

# University of Idaho

College of Agricultural and Life Sciences



Calf source heifer-raising facility in DePere, WI (Photo: Vitaplus.com)

## **EBB-DR2-14**

### **Costs and Returns for a 10,000-Head Heifer Raising Facility in Southern Idaho**

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and  
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Budget spreadsheets are available at the following links:

<http://www.tinyurl.com/IdahoDairyBudgets>

<http://web.cals.uidaho.edu/idaohogbiz/enterprise-budgets/>

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## **Background & Assumptions**

Economic costs are used in the University of Idaho costs and returns estimates. All resources are valued based on market price or opportunity cost. This budget represents the average costs and returns per cow associated with a 10,000-head springer raising facility. Calves are brought in from baby calf ranches at about 400 pounds and raised to about 1100-1200 lb. They are sent to dairies when they are within 30-60 days of calving, depending on the dairies' preferences.

## **Facility Overview**

The site for this facility is about 100 acres, with one-third of the land used for composting manure. Pens have cement back curbs and scrape boxes, which are small pits outside the corral for scraping the manure into each day. A four-stall commodity barn is used for dried distillers' grain (DDG) and dry supplements. Silage is stored in two large pits and on asphalt beds. Most hay is tarped. There are five sets of scales for weighing feed around the facility.

The facility has an extensive set of corrals, mainly constructed from well casing posts and rod or cable fencing. There is a liquid manure pond as well as a composting area for solids. The compost is spread on farm ground. Approximately 2,500 tons of straw are used as bedding, or 0.25 per head. The value to the farm ground from this compost is assumed to cover the cost of transporting it to the farm ground.

## **Labor**

Twelve full-time employees are used, with three employees feeding and three employees in charge of animal health. Three employees are in charge of all manure handling duties (no custom hauling or land application). The remaining employees include a supervisor and two floaters.

## **Feeds**

Heifer diets contain a blend of forages (hay, straw, corn silage, pushout from feed bunkers, ryegrass pellets), grain and by-production feeds (canola, distillers grains, barley, beet pulp) and mineral supplements. Diets are formulated for an average daily gain of 1.9 lb. Heifers are sorted each week by weight in 50-lb increment groups from 400 to 750 lb. Heifers are fed four different rations, depending on their weight. When the heifers reach 750 lb, energy is increased until they are pregnant, at which point it is cut back. This budget has four separate feed budgets, formulated for small heifers (24% of heifers), a pre-breeding group (24% of heifers), a breeding group (19% of heifers), and a pregnant group (34% of heifers). The rations for these different groups are presented in Table 1. Feed prices should be changed on the Feed Prices tab only, in order for these values to be consistent throughout the spreadsheet.

## **Herd Health**

Artificial insemination (AI) is used for breeding. A 70% average first conception is assumed for the first service. Heifers are pregnancy checked at 34 days and re-confirmed at 180 days. All non-breeders are culled at 14 months. About 3% are culled for nonbreeding.

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## Feed Prices

*Make any feed price changes here, and their values will change throughout the spreadsheet.*

		2014	
Item	Unit	Price/unit	
<b>Feed:</b>			
Feeder hay	ton	\$200.00	
Straw	ton	\$56.00	
Corn silage, 33% DM, 15% shrink	ton	\$45.00	
Pushout	ton	\$0.00	
Canola	ton	\$240.00	
Distillers	ton	\$190.00	
Barley	ton	\$155.00	
Beet pulp	ton	\$182.00	
Ryegrass pellets	ton	\$170.00	
Heifer molasses	ton	\$254.00	

	Small heifers	Pre-breeding	Breeding	Pregnant heifers	All
<b>NUMBER OF COWS:</b>	2385	2385	1875	3355	10000
% by category:	24%	24%	19%	34%	100%

