



ECONOMICS OF FEEDING MARKET COWS USING DIFFERENT MANAGEMENT STRATEGIES¹

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Background

- **Sale of market (cull) cows can contribute 15-30% additional income annually to cow-calf producers**
- **Estimate 6-8 million market cows harvested annually (Stalcup, 2008)**
- **Spring calving cows sold in fall (post weaning, pregnancy check) → supply large, returns low**
- **Little forethought given to add value to cows**

Background

- Enhance market cow value by feeding extra 60 to 100 days (Strohbehn et al., 2004)
 - Sell cows when market prices increase
 - Improve carcass quality of cows - ↑ white fat
- Cull cow prices based on expected USDA carcass grade:
 - Canner → very thin body condition BCS = 2 and 3
 - Cutter → thin body condition score BCS = 4
 - Utility → moderate body condition BCS = 5
 - Commercial → fleshy body condition BCS = 6+
- Cull cows require more nutrient dense rations with smaller particle size and softer feed (Drake, 2008)
 - loss of mechanical means (teeth) to break down feedstuffs

Background

- **loss of villi in digestive tract lining → lower feed efficiency and lower digestion (Nader, 2008)**
 - **internal organs possibly compromised (liver and kidney)**
- **Little research on use of self feeders to feed market cows**
- **Market cow feeding needs re-evaluation of feeding strategies and economic profit (Niemela et al., 2008)**
 - **continued drought in Northern Great Plains**
 - **↑ feed costs**
 - **↑ fuel costs**
 - **↑ input costs**

Study Objective



Evaluate traditional and self fed market cow feeding systems

- **feedlot performance**
- **carcass traits**
- **profitability within each feeding system**

Experimental Protocols

- 68 mature market cows purchased mid Oct. 2007 (Bowman, ND)
- Cows weighed, BCS, preg checked, branded, tagged, evaluated for health and temperament.
- Forty eight cows selected for study
(wt = 1313 lb, BCS = 5.71)



- Cows stratified by wt and BCS; randomly allotted to pens (4 cows/pen). Pens randomly assigned to one of three diet treatments:

- (1) corn-mixed hay (HAY)
- (2) barley-barley silage (SILAGE)
- (3) self-fed diet using controlled intake system (LIMIT)

- Self feeder (LIMIT) protocol developed by Purina nutritionists (ACCURATION and IMPACT)
- LIMIT cows had constant access to diets (self feeders) and were fed limited amounts baled hay daily
- HAY and SILAGE cows fed TMR rations once daily

Experimental Protocols



- Four step up rations (↑ energy density) fed to HAY and SILAGE cows to achieve final finishing diets (30 days)

- Cows vaccinated, dewormed and implanted with Finaplex H implant

- MGA was fed to all diets to prevent estrus

- HAY and SILAGE feed samples collected weekly for 1st month → collected 1x/month when on final finishing diet

- LIMIT diet samples taken when new feed ground

- Feed samples composited by treatment and analyzed by a commercial laboratory

- Day 76- all cows commingled into one group and placed into a large pen (Lagoon)

- Cows fed TMR ration from day 76 - 104 (29 days) until shipped → auction market or slaughter

Experimental Protocols

- One cow removed from study (SILAGE; founder)
- One cow was selected from each pen and marketed live
 - evaluate local auction market's cull cow prices
- Data measures: weight gain (ADG), BCS, feed intake, feed efficiency, cost of gain, diet nutrients, carcass traits, and economic data (breakevens, closeouts)
- Cow performance, carcass traits, and economic data analyzed as a completely randomized design (SAS GLM procedures; pen = experimental unit) → mean separation by Least Significant Difference ($P < 0.05$ level)

Diet Ingredient Compositions

Item	Percent Dry Matter Basis		
	Hay	Silage	Lagoon
Days fed	47 – 75	47 - 75	76 - 104
Ingredient composition, %			
Alfalfa haylage	8.5	-	-
Barley silage	-	16.1	25.0
Calcium carbonate	0.7	0.7	0.5
Whole barley	-	67.2	22.5
Cracked corn	71.4	-	22.6
Finish supplement ^a	2.0	1.8	1.9
MGA [®] pellet ^b	2.6	2.4	2.5
Mixed hay	12.7	11.8	25.0
Soybean meal (48% CP)	2.1	-	-

^a Supplement contains 1000 gram/ton Rumensin[®].

