

STRATEGIES

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STRATEGIES

Objectives

This section includes a variety of actual case studies and other examples of management strategies. By studying these you will gain new ideas for effective management strategies in all areas of ranch management.

ANIMAL MANAGEMENT EXERCISE #7 - Value per head vs. value per pound: Value of additional weight.

Assignment:

1. Select one of the five market reports. Select and highlight different weight classes of either steers or heifers. Use larger lots rather than the lots containing only a few animals.

Multiply the weight per head by price per pound and record the value per head on this page.

Weight Class	STEERS		Weight	HEIFERS	
	Price	Value per Head		Price	Value per Head
300 - 400 lb :		:			
400 - 500 lb :		:			
500 - 600 lb :		:			

2. Read the article by Harlan Hughes. Discuss the concept and the table presented in this article with your group to ensure full understanding.



WINTER LIVESTOCK

Colorado's Progressive Livestock Auction

(719) 384-4491

P.O. Box 308, La Junta, CO

EVERY
TUESDAY

JOHN CAMPBELL
Res. (719) 384-2397

RAY WINTER
Res. (405) 234-5900

JERRY KEFFELER
Res. (719) 384-2244

MARY ANN ALLSWORTH, Office Mgr.
Res. (719) 384-4159

RON HOSS, Yard Mgr.
Res. (719) 384-7101

CATTLE SALE TUESDAY AT 9:00 A.M. (MST). LOAD LOTS CALVES SELL AT 12:00 P.M.

3894 cattle receipts Tuesday, January 23, 1996. Lightweight steers steady on limited selection, 62.50 to 70.00. Heavy steer calves steady to 1.00 lower 62.00 to 69.00. Light heifer calves sold steady 55.00 to 62.00. Heavy heifer calves steady to 1.00 lower, 50.00 to 58.00. Thin fleshed calves received the highest demand.

Tom Kay 5 mix str 445 lbs	70.00	Harold Eichman 11 ang x str 465 lbs	67.50	Harold Thompson 6 wf x str 515 lbs	63.00
Jon Grahm 9 mot str 425 lbs	70.00	Rudy Rudibaugh 16 sim x str 445 lbs	67.50	Charles Wilkinson Jr. 9 wf str 440 lbs	62.50
Jon Grahm 3 mix hfrs 340 lbs	62.00	Don Hard 12 x bred str 520 lbs	67.25	Quinlan Ranches 15 gel x hfrs 400 lbs	62.00
Tim Pfeiff 5 bl str 335 lbs	69.50	Jerry Cobb 20 gel x str 515 lbs	67.00	Quinlan Ranches 43 gel x hfrs 525 lbs	57.75
Arlin Chenoweth 15 x bred str 460 lbs	69.00	Jerry Cobb 31 gel x hfrs 525 lbs	56.50	James De Vore 7 mix hfrs 460 lbs	57.00
Arlin Chenoweth 13 x bred hfrs 430 lbs	60.50	Lester Snethen 16 lim x str 540 lbs	66.50	Ron Robertson 19 gel x hfrs 540 lbs	55.25
Sanchez Ranch 13 lim x str 395 lbs	68.00	Lester Snethen 17 lim x hfrs 505 lbs	55.50	Ruben Salas 22 char x hfrs 530 lbs	54.25
Sanchez Ranch 18 lim x hfrs 380 lbs	61.00	Warren Reed 11 gel x ang str 515 lbs	63.50	Randy Stevens 14 x bred hfrs 545 lbs	54.00
Stocker heifers 1.00 lower 50.00 to 56.50. Fleishy kind 47.50 to 52.50. Feeding heifers steady to 1.00 lower 53.00 to 57.40.					
Ron Robertson 74 gel x hfrs 680 lbs	57.50	Marvin Gruenloh 9 sim x hfrs 685 lbs	56.25	Warren Reed 30 gel x ang hfrs 635 lbs	54.75
Willhite & Willhite 68 sim x hfrs 710 lbs	57.40	Steve Milenski 17 lim x hfrs 720 lbs	56.00	Don Hard 13 x bred hfrs 560 lbs	54.50
Quinlan Ranches 85 gel x hfrs 675 lbs	57.20	Robert Espinosa 25 lim x hfrs 560 lbs	55.50	Mark Satak 18 mix hfrs 595 lbs	54.50
Quinlan Ranches 103 gel x hfrs 620 lbs	54.85	Ron Bates 35 mix hfrs 785 lbs	55.25	Lester Snethen 17 lim x hfrs 590 lbs	54.25
Harold Eichman 66 ang x hfrs 685 lbs	57.20	Ron Bates 24 mix hfrs 660 lbs	55.00	Mark & Clyde McVey 17 sim hfr 750 lbs	54.00
Harold Eichman 50 ang x hfrs 605 lbs	54.75	Jerry Cobb 24 gel x hfrs 585 lbs	55.00	Arlin Chenoweth 19 x bred hfr 565 lbs	54.00
Jacobs Ranch 20 bl bwf hfrs 585 lbs	56.50	Larry Hammond 19 ang x hfr 610 lbs	54.75	Valentine Ranch 18 ang hfr 550 lbs	54.00
Stocker steers steady on those with quality and condition 60.00 to 65.00. Fleishy stockers 54.00 to 58.00. Feeding steers steady to 1.00 lower 58.00 to 61.50.					
Leonard Wright 14 x bred str 555 lbs	65.00	Ron Robertson 44 gel x str 775 lbs	60.85	Jerry Cobb 23 gel x str 665 lbs	60.50
Dan Sharpe 7 mix str 560 lbs	62.50	Ron Roberson 56 gel x str 680 lbs	60.70	Ron Bates 16 mix str 730 lbs	60.40
Jacobs Ranch 31 bl, bl wf str 675 lbs	61.35	Harold Eichman 53 ang x str 745 lbs	60.80	Ron Bates 25 mix str 865 lbs	58.75
Bradley Burch 50 gel x str 635 lbs	61.20	Harold Eichman 48 ang x str 620 lbs	60.00	Off Ranches 21 lim x str 740 lbs	60.30
Bradley Burch 31 gel x str 680 lbs	60.50	Steve Norris 102 salers x str 600 lbs	60.75	Off Ranches 49 lim x str 695 lbs	58.25
Bradley Burch 17 gel x str 570 lbs	60.00	Steve Norris 192 salers x str 690 lbs	60.20	Steve Milenski 12 lim x str 725 lbs	60.25
Ruben Salas 44 char x str 600 lbs	61.10	Warren Reed 45 gel x ang str 725 lbs	60.70	Bill Phipps 16 x bred str 800 lbs	59.50
Robert Reyher 31 char x str 630 lbs	61.00	Warren Reed 27 gel x ang str 620 lbs	60.00	Mark Satak 29 mix str 620 lbs	59.50
Valentine Ranch 18 bl str 620 lbs	61.00	Lester Snethen 12 lim str 635 lbs	60.50	Sills Ranch 52 lim x str 725 lbs	59.00
Robert Espinosa 16 lim x str 640 lbs	61.00	Arlin Chenoweth 14 x bred str 590 lbs	60.50	Larry Hammond 17 ang x str 680 lbs	59.00
Stancil Bagwell & Son 22 sim x str 655 lbs	61.00	Jerry Cobb 39 gel x str 610 lbs	60.50	Mark & Clyde McVey 11 sim str 730 lbs	58.00
Butcher cows 2.00 higher, top dressing kind 32.50 to 39.50, mostly 32.50 to 35.00. Cutter cows 28.50 to 32.00. Canner cows 26.00 to 29.00.					
Butcher bulls sold mostly 42.00 to 48.00 on the high yielding kind. Lower dressing bulls 35.00 to 40.00.					
Dwayne Fritzier 1 bwf cow 1190 lbs	39.50	Buddy Taylor 1 lim x cow 1150 lbs	36.50	Art Allen 11 wf cow 1055 lbs	33.75
Cody Duvall 1 char cow 1330 lbs	39.50	Jesus Mariscal 1 mot cow 1085 lbs	36.25	Willhite & Whillite 9 bl blf cow 1100 lbs	33.75
Sam Love 1 chi cow 1320 lbs	38.25	Ruben Salas 1 rd cow 1270 lbs	35.75	Reverse S Slash 2 mix cow 1140 lbs	33.00
Felipe Padilla 1 hol cow 1135 lbs	38.00	Don Wright 5 mot cow 1380 lbs	35.75	John Schweizer Jr 1 wf cow 1130 lbs	31.00
Bill Taylor 1 mot cow 1175 lbs	37.25	Tim Pfeiff 1 hol cow 1560 lbs	35.00	Jack Smith 1 lim bull 2365 lbs	48.00
Dr. Dow 1 bwf cow 1185 lbs	36.75	Quinlan Ranches 5 mix cow 1180 lbs	35.00	Buzz Taylor 1 lim bull 1605 lbs	47.25
Barbara East 1 mot cow 1245 lbs	36.50	Duvall Ranches 2 wf cow 1175 lbs	34.00	Weirich Ranch 1 lim bull 2210 lbs	45.50

ESTIMATE 3500 CATTLE TUESDAY, JANUARY 30, 1996. NOW CONSIGNED:

HAROLD & GERALD ZIEGLER - 300 choice gel x, ang x str & hfr 600-700 lbs, 8-way, Cattlemaster 4, dehorned, hay wintered
ROSS MAY - 160 choice lim x str & hfr 550-650 lbs

CURTO RANCH - 40 choice red ang x, wf x, ang x str & hfr 500-600 lbs
MCENERNEY RANCH - 35 choice gel x, wf x, ang x str 500-700 lbs
GEORGE ETCHART - 65 choice gel x, char x str 700-850 lbs, 7-way, Smonus, Triangle 4
KENNETH ESKEW - 70 choice gel x, sim x str & hfr 350-500 lbs. Cattlemaster 4, home raised

1994



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CATTLE SALE TUESDAY AT 10:00 A.M. (MST). LOAD LOTS CALVES SELL AT 1:00 P.M.

