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# Costs and Returns In Producing Eggs On New York Farms, 1946-47

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COSTS AND RETURNS IN PRODUCING EGGS ON NEW YORK FARMS  
1946-47/1

C. D. Kearl

Poultry farming in New York State is an important enterprise. About two-thirds of the 150 thousand farms in the State keep poultry. The receipts from the sale of poultry and poultry products from these farms totaled \$142 million in 1947. This was one-fourth of the total receipts from all livestock and livestock products for the State.

Although the bulk of the flocks in New York State are small flocks of less than 400 layers, there were, in 1945, 8,177 farms with 400 and more layers. To keep abreast of the technological developments in egg production on these latter farms it has been necessary to make poultry farm management studies at frequent intervals. Studies were made in 1926, in each year from 1929 to 1933, in 1941, and again in 1947.

The latter study was made during one of the most prosperous periods in the history of farming. Prices generally were high, having risen rapidly from the pre-war levels. Egg prices were high, but had not risen as rapidly as had other farm prices.

The 1947 study included 172 poultry farms situated in four different regions of the State and covered the year ending August 30, 1947. The purposes of the study were to: (1) measure the technological changes in the production of eggs, (2) study the costs and returns in producing eggs, and (3) evaluate the important factors which affect costs and returns.

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/1 ACKNOWLEDGMENTS. This report was prepared under the direction of L. B. Darrah of Cornell University. M. S. Parsons and others of the Bureau of Agricultural Economics read the manuscript and made valuable suggestions.

This publication is the second report from New York on a cooperative study conducted by the Cornell Agricultural Experiment Station, several other Agricultural Experiment Stations, and the Bureau of Agricultural Economics. The objectives of the overall study were to analyze the comparative economic efficiency with which farmers use their resources in the production of eggs and other poultry products, in different regions of the United States. The field records in New York were taken by: A. H. Kantner, W. G. Earle, E. N. Searls, C. D. Kearl and L. B. Darrah of the Department of Agricultural Economics at Cornell University, and W. F. Finner, E. G. Strand, H. C. Fowler, R. P. Christensen and M. S. Parsons of the Bureau of Agricultural Economics, United States Department of Agriculture.

The first report on this study from New York was A. E. 682, entitled "Costs of Raising Pullets on New York Farms, 1947" by M. J. Pickler and published by the Department of Agricultural Economics at Cornell University in cooperation with the Bureau of Agricultural Economics, United States Department of Agriculture.

The State was divided into five areas according to the nature of poultry production within the areas as determined from census information (figure 1). The Eastern Area adjacent to the New York City Market is an area of large commercial flocks. The Central Area is next in importance in large scale commercial production and depends to a considerable extent on New York City for its market. The Western Area is similar to the Central Area except that Buffalo and Rochester provide large local markets for eggs. The Southwestern Area is less advantageously located with reference to markets and has somewhat smaller flocks. The Northern Area has very little commercial poultry production with most of the chickens in small flocks primarily for home use.

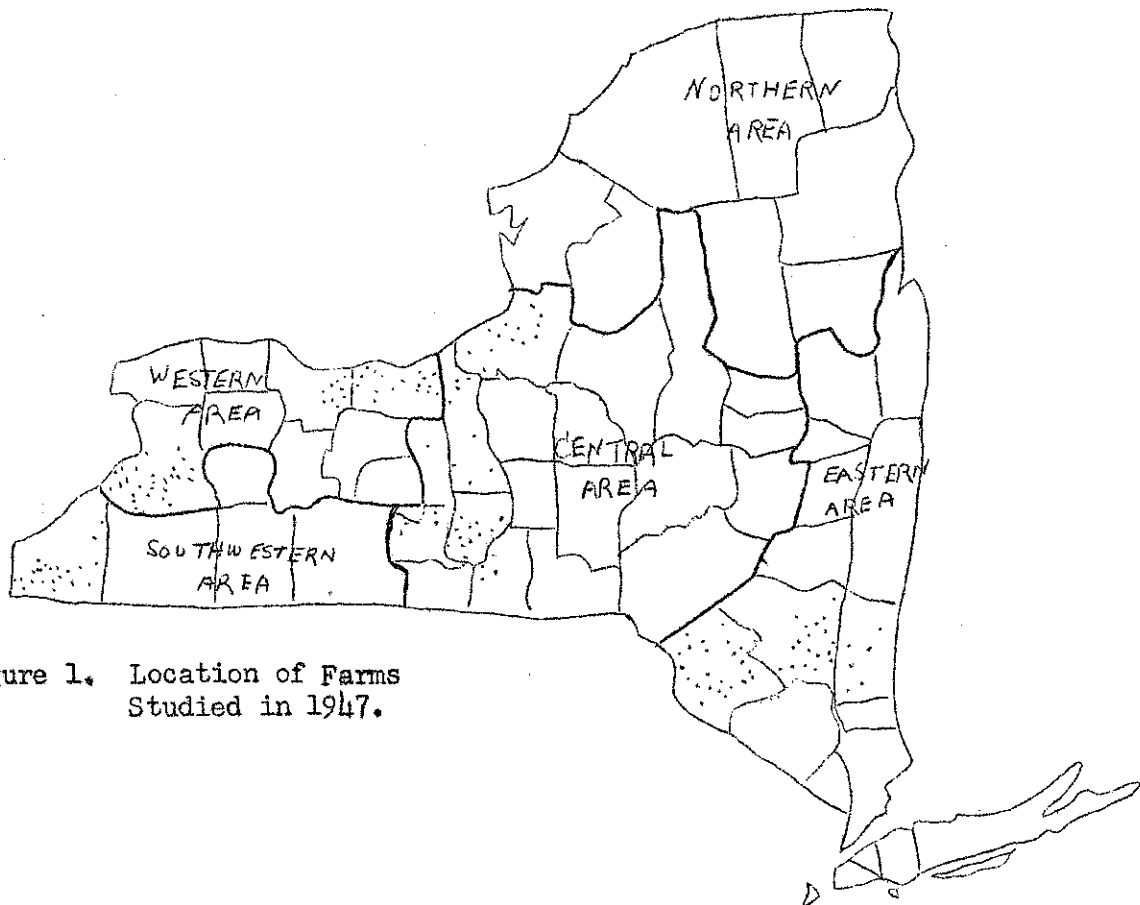


Figure 1. Location of Farms Studied in 1947.

