Winter Cow Feeding Strategies



Travis Meteer
Beef Extension Educator
University of Illinois
wmeteer2@illinois.edu

UNIVERSITY OF ILLINOIS EXTENSION

Why is this Important?

- **"Feed Costs represent over 60% of the total costs in a cow-calf production system and are the largest determinant of profitability for beef producers"**

(Miller, et al., 2001)

UNIVERSITY OF ILLINOIS EXTENSION

Why is this Important?

- "Its not about marketing this year, its production challenges"

(Derrell Peel, Fall 2012)


UNIVERSITY OF ILLINOIS
EXTENSION

Objective

- Identify proven feeding strategies that can save YOU money
- Discuss pro's and con's of feeding strategies
- Ideal: Feeding "cheap" feeds, with no waste, that meet cow requirements, and do not cause negative side-effects. They are easy to handle and require little equipment, facility, and labor investment.


UNIVERSITY OF ILLINOIS
EXTENSION

Outline

- Set the stage
- Feeding Hay
- Extending the grazing season
- Cornstalks
- Corn Silage
- Feed Additives

UNIVERSITY OF ILLINOIS EXTENSION

Set the Stage

UNIVERSITY OF ILLINOIS EXTENSION

"Profit Robbers"

The Cattle Connection Blog

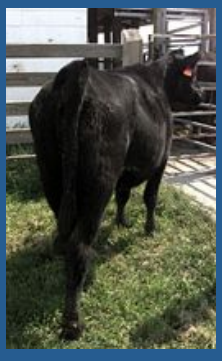
A few things to consider when determining if you are meeting cow requirements are:

- **Mature Cow Weights**; Cow weights have increased industry wide. In the most recent Angus Journal an article by Sally Northcutt entitled "What does an Angus cow weigh?" showed the average 7 year-old Angus cow weighed 1394 lbs. Do you know how much your cows weigh? If you do not have a scale you can gauge cow weights by the weights of cull cows marketed.
- **Temperature**; Winter weather can be quite harsh at times. Cows adapt well to colder weather as long as they are dry. If cows are wet, requirements increase 2% for every degree below 30°. Thus, a cow with a wet hair coat and an outside temperature of 15° would have a 30% increase in requirements. Providing windbreak and shelter helps keep outside conditions from increasing requirements.
- **Mud**; I recommend you walk the same path your cows walk. If they are walking through mud of any kind requirements will be increased. Mud that is declaw deep is associated with 7% decrease in feedlot ADG, a 28% decline if mud is hock deep, and a 35% decline if mud is belly deep. Mud is a big-time profit robber.
- **Parasites**; internal and external parasites can steal valuable nutrition from cattle. It is a good-practice to delouse and deworm cattle prior to winter feeding.

http://web.extension.illinois.edu/oardc/

UNIVERSITY OF ILLINOIS EXTENSION

BCS 4



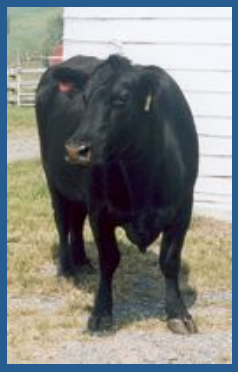
UNIVERSITY OF ILLINOIS EXTENSION

BCS 5



UNIVERSITY OF ILLINOIS EXTENSION

BCS 6 - ideal


UNIVERSITY OF ILLINOIS EXTENSION

Feeding Hay

UNIVERSITY OF ILLINOIS
EXTENSION

Feeding Hay

- Considered SOP (Standard Operating Procedure)
- Important to realize:
  - Average to high cost
  - High waste
  - May or may not meet cow requirements
  - No big negative side-effects.
  - Very easy to handle
  - Low equipment, facility, and labor investment

UNIVERSITY OF ILLINOIS
EXTENSION

Hay Waste

- Hay waste occurs during
  - Baling, Storage, Feeding

Bale Storage

- Outside
  - Ground - 5-20% loss
  - Elevated - 3-15% loss
- Covered
  - Ground - 5-10% loss
  - Elevated - 2-4 % loss
- Under Roof - 2-5 % loss
- Enclosed Barn - < 2% loss

UNIVERSITY OF ILLINOIS EXTENSION

Feeding Hay

- **Must have high quality to meet needs**
  - **EXPENSIVE $$$$$**
    - **Alfalfa - Good: $220/T**
    - **Mixed - Good: $180/T**
    - **Grass - Good: $165/T**
    - **Grass - Utility: $130/T**

USDA Market Report (Jan 2013)
-Northern IL, big rounds

- **Average to poor quality hay**
  - **Needs supplementation**

UNIVERSITY OF ILLINOIS
EXTENSION

Limit Feeding Hay

UNIVERSITY OF ILLINOIS
EXTENSION

Limit Feeding Hay

- 72 Simmental Cows (~ 1250 lb.)
  - 2nd and 3rd trimester
- 4 Treatments of time restriction
  1) 24 hours/day
  2) 9 hours/day
  3) 6 hours/day
  4) 3 hours/day

