



Current Report

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Ranch Calculator (RanchCalc)

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Modern cow/calf operations are highly complex and the addition of a retained ownership phase after weaning further complicates analysis of the economics of multiple enterprises. With constantly changing input and commodity prices, evaluating “what if” propositions may need to be done frequently. Financial analysis to support decision-making requires information from both cash flow and profitability angles. While evaluating the economic effect that a change in even one area (marketing, feeding, stocking density, labor changes, etc.) has on the total operation could be extremely tedious and time consuming. Spreadsheet programs make analysis both simple and quick. **RanchCalc** is a spreadsheet designed at Oklahoma State University to assist the beef manager in planning and analysis.¹ RanchCalc can be downloaded from <http://agecon.okstate.edu/faculty/publications/3397.xlsm>.

RanchCalc can be used to enter cow/calf and stocker information for an individual beef cattle operation. The program calculates net operating returns and annual cash flow for the ranch under different production-marketing alternatives. It is designed to assist in analyzing the economic dimensions of decisions and does not include “checks” on the reasonableness of production decisions such as the feed requirements. More detailed information on production, marketing and risk management in cow/calf operations is available in the Oklahoma Cooperative Extension Services' circular E-913 *Oklahoma Beef Cattle Manual* (Lalman and Doye). RanchCalc example data are based on an Oklahoma spring-calving cow/calf operation with cows maintained on native range—the land base is a combination of rented and owned acres. Steer calves are retained after weaning for grazing on wheat pasture. Some heifer calves are saved for replacement heifers and others are sold at weaning. Yearling heifers use both native range and wheat pasture. This example will demonstrate the use of multiple types of pasture in a retained ownership operation.

Entering Data Into RanchCalc

This software is programmed in MS Excel 2007. Substantial loss of functionality, run-time errors and calculation errors will likely occur if it is run in MS Excel 2003 or earlier version of Excel. Therefore, its use in MS Excel 2003 is not recommended. For the program to function properly, the user must allow the macro features of MS Excel. In MS Excel 2007, the user is prompted with a warning just below the button bar that macros have been disabled. Click on the warning and enable macros.

The spreadsheet contains several worksheets for data entry. Worksheet tabs are: **cows, heifers & bulls; calves; pastures; feed, vet & breeding cost; and overhead & interest**. Data are entered by moving the cursor to a cell and entering the appropriate information. Values generated by the program are protected, so they cannot be accidentally overwritten and the equations erased. Cells for data entry will appear in yellow on the screen. Though the default data is only an example, if you want to preserve it, save a copy of the file on your computer's hard drive before you begin customizing it for your operation. Figures are included in this article to illustrate screens in the spreadsheet.

Cows, Heifers & Bulls

In this worksheet, information is summarized in four tables: *cow, heifer and bull inventory; breeding stock purchases; cull sales; and inventory* (Figure 1). In *cow, heifer, and bull inventory*, the cow herd is represented by three classes: *mature cows, 1st calf heifers, and yearling heifers*—as these are the logical sorts to be made for optimum nutritional management. An additional column allows for the entry of raised and purchased bulls. Producers who raise replacement females or bulls enter the cost of raising females or bulls to the selected stage as its base value. For instance, a raised yearling heifer might have a base value of \$700, a raised 1st calf heifer might have a base value of \$900 and a raised cow might have a base value of \$1,000. When the user enters the number of purchased head, a prompt to enter the purchase price per head and percent financed appear. Other loan terms—interest rate, loan terms, years remaining on the note, and payment frequency—are specified further down in the table.

¹ Software and fact sheet originally developed by Keith Lusby, former OSU Beef Cattle Specialist, and Odell Walker, OSU Agricultural Economics professor emeritus. Enterprise budget software may also be of interest to users (see agecon.okstate.edu/budgets). The enterprise budgets provide more in-depth analysis of individual components of production: cow-calf, stocker, perennial forage, hay, etc.

