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A. E. Ext. 434

FREE-STALL-BARN, HERRINGBONE -
PARLOR, HIGH-SILAGE-FEEDING
DAIRY CHORE SYSTEMS

PLANNING
THE
CHANGE

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PLANNING THE CHANGE

Anyone planning a major change in the farm business should first budget that change. This involves determining the actual physical changes that would take place and getting down on paper the additional investment required, the increase or decrease in expenses and receipts expected and the change in net income that should result.

This booklet is designed to be used in planning and budgeting the change from a conventional stanchion-barn, bucket-milker, hay and silage dairy chore system to the free-stall-barn, herringbone-parlor, high-silage-feeding system. It can also be used when changing to or from other types of systems if the labor requirement factors given are not used.

Throughout this paper an example farm is used to show the type of calculations to make. This example farm is modeled after the 1964 average of 434 New York dairy farmers cooperating with the extension service in the dairy farm business management projects. A comparison of the example farm and the average of those farms is shown below.

	<u>Example farm</u>	<u>434 N. Y. dairy farms, 1964</u>
Number of cows	40	40
Acres of cropland	130 (no cow pasture)	105 (plus cow pasture)
Hay per acre	2.0 tons	2.0 tons
Corn silage per acre	12.0 tons	12.0 tons
Milk per cow	12,000 #	11,300 #

The change budgeted for the example farm is a change in chore systems and an increase in the herd size up to 80 cows. The prices and values given are meant to be realistic and can be used as guidelines. However, each farmer should enter the figures which represent his own specific situation.

One of the best sources of planning data is the record of past experience. Although many factors may not, and often should not, be the same in the future as they were in the past, past experience should provide a good base point for estimating for the future. Caution should be advised. Be as realistic as possible. A change in chore systems will not in itself make a man a better manager.

Other available publications on free-stall-barn, herringbone-parlor, high-silage-feeding dairy chore systems include:

Comparison and Analysis	A.E. Res. 188
Financial Considerations	A.E. Res. 189
Buildings and Arrangements	A.E. Res. 190

I. BASIC INFORMATION - MY FARM

Number of cows

Number of youngstock

Acres of hay

Acres of corn silage

Acres of oats

Acres of hay crop silage

Acres of cow pasture

II. ROUGHAGE PRODUCTION AND REQUIREMENTS WITH CHANGE - MY FARM

Forage requirements

Number of cows (after change is made)

Hay equivalent per cow (tons)

Hay equivalent required for cows (tons)

Number of heifers (after change is made)

Hay equivalent per heifer (tons)

Hay equivalent required for heifers (tons)

Total Hay Equivalent Required (tons)

Forage Production - Present Cropping System - Example Farm

<u>Crop</u>	<u>Acres</u>	<u>Yield</u>	<u>Production</u>	<u>Hay equivalent</u>
Hay (for youngstock)	<u>14</u>	<u>2.0</u>	<u>28 tons</u>	<u>28 tons</u>
Hay crop silage	<u>82</u>	<u>6.0</u>	<u>492</u>	<u>164</u>
Corn silage	<u>13</u>	<u>12.0</u>	<u>156</u>	<u>52</u>
Oat silage (seeded)	<u>20</u>	<u>6.0</u>	<u>120</u>	<u>40</u>
<hr/>				
Hay equivalent produced				<u>284 tons</u>
Hay equivalent required (from P.2)				<u>519</u>
Deficit				<u>235 tons</u>

Forage Production - More Corn Silage

<u>Crop</u>	<u>Acres</u>	<u>Yield</u>	<u>Production</u>	<u>Hay equivalent</u>
Hay	<u>14</u>	<u>2.0</u>	<u>28</u>	<u>28 tons</u>
Hay crop silage	<u>45</u>	<u>6.0</u>	<u>270</u>	<u>90</u>
Corn silage	<u>55</u>	<u>12.0</u>	<u>660</u>	<u>220</u>
Oat silage (seeded)	<u>15</u>	<u>6.0</u>	<u>90</u>	<u>30</u>
<hr/>				
Hay equivalent produced				<u>368 tons</u>
Hay equivalent required				<u>519</u>
Deficit				<u>151 tons</u>

