1992 DAIRY ENTERPRISE BUDGET: 200-COW HERD
AUTHORS AND ACKNOWLEDGMENTS

The information presented in this publication was developed by dairy Cooperative Extension faculty, Washington State University. Appreciation is expressed to the dairy farmers and suppliers who provided most of the data on which this publication is based. Faculty participating in the study were:

John W. Bernard, Area Extension Agent, Seattle
Roger A. Cady, Dairy Specialist, Puyallup
Gary R. Fredricks, Area Extension Agent, Vancouver
David C. Grusenmeyer, County Extension Agent, Bellingham
Wayne H. Madson, Area Extension Agent, Colville
Richard W. Mathews, Area Extension Agent (retired), Everett
Eddie L. Thomason, Area Extension Agent, Yakima
Gayle S. Willett, Farm Management Specialist, Pullman

Issued by Washington State University Cooperative Extension, Larry G. James, Interim Director, and the U.S. Department of Agriculture in furtherance of the Acts of May 8 and June 30, 1914. Cooperative Extension programs and policies are consistent with federal and state laws and regulations on nondiscrimination regarding race, color, national origin, religion, gender, age, disability, and gender preference. Trade names have been used to simplify information; no endorsement is intended. Revised October 1991. A
INTRODUCTION

OBJECTIVES

SOURCES OF INFORMATION

BUDGET ASSUMPTIONS

BUDGET FOR A COW PRODUCING 20,000 POUNDS OF MILK PER YEAR

IMPACT OF COW PRODUCTIVITY ON REVENUES, EXPENSES AND RETURNS

TABLES

1. Annual expenses for a Holstein dairy cow producing 20,000 pounds of milk per year

2. Annual revenues, expenses and returns for a Holstein dairy cow producing 20,000 pounds of milk per year

3. Capital investment for a 200-cow herd

4. Initial investment, annual depreciation, and interest expenses for a 200-cow herd

5. Annual expenses for a Holstein dairy cow producing 22,000 pounds of milk per year

6. Annual revenues, expenses and returns for a Holstein dairy cow producing 22,000 pounds of milk per year

7. Annual expenses for a Holstein dairy cow producing 18,000 pounds of milk per year

8. Annual revenues, expenses and returns for a Holstein dairy cow producing 18,000 pounds of milk per year

9. SUMMARY OF REVENUES, EXPENSES AND RETURNS FOR HOLSTEIN DAIRY COWS PRODUCING MILK AT SELECTED LEVELS
INTRODUCTION

Washington’s dairy industry has changed substantially in recent years. Perhaps the most striking change is the reduction in the number of dairy farms. In 1976, there were 1,786 Washington producers shipping milk to handlers regulated by the state’s federal milk marketing orders. Only 1,222 farms were shipping milk to federal order handlers in 1991. Thus, over a period of 15 years commercial dairy farm numbers dropped by 564, a 32% decline. However, dairy cows increased from 129,000 in 1976 to 234,000 in 1991. The average number of cows per farm has risen substantially. Further, cow production has increased from 15,488 pounds per cow in 1976 to 20,506 pounds in 1990 for cows enrolled in the Washington Dairy Herd Improvement Association. Because of larger and more productive herds, greater mechanization and inflation, commercial dairy farmers control substantial capital resources.

Large capital investments, rapid technological change, rising production costs and volatile milk prices may pose difficult challenges for you, the dairy farmer. Survival requires the effective use of production and business management skills.

An enterprise budget is a basic business management tool. It reflects projected revenues, expenses and various measures of returns for an existing or potential business activity (for example, milk production). Enterprise budgets can help you identify business strengths and weaknesses, plan for adjustments, determine financing requirements and address other business management issues.

OBJECTIVES

The objectives of this bulletin are to present:


2. Capital investment needed to replace or initially purchase the cows, buildings, facilities, machinery, equipment and land for such an enterprise.

3. The impact of dairy cow productivity on 1992 per-cow revenues, expenses and returns.
SOURCES OF INFORMATION

Information was collected from several sources, including the records of individual dairy farmers. Also, the annual summary of the Whatcom Community College farm records program was helpful. Farm suppliers and contractors furnished prices for numerous inputs. We based some information on the experience and judgment of participating WSU faculty. Due to the procedures and sources of information used in developing the enterprise budgets, the results are estimates of a typical enterprise characterized by the assumptions outlined below rather than a mathematical average of a large number of producers.

BUDGET ASSUMPTIONS

Major assumptions used in developing the enterprise budgets are:

1. The budget analysis reflects the milk production enterprise of a 200-cow Washington dairy farm. Accordingly, to separate the milk production enterprise from other enterprises found on Washington dairy farms (for example, heifer raising and forage production), all farm-produced inputs are valued at market prices. A 200-cow herd was selected because it is a common size for a Washington DHIA Holstein herd.

2. The herd is composed of Holstein cows producing 20,000 pounds milk annually per cow. This level is close to the current state DHIA average. Budgets were also developed for Holstein cows producing 18,000 and 22,000 pounds of milk. These levels are 10% above and below the average DHIA Holstein herd and were used to estimate the relationship between cow productivity and returns. The three levels reflect three different herds fed according to production, rather than the same herd fed at three different levels.

3. Annually, 30% of the cows are removed from the herd. Replacements are two-year-old springer heifers valued at anticipated market prices. While it may be argued that the cost to the milk production enterprise should be the cost of raising the animal, the milk production enterprise can be analyzed separately from other enterprises by expensing all produced inputs at market prices. If valued at cost, the efficiency (or lack of it) of the business in raising replacements will influence the performance of the milk production enterprise.

4. Alfalfa hay and silage are the principal forages in the cow ration. A commercially mixed concentrate is fed. All feed is valued at market prices.

5. The cows are milked in a double-6 herringbone parlor and housed in a free-stall barn. A liquid (lagoon flush) manure system with a solids separator and a pump for field application is used.

6. Total labor requirements are 40 hours per cow per year. Seventy-five percent (30 hours) of the labor is hired and the owner-operator provides the remaining 25 percent (10 hours).
7. New purchase costs are used for all buildings, machinery and equipment. While this may overstate current costs experienced by dairy farmers, it measures the ability of the dairy enterprise to replace depreciable assets. When prices rise, depreciation claimed on earlier purchases does not offset the increased cost of replacing those purchases. In the long run, this will hurt an enterprise that doesn’t take this into account. Since you periodically replace these assets as they wear out, you should include those replacement costs in your long-range plans.

**BUDGET FOR A COW PRODUCING 20,000 POUNDS OF MILK PER YEAR**

**Annual Expenses**

As indicated in Table 1, annual per-cow production expenses are grouped into three categories:

(1) operating expenses; (2) ownership expenses; and (3) operator and family labor and management expenses. Operating expenses vary with the number of cows and include feed, veterinary care and medicine, breeding, milk hauling and marketing, hired labor, repairs, cow testing, bedding, supplies, utilities, fuel and oil, interest on operating capital, herd replacements, interest on the cow investment and other miscellaneous outlays.

