Diversity of Myostatin Gene (GDF-8) on Madura Cattle

Nama	:	Iqbal Imannulloh G34070079
Pembimbing	:	Achmad Farajallah RR Dyah Perwitasari
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Abstrak:
Sapi madura merupakan salah satu sapi lokal Indonesia yang memiliki kemampuan adaptasi terhadap iklim tropis di kepulauan Madura dan memiliki kualitas daging serta kulit yang baik. Perkembangan dan diferensiasi massa otot rangka dikendalikan oleh gen miostatin atau growth differentiation factor-8 (GDF-8). Penelitian ini dilakukan untuk mengetahui keragaman gen miostatin (ekson 2 dan ekson 3) pada sapi madura dan dibandingkan dengan gen miostatin dari genus Bos lainnya pada tingkat runutan nukleotida. Identifikasi varian gen miostatin dilakukan terhadap 21 sampel DNA sapi madura dan perunutan nukleotida dilakukan terhadap amplikon menggunakan metode sampel DNA pooling. Enam varian yang ditemukan pada ekson 2 yaitu C1G (Leu), C41T (Ala), G239A (Arg), G266A (Arg), A268G (Thr), dan A331G (Met), sedangkan pada ekson 3 yaitu G75A, G77A, T261C, C273T, A330C (Ile), dan T336C (Thr). Analisis varian menunjukkan bahwa empat varian pada ekson 3 hanya terdapat pada sapi madura, satu bersifat missense yaitu G77A (His -- Arg), tiga varian lainnya bersifat nonsense yaitu G75A (Glu), T261C (Ala), dan C273T (Cys). Enam varian pada ekson 2 dan dua varian pada ekson 3 memiliki kesamaan nukleotida basa pada genus Bos lainnya, yaitu C1G (48%), C41T (64%), G239A (88%), G266A (92%), A268G (96%), A331G (92%), A330C (72,7%), dan T336C (36,4%). Varian yang ditemukan pada sapi madura berbeda dengan varian yang menunjukkan fenomena double muscling.

Abstract:

Madura cattle is one of Indonesian local cows that have an ability to adapt the tropical climate in Madura island and produce good quality meats and skins. Development and differentiation of muscle mass are controlled by myostatin gene or growth differentiation factor-8 (GDF-8). This research aimed to estimate the diversity of myostatin gene (exon 2 and exon 3) in madura cattle and compared it with myostatin gene from other Bos genus. The identification of myostatin gene diversity was performed on 21 DNA samples from madura cattle and nucleotides sequencing was conducted on the amplicon using DNA pooling sample methods. The six variants of the exon 2 were C1G (Leu), C41T (Ala), G239A (Arg), G266A (Arg), A268G (Thr), and A331G (Met), whereas on exon 3 was G75A, G77A, T261C, C273T, A330C (Ile), and T336C (Thr). The variance analysis showed that there were four variants of exon 3 that only found in a madura cattle, one variant has missense characteristic, that is G77A (His -- Arg), and the three other variants have nonsense characteristic, that are G75A (Glu), T261C (Ala), and C273T (Cys). The six variants of exon 2 and two variants of exon 3 had a nitrogen base similarity with the other Bos genus, that are C1G (48%), C41T (64%), G239A (88%), G266A (92%), A268G (96%), A331G (92%), A330C (72,7%), and T336C (36,4%). The variants found in madura cattle are different from variants that showed the double muscling phenomena.