UNIVERSITY OF ILLINOIS EXTENSION

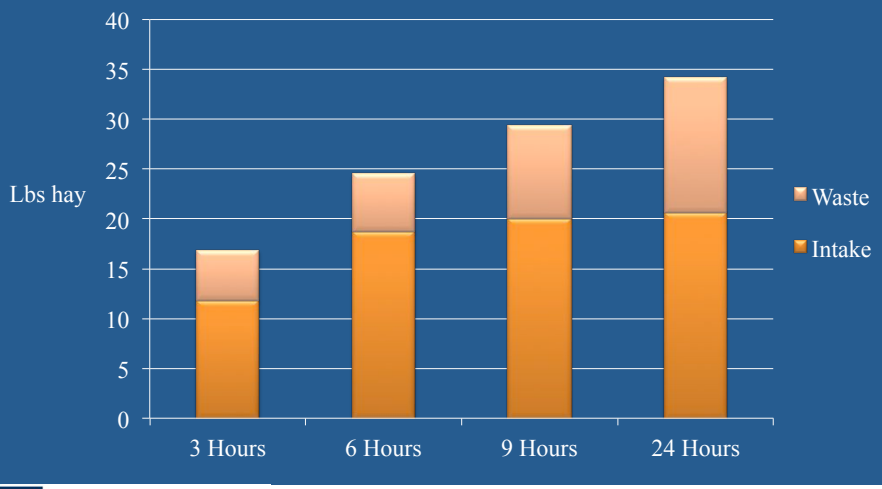
Diet Composition

- Diet consisted of large round bales of alfalfa hay stored inside

CP	17.8%
ADF	35.7%
NDF	45.7%
RFV	125

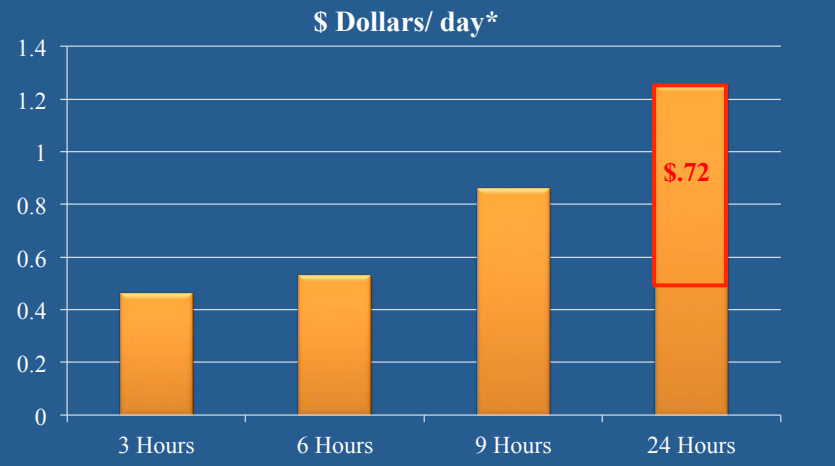
UNIVERSITY OF ILLINOIS EXTENSION

Hay Disappearance



UNIVERSITY OF ILLINOIS EXTENSION

Hay Waste Costs



*Hay price: $185/ton

UNIVERSITY OF ILLINOIS EXTENSION

Bale Feeders Waste

- Trailer – 11.4%
- Cone – 3.5%
- Ring – 6.1%
- Cradle – 14.6%

Buskirk, MSU


Trailer


Cone


Ring


Cradle

UNIVERSITY OF ILLINOIS EXTENSION

Bale Feeders Waste

Item	Feeder Type			
	CONE	SHEET	RING	POLY
Waste, % bale wt	5.3a	13.0b	20.5c	21.0c
Total waste, lb*	63.6a	156b	246c	252c
Cost of waste/bale	$ 3.71	$ 9.10	$ 14.35	$ 14.70
Cost of wasted hay per month	$111.30	$ 273.00	$ 430.50	$ 441.00
Cost of wasted hay per season*	$667.80	$1,638.00	$2,583.00	$ 2,646.00

[a,b,c] Means within a row with uncommon superscripts differ (P<0.05)
* Assuming $70 per 1,200 lb bale, feeding 180 bales per season