**Table 1: Feed Rations by Stage of Growth for a 10,000-Head Custom Heifer Raising Facility**

Item	Small Heifers (lb/day)	Pre-Breeding (lb/day)	Breeding (lb/day)	Pregnant Heifers (lb/day)	Average (lb/day)	Unit	Cost (\$/ton)	Annual Cost/Dairy	Annual Cost/Head	Daily Cost/Head
<b>Feed Costs by Growth Stage</b>										
<b>Feed (lb/head/yr):</b>								<b>\$8,427,796</b>	<b>\$842.78</b>	<b>\$2.31</b>
Feeder hay	13.00	17.15	17.25	15.75	15.71	head	<b>\$200.00</b>	\$5,733,885	\$573.39	\$1.57
Straw	0.00	0.00	1.85	3.50	1.52	head	<b>\$55.00</b>	\$152,683	\$15.27	\$0.04
Corn silage, 33% DM, 15% shrink	13.00	13.20	18.50	15.00	14.75	head	<b>\$45.00</b>	\$1,211,340	\$121.13	\$0.33
Pushout	0.00	0.00	0.00	2.00	0.67	head	<b>\$0.00</b>	\$0	\$0.00	\$0.00
Canola	0.65	0.20	0.00	0.00	0.20	head	<b>\$240.00</b>	\$88,794	\$8.88	\$0.02
Distillers	0.75	0.20	0.00	0.00	0.23	head	<b>\$250.00</b>	\$103,375	\$10.34	\$0.03
Barley	2.25	0.55	0.00	0.00	0.67	head	<b>\$155.00</b>	\$188,904	\$18.89	\$0.05
Beet pulp	0.65	0.35	0.00	0.00	0.24	head	<b>\$182.00</b>	\$79,218	\$7.92	\$0.02
Ryegrass pellets	0.00	0.00	3.00	5.00	2.24	head	<b>\$170.00</b>	\$694,960	\$69.50	\$0.19
Heifer molasses	0.44	0.55	0.75	0.00	0.38	head	<b>\$254.00</b>	\$174,638	\$17.46	\$0.05

NUMBER OF COWS: 10000

**Table 2: Annual Enterprise Budget for a 10,000-Head Custom Heifer Raising Facility**

Item	Quantity Per Head (lb/day)	Unit	No. of Heifers	Price or Cost <sup>1</sup> (\$/ton)	Value or Cost/Dairy	Value or Cost/Head/Yr
<b>Income:</b>					<b>\$18,642,960</b>	<b>\$1,864.30</b>
Springers per head	0.959	head	10000	\$1,944.00	\$18,642,960	\$1,864.30
<b>Operating Costs:</b>						
<b>Feed (ton/head/yr):</b>					<b>\$8,481,643</b>	<b>\$848.16</b>
Feeder hay	15.71	head	10000	\$200.00	\$5,733,885	\$573.39
Straw	1.52	head	10000	\$55.00	\$152,690	\$15.27
Corn silage, 33% DM, 15% shrink	15.41	head	10000	\$45.00	\$1,265,171	\$126.52
Pushout	0.67	head	10000	\$0.00	\$0	\$0.00
Canola	0.20	head	10000	\$240.00	\$88,790	\$8.88
Distillers	0.23	head	10000	\$250.00	\$103,371	\$10.34
Barley	0.67	head	10000	\$155.00	\$188,897	\$18.89
Beet pulp	0.24	head	10000	\$182.00	\$79,215	\$7.92
Ryegrass pellets	2.24	head	10000	\$170.00	\$694,992	\$69.50
Heifer molasses	0.38	head	10000	\$254.00	\$174,631	\$17.46
<b>Other costs:</b>					<b>\$6,043,518</b>	<b>\$604</b>
Labor, including fringe costs	1.00	head	10000	\$39.75	\$397,500	\$39.75
Death loss	1%	head	10000	\$1,864.30	\$186,430	\$18.64
Veterinary, breeding, testing	1.00	head	10000	\$77.52	\$775,200	\$77.52
Straw	0.25	head	10000	\$56.00	\$140,000	\$14.00
Supplies	1.00	head	10000	\$209.00	\$2,090,000	\$209.00
Repairs and maintenance	1.00	head	10000	\$74.12	\$741,188	\$74.12
Utilities	1.00	head	10000	\$30.18	\$301,800	\$30.18
Miscellaneous (fuel, insur., etc.)	1.00	head	10000	\$62.95	\$629,500	\$62.95
Interest	1.00	head	10000	\$78.19	\$781,900	\$78.19
<b>Total Operating Costs</b>					<b>\$14,525,161</b>	<b>\$1,452.52</b>
<b>Net Returns Above Variable Costs</b>					<b>\$4,117,799</b>	<b>\$411.78</b>
<b>Fixed Costs:</b>					<b>\$704,938</b>	<b>\$70.49</b>
Capital recovery*	1.00	head	10000	\$34.08	\$340,774	\$34.08
Insurance*	1.00	herd	1	\$1,035.00	\$1,035	\$0.10
Overhead (2.5% Oper Costs)	1.00	herd	1	\$363,129.01	\$363,129	\$36.31
*See Table 2.						
<b>Total Costs (Operating and Fixed)</b>					<b>\$15,230,098</b>	<b>\$1,523.01</b>
<b>Net Returns Above Total Costs</b>					<b>\$3,412,862</b>	<b>\$341.29</b>