Cow, heifer, and bull inventory						
	units	Mature cows	1 st Calf heifers	Yearling heifers	Bulls	Totals
Raised	hd	75	25	25	0	xxx
Base value	\$/hd	\$800	\$700	\$600	\$0	xxx
Purchased	hd	0	0	0	3	xxx
% financed	%	0.0%	0.0%	0.0%	50.0%	xxx
Death loss	%	1.0%	1.5%	1.0%	1.0%	xxx
Borrowed	\$/hd	\$0	\$0	\$0	\$1,500	xxx
Wean percentage	%	89.0%	85.0%	xxx	xxx	88% avg
Calves weaned	hd	66.8	21.3	xxx	xxx	88.0
Steers weaned	hd	33.0	10.0	xxx	xxx	43.0
Heifers weaned	hd	33.8	11.3	xxx	xxx	45.0
Heifers retained	hd	25.0	0.0	xxx	xxx	25.0
Initial principal	\$	\$0	\$0	\$0	\$4,500	xxx
Interest rate	%	5.00%	5.00%	5.00%	6.00%	xxx
Loan term	years	4	5	5	5	xxx
Years remaining on loan		3	5	4	4	xxx
Payment frequency		Annually	Annually	Annually	Monthly	xxx
Total annual payments		\$0	\$0	\$0	\$1,044	\$1,044
Total principal, current year		\$0	\$0	\$0	\$845	\$845
Total interest, current year		\$0	\$0	\$0	\$199	\$199

Breeding stock purchases								
	Head	\$/head	Total \$	Percent financed	Interest rate	Month purchased	Downpayment	1st year interest
Mature cows	0	\$900	\$0	0%	4.50%	1	\$0	\$0
1st calf heifers	0	\$1,000	\$0	0%		2	\$0	\$0
Yearling heifers	0	\$1,200	\$0	0%		9	\$0	\$0
Bulls	1	\$5,000	\$5,000	100%	5.25%	4	\$0	\$197
Total purchases	1		\$5,000				\$5,000	\$0

Cull sales						
	# sold	Average weight (lbs)	Average cost basis/base value	Sale price (\$/cwt)	\$/head	Total
Cull cows and 1st calf heifers	14	1,150	\$900	\$46.00	\$529	\$7,406
Cull yearling heifers	5	825	\$800	\$92.00	\$759	\$3,795
Cull bulls	1	1,750	\$1,200	\$60.00	\$1,050	\$1,050
Total sales	20	21,975				\$12,251

Inventory							
	Beginning	Purchased & retained	Sales	Death loss	Net transfers	Ending	Change
Mature cows & 1st calf heifers	100.0	0.0	19.0	1.1	25.0	104.9	4.9
Yearling heifers	25.0	25.0	5.0	0.3	0.0	44.8	19.8
Bulls	3.0	1.0	1.0	0.0	xxx	3.0	0.0

Figure 1. Cows, Heifers & Bulls Worksheet.

Death loss is the percent of deaths expected for that class of livestock. Enter the *weaning percentage* expected for mature cows and 1st calf heifers separately. The number of *calves weaned* is calculated using the weaning percent with the number of cows and heifers in the herd (cow and heifer death losses are assumed to occur before calving). On average, a calf crop is expected to be one-half females and one-half males. The user specifies the number of *steers weaned*, and *heifers weaned* is the calculated remainder. The user enters the number of heifers retained for the breeding herd as this impacts the calf sales figures and ultimately the cash flow summary figures. A pop-up form requires the user to divide the heifers produced into three groups: *heifers sold at weaning*, *heifers retained as stockers* and *heifers retained as replacements*.

Initial principal is calculated based on the purchase price and percent financed entered at the top of the table. The loan terms—*interest rate*, *loan term*, *years remaining on loan*, *payment frequency*—are used to calculate *total annual payments*; *total principal, current year*; and *total interest, current year*.

These numbers then flow automatically to the appropriate sections on the results worksheet.

In the *breeding stock purchases* table, the number of head and purchase prices for *mature cows*, *1st calf heifers*, *yearling heifers* and *bulls* are entered for the year being planned or analyzed.