^b Supplement contains 0.00011% Melengestrol Acetate.

Diet Nutrient Compositions

Nutrient ^a	Percent Dry Matter Basis		
	Hay	Silage	Lagoon
DM, %	76.92	69.22	75.0
CP, % DM	11.7	14.5	13.7
Ne _m , Mcal/lb DM	0.82	0.80	0.90
Ne _g , Mcal/lb DM	0.55	0.54	0.52
Ca:P	2.76	2.81	2.54

^a Nutrient analysis results from composited diet samples.

Ingredient Compositions of Self-Fed Diets

Item	Percent Dry Matter Basis		
	ACCURATION ^a		IMPACT ^b
	Day 1 - 21	Day 22 - 46	Day 47 - 75
Ingredient composition, %			
Cracked corn	34.80	60.80	78.50
MGA [®] pellets ^c	2.80	2.80	2.80
Purina supplement	52.1	26.1	8.7
Grass hay (bales)	10	10	10
12:12 mineral	0.3	0.3	-

^a Supplement contains 130 gram/ton Rumensin[®].

^b Supplement contains 227 gram/ton Rumensin[®] and 90 gram/ton Tylan[®].

^c Supplement contains 0.00011% Melengestrol Acetate.

Diet Nutrient Compositions of Self-Fed Diets

Nutrient ^a	Percent Dry Matter Basis		
	ACCURATION		IMPACT
	Day 1 - 21	Day 22 - 46	Day 47 - 75
DM, %	88.19	87.52	85.20
CP, % DM	23.7	22.9	14.8
Ne _m , Mcal/lb DM	0.92	0.93	0.87
Ne _g , Mcal/lb DM	0.61	0.62	0.58
Ca:P, % DM	1.56	1.50	1.62

^a Nutrient analysis results from composited diet samples.

