GMR Genetics and Molecular Research
Online Journal
ISSN:1676-5680

Identification and association of polymorphisms in *CAPN1* and *CAPN3* candidate genes related to performance and meat quality traits in chickens

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Genet. Mol. Res. 12 (1): 472-482 (2013)
Received May 3, 2012
Accepted November 26, 2012
Published February 8, 2013
DOI http://dx.doi.org/10.4238/2013.February.8.12

ABSTRACT. Meat quality is an important feature for the poultry industry and is associated with consumer satisfaction. The calpain 1 (*CAPN1*) gene is related to the tenderness process of meat post-mortem, and the calpain 3 (*CAPN3*) gene plays an important role in

myofibrillar organization and growth. The objective of the present study was to identify polymorphisms in these genes and to determine the association between these polymorphisms and traits of economic interest in poultry. Eleven animals (F_1) from an experimental poultry population at Embrapa Swine and Poultry were used to identify the polymorphisms. Four single nucleotide polymorphisms (SNPs) were found in the *CAPN1* gene, and one SNP was found in the *CAPN3* gene. A polymorphism from each gene was selected for genotyping in 152 chickens from the Embrapa F_2 experimental population and 311 chickens from a commercial population. Polymorphism g.2554T>C (*CAPN1*) was associated with body weight at 35 to 42 days, thigh weight, breast weight, carcass weight, and meat lightness content. SNP g.15486C>T (*CAPN3*) was associated with thigh yield, thawing-cooking loss, and shear force. Results suggest the possibility of using molecular markers in *CAPN1* and *CAPN3* genes as a tool for performance and meat quality traits in poultry breeding programs.

Key words: Calpain; Genetic marker; Poultry; Shear force