5909 Cattle receipts Tuesday, October 4, 1994. Light steer calves steady with last weeks higher market 85.00 to 99.00. Steer calves over 400 lbs steady to 2.00 higher 80.00 to 90.00. 5 weights 2.00 higher 75.00 to 86.00. Light heifers steady 77.00 to 85.50. Those with weight 72.50 to 78.50. Five weight heifers 2.00 higher, 67.50 to 74.50. Buyers are more selective, planer cattle, odd cattle, calves not dehorned and fleshy calves locking in frame were **VERY** hard to sell.

Michael Covalli..... 5 char x str..... 260 lbs	99.00	Tony Martinez..... 20 fm x hrs..... 390 lbs	83.00	Tom Kuykendall..... 35 char x str..... 510 lbs	85.75
Michael Covalli..... 12 char x str..... 315 lbs	96.00	Tony Martinez..... 25 fm x hrs..... 480 lbs	75.00	Tom Kuykendall..... 22 char x hrs..... 490 lbs	75.50
Michael Covalli..... 20 char x str..... 400 lbs	88.50	Williams Ranch..... 7 fm str..... 410 lbs	90.50	Loren Tempel..... 8 mix str..... 395 lbs	85.50
Michael Covalli..... 12 char x hrs..... 280 lbs	85.50	Vincent Holton..... 4 mix str..... 370 lbs	89.00	Loren Tempel..... 13 rdwl str..... 530 lbs	85.25
Michael Covalli..... 15 char x hrs..... 375 lbs	79.50	Vincent Holton..... 12 mix hrs..... 375 lbs	81.00	Fred Sedarsky..... 10 fm x str..... 440 lbs	84.00
ick & Randy Schofield..... 8 fm x str..... 345 lbs	95.00	Larry Mapes..... 10 char x bk str..... 415 lbs	89.00	B.L. Lewis..... 12 wf, bb str..... 435 lbs	83.25
ick & Randy Schofield..... 22 fm x str..... 515 lbs	79.50	Larry Mapes..... 31 char x bk str..... 545 lbs	85.90	B.L. Lewis..... 23 wf, bb str..... 515 lbs	75.00
ick & Randy Schofield..... 19 fm x gel x hrs..... 390 lbs	82.50	Larry Mapes..... 26 char x bk hrs..... 510 lbs	74.00	B.L. Lewis..... 20 wf, bb hrs..... 465 lbs	77.00
dna Marble..... 7 fm x str..... 330 lbs	93.50	Herman Woolen..... 20 mix str..... 415 lbs	87.00	Charlie Strasia..... 17 sim x str..... 530 lbs	83.25
oland Hoch..... 11 fm x str..... 400 lbs	87.50	Herman Woolen..... 25 mix hrs..... 420 lbs	77.50	Attilo Menegatti..... 11 fm x str..... 505 lbs	80.50
oland Hoch..... 19 fm x str..... 500 lbs	85.50	Stancil Bagwell..... 35 sim x str..... 430 lbs	86.50	Attilo Menegatti..... 15 fm x hrs..... 520 lbs	69.00
oland Hoch..... 23 fm x hrs..... 385 lbs	81.00	Stancil Bagwell..... 52 sim x str..... 495 lbs	84.50	Betty Bevans..... 14 sim x str..... 540 lbs	77.00
oland Hoch..... 20 fm x hrs..... 475 lbs	78.00	Loldahl Ranch..... 90 fm x str..... 520 lbs	86.50	Hardn Hereford..... 24 wf str..... 530 lbs	73.50
enneth Hill..... 9 fm x str..... 345 lbs	93.00	Loldahl Ranch..... 50 fm x hrs..... 490 lbs	78.25	A.B. Valdez..... 8 mix hrs..... 380 lbs	81.00
enneth Hill..... 10 fm x hrs..... 390 lbs	78.50	Betty Eacret..... 15 fm x str..... 500 lbs	86.10	Robert Waltrip..... 13 mix hrs..... 510 lbs	74.50
ony Martinez..... 14 fm x str..... 360 lbs	93.00	Betty Eacret..... 9 fm x hrs..... 450 lbs	78.00	Mark Koch..... 11 bl, bwl hrs..... 510 lbs	71.00
ony Martinez..... 24 fm x str..... 475 lbs	86.25	Betty Eacret..... 10 fm x hrs..... 540 lbs	69.50	Steve Wills..... 19 mix hrs..... 545 lbs	70.00

Stocker heifers 1.00 to 2.00 higher, 67.00 to 72.50. Planer stockers 62.50 to 67.00. Feeding heifers steady 67.50 to 70.25.

om Kuykendal..... 24 char x hrs..... 560 lbs	72.50	Weldon McKinley..... 12 x bred hrs..... 585 lbs	69.25	George Kirkpatrick..... 6 mix hrs..... 845 lbs	67.50
om Kuykendal..... 12 char x hrs..... 700 lbs	70.25	Norman Burk..... 36 wf x hrs..... 700 lbs	69.25	James Marchetti..... 38 belmstr hrs..... 730 lbs	67.10
ark Zele..... 17 mix hrs..... 575 lbs	72.00	Norman Burk..... 17 mix hrs..... 770 lbs	67.75	Hal Porter..... 21 mix hrs..... 745 lbs	67.00
W Kinkensmith..... 42 mix hrs..... 620 lbs	72.00	Merin Rushton..... 67 wf x hrs..... 700 lbs	69.25	Jay Jolly..... 27 angus x hrs..... 810 lbs	66.50
xe Schuman..... 133 char x, rd hrs..... 715 lbs	70.20	Merin Rushton..... 56 wf x hrs..... 760 lbs	68.40	Donald Watts..... 6 mix hrs..... 835 lbs	66.00
xe Schuman..... 144 char x, rd hrs..... 760 lbs	67.75	Art Goehl..... 72 x bred hrs..... 710 lbs	69.20	F.D. Owens..... 12 gel x hrs..... 860 lbs	65.75
en Williams..... 8 fm x hrs..... 570 lbs	70.00	Betty Eacret..... 11 fm x hrs..... 720 lbs	68.50	Harold Horner..... 16 char x hrs..... 860 lbs	65.25
arl Zele..... 16 mix hrs..... 560 lbs	69.75	Cliff Wildersph..... 11 mix hrs..... 555 lbs	68.00	Cow Country Corp..... 14 mix hrs..... 830 lbs	65.00

Stocker steers steady to 1.00 higher, 74.00 to 80.00. Planer stockers 70.00 to 75.00. Feeding steers steady to 1.00 higher, 72.00 to 77.00. Heavy steers 66.00 to 70.00.

Several lots lacking quality 62.50 to 68.00.

arch Koch..... 11 bl, bwl str..... 560 lbs	80.50	Sebebo Chacon..... 17 mix str..... 600 lbs	74.00	George Hackle..... 13 bk str..... 630 lbs	73.50
amb Williams..... 6 fm x str..... 550 lbs	79.00	Tom Kuykendal..... 37 char x str..... 615 lbs	74.00	Joseph Provenza..... 14 fm x str..... 670 lbs	73.50
ax Vezzani..... 11 fm x str..... 565 lbs	78.00	Flat Top Ranch..... 73 x bred str..... 710 lbs	74.00	Frank Zele..... 12 mix str..... 670 lbs	73.00
onald Peters..... 42 wf x str..... 700 lbs	77.50	Flat Top Ranch..... 146 x bred str..... 710 lbs	73.50	Mac McMullen..... 32 x bred str..... 735 lbs	73.00
ith James..... 128 x bred str..... 740 lbs	76.00	Flat Top Ranch..... 57 x bred str..... 790 lbs	70.50	Mac McMullen..... 74 x bred str..... 845 lbs	70.00
ith James..... 145 x bred str..... 780 lbs	73.60	Flat Top Ranch..... 157 x bred str..... 760 lbs	70.00	Corpus Gallegos..... 10 fm x str..... 770 lbs	70.00
river Horn..... 29 mix str..... 735 lbs	75.00	Flat Top Ranch..... 208 x bred str..... 780 lbs	70.00	Charence Kendall..... 14 bl, bwl str..... 810 lbs	68.50
rl Zele..... 35 mix str..... 620 lbs	74.25	Flat Top Ranch..... 99 x bred str..... 825 lbs	67.50	BA Reed & Sons..... 31 x bred str..... 800 lbs	67.50
bert Hite..... 31 mix str..... 720 lbs	74.25	Flat Top Ranch..... 151 x bred str..... 860 lbs	66.75	BA Reed & Sons..... 23 x bred str..... 840 lbs	66.75
bert Hite..... 29 mix str..... 810 lbs	70.00	Marvin Rushton..... 34 mix str..... 745 lbs	74.00	Angelo Sabela..... 13 mix str..... 870 lbs	67.50

Butcher cows 2.00 lower, bulk of fleshy cows 37.00 to 42.00. Few high yielding to 46.00. Cutter cows 31.00 to 35.00. Canner cows mostly 30.00 to 33.00. Butcher Bulls 45.00 to 52.00. Solid mouth stock cows 500.00 to 625.00 on those with quality. Broken mouth stock cows 375.00 to 450.00.

thony Martinez..... 15 bl, bwl cows, solid..... 1050 lbs	585.00	Tommy Smith..... 1 char cow..... 1260 lbs	46.00	Eddie Knight..... 1 wf cow..... 1225 lbs	39.75
thony Martinez..... 32 rd, rdwl cows, solid..... 1170 lbs	575.00	Andrew Walter..... 1 black cow..... 1475 lbs	43.25	David Eastley..... 1 mol cow..... 1645 lbs	39.50
thony Martinez..... 10 wf cows, solid..... 1155 lbs	500.00	George Hackel..... 1 black cow..... 1185 lbs	43.00	Gale Tempel..... 3 wf cows..... 1140 lbs	38.75
thony Martinez..... 20 mol cows, broken..... 1120 lbs	480.00	Charlie Strasia..... 5 wf cows..... 1370 lbs	42.50	Helen Moore..... 1 black cow..... 1510 lbs	38.75
om Kuykendal..... 1 mol cow..... 1170 lbs	46.00	F.D. Owens..... 1 red cow..... 1155 lbs	40.25	Betty Eacret..... 2 mix cows..... 975 lbs	38.50
erizo Ranch..... 11 wf cows..... 1080 lbs	37.75	Smith Ranch..... 2 char cows..... 1215 lbs	37.50	Corpus Gallegos..... 7 mix cows..... 1020 lbs	35.00
land Hoch..... 3 bl, bwl cows..... 1095 lbs	37.75	Patrick Montoya..... 3 mix cows..... 1120 lbs	37.25	Max Vezzani..... 4 mix cows..... 1115 lbs	34.50
ren Tempel..... 2 wf cows..... 1390 lbs	37.75	Wayne Kreutzer..... 22 wf cow..... 955 lbs	35.00	Betty Bevans..... 11 sim x cows..... 1170 lbs	34.00

