



# U of M Horse Newsletter

Providing research-based information to Minnesota Horse Owners

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Volume 4, Issue 3

March 2008

UNIVERSITY OF MINNESOTA

EXTENSION

## Distillers Dried Grains with Solubles: useful, but not a balanced equine feed.

By: R. Johnson and J. Shelton, PhD, Cargill

Distillers Dried Grains with Solubles (DDGS) have generated a great deal of interest as a feed ingredient as the ethanol industry has grown in the U.S. DDGS are defined by the American Association of Feed Control Officials (AAFCO) as "The product obtained after the removal of ethyl alcohol by distillation from the yeast fermentation of a grain or grain mixture." DDGS can come from a number of different grains, with corn being the most common in the U.S. Industry estimates suggest that over 22 million tons of DDGS will be produced in 2008 in the U.S. and will be used both domestically and for export as a feed ingredient.

Because of the processing involved, DDGS contain substantially less starch and sugar (Non-Structural Carbohydrates or NSC) than the base or starting grain (corn). Other nutrients may be concentrated as the starch and sugar are removed. Although the remaining nutrients are concentrated, the energy value (DE Mcal/kg) is lower.

Table 1 lists the National Research Council's (NRC) nutritional values for Corn and Corn DDGS expressed on a dry matter basis. What the NRC and Table 1 do not show is the change in the Non-Structural Carbohydrate (NSC) content of the two ingredients or the variability. Equi-Analytical Laboratory data gives average NSC value on a dry matter basis for corn of 73.13% and for DDGS of 10.4%. The large drop in NSC demonstrates the amount of starch and sugar that is fermented to produce alcohol.

Table 1. The NRC nutritional values for Corn and Corn DDGS.

Ingredient	DM % (dry matter)	CP % (protein)	Lysine %	DE Mcal/kg	NDF %	Fat %	Ash %	Ca%	P %
Corn	88.1	9.4	0.27	3.88	9.5	4.2	1.5	0.04	0.3
Corn DDGS	90.2	29.7	0.67	2.99	38.8	10.0	5.2	0.22	0.83

Probably the most significant nutritional problem with DDGS is that the Ca:P ratio (recommended ratio for the mature horse is 2:1) is inverted (Table 1). The inverted Ca:P ratio, if not corrected, may contribute to bone development problems, particularly in young animals.

Another challenge with DDGS is the variability of the product in nutrient content and value (Figure 1). Different distiller plants have different processing techniques and different drying systems. The normal range for protein reported by Equi-Analytical is 26 to 34%. Perhaps more importantly, there is a wide range in lysine digestibility depending on the level of heating during drying. There is also a wide range in aroma due to processing techniques.

Figure 1. Color variation in Corn DDGS



DDGS can be used effectively as an ingredient in horse feeds and in a wide range of livestock feeds to deliver balanced diets (feed companies test each batch of feed and compensate for the variability with additional additives or products). If owners choose to purchase DDGS to feed straight to animals, they need to be aware of the inverted Ca:P ratio, the risk of nutrient variability and the potential presence of mycotoxins (from moldy corn) which may be detrimental to the animals.

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### Up Coming Events

#### 2008 Regional Horse Owner Programs

St. Paul, MN

Advanced Program

Equine Center

March 15

Cost: \$50

On-line Registration Available:

[www.cvm.umn.edu/outreach](http://www.cvm.umn.edu/outreach)

/events/horseowner

Pre-Registration Required

Questions? 888-241-0719

#### U of M Vet Meet & Greet

Tuesday, March 25

7:00 - 9:00 pm

Hamel Community Building

Topics: Sarcoids & Hoof Care

Questions? 763-479-2932

#### Would You Like to

#### Volunteer at the

#### Equine Center?

Contact Sue Loly at

Lolyx001@umn.edu

#### Would You Like to Tour

#### the Equine Center?

Contact Vivian at

Neige001@umn.edu

or 612-624-3928

#### Would You Like to Use

#### the Equine Center?

Contact Bob at

john3854@umn.edu

#### Poisonous Plant Book

#### Available

44 pages, 70 photos.

