

Using By-Product Feeds in Cow Calf Programs

Ivan Rush, beef specialist
Un of NE – Panhandle Res and Ext Center
Scottsbluff NE

Many By-Product Feeds to Consider

- Cottonseed meal
- Soybean meal
- Sunflower meal
- Wheat middlings – bran
- Beet pulp - molasses
- Brewers grains
- Corn gluten feed – wet or dry
- Distillers grains – wet or dry
- Many others

Comment Often Made

- “By-product feeds are highly variable”
 - Variation does occur but may be greater from plant to plant than from a given plant
 - Moisture may be the greatest variable in wet feeds

Test Feed to Know Nutrient Content

- Water is often the most important factor in determining value especially in wet feeds

Example of Moistures Effect on Price

- Wet fed - \$55 @ 60 % ● Wet fed - \$55 @ 65 %
 $\$55/.40 = \$138/\text{T of DM}$ $\$55/.35 = \$157/\text{T of DM}$

5% moisture difference = \$159 on 23 T load
or \$3500 on 500 Ton of feed

If the higher moisture feed was priced equivalently
it would be valued at \$48/ton

Other Important Nutrients

- Crude Protein
 - Does not distinguish between UIP or DIP or quality of protein in UIP - balance of amino acids
- Energy
 - Chemical analysis may under estimate TDN
 - Most labs use ADF but does account for differences in digestibility

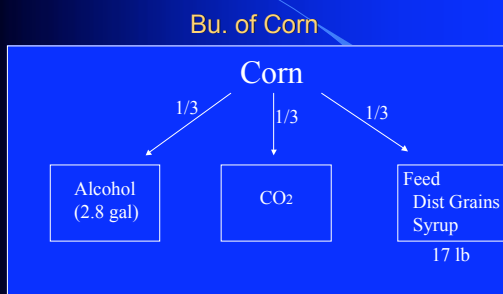
Highly Digestible Fiber Feeds

- Usually have low levels of rapidly digestible nutrients such as starch or sugars
 - Do not have negative effect on fiber digestion

Other nutrients - Minerals

- Grain by-products usually great source of phosphorus
- Trace minerals will vary
- Sulfur is a concern from the ethanol by-products

Corn By-Products



Comparing Nutrient Content of Corn Byproducts

	Corn	WDG	WCGF	Syrup
C Protein	9.8	31	20	23
UIP, %CP	60	65	20	65
TDN, %	90	110+	92	110
Fat, %	3	10	2	10
Phos, %	.30	.83	.90	.73

Corn By-Products for the Beef Cow In Range Country

- Excellent source of protein, energy and phosphorus
 - Compliments most wintering programs
 - Excellent for growing cattle

Excellent Supplement for Cows

- Base forage of 6% Protein, 50% TDN
- 1200 lb dry cow:

	Intake	CP	TDN	Phos, g
Requirement		1.8	13	25
Base forage	23	1.4	11.5	15
DDG	2	.6	2	8
Total	25	2.0	13.5	23

No negative effects on forage digestibility

Limitations in feeding Corn By-products

- DG is relative high in fat - 8-10%
 - If fat is fed at high levels forage digestibility is lowered
- Corn byproducts will have low Ca:P ratio
 - Correct ratios if feeding high levels
 - Phosphorus can be benefit but can be problem
- Sulfur is variable and can be high
 - Thiamine is often supplemented but research is lacking to support

Amount of Corn By-products Often Fed in Forage Rations

- Protein Supplement – 1-3 lbs
- Energy supplement can feed up to 30 -40% in high roughage rations
 - Calf – 4-6 lb
 - Cow – 8 lbs, gets fat level up to 4.5 – 5.0% from DDGS

How to feed dry commodity?

- Will handle and store well
- Feed on ground
 - Ranchers roughly estimate 5-10%
 - 15% waste of \$160/T = \$184/ton in cow
- In bunks
 - If \$350 bunk would last 7 years and feed 25 cows would add \$2.00 feed cost/cow/yr or may add \$10-\$12/T of supp

Economics of Feeding Corn By-products

- Wet verse dry
 - Wet is usually lower priced and feeding value is slightly higher than dry
- Distance from plant and when utilized ?

Calculate economic distance to haul

Step 1	Step 2	Step 3																																																																													
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Found at beef.unl.edu





Wet distillers mixed with dry forage

Wet Distillers Grains plus Solubles Ingredient Combinations When Stored in Bunker Silo

	Lb/T added	% of Mix
Grass hay, %	420	30-40 (17.0)
Wheat straw, %	310	25-32 (13)
Alfalfa hay, %	775	45-55

Wet distillers grains at 35% dry matter 65% moisture
Red percentages are 'as-fed' basis

Adams et al. University of Nebraska

Oil Seed By-Products

- Cotton seed meal
 - Used successfully for many years
- Soybean meal
 - Very high quality protein
 - Competes with poultry and swine rations
- Sunflower meal
 - Increased in use - perhaps most variable

Comparison of oil meals

	CSM	SBM	SFM
C Protein, %	46	49.9	33-35
UIP, % of CP	43	34	26
Fat, %	3.2	1.6	1-13
ADF, %	17.9	10	30
TDN, %	75	84	45-70
Phos, %	1.16	.71	.80

Nutrient Content - Various Hulls

	No Hulls Removed	Partially Dehulled	Dehulled
C Protein, %	28	34	41
Fiber, %	21	24	14
TDN, %	45	55	70

Assumes equal oil content

Sunflower Meal from Plants

Plant	Protein	Fat	Fiber
ADM Enderlin, ND	35	1.0	18.0
Cargill W Fargo, ND	32	0.5	21.0
ADM Goodland, KS	32	1.25	21.5
CO Mills Lamar, CO	29.5	13.3	23.9

