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Identification and characterization of a novel splice variant of the *PLCζ1* gene in bull testis tissues

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ABSTRACT. Phospholipase C zeta 1 (PLCζ1), which transcribes a key protein, has an important function in oocyte activation and embryo development because PLCζ1 can trigger a series of intracellular Ca^{2+} oscillations in mammals. In this study, a novel splice variant in the testis tissues of adult and fetal Chinese Holstein bulls was characterized by reverse transcription-polymerase chain reaction (RT-PCR) and sequencing analysis. The novel splice variant *PLCζ1*-sv1 was derived from the *PLCζ1* complete transcript (*PLCζ1*-complete) by alternative splicing; the alternative splicing pattern exhibited alternative 5'-splice sites. The full-length transcript, *PLCζ1*-complete, is the main transcript found in fetal and adult cow testis tissue. Quantitative real-time PCR (qPCR) analysis demonstrated that the expression levels of the *PLCζ1*-complete transcript were significantly higher than those of the *PLCζ1*-sv1 splice variant in bovine testis tissues. PLCζ1 protein sequencing analysis showed that the amino acids at positions 453 to 457 were

deleted in PLCζ1-sv1, thereby terminating transcription prematurely. In summary, this study provided information to elucidate the structure and function of the bovine *PLCζ1* gene.

Key words: *PLCζ1* gene; Chinese Holstein bull; Splice variant; Quantitative real-time polymerase chain reaction; Protein sequencing analysis

