

Noppanan Rungsakinnin 2010: Effect of Beta and Kappa Casein Gene on Milk Yield and Milk Composition in Various Percentage of Crossbred Holstein. Master of Science (Animal Breeding), Major Field: Animal Breeding, Department of Animal Science. Thesis Advisor: Mrs.Amonrat Molee, Ph.D. 75 pages.

There were 3 objectives of this study: 1) study the polymorphism, the frequency of alleles, genotypes and composite genotypes of  $\beta$  and  $\kappa$ -casein gene, linkage disequilibrium (LD) and the frequency difference of allele and genotype for 2 loci between 2 groups in crossbred Holstein, G1 ( $\leq 87.5\%HF$ ) 89 cows and G2 ( $>87.5\%HF$ ) 142 cows 2) study the relationship between genotype, composite genotype with %breed groups of Holstein and 3) study the effect of allele, genotype and composite genotype of both groups on milk yield and milk composition. Allele-specific PCR (ASPCR) and PCR-RFLP technique were used to classify the difference genotype of  $\beta$  and  $\kappa$ -casein gene, respectively.

$\beta$ -casein gene, 3 alleles ( $A^1$ ,  $A^2$  and B) and 5 genotypes ( $A^1A^1$ ,  $A^1A^2$ ,  $A^1B$ ,  $A^2A^2$  and  $A^2B$ ) were found. Allele  $A^2$  and genotype  $A^1A^2$  were the most frequencies in both groups.  $\kappa$ -casein gene, 3 alleles (A, B and E) and 5 genotypes (AA, AB, AE, BB and BE) were found in the G1, 3 alleles and 4 genotypes in G2 which BB genotype was absence. The frequency of allele A and genotype AA were the most found in both groups. The frequency of composite genotype  $A^1A^2AA$  was the most found in both groups. There were non-significant difference of frequency of both groups ( $P > 0.05$ ). Very highly significant LD were found between 2 loci ( $P < 0.0001$ ) in both groups. Significant negative effect of composite genotype on % milk composition in both groups, particularly in %SNF and %Protein which were the interesting traits. This results concluded that 1) the different % of Holstein levels did not effect on the casein gene polymorphism and frequency, 2) strong LD between 2 locus were found, the composite genotype was the suitable from to study the effect on interesting traits, 3) negative effect of composite genotype on interesting traits were found, the potential of these gene as genetic marker did not clear in this study, 4) the different percentages of Holstein showed the different significant effect, therefore, the further study should be considered.

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Student's signature

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Thesis Advisor's signature