





## FOREWORD

The purpose of this handbook is to provide Extension people and other agricultural workers with an economic reference to use when assisting farmers with their farm business plans, and in counseling with farmers on farm management problems. It is particularly intended for use in connection with the expanded program in farm and home management.

Organizing a handbook of this type in a useable form is not an easy task. Information is arranged by enterprise wherever possible, e.g., dairy, poultry, and each section is identified by a different color. An index by subject matter is also included.

The data presented is for the most part based on experimental data, and the most recent research information is included. Material has been drawn from cost accounts, farm management surveys, farm account projects, and other sources. Sources are listed. "A.E." numbers refer to mimeographed publications of the Department of Agricultural Economics at Cornell. Bulletin numbers refer to Cornell Bulletins unless otherwise indicated.

## ACKNOWLEDGEMENTS

In 1954, W. M. Barry compiled the first edition of the Farm Management Handbook, which was published as A. E. 974. At that time Mr. Barry was on leave from his position as County Agricultural Agent in Columbia County.

County agents, farm management specialists, and others, have found the Handbook of value and have seen the need for revision to include up-to-date price data and other information.

The present edition has been compiled by G. J. Conneman and R. S. Smith and supersedes A. E. 974.

V. B. Hart reviewed the Credit section. The Farm Business Chart and Productive Man Work Units were prepared by S. W. Warren. L. C. Cunningham prepared the Product Units Chart. R. B. How and B. F. Stanton assisted with the Vegetable section. W. G. Earle and K. S. Carpenter reviewed the data on Poultry; B. A. Dominick reviewed the Fruit section. Thanks are also due to C. A. Bratton and C. W. Loomis for their many helpful suggestions.

Specialists in other departments provided data and reviewed portions of the Handbook.

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PRICES PAID TO NEW YORK STATE PRODUCERS FOR FARM PRODUCTS<sup>1/</sup>

Item	Unit	Average 1936-55	1955	Estimated 1956	1957
Corn	bu.	\$ 1.32	\$ 1.43	\$ 1.42	
Oats	bu.	.73	.78	.75	
Wheat	bu.	1.61	1.96	2.00	
Barley	bu.	1.03	1.07	1.02	
Buckwheat	bu.	1.07	1.17	1.38	
Dry beans	bu.	4.15	5.49	5.36	
Hay (baled)	ton	17.88	20.86	21.00	
Hogs	cwt.	15.10	15.48	14.00	
Chickens	lb.	.26	.25	.23	
Eggs	doz.	.44	.48	.49	
Milk*	cwt.	3.52	4.09	4.15	
Milk cows	head	166.00	174.00	180.00	
Beef cattle (dairy)	cwt.	11.99	11.30	11.25	
Veal calves	cwt.	17.59	16.83	16.50	
Lambs	cwt.	16.85	19.33	19.86	
Wool	lb.	.44	.48	.45	
Potatoes	cwt.	1.83	1.17		
Snap beans	ton	98.13	111.90		
Sweet corn	ton	18.00	19.70		
Peas	ton	80.54	101.20		
Tomatoes	ton	23.50	31.50		
Cabbage for kraut	ton	12.79	22.20		
Danish cabbage	ton	24.55	40.00		
Apples	bu.	1.49	1.23		
Cherries, sour	ton	152.50	106.00	175.00	
Cherries, sweet	ton	206.85	191.00	368.00	
Peaches	bu.	2.02	2.05	2.65	
Grapes	ton	84.35	92.00		
Pears	bu.	1.91	2.00		

<sup>1/</sup> Season average price for fruits and vegetables; calendar year prices for grains and livestock.

\* New York Market, 3.7%, 201-210 mile zone.

Source: U. S. D. A.

Prices and Costs in New York

Year	Milk per cwt.	Eggs per doz.	Index 1910-14 = 100		Dairy ration per ton	Dairy cows per head
			New York farm prices	Costs in dairy farming		
1951	\$4.70	\$ .60	274	328	\$80	\$293
1952	4.76	.54	281	350	88	300
1953	4.34	.58	243	339	79	209
1954	4.11	.46	227	337	77	176
1955	4.09	.48	226	339	72	174
1956 (Est.)	4.15	.49	231	344	72	180
1957						

For up-to-date prices, see "Current Prices and Costs".

FARM MACHINERY -- APPROXIMATE NEW PRICE -- FALL 1956

Tractor	
1-plow	\$ 800 - 1,200
2-plow	2,000 - 2,300
3-plow	2,400 - 2,600
Diesel, 40 H.P. plus	3,200 - 4,000
Tractor plow, 1 bottom, 12", mounted	75 - 125
Tractor plow, 2 bottom, 14", trailer	250 - 350
Tractor plow, 3 bottom, 14", trailer	350 - 550
Springtooth harrow, 3 section, 12' wide	150 - 200
Disc harrow, 8-9 ft. cut	300 - 350
Tractor cultivator, 2 row	250 - 300
Tractor cultivator, 4 row	400 - 600
Grain drill, 15 ft., with fertilizer attachment	500 - 700
Tractor mower -- 7 ft.	300 - 450
Side delivery rake	350 - 500
Wagon, without tires and rack	125 - 225
Forage harvester	
PTO, hay and corn attachments	1,500 - 1,800
Motor, hay and corn attachments	2,000 - 2,600
Blower, 30 ft. of pipe	575 - 600
Wagon unloader	100 - 175
Combine	
6' PTO	1,200 - 1,500
6' Motor drive	1,700 - 1,900
9' Motor drive	2,900 - 3,600
10' Self-propelled	4,500 - 5,500
Manure spreader, 2-wheel on rubber, 90 bu.	450 - 550
Gutter cleaner, 30 cows, 2 rows, typical installation	1,300 - 1,500
Corn picker	
Mounted, 2-row	1,400 - 1,800
Pull type, 1-row	850 - 1,000
Pull type, 2-row	1,000 - 1,600
Picker sheller, 2-row	1,300 - 1,700
Hay baler	
PTO, twine tie	1,300 - 2,100
Motor, twine tie	1,700 - 2,700
Bale elevator, 26 ft., 1 H.P. electric motor	400 - 450
Corn planter	
2-row, lift	250 - 275
4-row, lift	500 - 550
Milk cooler, 6-can	425 - 475
Milking machine, pump with 2 units (no installation)	275 - 325
Potato digger, 2-row, without rubber	900 - 950
Potato planter, 2-row, without rubber	625 - 675
Weed sprayer	
Boom type	175 - 200
Boom-less type	150 - 175

FEED PRICES

Item	Protein	TDN	Price per cwt. October 1956 Ithaca, New York	Price 1957
Corn on cob (15% moisture)	7.3	73.2	\$ 50	_____
Local corn, shelled, No. 2	8.6	80.1	63	_____
Local oats	12.0	70.1	59	_____
Local wheat	13.2	80.0	76	_____
Dried citrus pulp	5.9	74.4	62	_____
Dried beet pulp	9.2	67.8	73	_____
Wheat bran	16.9	67.2	54	_____
Wheat middlings and sc.	18.2	78.4	57	_____
Corn gluten feed	25.5	76.0	60	_____
Corn distillers' grain	28.8	80.9	72	_____
Brewers dried grain	27.6	67.1	66	_____
Soybean oil meal	44.3	78.4	72	_____
Linseed meal	35.4	77.2	78	_____
Cottonseed meal	41.5	70.6	80	_____
Molasses (bulk)	2.9	54.0	42	_____
<u>Dairy feeds:</u>				
16% ration			\$ 68	_____
20% ration			70	_____
24% ration			69	_____
32% ration			73	_____
<u>Poultry feeds:</u>				
Laying mash			\$ 89	_____
Starter			93	_____
Growing mash			87	_____
Scratch grains			77	_____

Source: Feeds and Feeding, 21st Edition.



PRICES

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APPROXIMATE FERTILIZER COSTS PER TON

	<u>Fall 1956</u> <u>Ithaca, New York</u>	<u>1957</u>
8 - 16 - 16	\$ 74	_____
8 - 16 - 8	71	_____
10 - 10 - 10	66	_____
8 - 8 - 8	58	_____
5 - 10 - 10	51	_____
6 - 12 - 6	54	_____
5 - 10 - 5	49	_____
0 - 15 - 30	62	_____
0 - 20 - 20	61	_____
20% Superphosphate	35	_____
Ground limestone	8.50	_____
Ammonium nitrate	86	_____
Nitrate of soda	74	_____
Muriate of potash (60%)	58	_____
Liquid fertilizer, 41% nitrogen, in buyer's drum	78	_____

DRAINAGE COSTS

	<u>Price per foot</u>
4-inch agricultural tile	\$ .12
Average installation cost	\$ .08 - .20
Diversion terracing	\$ .08 - .12

PRICES OF FARM SEEDS

Item	Weight per bushel*	Usual seeding rate per acre	Price Fall 1956 Ithaca, New York	Price 1957
<u>Grains</u>				
			Per bushel	
Barley (Hudson)	48	2 bu.	\$ 2.50	
Buckwheat	48	1½ bu.	2.85	
Corn	56	7-10 qts.	10.00	
Oats (Garry)	32	1½-2 bu.	3.50	
Peas, Canada, field	60	60-120 lbs.	7.85	
Rye	60	2-3 bu.	1.75	
Wheat	60	1½-2 bu.	3.25	
<u>Legumes</u>				
			Per pound	
Alfalfa				
Ranger	60	3-10 lbs.	\$ .46	
Naragansett	60	3-10 lbs.	.64	
Du Puits	60	3-10 lbs.	.49	
Birdsfoot Trefoil				
Empire (Certified)	60	5 lbs.	1.80	
European	60	5 lbs.	.90	
Ladino Clover (Certified)	60	1-2 lbs.	.90	
Medium Red Clover	60	3-8 lbs.	.54	
Sweet Clover	60	10-15 lbs.	.22	
Alsike Clover	60	2 lbs.	.48	
<u>Grasses</u>				
Smooth Bromegrass	14	8 lbs.	\$ .46	
Kentucky Bluegrass	14	5-10 lbs.	.92	
Orchard Grass	14	8 lbs.	.43	
Red Top	14	2-5 lbs.	.77	
Rye Grass, domestic	20-24	8-15 lbs.	.12	
Rye Grass, perennial	20-24	8-15 lbs.	.20	
Reed Canary Grass	44-48	4-12 lbs.	.58	
Timothy	45	6-8 lbs.	.27	
<u>Other Forages</u>				
Sudan Grass	32	35 lbs.	\$ .11	
Piper Sudan Grass	40	35 lbs.	.16	
Millet	32-35	½ bu.	.10	
Amber Sorghum				
30" row	32-35	10-14 lbs.	.13	
Solid	32-35	40 lbs.	.13	

\* Weight per bushel varies substantially, estimated average given.

RETURN PER HOUR OF LABOR  
New York Cost Account Farms

Farm enterprises	Return per hour of labor <sup>1/</sup>		
	1934-38	1944-48	1950-54
<u>Livestock:</u>			
Dairy cows	\$ .25	\$ 1.49	\$ 1.36
Hens	.29	1.34	.98
Raising chicks	.33	.48	.97
<u>Fruit:</u>			
Apples	\$ .45	\$ 1.60	\$ 2.49
Cherries	.64	2.30	1.79
Peaches	.54	1.57	1.20
<u>Hay and Grain:</u>			
Hay	\$ .18	\$ 1.09	\$ 1.28
Corn for grain	.22	1.79	2.18
Oats	-.02	.76	.15
Wheat	.47	3.15	3.67
<u>Vegetables:</u>			
Dry beans	\$ .30	\$ 1.51	\$ 1.73*
Cabbage	.48	1.15	1.24**
Peas, canning-factory	.16	2.95	.82*
Potatoes	.50	2.11	2.53*
Tomatoes, canning-factory	.41	1.56	1.39

<sup>1/</sup> Return per hour of labor is the amount of the returns to an enterprise which is left after paying all costs -- cash and non-cash -- except labor divided by the number of hours of man labor spent on the enterprise. The labor includes both hired and unpaid labor. It includes work done on a piece work basis.

Example:  $\frac{\text{Total returns} - \text{all costs except labor}}{\text{Number of hours}} = \text{Return per hour of labor}$

\* Four-year average 1949-52.

\*\* 1949-53.

FARM WAGE RATES -- NEW YORK STATE  
October 1, 1956

<u>Per Month</u>	
With board and room	\$ 130.00
With house	184.00
<u>Per Week</u>	
With board and room	\$ 35.25
Without board	49.00
<u>Per Day</u>	
Without board and room	\$ 8.50
<u>Per Hour</u>	
Without board and room	\$ 1.07

Source: Farm Labor, U.S.D.A.

BUYING LOCAL CORN

Local corn is often a good buy, but should be bought on a moisture content basis.

EFFECT OF MOISTURE IN CORN ON NET WEIGHT

Moisture content	Pounds		Bushels shelled corn 15% moisture
	Corn and cob 15% basis	Shelled corn 15% equivalent	
15%	2,000	1,600	28.5
20%	1,900	1,520	27.1
25%	1,800	1,439	25.7
30%	1,700	1,360	24.3
35%	1,500	1,280	22.9

To find number of bushels in a crib or other structure:

1. Multiply length x width x height, then take  $\frac{4}{5}$  of the answer and you have bushels of ears.
2. Two bushels of ear corn, by measure, are required to make one bushel of shelled corn.
3. 70 pounds of ear corn will make 56 pounds of shelled corn (1 bushel).

Example:

A corn crib measures 20 feet x 4 feet x 8 feet = 640 cubic feet

$\frac{4}{5}$  of 640 = 512 bushels of ears

$\frac{1}{2}$  of 512 = 256 bushels of shelled corn

256 x 56 lbs. per bushel = 14,336 pounds of corn



## PRINCIPAL SOURCES OF CREDIT TO FARMERS AND USUAL TERMS

	Maximum length of loan	Usual annual interest rate	Maximum % loaned of appraised value	Purpose of loan
<u>Long term credit</u>				
Commercial Banks	15 yrs.	5 to 5½%	40 to 60%	Purchase real estate or refinance short or long term credit or finance improvements
Savings Banks	20 yrs.	5 to 5½%	40 to 60%	
Federal Land Bank	33 yrs.	5%	65%*	Purchase real estate or refinance or finance improvements
Life Insurance	20 to 25 yrs.	5 to 6%	60%	
Farmers' Home Administration	40 yrs.	4½%	to 100%	
G.I. Loans	10 to 20 yrs.	4½%	to 90%	Purchase real estate or finance improvements
Individuals	Varies	4 to 6%+	Varies	Purchase real estate, etc.
<u>Short term credit</u>				
Commercial Banks	3 to 30 mo.	6%	Varies	Current operating expenses, livestock, and equipment
Production Credit Associations	30 to 60 mo.	6%	Varies	Same
Farmers' Home Administration	7 yrs.	5%	to 100%	Same
Merchant and Dealer Credit	30 days plus	Varies	to 100%	Same
Machinery Co.	to 18 mo.	5 to 6% on orig. amt.	to 75%	Farm machinery
Auto or Truck	to 18 mo.	5 to 6% on orig. amt.**	to 75%	Auto or truck
Individuals	Varies	3 to 6%+	Varies	Production, etc.

\* 65% of long time agricultural value.

\*\* And frequently plus insurance and "carrying charges".

### INTEREST RATES

There are several ways of computing interest charges. Suppose you want to borrow \$1200 on April 1, and plan to pay it back at the rate of \$100 per month. You shop around to see where you can get the money the cheapest.

Lender A says he'll charge you 6 per cent interest, and he'll deduct the 6 per cent in advance from the amount of the loan. Lender B says he'll charge you 6 per cent interest, to be calculated monthly on the original amount of the loan. Lender C says he'll charge you 6 per cent interest, and this is to be calculated monthly on the unpaid balance.

Even though all three talked "6 per cent interest", the following table shows the actual annual rate of interest you'd pay for the money you used from each lender:

Month	Amount of loan outstanding	Lender A Interest paid in advance	Lender B Annual interest on original amount	Lender C Annual interest on balance
<u>Amount of interest paid each month</u>				
April	\$ 1200	( \$ 72 )	\$ 6.00	\$ 6.00
May	1100	( in )	6.00	5.50
June	1000	(advance)	6.00	5.00
July through December	omitted --	--	--	--
January	300		6.00	1.50
February	200		6.00	1.00
March	100		6.00	.50
Total interest paid		\$ 72	\$ 72	\$ 39
Average money used monthly		\$578	\$650	\$650
Interest rate-- annual basis		12.46%	11.08%	6.0%

### How to Calculate Interest

If you know the rate of interest to be charged, and need to find the amount of interest to be paid, calculate as follows:

Interest = Principal (average amount owed) X Rate of Interest X Length of Loan in Years or Fraction of Year

If you have been charged "X" dollars in interest and want to know the interest rate, calculate as follows:

Rate of Interest =  $\frac{\text{Dollars Interest Actually Paid}}{\text{Principal (average amount owed) X Length of Loan in Years or Fraction of Year}}$

EFFECT OF INCREASE IN INTEREST RATES

The significance of variations in interest rates is not always easy to see on loans to be amortized over a period of years. The following shows the approximate increase in cost to the borrower of an increase in interest rates on a \$10,000 loan amortized over 10 or 20 years.

Period of loan - years	Per cent increase in interest	Extra dollars which must be paid
10	$\frac{1}{2}$	\$ 308
10	$\frac{1}{2}$	621
<u>20</u>	$\frac{1}{2}$	<u>\$ 659</u>
20	1	1332
20	2	2721

PLANS FOR AMORTIZATION OF LONG TERM LOANS

	Annual payments			Unpaid principal end of year
	Interest	Principal	Total	
<u>A. Standard Plan (Even Payments) \$1,000 loan</u>				
1st year	\$50.00	\$30.24	\$80.24	\$969.76
2nd year	48.49	31.57	80.24	938.01
3rd year	46.90	33.34	80.24	904.67
19th year	7.46	72.78	80.24	149.28
20th year	<u>3.82</u>	<u>76.50</u>	<u>80.32</u>	
Total	\$604.80	\$1,000.00	\$1,604.80	
<u>B. Springfield Plan (Reducing Payments) \$1,000 loan</u>				
1st year	\$50.00	\$50.00	\$100.00	\$950.00
2nd year	47.50	50.00	97.50	900.00
3rd year	45.00	50.00	95.00	850.00
19th year	5.00	50.00	55.00	50.00
20th year	<u>2.50</u>	<u>50.00</u>	<u>52.50</u>	
Total	\$525.00	\$1,000.00	\$1,525.00	

The use of the Springfield plan is mandatory for all loans made by National Farm Loan Associations in the Springfield District.

MONTHLY PAYMENTS NEEDED TO AMORTIZE A LOAN OF \$1,000  
Standard Plan

Length of loan period	Monthly payments at various interest rates				
	4%	4½%	5%	5½%	6%
1 year	\$85.15	\$85.37	\$85.61	\$85.37	\$86.07
2 years	43.42	43.65	43.87	44.09	44.32
3 years	29.52	29.75	29.97	30.20	30.42
5 years	18.42	18.64	18.87	19.10	19.33
10 years	10.12	10.36	10.61	10.85	11.10
15 years	7.40	7.65	7.91	8.17	8.44
20 years	6.06	6.33	6.60	6.88	7.16
25 years	5.28	5.56	5.85	6.14	6.44
30 years	4.77	5.07	5.37	5.68	6.00

HOW MUCH MONEY WILL A FARMER HAVE LEFT TO PAY INTEREST AND DEBTS?

Example No. 1 -- Too Heavy Debt Payments

He has \$25,000 invested in land and buildings on which there is a \$13,000 mortgage amortized over a 20 year period. He owes \$10,000 on short term credit on which he is paying \$300 a month. His total capital investment is \$55,000.

Total milk sales	\$16,980
Other receipts	<u>1,755</u>
Total cash receipts	\$18,735
Total cash operating expenses	<u>12,345</u>
Available for living and dept payment	\$ 6,390
Total payment on debts	<u>\$ 4,743</u>
Amount left for living	\$ 1,647

- 1) Could he pay 1/3 of his milk check on his debts and interest?
- 2) What will happen if he has a 5 per cent drop in receipts, if expenses stay the same?

Example No. 2 -- Low Debt, Good Business

This farmer has \$39,620 invested; \$20,000 is in land and buildings; \$19,620 is in livestock and equipment. He pays \$550 a year in principal and interest on a \$5,800 real estate mortgage.

Total cash receipts	\$16,152
Total cash expenses	<u>8,163</u>
Available for living and debt payment	\$ 7,989
Total payment on debts	550
Income tax	<u>750</u>
Amount left for living and saving	\$ 6,689
Farm income	\$ 6,794
Labor income	\$ 4,813



COMPARISONS OF TYPES OF LIFE INSURANCE POLICIES  
\$100 annual premium at age 25 provides:\*

Type of policy	Size of policy Dollars	Proportion of premium for Protection      Savings		Cash value in 20 years Dollars
20-year term	10,000	all	none	none
Straight life	5,000	1/2	1/2	1,300
20-payment life	3,000	1/3	2/3	1,650
20-year endowment	2,000	1/5	4/5	2,000

\* Amounts are approximate. Provisions of different companies vary.

TYPE AND AVERAGE SIZE OF LIFE INSURANCE POLICIES  
587 Commercial Farms, New York, 1953

Type of policy	Per cent of total number policies	Average size of policies
Ordinary life	27	\$ 2,652
Limited payment	38	1,772
Endowment	31	2,159
Term	1	6,224
Family income	1	4,295
Other	2	2,181
Total or average	100	\$ 2,222

Total coverage on the operator averaged	\$ 4,773
Total coverage on members of the family averaged	1,202
Total coverage	\$ 5,975

34% of the operators had coverage on only the operator  
42% of the operators had also taken policies on members of the family  
76% of the operators were covered

Source: A.E. 953, "Insurance Programs on 587 New York Farms" by John R. Tabb.

LIFE INSURANCE  
Annual Premium Per Thousand Dollars Insurance

Age at issue	Type of policy			
	10 Year term	Ordinary life	20 Payment life	20 Year endowment
20	\$ 7.27	\$ 16.24	\$ 30.42	\$ 50.18
30	9.10	21.31	36.32	51.41
40	13.66	29.48	44.50	54.40
50	24.87	42.98	56.75	61.65
60	40.57	66.26	77.49	78.11

Source: Little Gem Life Chart, 1956, National Underwriter Company -- average of policies offered by five selected companies.

ESTIMATED LUMP SUM VALUES OF SOCIAL SECURITY  
BENEFITS AT RETIREMENT OR DEATH

Net income reported	Retirement income man and wife 65*		
	Monthly income		Annuity value (man and wife)
	Man	Man and wife	
\$ 4,200	\$ 108	\$ 163	\$ 27,000
2,400	78	118	20,000
1,200	55	82	13,500
Min.	30	45	7,500

Net income reported	Survivorship benefits			
	30 year old man, wife, 30, children 1-3-5			
	Monthly income			
	While 2 or 3 children under 18	1 child under 18	Widow after 65	Total amount will receive
\$ 4,200	\$ 200	\$ 163	\$ 81	\$ 43,000
2,400	157	118	59	33,000
1,200	83	83	41	18,500
Min.	50	45	30	12,000

\* Under the 1956 amendments to the Social Security Law, women may retire at age 62 on reduced benefits. The wife of a retired worker may also elect to receive benefits at age 62, but on a reduced basis.

VEHICLE INSURANCE

Following are 1956 rates for Tompkins County, New York. Rates vary widely from territory to territory within the State, but these rates are fairly typical of most upstate New York territories.