ESTIMATE 4000 CALVES MONDAY, OCTOBER 10TH FOR OUR FIRST SUPER SERIES CALF SALE!

average cost of production

From Mayan
per head

150 head

at

1030 cow weight

510 at \$67.25 currency

at

1170

553 at \$5.00

at

1320

576 at \$1

Sales

34,297

From Revenue

34,257

Direct Cost

Insurance
Feed in Mexico City
5 months at

28 body weight at \$65.00

165. needed
2,090 each

x 65

1/10,012. Local feed

From Mayan

24,255

or
From Mayan per head
2421

245

24,538

23,486

234

\$11,407

\$12,870

3510 each

3960 each

35,945

36,356

35,945

36,356

THE EFFECTS OF WEANING WEIGHT ON GROSS MARGIN

	1000 LB. COW VS.	1200 LB. COW VS.	1300 LB. COW
100 HEAD STRAIGHT BREAD COWS			
Average Weaning Weights (50% of cows weight)	500	600	675
Sell Prices			
Average Steer/Heifer price	\$105.00	\$93.00	\$87.50

ENTERPRISE GROSS MARGIN

Sales	52,500	55,880	59,063
Change in Inventory	—	—	—
Purchases	—	—	—
Gross Revenue	52,500	55,880	59,063
Direct Cost:			
Feed	9,750	11,700	13,163
(Winter, 5 months at 2% body weight) (at \$65.00/ton)	<i>5 months x (.02 x 500 body weight) x 65.00</i> 3250		
Gross Margin	42,750	44,100	45,900
Gross Margin/Head	427.00	441.00	459.00
Difference	—	14.00	32.00

EXERCISE

Identifying the most efficient cows in your herd is a difficult task since the bigger, heavier milking cows that tend to wean the growthier, heavier calves also have higher maintenance and feed requirements. These increases in output affect both pasture stocking rates and harvested feed requirements. Table 3 shows the projected herd sizes for cows with various mature weights and milk production potentials that could be run on the same feed and pasture resources as 100 head of 1030 lb cows with 18 lb peak milk production. As cow size and/or milk production increases, the herd size supported by the same feed resources decreases. If reproductive performance is constant, the bigger and heavier milking cows will have to individually wean heavier calves to produce the same total pounds of beef from the feed resource. In other words, the 92 head of 1770 lb cows will have to wean an average of 553 lb/cow to produce the same total weight as the 100 head of 1030 lb cows that weaned 510 lb calves. It should be noted that when calf weight is expressed as a percentage of cow weight, the similar levels of herd production result in quite differing percentages. Using "% of cow weight weaned" as an estimate of efficiency is biased in favor of smaller cows and should be used cautiously, if at all.

not cow heavy heavy calves

what is the problem. do CRU's really

depends on price per lb

Table 3. Impact of Cow Size and Milk on Herd Size and Production^a

Cow Weight	Peak Milk	Herd Size	Calf Wt. ^b	% of Cow Wt. ^b
1030	18	100	510 <i>.65</i>	49.5
1170	18	92	553 <i>.67</i>	47.3
1320	18	86	596 <i>.69</i>	45.2
1170	24	84	605	51.7
1320	24	79	646	48.9

*65
321.5
270
411*

^aAdapted from Fox, 1988

^bNeeded to equal production from 100 cow herd of 1030 lb cows weaning 510 lb calves. Assumes 90% calf crop for all weights and levels of milk.

2/12/88

Review

1. List all the CRMS diagnostic and monitoring tools for financial, forage and livestock management. How do you plan to use these in the management of your ranch.

2. Explain the FIO principle to your Forest Ranger.

3. Explain why continuous grazing with low stocking rates results in high animal performance.

Explain how increasing the stocking rate increased the risk of damaging the forage resource.

4. You have been asked to be the featured speaker at the Annual Banquet of Environmentalist International. Explain to them, using CRMS principles and using the 4 ecosystem components, how your grazing management on the National Forest is protecting the riparian areas and improving the Watershed.

5. Develop a 15 minute presentation in which you effectively teach all the major CRMS principles to your business partner.

all the factors
Balance of the system
forage - animals
financial

Percent Return on Investment^a from Combinations of Mature Size for Two Breeding Systems Under a Pasture Program

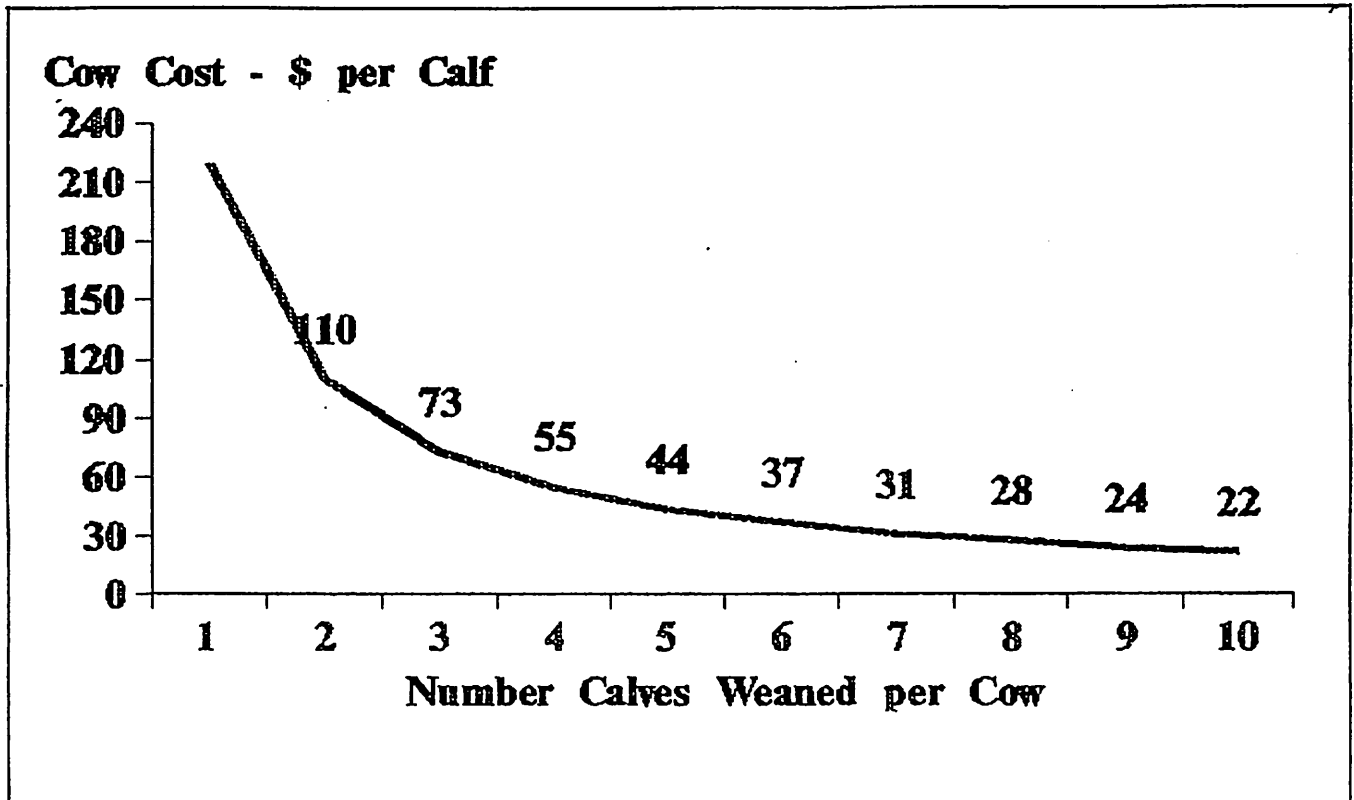
Breeding System and Size of Sire	Size of Cow		
	Small	Medium	Large
<i>Crossbreeding</i>			
Small	15.9%	15.9%	15.0%
Medium	16.7	16.6	15.4
Large	17.7	17.4	16.0
<i>Straightbreeding</i>	14.8	14.9	14.9

^aReturn on investment is defined as total income less expenses, other than interest; it is expressed as a percentage of total expenditures other than interest.

Source: J. Anim. Sci. 41: 1,238.