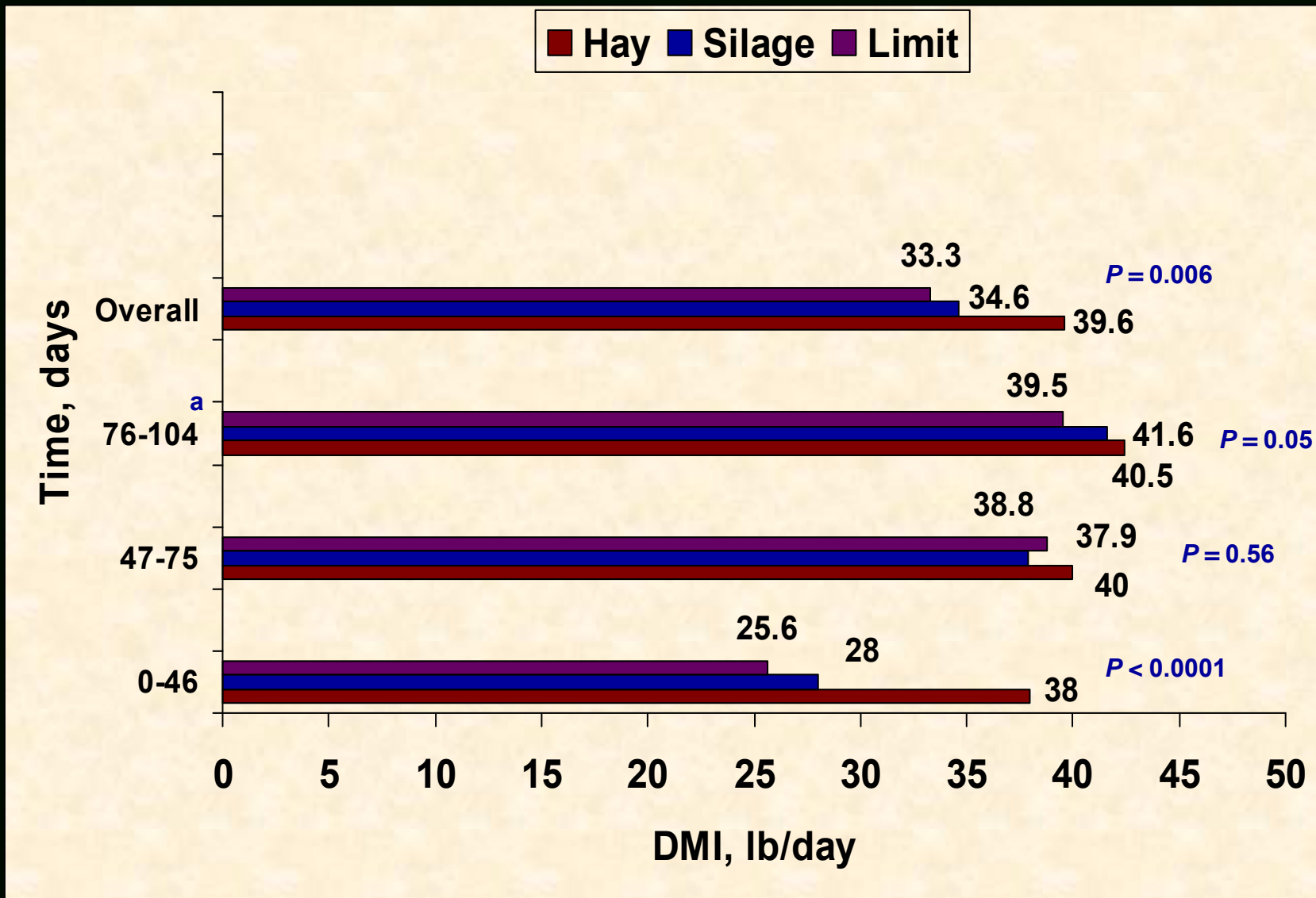
Feed Ingredient Costs

Feed ingredient	Cost
Barley silage, \$/ton	38.38
Mixed Hay ^a , \$/ton	66.05
Finish Supplement, \$/ton	379
MGA pellets [®] , \$/ton	364
Whole barley grain, \$/bushel	3.25
Cracked corn grain ^b , \$/bushel	3.95 - 5.25
Purina AccuRation 3HL RM 130, \$/ton	431
Purina Impact 44 RM 227 T 90, \$/ton	433
Calcium carbonate, \$/ton	213.30
48% CP Soybean meal, \$/ton	292

^a Includes fee for processing hay (chopping by custom hay processor).

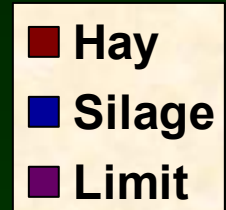
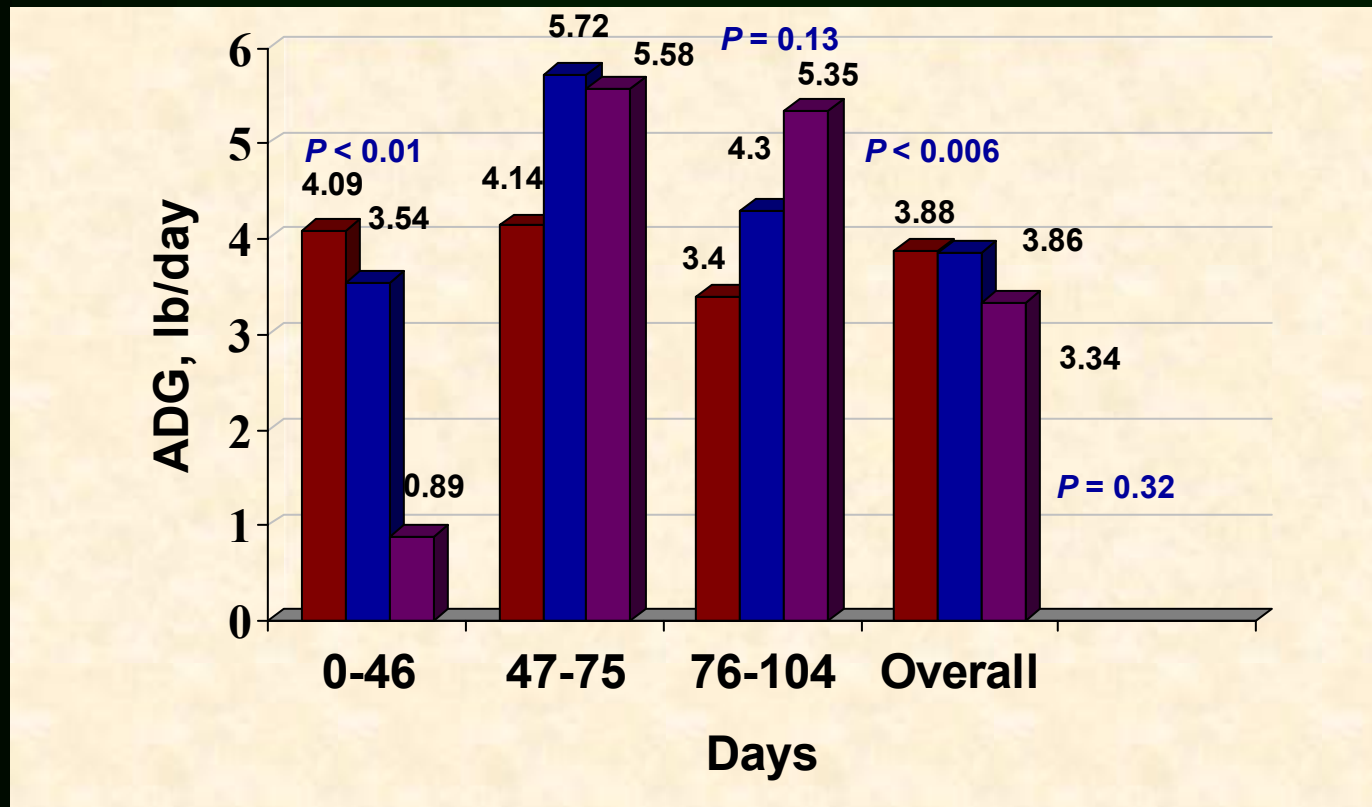
^b Includes fee for processing grain (cracking).