Sunflower in cattle rations

- Even though protein quality is lower it appears to be equal to other protein sources in research trials
- Energy is lower than other feeds but unless fed at high levels has minimum significance

Research Summary - Cows

- Jordan in NE compared SBM and SFM when fed at 1.5 lbs on corn stalks and found no difference in cow performance

Research Summary - Calves

- Research in ND and CO found when SFM was compared to other oil meal sources on and equal protein level, gain and feed efficiency was the same

Feeding Beet Pulp

	Corn Silage	Wet Pulp	Mod Molasses
Moisture, %	65	76	40
C Protein	8.7	9.8	18.0
TDN, %	72	75	71

Pressed Beet Pulp

- Approx 24% dry matter or 76% water
- Pricing
 - Price on DM basis
 - Example: 6X bu corn @ \$3.75 bu = \$22.50/wet ton
 - \$28.05 divided by .24 = \$117/ Ton DM
 - Compare 15.5 corn at \$3.75 = \$7.92 cwt or \$158 /T or beet pulp is priced at 74 % of corn

Storage of Wet Pulp

- Can be stored for least one year with only loss of mold cap
 - Data shows 13 % DM loss with 7 months storage in bunker silo
- Difficult to pile and pack - use track or dual 4 WD – perhaps add some dry forage

Other feeds

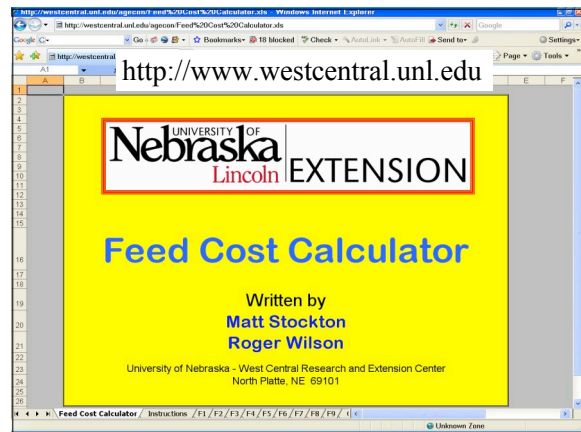
- Wheat midds
 - Makes excellent cube
 - Varies with level of floor (starch) left so may have slight decrease in forage digestibility if fed at high levels
- Soy hulls
 - Relative low in protein (12.2%) but good energy (77%)

Other feeds

- Brewers grains –wet or dry
 - Relative high in protein (29.5%) and UIP
 - Moderate in energy because of barley hull
 - Similar storage of wet to wet distillers grains
 - Very palatable

So Which By-Product Should be Fed?

- Use least cost ration using prices delivered to cattle
- Calculate cost of nutrient needed most
 - For low quality forages, usually cost of protein
 - To gain cow condition or to substitute for forage then will probably be energy



Summary

- By-products offer economical alternatives
- Nutrient analysis are important – esp water
- Many are high in protein and energy because of digestible fiber and fat
- Storage of wet products can be achieved

Thanks – See you at the bull pen

Comparing Nutrient Content of Feeds – DM %

	Crude Protein	% Fiber ADF	TDN,%	NEg, Mcal/lb
Beet Pulp	10	27.5	74 ?	.52 ?
Corn Silage	8.7	26.6	72	.49
Corn	9.8	3.3	90	.70
Alfalfa hay	18.6	33.6	60	.34
DDG	30.4	21.3	90	.68

Sunflower Meal Compared to Other Supplements

	SFM	SBM	CSM	DDG	W Mids
Protein	33-35	49.9	46	30	18.7
Fat	1-13	1.6	3.2	10	4.7
ADF	30	10	17.9	21.3	11.7
TDN	45-70	84	75	90	69
Ca	.35	.4	.2	.26	.17
Phos	.80	.71	1.16	.83	1.01

Sunflower Meal Compared to Other Supplements

	SFM	Canola	SBM	CSM	DDG	W Mids
Protein	33-35	40	49.9	46	30	18.7
Fat	1-13	1-4	1.6	3.2	10	4.7
ADF	30	17	10	17.9	21.3	11.7
TDN	45-70	70	84	75	90	69
Ca	.35	.7	.4	.2	.26	.17
Phos	.80	1.2	.71	1.16	.83	1.01
Lysine	1.14	1.93	3.00	1.72	0.70	0.60

Sunflower Meal Compared to Other Supplements

	SFM	SBM	CSM	DDG	W Mids
Protein	33-35				
Fat	1-13				
ADF					
TDN	45-70				
Ca	.35				
Phos	.80				

Protein Fractions in Oil Meals

	CSM	SBM	SFM
Protein,%	46	49	33-35
UIP, of protein	43	34	26

Comparing Nutrient Content of Corn Byproducts

	Crude Protein	% UIP	TDN,%	Phos, %
Corn	9.8	60	90	.30
DDG-S	30	65	101	.83
CGF	20	20	92	.90
SBM	49	34	84	.73

Distillers Grains

- ⇒ 30% CP(65% UIP), .8% P, 8-10% fat
- ⇒ High fiber energy source with high digestibility
- ⇒ Energy content - 115% of corn
- ⇒ Fat content important
- ⇒ Sulfur content - .35 to 1.0%, variable



Corn Gluten Feeds:

- ⇒ 19-22% CP(80% DIP), .9% P, 2.0% fat
- ⇒ High fiber energy source with high digestibility
- ⇒ Energy content - 100 % of corn
- ⇒ Sulfur content - .40 – 1.0%



Summary of corn by-products

- Corn byproducts will make excellent supplements
- May be reasonably priced especially during summer
- Composition and value will vary
- Consider nutrient composition of all supplements in making a decision

How Far Can Wet Products be Hauled?