In the *cull sales* table, the number of *head sold*, *average weight* per head in pounds, *average cost basis/base value* and *sale price (\$/cwt)* are specified for three classes of cattle: *cull cows and 1st calf heifers*, *cull yearling heifers* and *cull bulls*. The *average cost basis/base value* is purchase price minus accumulated depreciation for purchased breeding stock; for raised breeding stock, it is the base value of the animal (the cost of raising the animal to that stage, e.g. mature cow).² Average cost basis is important because it impacts the net income calculation and profitability figures (net income is sales price less the average cost basis or base value). For

² For more information, see AGEC-323, Valuation of Raised Breeding Livestock, <http://pods.dasn.okstate.edu/docushare/dsweb/Get/Document-1940/AGEC-323web.pdf>

cash flow calculations, the dollar value of sales per head, as well as the total for each class of cattle is calculated.

The *inventory* table summarizes changes in number of head in the breeding herd by class of cattle for the analysis period—listing the *beginning inventory, purchased & retained, sales, death loss, net transfers, ending inventory* and the *change* in number of head for the time period. Death loss is the beginning inventory multiplied by the percentage death loss. Net transfers shows the number of females that mature to the next stage. For example, yearling heifer transfers is the sum of the heifers retained from mature cows and first calf heifers minus the beginning inventory of yearling heifers that age to become 1st calf heifers. The final line in the table allows the user to track the ranch’s bull inventory.

Calves

It is anticipated that producers may retain their own calves as stockers, purchase stockers, or have a combination

of retained and purchased stockers. The **calves** worksheet includes two tables: *stocker inventory* and *calf and stocker sales* (Figure 2). If stockers are kept, the *number of head, percent financed, initial weight, initial price* (purchase price for stockers, market price at weaning for retained stockers) is entered along with estimated average daily gain (*ADG*), *death loss*, and *days owned*. Producers retaining their own calves estimate average weight and price per hundredweight for calves at weaning and sell them to their stocker enterprise to permit economic analysis of this production activity. This can be thought of as an internal transfer between ranch enterprises. The sale price is required for the cow/calf enterprise and the purchase price is required for the stocker enterprise.

Two types of purchased stockers are allowed. The two types of stockers can be used to represent two qualities, two genders, two weights or two prices for stockers. Entering a zero in the initial *inventory* line will eliminate a stocker type

Stocker inventory						
		Purchased	Purchased	Retained	Retained	Totals and averages
	units	Stocker 1	Stocker 2	stocker steers	stocker heifers	
Number	hd	150	0	43	0	193
% financed	%	100.0%	0.0%	xxx	xxx	
Initial weight	lbs	500	510	540	510	
Initial price	\$/cwt	\$112.00	\$108.00	\$110.00	\$105.00	
ADG	lb/day	2.00	2.20	2.40	2.20	
Death loss	%	2.0%	1.0%	1.0%	1.0%	
Days owned	days	135	135	180	180	
Borrowed	\$/hd	\$560	\$0	xxx	xxx	\$560 avg
Initial principal	\$	\$84,000	\$0	xxx	xxx	\$84,000
Interest rate	%	6.25%	5.00%	xxx	xxx	6.25% avg
Loan term		135 days	135 days	xxx	xxx	
Years remaining on note				xxx	xxx	
Payment frequency		Annually	Annually	xxx	xxx	
Total annual payments		\$85,942	\$0	xxx	xxx	\$85,942
Total principal current yr		\$84,000	\$0	xxx	xxx	\$84,000
Total interest current year		\$1,942	\$0	xxx	xxx	\$1,942

Calf and stocker sales						
		Head sold	Weight (lbs)	Sale price (\$/cwt)	\$/head	Total
		Calf sales	From cows			
steer calves	0.0		530	\$110.00	\$582	\$0
heifer calves	8.8		502	\$105.00	\$527	\$4,610
From 1st calf heifers						
steer calves	0.0		530	\$110.00	\$583	\$0
heifer calves	7.3		502	\$105.00	\$527	\$3,821
Stocker sales	Retained calves					
	stocker steers	42.6	972	\$89.00	\$865	\$36,826
	stocker heifers	0.0	906	\$86.00	\$779	\$0
	Purchased calves					
	Stocker 1	147.0	770	\$97.00	\$747	\$109,794
	Stocker 2	0.0	807	\$0.00	\$0	\$0
Totals		205.6	162,598	\$95 avg	\$754 avg	\$155,053

Figure 2. Calves Worksheet.

