



# Current Report

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## Ranch Calculator (RanchCalc)

Damona Doye

Extension Farm Management Specialist

Eric A. DeVuyst

Extension Farm Management Specialist

David Lalman

Extension Beef Cattle Specialist

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.<sup>1</sup> 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.

<sup>1</sup> 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](http://agecon.okstate.edu/budgets)). The enterprise budgets provide more in-depth analysis of individual components of production: cow-calf, stocker, perennial forage, hay, etc.

### Entering Data Into RanchCalc

This software is programmed in MS Excel 2007 or later versions of Excel. 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 and later versions, 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, 1<sup>st</sup> 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 \$850, a raised 1<sup>st</sup> calf heifer might have a base value of \$1,000 and a raised cow might have a base value of \$1,125. 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.

Cow, heifer, and bull inventory						
	units	Mature cows	1 <sup>st</sup> Calf heifers	Yearling heifers	Bulls	Totals
Raised	hd	80	20	25	0	xxx
Base value	\$/hd	\$1,125	\$1,000	\$850	\$0	xxx
Purchased	hd	0	0	0	3	xxx
% financed	%	0.0%	0.0%	0.0%	50.0%	xxx
Death loss	%	1.0%	1.0%	1.0%	1.0%	xxx
Borrowed	\$/hd	\$0	\$0	\$0	\$875	xxx
Wean percentage	%	86.0%	82.0%	xxx	xxx	85% avg
Calves weaned	hd	68.8	16.4	xxx	xxx	85.2
Steers weaned	hd	34.0	8.0	xxx	xxx	42.0
Heifers weaned	hd	34.8	8.4	xxx	xxx	43.2
Heifers retained	hd	19.0	6.0	xxx	xxx	25.0
Initial principal	\$	\$0	\$0	\$0	\$2,625	xxx
Interest rate	%	6.00%	6.00%	6.00%	6.00%	xxx
Loan term	years	4	5	5	3	xxx
Years remaining on loan		3	5	4	2	xxx
Payment frequency		Annually	Annually	Annually	Annually	xxx
Total annual payments		\$0	\$0	\$0	\$982	\$982
Total principal, current year		\$0	\$0	\$0	\$874	\$874
Total interest, current year		\$0	\$0	\$0	\$108	\$108

Breeding stock purchases								
	Head	\$/head	Total \$	Percent financed	Interest rate	Month purchased	Downpayment	1st year interest
Mature cows	0	\$1,200	\$0	0%		1	\$0	\$0
1st calf heifers	0	\$1,000	\$0	0%		2	\$0	\$0
Yearling heifers	0	\$950	\$0	0%		9	\$0	\$0
Bulls	1	\$2,850	\$2,850	50%	6.00%	4	\$1,425	\$64
Total purchases	1		\$2,850				\$2,850	\$0

Cull sales						
	# sold	Average weight (lbs)	Average cost basis/base value	Sale price (\$/cwt)	\$/head	Total
Cull cows and 1st calf heifers	24	1,150	\$1,100	\$75.00	\$863	\$20,700
Cull yearling heifers	5	825	\$1,000	\$120.00	\$990	\$4,950
Cull bulls	1	1,750	\$2,200	\$95.00	\$1,663	\$1,663
Total sales	30	33,475				\$27,313

Inventory			
	Mature cows & 1st calf heifers	Yearling heifers	Bulls
Beginning inventory	100.0	25.0	3.0
Transferred in	25.0	25.0	
Transferred out		-25.0	
Purchases	0.0	0.0	1.0
Sales	-24.0	-5.0	-1.0
Death loss	-1.0	-0.3	0.0
Ending inventory	100.0	19.8	3.0

**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 1<sup>st</sup> 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*, *1<sup>st</sup> 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 1<sup>st</sup> calf heifers*, *cull yearling heifers* and *cull bulls*.