Personal Injury Liability Premiums

Class I -- No male operator under 25 in family

IA -- Car used only for private purposes

IB -- Car driven less than 10 miles to work one way

IC -- Car driven more than 10 miles to work one way

Class II -- Male operator under 25 in family

IIA -- Principal operator is over 25 or is under 25 but married

IIB -- Principal operator or owner is under 25

Class III -- Vehicle used entirely for business

SELECTED RATES

Class	Policy limits*		
	10-20-5	25-50-5	50-100-5
IA	\$ 62.40	\$ 67.52	\$ 70.40
IB	62.40	67.52	70.40
IC	86.20	93.56	97.70
IIA	114.40	124.32	129.90
IIB	190.60	207.88	217.60
III	100.80	109.44	114.30

\* Includes \$1,000 medical payments. Protection against uninsured motorists can be purchased for an additional \$3.00 in any class. Property damage may be increased from \$5,000 to \$10,000 for 10 per cent of the basic property damage charge (this means only \$1.50 additional in classes IA and IB).

Collision Premiums

Collision premiums decrease as age of car increases, and decrease as amount of deductible feature increases. Classes somewhat similar to those for liability insurance also prevail.

Class I -- No operator under 25 in family, car not used for business

IF -- Same as I, and chief operator is a farmer

II -- Operator under 25 in family

IIF -- Same as II, except chief operator is a farmer

III -- Business use, no operator under 25

COLLISION PREMIUMS  
Tompkins County, 1956

Vehicle and coverage	Class				
	I	IF	II	IIF	III
	\$	\$	\$	\$	\$
New auto, medium price range					
\$50 deductible	70	56	100	80	87
\$100 deductible	73	42	76	61	66
New auto, lower price range					
\$50 deductible	54	43	77	62	67
\$100 deductible	34	28	49	40	43

Comprehensive -- (Fire, theft, glass breakage) approximately \$7 per year.

PROPERTY INSURANCE  
TYPICAL FIRE INSURANCE RATES (STOCK COMPANIES)  
Annual Premiums per \$100 Insurance

Property insured	Standard farm rates Tompkins County, 1956
Dwelling	
Brick: Owner	\$ .48
Tenant	.68
Frame: Owner	.50
Tenant	.74
Barn	
Brick: Owner	.82
Tenant	1.06
Frame: Owner	.88
Tenant	1.10
Produce	.60
Machinery	.50
Livestock	.50
Poultry	1.00

Extended coverage: Dwelling \$ .20 (.08 with \$50 deductible)  
                          Barns .55 (.35 with \$50 deductible)

Machinery and livestock floater policy, good anywhere, coverage includes theft -- \$1.60 for 3 years or \$ .64 per year.

Optional coverage endorsement on livestock floater policy -- \$ .26 for \$100 per year. This covers accidental shooting, drowning, artificial electricity, damage by dogs, or by collapse of buildings.

## FARMERS COMPREHENSIVE PERSONAL LIABILITY INSURANCE

Type of coverage	Premium for policy with \$10,000 liability limit, \$250 medical payment limit
Basic charge (includes premises up to 5 acres)	\$ 15.00
Tenant House	3.00
Additional farm premises with building	5.00
Acreage charge	
5 - 80 acres	2.00
81 - 160	4.00
161 - 240	6.00
241 - 320	8.00
321 - 400	10.00
401 - 500	12.00
501 - 1000	20.00
Custom farming -- minimum (50¢ per \$100 of receipts)	10.00
Animal collision	5.00

Higher liability limits may be purchased as follows:

Limit	Per cent increase in cost over \$10,000 basic coverage
\$25,000	+ 20%
50,000	+ 35%
100,000	+ 50%

## ANNUAL PREMIUMS FOR WORKMEN'S COMPENSATION INSURANCE

Type of farm	Definition	Rate per \$100 of payroll	Minimum charge
Poultry farms	At least 80% of gross receipts from poultry and eggs	\$ 2.80	\$ 50.00
Vegetable or berry farms	At least 60% of crop and pasture acreage in vegetables and/or berries	2.00	40.00
Fruit farms	At least 60% of crop and pasture acreage in fruit	4.10	62.00
General farms	All other farms, including dairy	4.90	70.00

Source: New York Compensation Insurance Rating Board, Manual Rates, July 1, 1956.

Employer's Liability Insurance

Employer's Liability is always written as an endorsement on the farmers comprehensive personal liability policy. Rates for Employer's Liability in 1956 at basic coverage of \$5,000 - \$10,000 and \$250 medical payments are 50 per cent of Workmen's Compensation rates for each class of farms. Increasing medical payment limits to \$500 raises cost to 55 per cent of Workmen's Compensation, increasing medical payment limits to \$1,000 raises cost to 60 per cent of Workmen's Compensation. Minimum payments for Employer's Liability are about 50 per cent of Workmen's Compensation minimum payments.

### FARM MACHINERY COSTS

Farming has become a mechanized business. Machinery costs make up from one-fifth to one-seventh of the total farm operating expenses. Investment in equipment per farm has jumped from about \$1000 in 1927 to about \$9000 in 1956. Investment in equipment represents more than one-fifth of the total dollar investment in the farm business today. Decisions on buying new machines are among the most important a farm owner makes.

### Should You Buy A New Machine?

#### What Will It Cost To Own It?

If you are thinking of buying a new piece of machinery, first estimate its annual cost to your business. The costs to put down are:

	93 Field Choppers with Auxiliary Motors, 1952, New York	Your Machine
Interest on investment	\$ 87	\$ _____
Annual depreciation*	232	_____
Cash repairs (include tires)	19	_____
Labor for repairs	14	_____
Fuel, oil, grease, etc.	34	_____
Insurance	4	_____
License } (if any)	-	_____
Miscellaneous (housing, etc.)**	12	_____
Total	<u>\$402</u>	\$ <u>_____</u>

\* Depreciation may be calculated in several different ways. One way is to use the "straight-line" method. Estimate the years of life of the machine and charge off this fraction of the cost of the machine each year. For example, a machine costing \$1,000 and having an estimated life of 10 years would depreciate \$100 a year.

\*\* In calculating the cost to your business, you should also consider the cost of the time spent in operating the machine.

#### Will It Be Efficient?

After you have estimated the annual cost to own the machine, you'll be better prepared to answer this important question: "Can I operate enough more efficiently with this new machine to justify buying it?"

Here are some of the items to consider in arriving at a decision:

1. How much work do I have for this machine (days or acres)?
2. Does owning this machine help make better use of other equipment?
3. Does buying this machine mean I'll also have to invest in companion machines?
4. How much can I save on repairs and delays which would occur with the old equipment simply by buying this machine?
5. How much labor will this machine save or replace?
6. Will I produce more by owning this machine?
7. Will owning this machine produce a product which is more valuable?
8. Will money invested here bring as high a return as invested elsewhere in the farm business?

What Alternatives Do I Have?

Few farms are large enough to justify owning all the modern equipment needed for farm operation. If your decision is that you can't use the new machine efficiently, what alternatives do you have?

1. Buy it anyway, but use it inefficiently - can you afford this?
2. Get along without it, and try to compete with the bigger business which can use it efficiently.
3. Buy it, and make full use of it by doing custom work.
4. Go in with the neighbors on cooperative ownership of the machine.
5. Hire someone who owns the machine to do the job.
6. Enlarge the farm business to where it justifies owning the machine.
7. Buy secondhand equipment.

ANNUAL USE TO JUSTIFY PURCHASE OF SELECTED MACHINES

Machine	Annual cost to own*	Annual use to justify
Combine, 6' power take-off	\$180	50 acres
Combine, 6' auxiliary engine	237	70 acres
Combine, 12' self-propelled	548	180 acres
Corn picker, 1 row, pull type	124	36 acres
Corn picker, 2 row, mounted	202	50 acres
Forage harvester, power take-off	185	50 acres
Baler, twine tie, power take-off	193	84 tons
Baler, twine tie, auxiliary engine	329	142 tons
Diesel tractor	--	1500 hours

\* Includes depreciation, housing, taxes, insurance, and interest.

Source: "Pennsylvania Farm Economics", State College, Pa., No. 46, April 1952.

COST PER HOUR OF OPERATING TRACTORS ON NEW YORK FARMS\*

<u>Amount of annual use</u>	<u>Cost per hour</u>		
	<u>1-plow</u>	<u>2-plow</u>	<u>3-plow</u>
Light	\$1.10	\$1.20	\$1.45
Medium	.80	.95	1.15
Heavy	.60	.75	.95

COST PER MILE OF OPERATING TRUCKS ON NEW YORK FARMS\*

<u>Amount of annual use</u>	<u>Cost per mile</u>	
	<u>Small trucks</u>	<u>Large trucks</u>
Light	12.0¢	23.0¢
Medium	9.5¢	19.0¢
Heavy	7.0¢	15.0¢

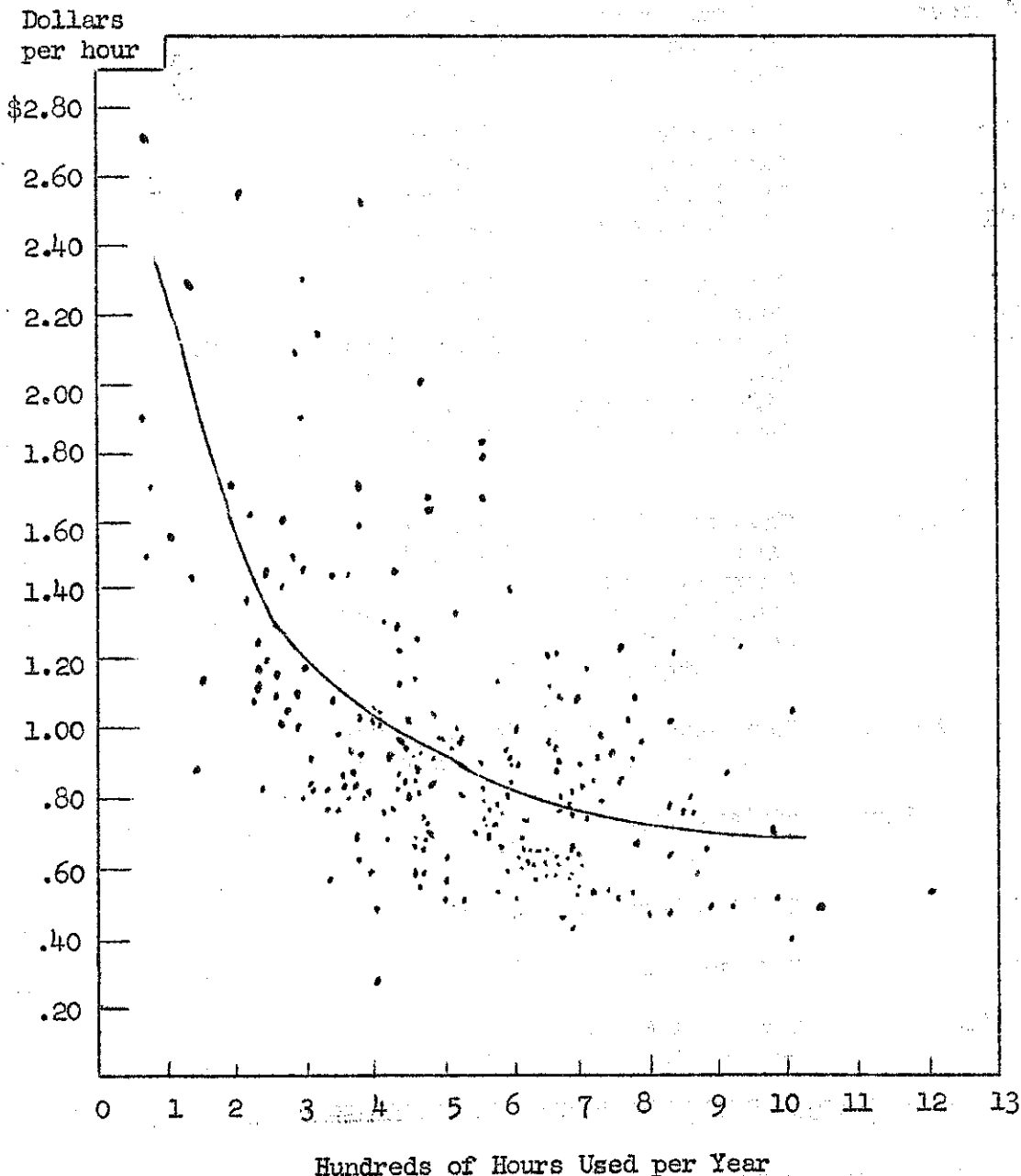
\*Based on data from New York Cost Accounts 1949-1953. Includes fuel, oil, grease, depreciation, repairs, tires, insurance, interest, use of buildings, servicing, etc., but does not include labor to operate the tractor or truck.

Source: A.E. 998

Amount of Use Affects Cost

In the diagram below, cost per hour is plotted against hours of annual use. Each dot in the scatter diagram represents an individual tractor. Inspection of the diagram shows that as a tractor is used more hours per year, the cost per hour tends to be reduced. This is because with more hours of annual use there is a large base over which to spread fixed costs such as depreciation, interest, insurance, housing, etc. This general principle applies to all types of machinery.

COST PER HOUR FOR TWO PLOW TRACTORS  
New York Farm Cost Accounts for 1949-1953; 225 Tractors





TYPICAL RATES OF WORK PERFORMANCE FOR SPECIFIC JOBS  
WITH TRACTOR EQUIPMENT

Job	Tractor equipment furnished by custom operator or used by farmers		Job time per acre	
	Kind	Size	Custom	Farmers on
			operators Hours	own farm Hours
Plow old ground	1-bottom plow	16-inch	2.0	2.4
	2-bottom plow	14-inch	1.0	1.3
	2-bottom plow	16-inch	0.8	1.0
Plow sod ground	1-bottom plow	16-inch	3.0	3.0
	2-bottom plow	14-inch	1.5	--
	2-bottom plow	16-inch	1.2	1.3
Spread fertilizer	1 spreader	8-foot	1.0	1.0
Harrow	Disc harrow	7-foot	1.0 <sup>1/</sup>	1.2 <sup>1/</sup>
Seed grass	Broadcast	8-foot	0.2	0.4
Seed small grain	Single disc drill	8-foot, 16-6	0.6	0.8
Plant corn	Corn planter	2-row	0.8	1.0
Cultivate corn	Cultivator	2-row	0.8	0.8
Spray weeds	Sprayer	18-foot boom	0.3	--
Mow hay	Mower	7-foot bar	0.6	0.7
Rake hay	Side delivery rake	9-foot	0.6	0.6
Bale hay	1-man pickup baler	Medium	0.4	0.6
Field chop hay or grass silage	Chopper, blower and 1 truck	Large chopper, 1½-ton truck	0.9	1.2
	Chopper, blower and 2 trucks	1½-ton truck	0.7	0.9
	Chopper, blower and 3 trucks	1½-ton truck	0.5	--
Field forage harvest corn silage	Harvester, blower and 2 trucks	Large harvester, 1½-ton truck	1.3	--
Harvest corn silage	Binder, ensilage cutter, 2 wagons	1-row	--	13.5
Harvest grain	Combine harvester	6-foot	1.3	--
Harvest corn	Corn picker	1-row	1.2	--
Land improving	Crawler tractor and dozer	Large	5.0	--

<sup>1/</sup> Once over with one-half lap.

Source: N. H. Experiment Station Bulletin 407.

HOW MUCH DOES IT COST TO OPERATE MACHINERY\*?

Item	201 Central New York Dairy Farms,		Your farm
	1955		
Beginning inventory	\$8,223		
New machinery bought	<u>1,422</u>		
Total	\$9,645		
End inventory	\$8,475		
Sale of old machinery	<u>69</u>		
Total	<u>\$8,544</u>		
Depreciation	\$1,101		
Interest on ave. capital @ 5%	417		
Gas and oil	642		
Machinery repairs	609		
Milk hauling	228		
Auto expense (farm share)	132		
Machine work hired	<u>123</u>		
Total Machinery Cost	<u>\$3,252</u>		
Machinery expense per cow	\$ 99		
Machinery expense per man	\$1,807		
Machinery expense per crop acre	\$ 31		
Machinery inventory (end): per cow	\$ 258		
per man	\$4,708		

\* Does not include general farm insurance, housing, or cost of farm labor for repair.

POWER AND MACHINERY COSTS, BY TYPE OF FARM  
525 Farms, Central Plains Region, New York, 1953-54

Items	Type of farm		
	Dairy	Crop	Mixed
Depreciation	\$773	\$938	\$730
Repairs	435	671	317
Tires, license, ins.	168	256	148
Gas and oil	616	684	448
Interest on investment	435	523	324
Milk hauling	385	4	11
Other machine hire (net)	47	86	95
Bale ties	117	40	32
Auto (farm share)	122	184	135
Electricity (farm share)	160	95	96
Total	\$3,258	\$3,481	\$2,336
Man equivalent	1.9	2.6	1.5
Costs per man	\$1,684	\$1,352	\$1,520

Source: A.E. 987

COST OF OPERATING TRACTORS  
New York Cost Account Farms, 1954

	3-plov	2-plov	1-plov
Average inventory value of tractor	\$1,712	\$918	\$817
Hours of operation per year	561	487	320
Cost per hour of operation	\$ 1.28	\$ 0.89	\$ 1.06
Gallons of fuel per tractor	1,062	602	288
Annual cost of operation and maintenance:			
Fuel	\$197	\$117	\$ 57
Oil, grease, greasing	19	13	7
Farm labor	33	20	15
Insurance	3	2	6
Depreciation	224	138	164
Repairs	108	69	26
Tires	30	15	--
Interest	84	43	41
Buildings	16	14	22
All other	3	4	1
Cost for the year	\$717	\$435	\$339

Source: A.E. 1024

INVESTMENT AND COSTS IN FORAGE HARVESTING MACHINERY\*  
Five Patterns on Dairy Farms, New York, 1952

Forage harvesting pattern	Investment per farm	Cost per farm	Cost per ton hay equivalent
HAY AND CORN SILAGE:			
Loader-ensilage cutter	\$ 920	\$ 224	\$ 1.65
Baler-ensilage cutter	2,850	961	3.47
Baler-field chopper	4,380	1,310	3.58
HAY, GRASS AND CORN SILAGE:			
Baler-field chopper	4,260	1,212	3.61
Field chopper	2,840	657	2.08

\* Mobile power not included.

LABOR USED IN HARVESTING FORAGE CROPS  
Five Patterns on Dairy Farms, New York, 1952

Forage harvesting pattern	Average hours per ton			
	Hay	Corn silage	Grass silage	Hay equivalent
HAY AND CORN SILAGE:				
Loader-ensilage cutter	3.2	2.4	--	4.4
Baler-ensilage cutter	2.2	2.1	--	3.3
Baler-field chopper	2.2	0.6	--	2.1
HAY, GRASS AND CORN SILAGE:				
Baler-field chopper	2.4	0.6	1.1	2.4
Field chopper	1.4	0.6	0.9	1.8

TONS OF HAY EQUIVALENT AND ESTIMATED MACHINERY AND LABOR  
COST PER TON

Five Patterns on Dairy Farms, New York, 1952

Forage harvesting pattern	Tons of hay equivalent handled				
	100	150	200	300	400
	Approximate size of business				
	15- cow	25- cow	35- cow	50- cow	65- cow
HAY AND CORN SILAGE:					
Loader-ensilage cutter	\$ 7.20	\$ 5.80	\$ 5.20	\$ 4.80	--
Baler-ensilage cutter	--	8.30	7.10	6.20	\$ 5.90
Baler-field chopper	--	8.90	7.50	6.00	5.30
HAY, GRASS AND CORN SILAGE:					
Baler-field chopper	--	9.50	8.20	6.20	5.30
Field chopper	7.00	5.60	4.70	4.00	3.60

Source: Bulletin 917.

CUSTOM MACHINE RATES IN NEW YORK STATE - 1953TILLING AND PLANTING OPERATIONS

Custom job	Rate per acre		Rate per hour	
	Range	Average	Range	Average
Flowing:				
2-bottom	\$3.00-6.00	\$4.75	\$2.00-7.00	\$3.50
3-bottom	3.00-5.00	4.00	3.00-8.00	5.00
4-bottom	3.00-5.00	4.00	6.00-7.00	6.50
2-disc	--	--	3.00-3.50	3.25
Dragging:				
2-section	--	--	2.50-4.00	3.25
3-section	1.50-3.00	2.25	2.00-8.00	3.75
4-section	--	--	3.50-6.00	5.00
Discing:				
7-foot	--	--	2.00-3.50	3.00
8-foot	2.00-3.50	2.75	3.50-5.00	4.00
Corn Planting:				
2-row	1.50-5.00	2.75	1.75-6.00	3.75
4-row	2.00-3.00	2.25	--	--
Grain Drilling:				
11-hoe	1.50-4.00	2.50	2.50-5.00	3.75
13-hoe	1.00-3.50	2.25	--	--
15-hoe	1.50-2.00	2.00	--	--
16-hoe	1.50-4.00	2.50	--	--
Potato Planting:				
2-row	3.50-5.00	4.50	--	--
Cultivating:				
2-row	--	--	2.00-3.50	3.00

HARVESTING AND WEED SPRAYING OPERATIONS

Weed Spraying:				
Corn	\$1.25-4.00	\$2.75	\$2.00-2.75	\$2.50
Oats	1.25-3.00	2.75	--	--
Silo Filling:				
1-man ensilage cutter and tractor	--	--	2.00-5.00	3.50
Combining Small Grains:				
5-foot	5.00-8.00	6.00	5.00-7.00	6.00
6-foot	5.00-10.00	6.50	6.00-10.00	7.75
10-foot	5.00-8.00	6.75	10.00	10.00
12-foot	5.00-9.00	6.50	--	--
Combining Dry Beans:				
5-foot	7.00-10.00	8.50	--	--
Corn Picking:				
1-row	1.00-12.00	8.25	6.00-8.00	7.00
2-row	1.00-15.00	8.25	10.00-12.00	10.75

## HARVESTING AND WEED SPRAYING OPERATIONS (cont.)

Custom job	Rate per acre		Rate per hour	
	Range	Average	Range	Average
Mowing Hay:				
6-foot	--	--	3.00-5.00	3.50
7-foot	1.00-3.00	1.75	2.25-4.00	3.25
Threshing:	Rate per bushel			
Wheat	.06-.17	.11		
Oats	.05-.10	.08		
Beans	.15-.25	.20		
Hay Baling:	Rate per bale			
String tie	.10-.15	.12		
Wire tie	.12-.20	.15		

## CUSTOM FIELD CHOPPING

Job	Number of records	Rate per hour	
		Range	Average
Dry Hay	7	\$12.00-15.00	\$13.75
Straw	3	12.00-15.00	13.25
Grass Silage	23	10.00-17.00	12.50
Corn Silage	39	8.00-20.00	13.00

Source: A.E. 928

COST OF OPERATING TRUCKS  
New York Cost Account Farms, 1954

	Large trucks	Small trucks	All trucks
Average inventory value of trucks	\$888	\$711	\$765
Distance driven per truck, miles	4,101	7,337	5,758
Cost per mile, cents	17.8	8.1	11.5
Gallons of fuel per truck	463	608	529
Annual cost of operation and maintenance:			
Fuel	\$105	\$140	\$121
Oil, grease, greasing	13	17	13
Farm labor	27	12	21
License	53	23	41
Insurance	59	71	62
Depreciation	182	157	170
Repairs	132	60	97
Tires	47	23	31
Interest	43	36	37
Buildings	20	20	19
All other	2	1	2
Cost for the year	\$683	\$560	\$614

Source: A.E. 1024

## ELECTRIC CURRENT CONSUMPTION

Job	Unit	Kilowatt hours
Barn ventilator	Per cow per month	2.5
Brooder	Per chick	0.5
Clipper	Per hour	0.1
Dairy can cooler	Per 100 lbs. of milk in cans	1.2
Dairy bulk cooler	Per 100 lbs.	1.0
Dairy hot water heater	Per cow per month	7.5
Electric fence	Per month	7.0
Electric heating cable (60')	Per month	15
Gutter cleaner	Per cow per month	1.0
Hay dryer, (cold air)	Per ton of dry hay	50.0
Hay hoist	Per ton	0.33
Milking machine	Per cow per month	2.0
Poultry house lighting	Per 100 birds per month	5.0
Poultry water heater	Per day	1.0
Utility motor (1/4 hp)	Per hour	0.5
Utility motor (3 and 5 hp)	Per horsepower per hour of use	1.0
Water pump (shallow well)	Per month	20
Water pump (deep well)	Per month	30

Source: U.S.D.A. Bulletin. #124 (Agr. Infor.) "Electricity on Farms in New York and New England".