Ownership expenses are the second major category. These are associated with the ownership of facilities, equipment and land, and occur regardless of the number of cows supported. Such expenses include interest on the investment, depreciation, insurance and property taxes. Annual interest costs equal 10.5% of the average investment in all assets (see Table 4) and are computed in the following manner:

\[
\text{Annual interest expense} = \frac{\text{New cost} + \text{Salvage value}}{2} \times 0.105
\]

Depreciation is computed for buildings, equipment, and vehicles by the straight-line formula:

\[
\text{Annual depreciation expense} = \frac{\text{New cost} - \text{Salvage value}}{\text{Years useful life}}
\]
Table 1. Annual Expenses for a Holstein Dairy Cow Producing 20,000 Pounds of Milk per Year

<table>
<thead>
<tr>
<th>Category</th>
<th>Total per Cow</th>
<th>Total per Cwt.</th>
<th>My Farm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OPERATING EXPENSES:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feed:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alfalfa hay (3 tons @ $125 per ton)</td>
<td>375.00</td>
<td>1.87</td>
<td></td>
</tr>
<tr>
<td>Silage (5.7 tons @ $27 per ton)</td>
<td>153.90</td>
<td>0.77</td>
<td></td>
</tr>
<tr>
<td>Concentrate (4.5 tons @ $150 per ton)</td>
<td>675.00</td>
<td>3.37</td>
<td></td>
</tr>
<tr>
<td>Mineral (1:1 Ca-P, 46 lbs. @ $30 per cwt.)</td>
<td>13.80</td>
<td>0.07</td>
<td></td>
</tr>
<tr>
<td>Total Feed Expenses</td>
<td>1,217.70</td>
<td>6.08</td>
<td></td>
</tr>
<tr>
<td>Vet. - medicine</td>
<td>42.00</td>
<td>0.21</td>
<td></td>
</tr>
<tr>
<td>Breeding, semen and supplies (1.9 services @ $15 per service)</td>
<td>28.50</td>
<td>0.14</td>
<td></td>
</tr>
<tr>
<td>Bedding</td>
<td>20.00</td>
<td>0.10</td>
<td></td>
</tr>
<tr>
<td>Fuel (10 gal. gas @ $1.05, 3.33 gal. diesel @ 80¢)</td>
<td>13.16</td>
<td>0.07</td>
<td></td>
</tr>
<tr>
<td>Utilities (electrical power and telephone)</td>
<td>66.00</td>
<td>0.33</td>
<td></td>
</tr>
<tr>
<td>Repairs on equipment and facilities</td>
<td>70.00</td>
<td>0.35</td>
<td></td>
</tr>
<tr>
<td>Supplies (soap, inflations, brushes, etc.)</td>
<td>36.56</td>
<td>0.18</td>
<td></td>
</tr>
<tr>
<td>Hired labor (30 hours @ $11 per hour)</td>
<td>330.00</td>
<td>1.65</td>
<td></td>
</tr>
<tr>
<td>Replacement heifer ($1,200 x 30%)</td>
<td>360.00</td>
<td>1.80</td>
<td></td>
</tr>
<tr>
<td>Milk hauling and marketing (200 cwt. x 97% shipped x 60¢ per cwt.)</td>
<td>116.40</td>
<td>0.58</td>
<td></td>
</tr>
<tr>
<td>Cow testing (DHIA)</td>
<td>18.84</td>
<td>0.09</td>
<td></td>
</tr>
<tr>
<td>Miscellaneous (dues, legal, accounting, travel, education, etc.)</td>
<td>20.00</td>
<td>0.10</td>
<td></td>
</tr>
<tr>
<td>Interest on operating expenses ($1,862.76 + 12 x 10.5%)</td>
<td>16.30</td>
<td>0.08</td>
<td></td>
</tr>
<tr>
<td>Interest on avg. cow investment $1,200 + $585 x 10.5%</td>
<td>93.71</td>
<td>0.47</td>
<td></td>
</tr>
<tr>
<td><strong>Total Operating Expenses</strong></td>
<td>2,449.17</td>
<td>12.23</td>
<td></td>
</tr>
<tr>
<td><strong>OWNERSHIP EXPENSES:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depreciation on bldgs. and equip. (Table 4)</td>
<td>194.41</td>
<td>0.97</td>
<td></td>
</tr>
<tr>
<td>Interest on investment in bldgs., equip., &amp; land (Table 4)</td>
<td>171.15</td>
<td>0.86</td>
<td></td>
</tr>
<tr>
<td>Property taxes on bldgs., equip., &amp; land ($1,630 avg. inv. x 1.8%)</td>
<td>29.34</td>
<td>0.15</td>
<td></td>
</tr>
<tr>
<td>Insurance</td>
<td>15.00</td>
<td>0.08</td>
<td></td>
</tr>
<tr>
<td><strong>Total Ownership Expenses</strong></td>
<td>409.90</td>
<td>2.05</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL OPERATING AND OWNERSHIP EXPENSES</strong></td>
<td>2,859.07</td>
<td>14.28</td>
<td></td>
</tr>
<tr>
<td><strong>OPERATOR &amp; FAMILY LABOR &amp; MANAGEMENT EXPENSES:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operator &amp; family labor (10 hours @ $11 per hour)</td>
<td>110.00</td>
<td>0.55</td>
<td></td>
</tr>
<tr>
<td>Operator management (5% x $2,210.82 total revenues, Table 2)</td>
<td>110.54</td>
<td>0.55</td>
<td></td>
</tr>
<tr>
<td><strong>Total Operator &amp; Family Labor &amp; Management Expenses</strong></td>
<td>220.54</td>
<td>1.10</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL ALL EXPENSES</strong></td>
<td>3,079.61</td>
<td>15.38</td>
<td></td>
</tr>
</tbody>
</table>
New costs, salvage values and years of useful life used to estimate depreciation are reported in Table 4.

The third major category of expenses is operator and family labor and management. Total labor required to support the milk production enterprise is 40 hours per cow annually. The labor requirement is met by 30 hours of hired labor and 10 hours of operator and family labor. All labor is valued at $11 per hour. Management costs 5% of total revenues, a market-based rate.

### Annual Per-Cow Revenues, Expenses and Returns

Annual per-cow revenues and a summary of expenses and returns at selected milk prices are presented in Table 2. Revenues include milk sales, calf and cull cow sales and a manure value. The manure value is based on the amount of N, P$_2$O$_5$, and K$_2$O excreted by the cow and available for plant use the first year the manure is applied to the field. Current fertilizer prices are used in valuing manure nutrients.

Assuming an average milk price of $12 per cwt., total revenues are $2,598.82 per cow. Subtraction of feed and other operating expenses from total revenues provides a return above operating expenses of $149.45. That return falls to -$238.35 for $10 per cwt. milk and is $537.65 if milk prices average $14 per cwt. Returns above operating expenses are available as funds to cover ownership costs (depreciation; interest on investment in capital assets, except cows; property taxes and insurance) and to compensate the operator for labor and management contributions.

Subtraction of operating and ownership expenses from total revenues, yields the return to operator and family labor and management. The per-cow return is -$648.25 at $10 per cwt. milk, -$260.45 if milk is $12, and $127.75 at a milk price of $14 per cwt (Table 2).

A return to operator and family labor and management and capital (debt and equity) can be obtained by adding interest on the average capital investment to the returns to operator and family labor and management. The return to these three resources (labor, management and capital) is -$383.39, $4.41, and $392.61 at milk prices of $10, $12, and $14 per cwt., respectively.

