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# *Your Dairy In Transition*

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Animal Science Mimeo #177



## ***A Planning Process for Considering Dairy Farm Expansion***

***\* Appendix \****

***Worksheets for Analyzing and Planning  
Your Dairy Farm Expansion***

***Developed by  
Faculty and Staff***



**Cornell  
Cooperative  
Extension**



Workbooks in this series include:

- ✎ Your Farm and the Industry
- ✎ A Planning Process for Considering Dairy Farm Expansion
- ✎ Winding Down Your Farm Operation

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# **Your Dairy in Transition...**

## **A Planning Process for Considering Dairy Farm Expansion**

### **\* Appendix\***

#### **Worksheet for Analyzing and Planning Your Dairy Farm Expansion**

**Developed by  
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# Your Dairy in Transition

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## Worksheet 1-2. Farm Business Performance Calculations

- 1)  $\frac{\text{Average Number of cows from DHI records or Number of cows beginning of year + number of cows end of year}}{2} = \text{Avg. \# of cows}$
- 2)  $\frac{\text{Number of heifers beginning of year + number of heifers end of year}}{2} = \text{Avg. \# of heifers}$
- 3)  $\frac{\text{Total pounds of milk sold for the year}}{\text{Average number of cows in a year}} = \text{milk sold per cow, lbs}$
- 4)  $\frac{\text{Average number of cows for the year}}{\text{* Number of full time workers}} = \text{cows per worker}$
- 5)  $\frac{\text{Total pounds milk sold for the year}}{\text{* Number of full time workers}} = \text{milk sold per worker}$

\* Number of full time workers - needs to be calculated for each worker

$$\frac{\text{No. of hours/week} \times 4.3 \text{ weeks/month}}{230 \text{ hours}}$$

$$\times \text{No. of months worked} = \text{Full time months}$$

$$\frac{\text{Total full time months}}{12}$$

$$= \text{No. of full time workers per year}$$

- 6)  $\begin{array}{r} \text{Total accrual operating expenses} \\ + \text{Expansion livestock expense} \\ \hline \text{= Accrual operating expenses including exp. Livestock} \end{array} = \$ \text{_____}$
- 7)  $\begin{array}{r} \text{Total accrual receipts} \\ - \text{Accrual milk sales} \\ \hline \text{= Accrual receipts less milk sales} \\ \text{= Operating cost of producing milk} \\ \text{(Operating exp. incl. exp. livestock - receipts less milk sales)} \end{array} = \$ \text{_____}$
- $\frac{\text{+ Hundredweights of milk sold}}{\text{= Operating cost per hundredweight of producing milk}} = \text{+ } \$ \text{_____}$
- 8)  $\text{Grain and concentrate as a \% of milk sales} = \frac{\text{Total grain and concentrate expense}}{\text{Milk sales}} = \text{_____ \%}$
- 9)  $\begin{array}{r} \text{Total farm receipts} \\ - \text{Total farm operating expenses} \\ \hline \text{= Net farm income without appreciation} \end{array} = \$ \text{_____}$
- 10)  $\text{Debt to asset ratio} = \frac{\text{Total farm liabilities}}{\text{Total farm assets}} = \text{_____}$
- 11)  $\text{Farm debt per cow} = \frac{\text{Total farm liabilities}}{\text{Number of cows (end of year)}} = \text{_____}$

**Worksheet 1-3. Farm Business Performance Trends Worksheet**

Business Factors	Year					Comments
	19__	19__	19__	19__	19__	
<b>Size of Business</b>						
Average No. of cows						
Average No. of Heifers						
Milk sold, lbs						
<b>Rates of Production</b>						
Milk sold per cow, lbs						
<b>Labor Efficiency</b>						
Cows per worker						
Milk sold per workers, lbs						
<b>Cost Control</b>						
Operating cost of producing milk/cwt.						
Grain and concentrate as a % of milk						
<b>Profitability</b>						
Net farm income without appreciation						
<b>Financial Stability</b>						
Debt to asset ratio						
Farm debt per cow						