# PEN STABLES AND STANCHION BARN

A study of new pen stables and stanchion barns was conducted in 1956 by Paul Hoepner, a graduate student in the Department of Agricultural Economics. A list of new pen stables and new stanchion barns was obtained from county agricultural agents in 20 counties extending from eastern New York, through the Finger Lakes to the Central Plains Region. The barns studied were concentrated primarily in two areas - the East-Central New York dairy counties of Otsego, Oneida, and Delaware, and in and around the Rochester milk market.

Because there were considerably fewer new pen stables than stanchion barns, all the new pen stables in each of the counties were studied, along with an equal number of new stanchion barns of similar size and in the same neighborhood as the pen stables. Information on seventeen barns of each type was obtained by the survey method. All of the barns were constructed between 1950 and 1954.

The results concerning cost of construction, efficiency, and quantity of bedding used are summarized below.

## COMPARISON OF STANCHION BARN AND PEN STABLES 17 Stanchion Barns and 17 Pen Stables, New York, 1955

Item	Pen Stables	Stanchions
Cost of new barn per mature cow equivalent $\frac{1}{4}$		
Average*	\$300	\$400
Usual range*	\$200 to \$500	\$250 to \$650
Pounds of milk produced per man per year	167,000	161,000
Tons of bedding per cow equivalent	1.4	0.6

$\frac{1}{4}$  Heifers under one year =  $\frac{1}{4}$  cow equivalent  
Heifers 1-2 years =  $\frac{3}{4}$  cow equivalent

\* Does not include "non-real estate" equipment such as milking machines, barn cleaners, milk cooler, pipeline milkers, but does include equipments such as steel stanchions, drinking cups, ventilation fans, lightening rods, etc.

Source: Unpublished thesis by Paul H. Hoepner, Cornell University, September 1956.

## BUILDING COSTS

The following figures on costs are intended to serve as guides to farmers. Wide variation from the average figures may be expected.

Fair quality farm dwelling -- \$1500 per room.

Dairy barn -- A two story dairy barn including milk house, stanchions, drinking cups, etc., but not including barn cleaners, milking machines, milk cooler, and pipeline milker will cost about \$4.50 per square foot of ground area or about \$160 per linear foot for a 36 foot wide barn.

To convert a barn into a hen house -- If good foundation, frame, roof, and siding, figure \$1.75 to \$2.50 per hen. If foundation, roof, or siding needs much repair, the cost would exceed these figures.



BUILDING COSTS FOR POULTRY HOUSES  
Estimated 1956-57

Type of building	Cost per sq. ft. for each 12 foot section	Cost per sq. ft. for end section
Single story, frame, 48' wide, sheathing, insulated siding, insulated roof, concrete floor	\$1.35-1.50	\$1.60-1.75
Two story, frame, 48' wide, sheathing, insulated siding, insulated roof, concrete floor	\$1.00-1.15	\$1.60-1.75
Two story, frame, 48' wide, insulated sides, protected with an impervious type material	\$1.15-1.25	\$1.60-1.75
Single story, block house, 48' wide, insulated roof, concrete floor	\$1.60-1.75	\$1.50-1.75
Two story, block house, 48' wide, insulated roof, concrete floor	\$1.00-1.15	\$1.50-1.75
Pole building, 48' wide, earth floor	\$1.00-1.25	--
Pole building, 48' wide, insulated, concrete floor	\$1.35-1.50	--

1. Multi-story (3-4) buildings will reduce cost per sq. ft. 5-10% per floor.
2. Narrow buildings (less than 48') will increase cost approximately 1% per ft. of width decrease.
3. Wider buildings (over 48') will decrease cost about 1% per ft. of width increase.
4. All costs will vary between areas depending on cost of materials, labor, work done by the individuals and the particular type of building.

ESTIMATED CONSTRUCTION COSTS OF NEW POULTRY BUILDINGS  
1956-57

Item	Estimated cost of materials in place
Cinder or concrete blocks	2 times retail price of block + 5¢
Concrete	2 times retail price per yard of concrete delivered.
Insulated siding	Cost of siding per square + \$2.50 to \$10.00 per square application.
Sheathing material	Cost per sq. ft. of siding + 1/6 + \$2.50 to \$3.50 per square application.
Insulation (blanket)	Cost per square + \$2.00 to \$2.50 per square application.
Dimension stock	Cost per thousand bd. ft. + 40% for labor.

Source: Hollis Davis, Department of Agricultural Engineering; Agricultural Engineering Mimeo. #330.

AVERAGE INITIAL INVESTMENT\* PER TON  
OF RATED STORAGE CAPACITY FOR TOWER SILOS  
Estimates of Prices at the Farm, 1955-56

Kind of material	Initial investment per ton		
	Size of Structure		
	(12x35)	(14x40)	(16x40)
Poured concrete	\$ 17	\$ 13	\$ 11
Concrete stave	16	13	11
Concrete stave (plastic improved)	22	18	16
White pine or spruce	15	12	11
Oregon fir	20	16	14
Glass-lined steel**		35	28***

\* Includes only the cost of foundation, walls, chute, and roof.

\*\* Includes cost of bottom silo unloader.

\*\*\* 17x40.

AVERAGE ANNUAL OPERATING COSTS FOR 31 MECHANICAL UNLOADERS  
IN TOWER SILOS  
1954-55

	Average	Usual range
Original investment	\$ 1,021	\$ 900 to 1,200
Present value	\$ 729	--
Estimated years of life at time of purchase	10	5 to 20
Total tons of silage removed	200	125 to 250
Cost per ton removed	\$ .88	\$ .50 to 2.00
		Per cent of total
<u>Annual Operating Costs:</u>		
Depreciation	\$ 107	60
Interest	44	25
Repairs and maintenance	11	6
Electricity	15	9
Total Operating Cost	\$ 177	100

Source: Unpublished thesis by John W. Wysong, Cornell University, September 1956.

MOW-DRIERS

ESTIMATES OF THE INSTALLED COST OF A MOW-DRIER  
 USING A 36 INCH FAN AND FIVE HORSEPOWER MOTOR  
 1956-57

Items of cost	Averages for 39 farms studied	Expected range in costs 1956-57
Motor, fan, and frame	\$510	\$575 - 625
Lumber	55	40 - 100
Wiring	60	35 - 150
Labor	<u>45</u>	<u>30 - 100</u>
Total Installed Cost	\$670	\$680 - 975

ESTIMATED ANNUAL OPERATING COSTS FOR A MOW-DRIER  
 USING A 36 INCH FAN AND FIVE HORSEPOWER MOTOR  
 1956-57

Items of cost	Expected cost for 35 tons	Expected cost for 70 tons
Depreciation, 22 years of life	\$ 34	\$ 34
Interest @ 6%	45	45
Insurance	2	2
Repairs	7	10
Electricity @ \$.85 per ton	<u>30</u>	<u>60</u>
Total Operating Cost	\$118	\$151
Operating Cost per Ton	\$ 3.37	\$ 2.15

ESTIMATES OF THE INSTALLED COST OF A MOW-DRIER  
 USING A 42 INCH FAN AND 7.5 HORSEPOWER MOTOR  
 1956-1957

Items of cost	Averages for 18 farms studied	Expected range in costs 1956-1957
Motor, fan, and frame	\$670	\$800 - 875
Lumber	60	40 - 125
Wiring	95	50 - 175
Labor	<u>55</u>	<u>40 - 125</u>
Total Installed Cost	\$880	\$930 -1300

ESTIMATED ANNUAL OPERATING COSTS FOR A MOW-DRIER  
USING A 42 INCH FAN AND 7.5 HORSEPOWER MOTOR  
1956-1957

Items of cost	Expected cost for 50 tons	Expected cost for 100 tons
Depreciation, 22 years life	\$50	\$50
Interest @ 6%	66	66
Insurance	3	3
Repairs	10	12
Electricity @ \$1.00 per ton	<u>50</u>	<u>100</u>
Total Operating Cost	\$179	\$231
Operating Cost per Ton	\$ 3.58	\$ 2.31

Source: A.E. 1040

BULK MILK TANK COSTS  
18 Vermont Farms

Item	Top third	Middle third	Bottom third
Number of farms	7	5	6
Cows per farm	79	47	27
Average size of tank (gallons)	357	220	143
Average cost of tank	\$2,483	\$1,939	\$1,567
Average installation cost	97	45	83*
Cost of remodeling	10	6	3
Cost of new milk room	<u>571</u>	<u>--</u>	<u>258</u>
Total conversion costs	\$3,161	\$1,990	\$1,911
Cost of bulk tank alone:			
Per cow	\$ 31	\$ 41	\$ 58
Per can of storage capacity	70	88	110
Cost of tank plus installation and remodeling:			
Per cow	\$ 33	\$ 42	\$ 62
Per can of storage capacity	73	90	116

\*Average is high because of unreasonably high costs of installation at one farm.

Source: Vermont Bulletin 581, June 1955

IRRIGATING PASTURES AND MEADOWS

An investment in irrigation equipment to irrigate pastures and hay represents a sizable outlay of cash. A farmer should consider carefully whether or not the increase in yield of these crops over a period of years will warrant the necessary expenditure. Irrigating crops with a high cash value has been profitable for many New York farmers. However, pasture and hay crops are low in value and require relatively high yield increases to make irrigation profitable.

The total cost of irrigating pastures depends upon the initial cost of the equipment, how efficiently it is used, and number of applications. Cost figures are summarized below:

ANNUAL COST OF IRRIGATING ONE ACRE OF PASTURE OR MEADOW LAND

Initial cost of equipment	Number of $1\frac{1}{2}$ inch applications of water per acre per year						
	0	1	2	3	4	5	6
\$100 per acre	\$15.00	\$17.40	\$19.80	\$22.20	\$24.60	\$27.00	\$29.40
\$200 per acre	28.00	30.40	32.80	35.20	37.60	40.00	42.40
Total inches of water applied	0	$1\frac{1}{2}$	3	$4\frac{1}{2}$	6	$7\frac{1}{2}$	9

Points in Favor of Pasture Irrigation

1. Irrigation increases yield of forage during mid- and late-summer when pasture may be short.
2. Forage is more succulent and on a dry matter basis may be slightly higher in feeding value for dairy cows.
3. Increased succulence improves palatability and encourages uniform grazing of the forage.
4. Irrigation is an aid in establishing seedings in dry weather.

Points Against Pasture Irrigation

1. Inexpensive, adequate, and dependable water supply is a "must".
2. Initial investment is high.
3. Irrigating requires extra labor in a busy season.
4. Yield increases are not large on certain soil types and in some areas of the state. Irrigation of forage crops is most likely to pay on an excessively drained gravelly or sandy soil.
5. Raising soil pH and fertility level may increase yields at a lower cost than

irrigation. If lime and fertilizer are properly used, irrigation may not be needed.

6. The right kind of forage mixture is a prerequisite to an effective irrigation set-up. The irrigation of unproductive meadows or pastures is never a paying proposition.
7. The irrigation design must be tailor-made for each farm. Efficient utilization is required to make it profitable.
8. Consider all the alternatives for providing summer feed before deciding on irrigation. Irrigation of forage crops has a place in New York State but on many farms it is not the most economical method of providing extra forage. Extra pasturing during mid- and late-summer is worth quite a lot, but many times lack of pasture can be made up by storing extra hay and silage or by purchasing hay and/or grain. The cost of irrigation should be compared with the cost of supplying other feed.

Source: Adapted from Agronomy Mimeo. 945.

AVERAGE ANNUAL OPERATING COSTS FOR IRRIGATION EQUIPMENT  
65 Western New York Farms, 1955

	Original investment in irrigation equipment <sup>1/</sup>				
	\$10,001- 20,000	\$ 5,001- 10,000	\$ 3,001- 5,000	\$ 1,000- 3,000	All farms
Number of farms	15	15	21	14	65
Average investment	\$12,632	\$ 6,982	\$ 4,134	\$ 2,176	\$ 6,330
Average cost per acre-inch applied	\$ 6.03	\$ 7.41	\$ 4.88	\$ 6.49	\$ 6.08
<u>Average Operating Costs:</u>					
Depreciation	\$ 924	\$ 499	\$ 330	\$ 161	\$ 470
Interest	443	230	149	75	220
Fuel	623	290	230	72	300
Repairs	74	73	34	6	46
Other	18	39	5	1	15
Total operating cost	\$ 2,082	\$ 1,131	\$ 748	\$ 315	\$ 1,051

<sup>1/</sup> Irrigation equipment includes pumps and power units, pipe and fittings, ponds, wells and similar investments in water sources.

RELATIONSHIP OF ACRE-INCHES OF IRRIGATION WATER APPLIED  
TO THE COST OF OPERATING IRRIGATION EQUIPMENT  
65 Western New York farms, 1955

Acre-inches of water applied	Number of farms	Present value irrigation equipment	Acres irrigated	Cost per acre-inch
Less than 100	16	\$ 2,063	22	\$ 9.51
101 - 200	22	3,468	57	5.55
201 - 300	11	5,602	120	5.64
301 - 1,000	16	7,204	179	3.68

Source: B. F. Stanton.

HOURS OF LABOR PER ACRE, YIELD PER ACRE, AND HOURS OF LABOR  
PER 100 BUSHELS OR PER TON, FOR SELECTED CROPS, NEW YORK

Crop and item	New York		
	1924-28	1949-53	% Change
<u>Man Hours per Acre:</u>			
Hay	9	6	- 33
Corn for grain	57	13	- 77
Wheat	19	9	- 53
Apples	87	118	+ 36
<u>Yield per Acre:</u>			
Hay (tons)	1.6	2.0	+ 25
Corn (bu.)	32	50	+ 56
Wheat (bu.)	22	33	+ 50
Apples (bu.)	146	307	+110
<u>Amount Produced per Hour of Labor:</u>			
Hay (tons)	.18	.32	+ 78
Corn (bu.)	.56	3.94	+604
Wheat (bu.)	1.19	3.80	+219
Apples (bu.)	1.64	2.61	+ 59
Milk (lbs.)	50	91	+ 82
Eggs (doz.)	5.0	13.0	+160
<u>Average Hours per Man per Year</u>	3,059	2,826	- 8

Source: A.E. 984.

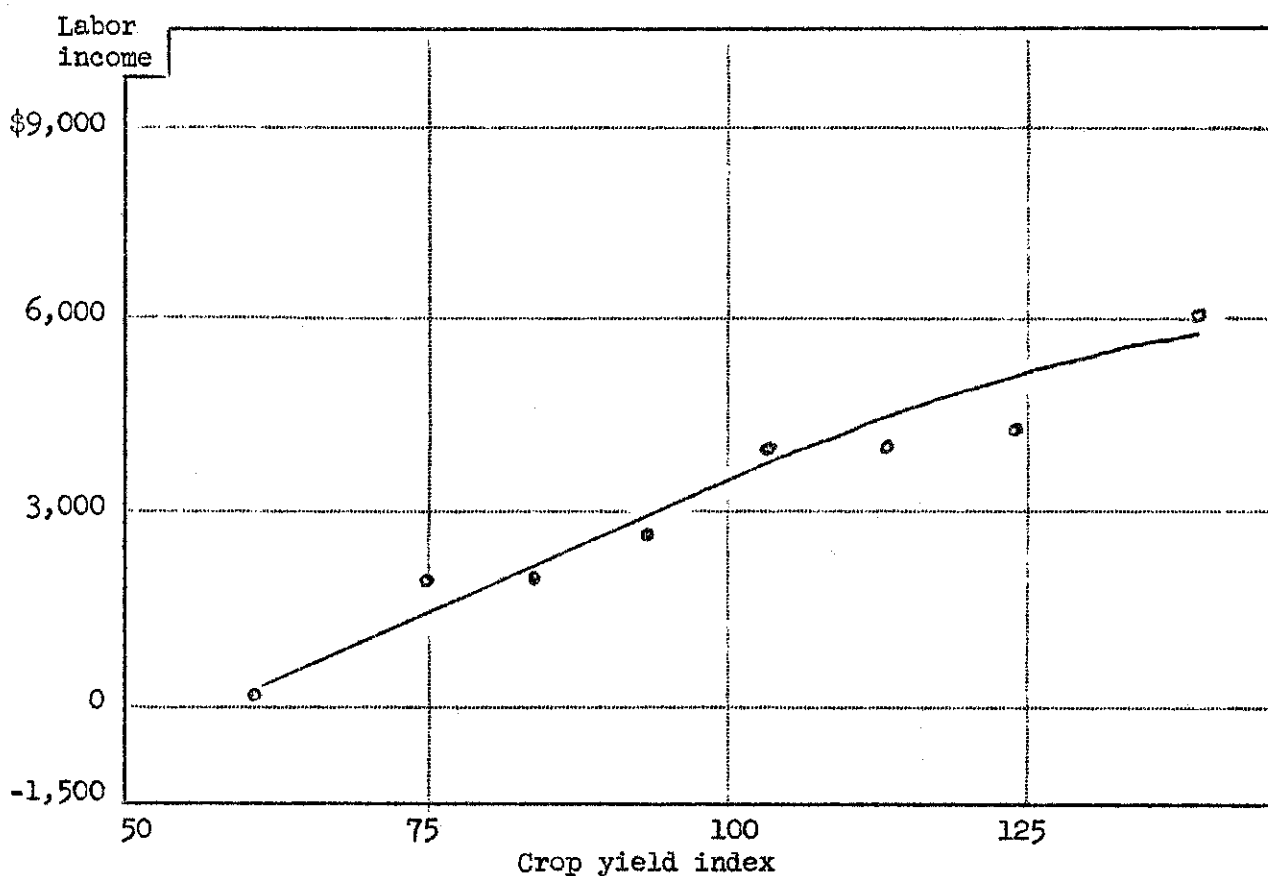
FARM MANAGEMENT PRINCIPLES

The following five pages illustrate and discuss some important principles of farm management. The data on which the charts and tables are based are from a study by L. C. Cunningham in the Central Plains Region in 1953-54. The table below shows the variation in size of labor force on three types of farms in the Central Plains Region.

VARIATION IN SIZE OF LABOR FORCE, BY TYPE OF FARM  
525 Farms, Central Plains Region, New York, 1953-54

Man equivalent	Type of farm			All farms
	Dairy	Crop	Mixed	
	<u>Per cent of farms</u>			
1.0	13	15	31	17
1.1 to 1.9	39	48	42	40
2.0 to 2.9	35	18	20	31
3.0 to 3.9	9	0	6	7
4.0 to 4.9	2	4	1	2
5.0 or more	<u>2</u>	<u>15</u>	<u>0</u>	<u>3</u>
Total	100	100	100	100

RELATION OF CROP YIELD INDEX TO LABOR INCOME  
521 Farms, Central Plain Region, New York, 1953-54



Labor income increased moderately as crop yields increased.

The farms with yields 30 per cent or more below average made a labor income of only about \$250, whereas the farms with yields 30 per cent or more above average made more than \$6,000.

The farms with high crop yields had larger crop acreages and larger herds than the farms with low yields. Crop sales per farm were, of course, much larger on the farms with high yields.

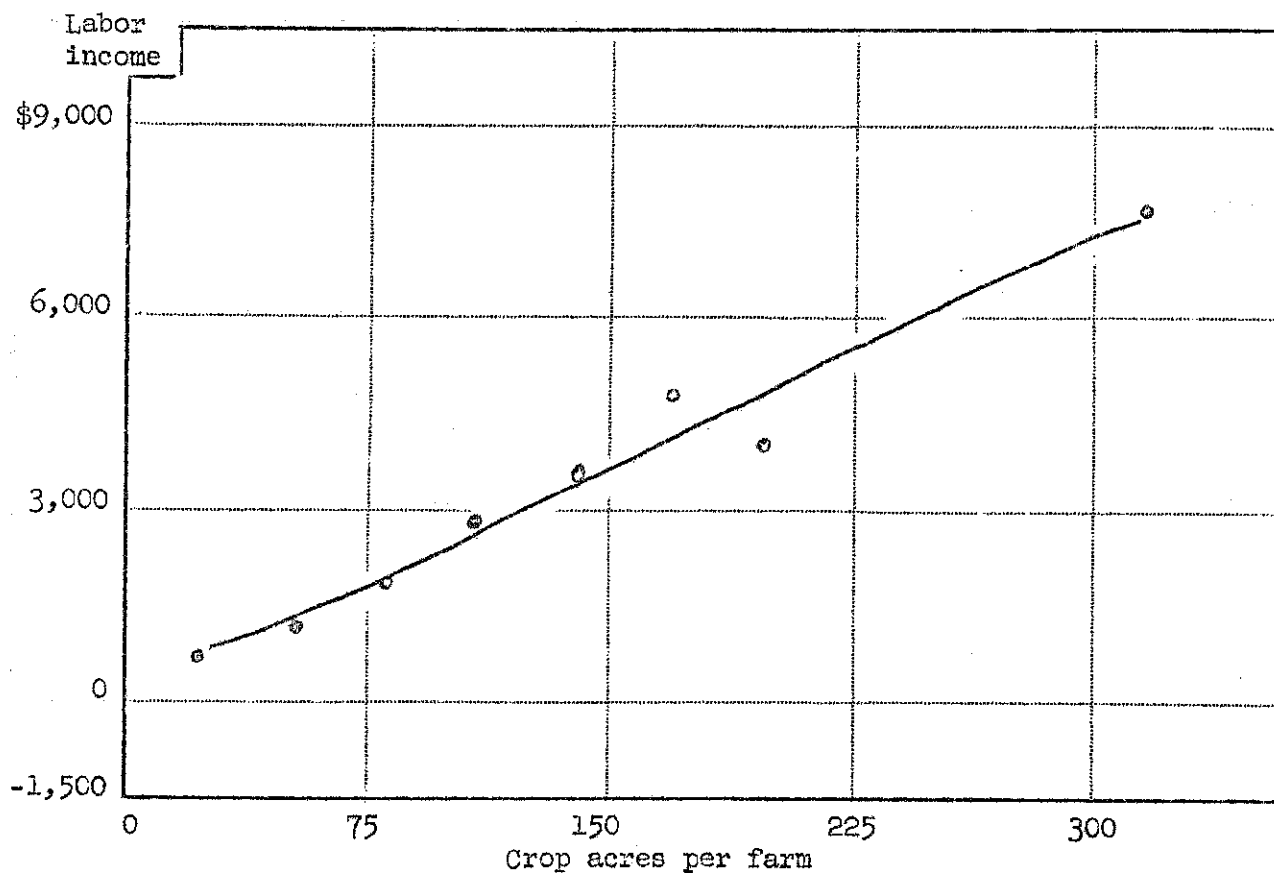
CROP YIELD INDEX AND LABOR INCOME  
521 Farms, Central Plain Region, New York, 1953-54

Crop yield index		Number of farms	Crop acres per farm	Crop sales per farm	Milk cows per farm	Pounds of milk sold per cow*	Labor income
Range	Average						
Less than 70	63	38	87	\$ 2,055	11	6,670	\$ 240
70 to 89	83	129	117	3,342	15	7,531	2,091
90 to 109	101	207	135	6,181	18	8,061	3,253
110 to 129	120	121	118	6,131	17	8,580	4,163
130 or more	142	26	145	13,369	20	8,044	6,154

\* On dairy farms.