UNIVERSITY OF ILLINOIS EXTENSION

David Lalman OSU, Robert Wells, Noble

Extend the Grazing Season

UNIVERSITY OF ILLINOIS EXTENSION

Extending the Grazing Season

- Management Intensive Grazing (MIG)
- Alternative Forages
- Cornstalk Grazing



UNIVERSITY OF ILLINOIS EXTENSION

Corn Residue

UNIVERSITY OF ILLINOIS EXTENSION

Utilizing Corn Residue

UNIVERSITY OF ILLINOIS EXTENSION

Utilizing Corn Residue

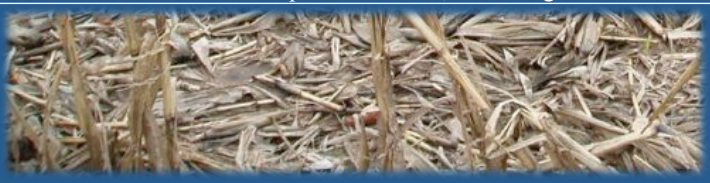
- Not new, but new methods used. Some past poor experiences
- Important to realize:
  - Low cost
  - Variable waste
  - May or may not meet cow requirements
  - No big negative side-effects.
  - Generally easy to handle
  - Average equipment, facility, and labor investment

UNIVERSITY OF ILLINOIS EXTENSION

Composition of Corn Residue

	% Dry Matter
Total Digestible Nutrients (TDN)	54
Crude Protein	5
Neutral Detergent Fiber (NDF)	70
Calcium	0.45
Phosphorus	0.15

Source: Feed Composition Tables, Beef Magazine.



UNIVERSITY OF ILLINOIS EXTENSION

UNL Cornstalk Grazing

- 5 yr. study to evaluate supplementing stalks
- Supplemented with a DDGS based cake
  - 25% CP
  - 7% fat
- October- weaning, start on stalks
- February- off stalks, pre-calving
- May- pre-breeding

Warner, 2012 UNL Beef Report

Table 2. Effects of late gestation supplementation on cow and calf performance.

Item	Treatment		SEM	P-Value
	SUPP[a]	CON[b]		
Oct. BW, lb	1263	1265	23.5	0.79
Feb. BW, lb	1351	1327	16.5	0.19
May BW, lb	1247	1243	9.7	0.75
Change in BW, Oct.-Feb., lb	89	62	15.0	0.20
Change in BW, Feb.-May, lb	-112	-81	12.3	0.14
BCS, Oct.	5.4	5.4	0.09	0.89
BCS, Feb.	5.6[d]	5.4[e]	0.08	0.02
BCS, May	5.4	5.3	0.07	0.32
Change in BCS, Oct.-Feb.	0.19[d]	0.03[e]	0.05	0.03
Change in BCS, Feb.-May	-0.14	-0.11	0.09	0.72
Cyclic, %	76	71	0.05	0.46
Pregnancy rate, %	94	91	0.02	0.18
Calving interval, day	367	366	1.6	0.80
Calf birth weight, lb[c]	86	85	1.0	0.27
Calf weaning wt, lb[c]	552	548	11.4	0.35

[a]SUPP = cows supplemented 2.2 lb/head/day (DM basis) while grazing cornstalks.
[b]CON = cows not supplemented while grazing cornstalks.
[c]Actual weights including both steer and heifer progeny.
[d,e]Within a row, means without common superscripts differ at $P \leq 0.05$.

Warner, 2012 UNL Beef Report

Dudley Smith Project

- **Cornstalk Grazing and Supplementation**

UNIVERSITY OF ILLINOIS EXTENSION

Objectives of DSI Project

- Maximize production per acre
  - Harvest corn grain
  - Utilize DDGS and corn residue for cattle
- Compare stocking rates
  - 1 cow / acre vs. 1.5 cows / acre
- Compare strip-grazing management
  - Move fence every week or every other week

UNIVERSITY OF ILLINOIS
EXTENSION

DDGS / Crop Residue

- Treatments (All cows fed 4 lbs DDGS)
  - 1 cow / acre (fence moved every 2 weeks)
    - 24 acres divided into 3 strips
    - 2 replications (24 cows each)
  - 1.5 cows / acre (fence moved every 2 weeks)
    - 24 acres divided into 3 strips
    - 2 replications (36 cows each)
  - 1.5 cows / acre (fence moved every week)
    - 24 acres divided into 6 strips
    - 2 replications (36 cows each)

UNIVERSITY OF ILLINOIS
EXTENSION

Cow Performance Results

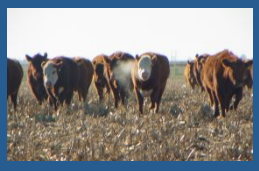
Item	1 cow /acre (2 wk)	1.5 cows/ acre (2 wk)	1.5 cows/ acre (1 wk)
Initial BW, lbs	1260	1276	1272
Final BW, lbs	1343	1340	1318
BW Change, lbs	83	63	46
Initial BCS	5.4	5.4	5.3
Final BCS	5.8	5.7	5.8
BCS Change	0.4	0.3	0.4