A final measure of return is the rate of return on the average capital investment. Calculate this return by first subtracting the estimated contribution (or cost) of operator and family labor and management from the return to operator and family labor and management and capital. After that, the residual is the return to capital, which is divided by the average capital investment in cows, buildings, equipment and land to get the rate of return on the average capital investment. Assuming $12 per cwt. milk, the rate of return is -9.3%. The proper interpretation of this figure is that the operator loses 9.3% on the average debt and equity capital investment while receiving $239.94 per cow for operator and family labor and management. To the extent the operator is willing to accept less than these amounts for labor and management, the rate of return to capital will improve. The return is -23.9% and 5.3% for $10 and $14 per cwt. milk, respectively.
Table 2. Annual Revenues, Expenses and Returns for a Holstein Dairy Cow Producing 20,000 Pounds of Milk per Year

<table>
<thead>
<tr>
<th>Milk Price ($ per cwt.)</th>
<th>$10</th>
<th>$12</th>
<th>$14</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total per CoW</td>
<td>Total per Cwt.</td>
<td>Total per CoW</td>
<td>Total per Cwt.</td>
<td>Total per CoW</td>
<td>Total per Cwt.</td>
</tr>
<tr>
<td>REVENUES:</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>Milk sales (200 cwt. x 97% shipped)</td>
<td>1,940.00</td>
<td>9.70</td>
<td>2,328.00</td>
<td>11.64</td>
<td>2,716.00</td>
<td>13.58</td>
</tr>
<tr>
<td>Calf sales (.46 bull @ $50 + .46 heifer @ $100)</td>
<td>69.00</td>
<td>0.34</td>
<td>69.00</td>
<td>0.34</td>
<td>69.00</td>
<td>0.34</td>
</tr>
<tr>
<td>Cull cow sales (30% culled or died -2.5% death less x 1,300 lbs. @ 45¢ per lb.)</td>
<td>160.87</td>
<td>0.80</td>
<td>160.87</td>
<td>0.80</td>
<td>160.87</td>
<td>0.80</td>
</tr>
<tr>
<td>Manure value (40 lbs. N @ 27¢, 47 lbs. P₂O₅@ 25¢, 92 lbs. K₂O @ 20¢)</td>
<td>40.95</td>
<td>0.20</td>
<td>40.95</td>
<td>0.20</td>
<td>40.95</td>
<td>0.20</td>
</tr>
<tr>
<td>Total Revenues</td>
<td>2,210.82</td>
<td>11.04</td>
<td>2,598.82</td>
<td>12.98</td>
<td>2,986.82</td>
<td>14.92</td>
</tr>
<tr>
<td>LESS Feed Expenses</td>
<td>1,217.70</td>
<td>6.08</td>
<td>1,217.70</td>
<td>6.08</td>
<td>1,217.70</td>
<td>6.08</td>
</tr>
<tr>
<td>RETURNS Above Feed Expenses</td>
<td>993.12</td>
<td>4.96</td>
<td>1,380.92</td>
<td>6.90</td>
<td>1,769.12</td>
<td>8.84</td>
</tr>
<tr>
<td>LESS Nonfeed Operating Expenses</td>
<td>1,231.47</td>
<td>6.16</td>
<td>1,231.47</td>
<td>6.16</td>
<td>1,231.47</td>
<td>6.16</td>
</tr>
<tr>
<td>RETURNS Above Operating Expenses</td>
<td>-238.35</td>
<td>-1.20</td>
<td>149.45</td>
<td>0.74</td>
<td>537.65</td>
<td>2.68</td>
</tr>
<tr>
<td>LESS Ownership Expenses</td>
<td>409.90</td>
<td>2.05</td>
<td>409.90</td>
<td>2.05</td>
<td>409.90</td>
<td>2.05</td>
</tr>
<tr>
<td>RETURNS to Operator &amp; Family Labor &amp; Mngmt.</td>
<td>-648.25</td>
<td>-3.25</td>
<td>-260.45</td>
<td>-1.31</td>
<td>127.75</td>
<td>0.63</td>
</tr>
<tr>
<td>PLUS Interest on Investment (cows, bldgs., equip., land)</td>
<td>264.86</td>
<td>1.32</td>
<td>264.86</td>
<td>1.32</td>
<td>264.86</td>
<td>1.32</td>
</tr>
<tr>
<td>RETURNS to Operator &amp; Family Labor &amp; Mngmt. &amp; Capital</td>
<td>-383.39</td>
<td>-1.93</td>
<td>4.41</td>
<td>0.01</td>
<td>392.61</td>
<td>1.95</td>
</tr>
<tr>
<td>LESS Operator &amp; Family Labor &amp; Mngmt.</td>
<td>220.54</td>
<td>1.10</td>
<td>239.94</td>
<td>1.20</td>
<td>259.34</td>
<td>1.30</td>
</tr>
<tr>
<td>RETURNS to Capital Investment</td>
<td>-603.93</td>
<td>-3.03</td>
<td>-235.53</td>
<td>-1.19</td>
<td>133.27</td>
<td>0.65</td>
</tr>
<tr>
<td>RATE OF RETURN on $2,523 Average Investment (Table 4)</td>
<td>-23.9%</td>
<td>-9.3%</td>
<td>5.3%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 Assumes 30% herd turnover, 227-day average calving interval for cows leaving herd, 389-day average calving interval for the entire herd, replacements calve upon entering herd, and 12% calf mortality.

2 Equals returns to capital investment + $2,523 average annual investment (Table 4).
Table 3. Capital Investment for a 200-Cow Herd