No farms were selected in the Northern Area because of the relatively small importance of poultry production. Farms selected in the other four areas were chosen to reflect the production characteristics of the area as indicated by special census tabulations. That is, more of the flocks in the Eastern Area were on specialized farms averaging about 1,000 layers (table 1). In the Western and Central Areas the flocks were smaller and were frequently found on farms with dairy or fruit enterprises. In the Southwestern Area the flocks were still smaller with most having fewer than 400 birds. No farms with less than 100 birds were included.

Table 1. NUMBER OF RECORDS TAKEN IN EACH AREA BY SIZE OF FLOCK

Area	Average number of layers for year			Total
	100-399	400-999	1000 and more	
Southwestern	10	7	2	19
Western	13	27	13	53
Central	14	26	10	50
Eastern	3	18	29	50
Northern	---	---	---	---
Total	40	78	54	172

### THE FARM BUSINESS

The farms included averaged just under two-men businesses with a range from 1.0 to 4.8 (table 2). The average acreage per farm was 83 of which 32 were cropped. The size of flock ranged from 113 to 5,337 and averaged 917 layers which produced 13,173 dozen eggs. The number of pullets raised was 1,196 per farm.

Table 2. SIZE OF FARM  
172 New York Farms, 1946-47

Item	Amount per farm	
	Average	Range
Work units*	479	115 - 1,429
Man equivalent	1.8	1.0 - 4.8
Total acres operated	83	3 - 287
Acres of crops	32	0 - 196
Number of layers	917	113 - 5,337
Dozens of eggs produced	13,173	1,624 - 73,406
Number of pullets raised	1,196	0 - 7,500

\* A work unit is the average amount of productive work accomplished by a man in 10 hours.

On most of the farms the poultry enterprise was in combination with other enterprises such as dairy, fruit and cash crops. The average number of work units for all farms was 479. Poultry, including the hen, chick and incubation enterprises, accounted for slightly over one-half of the total work units (table 3). Hens accounted for 39 per cent of the total. However, on the farms with light breeds, hens were relatively about twice as important as on the farms with heavy breeds.

Table 3.

DISTRIBUTION OF PRODUCTIVE WORK  
172 New York Farms, 1946-47

Enterprise	Work units per farm			Per cent of total work units		
	Light breeds	Heavy breeds	All farms*	Light breeds	Heavy breeds	All farms*
Layers	221	126	186	47.9	25.5	38.8
Rearing	49	60	56	10.6	12.1	11.7
Incubation	7	3	5	1.4	0.6	1.1
Total on poultry	277	189	247	59.9	38.2	51.6
Cows	71	135	96	15.5	27.4	20.0
Other livestock	9	14	11	2.0	2.9	2.3
Forage crops	18	26	20	3.9	5.3	4.2
Grain crops	15	27	20	3.2	5.5	4.2
Fruit	26	35	27	5.7	7.1	5.6
Cash crops	14	27	23	3.2	5.3	4.8
Outside labor	31	41	35	6.6	8.3	7.3
Total	461	494	479	100.0	100.0	100.0

\* Includes 39 farms with mixed breeds.

There was a significant difference in the organization of the farms having light breeds and those with heavy breeds. The farms with light breeds were slightly smaller in terms of work units and more of the work units were on poultry. Of the average of 461 work units, 277 or almost 60 per cent were on poultry. For the heavy breeds 189 work units out of 494 were on poultry. Fifteen per cent of the work units for the farms with light breeds were on dairy cows. For those with heavy breeds dairy cows were almost twice as important. As would be expected, with more cows and other livestock the farms with heavy breeds had more work units on roughage and grain crops.

### THE LAYING ENTERPRISE

#### Number of Layers in Flocks by Months

The farms with light breeds averaged 1,095 layers as compared to 614 for those with heavy breeds (table 4). The peak number of layers for the light breeds was in the month of November when the average was 1,195. For the heavy breeds the peak came somewhat earlier in the year with an average of 852 layers in September.

There was considerably more variation from month to month in the heavy breeds than the light. The peak month for the light breeds was 109 per cent of the average for the year while the lowest month, June, was 87 per cent. For the heavy breeds the peak in September was 139 per cent of the average for the year while the low in May was only 59 per cent. Much of this variation was due to the fact that several of the farms with heavy breeds sold their laying flocks after four or five months. This practice is followed on increasing numbers of farms and will be considered in greater detail in a later report.

Table 4. NUMBER OF LAYERS IN FLOCKS BY MONTHS  
172 New York Farms, 1946-47

Year and month	Light breeds		Heavy breeds		All farms*	
	Number	Percentage of average for year	Number	Percentage of average for year	Number	Percentage of average for year
1946:						
September	1,134	104	852	139	1,027	112
October	1,178	108	788	129	1,045	114
November	1,195	109	742	121	1,053	115
December	1,179	108	724	118	1,026	112
1947:						
January	1,141	104	669	109	966	105
February	1,104	101	566	93	893	97
March	1,066	97	448	73	818	89
April	1,027	94	378	62	765	83
May	990	90	363	59	737	80
June	951	87	400	65	732	80
July	998	91	501	82	814	89
August	1,115	102	683	112	980	107
Year	1,095	100	614	100	917	100

\* Includes 39 farms with mixed breeds.

Although different farms were included in the poultry farm management study conducted in 1940-41/2, the variation in poultry numbers was similar to that found in 1946-47. There was slightly more variation for the light breed flocks, 111 per cent in October to 82 per cent in June, and less variation for heavy breed flocks with 120 per cent in October and 67 per cent in May. The number of layers in the 1940-41 study averaged 1,369 for the farms with light breeds and 838 for those with heavy breeds.

#### Additions of Pullets to Laying Flocks

During the year for all farms an average of 831 pullets were added to the laying flock (table 5). Farms with light breeds added an average of 730; those with heavies, 822. For the farms with light breeds the month of largest additions was July when 29.5 per cent of the pullets were added. An additional 25.0 per cent were added in August, 14.9 per cent in September and 19.1 per cent in October. Poultrymen started adding the heavy breed pullets earlier than they did light breeds. Some pullets were added in May and by the end of July over 44 per cent of the pullets had been added to the laying flock. However, August with 31.2 per cent was still the most important month. As with the light breeds, the number housed declined in September, then rose to a minor peak of 10.0 per cent in October.

/2 Costs and Returns From the Laying Flock on Commercial Poultry Farms, 1940-41. Cornell University Agricultural Experiment Station Bulletin 802, L. B. Darrah, November, 1943.