### Worksheet 1-4. Farm Business Performance Analysis Worksheet

	Areas in the business that need improving before considering farm expansion	Farm expansion has potential but can be improved with better management	Excellent position to consider farm expansion
<b>Size of Business</b>			
Average No. of cows	decreasing	remaining the same	increasing
Average No. of heifers*	decreasing	remaining the same	increasing
Total Milk sold, lbs.	decreasing	remaining the same	increasing
<b>Rates of Production</b>			
Milk sold per cow, lbs**	< 17,000	17,000 - 20,000	> 20,000
<b>Labor Efficiency</b>			
Cows per worker	< 30	36 - 40	> 40
Milk sold per worker, lbs	decreasing	remaining the same	increasing
<b>Cost Control</b>			
Operating cost of producing milk/cwt.	> \$11.00/cwt	\$10.00 - 11.00/cwt	≤ \$10.00/cwt
Grain and concentrate as a % of milk sales	> 32%	28 - 32%	< 28%
<b>Profitability</b>			
Net farm income without appreciation	decreasing	remaining the same	increasing
<b>Financial Summary</b>			
Deb- to-asset ratio	> 40%	30 - 40%	< 30%
Farm debt/cow	> \$2500	\$1500 - 2500	< \$1500

\* Average number of heifers rating applies to farms who raise own replacements and do not continually purchase additional young stock

\*\* Large breed





Worksheet 2-6. Organizational chart after expansion

**Board of Directors**

**Chairman**

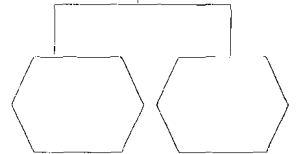
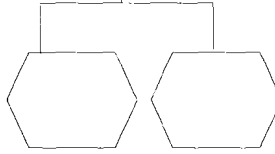
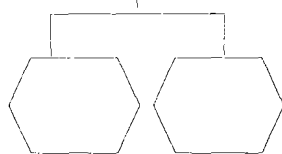
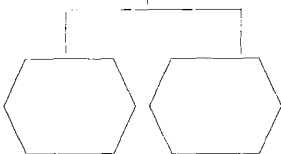
**General Manager**

**Operations  
Manager**

**Operations  
Manager**

**Operations  
Manager**

**Operations  
Manager**



**Worksheet 3-1. Factors to consider in farmstead planning**

Directions: Check when completed or evaluated.

- Is an adequate supply of potable water available?
- Does the proposed farm site contain adequate surface and subsurface drainage? Will substantial site work be required to provide adequate drainage?
- Are off-farm factors present, such as rural housing or urban development, which may limit the site development?
- Can the facilities be oriented to achieve maximum efficiency in animal traffic, manure management, and feed storage and delivery?
- Is adequate room available for driveways, access roads, snow removal, and road right-of-ways?
- Is three-phase electrical power available from your power supplier?
- Do the proposed buildings and sites allow for major growth in the future of the farm?
- Has an agricultural waste management plan been developed for the farm site by the Soil Conservation Service (SCS)?
- Can livestock and other farm buildings be located downwind of farm houses, neighbors or adjacent?
- Are local planning or zoning laws in effect that will impact upon the farm plan?
- Will building permits need to be obtained prior to starting the project?
- Have building plans been submitted to your milk inspector for approval?



**Worksheet 3-3. Estimating cost of dry cow facilities**

How many dry cows will you have?  
(you may assume 20% of the herd) \_\_\_\_\_

Will you need additional dry cow facilities?

If **NO** go to  
next  
worksheet

If **YES**  
complete this  
worksheet

How many dry cows will be housed in new facilities? \_\_\_\_\_

How many dry cow groups will you have? \_\_\_\_\_

**Cost estimate**

Housing type	Cost per cow	Number of cows	Cost estimate	
			Low	High
Free stall and feed area	\$600 to \$1,100	_____	\$ _____	\$ _____
Bedded pack and feed area	\$500 to \$ 900	_____	_____	_____
<b>Total cost*</b>			\$ _____	\$ _____

\* Place here and on line 2 Worksheet 3-12

**Worksheet 3-4. Estimating cost of heifer facilities**

What is the total number of heifers needed to provide replacements for this herd? (Actual number or estimate from Table 3-1 on the next page) \_\_\_\_\_

Will you need additional facilities for heifers? If **NO** go to next worksheet If **YES** complete this worksheet