Feeding and Management Strategies on Market Cow Dry Matter Intake



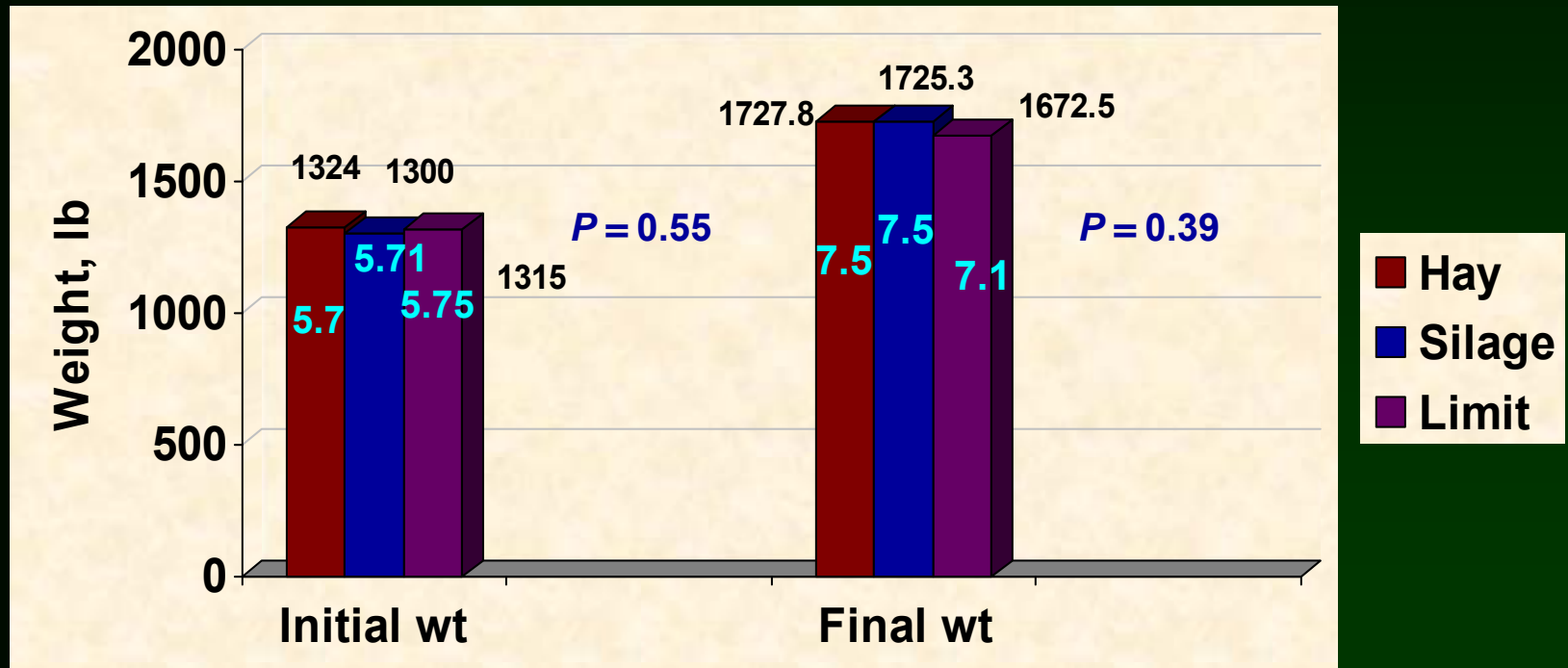
^aDry matter intake of commingled cows estimated at 2.6% body wt (75 day wt)