Cross bred cows perform better

THE IMPORTANCE OF LONGEVITY



Cost of owning cow = \$220

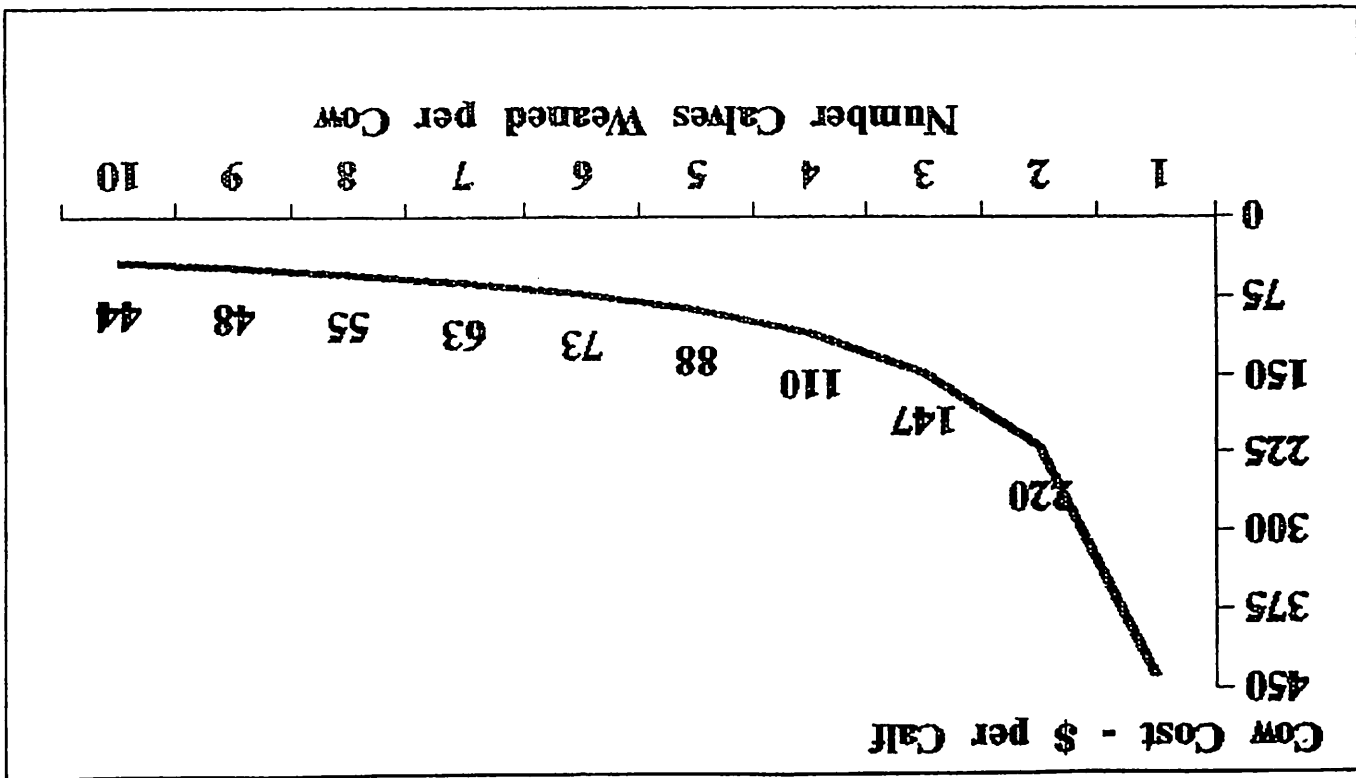
Based on:

Purchase \$800 - Salvage \$600 = \$200 depreciation

Interest @ 10% 20

Total cost over lifetime \$220

THE IMPORTANCE OF LONGEVITY



Cost of owning cow = \$440

Based on:

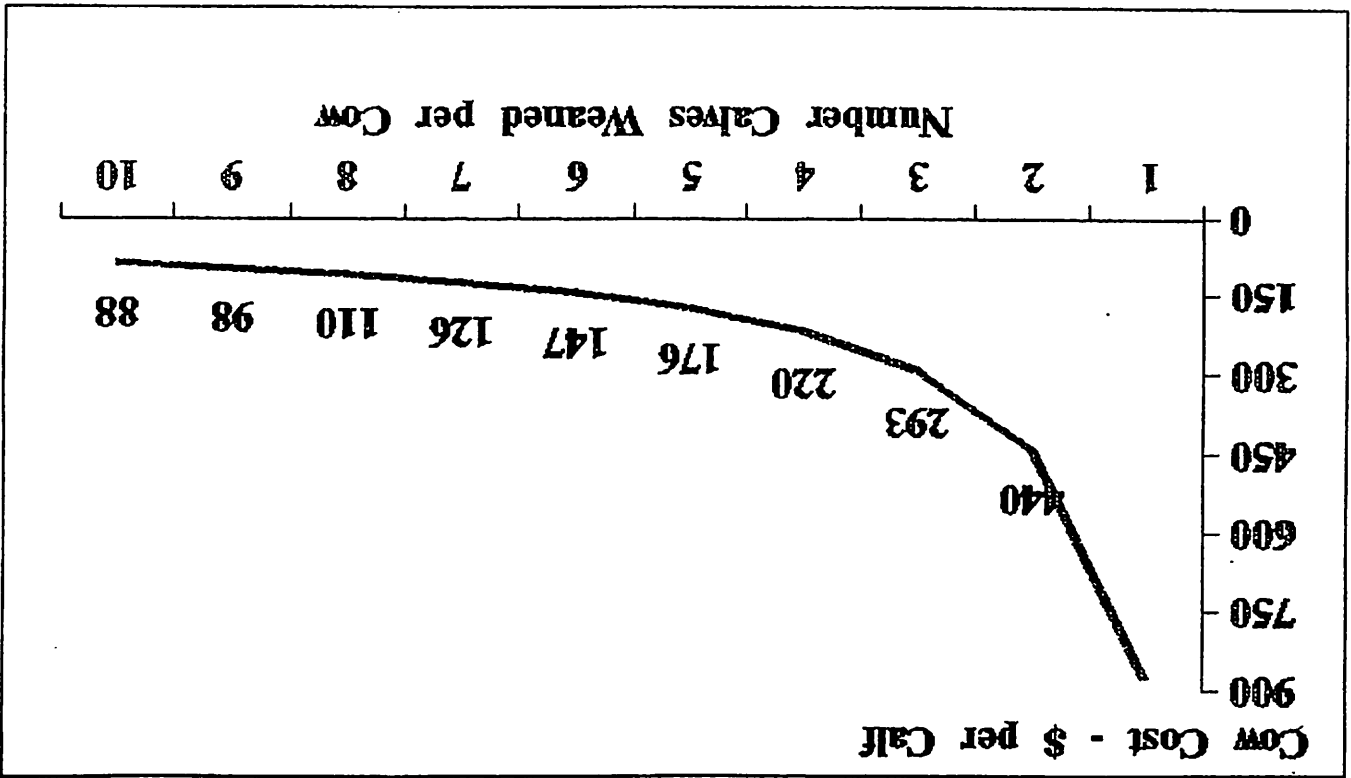
Purchase \$800 - Salvage \$400 = depreciation

Interest @ 10%

40

Total cost over Lifetime \$440

THE IMPORTANCE OF LONGEVITY



Cost of owning cow = \$880

Based on:

Purchase \$800, cow dies so no salvage = \$800 depreciation

Interest @ 10%

80

Total cost over lifetime

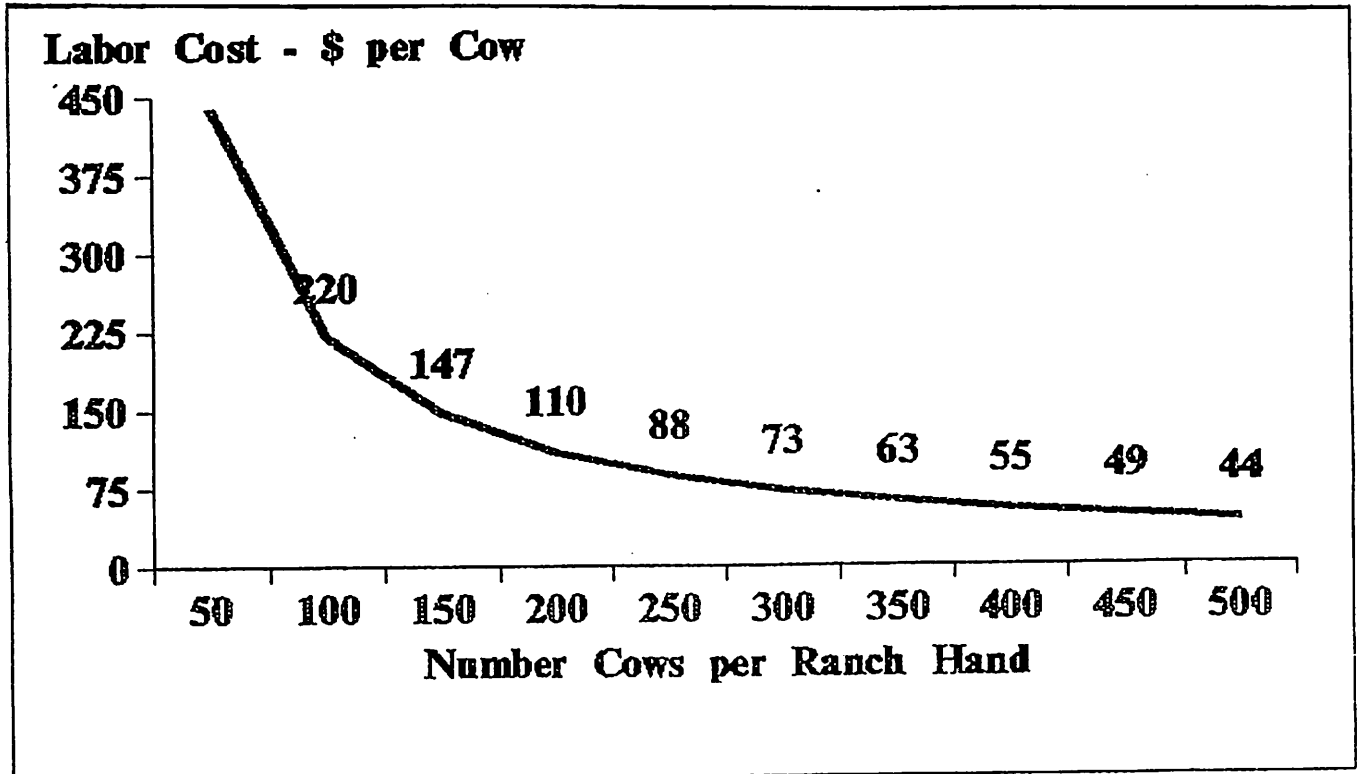
\$880

HERD REPRODUCTION PERFORMANCE/CLASS

Here

	PREGNANCY %	CALVING %	WEANING %	WEANING WEIGHT
COWS	<u>95</u>	<u>90</u>	<u>90</u>	<u>500</u>
H2	<u>85</u>	<u>90</u>	<u>85</u>	<u>475</u>
H1	<u>92</u>	<u>80</u>	<u>75</u>	<u>450</u>