How many heifers will be housed in the new facility? \_\_\_\_\_

Number of calves on milk \_\_\_\_\_

Number of weaned calves up to one year of age \_\_\_\_\_

Number of yearlings and bred heifers \_\_\_\_\_

**Cost estimate**

Animal type	Cost per animal	Number of animals	Cost estimate	
			Low	High
Calves on milk	\$100 to \$300	X _____	= \$ _____	= \$ _____
Calves to 1 year of age	\$300 to \$600	X _____	= _____	= _____
Yearlings & bred heifers	\$400 to \$800	X _____	= _____	= _____
<b>Total cost*</b>			<b>= \$ _____</b>	<b>= \$ _____</b>

\*Place here and on line 3 of worksheet 3-12

**Worksheet 3-5. Estimating cost for milking center**

Do you need to consider a different milking system?

If **NO** go to next worksheet

If **YES** complete this worksheet

What type of milking system are you planning?

\_\_\_\_\_

Complete the appropriate section below depending upon whether you plan to renovate or build new.

**Cost estimate**

Cost per Stall		Number of stalls	Cost estimate	
			Low	High
<b>Renovating facilities</b>				
Building	Low \$ _____	X _____	= \$ _____	= \$ _____
	High \$ _____			
Equipment	Low \$ _____	X _____	= \$ _____	= \$ _____
	High \$ _____			
<b>Total Cost*</b>			= \$ _____	= \$ _____
<b>New facilities (from Table 3-3)</b>				
Building	Low \$ _____	X _____	= \$ _____	= \$ _____
	High \$ _____			
Equipment	Low \$ _____	X _____	= \$ _____	= \$ _____
	High \$ _____			
<b>Total Cost*</b>			= \$ _____	= \$ _____

\*Place here and on line 4 of Worksheet 3-12

Note: Table 3-2 provides cow throughput information for different sizes and types of parlors and Table 3-3 provides capital cost for new construction by parlor type.

**Worksheet 3-6. Amount of forage to be stored**

Determine the forage dry matter requirement of animals to be fed (milking cows, dry cows and replacements) by using the tables found in the Pro-DAIRY Feeding or Forage management Manuals.

OR

Figure 6 to 8 tons of total forage dry matter is required per milk cow.

		tons DM
<hr/>		
Estimate the ensiling dry matter losses:		
Good management--5 to 20% per year		
Average management--20 to 30% per year		
Poor management--30 to 50% per year		
(Forage required X Percent loss)	+	tons DM
<hr/>		
Estimate forage dry matter losses during harvesting and feeding processes		
Guide: 5 to 15%		
(Forage required X Percent loss)	+	tons DM
<hr/>		
<b>Total Forage Needed</b>	<b>=</b>	tons DM
<hr/>		



### Worksheet 3-7. Bunker silo dimensions

	Corn Silage	Hay Crop Silage
Forage Dry Matter to be Stored	tons	tons
Pounds per ton	X                      2,000 lbs.	X                      2,000 lbs.
Density factor	÷                      18 lbs./cu. ft.	÷                      15 lbs./cu. ft.
Bunker Silo Space Required *	=                      cu. ft.	=                      cu. ft.

#### Guidelines for Wall Heights \*\*

<u>Cows</u>	<u>Wall Height</u>	<u>Avg. Crowned Height</u>
100 to 200	8 feet	10 feet
200 to 300	10 feet	12 feet
300 to 400	12 feet	14 feet
> 400	16 feet	18 feet

#### Width of Bunker Silo \*\*\*

<u>Cows</u>	<u>Width</u>
100 to 200	25 to 30 feet
200 to 300	30 to 40 feet
> 300	40 to 60 feet

Length of Bunker Silo	Corn Silage	Hay Crop Silage
Space required	cu.ft.	cu. ft.
Avg crowned height	÷                      ft.	÷                      ft.
Width	÷                      ft.	÷                      ft.
Length	=                      ft.	=                      ft.