UNIVERSITY OF ILLINOIS EXTENSION

Economics

Item	1 / acre (2 wk)	1.5 / acre (2 wk)	1.5 / acre (1 wk)
Corn stalks ($10/acre), $/hd/d	$0.24	$0.16	$0.16
DDGS ($275/ ton @ 4 lbs/hd/d)	$0.55	$0.55	$0.55
DDGS feeding labor[a] , $/hd/d (1.5 hrs for all 192 hd)	$0.09	$0.09	$0.09
Fence moving labor[a] , $/hd/d (20 minutes – 2x or 5x)	$0.01	$0.01	$0.02
Total cost, $/hd/d	$0.89	$0.81	$0.82

[a] Labor @ $12/ hr

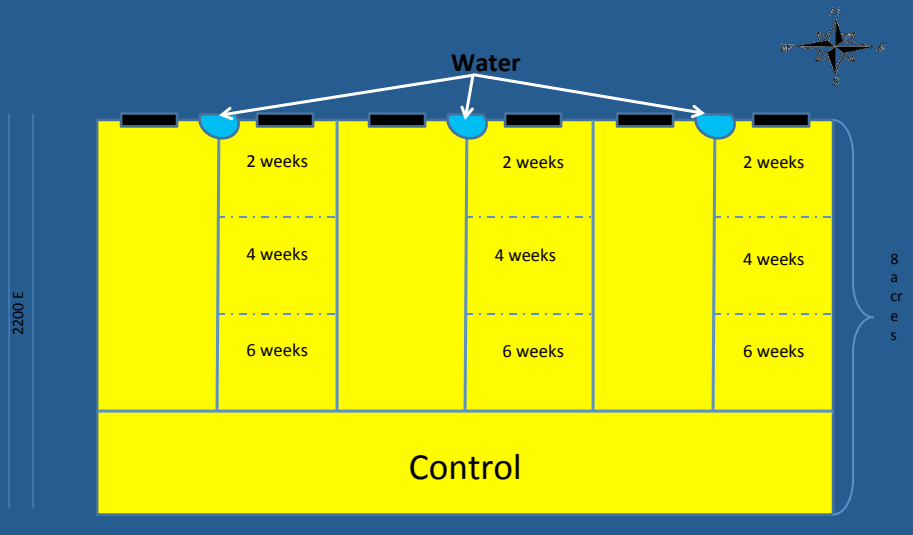


+

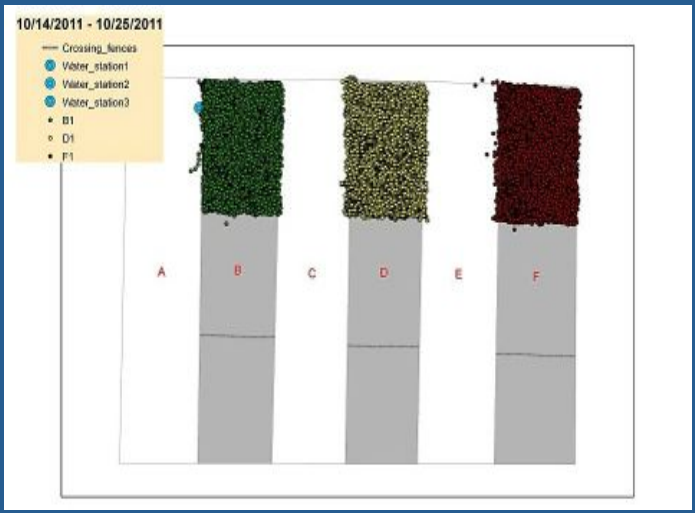
GPS Tracking

- Cattle were tagged with GPS tracking collars
- Location was logged every 4 sec for 5 day period
  - 2 days before and 3 days after fences were moved

