

University of Idaho

College of Agricultural *and* Life Sciences



EBB-D5-10 Costs and Returns for a 5000-Head Open Lot Dairy in Southern Idaho

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Budget spreadsheets are available at the following link:

http://www.cals.uidaho.edu/aers/r_livestock.htm

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Summary of Annual Costs and Returns for Operating a 5,000-Head Open Lot Dairy in Southern Idaho, 2010 (\$/head/year)

	Value/Head/Year
Annual Milk Production (cwt/head)	249.15
Milk Price (\$/cwt)	\$14.50
Annual Milk Revenue (\$/head/year)	\$3,613
Total Revenue (\$/head/year)	\$3,848
Annual Feed Costs (\$/head/year)	\$1,744
Total Variable Costs (\$/head/year)	\$3,237
Fixed Costs (\$/head/year)	\$471
Total Costs (\$/head/year)	\$3,708
Returns over Variable Costs (\$/head/year)	\$612
Returns over Total Costs (\$/head/year)	\$141

Change values in red on current page and they will be updated throughout the spreadsheet.

Table 1: Annual Enterprise Budget for a 5,000-Head Open Lot Dairy in Southern Idaho

Item	Quantity Per Head	Price or Cost	Value or Cost/Dairy	Value or Cost/Head/Yr	Value or Cost/Cwt
Income:			\$19,242,375	\$3,848.48	\$15.45
Milk (cwt/head)	249.15	\$14.50	\$18,063,375.00	\$3,612.68	\$14.50
Bull Calves (head)	0.51	\$35.00	\$89,250.00	\$17.85	\$0.07
Heifer Calves (head)	0.51	\$135.00	\$344,250.00	\$68.85	\$0.28
Cull Cows (head)	0.30	\$497.00	\$745,500.00	\$149.10	\$0.60
Operating Costs:					
Feed (ton/head/yr):			\$8,717,755.43	\$1,743.55	\$7.00
Alfalfa hay, dairy	2.27	\$153.00	\$1,737,177.54	\$347.44	\$1.39
Feeder hay	0.69	\$115.00	\$398,704.10	\$79.74	\$0.32
Close-up hay	0.07	\$136.00	\$45,368.75	\$9.07	\$0.04
Straw	0.07	\$55.00	\$19,658.20	\$3.93	\$0.02
Corn silage (32%DM)	5.87	\$35.00	\$1,027,301.95	\$205.46	\$0.82
Beet pulp	0.48	\$130.00	\$310,694.92	\$62.14	\$0.25
