

**IDENTIFICATION OF PRION PROTEIN GENE  
(*PRNP*) SEQUENCE VARIANTS IN AMERICAN  
BISON THAT HAVE BEEN PREVIOUSLY SHOWN  
TO BE ASSOCIATED WITH RESISTANCE TO  
BOVINE SPONGIFORM ENCEPHALOPATHY**

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ABSTRACT

Several studies have shown a relationship between *PRNP* genotype and susceptibility to transmissible spongiform encephalopathies (TSE's) in a number of different species. One study focused on a 23 base pair insertion/deletion (indel) in the *PRNP* promoter of German cattle breeds and found a strong correlation between the presence of the 23 bp insertion and resistance to bovine spongiform encephalopathy (BSE). Due to the close genetic relationship between cattle and American bison (*Bison bison*), it is possible that the 23 bp insertion allele exists in bison as well. The purpose of this study was to screen the *PRNP* promoter region in bison to determine the presence or absence of this indel in American bison. Fluorescent dye labeled bovine primers that amplify the 100/123 base pair indel region of the *PRNP* promoter were used to amplify the corresponding region of the bison genome. The amplification products were analyzed on an ABI 3100 Avant Genetic Analyzer. Of 178 bison genotyped, 15 appear to contain an insertion within the promoter region corresponding to the size of the 23 bp indel insertion. This suggests an allelic frequency for this polymorphism of 0.042. The frequency of this polymorphism is significantly different than previous studies in cattle. The significance of these findings to TSE disease in bison will be discussed.