



Polymorphisms in the leptin gene promoter in Brazilian beef herds

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ABSTRACT. Brazil is the world's largest producer of beef cattle; however, the quality of its herds needs to be improved. The use of molecular markers as auxiliary tools in selecting animals for reproduction with high pattern for beef production would significantly improve the quality of the final beef product in Brazil. The leptin gene has been demonstrated to be an excellent candidate gene for bovine breeding. The objective of this study was to sequence and compare the leptin gene promoter of Brazil's important cattle breeds in order to identify

polymorphisms in it. Blood samples of the Nellore, Guzarat, Tabapuã, and Senepol breeds were collected for genomic DNA extraction. The genomic DNA was used as a template for polymerase chain reaction (PCR) to amplify a 1575-bp fragment, which in turn was sequenced, aligned, and compared between animals of different breeds. Twenty-three single nucleotide polymorphic sites, including transitions and transversions, were detected at positions -1457, -1452, -1446, -1397, -1392, -1361, -1238, -963, -901, -578, -516, -483, -478, -470, -432, -430, -292, -282, -272, -211, -202, -170, and -147. Additionally, two insertion sites at positions -680 and -416 and two deletion sites at positions -1255 and -1059 were detected. As the promoter region of the leptin gene has been demonstrated to vary among breeds, these variations must be tested for their use as potential molecular markers for artificial selection of animals for enhanced beef production in different systems of bovine production in Brazil.

Key words: Molecular markers; Animal breeding; SNP; Gene promoter; Candidate gene