<table>
<thead>
<tr>
<th>Description</th>
<th>New Cost $</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cows</td>
<td>240,000</td>
</tr>
<tr>
<td>Manure System:</td>
<td></td>
</tr>
<tr>
<td>Flush tanks 4 concrete tanks (steel gates) each with 2,500 gal. capacity</td>
<td>12,500</td>
</tr>
<tr>
<td>Collection tank 0.5-day capacity @ 100 gal./cow/day, 8' deep x 10' x 20'</td>
<td>9,167</td>
</tr>
<tr>
<td>Transfer pump 5 hp, chopper pump, self-priming</td>
<td>4,000</td>
</tr>
<tr>
<td>Pipe (collection tank to lagoon) 4 PVC, 300 feet, class 100</td>
<td>450</td>
</tr>
<tr>
<td>Lagoon 20,740 cubic yards</td>
<td>28,500</td>
</tr>
<tr>
<td>PTO mixing propellor 3-point hitch mounted on tractor with wheels</td>
<td>4,300</td>
</tr>
<tr>
<td>Irrigation pump 30 hp, 3-phase</td>
<td>5,000</td>
</tr>
<tr>
<td>Electrical panel &amp; wiring</td>
<td>1,000</td>
</tr>
<tr>
<td>Big gun sprinkler on cart</td>
<td>1,150</td>
</tr>
<tr>
<td>Irrigation pipe 4 PVC, 3,800', class 100</td>
<td>5,700</td>
</tr>
<tr>
<td>Manure separator Separator (1,000 GPM), stand, plumbing, installation</td>
<td>20,000</td>
</tr>
<tr>
<td>Total Manure System</td>
<td>91,767</td>
</tr>
<tr>
<td>Water System:</td>
<td></td>
</tr>
<tr>
<td>Well and casing 100' well with 6&quot; casing</td>
<td>7,500</td>
</tr>
<tr>
<td>Sand screen 10' of screen installed</td>
<td>1,000</td>
</tr>
<tr>
<td>Pump 5 hp, 51 gpm, 3-phase installed</td>
<td>1,800</td>
</tr>
<tr>
<td>Tank 315 gal.</td>
<td>850</td>
</tr>
<tr>
<td>Pipe 2&quot; PVC, 100'</td>
<td>50</td>
</tr>
<tr>
<td>Electrical system Wire, wiring, fitting, starter</td>
<td>800</td>
</tr>
<tr>
<td>Hot water heaters 2, 100 gal. heaters, installed</td>
<td>3,000</td>
</tr>
<tr>
<td>Heat exchanger Installed</td>
<td>2,400</td>
</tr>
<tr>
<td>Total Water System</td>
<td>17,400</td>
</tr>
<tr>
<td>Machinery:</td>
<td></td>
</tr>
<tr>
<td>Wheel tractor 70 hp, diesel $28,000 x 60% dairy</td>
<td>16,800</td>
</tr>
<tr>
<td>Wheel tractor 40 hp, diesel $18,000 x 75% dairy</td>
<td>13,500</td>
</tr>
<tr>
<td>Front-end loader</td>
<td>5,500</td>
</tr>
<tr>
<td>Forage wagon Self-unloading steel box</td>
<td>11,000</td>
</tr>
<tr>
<td>Blade</td>
<td>650</td>
</tr>
<tr>
<td>Total Machinery</td>
<td>47,450</td>
</tr>
<tr>
<td>Description</td>
<td>New Cost</td>
</tr>
<tr>
<td>-------------</td>
<td>---------</td>
</tr>
<tr>
<td>Machine Shed/Shop</td>
<td>$10,080</td>
</tr>
<tr>
<td>Description</td>
<td>$16,800 x 60% dairy</td>
</tr>
<tr>
<td>Vehicles:</td>
<td></td>
</tr>
<tr>
<td>Pickup</td>
<td>$13,500</td>
</tr>
<tr>
<td>3/4 ton, 4x4, $18,000 x 75% dairy</td>
<td></td>
</tr>
<tr>
<td>Auto</td>
<td>$6,000</td>
</tr>
<tr>
<td>$12,000, 50% dairy</td>
<td></td>
</tr>
<tr>
<td>Total Vehicles</td>
<td>$19,500</td>
</tr>
<tr>
<td>Land</td>
<td>$12,500</td>
</tr>
<tr>
<td>5 acres for farmstead @ $2,500 per acre</td>
<td></td>
</tr>
<tr>
<td>Bunk Silo with Roof</td>
<td>$39,000</td>
</tr>
<tr>
<td>100' x 50' x 12', concrete poured in place, roof</td>
<td></td>
</tr>
<tr>
<td>Milk Parlor Building</td>
<td>$15,000</td>
</tr>
<tr>
<td>29'10&quot; x 16'8&quot;, concrete foundation and floor (with floor drains), 6' concrete wall with 4' concrete blocks on top, wood truss roof with metal ceiling and insulated roof. Includes labor and materials.</td>
<td></td>
</tr>
<tr>
<td>Holding Pen</td>
<td>$35,040</td>
</tr>
<tr>
<td>16'8&quot; x 70', same construction as milk parlor building, includes sprinkler system</td>
<td></td>
</tr>
<tr>
<td>Milkhouse</td>
<td>$10,800</td>
</tr>
<tr>
<td>18' x 20', same construction as parlor building</td>
<td></td>
</tr>
<tr>
<td>Parlor Equipment</td>
<td>$34,800</td>
</tr>
<tr>
<td>Double 6 HB, stainless steel stalls, air gates, feedbowl covers, grates, stainless steel curbing, gutter flush, crowd gate with 5 hp compressor</td>
<td></td>
</tr>
<tr>
<td>Milking Equipment</td>
<td>$41,400</td>
</tr>
<tr>
<td>Double 6, stainless steel double loop single slope pipeline, 12 in-place wash units, 2 stainless steel washline, 85 liter receiver group, 3 vacuum and pulsation lines, 12 milker units, 3/4&quot; udder wash lines, 10 hp vacuum pump, 12 detachers, 29&quot; double wash vat, 1.5&quot; milk discharge line</td>
<td></td>
</tr>
<tr>
<td>Grain Feeding Equipment</td>
<td>$6,400</td>
</tr>
<tr>
<td>Feed bin and augering system</td>
<td></td>
</tr>
<tr>
<td>Bulk Milk Tank</td>
<td>$29,698</td>
</tr>
<tr>
<td>3,000 gal., refrigeration units</td>
<td></td>
</tr>
<tr>
<td>Cow Housing, Hay Storage, and Feeding Area (under same roof)</td>
<td>$165,200</td>
</tr>
<tr>
<td>Free-stall barn, pipe loop stalls, lock-up stanchions, feed alleys, concrete blocks, 118 square feet per cow at $7.00 per square foot, 200 cows</td>
<td></td>
</tr>
<tr>
<td>Office Equipment</td>
<td>$5,000</td>
</tr>
<tr>
<td>Desk, furniture, files, computer and software</td>
<td></td>
</tr>
<tr>
<td>Miscellaneous Equipment</td>
<td>$3,550</td>
</tr>
<tr>
<td>Head catch, A.I. nitrogen tanks, refrigerator, small tools, cow lift, calf puller, breeding wheel, washer-dryer.</td>
<td></td>
</tr>
<tr>
<td>TOTAL INVESTMENT:</td>
<td>$824,585</td>
</tr>
<tr>
<td>Dairy</td>
<td>Per Cow</td>
</tr>
<tr>
<td>$824,585</td>
<td>$4,123</td>
</tr>
</tbody>
</table>
Table 4. Initial Investment, Annual Depreciation and Interest Expense for a 200-Cow Herd.

