



# USING DROUGHT SILAGE IN GROWING CATTLE DIETS

Many producers are taking advantage of the silage option to salvage the 2012 corn crop. The good news is that for much of this corn the feeding value will be near that of normal silage. For some, corn silage will be the most abundant and lowest cost feedstuff available for their feeding operation this year. So how do you get the most out of corn silage this year?

Silage has a long history as a feedstuff for Iowa feedlots. In the 1960's and 70's many, if not most Iowa cattle were finished on rations that were predominantly corn silage. Corn silage, a limited amount of corn and a protein supplement was the basic ration. Touted as the "king of feeds," corn silage would produce the most beef production per acre. High interest rates, cheap corn and the desire for improved efficiency delegated silage from the primary feed to a roughage source option in recent years. However, growing or backgrounding rations similar to those high silage rations in years past may very well be the low cost option for many feeders this year.

One question that has been asked by some producers relates to whether calves can be started directly on corn silage rations, or if it is best to adapt them to silage based rations using dry feed.

We conducted a three-year study several years ago to evaluate that question. We used 547 head of newly weaned calves that were started on a ration that was 86% corn silage and 14% protein supplement on a dry matter basis or started on a complete milled supplement (60% concentrate) for two weeks and adapted to silage on week three.

The results of these studies are shown in Table 1. This study found that the use of a 60% concentrate complete dry feed did aid in the transition to a corn silage based growing ration. However, it should be noted that the performance of calves started directly on corn silage was certainly acceptable with no reduction in dry matter intake.

**Table 1. Performance of calves during adaptation to corn silage rations (three trial study)**

Item	Silage based ration	Complete dry feed for two weeks, adapted to silage in week three
No. calves	275	272
Starting weight	472	472
Average Daily Gain, lb.		
0-14 days	3.07	3.19
14-28 days	2.01	2.49
0-28 days	2.53	2.87
Dry Matter Intake, lb.		
0-14 days	10.73	10.89
14-28 days	13.09	13.18
0-28 days	11.91	12.00
Feed/gain (dry matter)		
0-14 days	4.05	4.20
14-28 days	8.22	6.29
0-28 days	5.09	4.34

Loy et. al. (1989) ISU Beef Res. Report ASL-R615.

Traditionally, backgrounding rations are fed from weaning for 60-90 days before cattle are placed on higher energy finishing rations. However, if market signals call for rationing of corn, backgrounding rations can be fed for longer periods, up to 900 or 1000 pounds. Research suggests that for cattle to produce acceptable carcass quality through traditional market channels, at least 70-80 days of feeding on a high energy ration is required.

The following example (Table 2) represents backgrounding rations and costs for 500-1000 lb steers using corn silage harvested from drought stressed fields compared to normal corn silage. These projections were calculated assuming reduced energy value of drought-stressed silage, but also reduced economic value because of the reduced grain content.

The TDN values of the silages were 70%, 66.5%, 59.5% and 55% for normal, slight, moderate and severe drought stress. Producers are encouraged to sample and analyze their own silage to determine the specific nutrient analysis to be used in diet formulation.

Two publications available for free download are "Forage Sampling and Sampling Equipment, PM 1098B" at (<https://store.extension.iastate.edu/ItemDetail.aspx?ProductID=4422>) and "Forage Testing Laboratories, PM 1098A" at (<https://store.extension.iastate.edu/ItemDetail.aspx?ProductID=4421>)

The normal silage was priced at 9 times the price per bushel of corn, slight stress at 8 times, moderate stress at 7 times, and severe stress at 5 times. To evaluate how your drought silage should be priced, download the silage pricing spreadsheet from the Ag Decision Maker website (<http://www.extension.iastate.edu/agdm/crops/html/a1-65.html>)

Rations were developed using the BRaNDS program (from the Iowa Beef Center at Iowa State University) which projects the intake and gain of the cattle. The rations were not balanced to meet vitamin and mineral requirements, and costs for those ingredients if needed are not included. The silage dry matter was 35%, except for the severe drought stress silage at 30%. Modified distiller grains, priced at 90% of corn price, were added at 20-25% of the diet which would meet or exceed the protein requirements. Corn grain was added at 0, 20, 40 and 55% of the dry matter respectively to determine the effect of increased energy on performance and cost. This resulted in backgrounding rations that were 20-80% corn silage on a dry matter basis. A yardage charge of \$.35/head/day on feed is added to the feed cost.