Owned pasture information							
Types	units	Native	Bermuda	Wheat	Native- purch	Fescue	TOTALS
Acres		500	200	0	500	0	1,200
% financed	%	0.0%	75.0%	50.0%	50.0%	50.0%	33% avg
Purchase price	\$/acre	\$500	\$1,200	\$1,000	\$800	\$1,000	\$742 avg
Financed per acre	\$/acre	\$0	\$900	\$500	\$400	\$500	\$2,300
Taxes	\$/acre	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2 avg
Original loan principal	\$	\$0	\$180,000	\$0	\$200,000	\$0	\$380,000
Interest rate	%	5.00%	8.00%	6.00%	5.00%	5.00%	6% avg
Payment frequency		Annually	Annually	Annually	Annually	Annually	
Loan term	years	20	20	15	15	15	
Years remaining on loan		10	10	15	3	10	
Total annual payment	\$/year	\$0	\$18,333	\$0	\$19,268	\$0	\$37,602
Total principal payment	\$/year	\$0	\$8,492	\$0	\$16,645	\$0	\$25,137
Total interest payment	\$/year	\$0	\$9,841	\$0	\$2,624	\$0	\$12,465

Rented pasture information							
Types	units	Native	Bermuda	Wheat	Native- purch	Fescue	TOTALS
Acres		0	0	400	0	0	400
Annual rent per acre	\$/acre	\$12	\$35	\$30	\$14	\$14	\$30 avg
Total rent	\$/year	\$0	\$0	\$12,000	\$0	\$0	\$12,000

Pasture allocation--head grazed on each pasture type (optional)							
Pasture (head)	Mature cows (75)	1st Calf heifers (25)	Yearling heifers (25)	Purchased Stocker 1 (150)	Purchased Stocker 2 (0)	Retained stocker steers (43)	Retained stocker heifers (0)
Native	55	0		0			
Bermuda	0	0	25				
Wheat				150	0	43	0
Native- purch	20	25					
Fescue		0			0		0
Head remaining to allocate	0	0	0	0	0	0	0

Pasture allocation--acres per head (optional)									
Pasture Types	total acres	Mature cows	1st Calf heifers	Yearling heifers	Purchased Stocker 1	Purchased Stocker 2	Retained stocker steers	Retained stocker heifers	Excess/deficit acres
Native	500	9	9	9	0				5
Bermuda	200	6	6	6	0				50
Wheat	400	0		0	2	2	2		14
Native- purch	500	10	10	10					50
Fescue	0								0

Pasture cash expense								
Cash expense	units	Native (500 acres)	Bermuda (200 acres)	Wheat owned (0 acres)	Wheat rented (400 acres)	Native- purch (500 acres)	Fescue (0 acres)	TOTALS
Fertilizer and lime	\$/acre	\$0	\$17	\$45	\$20	\$0	\$0	\$11,400
Tillage	\$/acre		\$0					\$0
Seeding	\$/acre		\$0					\$0
Spraying, burning, other	\$/acre	\$2				\$2		\$2,000
Total per acre	\$/acre	\$2	\$17	\$45	\$20	\$2	\$0	\$8.38 avg
Total for farm	\$	\$1,000	\$3,400	\$0	\$8,000	\$1,000	\$0	\$13,400

Pasture rent and overhead allocation							
	Native (500 acres)	Bermuda (200 acres)	Wheat owned (0 acres)	Wheat rented (400 acres)	Native- purch (500 acres)	Fescue (0 acres)	
Enterprise							
Cow-calf	100%	100%	0%	0%	100%	0%	
Stocker	0%	0%	100%	100%	0%	0%	
Crops and other	0%	0%	0%	0%	0%	100%	
Total	100%	100%	100%	100%	100%	100%	

Figure 3. Pastures Worksheet.

in the analysis, permitting quick evaluation of strategies with and without one or more types. For example, entering a zero for *stocker 1* or *stocker 2* (these labels can be changed) will remove the type from all later cash flow and profitability calculations. Using the specified *percent financed* and *interest rate*, loan values are calculated assuming the loan will be repaid when calves are sold.