<table>
<thead>
<tr>
<th></th>
<th>New Cost 1</th>
<th>Salvage</th>
<th>Useful</th>
<th>Average Annual</th>
<th>Annual</th>
<th>Annual Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$</td>
<td>Value</td>
<td>Life</td>
<td>Investment 2</td>
<td>Depreciation 3</td>
<td>@10.5%</td>
</tr>
<tr>
<td>Cows (200 hd. @ $1,200)</td>
<td>240,000</td>
<td></td>
<td></td>
<td>178,500</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Manure system:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flush tanks</td>
<td>12,500</td>
<td></td>
<td>20</td>
<td>6,250</td>
<td>625</td>
<td>656</td>
</tr>
<tr>
<td>Collection tank</td>
<td>9,167</td>
<td></td>
<td>20</td>
<td>4,583</td>
<td>458</td>
<td>481</td>
</tr>
<tr>
<td>Transfer pump</td>
<td>4,000</td>
<td>400</td>
<td>5</td>
<td>2,200</td>
<td>720</td>
<td>231</td>
</tr>
<tr>
<td>Pipe (tank to lagoon)</td>
<td>450</td>
<td>45</td>
<td>15</td>
<td>247</td>
<td>27</td>
<td>26</td>
</tr>
<tr>
<td>Lagoon</td>
<td>28,500</td>
<td></td>
<td>20</td>
<td>14,250</td>
<td>1,425</td>
<td>1,496</td>
</tr>
<tr>
<td>Mixing propellor</td>
<td>4,300</td>
<td>430</td>
<td>5</td>
<td>2,365</td>
<td>774</td>
<td>248</td>
</tr>
<tr>
<td>Irrigation pump</td>
<td>5,000</td>
<td>500</td>
<td>5</td>
<td>2,750</td>
<td>900</td>
<td>289</td>
</tr>
<tr>
<td>Electrical system</td>
<td>1,000</td>
<td></td>
<td>15</td>
<td>500</td>
<td>67</td>
<td>52</td>
</tr>
<tr>
<td>Big-gun sprinkler</td>
<td>1,150</td>
<td>100</td>
<td>5</td>
<td>625</td>
<td>210</td>
<td>66</td>
</tr>
<tr>
<td>Irrigation pipe</td>
<td>5,700</td>
<td>570</td>
<td>15</td>
<td>3,135</td>
<td>342</td>
<td>329</td>
</tr>
<tr>
<td>Manure separator</td>
<td>20,000</td>
<td></td>
<td>10</td>
<td>10,000</td>
<td>2,000</td>
<td>1,050</td>
</tr>
<tr>
<td>Water system:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Well and casing</td>
<td>7,500</td>
<td></td>
<td>25</td>
<td>3,750</td>
<td>300</td>
<td>394</td>
</tr>
<tr>
<td>Sand screen</td>
<td>1,000</td>
<td></td>
<td>10</td>
<td>500</td>
<td>100</td>
<td>52</td>
</tr>
<tr>
<td>Pump</td>
<td>1,800</td>
<td>150</td>
<td>10</td>
<td>900</td>
<td>165</td>
<td>94</td>
</tr>
<tr>
<td>Tank</td>
<td>850</td>
<td>85</td>
<td>15</td>
<td>467</td>
<td>51</td>
<td>49</td>
</tr>
<tr>
<td>Pipe</td>
<td>50</td>
<td></td>
<td>15</td>
<td>25</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Electrical system</td>
<td>800</td>
<td></td>
<td>15</td>
<td>400</td>
<td>53</td>
<td>42</td>
</tr>
<tr>
<td>Hot water heaters</td>
<td>3,000</td>
<td></td>
<td>10</td>
<td>1,500</td>
<td>300</td>
<td>157</td>
</tr>
<tr>
<td>Heat exchanger</td>
<td>2,400</td>
<td></td>
<td>7</td>
<td>1,200</td>
<td>343</td>
<td>126</td>
</tr>
<tr>
<td>Machinery</td>
<td>47,450</td>
<td>9,500</td>
<td>10</td>
<td>28,475</td>
<td>3,795</td>
<td>2,990</td>
</tr>
<tr>
<td>Machine shed/shop</td>
<td>10,080</td>
<td>2,016</td>
<td>15</td>
<td>6,048</td>
<td>538</td>
<td>635</td>
</tr>
<tr>
<td>Vehicles</td>
<td>19,500</td>
<td>2,924</td>
<td>5</td>
<td>11,212</td>
<td>3,315</td>
<td>1,177</td>
</tr>
<tr>
<td>Land</td>
<td>12,500</td>
<td>12,500</td>
<td></td>
<td>12,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bunk silo</td>
<td>39,000</td>
<td>3,900</td>
<td>20</td>
<td>21,450</td>
<td>1,755</td>
<td>2,252</td>
</tr>
<tr>
<td>Milk parlor building</td>
<td>15,000</td>
<td>1,500</td>
<td>20</td>
<td>8,250</td>
<td>675</td>
<td>866</td>
</tr>
<tr>
<td>Holding pen</td>
<td>35,040</td>
<td>3,500</td>
<td>20</td>
<td>19,270</td>
<td>1,577</td>
<td>2,023</td>
</tr>
<tr>
<td>Milkhouse</td>
<td>10,800</td>
<td>1,000</td>
<td>20</td>
<td>5,900</td>
<td>490</td>
<td>619</td>
</tr>
<tr>
<td>Parlor equipment</td>
<td>34,800</td>
<td>3,480</td>
<td>10</td>
<td>19,140</td>
<td>3,132</td>
<td>2,010</td>
</tr>
<tr>
<td>Milking equipment</td>
<td>41,400</td>
<td>4,100</td>
<td>10</td>
<td>22,750</td>
<td>3,730</td>
<td>2,389</td>
</tr>
<tr>
<td>Grain feeding equipment</td>
<td>6,400</td>
<td>640</td>
<td>10</td>
<td>3,520</td>
<td>576</td>
<td>370</td>
</tr>
<tr>
<td>Bulk tank</td>
<td>29,698</td>
<td>3,000</td>
<td>15</td>
<td>16,349</td>
<td>1,780</td>
<td>1,717</td>
</tr>
<tr>
<td>Cow housing</td>
<td>165,200</td>
<td>16,500</td>
<td>20</td>
<td>90,850</td>
<td>7,435</td>
<td>9,539</td>
</tr>
<tr>
<td>Office equipment</td>
<td>5,000</td>
<td>500</td>
<td>5</td>
<td>2,750</td>
<td>900</td>
<td>289</td>
</tr>
<tr>
<td>Miscellaneous equipment</td>
<td>3,550</td>
<td>350</td>
<td>10</td>
<td>1,950</td>
<td>320</td>
<td>205</td>
</tr>
<tr>
<td><strong>TOTAL FOR 200 COWS</strong></td>
<td><strong>824,585</strong></td>
<td></td>
<td></td>
<td><strong>504,561</strong></td>
<td><strong>38,881</strong></td>
<td><strong>34,231</strong></td>
</tr>
<tr>
<td><strong>TOTAL PER COW</strong></td>
<td><strong>4,123</strong></td>
<td></td>
<td></td>
<td><strong>2,523</strong></td>
<td><strong>194.41</strong></td>
<td><strong>171.15</strong></td>
</tr>
</tbody>
</table>

1. Taken from Table 3.
2. New cost + salvage value + 2.
4. Depreciation and interest on the cow investment are reported in Table 1.
Capital Investment

The estimated capital required to purchase all new buildings, facilities, machinery, vehicles, land (5 acres) and cows is indicated in Table 3. Where assets are used in more than the milk production enterprise (for example, tractors, machine shed and vehicles) only the portion used in the milk production enterprise is included.

The total investment is estimated to be $824,585 (Table 3). Assuming 200 cows, the per-cow investment is $4,123, including a $1,200 investment for each cow. These figures should be interpreted as either the initial capital investment currently required to acquire a complete 200-cow dairy enterprise with new assets, or as the capital needed to replace all assets on an existing 200-cow dairy enterprise.

IMPACT OF COW PRODUCTIVITY ON REVENUES, EXPENSES AND RETURNS

Production per cow greatly determines cow expenses, revenues and returns. Accordingly, we prepared budgets for cows producing 2,000 pounds below and 2,000 pounds above the 20,000 pounds assumed in Tables 1 and 2. Annual expenses, revenues and returns for a Holstein cow producing 22,000 pounds of milk annually are presented in Tables 5 and 6. Budgets for a Holstein cow producing 18,000 pounds of milk appear in Tables 7 and 8.