2 For more information, see AGEC-323, Valuation of Raised Breeding Livestock, <http://factsheets.okstate.edu/documents/agec-323-valuation-of-raised-breeding-livestock/>

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).<sup>2</sup> 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 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 1<sup>st</sup> 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

Stocker inventory						
	units	Purchased Stocker 1	Purchased Stocker 2	Retained stocker steers	Retained stocker heifers	Totals and averages
Number	hd	150	0	42	0	192
% financed	%	100.0%	0.0%	xxx	xxx	
Initial weight	lbs	500	510	525	500	
Initial price	\$/cwt	\$150.00	\$150.00	\$150.00	\$135.00	
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	135	135	
Borrowed	\$/hd	\$750	\$0	xxx	xxx	\$750 avg
Initial principal	\$	\$112,500	\$0	xxx	xxx	\$112,500
Interest rate	%	6.25%	6.25%	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		\$115,101	\$0	xxx	xxx	\$115,101
Total principal current yr		\$112,500	\$0	xxx	xxx	\$112,500
Total interest current year		\$2,601	\$0	xxx	xxx	\$2,601

Calf and stocker sales						
		Head sold	Weight (lbs)	Sale price (\$/cwt)	\$/head	Total
Calf sales	From cows					
	steer calves	0.0	525	\$150.00	\$788	\$0
	heifer calves	15.8	500	\$135.00	\$675	\$10,665
	From 1st calf heifers					
	steer calves	0.0	475	\$150.00	\$713	\$0
	heifer calves	2.4	450	\$135.00	\$608	\$1,458
Stocker sales	Retained calves					
	stocker steers	41.6	849	\$125.00	\$1,061	\$44,127
	stocker heifers	0.0	797	\$122.00	\$972	\$0
	Purchased calves					
	Stocker 1	147.0	770	\$130.00	\$1,001	\$147,147
	Stocker 2	0.0	807	\$0.00	\$0	\$0
	<b>Totals</b>	206.8	157,471	\$129 avg	\$984 avg	\$203,397

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%	70.0%	50.0%	50.0%	50.0%	33% avg
Purchase price	\$/acre	\$1,100	\$1,500	\$2,000	\$1,100	\$1,700	\$1167 avg
Financed per acre	\$/acre	\$0	\$1,050	\$1,000	\$550	\$850	\$3,450
Taxes	\$/acre	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2 avg
Original loan principal	\$	\$0	\$210,000	\$0	\$275,000	\$0	\$485,000
Interest rate	%	5.50%	5.75%	5.00%	5.50%	5.00%	6% avg
Payment frequency		Annually	Annually	Annually	Annually	Annually	
Loan term	years	20	30	15	20	15	
Years remaining on loan		10	20	10	5	10	
Total annual payment	\$/year	\$0	\$14,850	\$0	\$23,012	\$0	\$37,862
Total principal payment	\$/year	\$0	\$4,854	\$0	\$17,607	\$0	\$22,461
Total interest payment	\$/year	\$0	\$9,996	\$0	\$5,405	\$0	\$15,401

Rented pasture information							
Types	units	Native	Bermuda	Wheat	Native- purch	Fescue	TOTALS
Acres		0	0	400	0	0	400
Annual rent per acre	\$/acre	\$15	\$25	\$40	\$15	\$35	\$40 avg
Total rent	\$/year	\$0	\$0	\$16,000	\$0	\$0	\$16,000

Pasture allocation--head grazed on each pasture type (optional)							
Pasture	Mature cows	1st Calf heifers	Yearling heifers	Purchased Stocker 1	Purchased Stocker 2	Retained stocker steers	Retained stocker heifers
(head)	(80)	(20)	(25)	(150)	(0)	(42)	(0)
Native	55						
Bermuda			25				
Wheat				150		42	
Native- purch	25	20					
Fescue							
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					5
Bermuda	200			6					50
Wheat	400				2		2		16
Native- purch	500	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	\$60	\$15	\$15	\$0	\$60	\$18,000
Tillage	\$/acre		\$0					\$0
Seeding	\$/acre		\$0	\$8	\$8			\$3,200
Spraying, burning, other	\$/acre	\$4	\$4			\$4	\$4	\$4,800
Total per acre	\$/acre	\$4	\$64	\$23	\$23	\$4	\$64	\$16.25 avg
Total for farm	\$	\$2,000	\$12,800	\$0	\$9,200	\$2,000	\$0	\$26,000

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

Figure 3. Pastures Worksheet.