RELATION OF CROP ACRES PER FARM TO LABOR INCOME  
525 Farms, Central Plain Region, New York, 1953-54

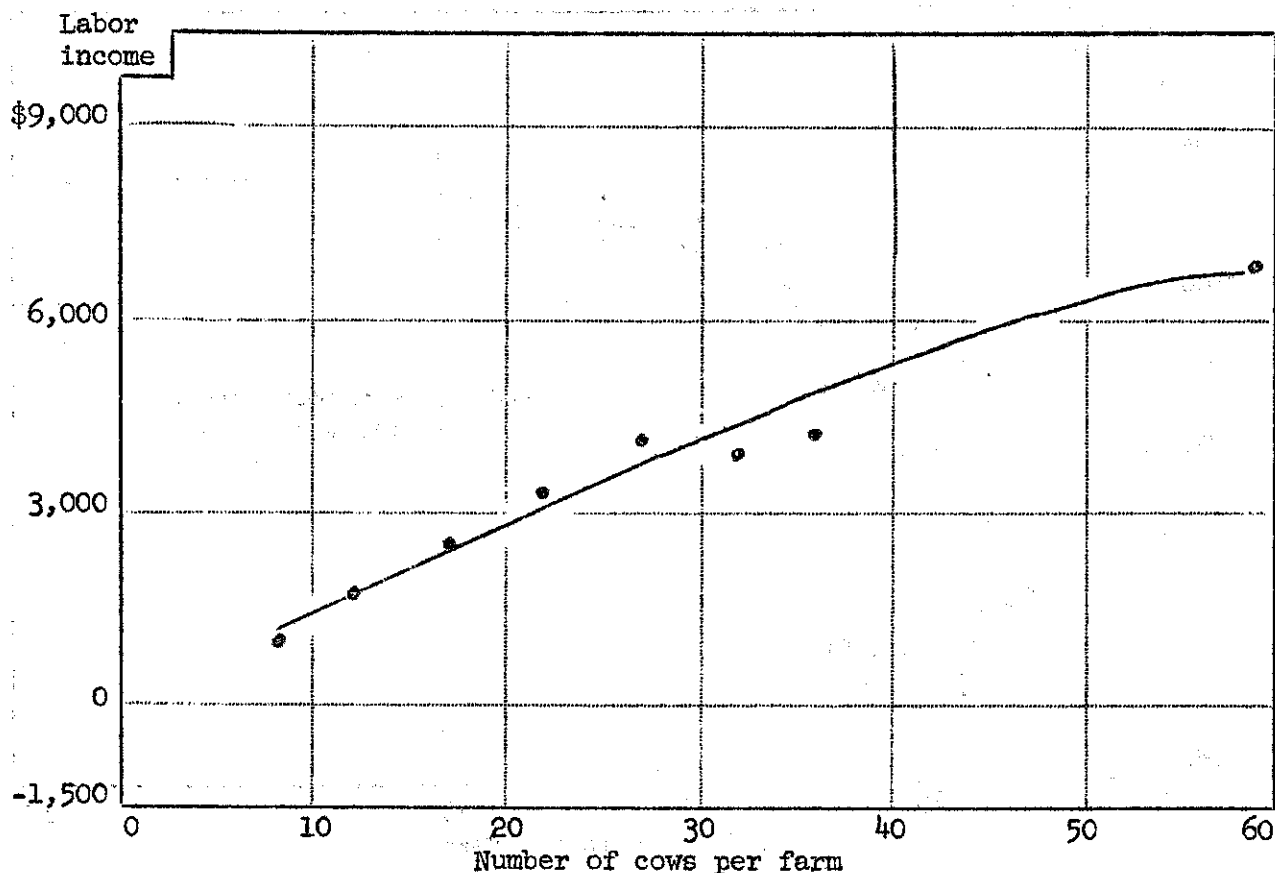


The larger the acreage of crops per farm, the higher the average labor income. In contrast to the labor income of only about \$800 on the very small farms (less than 50 crop acres), the farms with 200 or more crop acres made about \$7,200. There was considerable financial advantage in large scale of operations.

CROP ACRES PER FARM AND LABOR INCOME  
525 Farms, Central Plain Region, New York, 1953-54

Crop acres		Number of farms	Age of operator	Number of cows	Crop index	Crop sales	Labor income
Range	Average						
Less than 50	30	46	53	6	92	\$ 1,550	\$ 815
50 to 99	70	196	49	12	100	2,453	1,695
100 to 149	116	144	45	17	99	4,706	3,123
150 to 199	167	67	44	22	105	6,779	4,201
200 or more	299	72	43	29	102	16,672	7,227

RELATION OF SIZE OF HERD TO LABOR INCOME  
371 Dairy Farms, Central Plain Region, New York, 1953-54



The larger the herd, the higher the labor income. An average income of nearly \$7,000 was realized with the herds of 40 or more cows, averaging 59, as compared with only about \$1,000 with the herds of less than 10 cows, and about \$2,000 with the herds ranging in size from 10 to 19 cows.

Only 117 hours of labor per cow were used to do the cow chores in the largest herds, as compared with 207 hours per cow in the smallest herds. Inefficient use of labor in the small herds is almost inevitable.

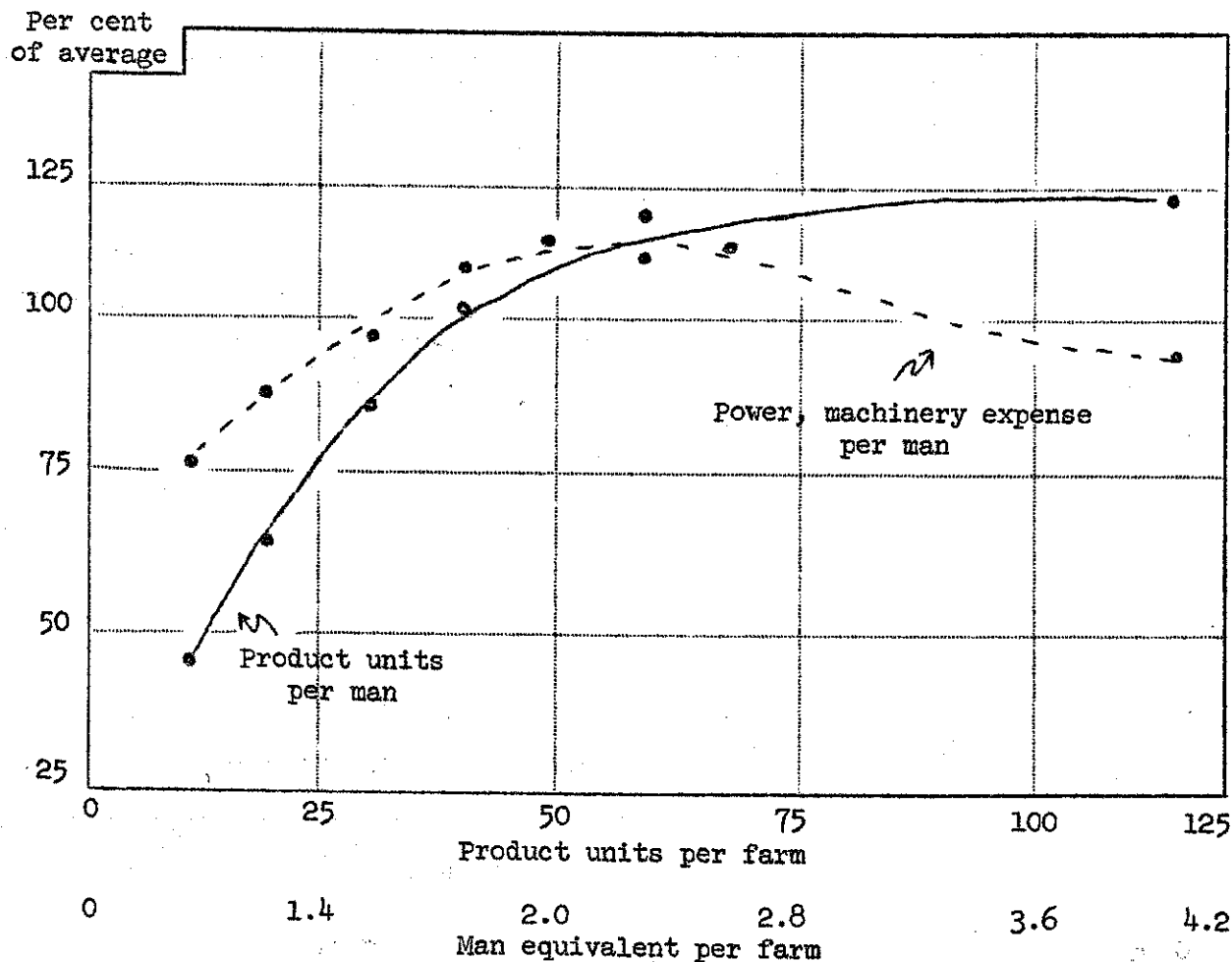
COWS PER FARM AND LABOR INCOME  
371 Dairy Farms, Central Plain Region, New York, 1953-54

Cows per farm		Number of farms	Pounds of milk per cow	Crop acres per farm	Crop sales per farm	Hours per cow*	Labor income
Range	Average						
Less than 10	8	34	7,471	75	\$ 3,162	207	\$ 1,072
10 to 19	14	145	7,917	91	3,096	151	2,162
20 to 29	24	120	7,913	126	3,731	126	3,729
30 to 39	33	45	8,224	176	4,916	124	4,115
40 or more	59	27	8,422	287	8,626	117	6,933

\* Based on records of 113 farms.

EFFECT OF VOLUME OF FARM BUSINESS ON LABOR EFFICIENCY AND POWER  
AND MACHINERY EXPENSE PER MAN

525 Farms, Central Plain Region, New York, 1953-54



Output per man rose rapidly as size increased from small one-man businesses to two-man operations. As size increased beyond the two-man business, labor efficiency continued high with little further increase. Most of the advantage in size so far as use of labor is concerned is gained in going from a one-man to a two-man business.

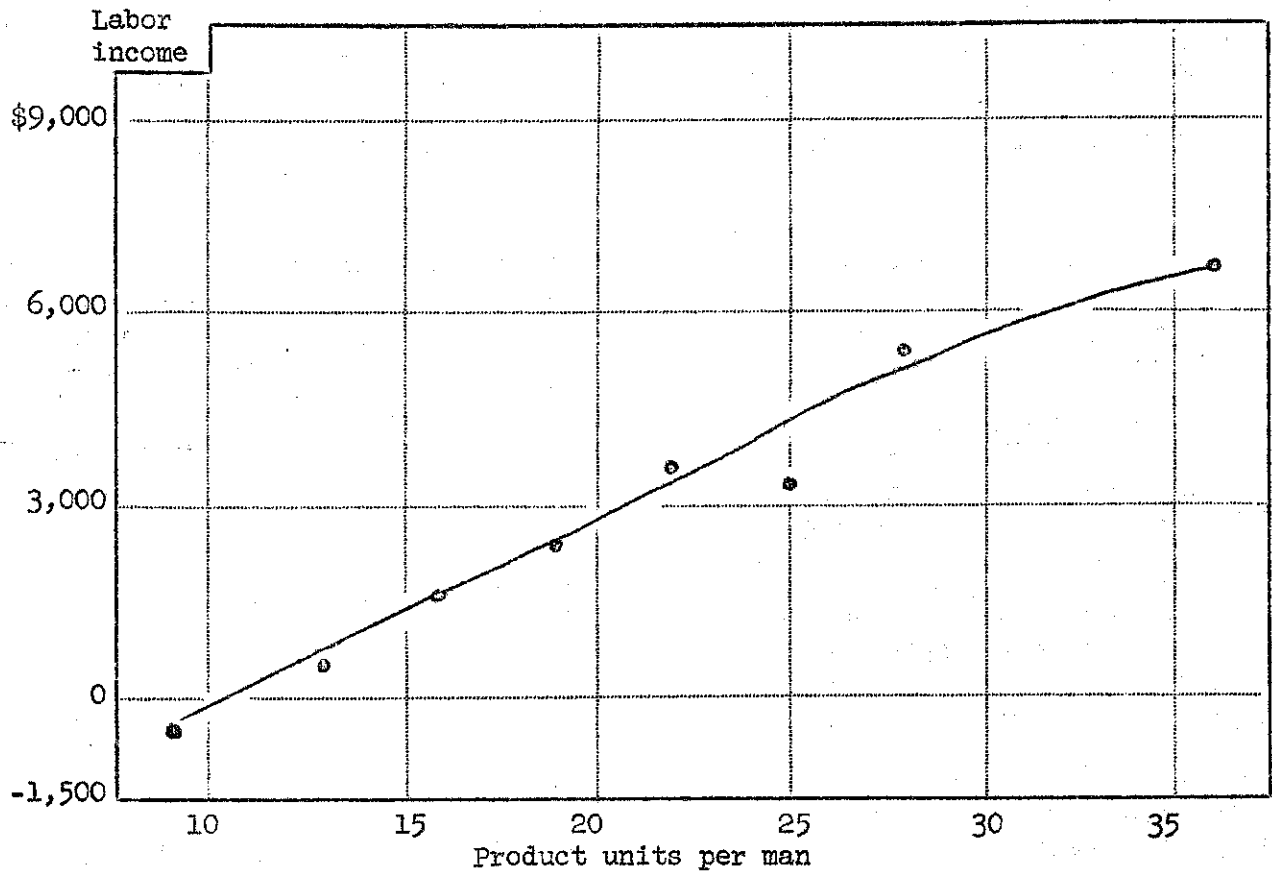
Power and machinery expense per man rose as size increased. Beyond the two-man business, however, this item of cost tended to decline. The three-man and four-man businesses do have an added advantage over smaller businesses in the economic use of present-day power and machinery.

RELATION OF PRODUCT UNITS PER FARM TO PRODUCT UNITS PER MAN  
AND POWER AND MACHINERY EXPENSE PER MAN

525 Farms, Central Plain Region, New York, 1953-54

Product units per farm		Power, machinery expense per man	Total inputs except labor per man	Product units per man
Range	Average			
Less than 15	11	\$ 1,263	\$ 3,444	10
15 to 34	24	1,575	3,968	18
35 to 54	44	1,862	4,726	26
55 to 74	62	1,885	4,936	27
75 or more	116	1,539	4,716	30

RELATION OF PRODUCT UNITS PER MAN TO LABOR INCOME  
525 Farms, Central Plain Region, New York, 1953-54



The larger the outturn of products per man, the higher the average labor income. On the high labor efficiency farms, 30 or more product units per man, the average labor income was about \$6,600. Not only was the average labor income high, but the chances of making a large income were good. One-half of them made \$5,000 or more.

With low production per man, losses were incurred. Not only was the average income limited, but the chances of making a good income were pretty dim. With less than 12 product units per man, 80 per cent of the farms made less than \$1,000 average labor income, and none made as much as \$3,000.

PRODUCT UNITS PER MAN AND LABOR INCOME  
525 Farms, Central Plain Region, New York, 1953-54

Product units per man Range	Average	Number of farms	Man equivalent per farm	Total prod. un. per farm	Crop acres per farm	Number of cows per farm	Labor income
Less than 12	9	56	1.5	14	67	4	\$ -434
12 to 17	15	132	1.7	26	93	10	1,160
18 to 23	21	134	2.1	45	131	16	3,020
24 to 29	27	115	2.1	56	139	23	4,366
30 or more	36	88	1.9	69	169	27	6,655

PRODUCT UNITS CHART

A product unit is the equivalent of 7,000 pounds of milk -- the amount sold in a year from one average cow. Product units per farm is a measure of volume of production resulting from the acres and animals times the yields obtained. It is similar to the total amount of milk from a dairy farm, but it also includes the other products.

Instructions for using the product units chart are given below.

Man Equivalent -- Total months of labor performed by the operator, hired help and months equivalent of family labor, divided by 12.

Total Product Units -- Physical volume of crop and livestock production and work done off the farm by the labor force. A product unit is the equivalent of the amount of milk sold from one average cow in a year -- 7,000 pounds. Labor is the common denominator. Under average conditions, 130 hours are required to produce 7,000 pounds of milk. Hence, the amount of any product produced with 130 hours of labor is equivalent to a product unit (see work sheets). Divide the total amount produced on the farm by the factor to get the number of product units of that item.

Product Units per Man -- Total product units divided by the man equivalent.

The Chart -- The figures in each column are the averages for each of 10 equal groups of farms when arrayed from high to low in that factor. They show the range of actual experience on commercial farms. Lines drawn across the columns indicate the rank of a particular farm. The data are for 525 commercial farms in the Central Plain Region of New York.

Man equiv- alent	Total product units	Product units per man
4.5	120	40
2.6	66	31
2.2	53	28
2.0	46	25
1.8	40	22
1.5	33	20
1.3	27	18
1.1	21	15
1.0	16	12
1.0	11	9

## PRODUCT UNITS

	Amount or number on this farm	Amount per product unit	Total product units
Livestock and livestock products			
Milk sold, lbs.		÷ 7,000	
Heifers on hand, no.		6.5	
Bulls on hand, no.		2.6	
Eggs sold, doz.		1,300	
Pullets raised, no.		425	
Broilers raised, no.		1,850	
Hogs raised, no.		25	
Brood sows, no.		4.3	
Wool sold, lbs.		365	
Lambs raised, no.		50	
Crops harvested			
Hay, tons		22	
Grass silage, tons		96	
Corn silage, tons		72	
Corn for grain, bu.		435	
Oats, bu.		535	
Wheat, bu.		375	
Dry beans, bu.		115	
Potatoes, bu.		420	
Cabbage, tons		22	
Apples, bu.		220	
Other			
Work off farm, days		13	
Total product units			

Man equivalent \_\_\_\_\_

Product units per man \_\_\_\_\_

PRODUCT UNITS  
(Supplementary List)

<u>Other livestock and livestock products</u>	Amount per product unit	<u>Vegetables</u>	Amount per product unit
Beef cows	6.5	Snap beans M., bu.	92
Heifers	10.8	Snap beans P., tons	23
Calves	10.8	Beets P., tons	11.7
Steers, feeders	10.8	Cabbage M., tons	17
Bulls	5.2	Carrots M., tons	9.2
Feeder lambs	87	Cauliflower M., crates	193
Veals	13	Celery M., crates	217
Turkeys raised, sold alive	130	Corn M., 5 dozen ears	320
Turkeys raised, sold dressed	87	Corn P., tons	39
Ducks and geese	100	Cucumbers M., bu.	230
Cream wholesale, lbs.	700	Cucumbers pickels, bu.	133
Butterfat, lbs.	259	Lettuce M., crates	157
Butter, lbs.	333	Onions M., 50-pound sack	367
Milk retail, lbs.	5,040	Peas M., bu.	871
Cream retail, lbs.	504	Peas P., tons	5
Honey, lbs.	1,300	Spinach, tons	1.5
		Tomatoes P., tons	11
		Tomatoes M., bu.	190
		Lima beans P., tons	5
		Broccoli, crates	58
		Onion seed, pounds	369
		Peppers, bu.	65
		Squash, tons	10
		Pumpkins, tons	4
<u>Field crops</u>		<u>Forest products</u>	
Barley, bu.	416	1,000 feet lumber	3.7
Buckwheat, bu.	247	1,000 feet logs	6.5
Soybeans, bu.	173	15 cord fuel wood	4.3
Rye, bu.	247	100 fence posts	8.7
Clover seed, bu.	31	1 gal. Maple syrup	65
Corn fodder, tons	53	100 Christmas trees	1.3
Oats and barley mixtures, bu.	468		
Timothy seed, bu.	78		
Millet and sudan, tons	39		
Alfalfa drying, tons	112		
Sweet corn silage, tons	26		
<u>Fruit</u>			
Pears, bu.	114		
Peaches, bu.	130		
Cherries, tons	1.3		
Grapes, tons	2.4		
Prunes, tons	5.5		
Other berries, quarts	511		

# FARM BUSINESS CHART

FARM OF \_\_\_\_\_ YEAR \_\_\_\_\_ LAND CLASS \_\_\_\_\_

TOTAL ACRES IN THE FARM \_\_\_\_\_ ACRES OF TILLABLE LAND \_\_\_\_\_

Success in farming is the result of many factors. Farm business studies show that the most important factors under the farmer's control are size of business, production rates of crops and animals, labor efficiency and selection and combination of enterprises.

The chart below shows the range of the experience of commercial farmers in New York with respect to size of business, production rates and labor efficiency.

The figure at the top of each column is the average for the best ten per cent of the farms in that factor. For example, the figure 3.3 at the top of the column headed "Tons of Hay" is the average of the ten per cent of the farms with the highest yield of hay. The other figures in the column are the averages for "the next best 10 per cent", "the 10 per cent below that", and so forth. The figure 1.0 at the bottom of the column is the average of the ten per cent of the farms with the lowest yield of hay.

Each of the columns is independent of the others. The figure 16 at the top of the column headed "Tons of Corn Silage" is the average of the ten per cent of the farms with the highest yield of corn silage.

Hay, Silage and Grain Yields per Acre						Vegetable Yields per Acre							Fruit Yields per Acre			
Tons of Hay	Tons of Grass Silage	Tons of Corn Silage	Bu. of Shelled Corn	Bu. of Oats	Bu. of Wheat	Bu. of Dry Beans	Bu. of Potatoes	Tons of Cabbage	Lbs. of Peas	Tons of Tomatoes	Tons of Sweet Corn	Tons of Snap Beans	Bu. of Apples	Bu. of Peaches	Tons of Grapes	Tons of Cherries
3.3	11.0	16	86	70	47	34	470	22	3400	19	5.0	3.5	380	290	4.2	6.6
2.7	9.0	14	72	59	41	30	420	19	2800	16	4.1	2.7	300	220	3.2	4.3
2.4	8.0	13	64	51	38	26	380	17	2400	14	3.6	2.2	260	180	2.7	3.1
2.2	7.0	12	57	45	35	23	350	15	2100	12	3.3	1.9	230	160	2.3	2.4
2.0	6.0	11	52	42	33	20	320	13	1900	11	3.1	1.7	205	140	2.0	2.1
1.9	5.5	10	48	39	31	17	300	12	1700	10	2.9	1.6	195	120	1.8	1.9
1.7	5.0	9	44	36	29	15	270	11	1500	9	2.7	1.4	175	100	1.6	1.7
1.5	4.5	8	40	33	27	13	240	10	1200	8	2.5	1.2	155	80	1.4	1.4
1.3	4.0	7	33	29	23	11	210	8	900	7	2.1	1.0	130	55	1.1	1.0
1.0	3.0	5	25	24	18	8	160	5	400	5	1.6	0.6	100	25	0.6	0.5

Animal Production		Poultry Mortality		Size of Business					Labor Efficiency			
Pounds Milk Sold per Cow	Eggs Sold per Hen	Hens Per Cent of Ave. No.	Chicks Per Cent of No. Started	Total Work Units	Man Equivalent	Number of Cows	Pounds of Milk Sold	Number of Hens	Work Units per Man	Cows per Man	Pounds of Milk Sold per Man	Hens per Man
10500	250	6	3	1200	3.8	50	450000	6000	420	23	175000	3000
9100	230	11	6	850	3.0	36	300000	3000	340	18	140000	2200
8200	215	14	8	700	2.5	30	245000	2200	310	16	125000	1600
7600	205	16	10	600	2.2	27	205000	1700	290	15	110000	1400
7200	200	18	12	530	2.0	25	175000	1400	270	14	99000	1250
6800	195	20	14	480	1.8	23	160000	1300	250	13	90000	1150
6400	190	23	16	430	1.6	21	140000	1200	230	12	81000	1100
5900	180	28	19	370	1.4	18	115000	1100	210	11	72000	1050
5300	170	35	25	310	1.2	15	90000	1000	190	10	62000	1000
4500	150	50	32	250	1.0	10	60000	900	160	9	50000	900

## HOW TO USE THIS CHART

Draw lines in each column to show the rank of the farm business being studied. For example, if the farm produced 43 bushels of oats per acre draw a line in the "oats" column between the 42 and 45.