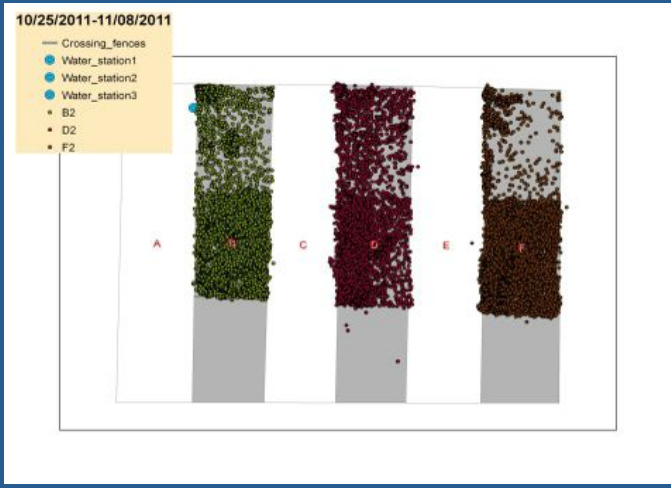
Dudley Smith Farm



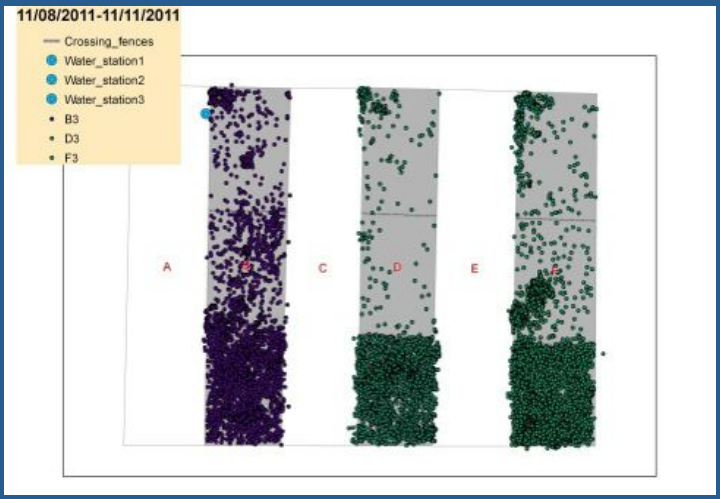
GPS Tracking 0 – 2 weeks



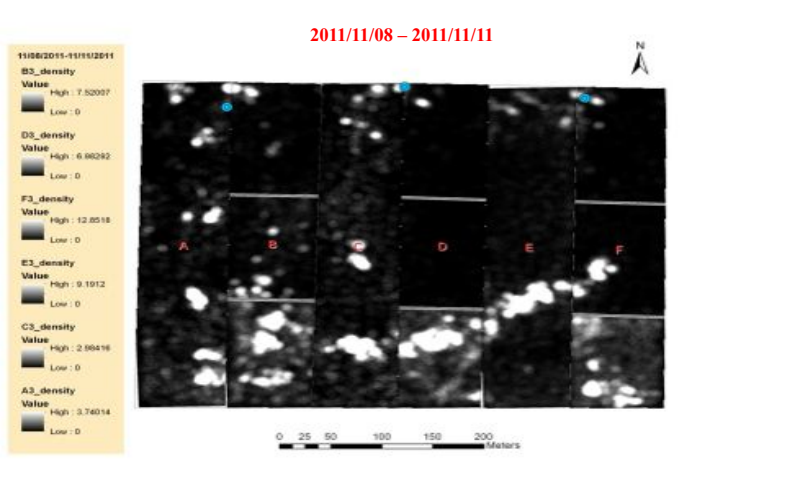
GPS Tracking 2 – 4 weeks



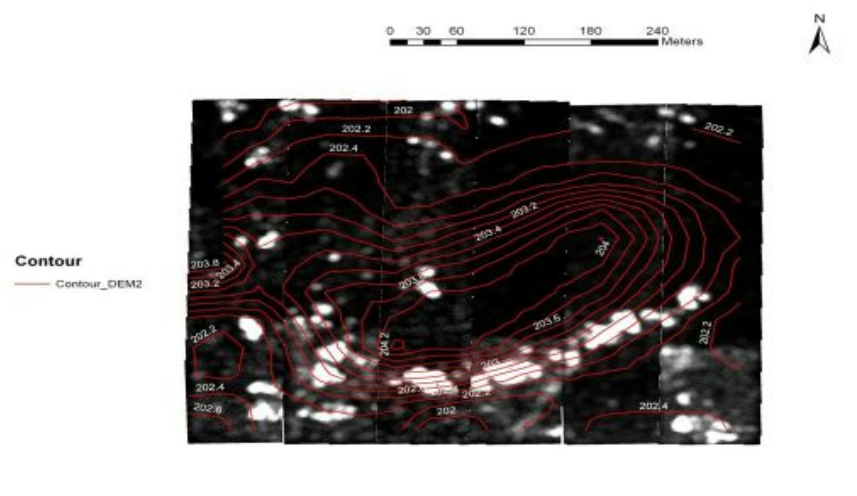
GPS Tracking 4 – 6 weeks



Hot-spot Analysis



Topography Impacts Cattle Movement



What if you can't graze?

