

2007 PLANNING BUDGETS FOR
DAIRY PRODUCTION IN MISSISSIPPI

COSTS AND RETURNS

112 and 250 COW DAIRY ENTERPRISES

LARGE BREED CATTLE

MISSISSIPPI, 2007

MISSISSIPPI STATE UNIVERSITY EXTENSION SERVICE
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2007 MISSISSIPPI DAIRY PLANNING BUDGETS

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The 2007 Mississippi Dairy Planning Budgets provide economic and technical information in the form of enterprise budgets for two different sized dairy herds or operations. The selected sizes of dairy operations that these budgets represent are for 112 and 250 cow herds utilizing a protein concentrate, corn silage, hay and pasture feeding regimen. These budgets have been revised and updated to represent estimated costs and returns for Mississippi dairy enterprises during 2007. Enterprise budgets should serve as guidelines for Mississippi dairy farmers and related agribusinesses when confronted with milk production, marketing, and financial decisions. Cost and return estimates reported in these budgets will **NOT** exactly correspond to any individual dairy farmer's operation. Therefore, these budgets should **ONLY** be used as guides for planning management strategies and assist in making decisions.

Milk output, feed requirements, buildings and equipment needs characterize recommended management practices and procedures for Mississippi dairy farmers. Price and cost information obtained from various governmental publications and through interviews of industry personnel. These planning budgets are products of a variety of professionals at Mississippi State University and the following persons provided assistance in estimating the 2007 Mississippi Dairy Planning Budgets:

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PLANNING BUDGETS ASSUMPTIONS

The following text provides a brief description of the various assumptions and components employed in derived the estimated expenses and income in each of the 112 and 250 cow dairy herd size operations. Income (or returns) from the dairy operation was derived from four different sources: (1) Milk Sales; (2) Sale of Bull Calves; (3) Cull Milk Cows; and, (4) Cull Bred Heifers. Expenses (or costs) are divided into two categories: (1) Direct Expenses; and, (2) Fixed Expenses. Direct expenses are described as cash or "out-of-pocket" costs that will vary according to the number cows milked and pounds of milk produced. Fixed expenses are those costs such as depreciation on: (a) tractors and pasture/silage equipment; and (b) buildings and milking equipment, costs of owning dairy livestock, and insurance expenses.

A. ESTIMATED INCOME, EXPENSES and RETURNS

I. INCOME

MILK SALES = MILK PRICE * QUANTITY MILK per COW * NUMBER of MILK COWS

where,

MILK PRICE in \$ per cwt. = \$16.80 per cwt. represents the past ALL-TIME RECORD HIGH ALL-MILK PRICE RECEIVED by dairy farmers in Mississippi. Farm-Level or Milk Check Price is calculated by deducting:

(1) Milk Hauling Costs of \$1.00 per cwt.

(2) Milk Market Promotion Fee of \$0.35 per cwt.

so, FARM MILK PRICE = \$15.45 per cwt. -- after the above deductions.

QUANTITY MILK per COW = 16,000 pounds of milk produced per cow in the milking herd. Same as Rolling Herd Average (RHA).

NUMBER of MILK COWS = 112 Cows in the 112-Cow Herd Planning Budget and, 250 Cows in the 250-Cow Herd Planning Budget.

BULL CALVES = BULL CALF PRICE * NUMBER of BULL CALVES

where,

BULL CALF PRICE per head = \$200.00 per head represents the GROSS price received by dairy farmers for 1-day-old bull dairy calves.

NUMBER of BULL CALVES = 63 Bull Calves in the 112-Cow Herd Planning Budget, 141 Bull Calves in the 250-Cow Herd Planning Budget

CALF CROP of MILK HERD = 115% of Number of Milk Cows. Bull Calves are 50% of Calf Crop less 1% Death Loss.

For Example: 112 Milk Cow Herd produces 100 calves from the adult milking herd and 28 calves from the Replacement Heifers. Total Calf Crop equals 128 calves and assuming a 50% bull calves birth rate and a 1% Death Loss at birth, this would yield 63 Bull Calves available for sale in the 112-Cow Herd Planning Budget.