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 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

Hay and feed costs per head																				
		Mature cows		1 <sup>st</sup> calf Heifers		Yearling heifers (replacements)		Purchased Stocker 1		Purchased Stocker 2		Retained stocker steers		Retained stocker heifers		Bulls				
		(80)		(20)		(25)		(150)		(0)		(42)		(-)		(3)				
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	390.00	2	60	2	60	0	0	0	0	0	0	0	0	0	0	2	60		
cubes 20%	tons	266.00	4	60	4	60	4	60	4	60										
prairie hay	tons	65.00	12	120	12	120	10	120	0	135	0	135	0	135	0	135	18	120		
bermuda hay	tons	75.00	0	40	0	120	0	120												
OWB	tons	70.00							2	135	2	135	2	135						
							0	0												
salt/minerals	lbs	0.05	0.25	365	0.25	365	0.25	365	0.02	135	0.02	135	0.02	135	0.02	135	0.25	365		
Total feed cost per head			\$107.05		\$107.05		\$75.85		\$9.60		\$9.60		\$9.60		\$0.15		\$98.53			
Total herd feed cost			\$8,563.80		\$2,140.95		\$1,896.19		\$1,439.37		\$0.00		\$403.02		\$0.00		\$295.58		Total Feed	
Feed cost for:			Cows and heifers				\$12,600.94		Purchased stockers		\$1,439.37		Retained stockers		\$403.02		Bulls		\$295.58	\$14,738.91

  

Veterinary and miscellaneous expense										
Cost	units	Mature cows	1 <sup>st</sup> Calf heifers	Yearling heifers	Purchased Stocker 1	Purchased Stocker 2	Retained stocker steers	Retained stocker heifers	Bulls	
Deworm, fly control	\$/hd	\$4.00	\$4.00	\$3.50	\$2.75		\$2.75		\$8.00	
Vaccines, vet, drugs	\$/hd	\$4.00	\$4.00	\$4.00	\$4.25		\$4.25		\$3.00	
Transport	\$/hd	\$8.00	\$5.00	\$5.00	\$4.00		\$4.00		\$8.00	
Marketing	\$/hd	\$6.00	\$6.00	\$6.00	\$6.00		\$6.00		\$6.00	
Property tax	\$/hd									
Other	\$/hd									
Total per head	\$/hd	\$22.00	\$19.00	\$18.50	\$17.00	\$0.00	\$17.00	\$0.00	\$25.00	Total Vet & Misc
Total herd cost	\$/hd	\$1,760.00	\$380.00	\$462.50	\$2,550.00	\$0.00	\$714.00	\$0.00	\$75.00	\$5,941.50

Figure 4. Feed, Vet and Breeding Cost Worksheet.

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 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.

### Other Revenue

Other sources of revenue from the ranching operation may be specified in this worksheet as shown in the table in Figure 5. Several examples are shown in the table. Since a proportion cannot be allocated to the cow herd or stocker enterprise, the total revenue represents an amount devoted to the entire ranch.

### 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 6). The terms of financing plus annual ownership and maintenance costs for vehicles, equipment, facilities, fences and buildings are entered in the first table. A total value for *machinery and equipment* plus a total value for *working fa-*

*cilities, 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 7). 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,

Other sources of revenue				
Description	Units	Number	Price	Revenue
Hunting lease	acres	500	\$ 6	\$ 3,000
Semen sales	straws	0	\$ 20	\$ -
Breeding certificates	certs	0	\$ 25	\$ -
Custom baling	bales	0	\$ 20	\$ -
other--type over				\$ -
other--type over				\$ -
other--type over				\$ -
other--type over				\$ -
other--type over				\$ -
Total other revenue				\$ 3,000

Figure 5. Other Revenue Worksheet.