\* Dimensions can be calculated for separate corn silage and hay crop silage storage or the total space required can be added together to calculate the size of a single storage for both forages

\*\* Minimum silage depth to control spoilage is 8 ft. Maximum average crowned height may be 2 ft. greater than wall

\*\*\* Narrower than 25 feet causes problems with equipment maneuverability; wider than 60 feet makes it difficult maintain a fresh face

## Worksheet 3-8. Bunker silo feedout rate\*

	Corn Silage		Haylage	
Avg crowned height		ft.		ft.
Width	X	ft.	X	ft.
Density Factor	X	18 lbs. DM/cu.ft.	X	15 lbs. DM/cu.ft.
Inches per foot	÷	12 in./ft.	÷	12 in./ft.
Dry matter per linear inch of silo	=	lbs. DM in.	=	lbs. DM in.
Forage required annually (from Worksheet 3-6)		tons DM		tons DM
Pounds per ton	X	2000 lbs.	X	2000 lbs.
Days per year	÷	days	÷	days
Dry matter per linear inch of silo	÷	lbs. DM	÷	lbs. DM
Daily feedout rate	=	in./day	=	in./day

\* If less than 5 inches per day, decrease the height and or width  
If greater than 7 inches per day, increase the height or width

**Worksheet 3-9. Cost of forage storage**

<b>Walls</b>	
Height	ft.
Length	X ft.
	X 2
Cost per square foot of wall; estimate = \$7.35	X \$ /sq.ft.
Cost of Walls	= \$
<b>Floor</b>	
Width	ft.
Length	X ft.
Cost per square foot of floor; estimate = \$1.35	X \$ /sq.ft.
Cost of Floor	= \$
Cost of Walls	+ \$
Total Cost of Bunker Silo*	
<u>Height</u> x <u>width</u> x <u>length</u>	= \$
* Place here and on line 5 of Worksheet 3-12.	

**Worksheet 3-10. Sizing mixer for total mixed ration**

Maximum number of cows in one group to be fed		
Minimum number of feedings per day	÷	
Maximum dry matter intake per cow per day for this group (guideline -- 40 to 55 lbs.)	X	lbs.
Minimum percent dry matter of total mixed ration (guideline -- 55% to 40%)	÷	%
Pounds of total mixed ration per bushel (guideline -- 25 lbs.)	÷	lbs.
Mixer capacity needed	=	bu.

Use quotes from local equipment dealers for the mixer size calculated for your cost estimate. Put the cost on line 6 of Worksheet 3-12. TMR mixers with scales, chassis and tires generally cost from \$15,000 to \$25,000.

**Worksheet 3-11. Estimated size and cost of commodity storage**

Bay Size	The size of front end loader planned for the farm must be considered when establishing bay dimensions		
Average size load of concentrate delivered			tons
Pounds per ton	X	2000	lbs.
	X	1.5	
Height (6 to 10 feet)	+		ft.
Width (8 to 12 feet)	+		ft.
Density factor (commodity densities range from 20 to 40 lbs./cu.ft.; 30 lbs./cu.ft. can be used as an average)	÷		lbs./cu.ft.
Length of bay	=		ft.
Number of bays -- Consider number of commodities to be used in TMR rations plus bedding and fertilizer needs			
Additional bays for rotation of feeds	+	2	
Total number of bays	=		
Cost per bay (range \$1,000 to \$5,000 per bay)	X \$		

### Worksheet 3-12. Estimated costs for manure handling components

Manure Storage	Unit Costs <sup>1</sup>		Your Estimate	
	\$	X No. <sup>2</sup> =	Low	High
Paved Bunker partial walls	25 to 40	X _____ =	_____	_____
Concrete Tank - no top	33 to 67	X _____ =	_____	_____
with heavy top	40 to 160	X _____ =	_____	_____
Earthen Basin	17 to 33	X _____ =	_____	_____
Equipment	X \$1000	X% Use <sup>3</sup>	Low	High
Tractor and Spreader	30 to 80	X _____ =	_____	_____
Tractor, Scraper and Bucket	12 to 30	X _____ =	_____	_____
Skidsteer Loader	20 to 42	X _____ =	_____	_____
Gutter Cleaner only <sup>4</sup>	8 to 14		_____	_____
Alley Scraper <sup>4</sup>	20 to 42		_____	_____
Manure Flow system <sup>4</sup>	25 to 40		_____	_____
Gravity Flow system <sup>4</sup>	40 to 90		_____	_____
Stacker -	8 to 10		_____	_____
Large Piston Transfer	10 to 16		_____	_____
Chopper Pump Transfer	12 to 20		_____	_____
Pneumatic Transfer	15 to 24		_____	_____
<b>Total Cost</b>			_____	_____

(Place here and on line 9 of Worksheet 3-12)

<sup>1</sup> Unit Costs are not verified.