CULL COWS = CULL COW PRICE * 1,300 lbs/head * NUMBER of CULL COWS

where,

CULL COW PRICE per cwt. = \$45.00 per cwt. represents the GROSS price received by dairy farmers for CULLED Milk Cows.

1,300 lbs. per head = Average Live Weight of CULLED Milk Cows.

NUMBER of CULL COWS = 29 Cull Cows in the 112-Cow Herd Planning Budget, 65 Cull Cows in the 250-Cow Herd Planning Budget.

CULL MILK COW RATE = 30% of Number of Milk Cows. Cull Cows available equals 30% of Milk Cow Herd less 4% Milking Herd Death Loss.

For Example: 112 Milk Cow Herd (250 Milk Cow Herd) would Cull 34 (75) Cows from the milking herd assuming a 30% Culling Rate. With a 4% Death Loss in the milking herd, this would yield 29 (65) Cull Cows available for sale in the 112-Cow Herd Planning Budget.

CULL BRED HEIFERS = BRED HEIFER PRICE * NO. of CULL BRED HEIFERS

where,

BRED HEIFER PRICE = \$1,400.00 per head represents the GROSS price received by dairy farmers for CULLED Bred Heifers.

**NO. of CULL BRED HEIFERS = 8 Cull Bred Heifers in the 112-Cow Herd Budget,
18 Cull Bred Heifers in the 250-Cow Herd Budget.**

For Example: 112 Milk Cow Herd (250 Milk Cow Herd) would have 42 (93) Bred Heifers available to replace the Cull Cows from the milking herd assuming a 30% Culling rate. With 34 (75) milking cows to be replaced, this would yield 8 (18) Cull or Excess Bred Heifers available for sale in the 112-Cow (250-Cow) Herd Planning Budget.

TOTAL INCOME = SUM OF ALL INCOME SOURCES FROM THE DAIRY OPERATION

II. DIRECT EXPENSES

FEED PURCHASES = 14%, 18%, and 20% Protein Dairy Ration and 18% Calf Starter Feed PURCHASED. See Section D. of the Budgets - Feed Requirements - for details.

where,

14% Protein FEED PRICE = \$200.00 per ton and Fed @ 5 lbs/day to Dry Milk Cows and Replacement Heifers 12-24 months old.

18% Protein FEED PRICE = \$210.00 per ton and Fed @ 22 lbs/day for 180 days to Milking Cows WITH pasture grazing.

20% Protein FEED PRICE = \$220.00 per ton and Fed @ 22 lbs/day for 185 days to Milking Cows WITHOUT pasture grazing.

18% Calf Starter PRICE = \$400.00 per ton and 118 Tons Fed @ 5 lbs/day to Heifer Calves 0-12 months old.

Hay-Sudan = \$62.88 per ton, assuming 5 tons of Sudan Hay produced per acre. See Section D. -- Estimated Feed Requirements of the Budgets for details. Estimated direct production costs for Sorghum Sudan Hay are \$314.40/acre and obtained from the 2007 Forage Budgets (Table 20) published at Mississippi State University.

Corn Silage = \$20.23 per ton, assuming 13 tons of Corn Silage produced per acre. See Section D. -- Estimated Feed Requirements of the Budgets for details. Estimated direct production costs for Corn Silage are \$263.04/acre and obtained from the 2007 Forage Budgets (Table 22) published at Mississippi State University.

Pasture-Permanent = \$136.94 per acre, assuming 75 acres and 150 acres for the 112-Cow Herd and 250-Cow Herd Budgets, respectively. Estimated Direct Production Costs for Permanent Summer Pasture Maintenance were obtained from 2007 Forage Budgets (Table 7) published at Mississippi State University.