Feeding and Management Strategies on Market Cow Performance



Feeding and Management Strategies on Market Cow Weight Gain

Weight and BCS



Feeding and Management Strategies on Market Cow Feed Cost of Gain

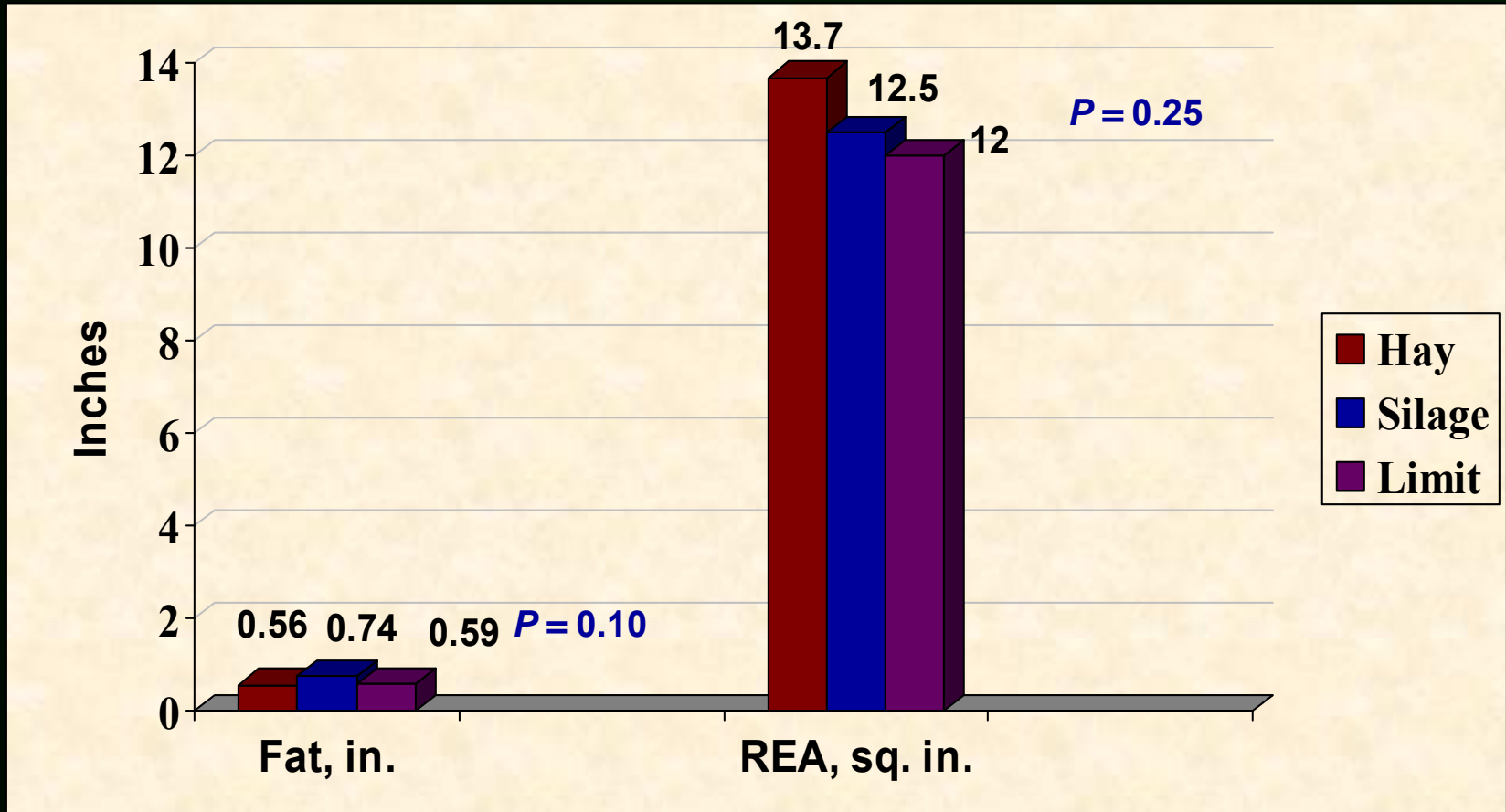
Item	Hay	Silage	Limit	SEM ^a	P-value ^b
No. head	16	15	16	-	-
No. pens	4	4	4	-	-
Day 0-46 Feed cost/lb gain, \$	0.79	0.83	2.21	1.44	0.74
Day 0-75 Feed cost/lb gain, \$	0.79	0.80	1.72	0.15	0.002
Day 76-104 Feed cost/lb gain ^c , \$	3.62	2.69	2.11	0.29	0.01
Day 0-104 Feed cost/lb gain, \$	1.47	1.34	1.87	0.11	0.02