<sup>2</sup> Each 70 cubic feet of storage for one cow-month.

<sup>3</sup> Choose a percentage for equipment charge for handling manure.

<sup>4</sup> Each 200 stalls to spreader loading, or with pipes to storage.

Reference: Holmes and Klemme, '88 U Wisc.; Holmes, '91, U Wisc.; Barrington and Cap, '91, McGill U. (Canadian Agric. Eng'ng. 381-386).

**Worksheet 3-13. Summary of facilities costs**

		Cost Estimate	
		Low	High
1). Housing for Additional Milking Cows	Worksheet 3-2	\$ _____	\$ _____
2). Housing for Additional Dry Cows	Worksheet 3-3	\$ _____	\$ _____
3). Housing for Additional Heifers	Worksheet 3-4	\$ _____	\$ _____
4). Cost of Milking Center or Additional Milking Equipment	Worksheet 3-5	\$ _____	\$ _____
5). Cost of Additional Forage Storage	Worksheet 3-9	\$ _____	\$ _____
6). Cost of Feed Delivery Equipment	Worksheet 3-10	\$ _____	\$ _____
7). Cost of Commodity Storage	Worksheet 3-11	\$ _____	\$ _____
8). Cost of Manure Storage Structure and Equipment	Worksheet 3-12	\$ _____	\$ _____
<b>Total Cost of Facility</b>		\$ _____	\$ _____

**Worksheet 4-1. Summary of proposed change**

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Proposed change: \_\_\_\_\_

	Average Future Year		
	Base Year	Without Major Change	With Major Change
Number of milk cows, miling and dry			
Number of heifers and calves			
Pounds of milk sold per cow			
Number of crop acres			
Milk price per cwt.			
Total cwt of milk sold			
<b>Capital purchases to be made</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>
Machinery and equipment			
Milking equipment			
Feeding equipment			
Manuare storage and handling eqiup.			
Other			
Animals- cows			
- Heifers			
Structures			
Barn			
Feed storage			
Other			
Land			
<b>Total Capital Needed</b>			



### Worksheet 4-2. Current balance sheet and net worth analysis

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Assets**

**Debt**

Current

Current

Cash, checking and saving \_\_\_\_\_  
 Account receivable \_\_\_\_\_  
 Prepaid expenses \_\_\_\_\_  
 Feed and supplies \_\_\_\_\_  
 Total \_\_\_\_\_

Accounts payable \_\_\_\_\_  
 Operating debt \_\_\_\_\_  
 Short term debt \_\_\_\_\_  
 Advanced govt. receipts \_\_\_\_\_  
 Total \_\_\_\_\_

Intermediate:

Intermediate:

Dairy cows  
     owned \_\_\_\_\_  
     leased \_\_\_\_\_  
 Heifers \_\_\_\_\_  
 Bulls/other livestock \_\_\_\_\_  
 Machinery/eq. owned \_\_\_\_\_  
 Machinery/eq. leased \_\_\_\_\_  
 Farm stocks or certificates \_\_\_\_\_  
 Total \_\_\_\_\_

Secured debt:  
 Int. Loan #1 \_\_\_\_\_  
 Int. Loan #2 \_\_\_\_\_  
 Int. Loan #3 \_\_\_\_\_  
 Int. Loan #4 \_\_\_\_\_  
 Financial lease \_\_\_\_\_  
 Machinery \_\_\_\_\_  
 Cattle \_\_\_\_\_  
 Total \_\_\_\_\_

Long-Term:

Long Term:

Land and buildings:  
     owned \_\_\_\_\_  
 Financial lease (structures) \_\_\_\_\_  
 Total \_\_\_\_\_

Secured debt:  
 LT Loan #1 \_\_\_\_\_  
 LT Loan #2 \_\_\_\_\_  
 Financial lease (structures) \_\_\_\_\_  
 Total \_\_\_\_\_