- Pasture-Ryegrass =** \$193.97 per acre, assuming 75 acres and 150 acres for the 112-Cow Herd and 250-Cow Herd Budgets, respectively. Estimated Direct Production Costs for Prepared Seedbed Ryegrass Annual Pasture were obtained from 2007 Forage Budget (Table 17) published at Mississippi State University.
- Breeding Fees =** \$33.00 per Head @ \$15.00 per straw, using 2.2 straws per Milk Cow and Bred Heifers (154 & 343 Cows & Heifers in the 112-Cow and 250-Cow Planning Budgets, respectively.)
- DHIA Testing =** \$14.40 per head (\$1.20/Milk Cow/month), assuming DHIA Basic Services for each Milk Cow in the Herd.
- Milk Hauling =** \$1.00 per cwt. of Milk Processor. Charges allocated by a Milk Hauler or Dairy Cooperative for transporting milk.
- Marketing =** \$0.35 per cwt. of Milk Produced. Assuming an allocation of a \$0.20 per cwt. **MARKETING** fee charged by a Dairy Cooperative and a \$0.15 per cwt. **PROMOTION** checkoff fee charged by the National Dairy and Regional Dairy Boards.
- Repairs =** 3% of the Total Value of Dairy Buildings and Equipment for Repairs and Maintenance. Buildings and Equipment values are \$254,600 and \$409,000 for the 112-Cow Herd and 250-Cow Herd Budgets, respectively.
- Veterinary & Med.=** \$50.00 per head for veterinary services and medical supplies. These costs are incurred for every dairy animal in the herd. See Section B. Capital Investment in these Budgets for details.
- Dairy Supplies =** \$70.00 per Milk Cow for dairy supplies. Supplies for hand towels, syringes, etc. are incurred for Milk Cows ONLY.
- Electricity& Utilities =** \$120.00 per Milk Cow for electricity and utilities. Electrical, water, etc. costs are incurred for Milk Cows ONLY.
- Hired Labor =** \$10.00 per Hour PLUS 25% of wage rate for a Total Labor cost of \$12.50/hour including Fringes (FICA, Workman's Compensation, etc.). Hired Labor requirements equal 35 hours per Milk Cow. Total hours required are 3,920 and 8,750 in the 112 & 250-Cow Planning Budgets, respectively.
- TOTAL DIRECT EXPENSES =** Total of ALL DIRECT EXPENSES listed as cash or out-of-pocket expenses or the Costs of Producing Milk.

III. RETURNS ABOVE TOTAL DIRECT EXPENSES

RETURNS ABOVE DIRECT EXPENSES = Total Income - Total Direct Expenses

where,

RETURNS ABOVE TOTAL DIRECT EXPENSES represent the Revenues obtained from the dairy operation available to pay for Depreciation and Interest on Investment on Buildings and Equipment and provide for Returns to the Land and Dairy Management. Estimated Total Returns Above Direct Expenses are \$19,726.91 in the 112-cow budget and \$123,097.94 in the 250-cow Planning Budget. These are the revenues available for reinvestment in the dairy operation, to pay for family expenses, and to compensate the management of the dairy business.

IV. FIXED EXPENSES

Tractors and Equipment = Expenses allocated for Depreciation and Interest on Investment of Tractors and Equipment used in producing Corn Silage, Sudan Hay, Permanent and Winter Pastures.

where,

Corn Silage = \$40.73 per acre, assuming 62 and 138 acres are required to produce 807 and 1,800 tons of silage, respectively, at 13 tons produced per acre. Estimated Fixed Costs for Corn Silage obtained from the 2007 Forage Budgets (Table 22) published at Mississippi State University.

Pasture-Permanent = \$28.92 per acre, assuming 75 and 150 acres are required to produce the summer pasture forage needs for the 112-Cow and 250-Cow operations, respectively. Estimated Fixed Costs for Permanent Summer Pasture Maintenance obtained from the 2007 Forage Budgets (Table 7) published at Mississippi State University.

Pasture-Ryegrass = \$8.48 per acre, assuming 75 and 150 acres are required to produce the winter pasture forage needs for the 112-Cow and 250-Cow operations. Estimated Fixed Costs for Prepared Seedbed Ryegrass Annual Pasture obtained from the 2007 Forage Budgets (Table 17) published at Mississippi State University.