<sup>1</sup>Price for heifers is assumed to be cost plus 5%.

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## Breakeven Price and Yield

The first breakeven analysis below presents breakeven market prices (\$/head) that will cover operating costs, ownership costs, and total costs for the base total gain in the enterprise budget above, as well as for gains that are 10% above and below the base gain. The second breakeven analysis below presents breakeven gain that will cover operating costs, ownership costs, and total costs for the base price in the enterprise budget above, and for market prices that are 10% or 20% above and 10% below the base price. In the spreadsheet version (Excel), you can change the numbers in the percentages in the orange cells and all values will be updated. Costs, prices, and yields in this breakeven table are all linked to values in the budget above, so any changes in the budgets will be automatically updated in these breakeven analyses.

### Breakeven Market Prices (\$/head):

	Mortality & Cull Rate				
	2.5%	3.0%	3.5%	This study's assumption: 4.0%	4.5%
Operating Cost Breakeven	\$1,490	\$1,497	\$1,505	\$1,513	\$1,521
Total Cost Breakeven	\$1,562	\$1,570	\$1,578	\$1,586	\$1,595

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**Table 3. Capital Costs for 10,000-Head Custom Heifer Raising Facility in Southern Idaho**

Item	Quantity Per Dairy	Unit	Price or Cost	Value or Cost	Years of Life (n)	Salvage Value (\$/head)	Salvage Value (\$/herd)	Discount Rate (i)	Capital Recovery Factor	Capital Recovery Value
<b>Initial Capital Outlays:</b>										
<b>Land:</b>				\$1,254,000						
Land purchase	120	ac	\$4,200	\$504,000	30			7.50%		\$42,674
Site Prep: Permits, well, roads	10,000	hd	\$75	\$750,000	30					\$25,000
<b>Feeding Facilities:</b>				\$228,800						
Scales	5	farm	\$31,600	\$158,000	30	\$0		6.00%	0.0727	\$11,479
Commodity shed, 4 bays	1	farm	\$62,000	\$62,000	30	\$0		6.00%	0.0727	\$4,504
Hay storage (1,200 tons)	1	farm	\$2,800	\$2,800	30	\$0		6.00%	0.0727	\$203
Hay tarps, 50' x 50'	12	stack	\$500	\$6,000	5	\$0		6.00%	0.2374	\$1,424
<b>Buildings &amp; improvements</b>				\$207,000						
Shop	1	farm	\$207,000	\$207,000	30	\$0		6.00%	0.0727	\$15,039
Corrals, pens	1	farm	\$311,000	\$311,000	30	\$0		6.00%	0.0727	\$22,594
Fuel Storage	1	farm	\$69,000	\$69,000	30	\$5,000		6.00%	0.0727	\$4,950