**Total Assets =** \_\_\_\_\_

**Total Debts =** \_\_\_\_\_

**Net Worth (A)<sup>a</sup>** \_\_\_\_\_

**Total Debt and Net Worth** \_\_\_\_\_

Net Worth \_\_\_\_\_

Total Debt \_\_\_\_\_

Total Assets + \_\_\_\_\_

Total Assets + \_\_\_\_\_

Percent Net Worth = \_\_\_\_\_

Debt: Asset Ratio = \_\_\_\_\_

<sup>a</sup> Net worth = Total Assets - Total Debts

**Worksheet 4-3. Projected balance sheet and net worth analysis after proposed change**

Name: \_\_\_\_\_ Date: \_\_\_\_\_

<b>Assets</b>		<b>Debt</b>	
Current:		Current:	
Cash, checking and savings	_____	Accounts payable	_____
Accounts receivable	_____	Operating debt	_____
Prepaid expenses	_____	Short term debt	_____
Feed and supplies	=====	Advanced govt. receipts	=====
Total	_____	Total	_____
Intermediate:		Intermediate:	
Dairy cows:		Secured debt:	
owned	_____	Int. Loan #1	_____
leased	_____	Int. Loan #2	_____
Heifers	_____	Int. Loan #3	_____
Bulls/other livestock	_____	Int. Loan #4	_____
Machinery/eq. owned	_____	Financial lease	_____
Machinery/eq. lease	_____	Machinery	_____
Farm stocks or certificates	=====	Cattle	=====
Total	_____	Total	_____
Long-Term:		Long-Term:	
Land and buildings:		Secured debt:	
owned	_____	LT Loan #1	_____
Financial lease (structures)	=====	LT Loan #2	=====
Total	_____	Total	=====
<b>Total Assets</b>	<b>=</b> _____	<b>Total Debts</b>	<b>=</b> _____
		Net Worth (B) <sup>a</sup>	=====
		Total Debt and Net Worth	_____

Net Worth	_____	Total Debt	_____
Total Assets	+ _____	Total Asset	+ _____
Percent Net Worth	= _____ %	Debt:Asset Ratio	= _____
Change In Net Worth (1) =			
Projected Net Worth (B) - Current Net Worth (A) (from Worksheet 4-2)			= _____

<sup>a</sup> Net Worth = Total Assets - Total Debts

### Worksheet 4-4. Estimating expenses

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Average Future Year

Expenses	Base Year <sup>a</sup>	Without Major Changes	With Proposed Changes
Hired Labor	+	+	+
Purchased concentrates	+	+	+
Purchased forages	+	+	+
Non-dairy feed	+	+	+
Custom work	+	+	+
Machinery repairs	+	+	+
Auto expense (farm share)	+	+	+
Fuels, oil and grease	+	+	+
Purchased livestock	+	+	+
Breeding fees	+	+	+
Veterinary and medicine	+	+	+
Milk marketing	+	+	+
Other dairy expense	+	+	+
Lime and fertilizer	+	+	+
Seeds and plants	+	+	+
Spray, and other crop expense	+	+	+
Land, building, and fence repair	+	+	+
Taxes	+	+	+
Insurance	+	+	+
Rent	+	+	+
Telephone (farm share)	+	+	+
Electricity (farm share)	+	+	+
Interest paid <sup>b</sup>	+	+	+
Miscellaneous expenses	+	+	+
<b>Cash farm operating expenses</b>	=	=	=
Depreciation of machinery	+	+	+
Depreciation of buildings	+	+	+
Expansion livestock	+	+	+
<b>Total farm expenses</b>	=	=	=

<sup>a</sup> Adjust all expenses to an accrual basis

<sup>b</sup> Interest paid is interest on average debt outstanding over the life of the investment

### Worksheet 4-5. Estimating receipts and profitability factors calculation

Name: \_\_\_\_\_ Date \_\_\_\_\_

#### Average Future Year

Receipts	Base Year <sup>d</sup>	Without Change	With Change
Milk sales			
Calf sales	+	+	+
Cattle sales	+	+	+
Crop sales	+	+	+
Custom work	+	+	+
Government payments	+	+	+
Gas tax refund	+	+	+
Other receipts	+	+	+
<b>Total farm receipts</b>	=	=	=