LABOR COST PER COW



But can they handle

Labor cost = \$22,000 per person

Based on:

Monthly wage @ \$1000	= \$12,000
FICA, Workman Comp. etc. @ 25%	= 3,000
Housing	= 2,500
Utilities	= 1,500
Truck	= 1,500
Incentive	= <u>1,500</u>
Total	\$22,000

FEBRUARY VS. MAY CALVING
THE B LAZY M RANCH

	CALVING IN FEBRUARY	CALVING IN MAY
Weaning Weights		
Steers	500	400
Heifers	475	375
Sell Prices		
Steers	\$0.93	\$1.16
Heifers	\$0.85	\$0.96

ENTERPRISE GROSS MARGIN

SALES	\$39,093	\$37,080
CHANGE IN INVENTORY	-	-
PURCHASES	-	-
GROSS REVENUE	\$39,093	\$37,080
DIRECT COSTS:		
FEED	\$18,900	\$14,700
GROSS MARGIN	\$20,193	\$22,380
GROSS MARGIN/HEAD	\$202.100 <i>head</i>	\$224 <i>100 head</i>

Enterprise Budget Analysis of Revenues and Costs on a \$/Cow Basis for 227-Cow Herd in Great Plains Area

Calving Season	Weaning Age (mos)	Total Returns (per cow)	Total Variable Costs (per cow)	Returns over Variable Costs (per cow)	Total Costs (per cow) ^a	Net Returns (per cow)
Jan.-Mar.	6	\$367.56	\$231.77	\$135.79	\$334.57	\$33.00
	7	383.16	233.18	199.99	335.97	47.19
	8	389.77	235.77	154.01	338.56	51.21
Season Average		380.16	233.57	163.26	336.37	43.80
Feb.-Apr.	6	367.81	222.70	145.11	325.50	42.31
	7	380.62	224.46	156.16	327.25	53.37
	8	391.57	227.15	164.41	329.94	61.62
Season Average		380.00	224.77	155.23	327.56	52.43
Mar.-May	6	360.04	212.09	147.96	314.88	45.16
	7	376.40	215.28	161.13	318.07	58.33
	8	387.79	218.49	169.30	321.28	66.51
Season Average		374.74	215.29	159.46	318.08	56.67
Total season average		378.30	224.54	159.32	327.34	50.97

^aIncludes an ownership cost of \$102.79 per cow.
 Source: Cattle Guard, July 1986.

REPLACEMENT HEIFER COSTS

QUESTION: How much do you have invested in a replacement heifer by the time she is bred to have her second calf?

	<u>PER HEAD</u>	<u>PER 100 HEAD</u>
	\$ 500.00	\$ 50,000.00
Value of heifer calf in fall		
12 months interest @ 10%	50.00	5,000.00
Breeding cost	30.00	3,000.00
Other direct cash cost	300.00	30,000.00
Investment to date		88,000.00
3% death loss first year		
Investment per head in remaining 97	907.00	

Sell 5 empties in fall @ \$700		- 3,500.00
--------------------------------	--	------------

	<u>PER HEAD</u>	<u>PER 92 HEAD</u>
Investment on remaining 92 head of yearling bred heifers	918.00	84,500.00
12 months interest @ 10%	92.00	8,450.00
Annual cash cost and calving expense	300.00	27,600.00
Sell 8 dries (8% death on calves)	- 650.00	- 5,200.00
Breeding cost on 82 head	30.00	2,460.00
Sell 82 calves @ \$450	- 450.00	- 36,900.00
Sell 7 empties in fall @ \$650	- 650.00	- 4,550.00
Investment to date		76,360.00
2 heifers die		
Investment per head on remaining 75 bred for 2nd time after 2 years ownership	1,018.00	

REPLACEMENT HEIFER COSTS

QUESTION: How much do you have invested in a replacement heifer by the time she is bred to have her second calf?

Saving over replacement

	<u>PER HEAD</u>	<u>PER 100 HEAD</u>
Value of heifer calf in fall <i>\$300/head x 100 = 30,000</i>	<u>300</u>	<u>30,000</u>
12 months interest @ <u>.19</u> %	<u>27</u>	<u>2,700</u>
Breeding cost	<u>22</u>	<u>2,200</u>
Other direct cash cost	<u>250</u>	<u>25,000</u>
Investment to date	<u>599</u>	<u>59,900</u>
<u>5</u> % death loss first year		
Investment per head in remaining _____	<u>630.5</u>	<u>63,000</u>
Sell <u>10</u> empties in fall @ \$ <u>5.28</u> <i>85% of 100 = 85, 900 lbs</i>	<u>522</u> <i>credit</i>	<u>(-5,280)</u>
Investment on remaining <u>85</u> head of yearling bred heifers	<u>643</u>	
12 months interest @ <u>.9</u> %	<u>58.1</u>	<u>4,921</u>
Annual cash cost and calving expense	<u>250</u> <i>no calving</i>	<u>21,250</u>
Sell <u>5</u> dries (<u> </u> % death on calves) <i>add 1000 lbs @ .54 = 540</i>		<u>(-2,700)</u>
Breeding cost on <u>80</u> head	<u>22</u>	<u>1,760</u>
Sell <u>80</u> calves @ \$ <u>2.835</u> <i>4.50</i>	<u>(283.50)</u>	<u>(22,680)</u>
Sell <u>7</u> empties in fall @ \$ <u>64.46</u> <i>add 1000 @ .54 = 540</i>	<u>460</u>	<u>3,220</u>
	<u>739.98</u>	<u>5,411</u>
Investment to date		
_____ heifers die		
Investment per head on remaining _____ bred for 2nd time after 2 years ownership		

about it takes a case
cost to you for saving heifer
at time of 2nd conception
can buy at \$700-\$900

LOWERING PRODUCTION COSTS: INVESTIGATING THE OPTIMUM USE OF BULL POWER

By Garth Boyd
From: Beef Sciences Newsletter
September/October 1990

What bull to female ratio do you use during the breeding season; 1:15, 1:20, 1:25, 1:30? Would you think I was a raving lunatic if I proposed 1:50 on both synchronized and naturally cycling heifers? Well, Terry Carlstrom, manager of Noffsinger Ranches in North Park probably thought I was, but, in spite of that Colorado State University and Noffsinger Ranches did a large scale cooperative project this past summer, the results of which show promise for a simple way of lowering production costs for cow/calf producers in this country. To determine bull power required, 800 heifers owned by Noffsinger ranches were divided into four experimental groups (see figure 1). Each group was replicated for a total of eight groups. The experimental groups were non-synchronized heifers with two bulls per 100 heifers (the control; 1 to 50 bull-to-female ratio); synchronized with two bulls per 100 heifers (1:50); synchronized with four bulls per 100 heifers (1:25); and synchronized with six bulls per 100 heifers (1:16).

Six weeks before the breeding season, 900 crossbred yearling heifers underwent reproductive soundness examinations that included an evaluation of body condition, reproductive tract, and pelvic area size. Selected heifers (800 head) showed average or above body condition, weighing an average of 730 pounds, and were sexually mature with an average pelvic area of 164 cm.

The bulls in the test were polled or dehorned (to reduce social dominance) mature, experienced two to three year old. Their average scrotal circumference was 35.5 cm with 80% or greater normal sperm count.

Six hundred heifers were synchronized with a 33-day MGA-Lutalyse synchronization program. Breeding season began on the day of injection of 25 mg of Lutalyse. Cattle were placed in eight different inter-mountain pastures ranging in size from 80 to 300 acres. Terrain varied from meadows to steep hills, with vegetation including partially irrigated meadow grasses, sagebrush, willow thickets, and aspen groves. Total length of the breeding season was 28 days. Pastures were ridden daily to ensure the bulls stayed in their intended pasture.

Because heifer pregnancy rate and conception date are the primary way to measure bull fertility, each heifer was examined for pregnancy and age of fetus 30 days after the end of the breeding season. Ultrasound was used on the heifers if there was any doubt as to pregnancy status.

We were somewhat surprised by the outcome of this research because there was little difference between the control and synchronized groups. Eighty-two percent of the heifers in the control group (1 bull to 50 females) were pregnant after 28 days (Figure 2). However, it appears there is a limit to how far bulls can be extended when utilizing synchronization. The two bulls per 100 synchronized heifer group had a 77% pregnancy rate, 5% less than treatment 1. Most likely the tightly synchronized heat put too much pressure on the bulls as they were unable to fully cover the heifers. Furthermore, it is interesting to note that there was no difference in average day of conception between 1 and 2. Normally one would expect synchronized heifers to have about a 5 day advantage in average day of conception, due to a high percentage of heifers showing heat and conceiving in the first 6 days of the breeding season. However, this advantage was not seen in this study, as the non-synchronized heifers essentially behaved as if they were synchronized, with 40% of the non-synchronized heifers conceiving in this time period, compared to 38% of the synchronized heifers at the same bull to female ratio.

How much bull power is required for synchronized heifers? Without considering costs, the answer seems to be advantage in the average day of conception, compared to the bull to female ratio of 1:25 (83% pregnancy rate). There was a drop off in pregnancy rate (77%) with a 1:50 bull to female ratio.

Although the pregnancy rates were similar across treatments, the costs for achieving a pregnant heifer varied greatly. Estimated cost per pregnant heifer for the control group of 1 bull to 50 heifers was \$13.78; for the moderate bull to female ratio of 1:25 that were estrous synchronized, the cost nearly doubled that of the control group or \$27.23. In the synchronized, high bull to female ratio group of 1 bull to 16.6 females, the cost was nearly three times more than the control group or \$42.04 per pregnant heifer.

This study underlines the need for ranchers to make sure their heifers are in good body condition and ready to breed before they turn them out with bulls. By the same token, bulls should be in good condition and checked for reproductive soundness before the breeding season. If these criteria are met most ranchers could reduce the size of their bull battery, maintain their herds productivity and improve their economic efficiency without any additional cash outlay.

Design of bull power experiment.