Sudan Hay = \$70.68 per acre, assuming 36 and 80 acres are required to produce 180 and 401 tons of hay, respectively at 5 tons produced per acre. Estimated Fixed Costs for Sorghum Sudan Hay obtained from 2007 Forage Budgets (Table 20) published at Mississippi State University.

Bldg.&Equip-Depr. = Depreciation Expenses ONLY for Dairy Buildings and Equipment, see Section C. of the Budgets for details. Depreciation Totals are \$21,320.00 and \$35,633.33 for the 112-Cow and 250-Cow Planning Budgets, respectively. FYI, Dairy Livestock can NOT be depreciated by law.

Bldg.&Equip-Invt. = Interest on Investment Expenses ONLY for Dairy Buildings and Equipment, see Section C. of the Budgets for details. Estimated Interest

on Investment Totals for Buildings and Equipment are \$13,111.90 and \$21,063.50 in the 112-Cow and 250-Cow Planning Budgets, respectively.

Dairy Lvst.-Invst. = Interest on Investment Expenses ONLY for Dairy Livestock and Equipment, see Section B. of the Budgets for details. Estimated Interest on Investment Totals for Dairy Livestock is \$14,662.05 and \$34,402.00 in the 112-Cow and 250-Cow Planning Budgets, respectively.

Insurance(Liability) = \$2,000 and \$3,000 for the expense of Liability Insurance to protect the 112-cow and 250-cow dairy operations from legal risks, respectively.

Professional Service = \$15.00 per Head for Professional Services; i.e. accounting, legal, etc. These costs are incurred for Milk Cows ONLY.

Taxes (Misc.) = \$18.00 per head for Taxes; i.e. Ad Valorem, Property, etc. These costs are incurred for Milk Cows ONLY.

TOTAL FIXED EXPENSES = Total of ALL FIXED EXPENSES listed as non-cash or indirect expenses related to the costs of owning a dairy farm. Total Fixed Costs are estimated as \$65,475.16 and \$119,260.94 in the 112 and 250-Cow Planning Budgets, respectively.

V. RETURNS TO LAND AND MANAGEMENT

Returns to Land and Management = Income above Direct Expense - Total Fixed Expenses where,

RETURNS TO LAND AND MANAGEMENT represent the Revenues derived from the dairy operation available to and provide for Returns to the Land and Dairy Management (i.e. the Dairy Farmer). These are revenues available for family expenses and to pay the dairy's management. Estimated Total Returns to Land and Management are \$-45,748.25 and \$3,837.00 in the 112 and 250-Cows Planning Budgets, respectively.

IV. RETURNS TO LAND AND MANAGEMENT PER COW

Returns to Land and Management per Cow = Returns to Land & Mgmt. / No. of Cows where,

RETURNS TO LAND AND MANAGEMENT PER COW represent the per Milk Cow Revenues derived from the dairy operation available to and provide for a Return to the Land and Dairy Management. These revenues are available for family expenses and to pay the dairy's management. Estimated per Milk Cow Returns are \$-408.47 per Milk Cow and \$15.35 per Milk Cow in the 112 and 250-Cow Planning Budgets, respectively.

B. ESTIMATED CAPITAL INVESTMENT IN DAIRY LIVESTOCK

CAPITAL INVESTMENT IN LIVESTOCK = Value of Livestock * No. of Livestock

where,
Milk Cows = \$1,600 per head. Value of Milking Cows in the Dairy Herd ranging from approximately 2 to 7+ years old.
Bred Heifers = \$1,400 per head. Value of Bred Heifers in the Dairy Herd ranging from approximately 15 to 24 months old.
Heifers = \$800 per head. Value of Yearling Heifers in the Dairy Herd ranging from 8 to 15 months old.
Heifer Calves = \$500 per head. Value of Female Calves in the Dairy Herd ranging from 0 to 8 months old.