In 1941, up through August 40.2 per cent of the pullets for the light breed flocks had been added, as compared with 56.7 per cent in 1947. For the flocks with heavy breeds up through August in 1941, 60.9 per cent had been added as compared to 66.3 per cent in 1947. This of course was made possible by starting pullets earlier in the year./3

Table 5. ADDITIONS OF PULLETS TO LAYING FLOCK  
172 New York Farms, 1946-47

Year and month	Average number of pullets added per farm			Proportion of total pullets added		
	Light breeds	Heavy breeds	All farms	Light breeds	Heavy breeds	All farms
1946:						
September	109	48	83	14.9	5.8	9.9
October	140	83	131	19.1	10.0	15.7
November	65	45	55	8.9	5.4	6.7
December	3	16	7	0.3	2.0	0.8
1947:						
January	1	9	3	0.1	1.1	0.4
February	—	—	—	—	—	—
March	2	—	2	0.3	—	0.2
April	—	—	—	—	—	—
May	—	53	30	—	6.5	3.7
June	14	114	56	1.9	13.9	6.8
July	216	198	231	29.5	24.1	27.8
August	183	256	233	25.0	31.2	28.0
Year	733	822	831	100.0	100.0	100.0

#### Method of Disposal and Value Received for Layers Sold

Most of the layers culled out of the laying flock were sold alive for meat (table 6). For all farms 86.7 per cent were sold in this manner; 7.0 per cent were sold dressed. The average value of the birds sold for meat was 31 cents higher for the dressed poultry than for the live.

For the farms with light breeds 83.3 per cent of the birds were sold alive while 6.6 per cent were sold dressed. For the heavy breeds 92.9 per cent were sold live and 3.7 per cent dressed. The dressed birds for the Leghorns returned 53 cents more per bird than those sold live. For the heavies the dressed birds averaged only 7 cents higher. On the basis of live weight the light breed birds sold alive weighed 4.5 pounds or 0.2 pounds more than those which were dressed. The heavy breeds sold alive weighed 6.1 pounds or 0.6 pounds more than those sold as dressed birds. If the birds sold dressed had weighed as much as those sold live, the difference due to method of sale would have been greater than that indicated above.

/3 Costs of Raising Pullets on New York Farms, 1947. A. E. 682, M. J. Pickler, November, 1948.



Table 6. METHOD OF DISPOSAL AND VALUE RECEIVED FOR LAYERS SOLD  
172 New York Farms, 1946-47

How disposed of	Light breeds			Heavy breeds			All farms		
	Layers per farm	Per- centage of total	Value per layer	Layers per farm	Per- centage of total	Value per layer	Layers per farm	Per- centage of total	Value per layer
Sold for layers:	6	1.2	\$2.00	1	0.1	\$2.19	3	0.5	\$2.01
Sold for meat:									
Dressed	33	6.6	1.79	29	3.7	2.52	45	7.0	2.16
Alive	420	83.3	1.26	736	92.9	3.45	555	86.7	1.85
Eaten	45	8.9	1.24	26	3.3	2.17	37	5.8	1.51
Total	504	100.0	\$1.30	792	100.0	\$2.43	640	100.0	\$1.85

#### Kind and Amount of Feed Used

The average amount of feed required per layer for all farms was 110.6 pounds (table 7). Of this, 9.8 pounds were homegrown. The balance, 100.8 pounds, was purchased. For the light breeds 108.6 pounds of feed were required per layer. Of this, 7.9 pounds were homegrown and 100.5 pounds were purchased. For the heavies, considerably more feed was required, the average being 116.8 pounds per layer. Slightly more of the feed for the heavy breed flocks was homegrown.

Even though feed was expensive and hard to obtain during part of the year, homegrown grain made up only a relatively small part, 8.9 per cent, of the total feed fed. Before the War it averaged 7.5 per cent.

In 1940-41 the average amount of feed per layer in light breed flocks was 95.0 pounds. For heavy breeds the average was 107.8. The amount of feed used per layer for light breed flocks has increased 16 per cent; for heavy breeds 8 per cent.

The amount of mash fed the light breeds was 54.9 pounds per layer. The grain fed was 50.2 pounds and the other feed consisting of shells, grit, milk products and succulents amounted to 3.5 pounds (table 8). For the heavy breeds more mash was required and slightly more scratch. Of the total feed fed per layer, 62.6 pounds were mash; 51.0 pounds, grain; 3.2 pounds, other feed.

Table 7.

KIND AND AMOUNT OF FEED USED  
143 New York Farms, 1946-47

Kind	Light breeds		Heavy breeds		All farms	
	Pounds per layer	Per-centage of total	Pounds per layer	Per-centage of total	Pounds per layer	Per-centage of total
Homegrown:						
Corn	2.1	1.9	4.6	3.9	2.5	2.3
Wheat	3.1	2.8	5.4	4.6	4.0	3.6
Other	2.7	2.5	4.4	3.8	3.3	3.0
Total	7.9	7.2	14.4	12.3	9.8	8.9
Purchased:						
Corn	4.5	4.1	6.5	5.6	5.0	4.5
Wheat	4.1	3.8	4.7	4.0	3.8	3.5
Cracked corn	1.3	1.2	0.7	0.6	1.1	0.9
Oats	1.9	1.7	0.9	0.8	1.4	1.3
Scratch	25.4	23.4	21.7	18.6	25.1	22.7
Laying mash	51.0	47.0	57.8	49.5	53.2	48.0
Breeder mash	3.9	3.6	4.8	4.1	3.7	3.4
Other	5.1	4.7	2.1	1.8	4.2	3.8
Grit and shell	3.3	3.1	3.1	2.6	3.1	2.8
Total	100.5	92.6	102.3	87.6	100.6	90.9
Milk products	0.2	0.2	0.1	0.1	0.2	0.2
Total all feed	108.6	100.0	116.8	100.0	110.6	100.0

Table 8. FEED USED PER BIRD AND PER DOZEN EGGS PRODUCED  
143 New York Farms, 1946-47

Kind of feed	Pounds per bird			Pounds per dozen eggs		
	Light breeds	Heavy breeds	All farms	Light breeds	Heavy breeds	All farms
Grain	50.2	51.0	50.5	3.3	3.3	3.3
Mash	54.9	62.6	56.9	3.7	4.0	3.8
Other*	3.5	3.2	3.2	0.2	0.2	0.2
Total	108.6	116.8	110.6	7.2	7.5	7.3

\* Includes shells, grit, milk products, succulents.

The feed required per dozen eggs for light breeds was 7.2 pounds. Heavy breeds required somewhat more with 7.5 pounds. The average for all farms was 7.3 pounds. Mash made up a slightly larger proportion of the total feed used in 1946-47 than in 1940-41.