Several expenses are adjusted to reflect differences in dairy cow productivity. Grain feeding rates are adjusted at the rate of 1 pound of grain for each 2.5 pounds of milk. Forage consumption is held constant at all levels of milk production. Expense adjustments are also made for veterinary care and medicine, breeding, replacement heifer, milk hauling and marketing, interest on cow investment and interest on operating capital.

A summary of per-cow revenues, expenses and net returns at all three production levels appears in Table 9. The analysis clearly demonstrates the payoff to be expected from increased cow productivity. For example, the added expenses of increasing production from 18,000 pounds to 22,000 pounds are estimated to be $325 per cow. The added revenues from that increased production, assuming milk prices are $12 per cwt., are $465. Consequently, net returns above all expenses improves by $140 per cow. This converts to 3.5 cents increased net return for each 1 pound increase in milk production. Of course, that conclusion is highly sensitive to the assumed milk and grain prices.
Table 5. Annual Expenses for a Holstein Dairy Cow Producing 22,000 Pounds of Milk per Year.

<table>
<thead>
<tr>
<th></th>
<th>Total per Cow</th>
<th>Total per Cwt.</th>
<th>My Farm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OPERATING EXPENSES:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feed:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alfalfa hay (3 tons @ $125 per ton)</td>
<td>375.00</td>
<td>1.70</td>
<td></td>
</tr>
<tr>
<td>Silage (5.7 tons @ $27 per ton)</td>
<td>153.90</td>
<td>0.70</td>
<td></td>
</tr>
<tr>
<td>Concentrate (4.9 tons @ $150 per ton)</td>
<td>735.00</td>
<td>3.34</td>
<td></td>
</tr>
<tr>
<td>Mineral (1:1 Ca-P, 46 lbs. @ $30 per cwt.)</td>
<td>13.80</td>
<td>0.06</td>
<td></td>
</tr>
<tr>
<td>Total Feed Expenses</td>
<td>1,277.70</td>
<td>5.80</td>
<td></td>
</tr>
<tr>
<td>Vet. - medicine</td>
<td>44.00</td>
<td>0.20</td>
<td></td>
</tr>
<tr>
<td>Breeding, semen and supplies (1.9 services @ $17 per service)</td>
<td>32.30</td>
<td>0.15</td>
<td></td>
</tr>
<tr>
<td>Bedding</td>
<td>20.00</td>
<td>0.09</td>
<td></td>
</tr>
<tr>
<td>Fuel (10 gal. gas @ $1.05, 3.33 gal. diesel @ 80¢)</td>
<td>13.16</td>
<td>0.06</td>
<td></td>
</tr>
<tr>
<td>Utilities (electrical power and telephone)</td>
<td>68.00</td>
<td>0.31</td>
<td></td>
</tr>
<tr>
<td>Repairs on equipment and facilities</td>
<td>70.00</td>
<td>0.32</td>
<td></td>
</tr>
<tr>
<td>Supplies (soap, inflations, brushes, etc.)</td>
<td>36.56</td>
<td>0.17</td>
<td></td>
</tr>
<tr>
<td>Hired labor (30 hours @ $11 per hour)</td>
<td>330.00</td>
<td>1.50</td>
<td></td>
</tr>
<tr>
<td>Replacement heifer ($1,400 x 30%)</td>
<td>420.00</td>
<td>1.91</td>
<td></td>
</tr>
<tr>
<td>Milk hauling and marketing (220 cwt. x 97% shipped x 60¢ per cwt.)</td>
<td>128.04</td>
<td>0.58</td>
<td></td>
</tr>
<tr>
<td>Cow testing (DHIA)</td>
<td>18.84</td>
<td>0.09</td>
<td></td>
</tr>
<tr>
<td>Miscellaneous (dues, legal, accounting, travel, education, etc.)</td>
<td>20.00</td>
<td>0.09</td>
<td></td>
</tr>
<tr>
<td>Interest on operating expense ($1,930.56 + 12 x 10.5%)</td>
<td>16.89</td>
<td>0.08</td>
<td></td>
</tr>
<tr>
<td>Interest on avg. cow investment ($1,400 + $585 x 10.5%)</td>
<td>104.21</td>
<td>0.47</td>
<td></td>
</tr>
<tr>
<td><strong>Total Operating Expenses</strong></td>
<td>2,599.70</td>
<td>11.82</td>
<td></td>
</tr>
<tr>
<td><strong>OWNERSHIP EXPENSES:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depreciation on bldgs. and equip. (Table 4)</td>
<td>194.41</td>
<td>0.88</td>
<td></td>
</tr>
<tr>
<td>Interest on investment in bldgs., equip. and land (Table 4)</td>
<td>171.15</td>
<td>0.78</td>
<td></td>
</tr>
<tr>
<td>Property taxes on bldgs., equip. and land ($1,630 avg. inv. x 1.8%)</td>
<td>29.34</td>
<td>0.13</td>
<td></td>
</tr>
<tr>
<td>Insurance</td>
<td>15.00</td>
<td>0.08</td>
<td></td>
</tr>
<tr>
<td><strong>Total Ownership Expenses</strong></td>
<td>409.90</td>
<td>1.87</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL OPERATING AND OWNERSHIP EXPENSES</strong></td>
<td><strong>3,009.60</strong></td>
<td><strong>13.69</strong></td>
<td></td>
</tr>
<tr>
<td><strong>OPERATOR AND FAMILY LABOR AND MANAGEMENT EXPENSE:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operator and family labor (10 hours @ $11 per hour)</td>
<td>110.00</td>
<td>0.50</td>
<td></td>
</tr>
<tr>
<td>Operator management (5% x $2,404.82 total revenues)</td>
<td>120.24</td>
<td>0.55</td>
<td></td>
</tr>
<tr>
<td><strong>Total Operator &amp; Family Labor &amp; Mngmt. Expenses</strong></td>
<td><strong>230.24</strong></td>
<td><strong>1.05</strong></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL ALL EXPENSES</strong></td>
<td><strong>3,239.84</strong></td>
<td><strong>14.74</strong></td>
<td></td>
</tr>
</tbody>
</table>
### Table 6. Annual Revenues, Expenses and Returns for a Holstein Dairy Cow Producing 22,000 Pounds of Milk per Year