UNIVERSITY OF ILLINOIS EXTENSION

Orr Center Trial Objectives

- To compare ad libitum hay diet to corn residue and DDGS diets
- Compare ad libitum corn residue bales and DDGS supplementation to mixed rations using high or low levels of ground corn residue and DDGS

UNIVERSITY OF ILLINOIS EXTENSION

Methods

- 164 Angus and Simmental Cows (16 pens)
- Trial started at calving
- Milk production determined at ~ 60 days
- Trial ended at time of AI
- Cow DM disappearance, BW change, milk production, calf ADG, and AI conception



UNIVERSITY OF ILLINOIS EXTENSION

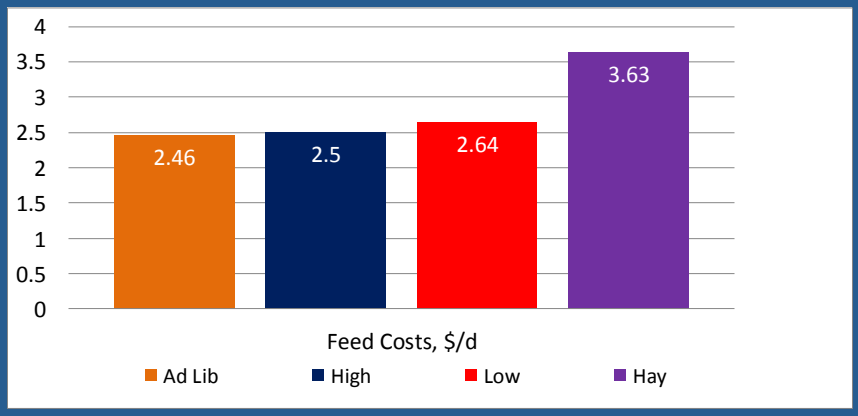
Treatments

- Ad Lib:
  - DDGS (~14.3 lbs DM/d)
  - ad libitum access to corn stalk residue bales
- High:
  - DDGS (~14.3 lbs DM/d)
  - ground corn stalk residue (~ 14.1 lbs DM/d) - TMR
- Low:
  - DDGS (~16.5 lbs DM/d)
  - ground corn stalk residue (~ 9.9 lbs DM/d) - TMR
- Hay: (Control)
  - Ad libitum access to good quality mixed alfalfa hay bales

UNIVERSITY OF ILLINOIS EXTENSION

Feed Costs, $/d

Prices: DDGS - $275 / ton, Hay- $210 / ton, Corn Residue $75 / ton

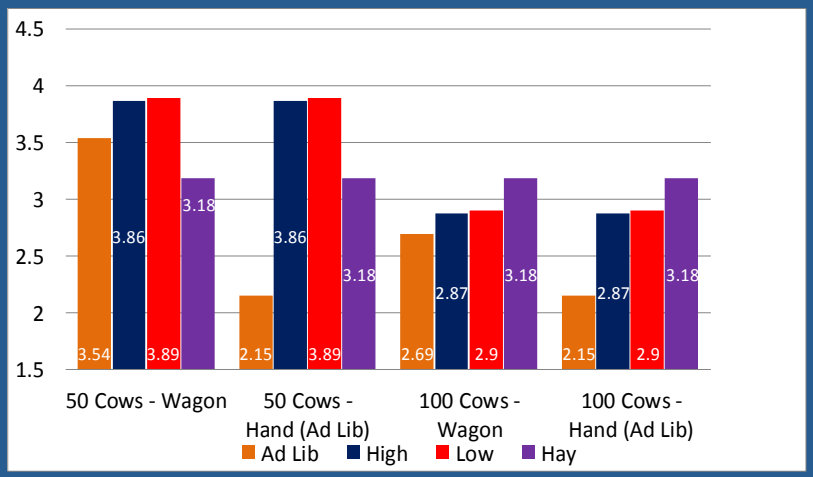


Are there other costs??

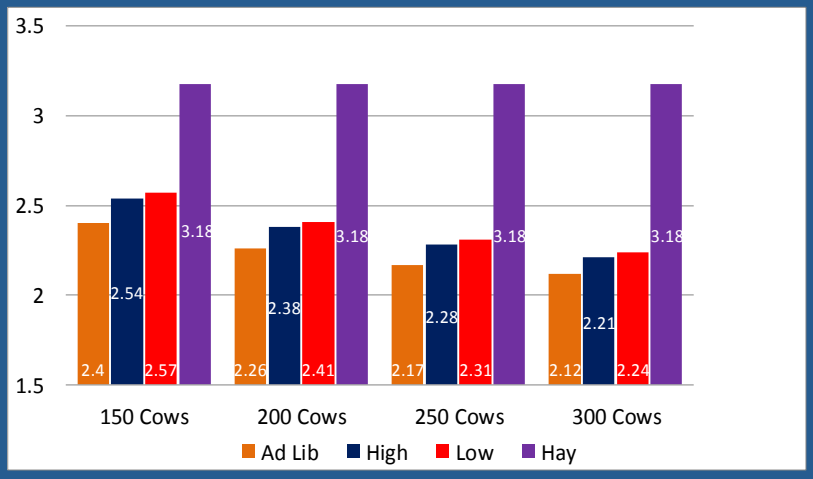
- How will residue/ and or hay be stored?
- How will DDGS be stored (dry/wet)?
- How will corn residue be fed (grind/ ad lib)?
- Do you have bunks and concrete?
- Do you have a tub grinder or feed wagon?