Even though the feed per layer was considerably higher in 1946-47 than the 98.0 pounds used in 1940-41, the feed per dozen eggs was only slightly higher for light breeds and slightly lower for heavy breeds. For light breeds the amount of feed used per dozen eggs in 1940-41 was 6.9 pounds and for heavies it was 7.9 pounds. Although feed used per bird has risen about 10 per cent since 1940-41, the increase in rate of lay has resulted in no significant change in the amount of feed required per dozen eggs.

### Labor Required

An average of two hours of man labor was required per layer for the light breeds (table 9). About one-half of this time was used in doing chores. Of the balance, three-quarters of an hour per layer was required for cleaning and handling eggs. For the heavy breeds 2.26 hours were required per layer. Here again about one-half was spent on chores and three-fourths of the balance on handling eggs. The average of all farms was 2.07 hours of labor per layer. Chores accounted for 1.1 hours and handling eggs 0.8 hours.

Table 9. LABOR REQUIRED PER LAYER AND PER DOZEN EGGS  
170 New York Farms, 1946-47

Item	Labor per layer			Labor per dozen eggs		
	Light breeds	Heavy breeds	All farms	Light breeds	Heavy breeds	All farms
	hours	hours	hours	minutes	minutes	minutes
Chores	1.0	1.3	1.1	4.3	5.2	4.6
Cleaning buildings	.1	.2	.1	.5	.7	.6
Handling eggs	.8	.7	.8	3.1	2.9	3.2
Other	.1	.1	.1	.3	.3	.3
Total	2.0	2.3	2.1	8.2	9.1	8.7

The labor per dozen eggs for farms with light breeds was 8.2 minutes, for heavy breeds, 9.0 minutes. For all farms the average was 8.7 minutes per dozen.

Although the farms studied in this survey were somewhat smaller than those in 1940-41, they were somewhat more efficient. In the earlier study 2.2 hours were required per layer for light breed flocks and 2.4 hours for those with heavy breeds. It should be noted that most of the efficiency gained has been in reducing chore time and time required for cleaning buildings. No improvement was evident in the time required for cleaning, grading and packing eggs.

### Egg Production Per Layer

The average egg production was 172 eggs per hen (table 10). This was 4 eggs per hen more than in 1940-41. For the light breeds the average was 175; for the heavy breeds, 179. In the earlier study these averages were 168 and 167, respectively.

Table 10. EGG PRODUCTION PER LAYER  
172 New York Farms, 1946-47

Item	Average number of layers per farm	Egg production	
		Average per layer	Range per farm
Light breeds	1,095	175	72-231
Heavy breeds	614	179	62-246
All farms	917	172	62-246

The average rate of lay for all farms was 47.2 per cent (table 11). The heavy breeds had a somewhat higher average than did the light breeds with 49.1 per cent as against 47.9. Part or all of this difference may have been due to heavier culling of the laying flock by the poultrymen with heavy breeds than by those with light breeds. For both groups of farms, the highest per cent lay came during the winter and spring months. During the fall months when the pullets were coming into production the per cent lay was the lowest. In 1946-47 and in 1940-41 the season of highest rate of lay came later for the light breeds than for the heavy. The peak month for the light breeds in 1946-47 was in May, whereas for the heavy breeds it was in March.

### Mortality of the Laying Flock

The mortality of light breed layers was 15.2 per cent of the average number of layers for the year (table 12). For the heavy breed flocks it was 16.3 per cent.

In 1940-41 the mortality for light breeds was 26.5 per cent and for heavies, 20.6 per cent. Not only has the mortality rate declined considerably during the past few years, but it has declined more for light breeds than for heavies.

The reduction in mortality was probably due to a combination of factors, chief of which would be: (1) higher sale value of the birds which encouraged close culling; (2) improved management practices such as keeping of all-pullet flocks, use of drugs and sanitary measures to combat disease, improvement of housing facilities to improve ventilation and cleanliness; (3) breeding for disease resistance; and (4) high city wages which probably encouraged farmers with high mortality rates for their flocks to discontinue the chicken business.

Table 11. EGGS PRODUCED PER LAYER AND PERCENTAGE LAY  
172 New York Farms, 1946-47

Year and month	Eggs produced per layer			Percentage lay		
	Light breeds	Heavy breeds	All farms	Light breeds	Heavy breeds	All farms
1946:						
September	11.7	12.1	11.8	39.0	40.4	39.4
October	12.6	13.6	12.8	41.5	43.9	41.2
November	12.6	14.8	13.5	44.9	49.3	45.0
Average for fall months	37.9	40.4	38.1	41.6	44.4	41.9
December	14.6	17.6	15.2	47.1	56.7	49.0
1947:						
January	15.6	18.4	16.1	50.4	59.3	51.9
February	15.1	16.3	15.2	54.0	58.3	44.5
Average for winter months	45.3	52.5	46.6	49.8	57.6	51.2
March	16.2	19.1	16.6	52.2	61.5	53.5
April	16.4	17.5	16.4	54.8	58.3	54.6
May	17.4	16.3	16.6	56.1	52.7	53.7
Average for spring months	49.9	53.2	49.6	54.9	58.5	54.5
June	16.3	14.7	15.4	54.2	49.1	51.4
July	14.7	15.0	15.4	47.4	48.4	46.3
August	12.9	13.4	12.5	41.5	43.4	40.4
Average for summer months	43.6	42.8	41.9	47.9	47.0	46.0
Year	175.1	179.2	172.4	47.9	49.1	47.2

Table 12. MORTALITY OF LAYING FLOCK  
172 New York Farms, 1946-47

Item	Number of farms	Average number of layers per farm	Mortality	
			Number of layers died	Per cent of average number that died
Light breeds	82	1,095	167	15.2
Heavy breeds	53	614	100	16.3
All farms	172	917	144	15.7

## COSTS AND RETURNS

In determining the costs and returns from the laying flock, the value of the feed used by the laying flock during the year, home-grown and purchased, was obtained from the farmer. The cost of purchased feed was in most cases taken from the farmer's feed purchase slips. The amounts and values of home-grown feeds used were estimated by the farmer.

The number of hours of labor which each person worked was obtained from the farmer. The cost for unpaid labor, except the farmer, and for all paid labor, was calculated from information supplied by the farmer as to labor rates. The value of the farmer's time was set at \$2,100 per year, which is about one and one-half times the average of New York hired men's wages, with and without board. This rate, from past experience, is about what farmers have estimated their time to be worth.

The depreciation cost was determined by adding the value of the beginning inventory of layers, the pullets added and the layers purchased, and subtracting from this total the value of the layers sold or eaten and the ending inventory of layers. Depreciation then results from mortality and the sale of hens at a price below the value of new pullets.