<table>
<thead>
<tr>
<th></th>
<th>Milk Price ($ per Cwt.)</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$10</td>
<td>$12</td>
<td>$14</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total per Cow</td>
<td>Total per Cwt.</td>
<td>Total per Cow</td>
<td>Total per Cwt.</td>
<td>Total per Cow</td>
<td>Total per Cwt.</td>
<td>My Farm</td>
</tr>
<tr>
<td>REVENUES:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milk sales (220 cwt. x 97% shipped)</td>
<td>2,134.00</td>
<td>9.70</td>
<td>2,560.80</td>
<td>11.64</td>
<td>2,987.60</td>
<td>13.58</td>
<td></td>
</tr>
<tr>
<td>Calf sales (.46 bull @ $50 + .46 heifer @ $100)</td>
<td>69.00</td>
<td>0.31</td>
<td>69.00</td>
<td>0.31</td>
<td>69.00</td>
<td>0.31</td>
<td></td>
</tr>
<tr>
<td>Cull cow sales (30% culled or died -2.5% death loss x 1,300 lbs. @ 45¢ per lb.)</td>
<td>160.87</td>
<td>0.73</td>
<td>160.87</td>
<td>0.73</td>
<td>160.87</td>
<td>0.73</td>
<td></td>
</tr>
<tr>
<td>Manure value (40 lbs. N @ 27¢, 47 lbs. P₂O₅ @ 25¢, 92 lbs. K₂O @ 20¢)</td>
<td>40.95</td>
<td>0.19</td>
<td>40.95</td>
<td>0.19</td>
<td>40.95</td>
<td>0.19</td>
<td></td>
</tr>
<tr>
<td>Total Revenues</td>
<td>2,404.82</td>
<td>10.93</td>
<td>2,831.62</td>
<td>12.87</td>
<td>3,258.73</td>
<td>14.81</td>
<td></td>
</tr>
<tr>
<td>LESS Feed Expenses</td>
<td>1,277.70</td>
<td>5.80</td>
<td>1,277.70</td>
<td>5.80</td>
<td>1,277.70</td>
<td>5.80</td>
<td></td>
</tr>
<tr>
<td>RETURNS Above Feed Expenses</td>
<td>1,127.12</td>
<td>5.13</td>
<td>1,553.92</td>
<td>7.07</td>
<td>1,981.03</td>
<td>9.01</td>
<td></td>
</tr>
<tr>
<td>LESS Nonfeed Operating Expenses</td>
<td>1,322.00</td>
<td>6.01</td>
<td>1,322.00</td>
<td>6.01</td>
<td>1,322.00</td>
<td>6.01</td>
<td></td>
</tr>
<tr>
<td>RETURNS Above Operating Expenses</td>
<td>-194.88</td>
<td>-0.88</td>
<td>231.92</td>
<td>1.06</td>
<td>659.03</td>
<td>3.00</td>
<td></td>
</tr>
<tr>
<td>LESS Ownership Expenses</td>
<td>409.90</td>
<td>1.87</td>
<td>409.90</td>
<td>1.87</td>
<td>409.90</td>
<td>1.87</td>
<td></td>
</tr>
<tr>
<td>RETURNS to Operator &amp; Family Labor &amp; Mngmt.</td>
<td>-604.78</td>
<td>-2.75</td>
<td>-177.98</td>
<td>-0.81</td>
<td>249.13</td>
<td>1.13</td>
<td></td>
</tr>
<tr>
<td>PLUS Interest on Investment (cows, bldgs., equip. &amp; land)</td>
<td>275.36</td>
<td>1.25</td>
<td>275.36</td>
<td>1.25</td>
<td>275.36</td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td>RETURNS to Operator &amp; Family Labor &amp; Mngmt. &amp; Capital</td>
<td>-329.42</td>
<td>-1.50</td>
<td>97.38</td>
<td>0.44</td>
<td>524.49</td>
<td>2.38</td>
<td></td>
</tr>
<tr>
<td>LESS Operator &amp; Family Labor &amp; Mngmt.</td>
<td>230.24</td>
<td>1.05</td>
<td>251.58</td>
<td>1.14</td>
<td>272.94</td>
<td>1.24</td>
<td></td>
</tr>
<tr>
<td>RETURNS to Capital Investment</td>
<td>-559.66</td>
<td>-2.55</td>
<td>-154.20</td>
<td>-0.70</td>
<td>251.55</td>
<td>1.14</td>
<td></td>
</tr>
<tr>
<td>RATE OF RETURN on $2,623 Average Investment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-21.3%</td>
<td>-5.9%</td>
<td>9.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 Assumes 30% herd turnover, 227-day average calving interval for cows leaving herd, 389-day average calving interval for the entire herd, replacements calve upon entering herd and 12% calf mortality.

2 Equal returns to capital investment + $2,623 average annual investment
Table 7. Annual Expenses for a Holstein Dairy Cow Producing 18,000 Pounds of Milk per Year.

<table>
<thead>
<tr>
<th></th>
<th>Total per Cow</th>
<th>Total per Cwt.</th>
<th>My Farm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OPERATING EXPENSES:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feed:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alfalfa hay (3 tons @ $125 per ton)</td>
<td>375.00</td>
<td>2.08</td>
<td></td>
</tr>
<tr>
<td>Silage (5.7 tons @ $27 per ton)</td>
<td>153.90</td>
<td>0.86</td>
<td></td>
</tr>
<tr>
<td>Concentrate (4.1 tons @ $150 per ton)</td>
<td>615.00</td>
<td>3.42</td>
<td></td>
</tr>
<tr>
<td>Mineral (1:1 Ca-P, 46 lbs. @ $30 per cwt.)</td>
<td>13.80</td>
<td>0.08</td>
<td></td>
</tr>
<tr>
<td>Total Feed Expenses</td>
<td>1,157.70</td>
<td>6.44</td>
<td></td>
</tr>
<tr>
<td>Vet. - medicine</td>
<td>40.00</td>
<td>0.22</td>
<td></td>
</tr>
<tr>
<td>Breeding, semen and supplies (1.9 services @ $13 per service)</td>
<td>24.70</td>
<td>0.14</td>
<td></td>
</tr>
<tr>
<td>Bedding</td>
<td>20.00</td>
<td>0.11</td>
<td></td>
</tr>
<tr>
<td>Fuel (10 gal. gas @ $1.05, 3.33 gal. diesel @ 80¢)</td>
<td>13.16</td>
<td>0.07</td>
<td></td>
</tr>
<tr>
<td>Utilities (electrical power and telephone)</td>
<td>64.00</td>
<td>0.36</td>
<td></td>
</tr>
<tr>
<td>Repairs on equipment and facilities</td>
<td>70.00</td>
<td>0.39</td>
<td></td>
</tr>
<tr>
<td>Supplies (soap, inflations, brushes, etc.)</td>
<td>36.56</td>
<td>0.20</td>
<td></td>
</tr>
<tr>
<td>Hired labor (30 hours @ $11 per hour)</td>
<td>330.00</td>
<td>1.83</td>
<td></td>
</tr>
<tr>
<td>Replacement heifer ($1,000 x 30%)</td>
<td>300.00</td>
<td>1.67</td>
<td></td>
</tr>
<tr>
<td>Milk hauling and marketing (180 cwt. x 97% shipped x 60¢ per cwt.)</td>
<td>104.76</td>
<td>0.58</td>
<td></td>
</tr>
<tr>
<td>Cow testing (DHIA)</td>
<td>18.84</td>
<td>0.10</td>
<td></td>
</tr>
<tr>
<td>Miscellaneous (dues, legal, accounting, travel, education, etc.)</td>
<td>20.00</td>
<td>0.11</td>
<td></td>
</tr>
<tr>
<td>Interest on operating expense ($1,794.96 + 12 x 10.5%)</td>
<td>15.71</td>
<td>0.09</td>
<td></td>
</tr>
<tr>
<td>Interest on avg. cow investment ( \frac{-1000 + 585}{2} ) x 10.5%</td>
<td>83.33</td>
<td>0.46</td>
<td></td>
</tr>
<tr>
<td><strong>Total Operating Expenses</strong></td>
<td>2,298.76</td>
<td>12.77</td>
<td></td>
</tr>
<tr>
<td><strong>OWNERSHIP EXPENSES:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depreciation on bldgs. and equip. (Table 4)</td>
<td>194.41</td>
<td>1.08</td>
<td></td>
</tr>
<tr>
<td>Interest on investment in bldgs., equip., and land (Table 4)</td>
<td>171.15</td>
<td>0.95</td>
<td></td>
</tr>
<tr>
<td>Property taxes on bldgs., equip., and land ($1,630 avg. inv. x 1.8%)</td>
<td>29.34</td>
<td>0.16</td>
<td></td>
</tr>
<tr>
<td>Insurance</td>
<td>15.00</td>
<td>0.08</td>
<td></td>
</tr>
<tr>
<td><strong>Total Ownership Expenses</strong></td>
<td>409.90</td>
<td>2.27</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL OPERATING &amp; OWNERSHIP EXPENSES</strong></td>
<td>2,708.66</td>
<td>15.04</td>
<td></td>
</tr>
<tr>
<td><strong>OPERATOR &amp; FAMILY LABOR &amp; MANAGEMENT EXPENSES:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operator and family labor (10 hours @ $11 per hour)</td>
<td>110.00</td>
<td>0.61</td>
<td></td>
</tr>
<tr>
<td>Operator management (5% x $2,016.82 total revenues)</td>
<td>100.84</td>
<td>0.56</td>
<td></td>
</tr>
<tr>
<td><strong>Total Operator &amp; Family Labor &amp; Mngmt. Expenses</strong></td>
<td>210.84</td>
<td>1.17</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL ALL EXPENSES</strong></td>
<td>2,919.50</td>
<td>16.21</td>
<td></td>
</tr>
</tbody>
</table>
Table 8. Annual Revenues, Expenses and Returns for a Holstein Dairy Cow Producing 18,000 Pounds of Milk per Year.