^a Standard Error of Mean, n = 4.

^b P-value for separation of treatment means; $P < 0.05$ considered statistically significant.

^c Dry matter intake of comingled cows estimated at 2.60% BW (75 day wt).

Feeding and Management Strategies on Market Cow Carcass Traits



Feeding and Management Strategies on Market Cow Carcass Traits

Item	Hay	Silage	Limit	SEM ^a	<i>P</i> -value ^b
Harvested cows^c					
No. head	11	11	11	-	-
HCW, lb	962	925	917	15.06	0.14
Dressing percent	54	53	54	0.74	0.88
Marbling score	398	390	422	21.81	0.58
Fat color (1-5) ^d	2.75	3.25	2.50	0.26	0.18
Muscling score (1-5) ^e	2.75	3.25	3.75	0.34	0.18
Total cow value, \$	1,038.33	999.27	990.32	16.26	0.14

^a Standard Error of Mean, n=4.

^b *P*-value for separation of treatment means; *P* < 0.05 considered statistically significant.

^c Cows shipped to Dakota Premium Foods, South St. Paul, MN on Feb. 13, 2008 for harvest.

^d Pure white = 1, Yellow = 5.

^e Thin = 1, Average = 3, and Thick = 5.

Input Costs for Feeding Market Cows Closeout Analysis

Item	Cost
Yardage costs, \$/cow	29.40
Veterinary medicine ^a , \$/cow	11.87-12.58
Marketing expense (for harvest), \$/cow	2.16
Marketing expense (for auction), \$/cow	25.55
Cash equity, \$/cow	150.00
Death loss, %	0
Interest rate, %	7.50

^a Veterinary medicine costs include vaccination, dewormer, implant and chute charges; costs varied due to two cows treated for footrot (HAY and LIMIT).

Input Costs for Feeding Market Cows Closeout Analysis

Item	Cost
Transportation	
Trucking costs (delivery to feedlot), \$/cow	7.25
Trucking costs (delivery to sale barn) ^a , \$/cow	6.76 - 8.45
Trucking costs (delivery to harvest), \$/cow	71.25

^a Transportation costs to sale barn (auction market) varied due to number of animals shipped per treatment.