SALVAGE = SAME AS NEW COST expect for MILK COWS. Milk Cow Salvage value equals Cull Cow Beef Price of \$45.00 per cwt. multiplied by 1,300 average weight per Milk Cow multiplied by the Number of Milk Cows.

DEPRECIATION = NO DEPRECIATION EXPENSES ALLOWED because the Dairy Livestock were assumed to have been raised on the dairy farm and the expenses for raising this livestock accounted for as feed, veterinary, etc. expenses.

Interest Rate = 5.15% Interest Rate on Livestock Investment. Interest Rate compares to the 10-Year U.S. Treasury Note and Bond Yield.

Interest on Investment = Return on Investment (Opportunity Cost) allocated as compensation for the Capital invested in Dairy Livestock.

C. ESTIMATED CAPITAL INVESTMENT IN DAIRY BLDGS AND EQUIPMENT

CAPITAL INVESTMENT IN BUILDINGS and EQUIPMENT

where,
 Dairy Buildings and Equipment are those required assets for operating a Representative or Simulated Dairy Farm/Operation in Mississippi under the assumptions used in these Dairy Planning Budgets.

YEARS = Number of Years of Service is expected from each Item/Asset of Capital Building and Equipment.

NEW COST = Current 2007 New Purchase Cost of the Item/Asset of Capital Building and Equipment.

SALVAGE = Salvage Value at the End of the Years of Service expected from the Item/Asset of Capital Building and Equipment. For these budgets, SALVAGE Value assumed to be ZERO.

DEPRECIATION = NEW COST minus SALVAGE VALUE divided by YEARS for each Item/Asset of Building and Equipment. Total Depreciation Expense is the sum of ALL Items Depreciation.

Interest Rate = 5.15% Interest Rate on Buildings and Equipment Investment. Interest Rate compares to the 30-Year U.S. Treasury Note and Bond Yield.

Interest on Invt. = Return on Investment (Opportunity Cost) allocated as compensation for Capital invested in Bldg. & Equipment.

D. ESTIMATED FEED REQUIREMENTS

FEED REQUIREMENTS = lbs. Fed per Day per Cow * Days Fed * Total lbs. per Cow
where,

lbs. Fed per Day = Pounds of each Feed Type Fed per Day to each of the different livestock categories.

Days Fed = Total Number of Days each Feed Type is Fed to each of the different livestock categories.

Total lbs. per Cow = Total Pounds of each Feed Type Fed to each of the different livestock categories.

Tons Fed = Total Tons of each Feed Type Fed to each of the different livestock categories.

Herd Totals = Total Tons of each Feed Type Required by the Dairy Herd.

E. ESTIMATED ECONOMIC RETURNS

NET RETURNS PER COW = Estimated Returns to Land and Management per Cow
where,

Pounds of Milk per Cow = Pounds of Milk per Cow allowed to range between 14,000 and 20,000 pounds of milk per cow. This demonstrates how Economic Returns are affected by milk output per cow.

Milk Price per cwt. = Milk Price per Cwt. allowed to range between \$15.30 per cwt. and \$18.30 per cwt. This demonstrates how Economic Returns are affected by milk price per cwt.

For Example: 112 Milk-Cow Planning Budget indicates that under the assumption of a milk price of \$16.80 per cwt. and 16,000 pound milk production per cow that Returns to Land and Management is calculated as \$-408.25 per milk cow. Similarly, the 250-cow Planning Budget Herd estimates Returns to Land and Management at \$15.35 per milk cow. Both milk price and milk output per cow were varied to provide information about how these factors effect profitability and provide flexibility in the planning process.

NET RETURNS PER CWT. = Estimated Returns to Land and Management per Hundredweight (cwt.) of milk produced on operation
where,

For Example: 112 Milk-Cow Planning Budget indicates that under the assumption of a milk price of \$16.80 per cwt. and 16,000 pound milk production per cow that Returns to Land and Management is calculated as \$-2.55 per cwt. Similarly, the 250-cow Planning Budget Herd estimates Returns to Land and Management at \$0.10 per cwt.