Corn	1.77	\$192.00	\$1,699,841.25	\$339.97	\$1.36
Barley	0.00	\$173.00	\$0.00	\$0.00	\$0.00
Canola	0.56	\$245.00	\$680,522.91	\$136.10	\$0.55
Distillers	0.83	\$165.00	\$681,392.64	\$136.28	\$0.55
Cottonseed	0.80	\$260.00	\$1,045,768.75	\$209.15	\$0.84
Molasses	0.30	\$155.00	\$232,681.64	\$46.54	\$0.19
Mineral, fresh cows	0.02	\$875.00	\$72,973.63	\$14.59	\$0.06
Mineral, lactating cows	0.17	\$515.00	\$449,136.33	\$89.83	\$0.36
Mineral, dry cows	0.01	\$1,284.00	\$38,244.14	\$7.65	\$0.03
Mineral, close-up cows	0.01	\$850.00	\$45,368.75	\$9.07	\$0.04
Bypass fat	0.05	\$850.00	\$232,919.92	\$46.58	\$0.19
Other costs:			\$7,465,000.00	\$1,510.95	\$5.99
Labor, including fringe costs	1.00	\$359.00	\$1,795,000.00	\$376.95	\$1.44
Herd replacement costs	1.00	\$287.00	\$1,435,000.00	\$287.00	\$1.15
Veterinary, breeding, testing	1.00	\$87.00	\$435,000.00	\$87.00	\$0.35
Supplies	1.00	\$171.00	\$855,000.00	\$171.00	\$0.69
Repairs and maintenance	1.00	\$147.00	\$735,000.00	\$147.00	\$0.59
Utilities	1.00	\$54.00	\$270,000.00	\$54.00	\$0.22
Milk hauling	1.00	\$61.00	\$305,000.00	\$61.00	\$0.24
State & association charges	1.00	\$50.00	\$250,000.00	\$50.00	\$0.20
Miscellaneous (fuel, insur., etc.)	1.00	\$160.00	\$800,000.00	\$160.00	\$0.64
Interest	1.00	\$117.00	\$585,000.00	\$117.00	\$0.47
Total Operating Costs			\$16,182,755.43	\$3,236.55	\$12.99
Net Returns Above Variable Costs			\$3,059,619.57	\$611.92	\$2.46
Fixed Costs:					
Capital recovery costs*	1.00	\$471.41	\$2,357,057.96	\$471.41	\$1.89
Insurance*	1.00	\$36,797.01	\$36,797.01	\$7.36	\$0.03
Overhead (2.5% Oper Costs)	1.00	\$404,568.89	\$404,568.89	\$80.91	\$0.32
*See Table 2.			\$0.00	\$0.00	\$0.00
Total Fixed Costs			\$2,798,423.86	\$559.68	\$2.25
Total Costs (Operating and Fixed)			\$18,981,179.29	\$3,796.24	\$15.24
Net Returns Above Total Costs			\$261,195.71	\$52.24	\$0.21