The buildings and equipment, horse and tractor, truck and auto costs were calculated by applying a cost rate obtained from cost account records to the average inventories, and hours or miles of use.

Interest on stock was figured at a rate of 5 per cent on the average inventory.

The returns for eggs were taken from the farmer's egg sales slips and estimates as to eggs sold or used. The returns other than eggs were estimated by the farmer.

### Costs and Returns Per Layer

The average cost per layer for all farms for the year 1946-47 was \$7.62 (table 13). Of this, \$4.57 or 60.0 per cent was for feed. Labor amounted to \$1.30 or 17.1 per cent. These two items made up about three-fourths of the total cost. The returns, almost entirely from eggs, averaged \$7.78 per layer; the profit, 22 cents. The return per hour of labor on the laying flock was 76 cents.

The average cost for the flocks with light breeds was \$7.64 per layer of which \$4.52 was for feed and \$1.26 for labor.

Table 13.

COSTS AND RETURNS PER LAYER  
172 New York Farms, 1946-47

Item	Light breeds		Heavy breeds		All farms*	
Number of farms	82		53		172	
Average number of layers	1,095		614		917	
Eggs per layer	175		179		172	
Per cent mortality	15		16		16	
Pounds of feed per layer	109		116		110	
Hours of labor per layer	2.0		2.3		2.1	
	Dollars	Per cent	Dollars	Per cent	Dollars	Per cent
<u>Costs per layer:</u>						
Feed	4.52	59.2	4.76	62.0	4.57	60.0
Labor	1.26	16.5	1.43	18.6	1.30	17.1
Buildings & equipment	.49	6.4	.56	7.3	.50	6.6
Depreciation	.97	12.7	.38	4.9	.82	10.7
Other	.40	5.2	.55	7.2	.43	5.6
Total	7.64	100.0	7.68	100.0	7.62	100.0
<u>Returns per layer:</u>						
Eggs	8.02	99.4	7.65	98.8	7.78	99.2
Other	.05	0.6	.09	0.2	.06	0.8
Total	8.07	100.0	7.74	100.0	7.84	100.0
Profit per layer	.43		.06		.22	
Return per hour of labor	.84		.65		.76	
Return for labor per layer	1.69		1.49		1.52	
Total return for labor	1,839.51		912.36		1,388.69	

\* Includes 39 farms with mixed breeds.

For flocks with heavy breeds the average cost was \$7.68 which is about the same as for light breeds. The cost for feed was \$4.76; for labor \$1.43. A part of the higher cost for feed, labor and other items for the heavy breeds was offset by a considerably smaller depreciation for the birds in the heavy breed flocks. For the heavy breeds the depreciation cost amounted to 38 cents per layer, whereas for the light breeds the cost was 97 cents. This difference in depreciation resulted not from mortality but from the higher sale value of the heavy breed layers.

The returns for the light breeds amounted to \$8.07; for heavy breeds, \$7.74. Profit per layer (over all costs including operator's labor) for light breeds was 43 cents as against 6 cents for the heavy breeds. The return per hour of labor was 84 cents as compared to 65 cents. The return for labor on the enterprise amounted to \$1,839.51 for the light breeds as compared to \$912.36 for the heavy breeds. Not only was the return per hour

of labor greater for the light breed flocks, but the light breed flocks were larger and, consequently, more labor was spent in caring for the larger flocks; thus the very large difference between farms with light and heavy breeds in total returns for labor on the enterprise.

### Costs and Returns Per Dozen

The average cost per dozen eggs was 53.0 cents (table 14). All returns per dozen were 54.5 cents, giving a profit of 1.5 cents per dozen. When the returns other than eggs were subtracted from the total cost, the net cost of producing eggs amounted to 52.6 cents.

Because of differences in the level of prices, both the costs and returns were much higher in 1946-47 than in 1940-41. The average cost per dozen eggs for all farms in 1940-41 was 28.6 cents and the returns amounted to 29.8 cents. The profit, 1.2 cents, was almost the same as in 1946-47.

Table 14.

### COSTS AND RETURNS PER DOZEN EGGS 172 New York Farms, 1946-47

Item	Light breeds		Heavy breeds		All farms	
Number of farms	82		53		172	
Average number layers	1,095		614		917	
Eggs per layer	175		179		172	
Per cent mortality	15		16		16	
Pounds of feed per dozen eggs	7.2		7.5		7.3	
Minutes of labor per dozen eggs	8.2		9.1		8.7	
	Per		Per		Per	
	Cents	cent	Cents	cent	Cents	cent
<u>Costs per dozen eggs:</u>						
Feed	31.0	59.1	31.9	62.1	31.8	60.0
Labor	8.6	16.4	9.6	18.7	9.0	17.0
Buildings and equipment	3.4	6.5	3.8	7.4	3.5	6.5
Depreciation	6.6	12.6	2.5	4.8	5.7	10.8
Other	2.8	5.4	3.6	7.0	3.0	5.7
Total	52.4	100.0	51.4	100.0	53.0	100.0
<u>Returns per dozen eggs:</u>						
Eggs	54.9	99.3	51.2	98.8	54.1	99.3
Other	0.4	0.7	0.6	1.2	0.4	0.7
Total	55.3	100.0	51.8	100.0	54.5	100.0
Profit per dozen eggs	2.9		0.4		1.5	
Net cost per dozen eggs	52.0		50.8		52.6	



Cost per dozen eggs produced for light and heavy breed layers was nearly the same with 52.4 cents for the light breeds and 51.4 cents for the heavies, a difference of one cent in favor of the heavy breeds.

The returns, however, were much higher for the light breeds with 55.3 cents as compared to 51.8 cents for the heavy breed layers, a difference of 3.5 cents. This difference in returns was sufficient to offset the lower cost for heavy breed layers and result in a much higher profit per dozen eggs for light breed flocks. The average profit per dozen eggs for the light breeds was 2.9 cents as compared to 0.4 cents for the heavies.

### Costs and Returns in Producing Eggs by Areas

The cost per dozen eggs varied considerably between areas of the State. For the Eastern Area it was highest at 55.7 cents (table 15). The lowest cost found was in the Central Area, 46.8 cents. The Western Area averaged 54.4 cents and the Southwestern Area 53.2 cents. The returns were lowest in the Southwestern Area with 50.5 cents per dozen. The returns in the Western Area and in the Eastern Area, both located near large cities, were 56.1 cents in each case. In the Central Area the returns per dozen eggs amounted to 51.3 cents.