Table 2 shows the cost of gain per cwt. for the rations described using corn prices that vary from \$7.00/bu. to \$9.00/bu. With the assumptions used, the lowest cost of gain was the high silage ration at 80% silage and 20% distillers and it was close to the 55% silage ration for the normal or slight drought stress silages. For severe or moderate drought stressed silage the lowest cost of gain for rations that had 20% corn grain added. The additional corn grain adds

**Table 2. Estimated cost of gain/cwt for steers from 500 to 1000 lbs.**

				Corn price per bushel				
			Silage type	\$7.00	\$7.50	\$8.00	\$8.50	\$9.00
Feedstuff	% DM	All	Normal	\$79.77	\$84.38	\$88.99	\$93.60	\$98.21
Silage	80	silage	Severe	\$116.72	\$122.70	\$128.68	\$134.66	\$140.64
M distiller	20	rations	Moderate	\$99.30	\$104.68	\$110.06	\$115.43	\$120.81
Corn	0		Slight	\$81.41	\$86.01	\$90.61	\$95.21	\$99.81
Feedstuff	% DM	High	Normal	\$79.74	\$84.51	\$89.28	\$94.05	\$98.81
Silage	55	silage	Severe	\$99.64	\$105.43	\$111.22	\$117.02	\$122.81
M distiller	25	rations	Moderate	\$93.42	\$98.91	\$104.39	\$109.88	\$115.37
Corn	20		Slight	\$81.51	\$86.35	\$91.18	\$96.01	\$100.84
Feedstuff	% DM	Moderate	Normal	\$84.74	\$89.97	\$95.19	\$100.42	\$105.65
Silage	35	silage	Severe	\$108.73	\$115.51	\$122.28	\$129.05	\$135.82
M distiller	25	rations	Moderate	\$101.17	\$107.45	\$113.74	\$120.02	\$126.30
Corn	40		Slight	\$99.11	\$105.33	\$111.55	\$117.77	\$123.99
Feedstuff	% DM	Low	Normal	\$85.82	\$91.15	\$96.48	\$101.81	\$107.15
Silage	20	silage	Severe	\$114.18	\$121.46	\$128.73	\$136.01	\$143.29
M distiller	25	rations	Moderate	\$104.30	\$110.89	\$117.49	\$124.09	\$130.68
Corn	55		Slight	\$89.73	\$95.32	\$100.92	\$106.52	\$112.11

enough energy to the lower energy drought stress silages for the cattle to maintain a daily gain at or near an estimated 2 pounds per day. . If the severe drought stress corn silage is priced at less than 1 times the price of a bushel of corn, or the moderate stress corn silage is priced at 4.75 or less times the price of corn per bushel, then the 80% silage rations are similar or lower cost for these two types of silage as well. As corn prices increase from \$7.00/bu. to \$9.00/bu the higher silage diets as compared to the higher corn diets were more cost competitive.

The following table (Table 3) shows the estimated performance and amount of each feedstuff used per head from 500-1000 lbs. for each ration and silage type. If feedlot operators have a fixed amount of silage and corn available they can determine approximately how

many head can be fed with each ration or type of silage available from 500-1000 lbs. Finishing the cattle to market weight would require additional corn and other feedstuffs.

Higher silage diets could also increase manure handling and feed handling costs. If cattle are on feed for a longer period typical marketing periods would change and seasonal market prices might affect market price.

These estimations and projects are meant to be a guide for feedlot operators to determine how best to utilize various types of corn silage as affected by the drought. They should determine the feed resources they have available and do their own projections. ISU Extension beef field specialists are available to help producers work through that process.

**Table 3. Estimated performance and feedstuff quantities for steers on feed from 500 to 1000 lbs.**

			Silage type	Days on Feed	Average ADG	Feed Efficiency	Tons of silage/hd	Tons of distillers/hd	Bu. of corn per hd
<u>Feedstuff</u>	<u>% DM</u>	<b>All</b>	Normal	217	2.30	6.49	3.60	0.73	0
Silage	80	<b>silage</b>	Severe	472	1.06	10.35	6.00	1.58	0
M distiller	20	<b>rations</b>	Moderate	343	1.46	8.72	4.60	1.14	0
Corn	0		Slight	243	2.06	6.99	3.84	0.81	0
<u>Feedstuff</u>	<u>% M</u>	<b>High</b>	Normal	186	2.69	5.97	2.36	0.74	13
Silage	55	<b>silage</b>	Severe	265	1.89	8.64	4.03	1.06	18
M distiller	25	<b>rations</b>	Moderate	237	2.11	7.62	3.02	0.94	16
Corn	20		Slight	198	2.53	6.37	2.52	0.79	13
<u>Feedstuff</u>	<u>% DM</u>	<b>Moderate</b>	Normal	165	3.02	5.95	1.53	0.72	25
Silage	35	<b>silage</b>	Severe	199	2.51	8.49	2.54	1.02	36
M distiller	25	<b>rations</b>	Moderate	188	2.65	7.60	1.95	0.91	32
Corn	40		Slight	171	2.92	6.34	1.63	0.76	27
<u>Feedstuff</u>	<u>% DM</u>	<b>All</b>	Normal	160	3.13	5.67	0.83	0.71	32
Silage	20	<b>silage</b>	Severe	175	2.85	8.18	1.45	1.02	46
M distiller	25	<b>rations</b>	Moderate	171	2.93	7.24	1.06	0.91	41
Corn	55		Slight	163	3.07	6.05	0.89	0.76	34

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