Draw heavy lines so that you can see them easily.

Do not draw lines for factors which are of only minor importance on the farm being studied.



## WORK UNITS FOR LIVESTOCK AND CROPS

### LIVESTOCK

	Number or acres on this farm	Work units per head or per acre	Total work units
Cows	_____X	12 =	_____
Heifers	_____X	2 =	_____
Bulls	_____X	5 =	_____
Hens	_____X	0.15 =	_____
Pullets raised	_____X	0.03 =	_____
Broilers raised	_____X	0.007 =	_____
Brood sows	_____X	3 =	_____
Hogs raised	_____X	0.5 =	_____
Ewes and rams	_____X	0.5 =	_____
_____	_____X	_____ =	_____

### CROPS

Hay—1st cutting	_____X	0.6 =	_____
2nd and 3rd cuttings	_____X	0.4 =	_____
Grass Silage	_____X	0.8 =	_____
Corn Silage	_____X	1.8 =	_____
Corn for grain	_____X	1.4 =	_____
Oats	_____X	1 =	_____
Wheat	_____X	1 =	_____
_____	_____X	_____ =	_____
_____	_____X	_____ =	_____
Dry beans	_____X	2 =	_____
Potatoes	_____X	9 =	_____
Cabbage	_____X	9 =	_____
Sweet corn (growing only)	_____X	1 =	_____
Tomatoes for canning	_____X	12 =	_____
_____	_____X	_____ =	_____
_____	_____X	_____ =	_____
_____	_____X	_____ =	_____
Apples	_____X	12 =	_____
Fruit not of bearing age	_____X	2 =	_____

### OTHER

Work off farm, days	_____X	1 =	_____
Marketing	_____X	_____ =	_____
_____	_____X	_____ =	_____

### TOTAL WORK UNITS

### MAN EQUIVALENT

Workers	Full-Time Months
Operator	_____
Sons	_____
Family	_____
Hired men	_____
Other	_____
Total	_____
Man equivalent (Total ÷ 12)	_____

Yield per  
acre

Total Crop

_____	_____ tons
_____	_____ tons
_____	_____ tons
_____	_____ bu.
_____	_____ bu.
_____	_____ bu.
_____	_____ bu.
_____	_____ bu.
_____	_____ bu.
_____	_____ bu.
_____	_____ tons
_____	_____ tons
_____	_____ tons
_____	_____ tons
_____	_____ bu.

### WORK UNITS PER MAN

(Total work units ÷ man equivalent)

Total pounds of milk sold	_____ ÷	no. of cows	_____ =	_____ pounds of milk sold per cow
Total dozens of egg sold	_____ ÷	no. of hens	_____ =	_____ dozens of eggs sold per hen
		Dozens of eggs per hen × 12 =	_____	_____ eggs sold per hen
Number of hens that died	_____ ÷	av. no. of hens for the year	_____ =	_____ % mortality
Number of chicks that died	_____ ÷	no. of chicks started	_____ =	_____ % mortality
Number of cows	_____ ÷	man equivalent	_____ =	_____ cows per man
Pounds of milk sold	_____ ÷	man equivalent	_____ =	_____ pounds of milk sold per man
Number of hens	_____ ÷	man equivalent	_____ =	_____ hens per man

PRODUCTIVE MAN WORK UNITS

(This sheet supplements the information given on the back of the farm business chart.)

A productive man work unit is the average amount of productive work accomplished in ten hours. The total number of work units on a farm represents the number of days that would be required, under average conditions, to care for the acreage of crops grown and the number of livestock kept.

The number of productive man work units on a farm is calculated by multiplying the acres of each crop and the number of each kind of animal by units which have been calculated on the basis of the average amount of time required to handle one acre or one animal.

Units for the most common livestock and crops in New York are given on the back of the farm business chart. Units for some other crops and animals are given below. For enterprises not listed, estimate the labor requirements.

<u>Grain (units per acre)</u>		<u>Fruit not of bearing age (units per acre)</u>	
Barley	1	Tree fruits	2
Buckwheat	1	Grapes, currants	10
Soybeans	1.2	Strawberries	20
<u>Vegetables (units per acre)</u>		<u>Fruit (units per acre)</u>	
Asparagus	15	Peaches	10
Beets for processing	12	Pears	7
Carrots	20	Plums, prunes	6
Cauliflower	30	Quinces	10
Celery	30	Cherries	20
Cucumbers	10	Grapes	12
Lettuce	20	Currants	25
Lima beans for processing	2	Gooseberries	25
Melons	10	Blackberries	25
Onions	20	Strawberries	45
Peas for processing	2	Raspberries	35
Snap beans			
Growing only	1		
Growing and harvesting	20		
Squash	10	<u>Livestock (units per head)</u>	
Spinach	12	Beef cows (with accompanying calves)	3
Sweet corn for market	4	Beef steers	1
Sweet corn for processing		Turkeys raised, sold alive	0.1
Growing only	1	Turkeys raised, sold dressed	0.15
Growing and harvesting	2	Feeder lambs	0.15
Miscellaneous vegetables	20	Bees, per hive	0.5
		<u>Forest Products</u>	
		1000 board feet of logs	2
		1000 board feet of lumber	3.5
<u>Marketing</u>		1 standard cord of fuelwood buzzed to stovewood length (3 to 3½ cords stovewood)	3
Grading apples, per 1000 bushels	15	1 standard cord of fuelwood sold in 4 foot lengths	1.5
Storing apples, per 1000 bushels	3	100 fence posts	1.5
Retail milk (processing, selling, delivery), per 1000 quarts	5	1 cord pulpwood	1
		1 gallon maple syrup	0.2

SELECTED FACTORS FOR GRAIN CROPS  
New York Cost Accounts, 1954

OATS  
26 Accounts

Item	Average	Range
Yield per acre, bushels	37	12 to 75
Fertilizer per acre, pounds	315	0 to 599
Labor per acre, hours	6	2 to 10
Cost per acre	\$ 56	\$ 21 to 109
Cost per bushel	\$ 1.43	\$ .66 to 3.20
Return per hour of labor	\$-2.10	\$-11.28 to 6.34

WHEAT  
26 Accounts

Item	Average	Range
Yield per acre, bushels	37	20 to 48
Fertilizer per acre, pounds	428	0 to 789
Labor per acre, hours	8	3 to 17
Cost per acre	\$ 65	\$ 44 to 120
Cost per bushel	\$ 1.51	\$ .68 to 3.37
Return per hour of labor	\$ 4.13	\$-2.71 to 12.61

CORN FOR GRAIN  
18 Accounts

Item	Average	Range
Yield per acre, bushels	47	17 to 96
Fertilizer per acre, pounds	463	122 to 709
Labor per acre, hours	10	6 to 25
Cost per acre	\$ 70	\$ 47 to 116
Cost per bushel	\$ 1.47	\$ .96 to 6.82
Return per hour of labor	\$ 1.28	\$-3.85 to 6.75

Source: A.E. 1023 and 1024.

SELECTED FACTORS FOR ROUGHAGE  
New York Cost Accounts, 1954

HAY  
38 Accounts

Item	Average	Range
Yield per acre, tons	2.2	1.0 to 3.8
Labor per ton, hours	2.6	1.3 to 4.0
Labor per acre to harvest, hours	6.0	2 to 12
Total cost per acre	\$ 47	\$ 26 to 98
Cost to harvest a ton	\$ 9.32	--
Net cost per ton	\$ 19	\$ 11 to 54
Return per hour of labor	\$ 1.34	\$-8.59 to 8.17

CORN SILAGE  
21 Accounts

Item	Average	Range
Yield per acre, tons	9.2	5 to 17
Labor per ton, hours	1.6	0.7 to 3.8
Labor per acre to harvest, hours	8	1 to 20
Total cost per acre	\$ 89	\$ 55 to 142
Cost to harvest per ton	\$ 3.01	\$ 1.68 to 6.72
Net cost per ton	\$ 9.66	\$ 6.43 to 18.70

GRASS SILAGE  
17 Accounts

Item	Average	Range
Yield per acre, tons	7.2	5 to 12
Labor per ton, hours	1.2	0.2 to 2.2
Labor per acre to harvest, hours	9	2 to 23
Total cost per acre	\$ 54	\$ 21 to 75
Cost to harvest per ton	\$ 3.95	\$ 1.96 to 7.39
Net cost per ton	\$ 6.64	\$ 3.76 to 16.60

Source: A.E. 1023 and 1024.

## TO FIGURE CAPACITY OF TRENCH SILO

Average cubic feet =  $\text{depth} \times \frac{\text{bottom width} + \text{top width}}{2}$  (in feet)

Capacity in tons per running foot =  $\frac{\text{average cubic feet} \times \text{average wt. per cu. ft.}}{2000}$

Average silage weighs 40 pounds per cubic foot

Example: A silo 8 ft. deep, 8 ft. bottom width, 10 ft. top width

Average cubic feet =  $8 \times \frac{8 + 10}{2} = 72$

Capacity per running foot =  $\frac{72 \times 40}{2000} = 1.44$  tons

## TABLE ON CAPACITY OF SILOS IN TONS FOR GRASS SILAGE

Height of silage (Feet)	Inside diameter (in feet)			
	12	14	16	18
	(Tons)			
20	50	67	88	111
22	56	76	99	126
24	62	85	111	141
26	69	94	123	156
28	76	103	135	171
30	83	113	148	187
32	90	122	160	203
34	98	133	174	220
36	105	143	187	236

Source: Connecticut Forage Program Handbook, 1953.

## HOW TO COMPUTE QUANTITIES OF SILAGE IN ROUND SILOS

The original amount of silage put in the silo can be estimated from the table on the next page. The depth to use is that found two days after filling stopped.

What is left in a silo after part has been used can be estimated as follows:

- First: Find the original amount of silage put in the silo, by referring to the table.
- Second: Find the amount of silage that has been used, by the same method, using as depth the difference between the present depth and the depth 2 days after filling.
- Third: Subtract the amount used from the original amount. The difference is the approximate amount of silage remaining in the silo.

SILAGE TABLE -- APPROXIMATE CAPACITY OF CYLINDRICAL SILOS FOR CORN SILAGE  
(Use height of silage after settling two days)

Depth of silage after settling 2 days (Feet)	Inside diameter of the silo, in feet						Mean weight per cubic ft.* (Pounds)
	10	12	14	16	18	20	
	(Tons)						
1	1	1	1	2	2	3	18.7
2	2	2	3	4	5	6	19.6
3	2	3	5	6	8	9	20.6
4	3	5	7	9	11	13	21.2
5	4	6	9	11	14	17	22.1
6	5	8	11	14	17	21	22.9
7	7	9	13	17	21	25	23.8
8	8	11	15	20	25	31	24.5
9	9	13	18	23	29	36	25.3
10	10	15	20	26	33	41	26.1
11	12	17	23	30	38	46	26.8
12	13	19	25	33	42	52	27.6
13	14	21	28	37	47	58	28.3
14	16	23	31	41	52	64	29.1
15	18	25	34	45	57	70	29.8
16	19	28	38	49	62	77	30.5
17	21	30	41	53	67	83	31.2
18	23	32	44	58	73	90	31.9
19	24	35	48	62	79	97	32.6
20	26	38	51	67	85	105	33.3
21	28	40	55	72	91	112	33.9
22	30	43	59	77	97	120	34.6
23	32	46	63	82	103	128	35.3
24	34	49	66	87	110	135	35.9
25	36	52	70	92	116	143	36.5
26	38	55	74	97	123	152	37.2
27	40	58	79	103	130	160	37.8
28	42	61	83	108	137	169	38.4
29	44	64	87	114	144	178	39.0
30	47	67	91	119	151	187	39.6
31	49	70	96	125	158	195	40.1
32	51	74	100	131	166	205	40.7
33	53	77	105	138	173	214	41.2
34	56	80	109	143	181	224	41.8
35	58	84	114	149	188	232	42.3
36	61	87	118	155	196	242	42.8
37	63	90	123	161	204	252	
38	66	94	128	167	212	262	
39	68	97	133	174	221	272	
40	70	101	138	180	229	280	
41		105	143	187	236	291	
42		109	148	193	244	300	
43		113	154	201	252	310	
44		117	159	207	261	320	
45		121	165	215	269	330	
50		137	186	248	310	389	
55		155	212	283	365	444	
60			240	319	415	500	

\* Mean weight of silage per cubic foot for whole depth.

Source: "Farm Inventory for Five Years", Dept. of Ag. Ec., Cornell University.

	Per cent of total work for the year												Hours
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	per year
<b>LIVESTOCK:</b>													
Dairy cows	10	9	10	9	8	7	6	7	7	8	9	10	115
Heifers	12	11	11	10	8	4	5	5	5	7	10	12	17
Hens	9	9	9	8	8	7	7	8	8	9	9	9	128
Chicks	3	7	11	15	14	12	11	9	7	6	3	2	26
<b>FIELD CROPS:</b>													
Hay	1		1	1	1	31	48	12	3	1		1	7
Grass silage						72	25	1	1	1			10
Corn silage			1	2	15	15	5	5	43	13	1		20
Corn for grain	1		2	4	25	20	6	1	1	14	21	5	13
Oats			1	28	22	2	6	35	4	1	1		8
Wheat				1			23	35	25	14	1	1	9
<b>FRUITS AND VEGETABLES:</b>													
Apples	2	3	5	5	4	4	4	4	29	34	4	2	123
Pears	2	5	2	6	6	5	2	25	45	2			44
Dry Beans	1		1	2	12	17	13	3	12	30	7	2	22
Potatoes	3	4	2	2	10	4	3	3	11	41	12	5	110
Cabbage	1			4	5	20	23	7	1	3	28	8	78
Canning factory tomatoes				1	10	8	8	19	46	8			117
Peas for proc.			1	25	8	26	40						14
<b>MACHINERY &amp; EQUIPMENT MAINTENANCE</b>													
	7	6	7	10	10	14	10	11	8	5	5	7	315
<b>REAL ESTATE MAINTENANCE</b>													
	8	6	6	9	9	8	9	12	8	7	9	9	586

Source: A.E. 926

WEIGHTS AND MEASURES

Bushel equals 32 quarts. Approximately 1 1/4 cubic feet.

Cubic feet per ton of hay and straw (approximately)

Hay - low mow or top of mow	550
average	500
bottom of mow	450
Straw (loose)	1200
Baled hay	
Loose bales	250 - 300
Tight bales	135 - 200
Chopped hay	
Long	250 - 360
Short	200 - 250
Baled straw	
Loose bales	250
Tight bales	150

Bushels in a bin or other storage - Length x Width x Height x 4/5 = bushels

Water - 1 cubic foot weighs 62.5 pounds

1 inch on 1 acre requires about 30,000 gallons

Square measure - 1 acre equals 160 square rods or 43,560 square feet

Pounds in one bushel

Corn	56	Barley	48	Clover seed	60
Oats	32	Buckwheat	48	Alfalfa seed	60
Wheat	60	Potatoes	60	Timothy seed	45

NUMBER OF PLANTS OR TREES PER ACRE

Distance	Number of plants	Distance	Number of plants
3' x 6"	29,040	6' x 2'	3,630
3' x 8"	21,500	6' x 4'	1,815
3' x 9"	19,360	6' x 6'	1,210
3' x 10"	17,420	7' x 1 1/2'	4,148
3' x 1'	14,520	8' x 8'	680
3' x 1 1/2'	9,680	8' x 9'	605
3' x 2'	7,260	8' x 7'	777
3 1/2' x 8"	18,857	16' x 16'	170
3 1/2' x 9"	16,594	18' x 18'	134
3 1/2' x 10"	15,125	19' x 19'	120
3 1/2' x 1'	12,445	20' x 20'	108
4' x 1 1/2'	7,260	22' x 22'	90
4' x 2'	5,445	22 1/2' x 22 1/2'	77
4 1/2' x 1 1/2'	6,453	25' x 25'	70
4 1/2' x 2'	4,840	40' x 20'	54
4' x 4'	2,722	40' x 40'	27
5' x 5'	1,742	45' x 22 1/2'	43



DIMENSIONS AND SPACE ALLOWANCES IN MODERN BARN

Width: Dairy barns should be 34' wide on the inside.

Desirable stable height: 7' 9" to 8' 3" from platform.

Cross alleys: 4' wide. There should be alleys at each end of cow stanchions, and also in the middle if the row is long.

Width of cow stalls: Eight-tenths of platform length. Most barns have stalls too narrow. For large cows they should be 4' or wider. Variable widths from 3' 6" to 4' 6" are desirable.

Following are desirable dimensions for a modern dairy barn. Small variations from these dimensions are not a serious handicap.

Feed alley	4'
Manger	2'
Curb	6"
Platform	5'2"
Gutter	1'4"
Drive	8'
Gutter	1'4"
Platform	5'2"
Curb	6"
Manger	2'
Feed alley	4'
<hr/>	
Total	34'

Pen Stable Requirements:

Loafing Area: Separate from feeding area -- 70 sq. ft. per cow.

Feeding area included -- 95 sq. ft. per cow.

Feeding Area: Width -- 10 ft.

Area -- 25 sq. ft. per cow.

Bunks --  $2\frac{1}{2}$  ft. per cow.

Ceiling Height: 10 ft. minimum suggested.

Milking Parlor: Stalls -- 8' x 28" to 32"

Alleys -- 4'

Work Area -- 4' to 5'

Source: Rural Appraisers' Handbook.  
N.Y.S. Health Department Minimum Standards.

FEED REQUIREMENTS AND OTHER FACTORS FOR DAIRY COWS  
New York Cost Accounts, 1954

Item	Average	Range
Cost of producing 100 pounds milk	\$ 4.32	\$ 3.22 to 7.47
Pounds of grain fed per cow	3,421	1,614 to 5,934
Tons of hay fed per cow	2.3	1.2 to 3.6
Tons silage fed per cow	5.6	0 to 10.2
Hours of labor per cow	99	68 to 134
Return per hour of labor	\$ .98	\$-1.24 to 2.09
Milk produced per cow (pounds)	10,000	7,100 to 12,500
Ratio of grain to milk	1 to 3.0	--

COST OF RAISING A HEIFER TO 27.5 MONTHS  
New York Cost Accounts, 1954

Item	Average	Range
Cost of raising to 27.5 months	\$ 311	\$ 191 to 510
Pounds of whole milk fed	338	--
Pounds of grain fed	1,739	--
Tons of hay fed	3.0	--
Tons of silage fed	1.9	--
Hours of labor	46	--

FEED REQUIREMENTS FOR DAIRY HEIFERS  
(Per head per 12 months -- average all ages)

Grain	833 pounds
Hay	1.1 tons
Silage	0.9 tons

Source: A.E. 1023 and 1024.

### CHOOSING THE MOST PROFITABLE RATE OF GRAIN FEEDING

A simple rule of thumb will not do a very good job in choosing the most profitable rate of grain feeding. A number of things must be considered:

- (1) the price received for milk
- (2) the price paid for grain
- (3) the quantity and quality of roughages available
- (4) the capacity of the cows to consume feed and produce milk

It is not easy to consider all these things at the same time. Yet they are all important.

On most farms in New York, high quality home-produced roughages are the cheapest source of nutrients available for dairy cows. Pasture and silage can be used efficiently only on the farm where they are produced. This is commonly true of hay, especially if it is not baled. In 9 out of 10 cases, it makes the best economic sense to feed dairy cows all the home-produced roughages they will eat. The higher the quality of these roughages, the more nutrients will be obtained from them and the less grain required to produce a given quantity of milk per cow.

If it pays to feed cows all the roughage they will eat, then a farmer need only determine how much grain it is most profitable to feed them. The following table is designed to help you with this job. It is based on the results of experiments in which cows were fed grain at different rates to find out what increases in milk production might be expected from changing from one level of feeding to another. Considering the relative prices of milk and concentrates, it tells you at approximately what rate of feeding the greatest profit per cow can be expected. These recommendations apply most particularly to cows with a

#### DETERMINING THE MOST PROFITABLE RATE OF GRAIN FEEDING\*

Pounds of milk equal in value to 100 pounds of grain or concentrates	Feed 1 lb. of Grain to the Number of Pounds of Milk Given Below	
	Large cows testing 3.5-4.0% fat	Smaller cows testing 5.0% fat or more
120	7.5	8.5
110	6.0	6.5
100	5.0	5.0
90	4.5	4.0
80	4.0	3.5
70	3.5	3.0
60	3.0	2.5
50	2.5	2.0
40	2.0	2.0

\*Based on a table prepared by John W. Klein and Ralph D. Jennings,  
Agricultural Situation, BAE, February, 1949.

capacity to produce 400 pounds of butter fat when fed all the high quality roughages they will eat.

How do we use this table? Let's take the case of a dairyman living about 200 miles from the New York market who buys his grain. Assume that his best estimate of the average price he will receive for his 3.7% milk is about \$4.00 per cwt. and that the price of 16% dairy ration is \$4.00 per cwt. The "pounds milk equal to 100 pounds of grain or concentrates" is in this case 100, ( $\$4.00 \div \$4.00$ ). The table suggests that he feed 1 pound of grain for every 5 pounds of milk produced.

Consider another dairyman producing milk for the Rochester market. He produces more than half of his concentrate feed on his farm and buys high protein ingredients and wheat bran to mix his own dairy ration. Valuing his corn and oats at the prices he would receive if he sold them to someone else, he figures that one ton of grain costs him about \$65.00 or \$3.25 per cwt. His best estimate of the average price he will receive for his 3.5% milk is \$4.50 per cwt. Therefore, the "pounds of milk equal in value to 100 pounds of grain or concentrates" is in this case 72, ( $\$3.25 \div \$4.50$ ). Under these circumstances the rate of feeding suggested is 1 pound of grain for every 3 to  $3\frac{1}{2}$  pounds of milk.

Using this grain feeding table will not guarantee that you will be feeding all of your cows at exactly the most profitable rate. It should help you to make a better decision for your particular price and feed situation. It will be most profitable for some farmers to feed at a 1:6 rate. Others should feed at a 1:3 rate for the greatest net income.

Take a look at your particular conditions. With the price of milk you receive, the cost of the concentrate mixture you use and recognizing the quality of the hay, silage, and pasture available to your cows, you can make a good estimate of the rate of grain feeding which will net you the most.

Source: Adapted from an article by B. F. Stanton

#### Manure Available

Approximately 8 tons of manure is available per animal unit per year for use on fields.

