The Latest Across the Plains

WELCOME DR. JORDAN O'NEILL!

Jordan joined the GPLC team in August. She was raised on a diversified commercial swine and beef cattle operation in eastern North Carolina where she developed a passion to help livestock producers optimize their production goals using their unique resources. Dr. O'Neill received her Masters in ruminant nutrition at the University of Nebraska– Lincoln. She then continued on to receive her Ph.D. in ruminant nutrition at North Caroline State University. During her free time, she enjoys running stocker calves with her husband Dustin.

Save Money $$$ Test Your Feeds

Tests are relatively inexpensive, usually costing less than $18, for the information derived. Contact our office to set up an appointment to have us pull feed samples if we have not done so yet.

Timely Reminders

- Inoculate and cover silage/earlage piles
- Consider planting cover crop for spring grazing and manure application
- Scrape pens and pile manure
- Clean water sources on a weekly basis
- Keep an eye on commodity contract prices the next two months
- Have us sample hay and silage (silage greater than 3 weeks after harvest)
- Start thinking about pre-weaning calf diets
- Contact your nutritionist about running projections on growing or finishing cattle, beef or Holstein, to help plan feedstuffs needs

Calendar of Events

- **Sept 22 - 23** Minnesota Livestock Nutrition Conference, Mankato, MN
- **Sept 10 - 11** Stockmanship & Stewardship Event, Danville, IN
- **Sept 24 - Oct 17** Texas State Fair, Dallas, TX
- **Oct 1 - 3** Ozark Fall Farm Fest, Springfield, MO
- **Oct 22 - 23** Stockmanship & Stewardship Event, Bowling Green, KY
- **Oct 14 - 15** Animal Care and Handling Conference, Kansas City, MO
- **Oct 15 - 24** Arkansas State Fair, Little Rock, AR
- **Oct 15 - 23** Northern International Livestock Exposition, Billings, MT
- **Oct. 24 - 26** Texas Cattle Feeders Association Annual Convention, Oklahoma City, OK
- **Oct 27 - 28** South Texas Farm & Ranch Show, Victoria, TX
- **Nov. 12 - 13** Annual Kansas Cattlemen's Association Convention and Tradeshow, Junction City, KS

Feed Analysis: What you need to know

Feed represents the largest operating cost for cattle producers today. Couple this with weaker cattle markets, the margins are slim to none on the production side of the beef industry. To obtain an optimum balance between feed costs and production, feeds must be routinely analyzed, and the results should be used to balance rations and/or supplements. It is possible to use an average book value for standard feeds, but it is important to remember that feeds vary significantly in nutrient profiles from year to year. Variation may be a result of location, maturity and/or other changes in feed management practices.

The first step in obtaining a feed analysis is collecting a good representative sample of that feed. Taking multiple subsamples of feed and mixing them will help ensure you have a representative sample. Additionally, samples of wet feed such as wet by-products and silages should either be shipped the same day they are taken or stored in a cool place prior to shipping to prevent any loses/spoilage. No sample should be set out in the sun for days at a time because heat and sunlight can degrade the sample. Sample bags and instructions on proper lab submission protocols can be obtained from your consultant or the commercial feed lab.

Most commercial laboratories have standard nutrient profiles for forages, grains and total mixed rations. At minimum, we like to analyze feeds for dry matter (DM), protein and energy. Labs will report nutrient values on both a DM and as-is basis. All rations are formulated on a DM basis, therefore, the nutrient levels reported on a DM basis are used. Once we have balanced rations, we can then convert values to an as-is basis (using the DM content of the feed) to determine the actual amount of feed that should be fed daily.

Labs can analyze feeds by two different methodologies: traditional wet chemistry or near infrared reflectance spectroscopy (NIR). NIR is faster and usually more economical; however, NIR results are only as good as the database of wet chemistry results summarized for that feed. Consult with your nutritionist if you have any questions about which analysis is best for the samples you are submitting.

Table 1 provides a list of common nutrients present on lab analysis reports, as well as the common units they are reported in. The following descriptions of each nutrient and their subcategories will help explain the information reported on the feed analysis.

MOISTURE

Dry Matter (DM): Dry matter is the moisture-free content of the sample. The DM portion of feed is made up of protein, fat, fiber, vitamins and minerals. Since moisture (i.e. water) dilutes the concentration of nutrients, it is important to always balance rations on a DM basis.