UNIVERSITY OF ILLINOIS EXTENSION

Feed and Delivery Costs, $/d



Feed and Delivery Costs, $/d



Conclusions

- Feeding DDGS and corn residue resulted in
  - Adequate or improved performance
  - Reduced feed cost compared to traditional ad libitum hay diets fed in herds with ≥ 100 cows
- Ad libitum stalks are less expensive than grinding stalks and feeding TMR
  - Especially in small herds - DDGS can be hand fed
- Herd size, existing equipment and facilities will determine which system is best fit!!!

UNIVERSITY OF ILLINOIS EXTENSION

Fall (Drought) Trial at Orr

- **Treatment 1: QLF - CB**
  - Ad lib access to cornstalk bales treated (20% bale wt.) with QLF liquid supplement blend
- **Treatment 2: MIX 30**
  - Ad lib access to cornstalk bales treated (20% bale wt.) with Mix 30 liquid supplement
- **Treatment 3: CGF**
  - Ad lib access to cornstalk bales and dry CGF bucket fed (5 lbs/hd/d as-is) in concrete bunks
- **Treatment 4: HAY**
  - Control, Ad lib access to grass hay

UNIVERSITY OF ILLINOIS EXTENSION

Fall (Drought) Trial at Orr

UNIVERSITY OF ILLINOIS EXTENSION

Fall (Drought) Trial at Orr

MIX 30 **QLF-CB**

UNIVERSITY OF ILLINOIS EXTENSION

Fall (Drought) Trial at Orr

UNIVERSITY OF ILLINOIS EXTENSION

Fall (Drought) Trial at Orr

UNIVERSITY OF ILLINOIS EXTENSION

Fall (Drought) Trial at Orr

Table 1. Nutrient Analysis for forages in experiment		
Item	Hay	Cornstalks
DM, %	88.29	83.88
Crude Protein, %	8.23	2.78
Acid Detergent Fiber, %	44.03	53.61
Neutral Detergent Fiber, %	63.47	81.50
TDN, %	52.73	53.39
Net energy of lactation, Mgcal/kg	0.52	0.50
Net energy of gain, Mgcal/kg	0.23	0.23
Net energy of maint., Mgcal/kg	0.48	0.49
Relative Feed Value	79	-
Calcium, %	0.51	0.26
Phosphorous, %	0.13	0.35
Magnesium, %	0.24	0.15
Potassium, %	0.42	1.60
Sulfur, %	0.01	0.11

UNIVERSITY OF ILLINOIS EXTENSION

Fall (Drought) Trial at Orr

Table 1. Nutrient Analysis for forages in experiment

Item	QLF	Mix 30	CGF
DM, %	61.6	42.9	89.3
Crude Protein, %	51.8	36.4	23.7
Acid Detergent Fiber, %	<1.6	2.9	7.7
Neutral Detergent Fiber, %	2.3	3.8	35.7
TDN, %			80.6
Net energy of gain, Mgcal/kg	.06	.02	.66
Net energy of maint., Mgcal/kg	.45	.42	.97
Fat, %	5.2	25.6	
Total Sugar, %	34.3	1.3	

UNIVERSITY OF ILLINOIS
EXTENSION

Fall (Drought) Trial at Orr

Table. Effects of Supplementing Cornstalks with liquid supplements or CGF on DM disappearance, and manure production

	Treatment			
Item	QLF	Mix 30	CGF	Hay
DM disappearance, lb/hd/d[a]	20.96	19.95	22.58	22.43
Total DM disappearance, lb/hd/d[b]	23.78	21.69	27	22.43
Supplement DM disappearance, lb/hd/d	2.82	1.74	4.42	0
DM Feed Refusal, lb/hd/d	0.54	0.51	0.49	0.44
Manure production,lb DM/hd/d	26.08	24.99	23.06	27.28

[a] Forage only, assuming all liquid consumed
[b] Forage plus supplements

UNIVERSITY OF ILLINOIS
EXTENSION

Fall (Drought) Trial at Orr

	Treatment			
Item	QLF	Mix 30	CGF	Hay
AS-IS Disappearance, lb/hd/d[a]	24.99	23.78	26.92	25.40
Assumed % waste of Disappearance	0.2	0.2	0.2	0.1
TRAVIS predicted intake	19.99	19.03	21.54	22.86
Forage DMI	16.77	15.96	18.06	20.19
Forage CP,lb	0.47	0.44	0.50	1.61
Forage TDN,lb	8.95	8.52	9.64	10.90
Supplement CP,lb	1.47	0.73	1.06	
Supplement TDN,lb	1.97	1.71	3.58	
Total CP, lb	1.94	1.17	1.56	1.61
Total TDN, lb	10.92	10.24	13.23	10.90
% of Requirement CP	118	71	95	98
% of Requirement TDN	88	83	107	88

