PERAN SISTEM PRODUKSI TERNAK TERHADAP KINERJA DAN VARIASI GENETIK BERDASARKAN GEN LEPTIN SAPI MADURA DI WILAYAH PENGEMBANGAN *SONOK*

INTISARI

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Tujuan dari penelitian ini adalah mengkaji peran sistem produksi ternak terhadap kinerja dan variasi genetik berdasarkan gen Leptin Sapi Madura di wilayah pengembangan *Sonok*. Penelitian dilakukan di Kabupaten Pamekasan, Jawa Timur. Data dikumpulkan melalui studi pustaka, wawancara pemangku kepentingan, pengukuran ternak dan analisis laboratorium. Wawancara semi terstruktur melibatkan 218 peternak Sapi Madura (93 konvensional, 71 *Taccek* dan 54 *Sonok*). Pengukuran ternak dilakukan pada 294 ekor sapi (123 konvensional, 88 *Taccek* dan 83 *Sonok*). Data karakteristik peternak yang bersifat kuantitatif, kinerja produksi dan kinerja reproduksi dianalisis dengan analisis variansi (ANOVA) pola searah menggunakan *software* R. Data bersifat kategori disajikan dalam bentuk distribusi frekuensi. Variasi genetik gen Leptin dianalisis dengan *software* Popgen32. Asosiasi variasi genetik dengan kinerja produksi dianalisis dengan ANOVA dan *t-test.* Hasil penelitian menunjukkan bahwa peternak sapi Madura kelas *Sonok* memiliki umur, ukuran keluarga, pengalaman beternak, kepemilikan lahan, tingkat pendidikan dan kepemilikan ternak lebih tinggi dibandingkan peternak *Taccek* dan konvensional. Peternak pada ketiga kelas memiliki tujuan utama beternak sebagai pendapatan dan tabungan tetapi peternak sapi *Sonok* lebih mengutamakan nilai budaya dan status sosial dibandingkan kelas lain. Sapi *Sonok* memiliki ukuran ukuran tubuh dan bobot badan lebih tinggi dibandingkan sapi *Taccek*, sedangkan sapi konvensional paling rendah. Sapi konvensional memiliki jarak beranak dan perkawinan pertama setelah melahirkan lebih baik dibandingkan sapi lain. Delapan SNP gen Leptin teridentifikasi pada lokasi g.1001G>C, g.1044C>T, g.1046A>G, g.1158T>C, g.1180C>T, g.1181G>A, g.1299G>A dan g.1311C>T. Sapi *Taccek* memiliki nilai heterosigositas gen Leptin lebih tinggi dibandingkan sapi konvensional dan Sapi *Sonok*. Genotip heterosigot pada SNP g.1044C>T, g.1046A>G, g.1158T>C, g.1180C>T, g.1299G>A dan g.1311C>T memiliki ukuran-ukuran tubuh yang lebih tinggi dibandingkan dengan genotip homosigot. Berdasarkan hasil penelitian dapat disimpulkan bahwa sistem produksi ternak berperan penting terhadap kinerja dan variasi genetik ternak di kawasan pengembangan *Sonok*. Kebudayaan *Sonok* meningkatkan kinerja produksi tetapi menurunkan variasi genetik ternak berdasarkan gen Leptin.

Kata kunci: Sistem produksi ternak, Sapi Madura, *Sonok*, Kinerja, Variasi genetik

THE ROLE OF LIVESTOCK PRODUCTION SYSTEM ON MADURA CATTLE PERFORMANCE AND GENETIC VARIATION OF LEPTIN GENE IN THE *SONOK* DEVELOPMENT AREA

ABSTRACT

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This study aimed to observe the role of livestock production systems Madura Cattle performance and genetic variation of Leptin gene in the *Sonok* area. Research was conducted in Pamekasan Regency, East Java. Data were collected through literature study, stakeholder interviews, livestock measurements, and laboratory analysis. Semi-structured interviews involved 218 Madura Cattle farmers (93 conventional, 71 *Taccek*, and 54 *Sonok*). Livestock measurements were carried out on 294 cows (123 conventional, 88 *Taccek*, and 83 *Sonok*). Quantitative data on farmer characteristics, production performance, and reproductive performance were analyzed by analysis of variance (ANOVA) using R software. Categorical data were presented in a frequency distribution. Genetic variations were analyzed by Popgen32 software. Association studies were analyzed by ANOVA and t-test. The results showed that the *Sonok* cattle farmers had higher age, family size, livestock experience, land ownership, education level, and livestock ownership compared to *Taccek* and conventional. Farmers in the three classes have the main goal of keeping cattle as income and savings, but *Sonok* farmers prioritize cultural values and social status over other classes. *Sonok* cattle have higher body size and body weight than *Taccek* cattle, while conventional cattle are the lowest. Conventional cows have better calving interval and post-partum mating than other cows. Eight Leptin gene SNPs were identified at locations g.1001G>C, g.1044C>T, g.1046A>G, g.1158T>C, g.1180C>T, g.1181G>A, g.1299G>A and g.1311C>T. *Taccek* cattle had a higher Leptin gene heterozygosity than conventional and *Sonok* cattle. Heterozygous genotypes at SNPs g.1044C>T, g.1046A>G, g.1158T>C, g.1180C>T, g.1299G>A and g.1311C>T had higher body sizes than the homozygous. It can be concluded that the livestock production system plays an important role in the performance and genetic variation in the *Sonok* development area. *Sonok* culture increased production performance but decreased genetic variation of the Leptin gene.

Keywords: Livestock production system, Madura cattle, *Sonok*, Performance, Genetic variation