PROTEIN

Crude Protein (CP): Crude protein is determined by measuring the nitrogen content of a feedstuff, which includes both true protein and non-protein nitrogen. In ruminants, separating out the rumen degradable (RDP) and rumen undegradable (RUP) portion of CP is important. However, most commercial labs do not have the capability to measure RDP correctly, if at all. Therefore, we formulate rations with the lab analysis of CP, and use the RDP and RUP values from the 2016 Nutrient Requirements of Beef Cattle.

- **Rumen Degradable Protein (RDP):** The portion of CP that is degraded by rumen microorganism to synthesize bacterial crude protein (BCP), which is utilized by the animal to help meet their amino acid requirements.
- **Rumen Undegradable Protein (RUP):** The portion of CP that bypasses rumen degrada-

tion, commonly referred to as “bypass protein.” This fraction is digested in the small intestine and utilized directly by the animal to help meet their amino acid requirements.

- **Metabolizable Protein (MP):** The protein that is directly available to the animal, which is a combination of BCP and RUP.

Table 1. Feed ingredients and their units of measure.	
Nutrient	Common Units
Moisture	%
Crude Protein	%
Total Digestible Nutrients (TDN)	%
Net Energy (NEm, NEg, NEl)	Mcal/lb
Neutral Detergent Fiber (NDF)	%
Acid Detergent Fiber (ADF)	%
Starch	%
Calcium	%
Phosphorus	%
Copper, Zinc	ppm
Vitamins	IU/lb

Heat Damaged or Insoluble Crude Protein (ICP): Nitrogen that has become cross linked with carbohydrates thus not contributing to either the RDP or RUP supply. The linkage is a result of hays heating when baled and/or stacked at a moisture greater than 20%, or when silage is harvested at less than 65% moisture. Feeds with high ICP are typically discolored and have a distinct sweet odor. When more than 10% of the CP is unavailable, the CP value is adjusted (see ACP below). Note: this only applies to roughages, heat damaged corn cannot accurately be measured.

Available Crude Protein (ACP): CP corrected for ICP. When ICP is greater than 10%, the ACP values are reported. This value is what we use when formulating rations.

FIBER

Crude Fiber (CF): Crude fiber is the traditional measure of fiber, but it is not as valuable as neutral detergent (NDF) and acid detergent fiber (ADF) in determining feeding value of various forages.

Neutral Detergent Fiber (NDF): Measures the structural components of the plant cell wall. NDF helps predict voluntary intake because it indicates the amount of bulk or fill of a forage. In general, a lower NDF value is desired because as a plant matures NDF increases.

Acid Detergent Fiber (ADF): Measures the least digestible components of a plant, which are cellulose and lignin. ADF values and digestibility are inversely related, therefore forages with low ADF values are usually higher in energy.

ENERGY

Total Digestible Nutrients (TDN): The summation of digestible fiber, protein, lipid and carbohydrate components of a feed or ration. TDN is related to digestible energy and is often calculated based on ADF values. TDN is useful when formulating beef cow rations that are composed of predominately forage. However, in high concentrate rations (i.e. backgrounding and finishing) net energy should be used to formulate and predict animal performance. TDN values typically underpredict the feeding value of concentrates relative to forages.

Net Energy (NE): Commonly referred to as net energy for maintenance (NEm), net energy for gain (NEg) and net energy for lactation (NEl). The net energy system separates energy requirements into their fractional components used for tissue maintenance, tissue gain and lactation. To accurately use the NE system, you must carefully predict feed intake.

Ether Extract (EE): The crude fat content of a feed. Fat provides 2.25 times the energy density of carbohydrates.

Relative Feed Value (RFV): A prediction of feeding value that combines estimated intake (NDF)

and estimated digestibility (ADF) into a single index. RFV is used to evaluate legume hay. RFV is often used as a benchmark of quality when buying or selling alfalfa hay. RFV is not used for ration formulation.

Relative Forage Quality (RFQ): Like RFV, RFQ combines predicted intake (NDF) and digestibility (ADF). However, RFQ differs from RFV because it is based on estimates of forage intake and digestibility determined by incubating the feedstuff with rumen microorganisms in a simulated digestion. Therefore, it is a more accurate predictor of forage value than RFV. Neither RFV nor RFQ are used in ration formulation.

As always, if you have questions on how to interpret your feed analysis results or would like to get some feed samples taken please contact a consultant at GPLC!

Feeding Wheat in Finishing Rations

Drought, mold, and sprouting, oh my! These three factors negatively impact wheat's ability to be used for human consumption but can be managed to create a price competitive feed option for cattle feeders. Along with being a highly digestible starch source, wheat is around 14% crude protein (CP) and depending upon wheat variety, roughly 85-89% TDN. Due to wheat's higher bushel weight and protein content, research shows that it is economically feasible to feed wheat at 108-115% the value of corn. Depending upon what feed commodities do this fall, wheat might be an economical ingredient for cattle rations.