[a] Forage only

UNIVERSITY OF ILLINOIS EXTENSION

Fall (Drought) Trial at Orr

Effects of supplementing cornstalks with liquid feeds or CGF on cow performance

	Treatment			
Item	QLF	Mix 30	CGF	Hay
Initial BW, lbs	1421	1420	1425	1418
Final BW, lbs	1377	1362	1499	1395
BW Change, lbs	-44	-58	74	-23
Diet Cost, $/hd/d[a]	1.73	1.43	1.67	2.03

[a] Current prices- Jan 2013

UNIVERSITY OF ILLINOIS EXTENSION

Fall (Drought) Trial at Orr

- CGF works well … if you can get it
  - Price volatility
- Liquids and Cornstalks
  - Similar performance as hay
  - Lower cost than hay
  - Lower labor

UNIVERSITY OF ILLINOIS
EXTENSION

Corn Silage

UNIVERSITY OF ILLINOIS
EXTENSION

Feeding Corn Silage

- New/old method, Dependent on operation
- Important to realize:
  - Average cost
  - Low waste
  - May or may not meet cow requirements
  - No big negative side-effects.
  - More difficult to handle
  - Average equipment, facility, and labor investment

UNIVERSITY OF ILLINOIS EXTENSION

Utilizing Drought Stressed Corn Silage

- Test for Nitrates
  - Get a nutrient analysis as well
- Determine Inclusion Rate
  - Nitrate test
  - Gain pattern
- Determine if supplement is necessary
  - Likely will need additional protein
  - For finishing cattle: more energy too

UNIVERSITY OF ILLINOIS EXTENSION

Utilizing Drought Stressed Corn Silage

- **Change in mindset**
  - **DM (Dry Matter)**
    - Hay: 30 x .85 = 25.5 lbs. DM
    - Corn silage: 30 x .35 = 10.5 lbs. DM.
  - **Protein/Energy ratio**
    - Hay: Adequate Protein, Low Energy
    - Corn Silage: Low Protein, High Energy
  - **Feeding Strategy**
    - Hay: Ad Lib
    - Corn Silage: Limit-feed

UNIVERSITY OF ILLINOIS
EXTENSION

Feed Additives

UNIVERSITY OF ILLINOIS
EXTENSION

Feed Additives

- Increase feed utilization, enhance rumen efficiency, increase feed efficiency
- High feed prices lead to larger ROI from using feed additives

UNIVERSITY OF ILLINOIS
EXTENSION

Feed Additives

- Rumensin
- Amaferm
- Yeast products
- Probiotics

UNIVERSITY OF ILLINOIS
EXTENSION

Feed Additives

- Rumensin
  - Ionophore
  - Alters the Acetate:Propionate ratio
  - 7-10% less intake needed to experience similar gains.
  - Best served in limit-fed scenarios
  - $0.02 - $0.03 per head per day

UNIVERSITY OF ILLINOIS
EXTENSION

Feed Additives

- Amaferm
  - Direct fed microbial
  - Aids in digestion of poor quality forages
  - 10% increase in forage utilization
  - Best served when feeding poor quality forages
  - $0.04 - $0.06 per head per day

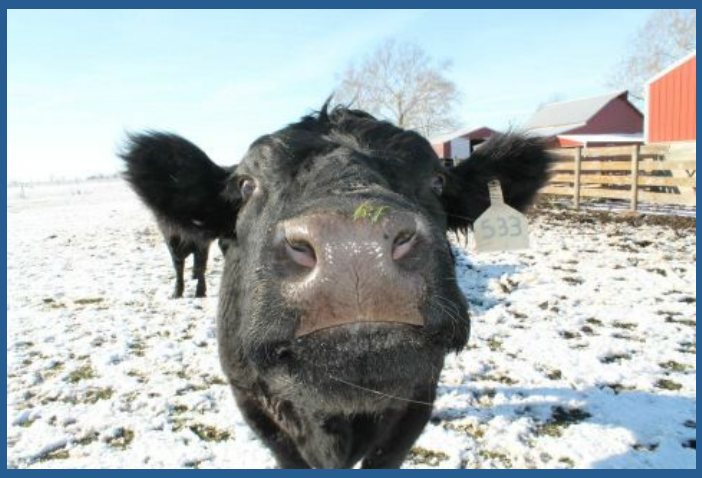
UNIVERSITY OF ILLINOIS
EXTENSION

Summary

- There is no ideal feeding strategy
- Decide which one fits your operation
- Set the stage
- Minimize waste
- Test feeds, Balance least-cost rations
- Utilize alternative feeds
- Re-evaluate often

UNIVERSITY OF ILLINOIS EXTENSION

Questions



UNIVERSITY OF ILLINOIS EXTENSION