Required to Meet Forage Production Deficit

<u>Crop</u>	<u>Acres</u>	<u>Yield</u>	<u>Production</u>	<u>Hay equivalent</u>
Hay crop silage	<u>0</u>	<u>_____</u>	<u>_____</u>	<u>_____</u>
Corn silage	<u>38</u>	<u>12.0</u>	<u>456 tons</u>	<u>152 tons</u>
Oat silage	<u>0</u>	<u>_____</u>	<u>_____</u>	<u>_____</u>
<hr/>				
Total	<u>_____</u>	<u>_____</u>	<u>_____</u>	<u>_____</u>

Additional land to be purchased or rented: 38 acres

Forage Production - Present Cropping System - My Farm

<u>Crop</u>	<u>Acres</u>	<u>Yield</u>	<u>Production</u>	<u>Hay equivalent</u>
Hay	_____	_____	_____	_____ tons
Hay crop silage	_____	_____	_____	_____
Corn silage	_____	_____	_____	_____
Oat silage	_____	_____	_____	_____
<hr/>				
Hay equivalent produced				_____ tons
Hay equivalent required (from P.3)				_____
Deficit				_____ tons

Forage Production - More Corn Silage

<u>Crop</u>	<u>Acres</u>	<u>Yield</u>	<u>Production</u>	<u>Hay equivalent</u>
Hay	_____	_____	_____	_____ tons
Hay crop silage	_____	_____	_____	_____
Corn silage	_____	_____	_____	_____
Oat silage	_____	_____	_____	_____
<hr/>				
Hay equivalent produced				_____ tons
Hay equivalent required				_____
Deficit or surplus				_____ tons

Required to Meet Forage Production Deficit

<u>Crop</u>	<u>Acres</u>	<u>Yield</u>	<u>Production</u>	<u>Hay equivalent</u>
Hay crop silage	_____	_____	_____	_____
Corn silage	_____	_____	_____	_____
Oat silage	_____	_____	_____	_____
<hr/>				
Total	_____	_____	_____	_____

Additional land to be purchased or rented: _____ acres

III. LABOR REQUIREMENT CHANGES - EXAMPLE FARM

Chore Labor

	<u>Hrs. per day</u>		<u>Days per year</u>	=	<u>Hrs. per year</u>
Increase in winter labor	<u>0</u>	x	<u> </u>	=	<u> </u>
Decrease in winter labor	<u>0</u>	x	<u> </u>	=	<u> </u>
Increase in summer labor	<u>2.2</u>	x	<u>150</u>	=	<u>330</u>
Decrease in summer labor	<u>0</u>	x	<u> </u>	=	<u> </u>

Crop Labor

<u>Additional crops</u>	<u>Acres</u>	<u>Additional hrs. per acre</u>	<u>Additional hrs. required</u>
Corn silage	<u>38</u>	<u>12</u>	<u>456</u>
Hay crop silage	<u>0</u>	<u>8</u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>	<u> </u>

Factors to use in determining approximate chore labor changesMinutes per cow per day

<u>Size of herd</u>	<u>Conventional Chore Systems</u>		<u>Free-Stall-Barn, Herringbone Parlor, High-Silage Systems</u>	
	<u>Winter</u>	<u>Summer</u>	<u>Winter</u>	<u>Summer</u>
<u>Cows</u>				
40 - 70	15.8	9.3	8.7	6.6
71 - 85	14.6	9.5	7.7	6.3
86 & over	13.6	9.8	6.8	6.0

III. LABOR REQUIREMENT CHANGES - MY FARM

Chore Labor

	<u>Hrs. per day</u>		<u>Days per year</u>	=	<u>Hrs. per year</u>
Increase in winter labor	_____	x	_____	=	_____
Decrease in winter labor	_____	x	_____	=	_____
Increase in summer labor	_____	x	_____	=	_____
Decrease in summer labor	_____	x	_____	=	_____

Crop Labor

<u>Additional crops</u>	<u>Acres</u>	<u>Additional hrs. per acre</u>	<u>Additional hrs. required</u>
Corn silage	_____	12	_____
Hay crop silage	_____	8	_____
_____	_____	_____	_____
_____	_____	_____	_____

Total Labor Change

	<u>Example Farm</u>	<u>My Farm</u>
Increase in summer chore labor	<u>330 hours</u>	_____ hours
Increase in crop labor	<u>456</u>	_____
Total Increase in summer labor	<u>786 hours</u>	_____ hours
Plus: Increase in winter labor	<u>0</u>	_____
Minus: Decrease in winter labor	<u>0</u>	_____
Total labor change	<u>786 hours</u>	_____ hours

