

Assessing Storage of Wet Brewers' Grain with Straws

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The objective of this study was to find a method to store wet brewers' grains without spoilage and to evaluate the ensiling properties of wet brewers' grain (WBG) so it can be used as the sole ration for any ruminant animal. The WBG was ensiled at 100:0 ratio and was also mixed with one of two straw treatments, wheat and tall fescue, at 20%, 30% and 40% WBG, respectively. Final mixtures were brought to 65% moisture content with water. Treatments were replicated three times. After the ingredients were thoroughly mixed in a Uebler mixer, each treatment was then placed into vacuum sealed bags and ensiled for 30 days. After ensiling, bags were opened and measured for dry matter and pH. Samples were freeze dried and analyzed for; ash, ether extract, neutral and acid detergent fiber, crude protein, ammonia-N, lactic acid, acetic acid, propionic acid, and butyric acid.

pH was evaluated with a difference ($P < .0001$) between the WBG at 3.49 pH and the straw treatments at 3.76 to 4.1 pH. The 20/80 WBG/wheat mix had the only difference ($P < .05$) among all straw treatments with a pH of 4.1 compared to the rest of straw treatments with a range of 3.76 to 3.88. This trend was also followed for dry matter content after ensiling. The WBG contained 18.75% DM and differed from all straw treatments ($P < .0001$). The only difference ($P < .05$) in straw treatments was between the wheat 20/80 (49.46% DM) and all other straw treatments (35.7% to 40.0% DM).

It was expected that crude protein of WBG/wheat straw mixtures would be 7.38%; 20/80 mix, 9.7%; 30/70, and 12.03% CP for the 40/60 mix. Actual results were: 20/80 mix; 4.39%, 30/70 mix; 8.1% and 40/60 mix; 7.89% CP. Grass straw expected results were to be 10.88% for the 20/80 mix, 12.77% for the 30/70, and 14.66% CP for the 40/60 mix. Actual results for grass straw were: 20/80 mix; 10.12%, 30/70 mix; 10.36% and 40/60 mix; 10.11% CP. The only difference ($P < .05$) was the 20/80 wheat straw among all straw treatments. The WBG was at 28.3% CP and differed ($P < .0001$) from all other treatments.

NDF and ADF followed the same trend as CP. The WBG had values of 52.3 % NDF & 24.08% ADF and differed ($P < .0001$) from all other treatments. The only difference among straw treatments ($P < .05$) was the 20/80 wheat straw (73.65% NDF and 45.42% ADF). The grass straw treatments ranged from: 62.77-63.2% NDF & 33.78-34.4% ADF. The other wheat treatments were: 30/70 mix =68.8% NDF & 41.15% ADF and the 40/60 mix =69.18% NDF & 41.8% ADF.

Ammonia (ppm) followed the same trend as before. The WBG showed an average level of 601.75ppm and differed ($P < .0001$) from all other treatments. The only difference ($P < .05$) among straw treatments was the wheat 20/80 mix (227.39 ppm) from all other straw treatments (331.96-416.97 ppm).

In conclusion, WBG can be used as an effective and nutritious feed for animals if storage is proper and spoilage can be reduced. Mixing a high percentage of WBG at 30 -40% with straws proves to be suitable because it is cost effective and offers a balanced ration for ruminant animals.