Non-synchronized		Synchronized			
Trt. 1	Trt. 2	Trt. 3	Trt. 4		
Pasture 1 2 Bulls 100 Heifers	Pasture 3 2 Bulls 100 Heifers	Pasture 5 4 Bulls 100 Heifers	Pasture 7 6 Bulls 100 Heifers	Pasture 2 2 Bulls 100 Heifers	Pasture 4 2 Bulls 100 Heifers
Pasture 2 2 Bulls 100 Heifers	Pasture 4 2 Bulls 100 Heifers	Pasture 6 4 Bulls 100 Heifers	Pasture 8 6 Bulls 100 Heifers	Internountain pasture size ranged from 80-300 acres.	

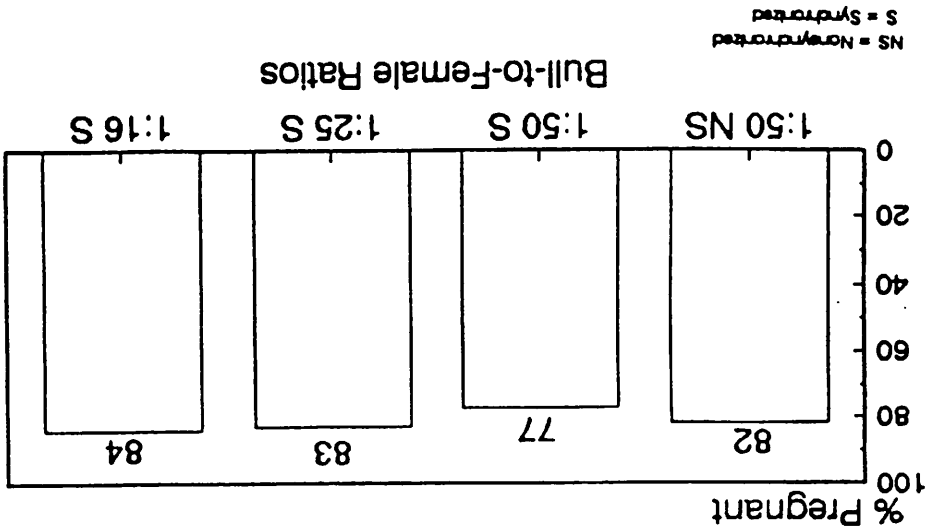


Figure 2. Pregnancy results by different bull-to-female ratios.

EFFECT OF BULL:COW RATIO ON GROSS MARGIN AND CASH FLOW

BULL POWER - What is the potential financial impact of lowering bull numbers?

Rancher Bravo learned at Colorado Ranch Management School that bulls have the physical capacity to serve 50 or more cows in a breeding season. He currently runs 25 bulls with his 400 cows and heifers (1:16).

There are a number of constraints on this mountain ranch, because of which, he is uncomfortable running one bull to 50 cows. With this new information, however, he feels confident that running one bull to 30 cows (1:30 or 13 bulls) will give him the same level of production as his current ratio of 1:16.

At the beginning of the current fiscal year, he fertility tests all 25 bulls and sells 12 of the older, less fertile ones at the local auction. He nets \$800 per bull.

Following is his current financial projections for the coming fiscal year before the change described above and for two years down the road after the change when inventory numbers have stabilized.

Question 1: How does this change influence enterprise profitability?

	<u>THIS YEAR BEFORE</u>	<u>THIS YEAR AFTER</u>	<u>TWO YEARS AFTER</u>
Buys bulls for \$1,200 each	5	0	3
Sells bulls for \$800 each	5	12	3
Inventory value of bulls	\$ 800	\$ 800	\$ 800
Number of breeding animals	425		413
Total Gross Product	\$ 159,875		\$ 160,675
Direct Cost Per Head	\$ 235		\$ 235
Total Direct Cost	\$ 99,875		\$ 97,055
Total Gross Margin	\$60,000		\$63,620
Gross Margin Per Unit	\$141		\$154

Therefore, profitability of the cow-calf enterprise increased by \$13.00 per head, yielding \$3,620 more gross margin to contribute to overheads. This was accomplished mostly by reducing costs.

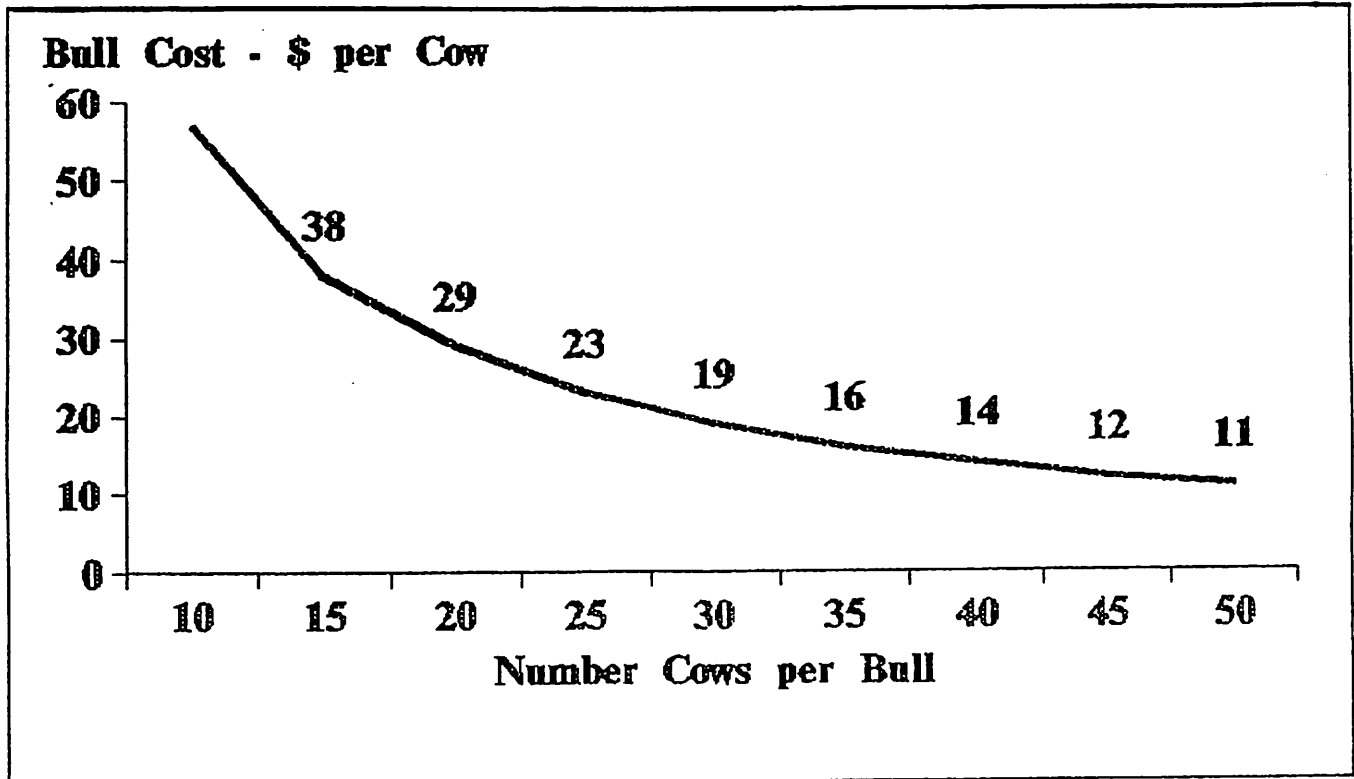
EFFECT OF BULL:COW RATIO ON GROSS MARGIN AND CASH FLOW (CONTD.)

QUESTION 2: How does this change influence this year's cash position?

1.	Extra cash income	
	Sells 7 extra bulls at \$800	+ 5,600
2.	Reduced cash outflow	
	Doesn't buy 5 new bulls	+ 6,000
	Saves direct cost on 12 head	+ 2,820
3.	Reduced cash income by changing	0
4.	Extra cash expense by changing	0
5.	Net cash position	+ 14,420

QUESTION 3: Rancher Bravo decides to buy 12 new cows to replace the 12 bulls he once ran. From a profitability stand point, how much additional total margin will he have to contribute to overheads and profit by making this change?

EFFECT OF BULL:COW RATIO ON CASH COST



Bull cost per year = \$572

Based on:

Purchase \$1800 - Salvage \$900 ÷ 3 years life = \$300 depreciation

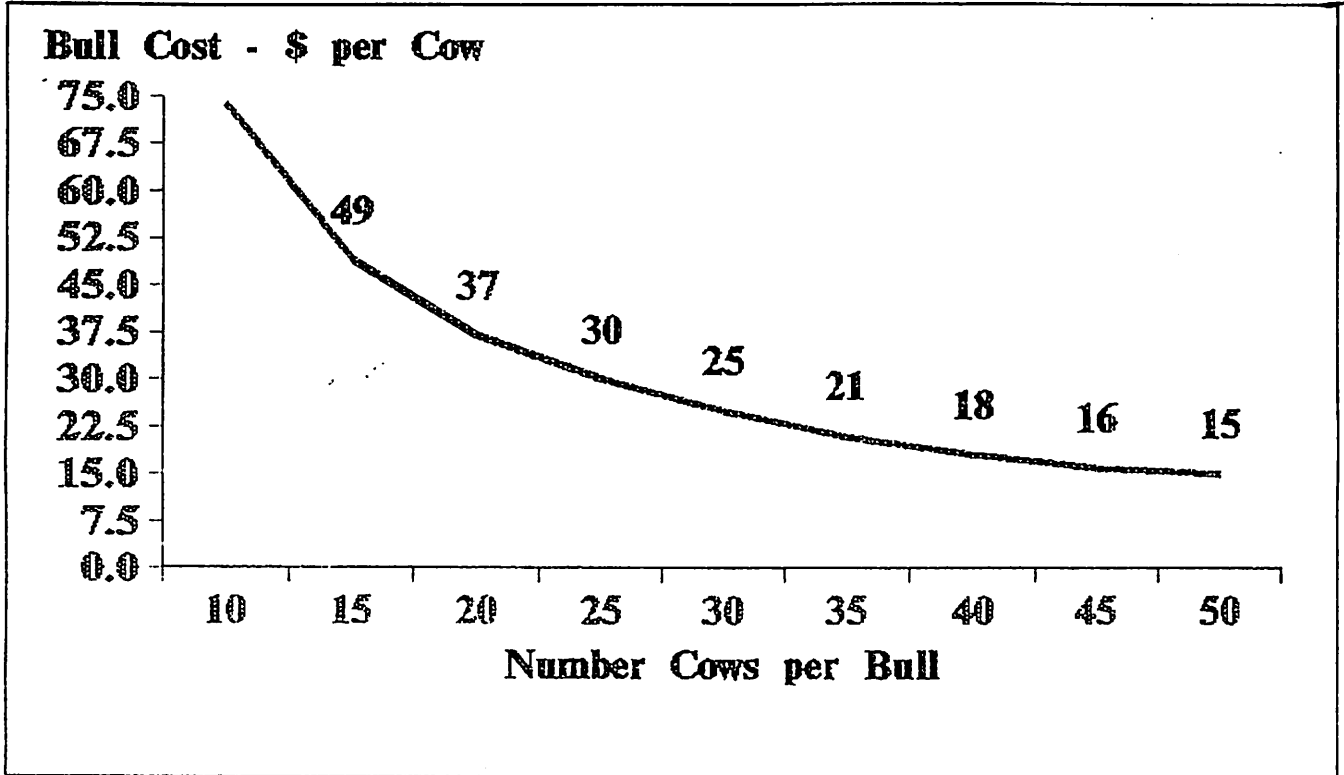
3 tons hay @ \$60 + \$20 supplement and mineral = 200 feed