#### Profitability Factors Calculation

Total farm receipts			
Total farm expenses	-	-	-
<b>Net farm income (2)</b>	=	=	=
Interest on equity capital <sup>d</sup> @ _____%	-	-	-
Value of unpaid family labor <sup>e</sup>	-	-	-
<b>Labor and management income (3)</b>	=	=	=
Net farm income			
Interest paid on debt	+	+	+
Unpaid family labor	-	-	-
Value operator management and labor	-	-	-
<b>Return to total farm asset (4)</b>	=	=	=
Total farm asset	+	+	+
<b>Rate of return on assets% (5)</b>	=	=	=

<sup>a</sup> Adjust all receipts to an accrual basis

<sup>d</sup> A percent of the average equity for the year. A typical value is 5%

<sup>e</sup> Value of unpaid family labor = number full time months worked x \$ per month.

Example: value unpaid family labor = 3 months x \$1200/mo. = \$3600.

<sup>f</sup> Value operator labor and management is an estimate what value you place on managing and operating your farm.

### Worksheet 4-6. Farm repayment ability.

Name: \_\_\_\_\_ Date: \_\_\_\_\_

	Average Future Year		
	Base Year	Without Major Changes	With Major Changes
Total farm receipts			
Capital sales	+	+	+
Non-farm income	+	+	+
<b>Total cash inflow</b>	=	=	=
Interest paid	+	+	+
Cash farm expenses	-	-	-
<b>Cash available for family living, debt repayment, and investment</b>	=	=	=
Family living expense <sup>9</sup>	-	-	-
Cash for asset replacement	-	-	-
<b>Cash available for debt payments (C)</b>	=	=	=
Subtract: planned debt payments (D)	-	-	-
<b>Cash excess/deficit (6)</b>	=	=	=

<sup>9</sup> Along with regular living expenses, includes income and self employment taxes, health insurance, medical expenses, savings, etc.

### Worksheet 4-7. Summary of financial worksheets.

Name: \_\_\_\_\_ Date: \_\_\_\_\_

	Average Future Year		
	Base Year	Without Proposed Change	With Proposed Changes
Annual change in net worth <sup>a</sup>			
Net farm income (2) Worksheet 4-5			
Labor and management income (3) Worksheet 4-5			
Return to total farm assets (4) Worksheet 4-5			
Rate of return on assets (5) Worksheet 4-5			
Able to service debt? Y/N (6) Worksheet 4-5			

<sup>a</sup> Annual change in net worth = Net worth year end - Net worth beginning of year

**Worksheet 4-8. Planning the transition achieve to proposed change**

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Scenario for year 1:

Scenario for year 2:

Scenario for year 3:

Scenario for year 4:

Scenario for year 5:

Farm Expenses	Year 1	Year 2	Year 3	Year 4	Year 5
Hired labor	+	+	+	+	+
Purchased concentrates	+	+	+	+	+
Purchased forages	+	+	+	+	+
Custom work	+	+	+	+	+
Machinery repairs and Auto	+	+	+	+	+
Fuels, oil, and grease	+	+	+	+	+
Purchased livestock	+	+	+	+	+
Breeding fees	+	+	+	+	+
Veterinary and medicine	+	+	+	+	+
Milk marketing expense	+	+	+	+	+
Other dairy expense	+	+	+	+	+
Lime and fertilizer	+	+	+	+	+
Seeds and plants	+	+	+	+	+
Spray and other crop exp.	+	+	+	+	+
Real estate repair	+	+	+	+	+
Taxes	+	+	+	+	+
Insurance	+	+	+	+	+
Rent	+	+	+	+	+
Telephone (farm share)	+	+	+	+	+
Electricity (farm share)	+	+	+	+	+
Miscellaneous expenses	+	+	+	+	+
<b>Total Farm Expenses (less interest)</b>	=	=	=	=	=

### Worksheet 4-8. Planning the transition to achieve the proposed change

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Farm Receipts	Year 1	Year 2	Year 3	Year 4	Year 5
Number cows					
Production/cow (cwt)	x	x	x	x	x
Price milk/cwt	x	x	x	x	x
Milk income	=	=	=	=	=
Cull cow sales	+	+	+	+	+
Calf sales	+	+	+	+	+
Other business income	+	+	+	+	+
<b>Total receipts</b>	=	=	=	=	=