Breakeven Price and Yield

The first breakeven analysis below presents breakeven milk prices (\$/cwt) that will cover operating costs, ownership costs, and total costs for the base yield in the enterprise budget above, as well as for milk yields that are 10% above and below the base yield.

The second breakeven analysis below presents breakeven yields that will cover operating costs, ownership costs, and total costs for the base price in the enterprise budget above, as well as for milk prices that are 10% above and below the base yield.

In the spreadsheet version (Excel) of this budget, the percentages in the orange cells can be changed 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 Milk Prices (\$/cwt):

	Less: 10%	Base Yield (cwt/hd/yr):	Plus: 10%
	224.2	249.15	274.1
Operating Cost Breakeven	\$14.43	\$12.99	\$11.81
Ownership Cost Breakeven	\$2.50	\$2.25	\$2.04
Total Cost Breakeven	\$16.93	\$15.24	\$13.85

Breakeven Yields (cwt/hd/year):

	Less: 10%	Base Price (\$/cwt):	Plus: 10%
	13.1	14.5	16.0
Operating Cost Breakeven	248.0	223.2	202.9
Ownership Cost Breakeven	42.9	38.6	35.1
Total Cost Breakeven	290.9	261.8	238.0

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02-11 (new)

Table 2. Capital Costs for a 5,000-Head Open Lot Dairy in Southern Idaho

Item	Quantity Per Dairy	Unit	Price or Cost	Value or Cost
Initial Capital Outlays:				
Cattle:				\$6,125,000
Initial cow purchase	5000	hd	\$1,225	\$6,125,000
Land:				\$3,950,000
Land purchase	300	ac	\$4,000	\$1,200,000
Site Prep: Permits, well, roads	5000	hd	\$550	\$2,750,000
Feeding Facilities:				\$526,000
Scales	1	farm	\$100,000	\$100,000
Commodity shed, 14 bays	1	farm	\$210,000	\$210,000
Hay sheds (180' x 50')	4	farm	\$54,000	\$216,000
Milking Barn				\$2,064,000
Buildings	8000	sq ft	\$60	\$480,000
2 double 36 parallel stalls	144	stall	\$11,000	\$1,584,000
Open Lots				\$3,025,000
Sheds, 400 sq ft per cow	5,000	head	\$425	\$2,125,000
Shades: 40 sq ft per cow	200,000	sq ft	\$4.50	\$900,000
Hospital Barn				\$390,000
Building	2100	sq ft	\$60	\$126,000
Double 12 parallel stalls	24	stall	\$11,000	\$264,000
Machinery, 5000-cow facility:				\$1,406,503
Generator	2	farm	\$75,000	\$150,000
Farm pickups, new	1	farm	\$40,000	\$40,000
Farm pickups, used	2	farm	\$20,000	\$40,000
4-wheelers	2	farm	\$6,000	\$12,000
10-wheel truck (manure removal)	2	farm	\$60,000	\$120,000
Tractor-125 HP	1	farm	\$95,000	\$95,000
Tractor-75 HP	1	farm	\$55,000	\$55,000
Tractor-60 HP	1	farm	\$41,000	\$41,000
Straw Spreader	2	farm	\$35,000	\$70,000
Loaders, new	1	farm	\$147,000	\$147,000
Loaders, used	2	farm	\$74,000	\$148,000
Skid steer loader	2	farm	\$35,000	\$70,000
Telehandler loader	1	farm	\$50,000	\$50,000
Semis, with feedbox mixers, new	1	farm	\$125,000	\$125,000
Semis, with feedbox mixers, used	1	farm	\$65,000	\$65,000
Dump truck	2	farm	\$16,188	\$32,376
Vacuum tank	1	farm	\$64,500	\$64,500
Backhoe	1	farm	\$45,000	\$45,000
Boxscraper	1	farm	\$3,000	\$3,000
Brush hog, 10'	1	farm	\$9,127	\$9,127
Gooseneck trailer, 28'	1	farm	\$24,500	\$24,500
Miscellaneous	1	farm	\$60,000	\$60,000
Insurance:				\$36,797
Insur., facilities @ \$5 per \$1,000	1	farm	\$30,025	\$30,025
Insur., machinery, @ \$4 per \$1,000	1	farm	\$5,626.01	\$5,626
Liability Insur. (\$1 million coverage)	1	farm	\$1,146	\$1,146
Total Capital Costs				\$17,583,300
Capital Costs per Head				\$3,517
Average Capital Costs (Purchase - Salvage Value)/2				\$8,846,178
Average Capital Costs per Head				\$1,769
Total Capital Recovery Costs				\$2,357,058
Capital Recovery Costs per Head				\$471

Table 3: Monthly Summary of Returns and Expenses for a 5,000-Head Open Lot Dairy in Southern Idaho