<table>
<thead>
<tr>
<th>REVENUES:</th>
<th>$10</th>
<th>$12</th>
<th>$14</th>
<th>My Farm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk sales (180 cwt. x 97% shipped)</td>
<td>1,746.00</td>
<td>9.70</td>
<td>2,095.20</td>
<td>11.64</td>
</tr>
<tr>
<td>Calf sales (.46 bull @ $50 + .46 heifer @ $100)¹</td>
<td>69.00</td>
<td>0.38</td>
<td>69.00</td>
<td>0.38</td>
</tr>
<tr>
<td>Cull cow sales (30% culled or died -2.5% death less x 1,300 lbs. @ 45¢ per lb.)</td>
<td>160.87</td>
<td>0.89</td>
<td>160.87</td>
<td>0.89</td>
</tr>
<tr>
<td>Manure value (40 lbs. N @ 27¢, 47 lbs. P₂O₅ @ 25¢, 92 lbs. K₂O @ 20¢)</td>
<td>40.95</td>
<td>0.23</td>
<td>40.95</td>
<td>0.23</td>
</tr>
<tr>
<td>Total Revenues</td>
<td>2,016.82</td>
<td>11.20</td>
<td>2,366.52</td>
<td>13.14</td>
</tr>
<tr>
<td>LESS Feed Expenses</td>
<td>1,157.70</td>
<td>6.44</td>
<td>1,157.70</td>
<td>6.44</td>
</tr>
<tr>
<td>RETURNS Above Feed Expenses</td>
<td>859.12</td>
<td>4.76</td>
<td>1,208.82</td>
<td>6.70</td>
</tr>
<tr>
<td>LESS Nonfeed Operating Expenses</td>
<td>1,141.06</td>
<td>6.34</td>
<td>1,141.06</td>
<td>6.34</td>
</tr>
<tr>
<td>RETURNS Above Operating Expenses</td>
<td>-281.94</td>
<td>-1.58</td>
<td>67.76</td>
<td>0.36</td>
</tr>
<tr>
<td>LESS Ownership Expenses</td>
<td>409.90</td>
<td>2.27</td>
<td>409.90</td>
<td>2.27</td>
</tr>
<tr>
<td>RETURNS to Operator &amp; Family Labor &amp; Management</td>
<td>-691.84</td>
<td>-3.85</td>
<td>-342.14</td>
<td>-1.91</td>
</tr>
<tr>
<td>PLUS Interest on Investment (cows, blggs., equip. &amp; land)</td>
<td>254.48</td>
<td>1.41</td>
<td>254.48</td>
<td>1.41</td>
</tr>
<tr>
<td>RETURNS to Operator &amp; Family Labor &amp; Mngmt. &amp; Capital</td>
<td>-437.36</td>
<td>-2.44</td>
<td>-87.66</td>
<td>-0.50</td>
</tr>
<tr>
<td>LESS Operator &amp; Family Labor &amp; Mngmt.</td>
<td>210.84</td>
<td>1.17</td>
<td>228.33</td>
<td>1.27</td>
</tr>
<tr>
<td>RETURNS to Capital Investment</td>
<td>-648.20</td>
<td>-3.61</td>
<td>-315.99</td>
<td>-1.77</td>
</tr>
<tr>
<td>RATE OF RETURN on $2,423 Average Investment ²</td>
<td>-26.8%</td>
<td>-13.0%</td>
<td>0.6%</td>
<td></td>
</tr>
</tbody>
</table>

¹ Assumes 30% herd turnover, 227-day average calving interval for cows leaving herd, 389-day average calving interval for the entire herd, replacements calve upon entering herd and 12% calf mortality.

² Equal returns to capital investment + $2,423 average annual investment.
Table 9. Summary of Revenues, Expenses and Returns for Holstein Dairy Cows Producing at Selected Levels.

<table>
<thead>
<tr>
<th>Annual Milk Production per Cow (lbs.)</th>
<th>18,000</th>
<th>20,000</th>
<th>22,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ per Cow</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total revenues (milk price = $12 per cwt.)</td>
<td>2,367</td>
<td>2,599</td>
<td>2,832</td>
</tr>
<tr>
<td>Feed expenses</td>
<td>1,158</td>
<td>1,218</td>
<td>1,278</td>
</tr>
<tr>
<td>Total nonfeed operating expenses</td>
<td>1,141</td>
<td>1,231</td>
<td>1,322</td>
</tr>
<tr>
<td>Total ownership expenses</td>
<td>410</td>
<td>410</td>
<td>410</td>
</tr>
<tr>
<td>Total operator &amp; family labor &amp; mngmt. expenses</td>
<td>228</td>
<td>240</td>
<td>252</td>
</tr>
<tr>
<td>Total all expenses</td>
<td>2,937</td>
<td>3,099</td>
<td>3,262</td>
</tr>
<tr>
<td>Returns above feed expenses</td>
<td>1,209</td>
<td>1,381</td>
<td>1,554</td>
</tr>
<tr>
<td>Returns above operating expenses</td>
<td>68</td>
<td>149</td>
<td>232</td>
</tr>
<tr>
<td>Returns to operator &amp; family labor &amp; mngmt.</td>
<td>-342</td>
<td>-260</td>
<td>-178</td>
</tr>
<tr>
<td>Returns to operator &amp; family labor, mngmt., &amp; capital</td>
<td>-88</td>
<td>4</td>
<td>97</td>
</tr>
<tr>
<td>Rate of return on average capital investment</td>
<td>-13.0%</td>
<td>-9.3%</td>
<td>-5.9%</td>
</tr>
</tbody>
</table>