#### Repayment Analysis

Total farm receipts					
Farm expense without interest	-	-	-	-	-
Net cash inflow	=	=	=	=	=
Non-farm income	+	+	+	+	+
Cash avail. for family living, debt payment, and investment	=	=	=	=	=
Family living expense	-	-	-	-	-
Cash for asset replacement	-	-	-	-	-
Cash available for debt payment (A)	=	=	=	=	=
Planned debt payments (B)	-	-	-	-	-
Cash excess/deficit	=	=	=	=	=



### Worksheet 5-1. Estimated yearly feed needs vs. feed produced.

#### YEARLY FEED NEEDS (Dry Matter)

$$\begin{array}{rcl}
 (\text{_____} \# \text{ cows}) \times (6.5 \text{ tons DM/cow}^*) = & & \text{_____ Tons DM for cows} \\
 (\text{_____} \# \text{ heifers}) \times (2.75 \text{ tons DM/heifer}^{**}) = & + & \text{_____ Tons DM for heifers} \\
 & = & \text{_____ Total tons needed}
 \end{array}$$

#### YEARLY FEED PRODUCED (Dry Matter)

$$\begin{array}{rcl}
 (\text{_____} \text{ acres corn silage}) \times (\text{_____} \text{ tons/acre}) \times (.35) = & & \text{_____ Total tons DM corn silage} \\
 (\text{_____} \text{ acres hay crop}) \times (\text{_____} \text{ tons/acre}) \times (.90) = & + & \text{_____ Total tons DM hay} \\
 & = & \text{_____ Total tons supplied}
 \end{array}$$

#### Do total tons needed = total tons supplied?

\* = 6.5 tons of Dry Matter/year is based on a 5.5 tons consumption plus 18% loss from fermentation and harvesting losses.

\*\* = 2.75 tons of Dry Matter/year is based on a 2.25 tons consumption plus 22% loss from harvesting and fermentation. This is a higher loss than for the cows to reflect the higher % hay often fed.

This is based on average quality feed, remember as quality increases, dry matter intake increases, which increases the amount of feed needed.

**Worksheet 5-2. Calculate the Ratios of Corn Silage and Haycrop Dry Matter Consumed to Total Forage Dry Matter Consumed for all Cattle on a Dairy Farm.**

Milk Cows	Dry Cows	Heifers	Herd	DM Fed
(lbs corn s.)	+ (lbs corn s.)	+ (lbs corn s.)	= corns s. lbs x % DM	=DM lbs corn silage
( _____ lbs)	+ ( _____ lbs)	+ ( _____ lbs)	= _____ lbs x _____% DM	= _____ DM lbs corn silage
(lbs haylage)	+ (lbs haylage)	+ (lbs haylage)	= haylage lbs x DM %	= DM lbs haylage
( _____ lbs)	+ ( _____ lbs)	+ ( _____ lbs)	= _____ lbsx _____% DM	= _____ DM lbs haylage
(lbs hay fed)	+ (lbs hay fed)	+ (lbs hay fed)	= hay lbs x % DM	= DM lbs hay fed
( _____ lbs)	+ ( _____ lbs)	+ ( _____ lbs)	= _____ lbs x .90	= _____ DM lbs hay fed
				Total = _____ DM lbs forage needed
(DM lbs corn silage)	+ (DM lbs haylage )	+ DM lbs hay	= DM lbs forage needed	
( _____ lbs)	+ ( _____ lbs)	+ _____ lbs	= _____ DM lbs forage needed	
(DM lbs haycrop)	+ total DM lbs forage needed)	x 100 =	% total DM from hay crop	
( _____ lbs)	÷ ( _____ lbs)	x 100 =	_____ %	
(DM lbs corn s.)	+ total DM lbs forage needed)	x 100 =	% total DM from corn silage	
( _____ lbs)	÷ ( _____ lbs)	x 100 =	_____ %	

**Worksheet 5-4. Water Worksheet**

A)	Number of cows per herd or group	
B)	Average milk production per herd or group	gal/cow
C)	Season of the year	
D)	Daily water needs per cow from table	gal/cow
E)	Water required by herd or group (D X A)	gal/day
F)	Number of water trough or tanks	
G)	Capacity of water trough or tanks	gal/tank
H)	Maximum available water (F X G)	gal
I)	Flow rate per tank or water bowl	gal/min