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Production:													
Milk	\$1,313,437	\$1,313,437	\$1,313,437	\$1,313,437	\$1,313,437	\$1,313,437	\$1,313,437	\$1,313,437	\$1,313,437	\$1,313,437	\$1,313,437	\$1,313,437	\$15,761,244
Bull Calves	\$3,943	\$3,943	\$3,943	\$3,943	\$3,943	\$3,943	\$3,943	\$3,943	\$3,943	\$3,943	\$3,943	\$3,943	\$47,316
Heifer Calves	\$14,646	\$14,646	\$14,646	\$14,646	\$14,646	\$14,646	\$14,646	\$14,646	\$14,646	\$14,646	\$14,646	\$14,646	\$175,752
Cull Cows	\$11,746	\$11,746	\$11,746	\$11,746	\$11,746	\$11,746	\$11,746	\$11,746	\$11,746	\$11,746	\$11,746	\$11,746	\$140,952
Total Receipts	\$1,343,772	\$1,343,772	\$1,343,772	\$1,343,772	\$1,343,772	\$1,343,772	\$1,343,772	\$1,343,772	\$1,343,772	\$1,343,772	\$1,343,772	\$1,343,772	\$16,125,264
Operating Inputs:													
Alfalfa hay, dairy	\$141,687	\$141,687	\$141,687	\$141,687	\$141,687	\$141,687	\$141,687	\$141,687	\$141,687	\$141,687	\$141,687	\$141,687	\$1,700,244
Feeder hay	\$24,491	\$24,491	\$24,491	\$24,491	\$24,491	\$24,491	\$24,491	\$24,491	\$24,491	\$24,491	\$24,491	\$24,491	\$293,892
Close-up hay	\$3,326	\$3,326	\$3,326	\$3,326	\$3,326	\$3,326	\$3,326	\$3,326	\$3,326	\$3,326	\$3,326	\$3,326	\$39,912
Straw	\$1,634	\$1,634	\$1,634	\$1,634	\$1,634	\$1,634	\$1,634	\$1,634	\$1,634	\$1,634	\$1,634	\$1,634	\$19,608
Corn silage (32%DM)	\$88,563	\$88,563	\$88,563	\$88,563	\$88,563	\$88,563	\$88,563	\$88,563	\$88,563	\$88,563	\$88,563	\$88,563	\$1,062,756
Beet pulp	\$23,169	\$23,169	\$23,169	\$23,169	\$23,169	\$23,169	\$23,169	\$23,169	\$23,169	\$23,169	\$23,169	\$23,169	\$278,028
Corn	\$129,859	\$129,859	\$129,859	\$129,859	\$129,859	\$129,859	\$129,859	\$129,859	\$129,859	\$129,859	\$129,859	\$129,859	\$1,558,308
Barley													
Canola	\$42,826	\$42,826	\$42,826	\$42,826	\$42,826	\$42,826	\$42,826	\$42,826	\$42,826	\$42,826	\$42,826	\$42,826	\$513,912
Distillers	\$56,202	\$56,202	\$56,202	\$56,202	\$56,202	\$56,202	\$56,202	\$56,202	\$56,202	\$56,202	\$56,202	\$56,202	\$674,424
Cottonseed	\$88,041	\$88,041	\$88,041	\$88,041	\$88,041	\$88,041	\$88,041	\$88,041	\$88,041	\$88,041	\$88,041	\$88,041	\$1,056,492
Molasses	\$19,338	\$19,338	\$19,338	\$19,338	\$19,338	\$19,338	\$19,338	\$19,338	\$19,338	\$19,338	\$19,338	\$19,338	\$232,056
Mineral, fresh cows	\$6,064	\$6,064	\$6,064	\$6,064	\$6,064	\$6,064	\$6,064	\$6,064	\$6,064	\$6,064	\$6,064	\$6,064	\$72,768
Mineral, lactating cows	\$37,327	\$37,327	\$37,327	\$37,327	\$37,327	\$37,327	\$37,327	\$37,327	\$37,327	\$37,327	\$37,327	\$37,327	\$447,924