IV. INVESTMENT REQUIRED FOR REMODELING - EXAMPLE FARM*

Gut and put floor in (\$.20 - \$.60 per sq. ft.)	<u>\$ 1,296</u>
Free stalls (\$5 - \$12 each)	<u>374</u>
Bunk and feeder (\$15 - \$23 per lin. ft.)	<u>950</u>
Parlor (\$5,000 - \$8,000)	<u>6,500</u>
Side addition (\$4 - \$6 per sq. ft.)	<u>3,375</u>
Bulk tank (trade)	<u>3,880</u>
Silo	<u>9,351</u>
Silo unloader	<u> </u>
End addition - complete (\$1.85 - \$2.25 per sq. ft.)	<u>6,242</u>
Electrical system	<u> </u>
Water system	<u> </u>
Grading	<u> </u>
Milkhouse	<u> </u>
Holding area	<u> </u>
<u> </u>	<u> </u>
<u> </u>	<u> </u>
<u> </u>	<u> </u>
Additional land (\$200 - \$300 per acre)	<u>9,500</u>
Additional cows (\$250 - \$350 each)	<u>12,000</u>
Additional heifers	<u> </u>
Machinery	<u> </u>
<u> </u>	<u> </u>
<u> </u>	<u> </u>
<u> </u>	<u> </u>
Total	<u>\$53,468</u>

* Example farm building investment figures are for purchased labor and materials only. No contractors fee has been added.

IV. INVESTMENT REQUIRED FOR REMODELING - MY FARM

Gut and put floor in (\$ _____ per sq. ft.) \$ _____

Free stalls (\$ _____ each) _____

Bunk and feeder (\$ _____ per lin. ft.) _____

Parlor _____

Side addition (\$ _____ per sq. ft.) _____

Bulk tank _____

Silo _____

Silo unloader _____

End addition - complete (\$ _____ per sq. ft.) _____

Electrical system _____

Water system _____

Grading _____

Milkhouse (\$ _____ per sq. ft.) _____

Holding area (\$ _____ per sq. ft.) _____

Additional land (\$ _____ per acre) _____

Additional cows (\$ _____ each) _____

Additional heifers (\$ _____ each) _____

Machinery _____

Total \$ _____

V. INVESTMENT REQUIRED FOR BUILDING NEW - EXAMPLE FARM*

Grading		\$	_____
Poles			_____
Lumber			_____
Blocks			_____
Concrete			_____
Siding			_____
Roofing			_____
Free stalls			_____
Augers and conveyors			_____
Carpenter supplies			_____
Labor			_____
Miscellaneous			_____
<hr/>			
<hr/>			
Pole building - complete (\$1.85 - \$2.25 per sq. ft.)			<u>\$12,989</u>
Parlor equipment	→ (\$5,000 - \$8,000)	→	<u>6,500</u>
Parlor building			_____
Milkhouse building	→ (\$4 - \$6 per sq. ft.)	→	<u>1,470</u>
Milkhouse equipment			_____
Bulk tank			<u>3,880</u>
Electrical system			_____
Water system			_____
Silos			<u>12,659</u>
Silo unloaders			_____
<hr/>			
<hr/>			
Additional land (\$200 - \$300 per acre)			<u>9,500</u>
Additional cows (250 - 350 each)			<u>12,000</u>
Additional heifers			_____
Machinery			_____
<hr/>			
<hr/>			
Total			<u>\$58,998</u>

* Example farm building investment figures are for purchased labor and materials only. No contractors fee has been added.

V. INVESTMENT REQUIRED FOR BUILDING NEW - MY FARM

Grading	\$ _____
Poles	_____
Lumber	_____
Blocks	_____
Concrete	_____
Siding	_____
Roofing	_____
Free stalls (\$ _____ each)	_____
Augers and conveyors	_____
Carpenter supplies	_____
Labor	_____
Miscellaneous	_____
_____	_____
_____	_____
Pole building - complete (\$ _____ per sq. ft.)	\$ _____
Parlor equipment	_____
Parlor building (\$ _____ per sq. ft.)	_____
Milkhouse building (\$ _____ per sq. ft.)	_____
Milkhouse equipment (\$ _____ per sq. ft.)	_____
Bulk tank	_____
Electrical system	_____
Water system	_____
Silos	_____
Silo unloaders	_____
_____	_____
_____	_____
Additional land (\$ _____ per acre)	_____
Additional cows (\$ _____ each)	_____
Additional heifers (\$ _____ each)	_____
Machinery	_____
_____	_____
_____	_____
_____	_____
Total	\$ _____

