

Myostatin (GDF8) single nucleotide polymorphisms in Nellore cattle

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ABSTRACT. The myostatin gene, also known as GDF8 (growth differentiation factor 8), is located on bovine chromosome 2 (BTA2); it has three exons and two introns. Myostatin is specifically expressed during embryonic development and in adult skeletal muscle, functioning as a negative regulatory protein. Several cattle breeds (Piedmontese, Belgian Blue and Blond'Aquitaine, and others) show polymorphisms in this gene; these polymorphisms are directly related to the double muscling phenotype. We looked for polymorphisms in the Nellore cattle myostatin gene and compared them with those known for taurine breeds. Seven regions, covering the three exons of this gene, were amplified by polymerase chain reaction and sequenced, including the untranslated region. DNA from 30 adult Nellore animals was collected; DNA sequencing revealed three, seven

and four polymorphisms in exons 1, 2 and 3, respectively. We found previously reported polymorphisms, as well as several new ones; for instance, 37 polymorphisms were found in the untranslated region segment, and in introns 1 and 2 there were one and three polymorphisms, respectively. The high degree of allelic heterogeneity in the myostatin gene could be related to its high mutation rate; it also could be the result of a long history of artificial selection for meat production, which has probably favored such modifications and maintained them in cattle populations. These polymorphisms identified in Nelore cattle could be useful for breeding programs.

Key words: Animal breeding; DNA sequencing; Double muscling; Meat production; Single nucleotide polymorphisms