERDCHAI VEARASILP<sup>1</sup>, UDO TER MEULEN<sup>2</sup>

<sup>1</sup>*Chiang Mai University, Department of Animal Science, Thailand*

<sup>2</sup>*Georg-August University Göttingen, Institute of Animal Physiology and Nutrition, Germany*

### Abstract

Heritability is the ratio of additive genetic variance to phenotypic variance. The possible range of values for heritability is 0 to 1.0, because additive genetic variance is a part of phenotypic variance. Phenotypes are measured traits influenced by genetic and environmental effects. The higher the heritability the greater the genetic control on the trait, and the more rapidly selection will result in genetic progress. Fat, protein and milk yield as well as size of the individual have high heritabilities. Fertility has low heritability. This research estimated the heritability of protein %, fat %, lactose %, non fat solids and total solids in 530 dairy cows with the lactation days ranging from 1–400 in Chiangmai, Chian-grai and Lamphun Province. The animal model BLUP was used and the fixed effects were herd-year, season and % of Holstein Friesian while the covariable was days in milk.

The results revealed that mean, standard error of mean and variance of protein % were 3.22, 0.028 and 0.42; of fat % were 4.41, 0.098 and 5.07; of lactose % were 4.66, 0.017 and 0.15; of non fat solids were 8.55, 0.024 and 0.29 and of total solids as 12.96, 0.096 and 4.88 respectively. The additive genetic variances of protein %, fat %, lactose %, non fat solids and total solids were 0.041, 0.130, 0.022, 0.036 and 0.963 respectively. The residual variances of protein %, fat %, lactose %, non fat solids and total solids were 0.079, 0.212, 0.069, 0.238 and 2.736 respectively. And the heritability of protein %, fat %, lactose %, non fat solids and total solids were 0.342, 0.379, 0.238, 0.133 and 0.260 respectively.

**Keywords:** Dairy cattle, heritability