[www.extension.umn.edu/horse](http://www.extension.umn.edu/horse)



## Research Update: Feeding TMR Cubes

Total mixed rations (TMR), wherein all the nutritional needs of the animals are met in a single feedstuff that is available free choice, are used in other species but not commonly for horses. In geographic areas, or years when a consistent, quality source of forage (either hay or pasture) is limited, TMR cubes may be a solution.

Research conducted at Rutgers

University evaluated feeding forage based TMR cubes as the sole feed source to weanling draft horse crosses in 2004 to 2006.

In the study, all 24 weanlings that were fed the TMR cubes maintained good health and body condition scores, while growing more efficiently than the 24 matched weanlings fed traditional hay/concentrate (grain) diets. Based on

the results of these trials, feeding TMR cubes to weanling draft horse crosses can be an effective alternative to traditional forage (hay or pasture), especially during times of limited, quality forage.

For more information on this research, visit: [http://web.mac.com/ru\\_horses/](http://web.mac.com/ru_horses/) Click on "Research" and then click on "Nutrition Research".

By: Krishona Martinson, PhD, U of M

to feed hay free choice.

*Gate Placement and Fencing.* Gates should be placed in corners closest to the direction of travel. Gates should be large enough to get equipment and several horses through at once. Avoid placing gates in low areas where water may pool. When selecting a fencing system(s), consider the BASIC rules; budget, appearance, safety, installation and containment.

*Water.* Clean, fresh water is a requirement for horses. Place waterers in areas where filling and cleaning is convenient, and if possible, where multiple pastures have access.

*Safety and Common Sense.* Design pastures that are safe, work with your pasture size and shape, and make sense for you, your horses, and your farm.

By: Erin Malone, DVM, U of M

treated with respect.

Please keep in mind that only a limited number of deceased horses are need for teaching purposes and unfortunately, the U of M Vet School can not accommodate all owners wishing to donate their unwanted, sick, or deceased horse.

Owners wishing to donate a horse can call 612-625-6700 for more information.

## Pasture Site Planning

Establishing a horse pasture takes time, patience, and resources. When establishing a horse pasture, site planning is very important (along with soil fertility, seedbed preparation, species selection, weed control, and grazing management). Planning ahead is an important step to take to ensure your pasture is successful and productive for years to come.

*Topography and Geography of Your Pasture.* Individual pastures should not include steeply sloping hillsides, wet lands, soil types that vary greatly; or paddocks that are oriented up and down hillsides.

*Environmental Concerns.* Keep horses out of rivers, creeks, swamps, or wetlands. Horses can cause environmental damage, and wet areas are usually home to insects (biting flies and mosquitoes) and poisonous plants.

*Pasture Size.* Pastures should be large enough to handle your stocking rate, acreage layout, and grazing system. Rectangular shaped pastures tend to better suit horses as they encourage exercise. The stocking rate (how many horses your pasture can handle) averages 2 acres per horse, however, soils type, grazing management, and weather conditions can influence the stocking rate.

*Sacrifice Paddock.* Dry lots, or sacrifice paddocks, provide an opportunity to move horses off the pasture during wet, dry, or times of needed pasture rest. Sacrifice paddocks can vary in size but should provide a minimum of 400 square feet per horse. The size should be increased proportionally as the number of horses increase. Sacrifice paddocks usually include a shelter/shed, water source, and ample area

## Ask the Expert

Q: Does the U of MN take donated horses for research or education?

R: The U of M Vet School will take donations (alive or deceased) if funds are available, or if the horse is needed/suited for a research project.

For example, mares are occasionally accepted for use in the reproductive herd. However, the U of M Vet School is often asked to take donated sick or deceased horses. The Vet School is more

likely to take a sick horse if the owners are willing to pay the \$250 it costs to euthanize and dispose of the body, otherwise the Vet School has limited dollars to spend on donations. Horses slated to be euthanized are routinely kept alive for approximately 24 hours after a donation (if possible), and euthanized horses are often used for teaching purposes and are always