Identification of Growth Hormone Releasing Hormone Gene in Local Buffalo (*Bubalus bubalis*) Using PCR-RFLP

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ABSTRACT

GHRH is a hypothalamic hormone which stimulates growth hormone secretion in the pituitary gland. The objective of this study was to identify polymorphisms Growth Hormone Releasing Hormone (GHRH) gene of Indonesian buffalo's. A total of 320 blood samples from Indonesian buffaloes were used to determine polymorphism using PCR-RFLP method. The polymorphism of GHRH gene that spanned within exon 2 and exon 3 was amplified, and their mutation was detected using endonuclease *Hae*III. In this study, there were three GHRH/*Hae*III genotype (AA genotype 0%, AB genotype 36% and BB genotype 64%) determined by two alleles, A (18%) and B (82%). The frequency of A allele was found 15% for Semarang population, 19% for Mataram population, 2% for Medan population and 40% for Banten population. The frequency of B allele was found 85% for Semarang population, 81% for Mataram population, 98% for Medan population and 60% for Banten population. The observed heterozygosis values were different among populations. The highest heterozygosis ($\hat{h}$) 0,485 for Banten population and the lowest was 0.037 for Medan population and the average heterozygosis for all populations ($\hat{H}$) detected was 0.270. Index fixation value of GHRH gene showed there was not fixed into one gene type ($F_{ski} \neq 0$). The smallest genetic distance value of GHRH gene was found between Semarang and Mataram population (0.001) and the highest between Medan and Banten population (0.202).

Key words: buffallo, GHRH gene, PCR-RFLP

INTRODUCTION

Local buffaloes have great potential to be developed as meat-producing animals because it is easy to adjust, has a relative carcass weights higher than the local cows and always maintained in rural areas (Hasinah and Handiwirawan, 2006). Generally local buffaloes not used to meat-producing livestock, although in terms of body weight potential. Genetic quality improvement is still far behind the buffalo from the other cattle. Improvement by considering the genetic markers can be used as an alternative in conducting the selection. One selection method that is currently developing a method of MAS (Marker Assisted Selection) is selected on the basis of markers DNA controlling economic traits.

Growth Hormone Releasing Hormone (GHRH) is one of the role of growth factors stimulate the synthesis and secretion of Growth Hormone in an additive effect on growth. Therefore, GHRH gene is a genetic marker which can be used as one basis for selecting cattle. This study aims to identify the gene diversity of Growth Hormone Releasing Hormone (GHRH) on the local buffalo in Indonesia.

GHRH is a hypothalamic hormone which stimulates growth hormone secretion in the pituitary gland. GHRH stimulates both synthesis and secretion of pituitary growth hormone (GH) binds to specific receptors on somatotrophs (Frohman et al., 1992). Growth-hormone-releasing hormone *(GHRH),* also known as growth-hormone-releasing factor (GRF or GHRF) or somatocrinin, is a 44-amino acid peptide hormone produced in the arcuate nucleus of the hypothalamus (Connor et al., 2005). Other studies showed that somatotropin, somatoliberin and their synthetic equivalents increased milk production in both dairy cows (Bonneau dan Laarveld, 1999) and in meat cows (Achtung et al., 2001) as well as improved cattle growth rate thereby reducing the time necessary to reach the slaughter weight. Cheong et al. (2006) suggest that polymorphism in GHRH might be one of the important genetic factors that influence carcass yield in Korean native cattle (Hanwoo). Bovine