

A low cost vacuum storage method can preserve high moisture, distiller's grains. P. Walker*¹, K. Earing², and L. Mathews¹, ¹*Illinois State University*, ²*University of Kentucky*.

Herd sizes of small scale beef cow-calf producers can be too few in number to utilize high moisture distiller's grains (DGS) as a protein-energy supplement prior to spoiling. The objective of this trial was to evaluate a vacuum ensiling method for longer term storage of high moisture distiller's grain. Freshly produced DGS ($36.53 \pm 0.43\%$ DM) were placed on .24mm thick white plastic silo cover in two rows containing either 49 t or 63.6 t. Each row was either 3.05 m or 4.57 m wide at the base and 22.86 m long. Prior to covering each row with plastic and sealing the plastic at the base with ground limestone a 5.08 cm diameter x 15.24 m perforated tube was laid on each side of each DGS row and connected to a 5 HP, 45.4 l, 120 volt Shop Vacr (Williamsport, PA) vacuum. Each vacuum was turned on 3x/d for a 5 minute duration at 0800h, 1200h and 1600h. Samples of DGS were collected at 0 d, 41 d and 78 d post-sealing and analyzed for DM, pH, acetic acid (AA), propionic acid (PA), butyric acid (BA) and lactic acid (LA). Initial DGS contained $36.18 \pm 0.48\%$ DM, 4.6 pH, 0.45 ± 0.07 mg/g AA, 0.09 ± 0.04 mg/g PA, 0.05 ± 0.03 mg/g BA and 1.01 ± 0.34 mg/g LA (DM basis). At 41d DGS contained $36.04 \pm 0.7\%$ DM, 4.35 pH, 0.53 ± 0.04 mg/g AA, 0.07 ± 0.02 mg/g PA, 0.04 ± 0.01 mg/g BA and 0.56 ± 0.08 mg/g LA (DM basis). At 78 d DGS contained $34.92 \pm 0.38\%$ DM, 4.18 pH, 0.06 ± 0.01 mg/g AA, 0.03 ± 0.01 mg/g PA, 0.02 ± 0.01 mg/g BA and 0.05 ± 0.01 mg/g LA (DM basis). Over the first 78 d of storage VFA concentration decreased ($P < 0.05$) 97.8%, 66.7%, 60.0% and 95.0% for AA, PA, BA and LA, respectively. Bag one was opened at 78 d post-sealing and fed for 112 d. Of the 63.6 t DGS stored in bag one, 19.8% was considered spoiled and unfit for feeding. Bag two was opened on day 190 post-sealing and fed for 67 d. Of the 49.0 t DGS stored in bag two 27.6% was considered spoiled and unfit for feeding. This trial suggests vacuum storing can preserve DGS for prolonged periods but the vacuum procedure used did not ensile DGS.

Key Words: Vacuum storage, High moisture, Distiller's grains

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