Calf and stocker sales are calculated once the *weight* is specified for calves sold at weaning and the *sale prices* are specified for all classes of calves. The number of stocker steers and heifers sold and their sale weights are calculated using the number of stockers, expected death loss, daily gain and length of ownership. Heifer calves retained as breeding replacements are not included in sales values but are included in income calculations.

Pastures

The **pastures** worksheet includes six tables: *owned pasture information*, *rented pasture information*, two *pasture allocation* tables (optional), *pasture cash expense* and *pasture rent and overhead allocation* (Figure 3). In addition to Native, Bermuda and Wheat pasture, users can specify two additional types of owned and/or rented pasture land. For owned pasture land, enter the label (for example, Old World Bluestem or Fescue) in the top row of *owned pasture information*, followed by the number of *acres*, *percent financed*, *purchase price* and *taxes* per acre. The amount *financed per acre* and *original loan principal* will be calculated. Payments per year on the land loan are calculated using the *interest rate*, *payment frequency*, *loan term* and *years remaining on loan* specified by the user.

In *rented pasture information*, enter the number of *acres* and the *annual rent per acre* or be sure that *acres* = 0 for all types of pasture where no land is rented.

In *pasture allocation—head grazed on each pasture type*, enter stocking rate information for all classes of cattle and pasture used. Cattle can use a mixture of the five pastures. The number of cattle of each class should be entered for each pasture type. Be sure all cattle are allocated to a pasture by studying the *head remaining to allocate* row at the bottom of this table. Note that if a specific group of cattle is rotated through several types of pastures the *head remaining to allocate* row may show a negative number. For example, if 100 retained stockers graze out wheat pasture and later are put on summer native pasture, you would enter 100 head in both the Native and Wheat row. Land requirements for the bulls are assumed to be included in the land provided for the cow herd.

In *pasture allocation—acres per head*, the total of all rented and owned land by pasture type is shown at the left side of the table. In the body of the table, stocking rates (acres per head) are specified for the different types of cattle on alternative forages. If the *excess/deficit acres* at the right side of this table are high, cattle numbers, stocking rates or acreage may need to be adjusted. Be sure to delete any stocking rate numbers remaining from previous analysis for classes of animal or pasture that are no longer relevant.

Applicable cash costs per acre for fertilizer and lime, tillage, seeding, weed control, and other are entered in the *pasture cash expense* table under each pasture type. Total cash cost per acre and cost per farm are calculated.

Feed, Vet and Breeding Costs

Two tables are included in this worksheet: *hay and feed costs per head* and *veterinary and miscellaneous expenses* (Figure 4). In *hay and feed costs per head*, the user can enter up to eight feeds or hays. In the example, cubes and hay are included along with salt/minerals. The labels for types of

Hay and feed costs per head																				
		Mature cows (35)		1 st calf Heifers (25)		Yearling heifers (replacements) (25)		Purchased Stocker 1 (150)		Purchased Stocker 2 (0)		Retained stocker steers (14)		Retained stocker heifers (5)		Bulls (5)				
Source	units	\$/unit	lb/day/ hd	days fed	lb/day/ hd	days fed	lb/day/ hd	days fed	lb/day/ hd	days fed	lb/day/ hd	days fed	lb/day/ hd	days fed	lb/day/ hd	days fed	lb/day/ hd	days fed		
cubes 38%	tons	344.00	1	150	0	120	0	120	0	100	5	15	1	3	5	10	2	120		
cubes 20%	tons	274.00			5	60	6	60		100										
prairie hay	tons	55.00	2	80	10	90	5	90	0	125		125	1	125		125	2	120		
alfalfa hay	tons	85.00	0	0	0	90				0		135								
bermuda hay	tons	80.00	2	40			5	90	0	0			15	1						
OWB	tons	60.00							2	135										
pellets	tons	195.00					0	0												
salt/minerals	lbs	0.05	0.25	365	0.25	365	0.25	365	0.02	135	0.25	135	0.25	135	0.25	135	0.25	365		
Total feed cost per head			\$38.33		\$70.78		\$84.62		\$8.25		\$14.72		\$6.38		\$10.42		\$52.81			
Total herd feed cost			\$1,341.46		\$1,769.44		\$2,115.56		\$1,236.87		\$0.00		\$89.26		\$52.11		\$264.04		Total Feed	
Feed cost for:			Cows and heifers				\$5,226.46		Purchased stockers		\$1,236.87		Retained stockers		\$141.38		Bulls		\$264.04	\$6,868.75