Machinery, equipment and facilities			
	Units	Machinery and equipment	Working facilities, fences, buildings
Purchase price	\$	\$17,500	\$21,500
% financed	%	50%	25%
Useful life	years	10	20
Salvage value	\$	\$5,000	\$5,000
Annual costs			
Repairs & maintenance	\$/yr	\$1,575	\$900
Taxes	\$/yr	\$110	\$215
Insurance	\$/yr	\$60	\$90
Fuel, lube, utilities	\$/yr	\$2,300	\$0
Depreciation	\$/yr	\$1,250	\$825
Original loan principal	\$	\$8,750	\$5,375
Interest rate	%	6.00%	6.00%
Loan term	years	5	5
Years remaining on loan		3	3
Payment frequency		Quarterly	Annually
Total Payments	\$	\$2,039	\$1,276
Total Principal	\$	\$1,744	\$1,071
Total Interest	\$	\$295	\$205
Opportunity cost on investment:			
Interest on average investment	3.00%	\$338	\$398

Labor and overhead allocation				
	Units	Cow herd	Stockers	total
Hired labor	\$/yr	\$0	\$0	\$0
Value of family and own labor	\$/yr	\$13,800	\$6,900	\$20,700
Miscellaneous expense	\$/yr	\$0	\$0	\$0
Machinery & equipment	%	50%	50%	100%
Facilities, fences, buildings	%	80%	20%	100%

Operating note information			
	units	Cow herd	Stockers
Percent financed	%	75%	100%
Months borrowed	months	9.0	4.0
Interest rate	%	6.25%	6.25%

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	80 head	\$865	\$1,125	xxx	xxx	\$720	\$880	3.00%	\$2,388
Mature cows	Purchased	0 head	\$865	\$1,500	8	\$0	\$0	\$0	3.00%	\$0
1st calf heifers	Raised	20 head	\$865	\$1,000	xxx	xxx	\$200	\$220	3.00%	\$560
1st calf heifers	Purchased	0 head	\$865	\$1,500	xxx	xxx	\$0	\$0	3.00%	\$0
Yearling heifers	Raised	25 head	\$990	\$850	xxx	xxx	\$250	\$275	3.00%	\$690
Yearling heifers	Purchased	0 head	\$990	\$800	xxx	xxx	\$0	\$0	3.00%	\$0
Retained heifers	Mature cows	19 head	xxx	\$800	xxx	xxx	\$130	\$170	3.00%	\$494
Retained heifers	1st calf heifers	6 head	xxx	\$1,750	xxx	xxx	\$40	\$55	3.00%	\$341
Raised bulls	Raised	0 head	\$1,665	\$1,750	xxx	xxx	\$0	\$0	3.00%	\$0
Purchased bulls	Purchased	3 head	\$1,665	\$3,000	4	\$1,001	\$60	\$90	3.00%	\$270
Native pasture		500 acres	xxx	\$1,100	xxx	xxx	xxx	\$1,000	3.00%	\$16,500
Bermuda pasture		200 acres	xxx	\$1,500	xxx	xxx	xxx	\$400	3.00%	\$9,000
Wheat pasture		0 acres	xxx	\$2,000	xxx	xxx	xxx	\$0	3.00%	\$0
Native- purch pasture		500 acres	xxx	\$1,100	xxx	xxx	xxx	\$1,000	3.00%	\$16,500
Fescue pasture		0 acres	xxx	\$1,700	xxx	xxx	xxx	\$0	3.00%	\$0
TOTAL						\$1,001	\$680	\$4,090		\$0

Figure 6. Overhead and Interest Worksheet.

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. Ranch-

Calc 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.