Vaccinations and fertility test = 20 vet
\$520

Interest @ 10% 52

Total yearly cost \$572

EFFECT OF BULL:COW RATIO ON CASH COST



Bull cost per year = \$740

Based on:

Purchase \$2300	- Salvage \$1000	÷ 3.5 years life	= \$371 depreciation
Annual cow feed cost of \$225	× 125%		= 281 feed
Vaccination and fertility test			= 20 vet
Interest @ 10%			<u>68</u>
Total yearly cost			\$740

FEWER BULLS IN ROUGH TERRAIN DIDN'T DECREASE HERD REPRODUCTIVE PERFORMANCE

Twin Buttes Ranch in North West Colorado, is a real life Ranch Bravo. The Robertson family owns and operates this ranch. They decided to experiment with different bull to cow ratios even though they run an extensive range operation in rough terrain. The Robertson are Colorado IRM Cooperators and the following text is excerpted from a CSU Beef Program Report article, written by Boyd and others, which reports the results to date of this on-ranch experiment.

Twin Buttes Ranch is range country located 30 miles south of Rangely, Colorado. They run about 1000 cows on approximately 165,000 acres. Much of the acreage is a large BLM allotment used for both summer and winter grazing.

For the first 10 to 20 days of the breeding season the cattle are concentrated in hay meadows, but soon move to oak-brush covered hillslides and then into forested mountain country. Water sources are numerous throughout the summer range. The problem of having enough bulls to find the cows in this terrain is always compounded by the problem of bulls dying or becoming injured during the breeding season. Like most range operators, the Robertsons have historically run one bull for every 16 to 18 cows.

Working with the Colorado IRM team, the Robertsons ranch-tested (kind of like the test of fire) a bull to cow ratio of 1:16 to a ratio of 1:24. The ranch offered the perfect test situation because the herd is split in half during the breeding season each year, due to the geography of the range and grazing management.

During the 1990 breeding season, approximately 500 cows on the west side of the ranch had one bull to 16 cows. On the east side, they ran one bull to 24 cows. The west herd, 1:16 east herd). All bulls were required to pass a breeding soundness exam within 3 weeks of turnout.

Pregnancy rate and date of conception were determined in mid October each year. You can see in Figure 1 that there was virtually no difference in pregnancy rate. Neither was there a difference in conception date, and of the cows that became pregnant, 97% to 98% bred in 60 days. This management change reduced the Robertson's cow cost by \$11.97 per head and they need 21 fewer bulls.

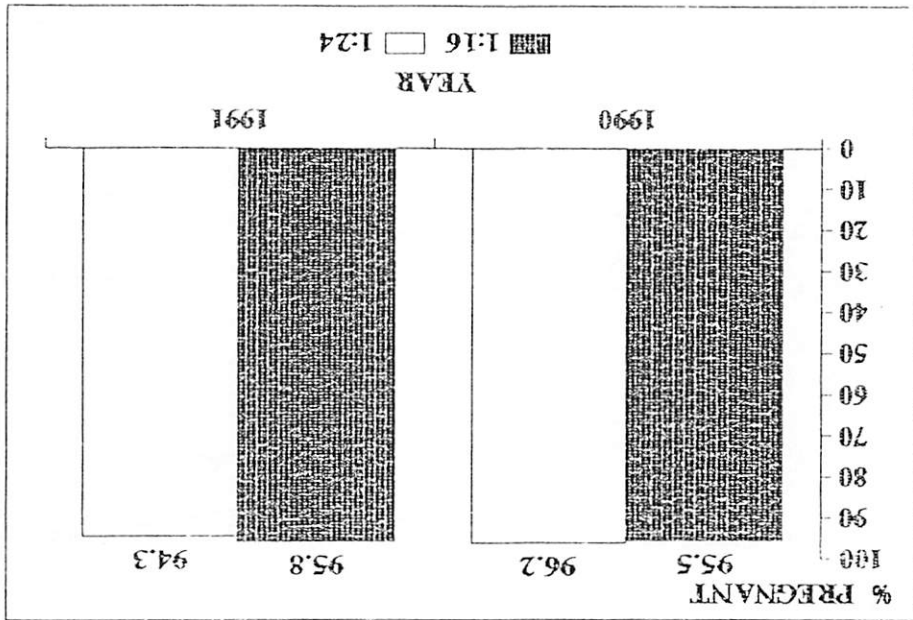


Figure 1: Pregnancy rate by year for different bull to cow ratios -Twin Buttes Ranch

Refer again to Animal Management exercise #6, Bull Power, and to the Breakthrough vs. Efficiency chart on bull cost per cows. What is your current bull to cow ratio? What is your rationale for this management decision? Where does it fit on the chart, in the breakthrough area or the efficiency area? How does the size of your operation influence the significance of bull to cow ratio? If this is an important management decision for you to consider changing, complete the remainder of this page.

1. Where am I now:
2. Where I would like to be: by when:
3. Possible benefit to me:
4. My worries are:
5. My first step in answering my worries is:
6. My first step in implementing this change is:
7. I will monitor the results by:

ANIMAL MANAGEMENT EXERCISE #1

Using Inexpensive Forage Resources

Read the following scenario, and do the exercise in your group.

Rancher: Come take a look at my cows; they are looking a little thin. When I counted my remaining hay inventory yesterday, I realized they are eating quite a bit less than I expected them to eat. They are just starting to calve, and some of the calves aren't too vigorous.

Advisor: How much are they eating?

Rancher: Well, I figured they would eat about 25 to 30 pounds per day. I knew they weren't cleaning up, so I cut back. Now that I figured it up for the last 40 days, they have only been eating about 15 to 18 pounds per head per day. I think I might start feeding them some corn.

Advisor: Let's have a look.

P.
2.6

OBSERVATIONS:	Cow size:	1,150 lb.
	Body Condition Score:	4 average, some 3 and some 5
	Appearance:	listless, drawn
	Diet:	2/3 grass hay (8% CP, 55% TDN) 1/3 straw (3% CP, 48% TDN) Free choice mineral mix

Advisor: What did you have them on before you started this diet?

Rancher: Well, I had them grazing my hay meadow (stubble) that would have been mid-December or early January. Before that, about the first of November, I had them on alfalfa stubble after it had frozen real good so there was no chance of bloat or nitrate poisoning.

Advisor: Were you feeding them anything else during that time?

Rancher: Mineral

ASSIGNMENT

Assess the situation, and discuss it in your group. Decide, in principle, what strategy you would suggest to the rancher for:

- 1) Current situation
- 2) A similar grazing strategy next fall

ANIMAL MANAGEMENT EXERCISE #2

Breeding Season

Read the following scenario, and do the exercise in your group.

Rancher: I am due to start breeding these cows in about three weeks, and I just haven't seen any of them cycling. Most of them calved more than 40 days ago, and I sure expected some of them to be in heat by now. I am thinking about getting some protein cubes for them and wondered if you could tell me how much to feed.

Advisor: They are mostly in body score 4 to 5, which is acceptable for this stage of production. These cows are pretty big and have big calves on them too. How much would you say the cows weigh?

Rancher: About 1,350 to 1,400 lb. average.

Advisor: What are you feeding them?

Rancher: Diet per cow, per day is:

- 15 lbs. oat hay (9% CP, 55% TDN)
- 10 lbs. grass hay (8% CP, 55% TDN)
- 10 lbs. alfalfa hay (16% CP, 58% TDN)
- 1.5 lbs. liquid supplement ("X" brand)

Advisor: What is in that "X" brand liquid supplement?

Rancher: I don't know, but it looks a lot better than "Y" brand, so I thought I would give it a try.

Advisor: I am not familiar with "X" either. Usually the liquid supplements have a combination of natural protein and non-protein nitrogen, and the contents usually provide some readily available energy. They are around 60% dry matter, give or take. How much of that did you say they are eating?

Rancher: A pound and a half.

ASSIGNMENT

Discuss this scenario in your group. Reach a consensus, in principle, of how you would respond to the rancher's initial question (how much protein cube to feed) and to his initial need (to get the cows to start cycling). As the rancher's advisor, is there anything else you would discuss with him on the issue of nutrition/reproduction/profitability. Prepare a five minute presentation on your flip chart to give to the class.

ANIMAL MANAGEMENT EXERCISE #3**Balancing Cow Needs and Feed Resources Economically**

Read the following scenario, and complete the exercise in your group.

