

Angus Foundation Research Project

Name of project: Genomic and proteomic markers for Angus bull fertility, Mississippi State University (MSU)

Status: Completed; renewal of \$15,000 in 2011

Timeline: 2009 to 2010

How much the Angus Foundation has provided in funding: \$25,000

Objective: To identify molecular markers (proteins and single-nucleotide polymorphisms-SNPs) associated with bull fertility.

Results, if any: MSU performed proteomics experiments using sperm from Angus bulls with varying fertility. Results showed more than 2,000 detectable protein spots from the spermatozoa. Of these, 80 of the protein spots were the most differentially expressed between sperm from high and low fertility bulls. Researchers determined the identities of these 80 protein spots, which showed diverse sets of proteins and functions. Although the results provided a complete view of proteins in bull spermatozoa, additional experiments are necessary to validate the potential protein markers to predict bull fertility.

Application: The sample size used in this study was small, but as mentioned above, studies on additional sperm proteins and mechanisms by which they regulate bull fertility are likely to generate a whole systematic model of protein markers.

The protein markers identified would:

- Improve the efficiency of cattle reproduction;
- Facilitate the method of fertility evaluation; and
- Reduce the costs associated with low fertility by eliminating low fertility bulls early on, thus generating economic savings from not having to house and maintain those bulls.