Feeding and Management Strategies on Market Cow Auction and Closeout Returns

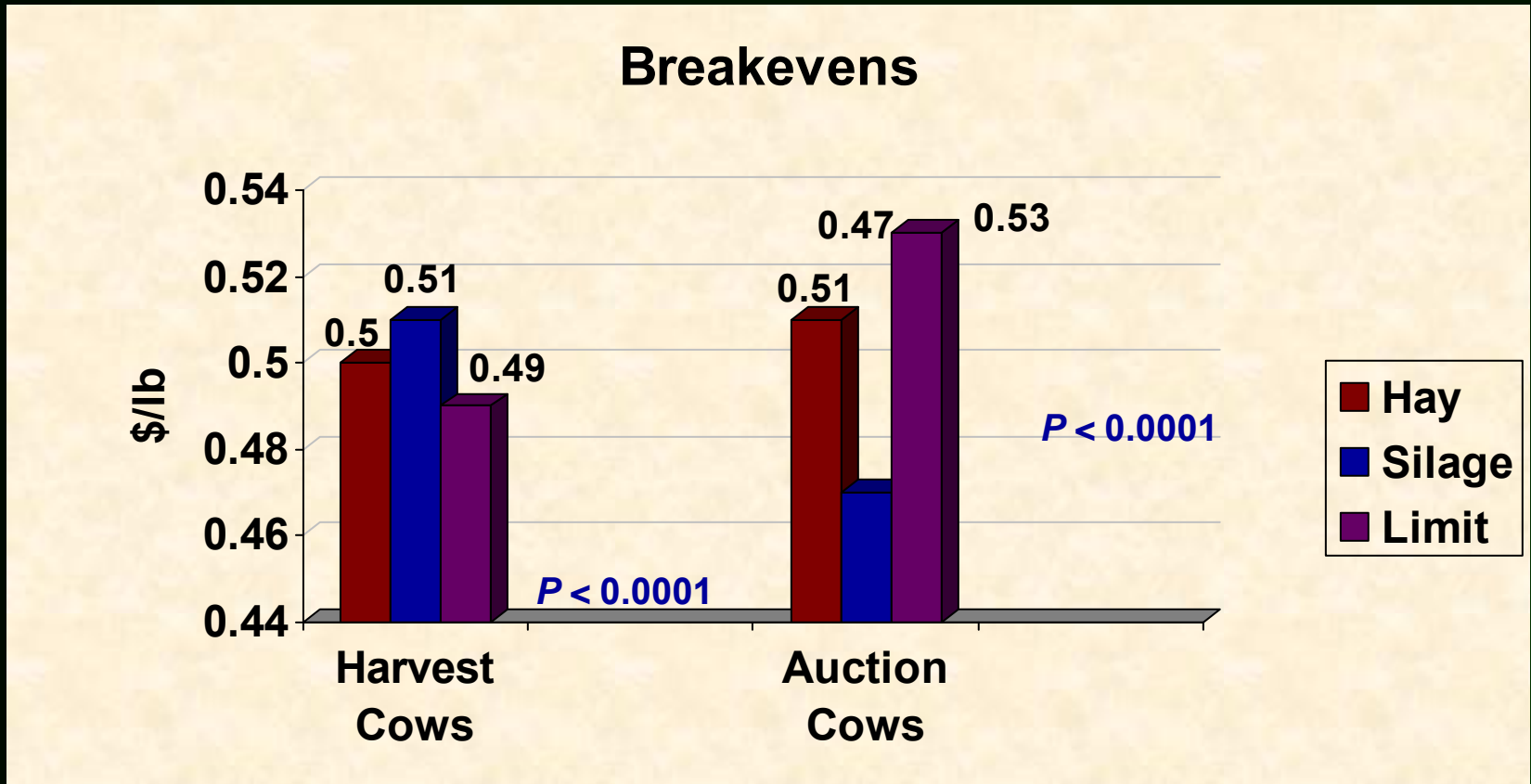
Item	Hay	Silage	Limit	SEM ^a	P-value ^b
Auctioned cows^c					
No. head	5	4	5	-	-
Sale wt, lb	1656.3	1776.3	1584.5	52.84	0.08
Sale price, \$/cwt	59.50	60.25	58.85	0.64	0.34
Total cow value, \$	962.74	1005.51	906.29	41.78	0.29

^a Standard Error of Mean, n=4.

^b P-value for separation of treatment means; P < 0.05 considered statistically significant.