Mineral, dry cows	\$3,184	\$3,184	\$3,184	\$3,184	\$3,184	\$3,184	\$3,184	\$3,184	\$3,184	\$3,184	\$3,184	\$3,184	\$38,208
Mineral, close-up cows	\$3,774	\$3,774	\$3,774	\$3,774	\$3,774	\$3,774	\$3,774	\$3,774	\$3,774	\$3,774	\$3,774	\$3,774	\$45,288
Bypass fat	\$19,410	\$19,410	\$19,410	\$19,410	\$19,410	\$19,410	\$19,410	\$19,410	\$19,410	\$19,410	\$19,410	\$19,410	\$232,920
Supplies	\$71,251	\$71,251	\$71,251	\$71,251	\$71,251	\$71,251	\$71,251	\$71,251	\$71,251	\$71,251	\$71,251	\$71,251	\$855,012
Utilities	\$22,500	\$22,500	\$22,500	\$22,500	\$22,500	\$22,500	\$22,500	\$22,500	\$22,500	\$22,500	\$22,500	\$22,500	\$270,000
Labor, including fringe costs	\$149,585	\$149,585	\$149,585	\$149,585	\$149,585	\$149,585	\$149,585	\$149,585	\$149,585	\$149,585	\$149,585	\$149,585	\$1,795,020
Herd replacement costs	\$119,584	\$119,584	\$119,584	\$119,584	\$119,584	\$119,584	\$119,584	\$119,584	\$119,584	\$119,584	\$119,584	\$119,584	\$1,435,008
Repairs & maintenance	\$61,250	\$61,250	\$61,250	\$61,250	\$61,250	\$61,250	\$61,250	\$61,250	\$61,250	\$61,250	\$61,250	\$61,250	\$735,000
Milk hauling	\$25,417	\$25,417	\$25,417	\$25,417	\$25,417	\$25,417	\$25,417	\$25,417	\$25,417	\$25,417	\$25,417	\$25,417	\$305,004
State & association charges	\$20,834	\$20,834	\$20,834	\$20,834	\$20,834	\$20,834	\$20,834	\$20,834	\$20,834	\$20,834	\$20,834	\$20,834	\$250,008
Misc. (fuel, insur., etc.)	\$66,667	\$66,667	\$66,667	\$66,667	\$66,667	\$66,667	\$66,667	\$66,667	\$66,667	\$66,667	\$66,667	\$66,667	\$800,000
Interest	\$48,750	\$48,750	\$48,750	\$48,750	\$48,750	\$48,750	\$48,750	\$48,750	\$48,750	\$48,750	\$48,750	\$48,750	\$585,000
Veterinary Medicine	\$36,250	\$36,250	\$36,250	\$36,250	\$36,250	\$36,250	\$36,250	\$36,250	\$36,250	\$36,250	\$36,250	\$36,250	\$435,000
Machinery (Fuel,Lube,Repair)	\$5,002	\$5,002	\$5,002	\$5,002	\$5,002	\$5,002	\$5,002	\$5,002	\$5,002	\$5,002	\$5,002	\$5,026	\$60,048
Vehicles (Fuel and Repair)	\$2,993	\$2,993	\$2,993	\$2,993	\$2,993	\$2,993	\$2,993	\$2,993	\$2,993	\$2,993	\$2,993	\$3,007	\$35,930
Equipment (Repair)	\$609	\$609	\$609	\$609	\$609	\$609	\$609	\$609	\$609	\$609	\$609	\$609	\$7,308
Housing, Improvements (Repair)	\$21,335	\$21,335	\$21,335	\$21,335	\$21,335	\$21,335	\$21,335	\$21,335	\$21,335	\$21,335	\$21,335	\$21,437	\$256,122
Taxes and Insurance	\$91,351	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$91,351
Total	\$1,432,273	\$1,340,922	\$1,340,922	\$1,340,922	\$1,340,922	\$1,340,922	\$1,340,922	\$1,340,922	\$1,340,922	\$1,340,922	\$1,340,922	\$1,341,062	\$16,182,555

