

*Seasonal Costs and Returns
in Producing Eggs
New York, 1946-47*

Prepared by
C. D. KEARL

Department of Agricultural Economics
Cornell University Agricultural Experiment Station
New York State College of Agriculture
Cornell University
in Cooperation with the
Bureau of Agricultural Economics
United States Department of Agriculture

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

C. D. Kearl

In the fall of 1946-47 a Poultry Farm Management survey was made in New York State to study (1) the raising of pullets, and (2) the production of eggs on commercial poultry farms. As a part of this study, information on costs and returns was obtained by seasons.

Poultrymen are aware of the seasonality of egg prices and have been encouraged to adjust the time of starting chicks so that relatively more eggs are produced during the period when prices are seasonally high. An understanding of the seasonal costs and returns should help explain (1) the profitableness of early chicks, and (2) how to adjust production to take full advantage of the seasonal changes in prices and increase profits.

The records on the poultry enterprises were for the year commencing September 1946 and ending August 1947. September, October and November were the months included in the Fall season; December, January and February made up the Winter season; March, April and May, the Spring; and June, July and August, the Summer.

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This publication is the third 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 over-all 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. The second report was A.E. 712, entitled "Costs and Returns in Producing Eggs on New York Farms, 1946-47" by C. D. Kearl. Both were published by the Department of Agricultural Economics at Cornell University in cooperation with the Bureau of Agricultural Economics, United States Department of Agriculture.

Egg prices during the year studied averaged higher than in any preceding year since 1920; however, they were below the two succeeding years (figure 1).

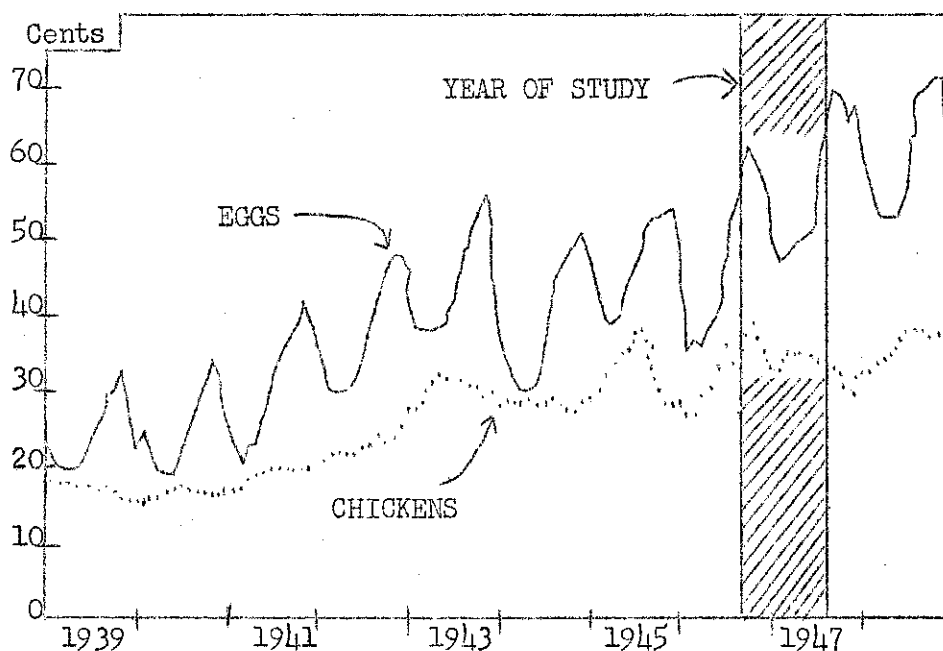


Figure 1. New York State Farm Price of Eggs and Chickens, By Months, 1939-1948.

Poultry prices were unusually high during the Fall months of the 1946-47 period, but for the other months were about in line with those for other post-war years.

Costs, although high, had not risen as rapidly as prices with the result that profits in poultry farming were favorable. The returns per hour of labor in producing eggs averaged 76 cents. This was above the returns for the preceding years but below those for subsequent years.