VI. ADDITIONAL INCOME EXPECTED - EXAMPLE FARM

Additional receipts

Milk (<u>40</u> cows x <u>12,000</u> #/cow x <u>4.15</u> per cwt.)	<u>\$19,920</u>
Slaughter cows (<u>10</u> cows x <u>175</u> per cow)	<u>1,750</u>
Calves (<u>35</u> calves x <u>\$15</u> per calf)	<u>525</u>
_____	_____
_____	_____
_____	_____
Total	<u>\$22,195</u>

Additional expenses

Fertilizer & lime	_____
Seed	_____
Additional equipment expense	_____
Crop labor	_____
_____	_____
Additional silage (<u>640</u> tons x <u>\$8.30</u> per ton)	<u>\$ 5,312</u>
<u>4,000</u> lbs. per cow	
Grain <u>2,000</u> lbs. per ton = <u>2</u> t/cow x <u>40</u> cows x <u>\$65</u> per ton)	<u>5,850</u>
Replacements (<u>10</u> heifers x <u>\$300</u> each)	<u>3,000</u>
Vet and breeding (<u>40</u> cows x <u>\$12</u> per cow)	<u>480</u>
Dairy expense (<u>40</u> cows x <u>\$15</u> per cow)	<u>600</u>
Building and equipment operation (<u>40</u> cows x <u>\$10</u> per cow)	<u>400</u>
Chore labor (<u>280</u> hrs. x <u>\$1.50</u> per hour)	<u>420</u>
Miscellaneous expense (<u>40</u> cows x <u>\$10</u> per cow)	<u>400</u>
_____	_____
_____	_____
_____	_____
Total	<u>\$16,462</u>

VI. ADDITIONAL INCOME EXPECTED - MY FARM

Additional receipts

Milk (___ cows x ___ #/cow x \$ ___ per cwt.) \$ _____

Slaughter cows (___ cows x \$ ___ per cow) _____

Calves (___ calves x \$ ___ per calf) _____

Total \$ _____

Additional expenses

Fertilizer & lime _____

Seed _____

Additional equipment expense _____

Crop labor _____

Additional silage (___ tons x \$ ___ per ton) \$ _____

Grain ___ lbs. per cow
2,000 lbs. per ton = ___ t/cow x ___ cows x \$ ___ per ton) _____

Replacements (___ heifers x \$ ___ each) _____

Vet and breeding (___ cows x \$ ___ per cow) _____

Dairy expense (___ cows x \$ ___ per cow) _____

Building and equipment operation (___ cows x \$ ___ per cow) _____

Chore labor (___ hrs. x \$ ___ per hour) _____

Miscellaneous expense (___ cows x \$ ___ per cow) _____

Total \$ _____

VII. TIME REQUIRED FOR REPAYMENT - EXAMPLE FARM

Total additional receipts (P.12)	<u>\$22,195</u>
Total additional expenses (P.12)	<u>16,462</u>
Additional net income	<u>\$ 5,733</u>

	<u>Additional investment</u>	÷	<u>Additional income</u>	=	<u>Factor</u>	<u>Yrs. required for repayment</u>
Remodeled buildings (P.8)	<u>\$53,468</u>	÷	<u>5,733</u>	=	<u>9.3</u>	<u>14</u>
New buildings (P.10)	<u>\$58,998</u>	÷	<u>5,733</u>	=	<u>10.3</u>	<u>16½</u>

When the additional investment divided by the additional income equals

Years required to repay the investment plus 6% interest is

.9	1
1.8	2
2.7	3
3.5	4
4.2	5
4.9	6
5.6	7
6.2	8
6.8	9
7.4	10
7.9	11
8.4	12
8.9	13
9.3	14
9.7	15
10.1	16
10.5	17
10.8	18
11.2	19
11.5	20

VII. TIME REQUIRED FOR REPAYMENT - MY FARM

Total additional receipts (P.13)	\$ _____
Total additional expenses (P.13)	_____
Additional net income	\$ _____

	<u>Additional investment</u>	÷	<u>Additional income</u>	=	<u>Factor</u>	<u>Yrs. required for repayment</u>
Remodeled buildings (P.9)	\$ _____	÷	_____	=	_____	_____
New buildings (P.11)	\$ _____	÷	_____	=	_____	_____

NOTES AND CONCLUSIONS