FEED GRADE WHEAT

Factors that prevent wheat from being utilized for human consumption do not necessarily deem them unworthy of cattle rations. Some of these factors include:

Drought. This is a reality in some areas of wheat country this year. Though the wheat kernels are smaller and consequently contain less starch, they are still a high-quality grain source in beef finishing diets.

Wet conditions. An extremely wet year can result in mold growth in wheat. Deoxynivalenol (DON), also known as vomitoxin, is the mycotoxin commonly found in wheat infected by Fusarium head blight (FHB). When infected by Fusarium molds, wheat is often referred to as "Scabby". Not all moldy wheat produces DON, but even when it does, it can be fed to cattle to some extent. Due to the pre-gastric fermentation in the rumen, ruminants can tolerate moldy feeds better than nonruminants. The FDA recommends that DON concentration not exceed 10 ppm in diets of beef animals greater than 4 months of age. Nutrient analysis needs to be conducted on suspect wheat to determine the concentration of DON present.

Sprouted wheat. This is wheat that has germinated. Granted, some bakeries still use or prefer to use sprouted wheat flour, but the vast majority do not, consequently sprouted wheat makes its way to the livestock sector. Sprouted wheat varies very little from non-sprouted wheat when it comes to fed cattle performance.

ACIDOSIS MANAGEMENT STRATEGIES

As Figure 1 illustrates; processed wheat is rapidly digested in the rumen. If not managed proper-

ly, this can result in an increase in digestive upsets. Generally, it is recommended that wheat not exceed 40 to 60% of the diet on a DM-basis in finishing cattle diets.

Wheat can be rolled, steam-flaked, or tempered, but the key is to avoid fines. Avoidance of fines starts at grain processing and continues all the way until feed delivery to the bunk. When rolling wheat, it is recommended to coarsely roll the grain. A coarse roll can increase wheat's digestibility from 60% for whole wheat to 86% in rolled wheat. Moya et al., (2015) found that regardless of processing method when comparing cattle performance and bunk behavior between cattle fed barley or wheat, wheat-fed cattle had lower DMI, spent less time at the bunk, and ate less per bunk visit. Overall performance did not vary between groups, but cattle fed wheat rations tended to have an increased number of liver abscesses indicating an increased incidence of acidosis.

Blending wheat with a more slowly digested grain source such as corn or sorghum creates a positive associative effect between the two grains. Blending slows rumen digestion, and acidosis incidences are lowered. It is also recommended that an ionophore be fed with wheat rations. Anderson et al, (1987) found that feeding ionophores improved cattle performance by 7.1% in rolled wheat rations compared to 3.1% in rolled corn rations.

FEEDING WHEAT AND DISTILLERS GRAINS

We know what the research says about the positive performance effects of including distillers grains in corn-based diets (12-40% WDGS DM-Basis), but what about including this byproduct in a wheat and corn blended diet? A recent study conducted at the University of Nebraska-Lincoln by Coulsen, et al., (2021), looked at comparing a 50:50 blend of wheat and dry rolled corn (DRC) to a 100% DRC-based diet with either 12 or 30% WDGS to determine the effects on cattle performance and potential acidosis mitigation. The study found that there was no interaction between grain type and WDGS inclusion. The typical response of increased performance when increasing WDGS inclusion from 12 to 30% was observed. There was minimal difference in cattle performance observed between cattle fed a DRC diet versus the blended DRC/wheat diet, thus the authors concluded that if it was economical to feed wheat, a producer could feed up to a 50:50 blend of DRC and wheat without negatively impacting cattle performance.

CONCLUSIONS

Agronomic factors influence wheat's ability to be used for human consumption. When wheat does not qualify for human consumption, it often is a price competitive feed ingredient in beef cattle finishing rations. Wheat is a highly digestible grain that is higher in crude protein than corn. Inclusion in the ration is typically 40-60% on a DM basis, but cattle feeders need to be diligent in reducing the number of fines present when grinding, mixing, and delivering wheat-based rations. Blending of wheat with a more slowly digested grain has been found to decrease the incidence of acidosis, and it is highly recommended that an ionophore be fed in wheat-based rations. Interested in feeding wheat this fall? Contact a GPLC consultant today to discuss how to best utilize wheat in a beef finishing operation!

Fall 2021

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