THE POULTRY ENTERPRISE BY SEASONS

The average number of layers for the year for all flocks was 917 (table 1). For the farms with light breeds the average was 1,095 and for those with heavy breeds, 614. Flocks of less than 100 layers were not included in the survey.

Records were obtained on 82 farms with light breeds. Of these, 23.1 per cent had an average number of layers of from 100 to 499; 36.6 per cent averaged from 500 to 999; and 40.3 per cent averaged 1,000 layers and more. Relatively more of the farms with heavy breeds had smaller flocks than those with light breeds. Of the 53 farms on which records were obtained, 58.4 per cent had flocks of from 100 to 499 layers; 28.3 per cent had flocks of from 500-999 layers; and 13.3 per cent had 1,000 layers and more.

For all farms, about one-third had flocks of less than 500 layers; another one-third had from 500 to 999 layers, and the remaining one-third had 1,000 layers or more.

TABLE 1. SIZE OF FLOCK
172 New York Farms, 1946-47

Average number of layers for year	Light breeds		Heavy breeds		All farms*	
	Number	Per cent	Number	Per cent	Number	Per cent
100-499	19	23.1	31	58.4	62	36.1
500-999	30	36.6	15	28.3	56	32.6
1000-1499	22	26.8	4	7.6	33	19.2
1500-1999	2	2.4	2	3.8	10	5.8
2000 and more	9	11.1	1	1.9	11	6.3
Total	82	100.0	53	100.0	172	100.0
Average number of layers	1,095		614		917	

* Includes 37 farms with mixed breeds

Number of Layers

The farms with light breeds had the largest average number of layers in the Fall with 1,164, which was 6 per cent above the average for the year. In the Winter the average was 1,141, and in the Spring numbers reached a low of 1,006 layers, which was just 8 per cent below the average for the year (table 2). During the Summer months, because of the addition of pullets, numbers increased somewhat from that for Spring and averaged 1,033.

There was considerably more variation in size of flock for the heavy breeds than for the light. With the heavy breeds the average number of layers in the Fall was 797. This was 30 per cent above the average for the year. Because more of the heavy breed flocks were sold during the year, the number of layers decreased to an average of 645 in the

Winter, and to 406 in the Spring months, which was 34 per cent below the average for the year. The average for the Summer, with the addition of new pullets, was 542.

TABLE 2. AVERAGE NUMBER OF LAYERS BY SEASONS
172 New York Farms, 1946-47

Season	Light breeds		Heavy breeds		All farms	
	Number	Per cent of average	Number	Per cent of average	Number	Per cent of average
Fall	1164	106	797	130	1040	113
Winter	1141	104	645	105	959	105
Spring	1006	92	406	66	778	85
Summer	1033	94	542	88	856	93
Year	1095	100	614	100	917	100

Addition of Pullets to Laying Flocks

As is typical in New York State, most of the pullets on the farms studied were housed during the Summer months of June, July and August and the Fall months of September, October and November (table 3). However, there were some pullets added during the other seasons, especially on farms with heavy breeds where about 10 per cent of the pullets were housed during the Winter and Spring months from December to May.

TABLE 3. PULLETS ADDED TO LAYING FLOCK BY SEASONS
172 New York Farms, 1946-47

Season	Average number of pullets added per farm			Proportion of total pullets added		
	Light breeds	Heavy breeds	All farms	Light breeds	Heavy breeds	All farms
Fall	314	176	269	42.9	21.2	32.3
Winter	4	25	10	.4	3.1	1.2
Spring	2	53	32	.3	6.5	3.9
Summer	413	568	520	56.4	69.2	62.6
Year	733	822	831	100.0	100.0	100.0

For the farms with light breeds, 56.4 per cent of the pullets were added during the Summer. During the Fall, 42.8 per cent of the pullets were added. Practically no light breed pullets were housed during the other two seasons. With the heavy breeds, 69.2 per cent of the pullets were added during the Summer. This was more than three times the proportion added in the Fall, the season next in importance.