Observation on cattle:

- Calving starts in two weeks
- Currently grazing winter range and receiving 2 lbs. 37% protein cube
- Mature cows mostly in body condition score 5, some 4
- Younger cows mostly in body condition score 4 some 3
- Cow size 1,050 to 1,150 lbs. (Requirements for 1,100 lb. cow, average milking: CP-2 lbs/day with 9.4% in diet; TDN 12 lbs/day)

Resources available:

- Winter range is now used up
- Standing forage in hay meadow (8" plus, regrowth from last fall estimated 4% CP, 52% TDN: Ample forage available for part of herd through the entire calving season or all of herd for part of calving season.)

Supplements/substitutes available:

- Alfalfa hay at \$85 per ton (20% CP, 58% TDN)
- Grass hay at \$70 per ton (9.5% CP, 55% TDN)
- Whole corn at \$160 per ton, delivered (10% CP, 90% TDN)
- 12.5% CP cake at \$190 per ton (80% TDN)
- 20% CP cake at \$210 per ton (80% TDN)
- 37% CP cake at \$270 per ton (80% TDN)

ASSIGNMENT

Discuss with your group the strategy you would take in the feeding program for this herd through the calving season. The following questions might be helpful in guiding your discussion.

- Do all cows in the herd have the same nutritional needs right now?
- How can the standing forage best be used?
- How can complete feeding best be used?
- How can supplementation best be used?
- With each possible scenario you establish, are the protein requirements met with the base diet? Energy?
- Of the supplements, which is the cheapest source of protein? Energy?

SOLUTION SHEET**ANIMAL MANAGEMENT EXERCISE #1**

In principle, cows have been protein deficient all fall and winter, and they do not have the rumen microbial population to handle the roughage. Ability to digest the forage decreases, rate of passage slows, intake decreases, available nutrients decreases and performance decreases. They need increased quality diet with increased protein and some energy until back on tract. Cows need appropriate protein supplementation throughout the fall next year as they graze low-quality clean-up forage.

ANIMAL MANAGEMENT EXERCISE #2

In principle, protein is not lacking nor is dry matter intake for energy. However, because of the tremendous nutrient demand of such large, heavy milking cows, an energy flush might speed up re-breeding. A high-energy supplement such as corn, fed at .4% of body weight (five to six pounds per head, per day for this size cow) would be the appropriate energy supplement choice.

The liquid supplement, though high in energy, will not benefit the cows because the dry matter intake is only about one pound per day. While the cows would probably benefit from additional bypass protein, NPN will not benefit them at all in this case. Therefore, the liquid supplement probably is not benefitting the cows as a protein supplement either.

For profitability, consider balancing cow size, level of production and production cycle to the feeding environment.

ANIMAL MANAGEMENT EXERCISE #3

Following is one viable approach to the feeding program of this herd through the calving season.

Step 1 - Cow Needs and Base Diet:

The thin, younger cows have different nutritional needs than the older cows which are in adequate condition. The thin cows are obviously not doing very well grazing the low quality winter range diet even though they are getting some supplemental protein. The thin cows would, therefore, benefit greatly by receiving a higher quality and more nutrient dense diet, especially if they are expected to re-breed on schedule.

Conversely, the older cows are capable of holding their own grazing the lower quality forage diet with appropriate supplementation. They are in body score 5 now as calving begins, which is our target to allow good reproductive performance. Therefore, with appropriate supplementation, they will likely perform adequately on the grass pasture carried over from last fall.

Separate the thin cows and feed grass hay as the base diet. The main herd will graze the carry-over grass as their base diet. By separating off part of the herd, there may be enough grass to handle the main herd through this entire period. Strip grazing may ensure better utilization of the grass. When quantity of standing forage becomes limited, the main herd would be changed to grass hay as the base diet also.

Step 2 - Supplementing the Base Diet:

Without crunching exact numbers, we know that the grass pasture is low in protein; so the first thing we must do is meet the protein requirement of the cows with supplemental protein. Once that is done, we can assess the energy provided by the base diet plus the supplement, compare that to the cow requirement and decided if additional energy supplementation is needed.

Likewise, the grass hay is marginal in protein, especially considering that we are playing catch-up with the thin cows. The first step, therefore, is to supplement protein then assess the need for additional energy.

Step 3 - Which Protein Supplement to Use:

Type of protein, economics, convenience and labor required to feed are the considerations in choosing the most appropriate supplement.

Type of Protein: NPN can be considered to supplement the carry-over grass (less than 7% CP). However, natural protein is preferred this close to calving, and this is what we choose to use. We want a combination of bypass protein and rumen degradable protein. All of the supplements we are considering provide both.

Economics: Price per pound of protein

Alfalfa hay -	\$ 85/ton, 90% DM, 20% CP
12.5% cake -	\$190/ton, 90% DM, 12.5% CP
20% cake -	\$210/ton, 90% DM, 20% CP
37% cake -	\$270/ton, 90% DM, 37% CP

Since all have the same dry matter content (90%), we will compare them on an as-fed basis rather than on a dry matter basis.

Alfalfa hay -	2,000 lbs. x 20% CP = 400 lbs. CP: \$85.00 divided by 400 = \$.21/lb. CP
12.5% cake -	2,000 lbs. x 12.5% CP = 250 lbs. CP: \$190.00 divided by 250 = \$.76/lb. CP
20% cake -	2,000 lbs. x 20% CP = 400 lbs. CP: \$210.00 divided by 400 = \$.53/lb. CP
37% cake -	2,000 lbs. x 37% CP = 740 lbs. CP: \$270.00 divided by 740 = \$.36/lb. CP

After considering the convenience and labor factors, alfalfa hay is chosen as the protein supplement.

Final Diet, Mature Cows: Calculations show that 10 lbs. of alfalfa hay is needed to balance the protein requirement. This level of supplementation becomes substitution in that the cows will eat less of the standing forage daily because they are eating so much alfalfa. In this particular case, this plan works well because we are limited on the availability of standing grass anyway. Calculations also show that we are marginal on energy. Because all thin, young cows have been removed from this group and because the winter temperatures are mild, we choose to let the mature cows do without additional energy supplementation. Their appearance and condition will be monitored, and energy will be added if needed.

Final Ration, Young and Thin Cows: Calculations show that 15 lbs. grass hay and 7 lbs. alfalfa meet the protein requirement of this group of cows. Energy is still deficient, however, especially since we want to feed some extra energy to these young, thin cows.

What Energy Supplement Should we Use? Each of the protein cakes will provide about 80% TDN. Obviously then, the lowest priced cake will be the least expensive energy source from the cake choices. Comparing cake to corn:

12.5% cake -	\$190 ton, 90% DM, 80% TDN
Corn -	\$160 ton delivered and stored, 88% DM, 90% TDN

Again, we will disregard the dry matter conversion since they are almost equal.

Cake -	2,000 lbs. x 80% TDN = 1,600 lbs. TDN: \$190.00 divided by 1,600 = \$.12/lb. TDN
Corn -	2,000 lbs. x 90% TDN = 1,800 lbs. TDN: \$160.00 divided by 1,800 = \$.09/lb. TDN

There is no method in place for storing or feeding the whole, bulk corn. Cost of storing the corn has been included in the price, but labor cost to develop storage and to feed back out is not yet included. Sacked corn is considered at \$220/ton, which is \$.12/lb. TDN. Labor will be tight at calving, and calving is rapidly approaching, so the 12.5% cake is chosen as an energy supplement.

The final ration is 15 lbs. grass hay, 5 lbs. alfalfa hay, 3 lbs. 12.5% cake.

The final step is to reconsider if grass hay with 37% CP cake and no alfalfa would more economically meet both the protein and energy requirements. In this case, it did not.

LIVESTOCK RATIONS PREPARED BY LARRY BROWN FOR:

NAME:

DATE: JANUARY, 1991

ANIMAL REQUIREMENTS

DESCRIPTION	DM(lbs)	CP(lbs)	TDN(lbs)
1. THIN COWS ,MILKING	21	2.1	12.9

FEEDS AVAILABLE

DESCRIPTION	%DM	%CP	%TDN	PRICE/TON	PRICE/LB
1. GRASS HAY	0.9	0.095	0.55	70	0.035
2. ALFALFA	0.9	0.2	0.58	85	0.043
3. CORN	0.88	0.1	0.9	220	0.110
4. 12.5% CAKE	0.88	0.125	0.8	190	0.095
5. 37% CAKE	0.88	0.37	0.8	270	0.135

PROPOSED RATION #1

FEED TYPE	lbs FED	DM(lbs)	CP(lbs)	TDN(lbs)	COST/hd/day
1. GRASS HAY	16	14.40	1.37	7.92	0.56
2. ALFALFA	5	4.50	0.90	2.61	0.21
3. CORN	0	0.00	0.00	0.00	0.00
4. 12.5% CAKE	3	2.64	0.33	2.11	0.29
5. 37% CAKE	0	0.00	0.00	0.00	0.00

Total provided by ration 21.54 2.60 12.64 1.06
 Percent of requirement 103 124 98

PROPOSED RATION #2

FEED TYPE	lbs FED	DM(lbs)	CP(lbs)	TDN(lbs)	COST/hd/day
1. GRASS HAY	20	18.00	1.71	9.90	0.70
2. ALFALFA	0	0.00	0.00	0.00	0.00
3. CORN	0	0.00	0.00	0.00	0.00
4. 12.5% CAKE	0	0.00	0.00	0.00	0.00
5. 37% CAKE	4	3.52	1.30	2.82	0.54

Total provided by ration 21.52 3.01 12.72 1.24
 Percent of requirement 102 143 99

PROPOSED RATION #3

FEED TYPE	lbs FED	DM(lbs)	CP(lbs)	TDN(lbs)	COST/hd/day
1. GRASS HAY	15	13.50	1.28	7.43	0.53
2. ALFALFA	5	4.50	0.90	2.61	0.21
3. CORN	3	2.64	0.26	2.38	0.33
4. 12.5% CAKE	0	0.00	0.00	0.00	0.00
5. 37% CAKE	0	0.00	0.00	0.00	0.00

Total provided by ration 20.64 2.45 12.41 1.07
 Percent of requirement 98 117 96

COMMENTS: