Verifikasi Kontrol Gen Kappa Kasein pada Protein Susu Sapi Friesian-Holstein di Daerah Sentra Produksi Susu Jawa Barat

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ABSTRACT

ANGGRAENI, A., C. SUMANTRI, A. FARAJALLAH and E. ANDREAS. 2009. Verification for the control of kappa-casein gene on milk protein yield of friesian-holstein in dairy central region of West Java. *JITV* 14(2): 131-141.

Genotipe of BB kappa kasein (κ-kasein) gene positively influences high milk protein yield. The aim of this research was to verify the use of the κ-casein gene as marker of assisted selecion (MAS) of high protein yield in domestic Holstein-Friesian (HF) cattle. Genotyping blood samples was conducted for lactating cows from BPPT-SP Cikole (82 head) and a number of small holders in KPSBU Lembang (190 head). Genotyping the κ-casein gene was also conducted for active and non active AI bulls (HF) from BIB Lembang (25 head) and BBIB Singosari (32 head). Varian genotipes were identified trough DNA migration, whereas frequencies of alleles were calculated by Nei Method (1987). The effects of variant genotypes on protein yield and other milk component yields were studied in lactating cows (56 head in BPPT-SP Cikole and 111 head in KPSBU Lembang) by applying Least Square Means (LSM) method of the General Linear Model (GLM). Genotyping the κ-kasein gene resulted in three genotypes, namely AA, AB and BB, with two alleles, namely A and B. It was identified that a very limited number of lactating cows with BB genotype (0-9%). These cows produced higher protein yield around 3.37-3.84% than that of AA cows, while AB cows produced protein yield in between, though these differences were not statistically significant (P>0,05). In contrast, AA cows tended to produced higher milk fat yield than BB cows. Cows BB and AB seemingly produced higher dry matter, while both specific density and pH were not affected by variant genotypes of the κ-casein gene. The results showed that BB genotype of the κ-casein gene tended to be quitely consistent in controlling high protein yield, so it would be a good oppurtinity to be used as MAS of milk protein yield in HF domestic.

Key words: Protein Yield, Dairy Cattle (HF), κ-Casein Gene, Genotype BB

ABSTRAK

ANGGRAENI, A., C. SUMANTRI, A. FARAJALLAH dan E. ANDREAS. 2009. Verifikasi kontrol gen kappa kasein pada protein susu sapi Friesian-Holstein di daerah Sentra Produksi Susu Jawa Barat. *JITV* 14(2): 131-141.

Genotipe BB gen kappa kasein (κ-kasein) berpengaruh positif terhadap kadar protein susu. Penelitian ini bertujuan memverifikasi penggunaan gen κ-kasein sebagai marka seleksi kadar protein susu pada sapi Friesian-Holstein (FH) di dalam negeri. Dilakukan genotyping sampel darah sapi laktasi dari stasiun bibit BPPT-SP Cikole (82 ekor) dan sejumlah peternak di KPSBU Lembang (190 ekor). Sampel darah pejantan FH aktif dan non aktif di BIB Lembang (25 ekor) dan BBIB Singosari (32 ekor) juga digenotyping. Varian genotipe diidentifikasi dari migrasi pita DNA, sedangkan frekuensi alel dihitung dengan rumus Nei. Pengaruh varian genotipe terhadap kadar protein susu dan kualitas susu lainnya diperiksa pada sapi laktasi (56 ekor di BPPT-SP Cikole dan 111 ekor di KPSBU Lembang) menerapkan Metoda Rataan Kuadrat Terkecil (RKT) dari Model Linier Umum. Genotyping gen κ-kasein menghasilkan tiga genotipe, yaitu AA, AB dan BB, dengan dua varian alel, yaitu A dan B. Teridentifikasi sangat sedikit sapi laktasi pengamatan bergenotipe BB (0-9%). Sapi genotipe BB menghasilkan kadar protein susu lebih unggul terhadap AA sekitar 3,37-3,84%, sedangkan sapi AB memproduksi protein susu diantaranya, meski perbedaan secara statistik tidak nyata (P>0,05). Sebaliknya, sapi AA cenderung menghasilkan kadar lemak susu lebih tinggi terhadap sapi BB. Genotipe BB (dan AB) juga bertendensi dengan kadar bahan kering lebih tinggi dibandingkan AA, sedangkan BJ dan pH susu tidak dipengaruhi varian genotipe. Hasil mengindikasikan genotipe BB dari gen κ-kasein cukup konsisten mengkontrol kadar protein susu tinggi, sehingga memberi peluang dipakai sebagai marka seleksi protein susu dari sapi perah FH domestik.

Kata Kunci: Kappa Kasein, Genotipe BB, Protein Susu, Sapi Perah (FH)

PENDAHULUAN

Perkembangan Industri Persusuan Sapi Perah Nasional sudah berjalan lebih dari dua dekade. Meskipun demikian, produksi susu segar di dalam negeri baru memenuhi sekitar 30% kebutuhan nasional. Selama lima tahun terakhir, laju konsumsi susu