#### One Animal Unit Equals:

- 1 cow
- 1 horse
- 2 heifers
- 100 hens
- 7 sheep

CAPITAL INVESTMENT, EXPENSES, AND RECEIPTS FOR SELECTED GROUPS OF FARMS

	Central New York 201 Dairy Farms 1955	Montgomery County 109 Dairy Farms 1954-55	Columbia County 25 New York Market Dairy Farms, 1955
<u>Capital Investment (end of year)</u>			
Land and buildings	\$ 18,353	\$ 16,487	\$ 27,199
Cattle	9,848	7,695	12,345
Machinery and equipment	8,475	6,174	8,330
Feed and supplies	3,491	340	3,432
Other	<u>213</u>	<u>131</u>	<u>228</u>
Total End Inventory	\$ 40,380	\$ 30,827	\$ 51,534
<u>Farm Receipts</u>			
Milk sales	\$ 11,808	\$ 7,852	\$ 14,792
Livestock sold	1,268	851	1,523
All other sales	<u>1,711</u>	<u>700</u>	<u>2,258</u>
Total Cash Receipts	\$ 14,787	\$ 9,403	\$ 18,573
Increase in Inventory	<u>1,656</u>	<u>419</u>	<u>946</u>
Total Farm Receipts	\$ 16,443	\$ 9,822	\$ 19,519
<u>Farm Expenses</u>			
Feed bought	\$ 3,314	\$ 2,338	\$ 4,281
Hired labor	1,031	536	1,800
Crop expense	1,161	718	1,549
Machinery repairs, auto, etc.	742	1,018	829
Gas and oil	642		610
Dairy expense	798	214	1,139
Livestock bought	567	373	281
Building repairs	346	444	333
Miscellaneous	<u>1,039</u>	<u>1,037</u>	<u>1,225</u>
Total Cash Operating	\$ 9,640	\$ 6,678	\$ 12,047
New Machinery	1,424	402	1,756
New Buildings	311	--	563
Unpaid Labor	<u>164</u>	<u>352</u>	<u>550</u>
Total Farm Expenses	\$ 11,539	\$ 7,432	\$ 14,916
<u>Financial Summary</u>			
Total farm receipts	\$ 16,443	\$ 9,822	\$ 19,519
Total farm expenses	<u>11,539</u>	<u>7,432</u>	<u>14,916</u>
Farm Income	\$ 4,904	\$ 2,390	\$ 4,603
Interest 5% Average Capital	<u>1,977</u>	<u>1,541</u>	<u>2,553</u>
Labor Income Per Farm	\$ 2,927	\$ 849	\$ 2,050
Number of Operators	237	133	*
Labor Income Per Operator	\$ 2,482	\$ 607	\$ 1,935

\* Not available.

Source: C. A. Bratton; Montgomery County data from unpublished thesis by Vance W. Edmondson, Cornell University, September 1956; Columbia County Farm Account Summary.

FARM BUSINESS FACTORS

	Central New York 201 Dairy Farms 1955	Montgomery County 109 Dairy Farms 1954-55	Columbia County 25 New York Market Dairy Farms, 1955
<u>Size of Business</u>			
Man equivalent	1.8	1.8	2.1
Average number cows	33	26	35
Pounds of 3.7% milk sold	288,652	196,638	327,500
Total crop acres	105	93	*
Total man work units	573	462	*
<u>Rates of Production</u>			
Pounds of milk sold per cow	8,747	7,563	9,277
Tons hay per acre	2.2	1.8	2.3
Tons corn silage per acre	9.9	7.8	9
Bushel oats per acre	50	22	47
<u>Labor Efficiency</u>			
Man work units per man	318	263	*
Pounds milk sold per man (3.7%)	160,362	110,148	162,802
Cows per man	18	15	17
Crop acres per man	58	53	*
<u>Use of Capital</u>			
Total capital per man	\$22,433	\$17,126	\$24,540
Total capital per cow	1,224	1,186	1,472
Land and buildings per cow	556	634	777
Machinery investment per man	4,708	3,430	3,967
Machinery investment per cow	257	237	238
<u>Machinery Costs</u>			
Total machinery expense	\$ 2,835	*	\$ 2,739
Machinery expense per cow	86	*	78
Machinery expense per man	1,575	*	1,219
Machinery expense per crop acre	27	*	*
<u>Feed Costs</u>			
Feed bought per cow	\$ 90	\$ 90	\$ 122
Per cent feed bought was of milk receipts	25%	30%	23%
Fertilizer and lime expense per crop acre	\$ 6	\$ 4	*
Hay equivalent harvested per cow (tons)	5.0	*	*
Number of heifers per 10 cows	6.1	5.4	*
Crop acres per cow	3.2	3.6	*
<u>Prices</u>			
Av. price received for milk (3.7%)	\$4.09	\$4.06	\$4.42
<u>Other</u>			
Per cent real estate is of total capital	45%	53%	53%
Per cent expenses are of receipts	70%	76%	76%
Per cent machinery cost is of total expenses	25%	*	17%

\* Not available.

CAPITAL INVESTMENT, EXPENSES, AND RECEIPTS FOR SELECTED GROUPS OF FARMS

	Central Plains Region 371 Dairy Farms 1953-54	Cayuga County 26 Farms 1955	Cattaraugus County 30 Dairy Farms 1955
<u>Capital Investment (end of year)</u>			
Land and buildings	\$ 23,827	\$ 21,230	\$ 16,570
Cattle	7,808	8,992	9,310
Machinery and equipment	9,251	9,384	8,040
Feed and supplies	879	5,248	2,280
Other	--	598	--
Total End Inventory	\$ 41,765	\$ 45,452	\$ 36,200
<u>Farm Receipts</u>			
Milk sales	\$ 8,026	\$ 10,063	\$ 10,200
Livestock sold	1,812	1,412	1,880
All other sales	4,366	4,361	2,174
Total Cash Receipts	\$ 14,204	\$ 15,836	\$ 14,254
Increase in Inventory	2,763	1,569	1,500
Total Farm Receipts	\$ 16,967	\$ 17,405	\$ 15,754
<u>Farm Expenses</u>			
Feed bought	\$ 1,561	\$ 2,651	\$ 2,850
Hired labor	1,260	1,566	1,130
Crop expense	1,285	1,515	1,020
Machinery repairs, auto, etc. )	2,274	990	730
Gas and oil )		757	475
Dairy expense	283	830	812
Livestock bought	579	573	940
Building repairs	572	424	--
Miscellaneous	721	1,138	1,443
Total Cash Operating	\$ 8,535	\$ 10,444	\$ 9,400
New Machinery	1,917	2,038	1,700
New Buildings	439	257	--
Unpaid Labor	375	124	160
Total Farm Expenses	\$ 11,266	\$ 12,863	\$ 11,260
<u>Financial Summary</u>			
Total farm receipts	\$ 16,967	\$ 17,405	\$ 15,754
Total farm expenses	11,266	12,863	11,260
Farm Income	\$ 5,701	\$ 4,542	\$ 4,494
Interest 5% Average Capital	2,019	2,233	1,810
Labor Income Per Farm	\$ 3,682	\$ 2,309	\$ 2,684
Number of Operators	435	27.5	*
Labor Income Per Operator	\$ 3,135	\$ 2,183	*

\* Not available.

Source: A.E. 987, 1005, 1006, 1035; Cattaraugus County Extension Service; Cayuga County Farm Business Summary.

FARM BUSINESS FACTORS

	Central Plains Region 371 Dairy Farms 1953-54	Cayuga County 26 Farms 1955	Cattaraugus County 30 Dairy Farms 1955
<u>Size of Business</u>			
Man equivalent	1.9	1.8	1.5
Average number cows	22	27	28
Pounds of 3.7% milk sold	179,537	250,338	253,000
Total crop acres	125	146	89
Total man work units	522	610	488
<u>Rates of Production</u>			
Pounds of milk sold per cow	8,051	8,909	9,050
Tons hay per acre	2.5	2.5	2.5
Tons corn silage per acre	11.6	10.1	11.0
Bushels oats per acre	54	51	*
<u>Labor Efficiency</u>			
Man work units per man	270	339	325
Pounds milk sold per man (3.7%)	93,006	139,077	167,000
Cows per man	12	16	18
Crop acres per man	65	81	59
<u>Use of Capital</u>			
Total capital per man	\$21,982	\$25,251	\$24,133
Total capital per cow	1,898	1,623	1,341
Land and buildings per cow	1,083	758	614
Machinery investment per man	4,869	5,213	5,360
Machinery investment per cow	421	335	300
<u>Machinery Costs</u>			
Total machinery expense	\$ 3,258**	\$ 3,573	\$ 2,220
Machinery expense per cow	148	127	82
Machinery expense per man	1,684	1,985	1,480
Machinery expense per crop acre	26	24	25
<u>Feed Costs</u>			
Feed bought per cow	\$ 71	\$ 76	\$ 105
Per cent feed bought was of milk receipts	19%	21%	28%
Fertilizer and lime expense per crop acre	\$ 7	\$ 7	\$ 11
Hay equivalent harvested per cow (tons)	*	6.6	*
Number of heifers per 10 cows	7.3	7.1	4.1
Crop acres per cow	5.7	5.2	3.3
<u>Prices</u>			
Av. price received for milk (3.7%)	\$4.40	\$4.02	*
<u>Other</u>			
Per cent real estate is of total capital	57%	47%	46%
Per cent expenses are of receipts	66%	74%	71%
Per cent machinery cost is of total expenses	29%	28%	20%

\* Not available.

\*\* Includes interest, electricity (farm share), and bale ties.



FACTORS FOR CONVERTING OF MILK TO A 3.7 PER CENT  
TEST ON AN ENERGY BASIS

Formula:  $F. C. M. = M (.418 + .157f)$   
(Based on 3.7% test)

1.0	.575	3.0	.889	4.0	1.046	5.0	1.203
1.5	.654	3.05	.987	4.05	1.054	5.05	1.211
2.0	.732	3.1	.905	4.1	1.062	5.1	1.219
2.5	.810	3.15	.913	4.15	1.070	5.2	1.234
		3.2	.920	4.2	1.077	5.25	1.242
2.8	.857	3.25	.928	4.25	1.085	5.3	1.250
2.85	.865	3.3	.936	4.3	1.093	5.4	1.266
2.9	.873	3.35	.944	4.35	1.101	5.45	1.274
2.95	.881	3.4	.952	4.4	1.109		
		3.45	.960	4.45	1.117	5.5	1.282
						5.55	1.290
		3.5	.968	4.5	1.124	5.65	1.305
		3.55	.976	4.55	1.132	5.7	1.313
		3.6	.984	4.6	1.140	5.75	1.321
		3.65	.992	4.65	1.148	5.8	1.329
		3.7	1.000	4.7	1.156	5.85	1.337
		3.75	1.008	4.75	1.164	5.9	1.344
		3.8	1.015	4.8	1.172		
		3.85	1.023	4.85	1.180	6.0	1.360
		3.9	1.030	4.9	1.187	6.05	1.368
		3.95	1.038	4.95	1.195	6.1	1.376
						6.2	1.392
						6.3	1.408
						6.35	1.416

Example:

During 1956, a farmer sold 450,000 pounds of milk. The average test was 3.6 per cent.

1. Pounds of milk sold x factor for butterfat test = pounds of 3.7 per cent milk.
2.  $450,000 \times .984 = 442,800$  pounds of 3.7 per cent milk.

CAPITAL INVESTMENT ON FRUIT FARMS  
22 Northern Wayne County Fruit Farms, 1955

Investment	Average	Range
Real estate	\$23,113	\$ 8,000 to 50,000
Livestock	302	0 to 4,500
Machinery and equipment	10,858	5,842 to 27,175
Feed and supplies	<u>2,277</u>	<u>0 to 11,050</u>
Total	\$36,550	\$20,335 to 78,675

Source: Data from unpublished thesis by D. K. Freebairn, Cornell University, September 1956. These data were obtained from a group of young farmers who started farming between 1945 and 1953. They averaged seven years as farm operators.

INVESTMENT IN SPRAY, DUST, AND WATER-SUPPLY EQUIPMENT  
108 Farms, 1950

Type of equipment	Average investment
Dilute air blast sprayer*	\$ 3,640
Water transport rig	499
Permanent water supply	<u>782</u>
Total	\$ 4,921

\* Concentrate airblast equipment approximately the same investment. High pressure equipment investments were 40 to 50 per cent of airblast.

Source: Bulletin 886.

APPROXIMATE PRICES OF NEW ORCHARD EQUIPMENT -- FALL 1956

High pressure sprayer	\$ 1,000 - 3,000
Speed sprayer	3,000 - 7,000
Power pruner (each)	\$ 90 - 105
Compressor	300 - 600
Ladders (per foot)	\$ .90 - 1.25
Picking bags	4.50 - 7.00

SELECTED FACTORS FOR FRUIT  
New York Cost Accounts, 1954

APPLES  
14 Accounts

Item	Average	Range
Yield per acre, bushels*	400	50 to 579
Labor to grow an acre, hours	28	19 to 38
Cost of spray and dust materials per acre	\$ 51	\$ 16 to 103
Cost to grow an acre	\$ 179	\$ 84 to 253
Net cost per bushel	\$ .85	\$ .56 to 3.40
Return per hour of labor	\$ 3.34	\$-.26 to 6.93

PEACHES  
9 Accounts

Item	Average	Range
Yield per acre, bushels*	168	33 to 387
Labor to grow an acre, hours	62	30 to 87
Cost of spray and dust materials per acre	\$ 25	\$ 6 to 34
Cost to grow an acre	\$ 205	\$ 90 to 277
Net cost per bushel	\$ 2.14	\$ 1.06 to 4.08
Return per hour of labor	\$ 1.02	\$-.12 to 1.86

GRAPES  
5 Accounts

Item	Average	Range
Yield per acre, tons	5.2	3 to 6
Labor to grow an acre, hours	65	11 to 128
Cost of spray and dust materials per acre	\$ 8	\$ 0 to 10
Cost to grow an acre	\$ 220	\$ 85 to 336
Net cost per ton	\$ 68	\$ 45 to 125
Return per hour of labor	\$ 3.56	\$ .84 to 5.49

\* Yield of packable fruit.

SWEET CHERRIES  
6 Accounts

Item	Average	Range
Yield per acre, pounds	9,236	955 to 15,760
Labor to grow an acre, hours	12	3 to 21
Cost of spray and dust materials per acre	\$ 27	\$ 8 to 46
Cost to grow an acre	\$ 136	\$ 56 to 172
Net cost per pound, cents	5.4	4.0 to 17.2
Return per hour of labor	\$ 4.02	\$ .58 to 5.54

SOUR CHERRIES  
6 Accounts

Item	Average	Range
Yield per acre, pounds	4,195	1,375 to 7,363
Labor to grow an acre, hours	13	3 to 29
Cost of spray and dust materials per acre	\$ 22	\$ 13 to 26
Cost to grow an acre	\$ 94	\$ 58 to 145
Net cost per pound, cents	6.3	5.0 to 8.2
Return per hour of labor	\$ 1.85	\$ 1.34 to 2.10

Source: A.E. 1023 and 1024.

RELATION BETWEEN SIZE OF BUSINESS AND COST OF SPRAYING AND DUSTING APPLES  
116 Blocks, New York State, 1950

Number of acres in bearing apples	Number of blocks	Cost per acre		Cost per tree	
		Appli- cation*	Total/	Appli- cation*	Total/
30 or less	15	\$ 50.53	\$ 117.43	\$ 1.35	\$ 3.17
31-39	14	35.41	94.29	1.05	2.78
40-45	15	35.78	100.85	.90	2.56
46-55	14	36.05	93.00	1.01	2.63
56-65	14	38.88	104.70	1.17	3.10
66-85	15	35.41	101.27	.97	2.78
86-149	14	29.37	94.99	.90	2.87
150 or more	15	24.70	74.11	.77	2.31

\* Application cost includes costs of labor, power, and spray equipment.  
/ Total cost includes application and materials cost.

Source: Bulletin 886.

COST OF SPRAY AND DUST MATERIALS FOR APPLES  
Per Acre, Per Tree, Per 100 Gallons, 1950

Materials used	Per acre	Per tree	Per 100 gallons
Number of blocks	116	116	90
Insecticides:			
Dormant spray	\$ 3.10	\$ .09	\$ .07
Miticides	3.95	.11	.08
All other	<u>25.20</u>	<u>.71</u>	<u>.49</u>
Total insecticides	\$32.25	\$ .91	\$ .64
Fungicides	26.85	.77	.50
Hormones	<u>2.78</u>	<u>.08</u>	<u>.06</u>
Total materials	\$61.88	\$1.76	\$1.20

Source: Bulletin 886.

RELATION BETWEEN COST OF SPRAYING APPLES AND EFFECTIVENESS  
OF DISEASE AND INSECT CONTROL

Control	Cost per acre*
Excellent control	\$ 66.47
Very good	\$ 55.81
Good	\$ 53.58

\* Based on 11 applications.

Spray required per tree per application:

Mature McIntosh (25 bu.)	15 to 17 gal.
Mature McIntosh (15 bu.)	7 to 8 gal.
Mature Greening (25 bu.)	20 gal.

Source: Bulletin 886.

AVERAGE COST OF SPRAYING AND DUSTING APPLE TREES  
116 Blocks, 1950

Cost item	Cost per acre	Cost per tree	Cost per 100 gallons*
Number of blocks	116	116	90
Spray and dust materials	\$ 61.88	\$ 1.77	\$ 1.20
Labor	9.54	.27	.20
Tractor power	7.01	.20	.14
Spray equipment	19.16	.55	.37
Total	\$ 97.59	\$ 2.79	\$ 1.91

\* Concentrate applications were not converted to a dilute basis for the purposes of this calculation. Their cost was merely based on cost per acre and on cost per tree, hence the cost per 100 gallons is based entirely on the dilute spray blocks.

Source: Bulletin 886.

AVERAGE LABOR COST AND TIME REQUIRED TO TRIM APPLE  
TREES BY DIFFERENT METHODS  
16 Fruit Farms, Western New York, 1952

Method	Minutes per tree	Number of cuts per minute	Cost of labor	
			Per tree	Per acre
Hand shears and ladders	55	--	\$ .85	\$ 22.45
Platform and hand shears	37	16	.55	15.10
Power pruners and ladders	30	22	.44	13.32
Power pruners and platform	19	28	.28	7.99

Source: A.E. 845.

EFFECT OF AGE OF TREE ON YIELD OF APPLES  
Hudson Valley, 1936-1939; 1943-1950

Age of tree (Years)	Bushels per acre	Bushels per tree
Less than 5	1	--
5 - 9	28	.7
10 - 19	147	3.8
20 - 29	222	5.8
30 - 39	209	6.1
40 and over	169	5.1

Source: A.E. 919.

EFFECT OF AGE AND TYPE OF SOIL ON YIELDS OF APPLES  
Niagara County, 1934-1950

Age of tree (Years)	Bushels per acre	
	Better soils	Poorer soils
9 - 14	83	37
15 - 19	163	62
20 - 39	168	63
40 and over	150	45

Source: A.E. 919.

RELATIONSHIP OF APPLE YIELDS TO TREES PER ACRE  
Hudson Valley, 1936-1939; 1943-1950

Trees per acre	Age of trees (years)					
	11 to 15		16 to 20		21 to 30	
	bushels per tree	bushels per acre	bushels per tree	bushels per acre	bushels per tree	bushels per acre
27 or less	3.1	78	5.7	142	6.8	169
28 - 39	3.5	119	5.9	202	6.4	217
40 - 49	3.5	154	4.9	216	5.5	247
50 - 59	3.1	162	4.6	246	4.7	252
60 and over	3.3	280	3.5	273	4.7	335

Yield per acre increased consistently as the number of trees increased from 27 or less to 60 and over per acre.

Source: A.E. 919.

YIELDS AND RETURNS PER ACRE FOR SELECTED VARIETIES OF APPLES  
Trees 15 Years and Older, Average 1946-1950

Variety	Hudson Valley		Niagara County	
	Bushels per acre	Net return per acre	Bushels per acre	Net return per acre
McIntosh	271	\$ 425	252	\$ 367
R. I. Greening	189	254	202	235
Baldwin	126	125	154	161
Cortland	307	420	288	352
Rome, Red Rome	256	374	190	346
Wealthy	156	192	172	190
Northern Spy	134	193	98	146
Red Delicious	140	232	148	256
Ben Davis	263	189	157	135
Jonathan	192	198	225	330
Golden Delicious	185	303	223	413
Early McIntosh	122	243	145	346
Macoun	140	206	130	175
Northwest Greening	241	280	171	208

Source: A.E. 919.

PRICE, YIELD, AND QUALITY IN RELATION TO LABOR INCOME  
64 Niagara County Farms, 1946

	Labor income	
	Mean	Median
Yield av. 62 bu. per acre and av. price \$1.49 per bu. (18% No. 1)	\$ 3,322	\$ 2,864
Yield av. 69 bu. per acre and av. price \$1.89 per bu. (45% No. 1)	3,875	3,195
Yield av. 162 bu. per acre and av. price \$1.58 per bu. (32% No. 1)	6,046	5,050
Yield av. 244 bu. per acre and av. price \$1.88 per bu. (52% No. 1)	10,085	6,950

Source: Farm Economics, page 4246.



## AVERAGE COSTS OF STORAGE CONSTRUCTION

Kind of storage	Cost per bushel
Cold storage	\$ 1.50 - 2.50
Controlled atmosphere	\$ 2.00 - 3.75

COST OF OPERATING APPLE COLD STORAGE  
(per bushel per season)

Kind of storage	Owners cost	Hired cost
Cold storage	10 - 15¢	25 - 30¢
Controlled atmosphere	15 - 20¢	45 - 60¢

Source: Unpublished thesis by Ronald O. Aines, University of Massachusetts, June 1954.

## ESTIMATED COST OF STORAGE OPERATION

Cost item	Controlled-atmosphere storages			Regular cold storage/
	A Small <sup>1/</sup>	B Medium	C Large	Medium
	Cents per bushel			
Interest on investment (5%)	4.0	10.0	10.0	2.5 <sup>1*</sup>
Depreciation	5.7	12.5	11.7	6.1 <sup>2*</sup>
Building (5% per year)				
Refrigeration (10% per year)				
Taxes	1.8	3.5	1.4	} 2.5 <sup>3*</sup>
Insurance	.7	2.5	.9	
Electricity	3.4	12.0	9.1	4.0
Caustic soda, salt	6.6	3.0	3.0	
Air purification	1.0	1.0	1.0	
Labor for gas analysis and maintenance	6.8	3.5	1.0	
Repair and maintenance	1.0	1.5	2.7	2.3 <sup>4*</sup>
Handling in and out of storage	7.0	10.0	5.7 <sup>2/</sup>	4.4
Other (management, bookkeeping)	1.0	1.0	1.0	
Total estimated operating cost per bushel	39.0	60.5	47.5	22.1

1/ Remodeled part of regular storage.

1\*/ At 4 per cent.

2/ Lift truck.

2\*/ Calculated at 10 per cent on refrigeration and 3 1/3 per cent on building.

3\*/ At 2 per cent each.

4\*/ At 2 per cent of building cost.

/ Gaston, H. P. and Levin, J. H., On the Farm Refrigerated Fruit Storage, Michigan State College, Agricultural Experiment Station, East Lansing, Michigan, Special Bulletin Number 389, January 1954.

Source: A.E. 1028.

POULTRY FARM CAPITAL

Broilers: About \$22,000 was invested in buildings and equipment in 1951-52 by full-time farmers. About \$1.00 per bird capacity.

