



## Characterization of a novel CAPN3 transcript generated by alternative splicing in cattle

S.Y. Liu<sup>1,2,3</sup>, H. Jiang<sup>1,2</sup>, B. Yuan<sup>1,2</sup>, Y. Gao<sup>1,2</sup>, L.S. Dai<sup>1,2</sup> and J.B. Zhang<sup>1,2,3</sup>

<sup>1</sup>College of Animal Sciences, Jilin University, Changchun, Jilin, China

<sup>2</sup>Laboratory Animal Center, Jilin University, Changchun, Jilin, China

<sup>3</sup>Jilin Provincial Key Laboratory of Animal Embryo Engineering, Jilin University, Changchun, Jilin, China

Corresponding authors: J.B. Zhang / L.S. Dai

E-mail: zjb515@163.com / ls\_dai@163.com

Genet. Mol. Res. 14 (1): 457-463 (2015)

Received March 3, 2014

Accepted October 15, 2014

Published January 23, 2015

DOI <http://dx.doi.org/10.4238/2015.January.23.20>

**ABSTRACT.** Calpain-3 (CAPN3) is a member of the calpain family of Ca<sup>2+</sup>-regulated cysteine proteases, which play an important role in sarcomere remodeling and mitochondrial protein turnover, and thus, regulating beef tenderness in cattle. Currently, multiple CAPN3 transcripts have been detected in human, monkey, rat, and rabbit. However, whether this transcript is present in cattle remains unknown. In this study, we identified 2 CAPN3 transcripts in the skeletal muscle individuals of local black cattle from Jilin, China. One transcript corresponded to the known full-length protein and was referred to as CAPN3a, while the second transcript did not contain exons 2-19 and contained a single-nucleotide insert in the penultimate base of exon 1 compared to CAPN3a; this protein was referred to as CAPN3b. The expression level of CAPN3b was approximately 50-fold lower than that of CAPN3a. Moreover, CAPN3b mRNA was not translated into a functional protein because it had lost essential domains according to bioinformatic analysis. Our results not provide a foundation for understanding the function

of CAPN3, but also are useful for further elucidating the effect of CAPN3 on meat quality in cattle.

**Key words:** Alternative splicing; CAPN3; Cattle; Transcript