Table 15. COSTS AND RETURNS IN PRODUCING EGGS BY AREAS  
172 New York Farms, 1946-47

Item	South- western	Western	Central	Eastern
Number of farms	19	53	50	50
Number of layers	470	692	730	1,512
Per cent mortality	15	15	17	15
Eggs per layer	182	169	187	166
Minutes of labor per dozen eggs	11.3	8.7	8.1	8.6
Pounds of feed per dozen eggs	7.8	8.0	7.0	7.9
	Cents	Cents	Cents	Cents
<u>Costs per dozen eggs:</u>				
Feed	30.8	32.4	28.9	33.3
Labor	12.4	9.6	8.3	8.7
Buildings and equipment	3.5	3.3	3.0	3.8
Depreciation	3.8	6.2	3.3	7.0
Other	2.7	2.9	3.3	2.9
Total	53.2	54.4	46.8	55.7
<u>Returns per dozen eggs:</u>				
Eggs	49.7	55.4	50.9	55.9
Other	0.8	0.7	0.4	0.2
Total	50.5	56.1	51.3	56.1
Profit per dozen eggs	- 2.7	1.7	4.5	0.4
Net cost per dozen eggs	52.4	53.7	46.8	55.5
Return per hour of labor	50.9	77.8	94.9	62.9

The differences in costs between areas was due primarily to differences in (1) rates of production and (2) prices of feed. The highest rates of production were on the farms studied in the Central and Southwestern Areas, and lowest in the Western and Eastern Areas. The value of the feed used averaged \$3.97 per hundred pounds in the Southwestern Area; \$4.06 in the Western Area; \$4.11 in the Central Area; and \$4.22 in the Eastern Area.

The profit per dozen eggs was highest in the Central Area with 4.5 cents. In the Western Area it was 1.7 cents per dozen. In the Eastern Area it was .4 cents and in the Southwestern Area -2.7 cents per dozen. This does not mean that the poultrymen in the Southwestern Area lost money on the eggs produced but rather that they worked for lower wages than poultrymen in other areas. The returns per hour of labor were highest in the Central Area at 94.9 cents per hour. The Western Area had returns of 77.8 cents per hour; the Eastern Area, 62.9 cents; and the Southwestern Area 50.9 cents.

In the 1940-41 study, records were obtained on farms in the Central and Eastern Areas of the State. Although the costs and returns differed because of the difference in the level of prices, the profits showed a similarity to those in 1946-47. For the Eastern Area the profit per dozen eggs was identical with that found in 1946-47, 0.4 cents per dozen. In the early, as in the later period, the profit in the Central Area was much higher than in the Eastern Area. In 1940-41 it was 1.6 cents per dozen and in 1946-47, as noted above, it was 4.5 cents.

These differences are reflected in the changes in numbers of layers (table 16). From 1930 to 1945 the number of hens and pullets in the Southwestern Area declined by 22 per cent; for the Central Area there was an increase of 15 per cent; for the Eastern Area an increase of 40 per cent; the Western Area, an increase of 3 per cent. The Northern Area, which was not included in the study, had a decrease in hens and pullets of 11 per cent.

Table 16. NUMBER OF LAYERS BY AREAS IN NEW YORK

Area	Number of hens and pullets			
	1930	1935	1940	1945
	Thousands			
Southwestern	1,494	1,544	1,125	1,172
Western	2,666	2,821	2,507	2,748
Central	4,126	4,426	3,960	4,730
Eastern	2,826	3,046	2,889	3,952
Northern	830	804	695	736

Source: U. S. Census

FACTORS AFFECTING COSTS AND RETURNS

Breed

With Similar Rates of Production

To study the advantage of having light or heavy breeds, the farms were matched for rates of production. When the effect of rates of production was eliminated, the average cost of production was about the same for light breeds and heavies with 53.2 cents per dozen for the former and 53.5 cents for the latter (table 17).

Table 17. RELATION OF BREED TO COSTS AND RETURNS  
(Farms Matched for Rates of Production)

Item	Light breeds	Heavy breeds
Number of farms	82	49
Number of layers	1,022	580
Eggs per layer	179	178
Per cent mortality	13	16
	Cents	Cents
Cost per dozen eggs	53.2	53.5
Returns per dozen eggs	54.7	52.3
Profit per dozen eggs	1.5	- 1.2

The returns, due to differences in egg prices, were considerably higher for the light breeds with 54.7 cents per dozen as compared to 52.3 cents for the heavies.

As will be noted later, white eggs generally command a higher price than brown eggs in the New York City market.

The light breed flocks showed a profit of 1.5 cents per dozen as compared to a -1.2 cents per dozen for the heavy breeds. This does not mean loss of cash but that the operators of flocks with heavy breeds worked for about three cents per dozen less wages than those with light breeds.

With Similar Size of Flock  
and Rates of Production

When the farms with light and heavy breeds with similar rates of production and similar size of flock were compared, the same relationship was found as was noted above. The cost of producing eggs was about the same for the light and heavy breeds, with costs of 52.0 and 52.9 cents, respectively (table 18). The returns from eggs were different. For the light breeds they were 53.6 cents; for the heavies 51.9 cents. The profit per dozen for the light breeds was 1.6 cents and the heavy breeds -1.0 cents.

Table 18. RELATION OF BREED TO COSTS AND RETURNS  
(Farms Matched for Production and Size of Flock)

Item	Light breeds	Heavy breeds
Number of farms	40	30
Number of layers	684	648
Eggs per layer	181	180
Per cent mortality	16	16
	Cents	Cents
Cost per dozen eggs	52.0	52.9
Returns per dozen eggs	53.6	51.9
Profit per dozen eggs	1.6	- 1.0

The difference in prices of white and brown eggs, which was the most important reason for differences in profits per dozen eggs between the two groups of breeds, was largest in November when large brown egg prices were 17 per cent below those for large white eggs (table 19). The narrowest spread was in June when brown egg prices were only 3 per cent below white egg prices.

In 1946-47 the season of greatest spread came earlier in the year than was the case during 1937-41 when it occurred in the winter months. Likewise the months of narrowest spread also came earlier. However, the average spread for the year was about the same as for the pre-war period.

Table 19. PRICES OF BEST LARGE BROWN EGGS IN PER CENT OF PRICES OF  
BEST LARGE WHITE EGGS

Month	1937-41*	1946-47
January	88	91
February	88	94
March	90	90
April	89	92
May	91	95
June	94	97
July	98	96
August	97	96
September	97	86
October	90	88
November	92	83
December	88	90
Year	91.5	91.1

\* Van Wagenen, A. Changes in Seasonal Variation of Wholesale Price of Eggs in New York City. Cornell University Agricultural Experiment Station Bulletin 808, 1944.