CAPITAL REQUIREMENTS FOR BUILDINGS AND EQUIPMENT  
AS ALLOCATED TO THE LAYING ENTERPRISE  
63 New York Poultry Farms, 1954-55

Size of flock	Average capital in buildings		Average capital in equipment	
	Per farm	Per layer	Per farm	Per layer
Under 3000	\$ 9,442	\$ 4.00	\$ 1,347	\$ .57
3000 - 5000	17,238	4.23	2,076	.53
Over 5000	29,505	4.31	3,596	.51
All flocks	\$ 18,215	\$ 4.18	\$ 2,280	\$ .54

Source: Data from unpublished thesis by John M. Bailey, Cornell University, September 1956.

FEED REQUIREMENTS AND OTHER FACTORS FOR LAYING HENS  
New York Cost Accounts, 1954

Item	Average	Range	
Mortality	19%	8% to	38%
Eggs per hen	192	121 to	232
Labor per bird (hours)	1.0	.8 to	2.0
Pounds grain fed per hen	32	14 to	56
Pounds mash fed per hen	72	35 to	106
Total cost to keep a hen	\$ 7.64	\$ 6.28 to \$ 9.61	
Cost per dozen eggs	\$ .48	\$ .36 to \$ .72	
Return per hour of labor	\$ -.13	\$ -2.04 to \$ 1.06	

Source: A.E. 1023 and 1024

RAISING PULLETS--COSTS AND OTHER FACTORS  
New York Cost Accounts, 1954

	Average	Range
Chick mortality	8%	2% to 34%
Labor per 100 chicks started (hours)	14	6 to 44
Return per hour of labor	\$ 1.01	\$ -3.92 to \$ 7.23
Cost to raise per bird (pullets, mature equiv.)	\$ 1.98	\$ 1.53 to \$ 3.09

Source: A.E. 1023 and 1024.

SEASONAL COSTS OF RAISING SEXED LEGHORN PULLETS  
67 Central New York Farms, Fall 1954 - Summer 1955

	Fall 1954	Winter 1954-55	Spring 1955	Summer 1955	All Seasons
Number of farms	19	19	17	12	67
Chicks started per farm	1,131	1,401	1,506	1,314	1,336
Percentage mortality	13	10	13	6	11
Labor (minutes) per pullet	13	10	10	11	11
Feed (pounds) per pullet	24	21	20	22	22
<u>Cost Per Pullet Housed</u>					
Fuel	\$ .06	\$ .06	\$ .04	\$ .02	\$ .05
Feed	1.09	.89	.84	.85	.92
Chicks	.43	.42	.43	.40	.42
Other	.05	.03	.03	.03	.03
Labor	.25	.19	.20	.22	.21
Equipment	.01	.01	*	.01	*
Depreciation	.24	.15	.11	.13	.16
Total cost per pullet	\$ 2.13	\$ 1.75	\$ 1.65	\$ 1.66	\$ 1.79
Returns other than pullets	.03	.03	.04	.07	.03
Net Cost per Pullet	\$ 2.10	\$ 1.72	\$ 1.61	\$ 1.59	\$ 1.76

\*Less than  $\frac{1}{2}$  cent

FORMULA FOR ESTIMATING COST OF RAISING PULLETS

With sexed Leghorn chicks:

Feed:	22 pounds X _____	price per pound	= _____
Labor:	11 minutes X _____	value per minute	= _____
Chicks:	1.1 chicks X _____	price per chick	= _____
Other items:	Add 12% of total cost of feed, labor and chicks= _____		
Average Net Cost of Pullets			= _____

Source: W. E. Earle and J. S. Tobey

LABOR REQUIRED PER LAYER AND PER DOZEN EGGS  
64 New York Poultry Farms, 1954-55

Size of flock	Labor per layer (hours)			Total hours of labor	Minutes per dozen eggs
	Chores	Cleaning and packing eggs	All other time		
Under 3000	.67	.39	.25	1.3	4.9
3000 - 5000	.49	.41	.18	1.1	4.1
Over 5000	.42	.42	.15	1.0	3.6
All flocks	.53	.40	.20	1.1	4.2

COSTS PER DOZEN EGGS  
63 New York Poultry Farms, 1954-55

Size of flock	No. of farms	Dozens	Depre- ciation of birds			Build- ings	Equip- ment	Other	Total
			Feed	Labor					
			\$	\$	\$	\$	\$	\$	\$
Under 3000	22	37,505	.27	.11	.09	.04	.01	.03	.55
3000 - 5000	22	62,943	.26	.08	.09	.04	.01	.03	.51
Over 5000	19	115,580	.25	.07	.09	.04	.01	.03	.49
All flocks	63	69,934	.26	.09	.09	.04	.01	.03	.52

RETURNS PER DOZEN EGGS  
63 New York Poultry Farms, 1954-55

Size of flock	No. of farms	Dozens	Eggs sold	Other	Total	Gain or loss
Under 3000	22	37,505	\$ .42	*	\$ .42	\$ -.13
3000 - 5000	22	62,943	.43	*	.43	-.08
Over 5000	19	115,580	.44	*	.44	-.05
All flocks	63	69,934	.43	*	.43	-.09

\* Less than .5 cent.

FORMULA FOR ESTIMATING COST OF PRODUCING A DOZEN EGGS

The formula shown below should give a reasonable estimate of the cost of producing a dozen eggs for Leghorn Flocks with an annual average rate of egg production of 55 per cent, and with birds weighing about 4.5 pounds each.

Feed: 6.7 pounds X \_\_\_\_\_ price per pound = \_\_\_\_\_

Labor: 0.07 hours X \_\_\_\_\_ value per hour = \_\_\_\_\_

Other costs: 45 per cent of feed and labor costs = \_\_\_\_\_

Annual Average Cost of Producing 1 Dozen Eggs = \_\_\_\_\_

RECEIPTS, EXPENSES AND INCOME ON POULTRY FARMS  
63 New York Poultry Farms, 1954-55

Item	Size of laying flock			All flocks
	Under 3000	3000-5000	Over 5000	
Average number of layers	2,380	3,944	6,982	4,356
<u>Receipts:</u>				
Poultry	\$ 16,171	\$ 28,062	\$ 52,882	\$ 31,395
Other	1,096	2,076	2,984	2,008
Total cash	\$ 17,267	\$ 30,138	\$ 55,866	\$ 33,403
Net inventory increase	953	301	6,257	2,348
Total receipts	\$ 18,220	\$ 30,439	\$ 62,123	\$ 35,751
<u>Expenses:</u>				
Cash	\$ 14,926	\$ 26,408	\$ 49,604	\$ 29,394
Unpaid labor	454	512	516	493
Poultry purchases	907	1,363	3,421	1,825
Livestock purchases	316	110	32	158
Total expenses	\$ 16,603	\$ 28,393	\$ 53,573	\$ 31,870
<u>Financial Summary:</u>				
Farm income	\$ 1,617	\$ 2,046	\$ 8,550	\$ 3,881
Interest on capital @ 5%	1,611	2,649	4,239	2,766
Labor income:				
Per farm	\$ 6	\$ -603	\$ 4,311	\$ 1,115
Per operator	6	-553	3,150	955

IMPORTANT FACTORS ON POULTRY FARMS  
64 New York Poultry Farms, 1954-55

Factor	Size of flock			All flocks
	Under 3000	3000-5000	Over 5000	
Average number of layers	2,380	3,944	6,982	4,356
Eggs per layer	191	191	196	193
Percent mortality	22	21	22	22
Hours per layer	1.3	1.1	1.0	1.1
Minutes per dozen eggs	4.9	4.1	3.6	4.2
Feed per layer	105	106	107	106
Feed per dozen	6.8	6.7	6.7	6.7
Percent feed homegrown	5	6	11	7
% of eggs sold to other than wholesale buyers	10	20	25	18
Work units per man	333	368	398	366
Layers per man	1,587	1,852	1,887	1,815
Dozens sold per man	24,881	29,417	30,879	29,197

Source: Data from unpublished thesis by John H. Bailey, Cornell University, September 1956.

CAPITAL INVESTMENT, EXPENSES, AND RECEIPTS FOR A SELECTED  
GROUP OF POULTRY FARMS  
11 Farms in Columbia and Chenango Counties, 1955

		<u>Your farm</u>
<u>Capital Investment (end of year)</u>		
Land and buildings	\$ 21,849	\$ _____
Hens	5,718	_____
Youngstock	614	_____
Machinery and equipment	6,469	_____
Feed and supplies	2,526	_____
Other livestock	441	_____
Total End Inventory	\$ 37,617	\$ _____
<u>Farm Receipts</u>		
Egg sales	\$ 29,309	\$ _____
Poultry sold	4,336	_____
Miscellaneous	1,394	_____
Total Cash Receipts	\$ 35,039	\$ _____
Increase in Inventory	1,589	_____
Total Farm Receipts	\$ 36,628	\$ _____
<u>Farm Expenses</u>		
Feed bought	\$ 20,092	\$ _____
Machinery and equipment	809	_____
Hired labor	1,277	_____
Building, fence expense	234	_____
Chicks bought	1,369	_____
Crop expense	216	_____
Poultry supplies	462	_____
Taxes and insurance	451	_____
Telephone, electricity, fuel	452	_____
Miscellaneous	280	_____
Total Cash Operating	\$ 25,642	\$ _____
New machinery	1,637	_____
New buildings	1,070	_____
Unpaid family labor	734	_____
Total Farm Expenses	\$ 29,083	\$ _____
<u>Financial Summary</u>		
Total farm receipts	\$ 36,628	\$ _____
Total farm expenses	29,083	_____
Farm Income	\$ 7,545	\$ _____
Interest 5% Average Capital	1,840	_____
Labor Income Per Farm	\$ 5,705	\$ _____
Number of Operators	13	_____
Labor Income per Operator	\$ 4,828	\$ _____
Average number of layers for year	4,389	_____
Man equivalent	2.2	_____

BROODING RECOMMENDATIONS  
FOR REPLACEMENT AND BROILER CHICKS

Unless otherwise noted the same requirements are for replacement and broiler chicks.

Hover Space

- 7 sq. in. for permanent hot water installation
- 7 sq. in. for oil, gas, coal, and wood brooders
- 10 sq. in. for electric brooders
- 1 250 watt infra-red bulb for 50 chicks (18 inches from floor first week and raise 3 inches each week until 24 inches from floor is reached. A canopy over unit will help retain heat).

Hover Temperature

95°F. 2 inches from litter under edge of hover for first week.  
Drop temperature 5 each week until 70°F. is reached.

Floor Space

Replacement chicks:

- $\frac{1}{2}$  sq. ft. per chick to 6 weeks
- 1 sq. ft. per chick from 6 to 12 weeks
- 2 sq. ft. per chick from 12 to 16 weeks

Broiler chicks:

- $\frac{3}{4}$  - 1 sq. ft. per chick to 10 weeks
- 1 -  $1\frac{1}{2}$  sq. ft. per chick from 12 to 16 weeks

Feeder Space

- 1 inch of feeding space per chick to 3 weeks
- 2 inches of feeding space per chick from 3 to 6 weeks
- 3 inches of feeding space per chick from 6 weeks to maturity

Waterer Space for Each 100 Chicks

- |                     |   |
|---------------------|---|
| Day-old to 4 weeks  | 20 inches or one 1-gallon fountain or its equivalent.<br>(two 1-quart fountains can be used instead of the one 1-gallon fountain for cold room brooding so they can be placed under the brooder). |
| 4 weeks to 8 weeks  | 30 inches or one 3-gallon fountain or its equivalent.   |
| 8 weeks to 12 weeks | 40 inches or one 5-gallon fountain or its equivalent.   |

Roosts

Not necessary for broilers

Install at 4-6 weeks old for replacement chicks. Each chick should be provided with 4 inches of roost space.

Source: Poultry Department mimeo.

LAYING FLOCK RECOMMENDATIONS

A. Floor Space

1.  $2\frac{1}{2}$  to 3 sq. ft. of floor area for light breeds,  
 $3\frac{1}{2}$  to 4 sq. ft. of floor area for heavy breeds.

B. Equipment

1. Feeders. Two 8 ft. feeders per 100 birds. Mechanical feeders, 6 to 8 birds per running foot.
2. Water fountains. Four (5 ft.) trough type automatic fountains per 1,000 birds, or four 12-inch to 16-inch diameter round pan automatic fountains per 1,000 birds. 1 cup for each 75 to 100 birds.
3. Roosting space. 6 inches to 7 inches for light breeds, 7 inches to 8 inches for heavy breeds.

APPROXIMATE LOSSES IN WEIGHT BY DRESSING

	Live to dressed	Dressed to ready-to-cook -per cent-	Live to ready-to-cook
Broilers or fryers	11 to 12	27 to 30	35 to 38
Roasters	10 to 11	24 to 27	31 to 35
Stewing hens	10 to 12	23 to 28	31 to 36
Hen turkeys	10 to 11	24 to 25	22 to 24
Tom turkeys	9 to 10	12 to 14	20 to 22
Ducks	10 to 12	20 to 24	28 to 33
Geese	10 to 13	16 to 20	25 to 30

PARTS AND THEIR PERCENTAGE OF WHOLE READY-TO-COOK CARCASS BY WEIGHT

1. Breast	26%
2. Legs	32%
3. Back and neck	23%
4. Wings	11%
5. Gizzard	5%
6. Liver	$2\frac{1}{2}\%$
7. Heart	$\frac{1}{2}\%$

Source: Poultry Department mimeo.



"CHICKEN" ARITHMETIC

Suggested ways to figure some important factors for your poultry farm:

<u>Example</u>	<u>Your Farm</u>																
1. AVERAGE NUMBER OF LAYERS FOR YEAR: $\frac{53,073 \text{ total hens } 13 \text{ inventories} = 4,083}{13}$	total hens of 13 inventories = <u>          </u> <u>13</u>																
2. NUMBER OF EGGS PRODUCED PER LAYER: $\frac{814,632 \text{ eggs produced}}{4,083 \text{ average number layers}} = 199$	$\frac{\text{eggs produced}}{\text{average number of layers}} = \text{_____}$																
3. NUMBER OF EGGS SOLD PER LAYER: $\frac{66,510 \text{ dozens sold } \times 12 = 798,120 \text{ eggs}}{4,083 \text{ average number layers}} = 195$	$\frac{\text{doz. sold } \times 12 = \text{_____ eggs}}{\text{eggs sold}} = \text{_____}$ $\frac{\text{eggs sold}}{\text{average number of layers}} = \text{_____}$																
4. MORTALITY AS PERCENTAGE OF AVERAGE NUMBER OF LAYERS: $\frac{1,206 \text{ layers died}}{4,083 \text{ av. no. layers}} = 0.30 \times 100 = 30$	$\frac{\text{layers died}}{\text{av. no. layers}} = \text{_____} \times 100 = \text{_____}$																
5. MORTALITY AS PERCENTAGE OF NUMBER OF CHICKS STARTED: $\frac{210 \text{ chicks died}}{3,120 \text{ chicks started}} = 0.07 \times 100 = 7$	$\frac{\text{chicks died}}{\text{chicks started}} = \text{_____} \times 100 = \text{_____}$																
6. AVERAGE NUMBER OF MEN WORKING ON THE FARM (MAN EQUIVALENT): <table> <tr> <td>Operator</td> <td>12 months</td> </tr> <tr> <td>Operator's family</td> <td>3 months</td> </tr> <tr> <td>Hired man</td> <td>3 months</td> </tr> <tr> <td></td> <td><u>18 months</u></td> </tr> </table> $\frac{18 \text{ months of labor}}{12} = 1.5$	Operator	12 months	Operator's family	3 months	Hired man	3 months		<u>18 months</u>	<table> <tr> <td>Operator</td> <td>_____ months</td> </tr> <tr> <td>Operator's family</td> <td>_____ months</td> </tr> <tr> <td>Hired man</td> <td>_____ months</td> </tr> <tr> <td></td> <td><u>_____ months</u></td> </tr> </table> $\frac{\text{months of labor}}{12} = \text{_____}$	Operator	_____ months	Operator's family	_____ months	Hired man	_____ months		<u>_____ months</u>
Operator	12 months																
Operator's family	3 months																
Hired man	3 months																
	<u>18 months</u>																
Operator	_____ months																
Operator's family	_____ months																
Hired man	_____ months																
	<u>_____ months</u>																
7. DOZENS OF EGGS SOLD PER MAN: $\frac{66,510 \text{ dozens sold}}{1.5 \text{ man equivalent}} = 44,340$	$\frac{\text{dozens sold}}{\text{man equivalent}} = \text{_____}$																
8. PRICE RECEIVED PER DOZEN EGGS SOLD: $\frac{\$30,581 \text{ received for eggs}}{66,510 \text{ dozens sold}} = \$0.46$	$\frac{\$ \text{ received for eggs}}{\text{dozens sold}} = \$ \text{_____}$																
9. POUNDS OF FEED PER DOZEN EGGS PRODUCED: $\frac{407,316 \text{ pounds feed}}{67,886 \text{ dozen eggs produced}} = 6.0$	$\frac{\text{pounds feed}}{\text{dozen eggs produced}} = \text{_____}$																

Source: Wendell Earle, 1955.

# POULTRY FARM BUSINESS CHART

FARM OF \_\_\_\_\_

YEAR \_\_\_\_\_

Success in farming is the result of many factors. Farm business studies show that the most important factors under the farmer's control are size of business, production rates of crops and animals, labor efficiency and selection and combination of enterprises.

The chart below shows the range of the experience of business poultrymen in New York with respect to size of business, production rates and labor efficiency.

The figure at the top of each column is the average for the best ten percent of the farms in that factor. For example, the figure 250 at the top of the column headed "Eggs Sold per Hen" is the average of the ten percent of the farms with the highest sales per hen. The other figures in the column are the averages for "the next best 10 percent", "the 10 percent below that", and so forth. The figure 150 at the bottom of the column is the average of the ten percent of the farms with the lowest sales of eggs.

Each of the columns is independent of the others. The figure 3000 at the top of the column headed "Hens per Man" is the average of the ten percent of the farms with the highest number of hens per man.

## HOW TO USE THIS CHART

Draw lines in each column to show the rank of the farm business being studied. For example, if the hens produced 188 eggs, draw a line between 185 and 190. Draw heavy lines so that you can see them easily.

Production	Mortality		Size of Business	Efficiency			
Eggs Sold per Hen	Hens Percent of Av. No.	Chicks Percent of No. Started	Number of Hens	Hens per Man	Lb. feed/doz.		Doz. Sold per Man
					Lights	Heavies	
250	6	3	6000	3000	5.1	5.7	52000
230	11	6	3000	2200	5.8	6.6	38000
215	14	8	2200	1600	6.1	7.0	27000
205	16	10	1700	1400	6.4	7.3	24000
200	18	12	1400	1250	6.7	7.6	21000
195	20	14	1300	1150	6.9	7.8	19000
190	23	16	1200	1100	7.2	8.3	18000
180	28	19	1100	1050	7.6	8.9	17000
170	35	25	1000	1000	8.4	9.5	15000
150	50	32	900	900	9.9	11.4	13000

The poultry business is undergoing continuous change. In New York average egg production since 1930 has increased from 140 to over 190 eggs per bird. The labor required to produce a dozen eggs has been almost cut in half as the result of this increase in egg production together with the mechanization of poultry houses. Another important change has been the decline in the number of small poultry flocks and the growth of the full-time commercial poultry farm.

REASONABLE STANDARDS FOR TURKEY PRODUCTION

Pounds of feed per bird raised - 20 lb.	90
Pounds of feed per lb. meat	5½
Brooding space per bird to 8 - 10 weeks	1½ sq. ft.
Porch space - 10 weeks to 6 months	5-6 sq. ft.
Cost of killing and dressing per bird	\$ .75
Mortality	10%
Shrink-live to New York dressed	10%
Shrink-live to oven dressed	23%
Labor per 100 birds raised, hours	75
Number of birds per man to 8 weeks of age	2,000
Investment in land and buildings per bird	\$ 9.00

Source: E. Y. Smith

NEW YORK FARM PRICE OF TURKEYS  
(price per pound)

1952	\$ .43
1953	.43
1954	.41
1955	.37

Source: "Agricultural Prices", U.S.D.A.

GOALS FOR BROILER PRODUCTION

Mortality, per cent	5
Feed per pound of gain, lbs.	2.7
Labor per pound, minutes	1.2
Age sold, weeks	9 - 10
Average weight at 9 - 10 weeks, lbs.	3.5

FORMULA FOR ESTIMATING THE COST PER POUND OF PRODUCING BROILERS

Feed:	_____ lbs. feed to make 1 lb. meat X _____ price per lb. = _____
Labor:	1.2 minutes X _____ cost per minute = _____
Chicks:	.35 X _____ cost of chicks = _____
Other items:	Total of above 3 items X 1.1 = _____
	Total = _____

Source: Bulletin 889 (formula slightly revised).

VEGETABLE YIELDS, PRICES AND GROSS RETURNS PER ACRE  
New York State, 1951-55

Vegetable	Unit	Yield per acre Average 1951-55	Farm price Average 1951-55	Gross return per acre 1951-55
Dry beans	cwt.	10.8	\$ 8.90	\$ 96
Lima beans (fresh)	32 lb. bu.	133	2.67	355
Lima beans (process.)	ton	0.75	152.08	114
Snap beans (early L.I.)	30 lb. bu.	141	2.13	300
Snap beans (late summer)	30 lb. bu.	140	2.27	318
Snap beans (process.)	ton	1.7	121.18	206
Beets (process.)	ton	10.0	21.20	212
Broccoli (fresh)	42 lb. crate	90	2.95	265
Cabbage (early summer)	ton	9.6	44.75	430
Cabbage (fall, L.I.)	ton	10.2	45.74	467
Cabbage (fall, other)	ton	11.6	36.17	420
Cabbage (kraut)	ton	14.7	16.12	237
Cantaloupe	70 lb. crate	124	3.40	422
Carrots	50 lb. bu.	580	.99	574
Cauliflower (summer upstate)	37 lb. crate	352	2.02	711
Cauliflower (fall, L.I.)	37 lb. crate	495	1.35	668
Celery (summer)	60 lb. crate	460	2.57	1,182
Celery (fall)	60 lb. crate	525	2.26	1,186
Cucumbers (fresh)	48 lb. bu.	184	2.01	370
Lettuce	70 lb. crate	238	2.91	693
Onions	50 lb. sacks	553	1.43	791
Peas (fresh)	30 lb. bu.	140	2.33	326
Peas (process.)	ton	0.87	102.38	89
Sweet corn (fresh)	5 doz. ears	97	1.59	154
Sweet corn (process.)	ton	2.9	22.48	65
Spinach (fresh)	20 lb. bu.	460	1.07	492
Spinach (process.)	ton	8.0	33.34	267
Potatoes	cwt.	179	2.04	365
Tomatoes (fresh)	53 lb. bu.	231	2.34	541
Tomatoes (process.)	ton	9.8	31.50	309

Source: U.S.D.A. Agricultural Marketing Service, Crop Reporting Board.

