

Project Title: Evaluating Energy Efficient Strategies and Product Quality for Distillers' Dried Grains with Solubles (DDGS) in Dry-Grind Ethanol Plants

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Amount Requested

Year 1:__\$25,000__

Year 2: __\$25,000__

Problem Identification and Related Research

The amount of corn used for ethanol production has increased 17-fold during the past 20 years, to more than 600 millions bu/year. This has resulted in 4.9 billion gallons of ethanol valued at \$10.8 billion and 12 million metric tons of distillers grains valued at \$ 1.6 billion in 2006 (RFA 2005a). Much of the fuel ethanol production capacity in the United States is concentrated in NC-213 states. Wet milling and dry grinding are used to produce ethanol from corn. Wet milling involves soaking the corn kernel in water (steeping) to soften it and fractionating it into its chemical components. Fractionation separates the starch, protein, fiber, and germ, and allows these components to be processed separately. The three major coproducts of wet-mill ethanol production are animal feed products, i.e., corn gluten meal (high protein, 40%) and corn gluten feed (low protein, 28%), and corn germ, which may be further processed into corn oil. In dry grinding, the corn kernel is physically broken apart and not fractionated, which results in one primary coproduct, i.e., distillers dried grains with solubles (DDGS). The marketing of coproducts represents approximately 10-20% of the product value from a dry grind ethanol plant, and thus is an important income stream to offset ethanol processing costs (Rausch and Belyea, 2006). This is especially important because dry-grind ethanol plants account for 70% of ethanol production in the U.S. and DDGS are the only coproduct available (RFA, 2005b).

The fermentation and distillation steps have undergone many technological