<b>Machinery:</b>				\$1,595,900					<b>Total:</b>	<b>\$212,906</b>
Generators	3	farm	\$47,400	\$142,200	25	\$4,740	\$14,220	6.00%	0.0782	\$10,865
Farm pickups, new	1	farm	\$41,200	\$41,200	8	\$4,120	\$4,120	6.00%	0.1610	\$6,217
Farm pickups, used	2	farm	\$20,600	\$41,200	8	\$2,060	\$4,120	6.00%	0.1610	\$6,217
JD gators	6	farm	\$6,300	\$37,800	10	\$630	\$3,780	6.00%	0.1359	\$4,850
10-wheel truck (manure removal)	3	farm	\$61,700	\$185,100	10	\$6,170	\$18,510	6.00%	0.1359	\$23,750
Tractor-180 HP	1	farm	\$77,400	\$77,400	20	\$7,740	\$7,740	6.00%	0.0872	\$6,538
Tractor-145 HP	1	farm	\$61,700	\$61,700	20	\$6,170	\$6,170	6.00%	0.0872	\$5,212
Tractor-125 HP	1	farm	\$48,600	\$48,600	20	\$4,860	\$4,860	6.00%	0.0872	\$4,105
Tractor-110 HP	1	farm	\$39,200	\$39,200	20	\$3,920	\$3,920	6.00%	0.0872	\$3,311
Tractor-95 HP	1	farm	\$32,400	\$32,400	20	\$3,240	\$3,240	6.00%	0.0872	\$2,737
Tractor-65 HP	1	farm	\$24,600	\$24,600	20	\$2,460	\$2,460	6.00%	0.0872	\$2,078
Straw Spreader	1	farm	\$36,900	\$36,900	10	\$3,690	\$3,690	6.00%	0.1359	\$4,735
Loaders, used	4	farm	\$78,000	\$312,000	10	\$7,800	\$31,200	6.00%	0.1359	\$40,033
Skid steer loader	1	farm	\$36,900	\$36,900	3	\$3,690	\$3,690	6.00%	0.3741	\$12,646
Telehandler loader	1	farm	\$52,700	\$52,700	3	\$5,270	\$5,270	6.00%	0.3741	\$18,060
Semis, with feedbox mixers, used	3	farm	\$97,800	\$293,400	2	\$9,780	\$29,340	6.00%	0.1610	\$44,274
Dump truck	1	farm	\$16,700	\$16,700	20	\$1,670	\$1,670	6.00%	0.0872	\$1,411
Boxscraper	1	farm	\$3,200	\$3,200	20	\$320	\$320	6.00%	0.0872	\$270
Brush hog, 10'	1	farm	\$9,600	\$9,600	10	\$960	\$960	6.00%	0.1359	\$1,232
Gooseneck trailer, 28'	2	farm	\$25,200	\$50,400	8	\$2,520	\$5,040	6.00%	0.1610	\$7,605
Miscellaneous	1	farm	\$52,700	\$52,700	10	\$5,270	\$5,270	6.00%	0.1359	\$6,762
<b>Insurance:</b>				\$1,035						
Insur., facilities & mach. @ \$6/\$1,000	1	farm		\$0						
Liability Insur. (\$1 million coverage)	1	farm	\$1,035	\$1,035						
<b>Total Capital Costs</b>				\$3,666,735		\$92,080	\$1,787,328			
<b>Capital Costs per Head</b>				\$366.67			\$178.73			
<b>Average Capital Costs (Purchase - Salvage Value)/2</b>				\$1,787,328						
<b>Average Capital Costs per Head</b>				\$179						
<b>Total Capital Recovery Costs</b>				\$340,774						\$340,774
<b>Capital Recovery Costs per Head</b>				\$34						\$34.08