Veterinary and miscellaneous expense											
Cost	units	Mature cows	1 st Calf heifers	Yearling heifers	Purchased Stocker 1	Purchased Stocker 2	Retained stocker steers	Retained stocker heifers	Bulls		
Deworm, fly control	\$/hd	\$3.80	\$2.64	\$2.10		\$1.00		\$3.80	\$3.80		
Vaccines, vet, drugs	\$/hd	\$3.00	\$3.00	\$3.00	\$4.59		\$2.00				
Transport	\$/hd				\$5.54						
Marketing	\$/hd	\$0.00	\$0.00	\$0.00							
Property tax	\$/hd										
Other	\$/hd				\$0.00						
Total per head	\$/hd	\$6.80	\$5.64	\$5.10	\$10.13	\$1.00	\$2.00	\$3.80	\$3.80		
Total herd cost	\$/hd	\$238.00	\$141.00	\$127.50	\$1,519.50	\$0.00	\$28.00	\$19.00	\$19.00	Total Vet & Misc	\$2,092.00

Figure 4. Feed, Vet and Breeding Cost Worksheet.

feed can be changed, as can the cost per unit, feeding rate in pounds per head per day and the total number of days fed. The total cost of each feed type for each class of cattle is calculated. If hay is purchased, the delivered price should be entered; if hay is raised, enter the estimated total cost of the home-grown hay. (Don't double count expenses if hay is taken off pasture where pasture expenses are included in the earlier table.)

Cash costs per head for pest control, vet costs, hired hauling, marketing, ad valorem taxes and other expenses

are entered in *veterinary and miscellaneous expense*. Note: costs such as hauling and marketing are affected by retention plans. Total cash cost per head and for the operation are calculated.

Overhead and Interest

Four tables are included in this worksheet for data entry: *machinery, equipment and facilities*; *labor and overhead allocation*; *operating note information*; and *other overhead costs* (Figure 5). The terms of financing plus annual ownership and maintenance costs for vehicles, equipment, facilities, fences

Machinery, equipment and facilities			
	Units	Machinery and equipment	Working facilities, fences, buildings
Purchase price	\$	\$17,400	\$9,000
% financed	%	50%	0%
Useful life	years	10	25
Salvage value	\$	\$5,000	\$2,500
Annual costs			
Repairs & maintenance	\$/yr	\$800	\$500
Taxes	\$/yr	\$175	\$0
Insurance	\$/yr	\$100	\$0
Fuel, lube, utilities	\$/yr	\$2,000	\$0
Depreciation	\$/yr	\$1,240	\$260
Original loan principal	\$	\$8,700	\$0
Interest rate	%	8.00%	8.00%
Loan term	years	5	5
Years remaining on loan		3	3
Payment frequency		Quarterly	Annually
Total Payments	\$	\$2,128	\$0
Total Principal	\$	\$1,729	\$0
Total Interest	\$	\$399	\$0
Opportunity cost on investment:			
Interest on average investment	4.00%	\$448	\$230

Labor and overhead allocation				
	Units	Cow herd	Stockers	total
Hired labor	\$/yr	\$5,368	\$3,720	\$9,088
Value of family and own labor	\$/yr	\$10,000	\$500	\$10,500
Miscellaneous expense	\$/yr	\$0	\$0	\$0
Machinery & equipment	%	50%	50%	100%
Facilities, fences, buildings	%	70%	30%	100%

Operating note information			
	units	Cow herd	Stockers
Percent financed	%	100%	100%
Months borrowed	months	9.0	4.0
Interest rate	%	6.00%	6.00%

