Rapid Communication: Nucleotide Sequence of the Promoter and First Exon of the Somatotropin Receptor Gene in Cattle

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Name of Sequence. Promoter and first exon of the bovine somatotropin receptor gene.
Accession Number. U15731.
Species. Bos taurus.

Origin of Clone. Hybridizing with a 220-bp cDNA of the somatotropin receptor (Hauser et al., 1990) 10 clones were identified from a bovine genomic library (EMBL3 SP6/T7 cloning vector; Clontech Laboratories, Palo Alto, CA). A 2.9-kb XhoIIAatII fragment containing the promoter and exon I was subcloned into pGEM-7Zf (Promega, Madison, WI), and both sense and antisense strands sequenced from a single clone using a Sequenase kit (Amersham Life Science, Arlington Heights, IL).

Comparison with Related Sequences. Compared to the analogous ovine sequence (O'Mahoney et al., 1994), the bovine sequence (Figure 1) is 94% identical from -500 to -1 and 45% identical from -670 to -500. The sequence from -2734 to -670 was not reported for the ovine. The DNA sequence of the first exon (double underline; untranslated in the bovine) was 100% identical to the first exon of the bovine cDNA of Hauser et al. (1990), 96% identical to the sheep cDNA of Adams et al. (1990), 72% identical to the human variant 1 cDNA of Pekhletsky et al. (1992), and 64% identical to the rabbit cDNA of Leung et al. (1987).

Sequence Data. Differences in the promoter sequences of the somatotropin receptor between sheep (O'Mahoney et al., 1994) and cattle, from -500 bp to the transcription start site (+1), include an additional nine nucleotides within the bovine sequence (–397 to –383, underlined) and an insertion of six guanosine residues (▼) within the ovine sequence. Other differences were found as single base changes. The bovine sequence contains a TATA box (bold) at –30 bp but does not contain a consensus sequence for a CCAAT box (found in ovine).

Comments. Because of the high homology of bovine and ovine sequences within the –500 to –1 region, and in light of the functional analysis of the ovine promoter presented by O'Mahoney et al. (1994), it can be inferred that the promoter of the bovine somatotropin receptor is contained in this region.

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