Eggs Per Layer

For both light and heavy breeds, when divided into groups according to production rates, the costs per dozen eggs were considerably higher for the farms with low rates of production than for those with high rates. For the light breeds those with low production had an average cost of 57.5 cents as compared to 48.3 cents for those with high production (table 20). For the heavy breeds, the low production group had a cost of 61.8 cents as compared to 45.7 cents for the high group.

Table 20. RELATION OF EGGS PER LAYER TO COSTS AND RETURNS  
PER DOZEN EGGS BY BREEDS  
135 New York Farms, 1946-47

Item	Light breeds			Heavy breeds		
	Low	Med.	High	Low	Med.	High
	pro- duc- tion	pro- duc- tion	pro- duc- tion	pro- duc- tion	pro- duc- tion	pro- duc- tion
Number of farms	28	27	27	18	18	17
Average number of layers	1,252	1,022	1,006	604	609	629
Per cent mortality	13	17	15	21	13	15
Labor per dozen eggs (minutes)	9.3	8.1	7.2	6.8	7.8	9.0
Feed per dozen eggs (pounds)	8.3	7.2	6.8	9.6	7.6	6.7
Eggs per layer	152	178	203	137	188	218
	Cents	Cents	Cents	Cents	Cents	Cents
<u>Cost per dozen eggs:</u>						
Feed	34.8	29.9	28.3	39.8	31.3	27.3
Labor	9.2	8.9	7.7	11.9	8.4	9.1
Buildings and equipment	3.8	3.6	2.8	3.6	4.2	3.5
Depreciation	6.9	6.1	6.9	2.3	2.9	2.3
Other	2.8	2.9	2.6	4.2	3.6	3.5
Total	57.5	51.4	48.3	61.8	50.4	45.7
<u>Returns per dozen eggs:</u>						
Eggs	54.7	54.4	55.7	51.1	51.4	51.2
Other	0.2	0.4	0.3	0.6	0.6	0.5
Total	54.9	54.8	56.0	51.7	52.0	51.7
Profit per dozen eggs	- 2.5	3.8	7.7	-10.1	1.6	6.0
Net cost per dozen eggs	57.3	51.0	48.0	61.2	49.8	45.2

Within each of the breed groups, the return per dozen eggs was about the same regardless of the level of production. However, because of the difference in cost of production the profits were considerably greater for the farms with high rates of production. The farms with light breeds and low rates made a -2.5 cents per dozen whereas the farms with high production made an average of 7.7 cents. For heavy breeds those with low rates of production made -10.1 cents, while those with high production made 6.0 cents per dozen.

Regardless of the breed, high rates of production are very important in determining profits. With heavy breeds each increase in production of a dozen eggs per hen decreased the average cost about 2.4 cents per dozen; with light breeds the decreased cost amounts to 2.2 cents for each dozen increase in production.

### Size of Flock

For both light and heavy breeds, large flocks had lower costs and higher returns per dozen eggs than small flocks (table 21).

The cost of production for the small flocks with light breeds was 55.4 cents as compared to 52.8 cents for the large flocks. The returns were one cent per dozen higher for the large flocks. The profit per dozen for the small flocks was -0.2 cents, for the large flocks the profit was 2.4 cents.

Table 21. RELATION OF SIZE OF FLOCK TO COSTS AND RETURNS  
(Farms Matched for Rates of Production)

Item	Light breeds		Heavy breeds	
	Less than 850 layers	850 layers and more	Less than 450 layers	450 layers and more
Number of farms	40	37	26	25
Average number of layers	574	1,624	283	995
Eggs per layer	174	174	180	180
Per cent mortality	15	16	20	15
	Cents	Cents	Cents	Cents
Cost per dozen eggs	55.4	52.8	55.9	51.6
Returns per dozen eggs	54.2	55.2	50.3	52.4
Profit per dozen eggs	- 0.2	2.4	- 5.6	0.8

For the heavy breeds, with small flocks the cost was 55.9 cents per dozen as compared to 51.6 cents for the larger flocks. The returns per dozen were 50.3 and 52.4 cents respectively. The small flocks made a -5.6 cents per dozen as compared to 0.8 cents per dozen for the larger flocks.

### Labor Efficiency

Efficiency in the use of labor is another factor which affects profits in producing eggs and which the farmer should watch in operating his poultry business. For the light breed flocks studied the cost per dozen for the farms which had a small number of hours labor per layer was 50.1 cents per dozen (table 22). For those which were less efficient in the use of labor the cost was 59.4 cents. The returns were approximately the same for each group. The profits for the efficient farms were 3.1 cents per dozen as compared to a -4.0 cents for the farms which were not so efficient. The labor cost on the less efficient farms was almost two times that of the efficient farms and accounted for most of the difference in the cost of production.

Table 22. RELATION OF LABOR EFFICIENCY TO COSTS AND RETURNS  
(Farms Matched for Rates of Production)

Item	Light breeds		Heavy breeds	
	Less than 2.2 hours per layer	2.2 hours per layer and more	Less than 2.2 hours per layer	2.2 hours per layer and more
Number of farms	41	40	21	25
Number of layers	1,310	851	855	379
Eggs per layer	176	175	174	175
Per cent mortality	15	15	15	22
Minutes of labor per dozen eggs	6.3	12.2	6.9	15.8
Cost of labor per dozen eggs (cents)	6.8	12.7	7.0	16.7
	Cents	Cents	Cents	Cents
Cost per dozen eggs	50.1	59.4	49.2	61.9
Returns per dozen eggs	55.2	55.4	50.9	50.7
Profit per dozen eggs	3.1	- 4.0	1.7	-11.2

For heavy breeds the results were similar to those for the light breeds. The cost per dozen for the efficient farms was 49.2 cents per dozen as compared to 61.9 cents per dozen for the less efficient farms. Returns per dozen were about the same for each of the groups. The profit per dozen for the efficient farms was 1.7 cents as compared to a -11.2 cents for the inefficient farms. Again, the cost of labor on the inefficient farms was about double that for the efficient farms, and the difference in the cost of labor accounted for most of the difference in profit per dozen eggs.

#### Deaths

Most poultrymen in this study kept the number of deaths pretty well under control. While the range in mortality was from 3 to 63 per cent of the average number for the year, three-fourths of the farms had from 5 to 25 per cent. While deaths affect the labor efficiency, the principal effect is in the loss of the sale value of a cull hen. When the loss of a few hens is distributed over the total egg production for the full year, the effect on the cost of a dozen eggs is much smaller than most people realize.

