

Liquid Feed Line

American Feed Industry Association

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Research and Education in the Liquid Feed Industry

A Symposium Review by Dr. Evan Titgemeyer, KSU

The following text contains a few notes from presentations at the 2006 Liquid Feed Symposium. There was much useful information about nutrition and changes in the availability of ingredients within the liquid feed industry.

Molasses availability/cost

Molasses is a key ingredient for many liquid feed products. Volatile pricing of molasses, as reflected by today's high prices, occurs because only a small percentage of world production is available on the export market. Availability, and thus price, of molasses is predominantly dependent on production in Thailand and Pakistan, the major molasses exporters. Brazil is a major producer of molasses, but Brazil uses essentially all of their molasses for ethanol production. In contrast, a number of countries that produce large amounts of molasses are flexible in the amount exported, with domestic utilization being dependent upon price. This is also becoming the case in Thailand and Pakistan where domestic demand for ethanol production is competing with exportation of molasses, and this may place more pressure on the world price of molasses in the future.

Nutrition of cattle

Dr. John Paterson discussed the use of supplementation for grazing cattle, with emphasis on range conditions in Montana. Responses to supplementation can come in three primary forms: 1) small amounts of high-protein supplements can lead to increases in intake and digestibility of poor-quality forages, 2) supplementation with greater amounts of supplement (such as with alfalfa or a high-fiber byproduct) will decrease forage intake, although the intake of the supplement and forage combined is typically increased by supplementation, and 3) grain supplementation can be used as a replacement for forage, and this strategy can make sense in situations where there is inadequate forage availability, such as during drought conditions. Self-fed supplements may be ideal for providing protein supplementation to cattle grazing on poor-quality forage. Many of the byproducts that are becoming increasingly available as a result of increases in ethanol production may also be used as protein supplements as well as fill other needs. In particular, they may be beneficial in situations where forage availability is limited due to drought or over-stocking.

When comparing self-fed supplements (typical liquid feeds) to hand-fed dry supplements, a number of differences are apparent. Self-fed supplements reduce labor and equipment costs. Although self-fed

Mark your calendar!

The 2007 Liquid Feed Symposium will be at the **Radisson Fort McDowell Resort & Casino in Scottsdale, Arizona**, September 5-7, 2007. This new 4 star hotel and conferencing facility is just minutes from the Phoenix Sky Harbor International Airport.

The Liquid Feed Committee will be planning a solid educational program with exceptional industry speakers offering a lot of "take home value". Plan on enjoying the relaxing environment and take advantage of the many recreational activities offered at the resort and the surrounding area.

Liquid Feed Symposium

Sept. 5-7, 2007

Scottsdale, AZ



supplements are generally more expensive on a per pound basis, the total cost of a supplementation program, which includes the cost of the supplement as well as the costs of transportation and labor, needs to be considered. Generally, labor and delivery costs are greatly reduced for self-fed supplements. Some of the disadvantages of self-fed supplements include cow-to-cow variability in supplement intake, placement limitations for some types of self-feeders, and over-consumption of some supplements. Consumption level is an issue that makes development of many self-fed supplements difficult. However, over-consumption often may not be related to a "defect" in the product as much as it is related to inadequate availability of the forage being grazed.

Dr. Jerry Spears discussed some of the changes in nutritional recommendations related to mineral nutrition of livestock. With regard to supplementation of specific minerals, he suggested that animal needs vary depending on the location within the country and, therefore, it was advisable to analyze feedstuffs typical of the specific region of the country and develop supplements accordingly.

Dr. Mark Engstrom focused on the value of supplementation in supplying specific nutrients as well as non-nutrient dietary components to improve the immune status of livestock. The benefits of modulating immune response can, under some circumstance, be quite valuable by reducing veterinary treatment costs and death loss and by improving carcass quality.

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Liquid Feed Line

“The Liquid Feed Committee sponsors certain research projects pertinent to the development and understanding of liquid supplements.”

Member in the Spotlight

A new feature of the Liquid Feed Line, Member in the **Spotlight** will randomly feature one of AFIA's liquid feed member companies.



Recently joining AFIA, Nutra-Lix is the newest AFIA liquid feed member company.

George Yost was an original owner and founder of Nutra-Lix, Inc. in 1987. He and two other partners established the liquid feed supplement manufacturing plant in Billings, Montana with the mutual commitment to produce the best free-choice, controlled-intake supplement on the market. One partner left the group within a couple of years and in 2004, Karen Yost, George's wife purchased the remaining interest.

Today, Nutra-Lix products are distributed throughout Montana, Wyoming, North and South Dakota, Idaho, Nebraska and Alberta, Canada within a network of nearly fifty dealers. The primary Nutra-Lix product line is the liquid feed supplement fed in open troughs. Nutra-Lix brand minerals, solid barrels and Nutra-Lix Plus Horse supplements have been added for a complete available line of quality supplements. Research and testing is done in the field on practicing ranch operations.