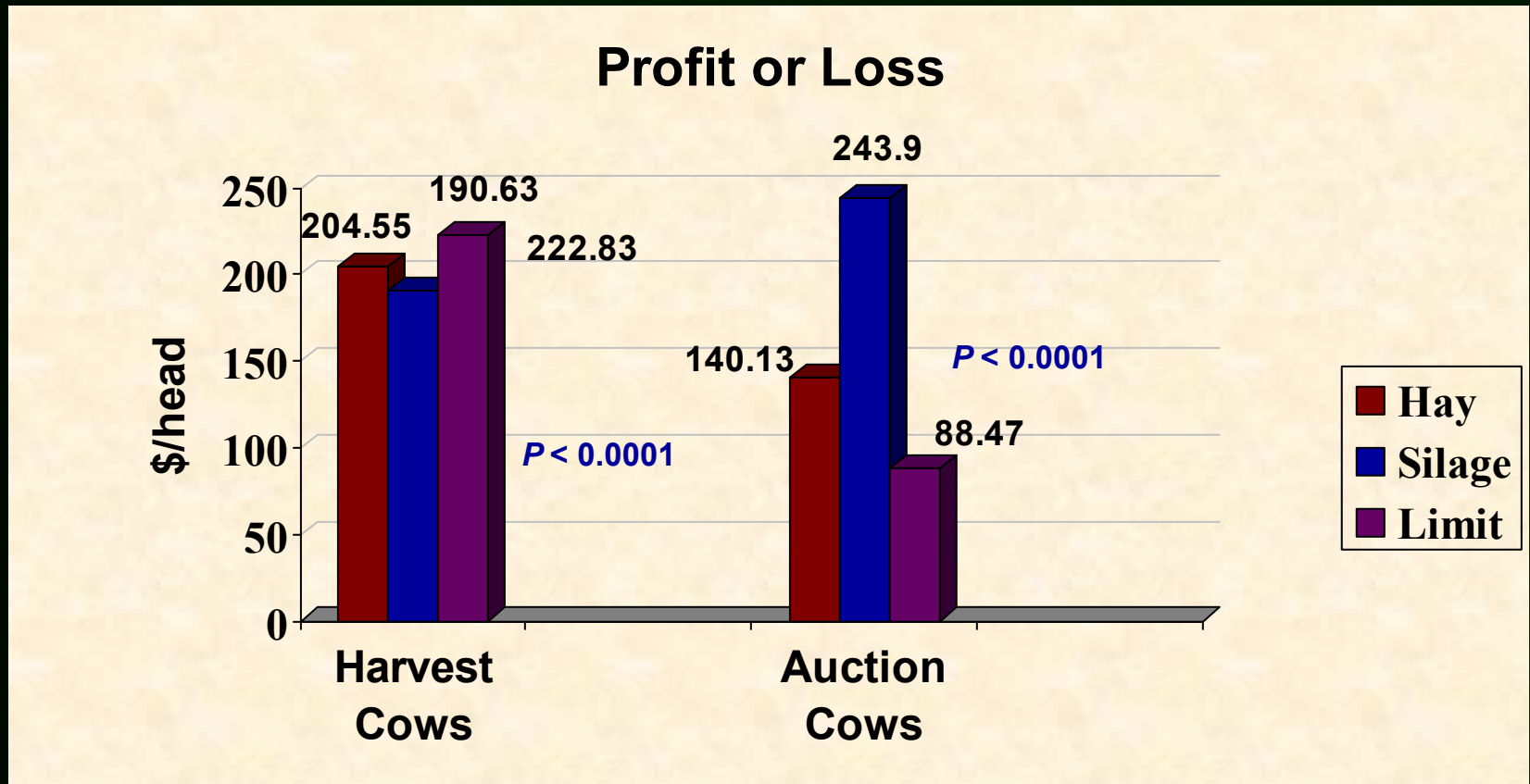
^c Fattened market cows sold at Lemmon Livestock, Inc., Lemmon, SD, Feb. 13, 2008.

Feeding and Management Strategies on Market Cow Auction and Closeout Returns



Values for breakevens, profits and losses derived from CalfWEB closeout calculator, www.chaps2000.com/calfweb/

Feeding and Management Strategies on Market Cow Auction and Closeout Returns



Values for breakevens, profits and losses derived from CalfWEB closeout calculator, www.chapman.edu/~calfweb/

IMPLICATIONS

- **Self feeders can be used to fatten market cows**
 - **LIMIT system (Purina products) requires time for cows to adapt to fishmeal**
 - **Feeder use may ↑ as fuel prices ↑**
- **Additional DOF for market cows:**
 - **↑ BCS**
 - **↑ carcass quality**
 - **↑ economic value of market cows**
- **Market Cow feeding requires:**
 - **Aggressive implants (Finaplex H)**
 - **MGA[®] feeding**
 - **Minimum 20 to 24 inch bunk space/cow**
 - **High energy finishing diets (minimum 60-63 Mcal NE_g)**

IMPLICATIONS

**Goal: ↑ white fat → get as many cows to Premium white
No 1 & 2 grades**

- **Market cow FCOG NOT competitive with feeding calves
\$ made from upgrading cow**
- **Profit HIGHLY dependent on:**
 - Initial cow BCS
 - Feed cost and availability
 - DOF (minimum = 60 days)
 - Carcass traits (quality)
- **More research needed to evaluate other low cost
methods ↑ market cow value**

Questions?

