

ESTIMASI *OUTPUT* SAPI POTONG DAN IDENTIFIKASI GEN  
MC4R SAPI PERANAKAN ONGOLE DI KABUPATEN TUBAN  
PROVINSI JAWA TIMUR

INTISARI

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Penelitian ini bertujuan untuk mengetahui estimasi *output* dan dinamika populasi sapi potong serta identifikasi polimorfisme gen MC4R dan kaitan gen MC4R terhadap sifat pertumbuhan sapi Peranakan Ongole (PO). Lokasi penelitian di tiga kecamatan, yaitu Kecamatan Kerek, Kecamatan Palang, dan Kecamatan Tuban, Kabupaten Tuban, Jawa Timur. Waktu penelitian 3 April 2019 sampai 30 September 2019. Materi tahap I adalah 446 peternak dan 1116 ekor sapi potong di Kabupaten Tuban. Tahap II menggunakan 92 sampel darah sapi Peranakan Ongole di Kabupaten Tuban. Metode tahap I menggunakan metode survey dengan wawancara, pengukuran dan penimbangan dengan variabel *natural increase* (NI), *net replacement rate* (NRR), *output*, dinamika populasi dan penampilan reproduksi berupa *post partum mating* (PPM), *service per conception* (S/C), *calving interval* (CI), dan nilai efisiensi reproduksi (ER). Metode tahap II yaitu analisis DNA dengan variabel asosiasi genotip ternak dengan ukuran tubuh berupa Lingkar Dada (LD), Tinggi Gumba (TG), dan Panjang Badan (PB). Hasil penelitian tahap I untuk penampilan reproduksi induk sapi potong di Kabupaten Tuban adalah nilai PPM  $5,36 \pm 0,25$  bulan, S/C  $2,46 \pm 0,12$  kali, CI  $16,82 \pm 0,39$  bulan, dan ER 88,04%. Nilai NI 29,13%, NRR jantan 255,38% dan betina 295,83%, dan *output* 27,80%. Hasil penelitian tahap II berdasarkan SNP g. 1133 C>G gen MC4R ditemukan dua alel (C dan G) dan tiga genotip (CC = 9, CG = 49 dan GG = 34). SNP g.1133C>G berkaitan secara signifikan terhadap LD dan TG pada sapi PO umur poel 4 ( $P < 0,05$ ). Ternak bergenotip GG memiliki LD ( $169,29 \pm 5,55$  cm) lebih tinggi dari pada CC ( $160,00 \pm 3,56$  cm) dan CG ( $160,14 \pm 6,65$  cm). Ternak bergenotip GG memiliki TG ( $133,71 \pm 1,83$  cm) lebih tinggi dibandingkan CC ( $132,33 \pm 2,36$  cm) dan CG ( $127,71 \pm 4,96$  cm). Berdasarkan hasil penelitian ini dapat disimpulkan bahwa Kabupaten Tuban, Provinsi Jawa Timur merupakan sumber bibit dan produsen sapi potong. Gen MC4R pada sapi Peranakan Ongole bersifat polimorfik dan berdasarkan SNP g.1133 C>G memiliki pengaruh nyata terhadap lingkar dada dan tinggi gumba saat umur dewasa atau poel 4 dimana genotip ternak terbaik yaitu genotip GG.

Kata kunci: Potensi *Output*, Dinamika Populasi, Gen MC4R, dan Sapi Peranakan Ongole.

THE ESTIMATION OF BEEF CATTLE OUTPUT AND MC4R GENE  
IDENTIFICATION ON ONGOLE GRADE IN TUBAN REGENCY  
EAST JAVA PROVINCE

**ABSTRACT**

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The objective of this study was to estimate output, population dynamics, and identification of MC4R gene polymorphisms and their relation to the growth characteristics of Ongole Grade cattle. This study was conducted in Kerek Subdistrict, Palang Subdistrict, and Tuban Subdistrict, Tuban Regency, East Java Province from 3 April 2019 to 30 September 2019. Stage I used 446 breeders and 1116 beef cattle in Tuban Regency. Stage II used 92 blood samples of Ongole Grade cattle in Tuban Regency. Survey and interview, determination of body measurements, body weight, and carcass weight which the variables were post partum mating (PPM), service per conception (S/C), calving interval (CI), and reproductive efficiency (ER) for performance of reproduction, natural increase (NI), net replacement rate (NRR), output, and population dynamics conducted in stage I, and association of body size to genotyped cattle conducted in stage II. The results of stage I showed that reproductive performance of Ongole Grade cattle in Tuban Regency were PPM  $5.36 \pm 0.25$  months, S/C  $2.46 \pm 0.12$  times and CI  $16.82 \pm 0.39$  months. The value of ER, NI, NRR male and female, and output were 88.04%, 29.13%, 255.38% (male), 295.83% (female), and 27.80%, respectively. Stage II, based on SNP g. 1133 C> G MC4R gene found two alleles (C and G) and three genotypes (CC = 9, CG = 49 and GG = 34). SNP g.1133C> G was significantly related to chest circumference (LD) and body height (TG) at age I<sub>4</sub> permanent teeth ( $P < 0.05$ ). GG genotyped cattle have LD ( $169.29 \pm 5.55$  cm) higher than CC ( $160.00 \pm 3.56$  cm) and CG ( $160.14 \pm 6.65$  cm) in Tuban Regency. GG genotype have TG ( $133.71 \pm 1.83$  cm) higher than CC ( $132.33 \pm 2.36$  cm) and CG ( $127.71 \pm 4.96$  cm). In conclusion, the Tuban Regency, East Java Province is a source of stocks and producer of beef cattle. The MC4R gene in Ongole grade cattle is polymorphic and based on SNP g.1133 C> G has a significant effect on chest circumference and body height during at age of I<sub>4</sub> permanent teeth where the best livestock genotype is the GG genotype.

Keywords: Potential Output, Population Dynamics, MC4R Gene, and Ongole Grade Cattle.