Cow herd cash flow and profitability analysis		
	Cash flow	Profitability
Revenue		
Calf production	\$12,123	\$70,898
Cull sales	\$27,313	\$23,013
Increase in replacement heifer value	xxx	\$3,750
<b>Total cow herd revenue</b>	<b>\$39,436</b>	<b>\$97,661</b>
Expenses		
Pasture rent	\$16,000	\$16,000
Pasture operating	\$16,800	\$16,800
Hay and feed	\$12,897	\$12,897
Veterinary etc.	\$2,678	\$2,678
Cash mach, equip, & facilities	\$2,987	\$2,987
Hired labor	\$0	\$0
Miscellaneous	\$0	\$0
Interest on:		
Operating	\$1,806	\$1,806
Pasture mortgage	\$15,401	xxx
Breeding stock notes	\$108	xxx
Mach, equip and facilities notes	\$311	xxx
Taxes	\$1,690	\$1,690
Insurance	\$1,400	\$1,400
Depreciation and death loss	xxx	\$3,579
Opportunity cost on investment	xxx	\$47,258
Value of unpaid labor	xxx	\$13,800
<b>Total Expenses</b>	<b>\$54,270</b>	<b>\$120,893</b>
<b>Other cash flows</b>		
Breeding livestock purchases	\$2,850	xxx
Principal payments--breeding stock	\$874	xxx
Principal payments--real estate	\$22,461	xxx
Principal payments--mach, facilities, etc.	\$1,729	xxx
<b>Net cash flow from cow herd</b>	<b>-\$42,749</b>	xxx
<b>Net income</b>	xxx	<b>-\$23,233</b>

Stocker cash flow and profitability analysis		
	Cash flow	Profitability
Revenue		
Purchased stockers	\$147,147	\$147,147
Retained stockers	\$44,127	\$44,127
<b>Total stocker revenue</b>	<b>\$191,274</b>	<b>\$191,274</b>
Expenses		
Purchased and retained calves	\$112,500	\$145,575
Pasture rent	\$16,000	\$16,000
Pasture operating	\$9,200	\$9,200
Hay and feed	\$1,842	\$1,842
Veterinary etc.	\$3,264	\$3,264
Cash mach, equip, & facilities exp	\$2,625	\$2,625
Hired labor	\$0	\$0
Miscellaneous	\$0	\$0
Interest on:		
Operating	\$3,030	\$3,030
Pasture mortgage	\$0	xxx
Calf notes	\$2,601	xxx
Mach, equip and facilities notes	\$188	xxx
Taxes	\$0	\$0
Depreciation	xxx	\$790
Opportunity cost on investment	xxx	\$248
Value of unpaid labor	xxx	\$6,900
<b>Total expenses</b>	<b>\$151,250</b>	<b>\$189,474</b>
<b>Other cash flows</b>		
Principal payments--real estate	\$0	xxx
Principal payments--mach, facilities, etc.	\$1,086	xxx
<b>Net cash flow from stockers</b>	<b>\$38,937</b>	xxx
<b>Net income</b>	xxx	<b>\$1,799</b>

Whole farm cash flow and profitability analysis		
	Cash flow	Profitability
Net cash flow from cow herd	-\$42,749	xxx
Net cash flow from stockers	\$38,937	xxx
Total other revenue	\$3,000	xxx
<b>Net cash flow--whole farm</b>	<b>-\$812</b>	xxx
Net income from cow herd	xxx	-\$23,233
Net income from stockers	xxx	\$1,799
Total other revenue	xxx	\$3,000
<b>Net income--whole farm</b>	xxx	<b>-\$18,434</b>

Figure 7. Results Worksheet.

### Selected References

Lalman, D. and D. Doye "Oklahoma Beef Cattle Manual." 7<sup>th</sup> edition. Oklahoma State University. September 2015.  
 OSU Enterprise Budget software. [agecon.okstate.edu/budgets](http://agecon.okstate.edu/budgets).

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