Table 5: Investment Summary for 5,000-Head Open Lot Dairy in

Item	Value or Cost (total)	Years of Life (n)	Salvage Value (\$/head)	Salvage Value (\$/herd)	Discount Rate (i)	Capital Recovery Factor	Capital Recovery Value
Initial Capital Outlays:							
Cattle:	\$6,125,000	3	\$525	\$2,625,000	5.00%	0.3672	\$1,416,450
Initial cow purchase	\$6,125,000						
Land:	\$3,950,000						
Land purchase*	\$1,200,000				7.50%		\$90,000
Site Prep: Permits, well, roads**	\$2,750,000	30	\$0		6.00%	0.0727	\$199,788
Feeding Facilities:	\$526,000						
Scales	\$100,000	30	\$0		6.00%	0.0727	\$7,265
Commodity shed, 14 bays	\$210,000	30	\$0		6.00%	0.0727	\$15,257
Hay sheds (180' x 50')	\$216,000	30	\$0		6.00%	0.0727	\$15,692
Milking Barn	\$2,064,000	30	\$0		6.00%	0.0727	\$149,950
Buildings	\$480,000						
2 double 36 parallel stalls	\$1,584,000						
Open Lots	\$3,025,000						
Sheds, 400 sq ft per cow	\$2,125,000	30	\$0		6.00%	0.0727	\$154,381
Shades: 40 sq ft per cow	\$900,000	30	\$0		6.00%	0.0727	\$65,385
Hospital Barn	\$390,000	30	\$0		6.00%	0.0727	\$28,334
Building	\$126,000						
Double 12 parallel stalls	\$264,000						
Machinery, 5000-cow facility:	\$1,406,503					Total:	\$208,205.75
Generator	\$150,000	10	\$7,500	\$15,000	6.00%	0.1359	\$19,816
Farm pickups, new	\$40,000	8	\$4,000	\$4,000	6.00%	0.1610	\$6,036
Farm pickups, used	\$40,000	8	\$2,000	\$4,000	6.00%	0.1610	\$6,238
4-wheelers	\$12,000	8	\$600	\$1,200	6.00%	0.1610	\$1,871
10-wheel truck (manure removal)	\$120,000	10	\$6,000	\$12,000	6.00%	0.1359	\$15,853
Tractor-125 HP	\$95,000	10	\$9,500	\$9,500	6.00%	0.1359	\$12,189
Tractor-75 HP	\$55,000	20	\$5,500	\$5,500	6.00%	0.0872	\$4,646
Tractor-60 HP	\$41,000	20	\$4,100	\$4,100	6.00%	0.0872	\$3,463
Straw Spreader	\$70,000	10	\$3,500	\$7,000	6.00%	0.1359	\$9,247
Loaders, new	\$147,000	10	\$14,700	\$14,700	6.00%	0.1359	\$18,862
Loaders, used	\$148,000	8	\$7,400	\$14,800	6.00%	0.1610	\$23,081
Skid steer loader	\$70,000	3	\$3,500	\$7,000	6.00%	0.3741	\$23,989
Telehandler loader	\$50,000	3	\$5,000	\$5,000	6.00%	0.3741	\$17,135
Semis, with feedbox mixers, new	\$125,000	10	\$12,500	\$12,500	6.00%	0.1359	\$16,039
Semis, with feedbox mixers, used	\$65,000	8	\$6,500	\$6,500	6.00%	0.1610	\$9,809
Dump truck	\$32,376	20	\$1,619	\$3,238	6.00%	0.0872	\$2,735
Vacuum tank	\$64,500	10	\$6,450	\$6,450	6.00%	0.1359	\$8,276
Backhoe	\$45,000	20	\$4,500	\$4,500	6.00%	0.0872	\$3,801
Boxscraper	\$3,000	20	\$300	\$300	6.00%	0.0872	\$253
Brush hog, 10'	\$9,127	10	\$913	\$913	6.00%	0.1359	\$1,171
Gooseneck trailer, 28'	\$24,500	8	\$2,450	\$2,450	6.00%	0.1610	\$3,697
Miscellaneous	\$60,000	16	\$0	\$0	7.00%	0.1059	\$6,351
Insurance:	\$36,797						
Insur., facilities @ \$5 per \$1,000	\$30,025						
Insur., machinery, @ \$4 per \$1,000	\$5,626						
Liability Insur. (\$1 million coverage)	\$1,146						
Total Investment Costs/Salvage Value	\$17,583,300		\$109,057				
Capital Costs/Salvage Value per Head	\$3,517		\$22				
Average Capital Costs	\$8,846,178.26						
Average Capital Costs per Head	\$1,769						
Total Capital Recovery Costs	\$2,357,058						\$2,357,058
Capital Recovery Costs per Head	\$471						\$471

*Opportunity cost on land investment is calculated as land value multiplied by the interest rate. Land is not depreciable.

**Site preparation charges include nutrient management expenses.