The AFIA Liquid Feed Committee is a national advocacy group representing liquid feed manufacturers and their suppliers.

Liquid Feed Hall of Fame - a Look Back

The Liquid Feed Hall of Fame was established in 2003 to publicly recognize individuals who have made significant contributions to the fundamental development and education of the uses and value of liquid feeds.

The liquid feed industry was fortunate to have so many talented, dedicated and visionary individuals in its beginnings and extraordinary individuals continue to emerge from the industry.

Nominations for the Liquid Feed Hall of Fame have come in from all segments of the industry and as future nominations are made, it is expected many deserving individuals will be re-nominated for this award.

Below is a list of individuals who have been inducted into the prestigious Liquid Feed Hall of Fame as of 2006.

Kenny Berg-*Quality Liquid Feeds*
Richard Loomis-*Loomix, Inc.*
Frank Rawlings-*PerforMix Nutrition Systems*
Jerry Scaggs-*Shur-Gro Liquid Feeds*
Dr. Wayne Perry-*Purdue University*
Rich Rawlings- *PerforMix Nutrition Systems*
Paul Duea, *PM Ag Products*
Dr. R. Hollis Klett, *XF Enterprises*

Research & Education Fund Dollars at Work

After reviewing several research proposals submitted this past year, the Liquid Feed Committee has contracted with two universities to fund research projects pertinent to the liquid feed industry.

Dr. Bradley Johnson and William Miller, of Kansas State University, are currently studying the effect of cane molasses on the absorptive capacity of rumen papillae in dairy cows during the dry period and early lactation. They are hoping to better understand what changes occur in rumen epithelium as liquids are added to the diet, study absorption capabilities of volatile fatty acids with a liquid molasses addition to the diet, and investigate the mechanisms associated with increased lactational performance.

University of Florida's, Dr. John Arthington and Matt Hersom, are investigating the effect of forage-liquid molasses interaction on acid-base physiology and performance of beef cattle. This study is a follow-up to a previous study by Dr. Arthington and Matt Hersom, *Effect of Negative Cation-Anion Balanced Forages on Acid-Base Physiology and Dry Matter Intake in Beef Cows*. "The opportunity that liquid molasses offers to manipulate dietary parameters is of great potential importance", says Matt Hersom.

Final reports of funded projects are generally presented at the annual Liquid Feed Symposium and may be available to download from the AFIA website.

2006-07 Liquid Feed Committee

Wes Klett, Anipro/xtraformance Feeds, Chair
Kevin Bates, PerforMix Nutrition Systems, Chair-elect
Dr. Dave Caldwell, Westway Trading Corp. Secretary
Jim Lere, Quality Liquid Feeds,(QLF), Ex-officio
Dennis Cockrum, Cargill Animal Nutrition
Nathan Yates, Corn Products International
Dr. Mark Engstrom, Diamond V Mills
Dr. Chet Fields, United States Sugar
Bob Frost, Ridley Block Operation
Jim Livingston, Alpharma Inc.
Dr. Mike Prokop, Liquid Feed Commodities
George Yost, Nutra Lix
Greg Shepard, Double S Liquids
Elvin Thomas, Elanco Animal Health
Evan Titgemeyer, KSU University Advisor
Leanna Nail, AFIA, Committee Staff Contact

AFIA member companies interested in serving on the Liquid Feed Committee should contact any of the committee members listed above or contact Leanna Nail, Liquid Feed Staff Contact at AFIA.

Dr. R Hollis Klett was inducted into the Liquid Feed Hall of Fame at the Symposium Awards Ceremony, Sept. 7, 2006, in Oklahoma City.



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Distiller's by-products

Nathan Yates did an excellent job of reviewing some of the changes in ethanol production and the impact that these changes will have on the supply and composition of related byproducts. Ethanol plants use a variety of strategies for milling grain prior to fermentation, and the variation in milling strategy can lead to different by-products being produced as well as to changes in the composition of the byproducts. Distiller's grains typically contain all of the corn fiber and corn fat in addition to residues from the fermentation. When ethanol plants mill corn prior to fermentation, it becomes possible for the germ (containing most of the oil) and the bran (fiber) to be separated from the starch-containing components prior to the fermentation. If these products are not combined with the distiller's grains, it is possible to produce distiller's grains with lower fat and fiber contents that can have greater value as feedstuffs for specific markets. For example, the oil content of distiller's byproducts can limit their inclusion level in ruminant diets, whereas the fiber content can limit their use in poultry diets.

