

# The Feeding Value of Heat Damaged Distillers Grains in Cattle Diets

## A.S. Leaflet R2768

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### Summary and Implications

Heat damaged grain including distillers grain does have a salvage value as animal feed. The value of this material can be partially assessed by the visual appearance with darker or more burnt grain being of lesser value than the lighter colored.

### Introduction

Heat damaged grain, if not completely destroyed by fire, takes on a roasted appearance ranging from a slight brownish tint to black. These feeds still have some value in cattle rations, but the extent of their value is variable and may be inferred by the darkness of the sample since the heating will darken the sample and theoretically proportionally reduce digestibility. The purpose of this trial was to quantify this heating and reduced digestibility relationship. One note worth maintaining though is that

distillers grain will darken not only from heating but also from exposure to air. Darkening from oxidation does not reduce nutrient digestibility to the degree that heating does although the exterior appearance of the grain does look similar. To assess the grain's value a NIR analysis would be of limited value due to combustion and chemical binding of the normally digestible carbohydrate fraction typical to the grain.

### Materials and Methods

Four dried distillers grain samples were obtained of no to somewhat severe heat damage. A 30 Hour In-vitro digestibility trial was performed on these samples at a commercial feed testing lab (Dairyland Laboratory of Arcadia, WI). The resulting digestibility was obtained, subsequent net energy value inferred.

### Results

The following pictures display a sample of the grain and the subsequent in-vitro digestibility analysis. Notice that the color of the grain provides a reference of sorts to the subsequent digestibility.

**Picture 1. No heating other than mild temperature drying - gold color.**



Wet distillers – no drying

NDF = 24.41%

NDF 30 hr Digestibility = 93.4%

IVTDMD = 98.39%

Est. NE<sub>g</sub> = 0.72 Mcal / lb

**Picture 2. Mild heat damage – brown color.**



NDF = 25.43%

NDF 30 hr Digestibility = 52.73%

IVTDMD = 87.98%

Est. NE g = 0.64 Mcal / lb

**Picture 3. Heat damage.**



NDF = 36.06%

NDF 30 hr Digestibility = 32.72%

IVTDMD = 75.74%

Est. NEg = 0.55 Mcal / lb

Picture 4. Extreme heat damage.



NDF = 46.17%

NDF 30 hr Digestibility = 0.80%

IVTDMD = 54.20%

Est. NEg = 0.40 Mcal / lb