SELECTED FACTORS FOR VEGETABLES  
New York Cost Accounts, 1948-54

	Yield per acre, tons	Labor per acre, hours	Total cost per acre	Return per hour of labor
<u>Canning-Factory Peas</u>				
1948	1.0	15	\$ 81	\$ 1.39
1949	0.5	13	71	- .71
1950	1.0	14	89	1.42
1951	1.1	18	110	1.49
1952	0.9	16	98	1.08
<u>Canning-Factory Tomatoes</u>				
1950	11.1	119	\$ 251	\$ 1.28
1951	13.5	138	332	2.10
1952	12.4	131	331	1.66
1953	11.7	140	364	1.07
1954	9.2	118	335	.82
<u>Cabbage</u>				
1949	9.3	80	\$ 207	\$ .90
1950	6.0	68	141	.08
1951	9.7	104	261	2.52
1952	11.4	105	252	2.02
1953	15.6	107	352	.70
<u>Potatoes</u>				
1948	326*	93	\$ 301	\$ 2.78
1949	325	94	314	1.75
1950	417	112	328	.82
1951	397	104	347	4.49
1952	309	91	389	3.06
<u>Dry Beans</u>				
1948	18*	20	\$ 77	\$ 1.18
1949	12	22	75	- .28
1950	20	18	70	2.06
1951	17	18	81	2.41
1952	21	21	91	2.72

\* Bushels per acre.

Source: A.E. 984, 1023.

AVERAGE COSTS PER ACRE IN PRODUCING PROCESSING CROPS AND POTATOES  
New York State, 1955

Item	Tomatoes	Sweet Corn	Broccoli	Snap Beans	Potatoes
Number of farms	78	88	63	25	34
Acres of crop	21.2	29	13	233	106
Yield per acre, tons	10.3	1.7	1.7	1.6	146**
<u>Growing costs:</u>					
Man labor	\$ 31	\$ 5	\$ 33	\$ 11	\$ 23
Power and equipment					
Tractor	13	5	) 12	6	11
Other power	1	1		1	5
Equipment	9	5		6	10
All fertilizer	46	17	36	19	64
Spray and dust	13	*	23	3	15
Seed or plants	35	3	8	19	54
Land charge	11	10	9	16	20
Interest	2	1	2	1	4
Other	3	--	3	2	3
Total growing cost	\$ 164	\$ 47	\$ 136	\$ 84	\$ 209
<u>Harvesting costs:</u>					
Labor					
Picking	) \$ 100	\$ 14	\$ 75	\$ 87	\$ 36
Supervision and hauling		1		7	9
Trucking and other power		--	10	3	13
Containers and other	5	--	1	1	11
Total harvesting cost	\$ 115	\$ 15	\$ 86	\$ 98	\$ 69
Total cost to grow and harvest one acre	\$ 279	\$ 62	\$ 222	\$ 182	\$ 278
<u>Inputs:</u>					
Man hours, growing	32	5.2	31.5	12.2	20.1
Tractor hours	15.2	4.9	14.3	6.3	14.1
Truck miles	46.9	--	65.6	29	33
Seed or plants	3,014	8 lb.	7,743	1.1 bu.	34 bu.
Commercial fertilizer, lbs.					
N	88	34	87	31	131
P <sub>2</sub> O <sub>5</sub>	163	41	92	59	237
K <sub>2</sub> O	145	39	87	48	233

\* Less than 50 cents.

\*\* Hundredweight per acre.

Source: A.E. 1017, 1018, 1025, 1026, 1044.

## \*ESTIMATING COST OF PRODUCING ONE ACRE OF \_\_\_\_\_

Item of expense	Amount used per acre	Price	Cost per acre
<u>Growing Costs:</u>			
1. Man labor	_____ hrs. @	_____	\$ _____
2. Tractor use	_____ hrs. @	_____	\$ _____
3. Hauling	_____ hrs. @	_____	\$ _____
4. Equipment	_____ hrs. @	_____	\$ _____
5. Fertilizer, manure, lime	_____ cwt. @	_____	\$ _____
6. Spray-dust materials	_____ lbs. @	_____	\$ _____
7. Seed or plants	_____ @	_____	\$ _____
8. Land charge	One acre @	_____	\$ _____
9. Irrigation	_____ @	_____	\$ _____
10. General overhead	_____ @	_____	\$ _____
	_____ @	_____	\$ _____
Total Growing Costs Per Acre			\$ _____
<u>Harvesting Costs:</u>			
11. Man labor	_____ hrs. @	_____	\$ _____
12. Tractor use	_____ hrs. @	_____	\$ _____
13. Hauling	_____ hrs. @	_____	\$ _____
14. Harvesting equipment	_____ @	_____	\$ _____
15. Containers	_____ @	_____	\$ _____
	_____ @	_____	\$ _____
Total Harvesting Costs Per Acre			\$ _____
<u>Storing and Selling Costs:</u>			
16. Storage	_____ @	_____	\$ _____
17. Grading and packing	_____ @	_____	\$ _____
18. Containers	_____ @	_____	\$ _____
	_____ @	_____	\$ _____
Total Storing and Selling Costs Per Acre			\$ _____
TOTAL COST PER ACRE			\$ _____

\* Suggestions for estimating these costs items are given on pages 84-90.

SUMMARY

Yield per acre \_\_\_\_\_ Harvesting cost per unit \_\_\_\_\_  
 Growing cost per acre \_\_\_\_\_ Storing and selling cost per unit \_\_\_\_\_

CALCULATING PROFIT AND LOSS

Gross Returns

<u>Sales</u>	<u>Total quantity</u>	<u>Value</u>	<u>Acres grown</u>	<u>Return per acre</u>
_____	_____	_____		
_____	_____	_____		
Credits for silage, etc.	_____	_____		
Total value		=====	=====	=====

Costs of Production per Acre

Growing costs per acre	_____
Harvesting costs per acre	_____
Storing and selling costs per acre	_____
Total production costs per acre	=====
PROFIT OR LOSS PER ACRE	=====

ESTIMATING BREAK EVEN POINTS

Break even points for yields or prices can be determined once production costs have been estimated. Formulas for estimating the yield necessary to break even at a given price, or the price necessary to break even with a given yield, are given below.

BREAK EVEN YIELD:

1. \$ \_\_\_\_\_ price per unit (-) \$ \_\_\_\_\_ harvest cost per unit (-) \$ \_\_\_\_\_ market cost per unit = per unit to apply toward growing cost

2. \$ \_\_\_\_\_ Difference per cwt. to apply toward growing cost ) \$ \_\_\_\_\_ Growing cost per acre

Yield necessary to break even

BREAK EVEN PRICE:

Break even price \$ \_\_\_\_\_ =  $\frac{\text{Total cost per acre } \$ \text{_____}}{\text{Yield per acre } \text{_____}}$



ESTIMATING COSTS AND RETURNS FOR CASH CROPS

Accurate knowledge of costs and returns for each individual crop can be very helpful to vegetable growers. Knowing last year's profit or loss per acre for each product is a good starting point from which to estimate next year's returns. This information can be used to decide whether to stay with the same crops or to switch to others. The forms on the previous pages provide space to summarize cost items, and will serve as a reminder of the major items.

Suggestions for Estimating Specific Items of CostGrowing Costs

1, 2, and 3. Man Labor, Tractor Hours, and Hauling -- To estimate the total number of man, truck, and tractor hours used in growing the crop fill in the following table.

	Man Labor		Tractor		Truck
	Regular (hours)	Special (hours)	Plow (hours)	Plow (hours)	
Plowing	_____	_____	_____	_____	_____
Fitting	_____	_____	_____	_____	_____
Applying fertilizer	_____	_____	_____	_____	_____
Planting	_____	_____	_____	_____	_____
Thinning or weeding	_____	_____	_____	_____	_____
Cultivating	_____	_____	_____	_____	_____
Applying spray or dust	_____	_____	_____	_____	_____
Irrigating	_____	_____	_____	_____	_____
Other _____	_____	_____	_____	_____	_____
Total hours of labor	=====	=====	=====	=====	=====
Hours per acre	=====	=====	=====	=====	=====

To value man labor it is best to use current market prices or actual wage rates whenever they apply. Family labor can be valued at its alternative in other uses. The average labor charge reported by New York farms keeping cost accounts is about \$1.15 per hour.

The following average costs of tractor operation are suggested as a guide. Fuel but not labor is included in these costs.

Tractor Operating Cost per Hour

<u>Amount of annual use</u>	<u>Tractor Size</u>		
	<u>One-plow</u>	<u>Two-plow</u>	<u>Three-plow</u>
Light	\$ 1.10	\$ 1.20	\$ 1.45
Medium	.80	.95	1.15
Heavy	.60	.75	.95

Information on time required to perform operations such as plowing, spreading fertilizer, etc. is provided on page 20 of this Handbook. Additional information on the number of hours of man labor and tractor operation required to perform certain growing operations on four processing crops and potatoes is given below.

AVERAGE MAN AND TRACTOR HOURS USED TO GROW ONE ACRE  
OF SELECTED CROPS -- 1955

429 Western New York Farms; 34 Steuben County Potato Farms

<u>Growing operation</u>	<u>Tomatoes</u>		<u>Sweet Corn</u>		<u>Broccoli</u>		<u>Snap Beans</u>		<u>Potatoes</u>	
	<u>Man</u>	<u>Trac.</u>	<u>Man</u>	<u>Trac.</u>	<u>Man</u>	<u>Trac.</u>	<u>Man</u>	<u>Trac.</u>	<u>Man</u>	<u>Trac.</u>
	<u>hrs.</u>	<u>hrs.</u>	<u>hrs.</u>	<u>hrs.</u>	<u>hrs.</u>	<u>hrs.</u>	<u>hrs.</u>	<u>hrs.</u>	<u>hrs.</u>	<u>hrs.</u>
Plowing	2.4	2.1	1.3	1.3	2.0	1.9	1.3	1.2	1.2	1.2
Fitting	2.2	2.2	1.5	1.5	2.4	2.4	2.0	2.0	0.6	0.6
Cutting seed	--	--	--	--	--	--	--	--	5.0	--
Planting	8.5	2.3	0.7	0.6	16.5	3.3	1.5	1.0	4.5	1.9
Cultivating	5.6	5.6	1.5	1.5	4.2	4.2	2.3	2.3	3.3	3.3
Spraying-dusting	2.8	2.1	0.1	--	2.9	2.6	0.7	0.7	5.0	3.2

4. Equipment Use -- Only expenses such as repairs, depreciation, servicing, shelter, interest on investment should be included here. Labor and power charges are made separately.

Accurate estimates of equipment costs are difficult to make. There are several indirect methods which give fairly satisfactory results:

- a. New York farm cost account records indicate that on the average the total cost of operating plows, cultivators, and fitting equipment is equal to about 40 per cent of the sale or inventory value of these machines, or,
- b. Multiply the annual depreciation charged by two, or,
- c. To the depreciation charged for the year add the cash cost of repairs and parts for the machine and a flat charge for sheltering, service, and interest on investment.

The charge per acre for the use of plows, fitting equipment, and cultivators should be at least \$3.00 - \$5.00, if not more, for all but very large acreage.

In addition to general tillage equipment, many vegetable farms require specialized equipment such as a setter, duster, sprayer, planter, etc. The cost of using certain special equipment for the production of processing crops is given in the following table:

AVERAGE COST PER ACRE PER TIME OVER FOR SPECIAL MACHINES

Kind of machine	Cost per acre per time over			
	Tomatoes	Broccoli	Snap Beans	Sweet Corn
Setter	\$ 1.20	\$ 1.25	--	--
Sprayer	.85	.95	\$ .90	\$ .45
Duster	.50	.55	.80	--

If the cost of using equipment is to be estimated directly, a form such as the following may be useful:

Annual Cost of Operating Equipment

Type of machine	Original cost	Years life	Present value	Items of annual cost					Cost per acre
				Depr.	Int.	Rep.	Other	Total	
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____

If some work is done by custom machine hire, this cost should also be entered under item 4.

5. Fertilizer, Manure, and Lime -- Information on fertilizer prices is provided on page 4.

A price or value for manure is not easy to determine. The quality of the manure, need for humus, and alternative uses are all considerations. Prices ranging between \$2.00 and \$6.00 per acre have been used. Such a charge would include the cost of spreading the manure on the field. Do not charge for labor, tractor, or equipment a second time if this is already included in the cost of the manure.

6. Spray or Dust Materials -- The cost of a spray or dust control program varies with the price of the materials and the amounts used. Illustrations of the cost of materials for selected treatments are presented on the next page. The cost of materials reported by farmers growing three processing crops is presented in the following table:

COST OF SPRAYING AND DUSTING FOR MATERIALS ONLY  
429 Farms, Western New York, 1954 and 1955

Control material	Cost per acre per application		
	Tomatoes	Broccoli	Snap Beans
Spray	\$ 2.80	\$ 3.05	\$ 1.50
Dust	4.20	4.70	2.85

7. Seed or Plants -- Typical seed costs for growers using purchased seed are shown for selected vegetables on page 89. These costs should only be used as guides. Home grown seed is frequently used for some crops, while in some cases hybrid seed is being introduced at substantially higher prices.

If it is the usual practice to set out plants, use the market price for plants instead of attempting to determine the cost of plants grown in the seed bed.

8. Land Charge -- This charge should approximate the income that can be expected from this acre of bare land in another use, for example, cash rent. A total of taxes, interest on the investment in land, and repairs and maintenance on fences and tiling if any, may provide a good estimate. Charges ranging from \$6.00 to \$12.00 per acre have been most common on farms keeping cost accounts.

9. Irrigation -- Fixed and operating costs for irrigation equipment should be charged in proportion to the amount the equipment was used for this particular crop. One way of doing this is to calculate total annual costs for depreciation, interest, repairs, fuel, and other costs for the power unit, pump, and pipes and divide this by the acre-inches pumped. This will give the cost per acre-inch which can be multiplied by the number of inches applied to the particular crop to find the total cost. Further information on irrigation costs is provided on page 33.

10. General Overhead -- There are some farm expense items that are difficult to charge directly to any enterprise. The farm share of the auto, electricity, and telephone expenses, subscriptions to farm magazines, dues, accounting fees, and

## ILLUSTRATIONS OF COST OF USING CHEMICALS TO CONTROL VEGETABLE INSECTS, DISEASES, AND WEEDS

Chemical	Method of use	Crop	Control sought	Application rate	Approximate 1956 prices	Chemical cost per application	Applications per season
D D	Soil fumigation	Onions, lettuce, carrots, spinach, tomatoes	Root knot nematode	20-30 gallons per acre	\$ 1.50/gal.	\$ 30-45 per acre	1
Ortho Seed Guard or Dupont Delsan	Seed treatment	Snap, dry, and lima beans; beets, cucurbits, sweet corn	Seed rot, damping off, maggots	1½-2 ounces per bushel	\$ 5.00/lb.	\$ .01 per pound of seed	1
Formaldehyde and Dieldrin 15%	Furrow drip at seeding	Onions	Smut and maggots	1½ gallons and 1 pint per acre	\$ 1.25/gal. and \$ 7.00/gal.	\$ 2.75 per acre	1
Dinitro Compounds (Premerge) (Sinox P.E.)	Pre-emergence spray	Snap, dry and lima beans; peas not seeded, sweet corn, cucurbits	All except late germinating weeds	3-4 pounds per acre	\$ 3.75/gal.	\$ 5-8 per acre	1
Parathion	Field spray	Snap, dry, and lima beans; cabbage, cucurbits, onions, potatoes, lettuce	Aphids, beetles, leaf hopper, thrips	1 pint 25% emulsifiable concentrate per acre	\$ 8.00/gal.	\$ 1 per acre	3-4 (6-8 for onions and potatoes)
Maneb (Manzate) (Dithane M22) (Ortho Maneb)	Field spray	Lima beans, beets, celery, cucurbits, onions, tomatoes, potatoes	Anthraxnose, early and late blight, downy mildew, blast, leaf spot	3 pounds per acre (4 pounds for tomatoes)	\$ 1.00/lb.	\$ 3-4 per acre	2-3 (5 for tomatoes)
Captan (Captan 50W) (Orthocide 50)	Field spray	Cucurbits, celery, onions	Scab, early and late blight, downy mildew, blast	3 pounds per acre	\$ .70/lb.	\$ 2 per acre	4-6 (6-8 for onions)

Source: Adapted from New York State Insecticide and Fungicide Conference Report, 1955.

USUAL SEEDING RATES AND COSTS OF VEGETABLE SEEDS PER ACRE

Item	Usual seeding rate per acre (pounds)	1956 price standard varieties (per pound)	Typical seed cost per acre	Usual planting rate per acre (plants)
Dry beans	60 - 80	\$ .25	\$ 18.00	
Lima beans	70 - 80	.35	25.00	
Snap beans	60 - 80	.35	22.50	
Beets	8 - 10	1.25	11.00	
Broccoli	3 - 4 oz. for plants	6.00	1.50	8 - 10,000
Cabbage	3 - 4 oz. for plants	6.00	1.50	7 - 9,000
Cantaloupe	2 - 3	5.00	12.00	
Carrots	2 - 3	2.50	6.00	
Cauliflower	3 - 4 oz. for plants	36.00	9.00	10 - 12,000
Celery	3 - 4 oz. for plants	16.00	4.00	20 - 25,000
Cucumbers	2 - 3	2.50	6.00	
Lettuce (head)	2 - 3	5.50	11.00	
Onions	4 - 5	3.50	16.00	
Peas	100 - 120	.32	35.00	
Potatoes	2,000	.03	60.00	
Sweet corn	10 - 12	.50	6.00	
Tomatoes	3 - 4 oz. for plants	8.00	1.75	2 - 3,000

similar costs must be distributed in some fashion to the various productive enterprises. Limited information would suggest that a charge of from \$2.00 to \$10.00 per acre would cover overhead varying with the type of crop and organization of the individual farm.

Harvesting Costs

11, 12, and 13. Man Labor, Tractor Use, and Hauling -- These costs for harvesting, storing, and selling can be estimated in the same way as labor, power and hauling costs were estimated for the growing operation.

14. Harvesting Equipment -- The same methods can be followed to estimate costs of using harvesting equipment as were used for growing equipment.

15. Containers -- Bags, ties, and baskets should be charged off at cost if used only one season. Containers which last more than one season may be handled in a similar manner if a set quantity are required each year to replace those that wear out.

Storing and Selling Costs

16. Storage -- It is desirable to use the going rate for storage in the locality rather than attempt to estimate actual costs.

17 and 18. Grading, Packing, and Containers -- Special equipment used as well as labor should be included here, and also the actual cost of containers used to market the crop. It is usually better to use the going rate for grading and packing rather than attempt to estimate the actual costs.

EXAMPLE OF USE OF BREAK EVEN POINTS

Suppose it cost \$180.00 to grow an acre of cabbage for kraut, and \$5.00 per ton to harvest it, and \$1.00 per ton to sell it. With a market price of \$15.00 per ton the break even yield would be 20 tons:

1.)  $\$15 - \$5 - \$1 = \$9$  Difference to apply toward growing cost

2.)  $\$9 \overline{) \$180}$  20 tons (Yield necessary to break even)

With a yield of 25 tons to the acre the break even price, on the other hand, would be \$13.20:

Break even price =  $\frac{\$180 + (\$6 \times 25 \text{ tons})}{25 \text{ tons}} = \frac{\$330}{25 \text{ tons}} = \$13.20 \text{ per ton}$

ANNUAL FEED USED BY BEEF CATTLE

Kind of feed	Animals by type			
	Cow	Yearling	Steer	Calf
Grain, lbs.	76	685	1,984	707
Silage, lbs.	5,219	2,386	1,185	447
Dry forage, lbs.	2,891	1,922	1,484	1,020

Source: A.E. 847.

LABOR REQUIRED PER TYPE OF BEEF ANIMAL

Type	Average hours per year
Cow	20
Bull	25
Yearling	12
Steer	12
Calf	12

Source: A.E. 847.

REPORT OF NEW YORK BEEF PRODUCTION PROJECT

	1951	1952	1953
Per cent calf crop weaned*	92	94	84
Average range	81 - 100	81 - 100	69 - 100
Average weight at 6 months:			
Steer		529	
Heifer		475	
Distribution of grade:			
Fancy	6.5%	3.4%	4.3%
Choice	51.5%	56.4%	55.2%
Good	28.1%	34.9%	33.5%
Medium	4.3%	5.3%	7.0%

\*Simple average.

Source: Animal Husbandry mimeo. "Report of the Beef Production Project", by M. D. Lacy

SPACE REQUIREMENTS FOR BEEF ANIMALS

Beef cows	50 - 75 sq. ft. per cow
Beef feeders	40 sq. ft. per animal



## ANNUAL FEED REQUIREMENTS FOR SHEEP

	Cost Account farms 1943-46 average	Indiana 1951
Ewe and lambs		
Grain, lbs.	193	106
Hay, lbs.	505	534
Silage, lbs.	281	

## IMPORTANT PRODUCTION FACTORS IN SHEEP RAISING

	New York production prospects 1947-49	Cost Accounts 1943-46	Ohio Club 1953-55
Lamb crop raised per ewe	1.07	1.05	1.20
Wool clip, lbs.	7.8	7.5	10.0
Annual labor per sheep, hours	--	5.4	--
Gross return per ewe	--	--	27.50
Average weight of lambs at 135 days, lbs.	66.	--	--

Source: Animal Husbandry mimeo., "Empire Sheep Production Prospects", by  
G. R. Johnson

## RELATION OF LAMB CROP TO PROFITS

Per cent lamb crop	Pounds lamb per ewe	Net returns per ewe
57	47	\$ 2.48
96	75	9.63
124	103	16.10

Source: Purdue Bulletin 591, "Sheep Returns in Southern Indiana, 1951".

## FATTENING LAMBS

	New York Cost Accounts 1942-46	Desirable goals
Number of days fed	140	--
Per cent mortality	6.0	--
Average weight at purchase, lbs.	60	--
Average weight per lamb sold, lbs.	84	--
Average daily gain	.171	.34
Feed per 100 lbs. gain:		
Grain, lbs.	--	370
Alfalfa hay, lbs.	--	470

Source: A.E. 659; G. R. Johnson

# FEED REQUIREMENTS FOR SWINE

400 lb. sow and 1 litter	1,800 to 2,000 lbs. per year
400 lb. sow and 2 litters	2,300 to 2,500 lbs. per year
Per 100 lbs. gain (excluding sow):	
Dry lot	375 to 400 lbs.
Pasture	325 to 350 lbs.

## Concentrates daily for:

A 50 pound pig (dry lot). . . . .	3 lbs. or 6% of live wt.
A 100 pound pig (dry lot). . . . .	5 to 5½ lbs. or 5½% of live wt.
A 200 pound pig (dry lot). . . . .	8 to 9 lbs. or 4 to 4½% live wt.

A sow nursing a large litter of pigs over 2 weeks of age may eat 10 to 15 pounds of suitable concentrate feed daily or may be self fed a suitable mixture.

Pigs given access to good pasture will eat about 75 per cent as much feed daily as pigs fed in dry lot.

Source: Animal Husbandry mimeo.

## LABOR PER SOW AND LITTER (7 DAYS) Report of New York Swine Production Project

	1947	1951
Number of live pigs farrowed per sow	10	10.8
Number of pigs weaned per sow	8	9.1

## GAINS AND EFFICIENCY OF GAINS BY PIGS AT VARIOUS PERIODS\*

Live weight (lbs.)	Average gain per day during period	Feed per 100# gain	Total feed per 100# weight at end of period
35 (weaning weight)	--	--	766
36-50	.62	338	638
51-75	.82	347	541
76-100	1.13	361	496
101-125	1.33	376	472
126-150	1.47	392	459
151-175	1.59	408	451
176-200	1.68	427	448
201-225	1.71	448	448
226-250	1.69	470	450
251-275	1.67	496	455
276-300	1.6	523	460

\*Includes feed eaten by the breeding herd.

Source: "Feeds and Feeding", 21st Edition; Animal Husbandry Mimeo. Report of Sow Testing Project.