One of the problems with distiller's grains is that there is great variation in the composition of the product among plants, partly due to differences in the milling processes. However, even within a single plant, there is likely to be variation in the by-products produced. In general, there is little emphasis on the consistency and quality of the byproducts being produced by the ethanol industry, and there are essentially no quality standards or standardized testing procedures used for distiller's byproducts, despite the fact that 12 million tons of distiller's grains will be produced this year with much greater production expected in the future. Because there are wide ranging processes involved in ethanol production, and thus a wide range of distiller's by-products being produced, there will likely be an increasing number of brand-name by-products on the market, each with its own nutritive values and market niche. Across all of the distiller's by-products, the phosphorus content remains an issue because most of the products contain phosphorus in excess of animal requirements, which challenges the nutrient management programs of large animal operations.

In addition to the issues related to product consistency, distiller's grains also suffer from transportation issues because of low bulk density, problems with flowability, and, for wet products, the expense of shipping water.

Another liquid feedstuff that is increasing in availability is glycerin, which is produced as a by-product of biodiesel production. Although

production of biodiesel is increasing rapidly, the amount of glycerin produced is still small relative to the amount of distiller's byproducts being produced. The value of fats for biodiesel production may impact the production of distiller's byproducts as well, as more value may be captured from corn by diverting corn oil to biodiesel production rather than including it in distiller's byproducts. The value of glycerin as an animal feedstuff has been studied relatively little, but it is a product that will likely be available for feeding in increasing quantities unless alternative non-animal uses are developed.

Liquid feeds for finishing cattle

Dr. Tom Peters discussed some potential changes in the feedlot industry that may result as a consequence of enormous amounts of ethanol by-products becoming available in the corn belt. He believes that more cattle will be fed in the corn belt in order to optimize the utilization of the ethanol by-products. With increasing use of distiller's grains, the type of supplementation needed by the cattle finishing business will also change. For example, protein supplementation will be decreased due to the high protein content of the distiller's grains.

Dr. Peters compared the use of liquid supplements to that of dry supplements for finishing cattle. Liquid supplements work well for urea supplementation, but are somewhat limited in the amount of calcium that can be included. The ability to get all of the necessary supplemental calcium into liquid supplements is considered a challenge, but the use of combinations of liquid supplements along with dry limestone could avoid this problem. Benefits of liquid supplements include limited shrink relative to dry supplements. Some issues related to use of liquid supplements include the need for agitation and for liquid supplements to be delivered in semi-load amounts. In contrast to liquid supplements, dry supplements work poorly for inclusion of urea, but work well for the macronutrients salt and calcium. Dry supplements can be included in diets with smaller inclusion rates and can be delivered to operations in less than semi-load quantities, but physical separation of ingredients is possible during flat storage of dry supplements. Nutrient dispersion in the diet is generally better with a liquid supplement than with a dry supplement, but the use of wet corn by-products in diets can allow for adequate mixing of dry supplements if the appropriate sequence of ingredient addition to the mixer is followed. Given the comparison of liquid and dry supplements, Dr. Peters concluded that liquid supplements may be well suited for typical high-plains finishing diets, whereas dry supplements may be well suited for Midwest finishing cattle diets that contain wet byproducts such as distiller's grains.

Summary

This year's Liquid Feed Symposium provided lots of information related to some of the impending changes in the liquid feed industry. The large amounts of by-products being produced by the ethanol industry will shape the livestock feeding industry, and use of these by-products is inevitable. From the nutritionist's perspective, it will be important to determine how to use the distiller's by-products most effectively, and, from the feed industry perspective, it will be important to determine how to provide supplements to meet the needs of the livestock as well as the livestock producer.

American Feed Industry Association Liquid Feed Committee Research Funding Guidelines

The American Feed Industry Association's Liquid Feed Committee (AFIA/LFC) has limited funds available for the sponsorship of applied research projects. Selection criteria include:

AFIA/LFC contribution should represent a minimum of 50% of estimated total funding. AFIA does not pay indirect costs. Cooperators are encouraged to solicit additional funding. Co-sponsorship from ingredient suppliers encouraged.

Projects should include the application of a marketable supplement. Research should involve the utilization of products that are reasonably produced and marketed by a variety of manufacturers. Protocols that involve evaluation of liquid supplements by animals other than beef and dairy are encouraged. The following research areas are of particular interest:

Minerals: form and bioavailability.
Methods of regulation of free choice intake.
Liquid feed ingredients: characterize and quantify composition.
Formulation/Manufacturing: ammonia release; drug stability.
Comparing liquid vs. dry forms of supplements.
Management: by-pass amino acids vs. by-pass protein.
Marketing: non-ruminants; non-agricultural; potential.

Protocols should meet criteria of statistical design that would allow results to be published in refereed professional journals.

Protocols will be reviewed for approval and funding by the research sub-committee of AFIA/LFC at its spring and fall meetings. Please send protocols by February 1 or August 1 to Leanna Nail, American Feed Industry Association, 1501 Wilson Blvd., Suite 1100, Arlington, VA 22209, or lnail@afia.org.