Disposal of Layers

The seasons of greatest sales of laying hens on farms with light breeds were Summer and Fall when the houses were being emptied and cleaned in preparation for the housing of new pullets, (table 4). An average of 175 layers were sold per farm during the Fall and 183 during the Summer. Only about one-half as many cull hens were sold during each of the Winter and Spring seasons. Most birds sold from the laying flocks were sold alive, especially during the Fall and Summer.

TABLE 4.

METHOD OF DISPOSAL AND VALUE
RECEIVED FOR LAYERS SOLD BY SEASONS
172 New York Farms, 1946-47

Season and method of disposal	Light breeds		Heavy breeds	
	Layers per farm	Value per layer	Layers per farm	Value per layer
Fall:				
Sold breeder and layer	3	\$ 2.18	1	\$ 2.19
Sold meat dressed	8	1.74	4	2.09
Sold meat alive	152	1.37	242	2.65
Eaten	12	1.24	8	2.23
Total or average	175	\$ 1.39	255	\$ 2.62
Winter:				
Sold breeder and layer	2	\$ 1.75	--	\$ ----
Sold meat dressed	9	1.91	11	2.72
Sold meat alive	50	1.25	241	2.48
Eaten	12	1.24	6	2.11
Total or average	73	\$ 1.35	258	\$ 2.49
Spring:				
Sold breeder and layer	--	\$ ----	--	\$ ----
Sold meat dressed	8	1.70	8	2.46
Sold meat alive	54	1.23	140	2.35
Eaten	11	1.24	5	2.12
Total or average	73	\$ 1.29	153	\$ 2.35
Summer:				
Sold breeder and layer	--	\$ ----	--	\$ ----
Sold meat dressed	8	1.74	7	1.96
Sold meat alive	164	1.18	113	2.05
Eaten	11	1.24	6	2.23
Total or average	183	\$ 1.21	126	\$ 2.05

Value received per light breed layer was highest during the Fall with an average of \$1.39. This was followed in order by the Winter, Spring and Summer with averages of \$1.35, \$1.29 and \$1.21, respectively.

For the farms with heavy breeds the seasons of greatest sale of layers were Fall and Winter. During the Fall an average of 255 layers were sold per farm. The average for the Winter was 258 layers. Here again, sales in the two low seasons were only about one-half those for the two high seasons. In all seasons most of the heavy breed layers were sold alive for meat.

The average value received per layer for the heavy breeds, like the light breeds, was highest in the Fall, followed by the Winter, Spring and Summer in that order. During the Fall months the value per layer sold averaged \$2.62, which was almost twice that for light breeds. As the year progressed the value per layer for heavy breeds declined more than that for the light breeds so that by Summer, the heavy breed birds brought only 75 per cent more than the light breed birds.

Mortality

The mortality rate for the farms with light breeds averaged 15 per cent for the year (table 5). Although there were somewhat more deaths during the Fall and Winter seasons because of the larger number of layers, the rate on an annual basis was fairly constant throughout the year.

For the heavy breeds the average rate for the Fall and Winter periods was 16 per cent, but in the Spring and Summer it was somewhat higher as the number of birds that died declined less than the number of layers.

TABLE 5. MORTALITY OF LAYING FLOCK BY SEASONS
172 New York Farms, 1946-47

Season	Light breeds		Heavy breeds		All farms	
	Average number of layers	Percentage mortality	Average number of layers	Percentage mortality	Average number of layers	Percentage mortality
Fall	1164	15	797	16	1040	15
Winter	1141	16	645	16	959	17
Spring	1006	16	406	18	778	17
Summer	1033	15	542	18	856	15
Year	1095	15	614	16	917	16

Eggs Produced

For both light and heavy breeds the Summer and Fall, when a large proportion of the flocks consisted of new pullets, were the seasons of lowest rates of production. For the light breeds the average production per layer in the Fall was 38 eggs (table 6). During the Winter season the rate increased to 45 eggs per layer. Production in the Spring reached a peak of 50, but declined in the Summer to 43.

