



New Genetic Marker Enables Testing for Improved Embryonic Survival Rate & Milk Production in Cattle

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WARF: P08266US

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a genetic marker for fertility in cattle.

Overview

Reproductive performance in high-producing dairy cows is declining. The decrease in fertility and early embryonic survival rate is a worldwide problem. It likely is caused by several factors, including genetics.

Little progress has been made on identifying genes affecting reproduction traits. Such genes would facilitate genetic testing of bulls to enable quick and accurate evaluation of fertility and embryo survival rate. By by-passing the need for live offspring, genetic testing of bulls could lower the high cost of traditional progeny testing methods.

A UW-Madison researcher previously identified a single nucleotide polymorphism (SNP) in the *STAT5* gene, which is associated with fertility and early embryo death in dairy cattle. Identification of more genes associated with reproduction traits is needed to facilitate marker-assisted selection and other approaches that can lower the cost of progeny testing.

The Invention

The UW-Madison researcher now has identified another SNP that is highly correlated with embryo survival in cattle. This SNP, which is in the *fibroblast growth factor 2 (FGF2)* gene, is a predictive marker for improved fertility in dairy cattle. Alleles of the SNP also are associated with improved milk production and health traits. This SNP can be used to identify cattle with superior traits for breeding.

Applications

- Genetic marker for improved fertility in cattle

Key Benefits

- Useful as a breeding tool in enabling selection decisions to be made earlier than in traditional breeding programs, thereby shortening the generation interval for cattle breeding
- Provides—for the first time—evidence of an association between *FGF2* and embryonic mortality in cattle
- DNA markers are easy to measure, unambiguous and co-dominant.

State of Development

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This SNP was associated with nearly 10 percent higher embryonic survival in a study of 3,171 embryos from seven bulls and 281 cows.

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Additional Information

For More Information About the Inventors

- [Hasan Khatib](#)

Publications

- Wang X., Schutzkus V., Huang W., Rosa G.J. and Khatib H. 2009. Analysis of Segregation Distortion and Association of the Bovine FGF2 with Fertilization Rate and Early Embryonic Survival. Anim. Genet. 40, 722-728.
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- Wang et al. 2008. Association of Bovine Fibroblast Growth Factor 2 (FGF2) Gene with Milk Fat and Productive Life: An Example of the Ability of the Candidate Pathway Strategy to Identify Quantitative Trait Genes. J. Dairy Sci. 91, 2475-2480.

Tech Fields

- [Animals, Agriculture & Food : Animal biotech](#)

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