When the farms with light breeds were divided into groups having high and low mortality, the cost for those farms with low mortality was about 1.5 cents per dozen less than for the farms with high mortality (table 23). For the heavy breeds the difference was 1.8 cents per dozen. The effect of mortality with heavy breeds is more severe because of the high value of the cull hens in relation to pullet cost.

Table 23. RELATION OF RATES OF MORTALITY TO COSTS AND RETURNS  
(Farms Matched for Rates of Production)

Item	Light breeds		Heavy breeds	
	Less than 15 per cent mortality	15 per cent mortality and more	Less than 15 per cent mortality	15 per cent mortality and more
Number of farms	39	38	28	23
Average number layers	1,185	990	499	659
Eggs per layer	174	173	176	176
Per cent mortality	9	23	11	21
	Cents	Cents	Cents	Cents
Cost per dozen	52.8	54.3	54.3	56.1

#### Proportion of Pullets

The usual practice of New York poultrymen is to have either all pullets or a high proportion of pullets in their laying flocks. For this reason, it is difficult to find commercial flocks which keep old hens in sufficient numbers to permit study of the relationship of pullet to non-pullet flocks. The farms with light breeds were placed into three groups, one having less than 70 per cent pullets, one with 70-99 per cent pullets and one with all pullets. More of the flocks with the heavy breeds were all-pullet, which made it impossible to get any further breakdown on flocks having less than 100 per cent pullets.

For light breed flocks with less than 70 per cent pullets the cost per dozen was 53.0 cents (table 24). For those with 70-99 per cent pullets the cost was 52.2 cents. For all pullet flocks it was 51.4 cents. The returns per dozen for the first group were 55.5 cents; for the second group, 55.9 cents; and for the all-pullet flocks, 53.8 cents. The lower returns for the all-pullet flocks were due to the difference in size of the eggs produced, and consequently, the price received by the farmer. The profit for the flocks with less than 70 per cent pullets was 2.5 cents per dozen; for those with 70-99 per cent pullets, 3.7 cents per dozen; and for those with all pullets, 2.4 cents per dozen.

For heavy breeds, the all-pullet flocks produced eggs at an average cost of 50.1 cents per dozen as against 57.1 cents per dozen for flocks which had less than 100 per cent pullets. The returns were considerably higher for the latter group than for the former. However, because of the considerably higher cost for the latter group, the profit per dozen was -2.0 cents as compared to 0.9 cents for the all-pullet flocks.

This would indicate that keeping a few (15-20 per cent) of the light breed hens for a second year of production and keeping only pullets in heavy breed flocks are sound business practices.



Table 24. RELATION OF PROPORTION OF PULLETS TO COSTS AND RETURNS  
135 New York Farms, 1946-47

Item	Light breeds			Heavy breeds	
	Less than 70 per cent pullets	70-99 per cent pullets	All pullets	Less than 100 per cent pullets	All pullets
Number of farms	36	27	19	12	41
Average number layers	1,139	1,102	1,002	566	628
Per cent mortality	18	13	14	15	17
Labor per dozen eggs (minutes)	8.6	8.3	7.3	10.5	8.9
Feed per dozen eggs (pounds)	7.4	7.4	7.5	8.0	7.7
Eggs per layer	171	177	181	164	183
	Cents	Cents	Cents	Cents	Cents
<u>Costs per dozen eggs:</u>					
Feed	31.2	30.2	31.6	34.2	31.4
Labor	9.1	8.7	7.5	10.8	9.3
Buildings and equipment	3.3	3.5	3.5	4.9	3.5
Depreciation	6.7	6.8	6.3	2.7	2.4
Other	2.7	3.0	2.5	4.5	3.5
Total	53.0	52.2	51.4	57.1	50.1
<u>Returns per dozen eggs:</u>					
Eggs	55.3	55.5	53.5	54.6	50.4
Other	0.2	0.4	0.3	0.5	0.6
Total	55.5	55.9	53.8	55.1	51.0
Net cost per dozen eggs	52.8	51.8	51.1	56.6	49.5
Profit per dozen eggs	2.5	3.7	2.4	- 2.0	0.9
Return per hour of labor	81.1	90.0	81.2	50.4	68.5

## SUMMARY AND CONCLUSIONS

1. This study was based on a farm management survey of the poultry enterprise on 172 farms in New York in 1946-47.
2. Although the average size of flock in the 1946-47 survey was smaller than that for the 1940-41 survey, a comparison of the two studies shows some of the important technological changes which have taken place. In this comparison, the differences between the years are reduced because of the smaller size flocks included in 1946-47. Some of the changes are:
  - a. The rate of lay has increased from 168 eggs per hen for light breeds and 167 for heavy breeds in 1940-41 to 175 and 179, respectively, in 1946-47. Part of this increase, especially for the heavy breeds, has been due to a shift to all-pullet flocks. Similar trends are indicated by the Bureau of Agricultural Economics reports on eggs produced per layer. In 1941 the average number of eggs per layer on farms in New York was 162 and in 1947 it was 183.
  - b. The increase in egg production has been accompanied by an increase in feed consumption per hen of about 16 per cent for light breeds and 8 per cent for heavies. The amount of feed required per dozen eggs, however, is about the same as the pre-war level.
  - c. The amount of labor required per layer has decreased from 2.2 to 2.0 hours for light breeds and 2.4 to 2.3 hours for heavies.
  - d. The mortality rates have decreased from 26.5 to 15.2 per cent for light breeds and from 20.6 to 16.3 per cent for heavies between the two periods.
  - e. The months of largest numbers of layers and greatest total egg production came somewhat earlier in 1946-47 due to earlier starting of chicks.

In view of the wide ranges still found in production rates, mortality and labor efficiency on the farms studied, the changes which have been taking place in poultry farming during the past few years are likely to continue as more poultrymen adopt better management practices.

3. The most profitable areas of the State for producing eggs are the Central, Western and Eastern Areas. In these areas poultry production has been expanding.
4. Light and heavy breed flocks of similar size and rates of lay had about the same costs per dozen. However, because of the differences in prices of brown and white eggs, the returns and profits were greater for the light breeds.

The question of which breed to raise is one for the individual poultryman to answer. Chief attention should be given to egg prices, but facilities, equipment and management need to be considered. The New York market usually pays premiums for white eggs but many of the up-state markets do not.

5. Factors which affected costs and returns were: rates of production, size of flock, labor efficiency, deaths and proportion of pullets.

Individual poultrymen need to study their enterprises to determine and evaluate these factors on their own farms. The minimum goal would be to be above average for all these factors as found in this survey.