TABLE 6. EGGS PRODUCED PER LAYER AND PERCENTAGE LAY BY SEASONS
172 New York Farms, 1946-47

Season	Eggs per layer			Percentage lay		
	Light breeds	Heavy breeds	All farms	Light breeds	Heavy breeds	All farms
Fall	38	40	38	42	44	42
Winter	45	53	47	50	58	51
Spring	50	53	50	55	58	55
Summer	43	43	42	48	48	46
Year	175	179	172	48	49	47

For the heavy breeds the average production was lowest in the Fall with 40 eggs per hen. During the Winter and Spring the average was high with 53 eggs. In the Summer the rate declined to 43 per layer.

Size of Eggs

For the light breed farms on which egg sizes were obtained, 70 per cent of the eggs graded were large (table 7). During the Fall, because of the high proportion of pullets just coming into laying, only 40 per cent of the eggs were large. In the Winter the proportion of large eggs increased to 72 per cent and a peak of 84 per cent was reached in the Spring. The proportion of large eggs decreased to 75 per cent during the Summer, again because of the addition of pullets to the laying flock. The proportion of medium eggs was highest in the Fall, decreased during the Winter and was lowest in the Spring. There was a slight increase in the Summer. Pullet and peewee eggs were produced mostly during the Summer and Fall when the pullets were starting to lay.

TABLE 7. PERCENTAGE DISTRIBUTION OF EGGS GRADED BY SIZE AND BY SEASON
69 New York Farms, 1946-47

Size	Fall	Winter	Spring	Summer	Year
<u>Light breeds</u>					
Large	48	72	84	75	70
Medium	34	25	15	17	23
Pullet	16	3	1	7	6
Peewee	2	--	--	1	1
Total	100	100	100	100	100
<u>Heavy breeds</u>					
Large	46	75	84	60	66
Medium	38	22	13	25	25
Pullet	14	3	2	12	8
Peewee	2	--	1	3	1
Total	100	100	100	100	100

Except for the Summer season, the proportions of large, medium and pullet eggs by seasons for farms with heavy breeds were similar to those for the farms with light breeds. During the Summer because of a larger number of pullets being added, the proportion of large eggs was considerably below that for the light breeds.

Price of Eggs

The highest prices for eggs came during the Summer and Fall seasons (table 8). Large white eggs averaged 63.4 cents per dozen in the Summer and 64.8 cents in the Fall. Medium and pullet sized eggs also were high during these seasons but were highest during the Summer whereas the large eggs were highest in the Fall.

The differences between large, medium and pullet egg prices were greatest during the Fall months. Large eggs averaged 14.0 cents higher than medium eggs during that season. Medium eggs averaged 10.3 cents higher than pullet eggs. The smallest margins were in the Spring months when there were only 6 or 7 cent differences in prices between the three sizes.

TABLE 8. AVERAGE PRICES RECEIVED FOR EGGS
55 New York Farms, 1946-47

Size	Fall	Winter	Spring	Summer	Year
<u>White eggs</u>					
Large	64.8¢	52.2¢	53.4¢	63.4¢	57.2¢
Medium	50.8	45.1	47.4	55.0	49.5
Pullet	40.5	38.5	40.4	43.1	40.4
Peewee	30.8	34.0	-----	30.9	31.0
<u>Brown eggs</u>					
Large	57.5¢	50.6¢	53.4¢	61.3¢	54.5¢
Medium	47.8	42.1	45.9	52.2	46.5
Pullet	36.9	34.9	39.8	42.6	37.5
Peewee	31.3	28.5	28.5	29.0	29.3

Prices of brown eggs were highest during the Summer and next highest in the Fall. The average price of large eggs in the Summer was 61.3 cents per dozen; in the Fall 57.5 cents; in the Winter 50.6 cents; in the Spring 53.4 cents. The price differentials between large, medium and pullet eggs were similar to those for the white eggs. The variation was greatest during the Fall when large eggs were 9.7 cents higher than medium eggs, and medium eggs were 10.9 cents higher than pullet eggs. The variation was smallest during the Spring months.