Other overhead costs										
Noncurrent asset	Origination	# of units	Salvage value (\$/head)	Investment (\$/unit)	Expected useful life (years)	Depreciation (\$)	Insurance (\$)	Taxes (\$)	Interest on average investment	Opportunity cost on investment
Mature cows	Raised	75 head	\$550	\$800	xxx	xxx	\$300	\$900	4.00%	\$2,025
Mature cows	Purchased	0 head	\$550	\$1,500	9	\$0	\$3	\$10	4.00%	\$0
1st calf heifers	Raised	25 head	\$700	\$700	xxx	xxx	\$30	\$100	4.00%	\$700
1st calf heifers	Purchased	0 head	\$700	\$1,500	xxx	xxx	\$0	\$0	4.00%	\$0
Yearling heifers	Raised	25 head	\$800	\$600	xxx	xxx	\$80	\$250	4.00%	\$700
Yearling heifers	Purchased	0 head	\$800	\$800	xxx	xxx	\$0	\$0	4.00%	\$0
Retained heifers	Mature cows	25 head	xxx	\$800	xxx	xxx	\$0	\$0	5.00%	\$167
Retained heifers	1st calf heifers	0 head	xxx	\$3,000	xxx	xxx	\$0	\$0	5.00%	\$0
Raised bulls	Raised	0 head	\$1,000	\$900	xxx	xxx	\$0	\$0	4.00%	\$0
Purchased bulls	Purchased	3 head	\$1,000	\$3,000	4	\$1,500	\$50	\$50	4.00%	\$360
Native pasture		500 acres	xxx	\$500	xxx	xxx	xxx	\$1,000	4.00%	\$10,000
Bermuda pasture		200 acres	xxx	\$1,200	xxx	xxx	xxx	\$400	4.00%	\$9,600
Wheat pasture		0 acres	xxx	\$1,000	xxx	xxx	xxx	\$0	4.00%	\$0
Native- purch pasture		500 acres	xxx	\$800	xxx	xxx	xxx	\$1,000	4.00%	\$20,000
Fescue pasture		0 acres	xxx	\$1,000	xxx	xxx	xxx	\$0	4.00%	\$0
TOTAL						\$1,500	\$163	\$3,710		\$43,552

Figure 5. Overhead and Interest Worksheet.

and buildings are entered in the first table. A total value for *machinery and equipment* plus a total value for *working facilities, fences, buildings* can be specified. Annual payments on outstanding loans are calculated using the interest rates and loan terms specified. Depreciation costs are calculated based on the difference between purchase price and salvage value, divided by years of useful life. The opportunity cost of capital (the cost of having money invested in these assets as opposed to investing it elsewhere) is the interest rate times average investment, where average investment is calculated using the average of purchase price and salvage value.

The cost of *hired labor* and *value of family and own labor* along with any remaining miscellaneous expenses for the entire ranch for the year are entered in the *labor and overhead allocation* table. Costs could include legal fees, insurance, consulting, business-related travel, seminars, computer software, etc. Also, enter the percent of time that *machinery and equipment* and *working facilities, fences, buildings* are used by the cow herd. Note: the total percent may be less than 100 percent if there are other enterprises (for instance, crops or other livestock) to which a portion of the expenses should be allocated.

Operating note information is partitioned between the cow herd and stockers by entering the percent of operating capital borrowed for each class of cattle and the average number of months the capital is borrowed. Interest rates for each category of loan may be entered.

The *other overhead cost* table facilitates calculation of fixed costs for other capital assets, namely breeding livestock and land. Depreciation costs for purchased mature cows are calculated using the difference between purchase price and salvage value, divided by years of useful life. No depreciation is calculated for raised livestock as their ownership costs are reflected in operating costs and, for the same reason, depreciation is not calculated for younger livestock purchased.

Opportunity cost on investment is the dollar amount of foregone returns from not investing elsewhere and is calculated by averaging investment over time and multiplying it by an interest rate. The average investment over time is equal to the purchase price plus salvage value divided by two. Interest on average investment is entered as a percent

and represents the rate of return the producer might have received if the funds had been invested elsewhere.

Results

Results are summarized in three tables: *cow herd cash flow and profitability analysis*, *stocker cash flow and profitability analysis* and *whole farm cashflow and profitability analysis* (Figure 6). The cash flow column highlights cash sources and uses, including principal and interest payments on any loans included in the analysis.

