

Manage Corn Coproducts in Feed Rations

By paying close attention to other effects on the diet, coproducts can be effectively used as supplementation, if the price is right.

Story by

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As distillers' grains (DGs) become increasingly available in an expanding ethanol-production environment, beef cattle specialists say the coproducts can be effectively used in a number of cow and yearling feeding and supplementation strategies, if the price is right.

"If supplementation to yearlings grazing pasture is to work, it must be economical," says Rick Rasby, University of Nebraska Extension beef cattle specialist. "Supplementation amounts should be targeted to meet desired gains when fed to yearlings on vegetative pasture. You should not expect distillers' to substitute much forage. Producers need to watch how prices change through the year for potential feeds, and determine opportunities to price when feeds are cheapest. For instance, corn gluten feed (CGF) and distillers' grains tend to be

cheapest during the summer and increase as fall approaches."

In substituting dried distillers' grains (DDGs) for grass in grazing, Rasby says to expect that for each pound of distillers' grains fed on a dry-matter (DM) basis, 0.4-0.6 pounds (lb.) of forage dry matter would be replaced. Research confirms average daily gain (ADG) and cost efficiency can be improved.

Daryl Strohbehn, Iowa State University Extension beef cattle specialist, agrees that use of distillers' grains in some cow-calf operations can be to the producer's advantage. "This is especially true when it comes to enhancing low-quality feeds like harvested cornstalks or poor-quality grass hay. In these situations, energy level of forages is below nutritional requirements. In the case of cornstalks, protein supplementation is a necessity," he says. "The number and types of distillers' grains that can be used in rations are endless."

Strohbehn notes that distillers' grains

are very palatable to cattle. Producers should be prepared for animals to aggressively compete for their fair share.

"Beef cattle consume wet (WDG) or dried distillers' grains and condensed distillers' solubles (CDS) readily. Like any high-energy or protein supplement fed in limited quantities, you need to think about how it is offered," he says. "If distillers' grains are supplemented as a single feedstuff, you need to allow sufficient bunk or feeding space to ensure consumption by timid cattle. If distillers' grains are mixed with some other feed, you must be sure that ingredient separation does not occur and cause ration hot spots."

Coproduct options

As seen in Table 1, coproducts can be worked into rations at various stages of the cow's cycle. Producers interested in early calf weaning and maintaining cows in more confined or limited pasture situations can use coproducts to meet

such feeding objectives as limited hay feeding situations with harvested cornstalks and distillers' grains, corn silage combinations, or strictly harvested cornstalk and distillers' combinations.

"As we ask more of the cow from a production standpoint — for milk production and pregnancy — the more need we have for inclusion of distillers' grains," he says.

Strohbehn encourages producers using distillers' grains in cow feeding to also consider using distillers' grains in heifer feeding systems (see Table 2). Use will vary by operation and depend on when calves are weaned, the size of calves and breeding heifer development.

Rasby adds that distillers' grains offer attributes that allow heifers to be fed without negative associative effects on the forage portion of their diet.

"When dried distillers' are fed as an energy source in growing heifer diets, undegradable intake protein (UIP) is in excess," he says. "Some data would suggest high UIP (UIP not from distillers' grains) intake in developing replacement heifers reduces reproductive performance. Our data would say that distillers' grains in heifer development diets actually enhance AI (artificial insemination) conception rate.

"In our study, the only difference between the diets of the control group and the distillers'-fed heifers was UIP intake," Rasby continues. "The heifers fed the distillers' diet were fed at a rate of 0.6% of their body weight on a dry-matter basis, which calculates to about 4.0 pounds per head per day on an as-fed basis. Age at puberty and the percentage of heifers cycling before the start of the synchronization protocol was no different between the control- and the distillers' grains-fed heifers."

Table 1: Rations formulated for 1,350-lb., higher-milk-level British beef cow in maintenance condition to begin calving March 20^{a,b}

Ration type	First trimester	Second trimester	Precalving	Early lactation	Mid-lactation
Limit-fed hay, cornstalks, WDG	Hay 2 lb. Stalks 20 lb. WDG 8 lb.	Hay 3 lb. Stalks 20 lb. WDG 12 lb.	Hay 5 lb. Stalks 20 lb. WDG 20 lb.	Hay 7.5 lb. Stalks 20 lb. WDG 30 lb.	Hay 5.5 lb. Stalks 20 lb. WDG 22 lb.
Corn silage, cornstalks, WDG	Corn silage 8.5 lb. Stalks 20 lb. WDG 5.5 lb.	Corn silage 10 lb. Stalks 20 lb. WDG 6.5 lb.	Corn silage 18 lb. Stalks 20 lb. WDG 11.5 lb.	Corn silage 26 lb. Stalks 20 lb. WDG 17 lb.	Corn silage 20 lb. Stalks 20 lb. WDG 13 lb.
Cornstalks or poor-quality grass hay, WDG	Stalks/hay 25 lb. WDG 6 lb.	Stalks/hay 25 lb. WDG 10 lb.	Stalks/hay 25 lb. WDG 21 lb.	Stalks/hay 25 lb. WDG 34 lb.	Stalks/hay 25 lb. WDG 24 lb.
Cornstalks or poor-quality grass hay, CDS (corn needed in lactation)	Stalks/hay 20 lb. CDS 13 lb.	Stalks/hay 24 lb. CDS 13 lb.	Stalks/hay 25 lb. CDS 25 lb.	Stalks/hay 25 lb. CDS 33 lb. Corn 4 lb.	Stalks/hay 25 lb. CDS 28 lb.
Good-quality hay, corn	Hay 22 lb. Corn 0 lb.	Hay 25 lb. Corn 0 lb.	Hay 28 lb. Corn 3 lb.	Hay 28 lb. Corn 8 lb.	Hay 28 lb. Corn 4 lb.

^aThese rations are intended for budgeting purposes and need mineral and vitamin supplementation balancing.

^bCondensed distillers' solubles (CDSs) will substitute for wet distillers' grains (WDGs) at approximately 1.33-to-1. Dried corn gluten feed (dried CGF) will substitute at approximately 0.4-to-1. For instance, if one is feeding 8 lb. of WDG, then 10.6 lb. of WDGs would be needed or 3.2 lb. of DDG or dried CGF.

Table 2: Rations formulated for developing breeding heifers to gain 1.5 lb. per day^{a,b}

Ration type	525 lb. to 575 lb.	675 lb. to 725 lb.	825 lb. to 875 lb.
Grass hay, cornstalks and WDG	Hay 7 lb. Cornstalks 7 lb. WDG 9 lb.	Hay 7.5 lb. Cornstalks 7.5 lb. WDG 14 lb.	Hay 8 lb. Cornstalks 8 lb. WDG 15 lb.
Cornstalks, corn silage and WDG	Cornstalks 9 lb. Corn silage 10 lb. WDG 8 lb.	Cornstalks 10 lb. Corn silage 13 lb. WDG 10 lb.	Cornstalks 12 lb. Corn silage 15 lb. WDG 10 lb.
Cornstalks, corn and WDG	Cornstalks 12 lb. Corn 2 lb. WDG 9 lb.	Cornstalks 15 lb. Corn 3 lb. WDG 10 lb.	Cornstalks 16 lb. Corn 3.5 lb. WDG 11 lb.

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A balanced diet

Rasby adds that any time distillers' grains are worked into the mix producers must pay close attention to other effects on the diet. For example, supplementing dried distillers' at 5.1 lb. per head per day will provide the phosphorus (P) animals need, in addition to energy and protein, but calcium (Ca) will need to be added. When using distillers' grains, producers will be able to eliminate inorganic phosphorus supplementation, which he says is often the most expensive ingredient in mineral mixes.

Rasby cautions that distillers' grains can be relatively high in sulfur (S), and producers should maintain dietary sulfur at or below 0.4% of diet DM.

"In most beef cow and backgrounding diets, sulfur is not an issue because of the level of distillers'

grains fed. But all animals should have the opportunity to consume the ration," he says. "In limit-fed, high-grain diets, you need to pay close attention to total sulfur content of the ration and watch if the sulfur content of your water is high. You should also not exceed 4.5%-5.5% added fat to the diet on a dry-matter basis."

Matter of storage

Finally, both beef cattle specialists advise producers to weigh storage options for using corn coproducts in their operations. Strohbehn says rations that balance off either cornstalks or poor-quality hay may only require 8 lb. to 15 lb. of wet distillers' grains per cow on a daily basis. For a herd of 50 cows, that's only 400 lb. to 750 lb. daily.

"Most ethanol plants will only sell the products in 50,000-pound truckloads," he says. "The dilemma is the short shelf life for wet distillers'. A load can last more than 60 days. Higher storage loss, especially in warm weather, means more feed cost per cow."

Wet distillers' can also freeze, creating chunks ranging from softball to bowling ball size. Cattle will eventually consume these, Strohbehn says, but mixing the ration can be difficult. Using dried distillers' does not present these problems, he adds, but the product does need to be stored in an area where losses from wind and rain are minimized.



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