In the profitability column, cash and non-cash income and expenses are included, while principal payments are excluded. Noncash income includes the value of raised heifers retained for the breeding herd, plus the increase in value of females retained as they mature to the cow stage. Noncash costs include depreciation, death losses and the opportunity cost associated with funds invested in fixed assets including breeding livestock, machinery, equipment, vehicles, buildings, facilities and land. The total of cash and noncash expenses are subtracted from total receipts to estimate annual returns to owned capital, management and risk. Note: interest on term debt (borrowed money) is included in opportunity cost on investment.

Summary

Spreadsheets offer tremendous flexibility for users, allowing quick analysis of complex management options. RanchCalc can be used to evaluate economic aspects of the cow/calf enterprise, stocker enterprise or a combination of both. The spreadsheet is designed to capture and summarize key information impacting both cash flow and profitability. Once the base case is defined, a number of alternative scenarios can be easily assessed. Users may explore alternative production assumptions, price assumptions, lending conditions, etc. and see how results change for each ranch enterprise.

Selected References

Lalman, D. and D. Doye "Oklahoma Beef Cattle Manual." 8th edition. Oklahoma State University. November 2008.
OSU Enterprise Budget software. Agecon.okstate.edu/budgets.

Cow herd cash flow and profitability analysis		
	Cash flow	Profitability
Revenue		
Calf production	\$8,432	\$53,974
Cull sales	\$12,251	\$9,351
Increase in replacement heifer value	xxx	\$2,500
Total cow herd revenue	\$20,683	\$65,825
Expenses		
Pasture rent	\$12,000	\$12,000
Pasture operating	\$5,400	\$5,400
Hay and feed	\$7,608	\$7,608
Veterinary etc.	\$790	\$790
Cash mach, equip, & facilities	\$1,888	\$1,888
Hired labor	\$5,368	\$5,368
Miscellaneous	\$0	\$0
Interest on:		
Operating	\$1,487	\$1,487
Pasture mortgage	\$12,465	xxx
Breeding stock notes	\$199	xxx
Mach, equip and facilities notes	\$200	xxx
Taxes	\$1,310	\$1,310
Insurance	\$463	\$463
Depreciation and death loss	xxx	\$3,318
Opportunity cost on investment	xxx	\$44,003
Value of unpaid labor	xxx	\$10,000
Total Expenses	\$35,690	\$93,635
Other cash flows		
Breeding livestock purchases	\$5,000	xxx
Principal payments--breeding stock	\$845	xxx
Principal payments--real estate	\$25,137	xxx
Principal payments--mach, facilities, etc.	\$865	xxx
Net cash flow from cow herd	-\$46,854	xxx
Net income	xxx	-\$27,810

Stocker cash flow and profitability analysis		
	Cash flow	Profitability
Revenue		
Purchased stockers	\$109,794	\$109,794
Retained stockers	\$36,826	\$36,826
Total stocker revenue	\$146,621	\$146,621
Expenses		
Purchased and retained calves	\$84,000	\$109,542
Pasture rent	\$12,000	\$12,000
Pasture operating	\$8,000	\$8,000
Hay and feed	\$1,353	\$1,353
Veterinary etc.	\$1,606	\$1,606
Cash mach, equip, & facilities exp	\$1,688	\$1,688
Hired labor	\$3,720	\$3,720
Miscellaneous	\$0	\$0
Interest on:		
Operating	\$2,247	\$2,247
Pasture mortgage	\$0	xxx
Calf notes	\$1,942	xxx
Mach, equip and facilities notes	\$200	xxx
Taxes	\$0	\$0
Depreciation	xxx	\$698
Opportunity cost on investment	xxx	\$293
Value of unpaid labor	xxx	\$500
Total expenses	\$116,755	\$141,646
Other cash flows		
Principal payments--real estate	\$0	xxx
Principal payments--mach, facilities, etc.	\$865	xxx
Net cash flow from stockers	\$29,001	xxx
Net income	xxx	\$4,974

Whole farm cash flow and profitability analysis		
	Cash flow	Profitability
Net cash flow from cow herd	-\$46,854	xxx
Net cash flow from stockers	\$29,001	xxx
Net cash flow--whole farm	-\$17,852	xxx
Net income from cow herd	xxx	-\$27,810
Net income from stockers	xxx	\$4,974
Net income--whole farm	xxx	-\$22,836

Figure 6. Results Worksheet.

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