Kind and Amount of Feed Used

Primarily because of the higher rate of lay, more feed was required per layer in light breed flocks in the Winter and Spring seasons, average about 28 pounds, than in the Fall and Summer when consumption averaged about 25 pounds (table 9). Even though the average rate of lay in the Summer was well above that for the Fall, more feed was required during the latter season when the pullets were still developing and relatively more of the feed was used for growth.

TABLE 9. KIND AND AMOUNT OF FEED USED PER LAYER BY SEASONS FOR FLOCKS WITH LIGHT BREEDS
66 New York Farms, 1946-47

Item	Fall	Winter	Spring	Summer	Year
	<u>Pounds</u>				
Homegrown:					
Corn	.4	.5	.7	.4	2.1
Wheat	1.0	.9	.7	.5	3.1
Other	.7	.7	.6	.5	2.7
Total	2.1	2.1	2.0	1.4	7.9
Purchased:					
Corn	1.0	1.1	1.1	1.2	4.5
Wheat	1.2	1.2	.7	.9	4.1
Cracked corn	.1	.4	.5	.2	1.3
Oats	.3	.6	.6	.4	1.9
Scratch	6.0	6.5	6.2	6.5	25.4
Laying mash	12.3	12.6	13.2	12.2	51.0
Breeder mash	.5	1.9	1.2	.3	3.9
Grit and shell	.7	.8	1.0	.7	3.3
Other	1.1	1.2	1.5	1.4	5.3
Total	23.2	26.3	26.0	23.8	100.7
Total all feed	25.3	28.4	28.0	25.2	108.6

About 50 per cent mash was fed in each of the seasons which indicates the tendency to feed the light breeds about the same proportion of scratch and mash throughout the year. Poultrymen tended to feed their homegrown grains rather evenly through the Fall, Winter and Spring months but the use of such feed declined about one-third during the Summer.

For the heavy breeds, the Fall was the season of highest feed consumption per layer, 30.6 pounds, followed closely by the Winter and Spring seasons with 29.8 and 29.4 pounds, respectively (table 10). The fact that Fall was the highest season even though the rate of egg production was not the highest is explained by the growth of the birds during the early part of their stay in the laying flock. Average consumption was found to be lowest in the Summer season, with 26.6 pounds.

TABLE 10. KIND AND AMOUNT OF FEED USED PER LAYER BY SEASONS FOR FLOCKS
WITH HEAVY BREEDS
46 New York Farms, 1946-47

Item	Fall	Winter	Spring	Summer	Year
	<u>Pounds</u>				
Homegrown:					
Corn	.9	1.2	1.2	1.4	4.6
Wheat	2.1	1.4	.6	.6	5.4
Other	1.2	1.2	1.0	1.1	4.4
Total	4.2	3.8	2.8	3.1	14.4
Purchased:					
Corn	2.4	1.3	1.3	1.3	6.5
Wheat	1.6	1.2	.8	.8	4.7
Cracked corn	---	.1	.5	.2	.7
Oats	.3	.2	.2	.2	.9
Scratch	5.0	5.8	6.2	4.9	21.7
Laying mash	14.4	14.3	15.2	14.5	57.8
Breeder mash	1.3	1.5	1.2	.6	4.8
Grit and shell	.8	.9	.6	.7	3.1
Other	.6	.7	.6	.3	2.2
Total	26.4	26.0	26.6	23.5	102.4
Total all feed	30.6	29.8	29.4	26.6	116.8

The proportion of mash to scratch was about 50-50 during the Fall months. During the other seasons the proportion of the total feed that was mash increased and averaged about 57 per cent during the Summer months.

Labor

On the farms with light breeds, the larger number of layers during the Fall months meant that more hours were required per farm during that season than for the other seasons (table 11). However, on a per layer basis, the average time required was least during the Fall season, because of a larger size of flocks and lower rate of lay. The average of 29 minutes per layer in the Fall increased to 30 in the Winter months and 32 in the Spring.

The number of minutes of labor per dozen eggs was lowest in the Spring when the rate of production and total production were highest. The season of highest labor requirement per dozen was the Fall when the rate and the total egg production were the lowest.

TABLE 11. LABOR ON LAYING FLOCK
172 New York Farms, 1946-47

Season	Light breeds			Heavy breeds			All Farms		
	Hours per farm	Minutes per layer	Minutes per dozen eggs	Hours per farm	Minutes per layer	Minutes per dozen eggs	Hours per farm	Minutes per layer	Minutes per dozen eggs
Fall	575	29	9.1	425	32	9.6	524	30	9.4
Winter	559	30	7.9	389	37	8.3	506	32	8.2
Spring	541	32	7.6	292	43	9.9	447	35	8.4
Summer	511	30	8.4	307	33	9.6	427	30	8.8
Year	2186	120	8.2	1413	138	9.1	1904	126	8.7

For the heavy breed farms the number of hours per farm was by far the highest in the Fall and decreased from 425 during that season to only 292 in the Spring. This was because of the wide variation in the average number of layers during the seasons. The number of minutes per layer was lowest during the Fall months when the flocks were large.

The number of minutes required per dozen eggs was least in the Winter with 8.3 and highest in the Spring with 9.9. The small size of flock during the latter season caused the labor per dozen to be high even though the rate of lay was high.

SEASONAL COSTS AND RETURNS

The poultry enterprise is different from most other farm enterprises in the nature of the costs involved. Approximately 99 per cent of the costs in the poultry enterprise must be met currently. Of this proportion, two-thirds are cash costs, while one-third represents items such as operator's labor, other unpaid family labor, and homegrown feed and litter, which might readily be converted to cash through use by other enterprises or by direct sale. Only 1 per cent of the poultry enterprise costs represents items such as depreciation on buildings and equipment which need not be met currently.

An analysis of costs and returns by seasons shows the effect of changing numbers of layers, rates of lay, and mortality rates on costs, and the effects of changing egg sizes, prices, and number of eggs produced on income. This is of value in determining the need for operating funds, and in serving as a basis for making seasonal adjustments in production.

Procedure

The depreciation in value of birds due to mortality was charged to the season in which it occurred, while the appreciation or depreciation due to the different value of old hens compared with pullets was distributed over the period that the birds were in the laying flock.

Labor was charged to the season in which it occurred, except that the labor in cleaning houses and other miscellaneous labor was allocated according to the average number of layers on hand each season.

Feed was charged to the flock according to the season in which used. The cost for use of buildings and equipment was distributed equally among the seasons during which the buildings were used.

Charges for egg cases were made according to the total eggs produced in each season. Electricity was charged 30 per cent to the Fall season, 40 per cent to the Winter, 20 per cent to the Spring, and 10 per cent to the Summer. Horse, truck and tractor costs were divided equally according to the number of months with a commercial flock. Interest was distributed on the basis of the average number of layers in each season. Other miscellaneous expenses were distributed equally to the months with chickens.

The returns from eggs sold and eaten were credited to the season in which the eggs were produced. The other returns, cash and non-cash, were divided among the seasons according to the average number of layers.

In a study of the poultry enterprise by seasons, the most useful measure of financial results is total profit per farm. This measure takes into consideration all the factors relating to the enterprise. Profits per layer or per dozen eggs consider all the various factors too, but with the latter measures, size of flock is considered only to the extent that it is associated with other factors. This limitation is important with the poultry enterprise because the number of layers varies considerably during the year.

Light Breeds

On farms with light breeds, total costs were highest in the Fall and Winter seasons (table 12). Costs totalled \$2164 in the Winter, which was slightly higher than in the Fall. Even though the number of layers declined from Fall to Winter, the total consumption of feed increased 6 per cent and egg production per hen increased about 18 per cent. Labor requirements also increased in Winter over that for the Fall period because of higher feed consumption and egg production.

Costs declined from the Winter peak to \$2067 in the Spring, and a low of \$1999 in the Summer. From Winter to Spring, costs declined primarily because of a 10 per cent reduction in size of the laying flock. From Spring to Summer, costs declined primarily because of an 11 per cent reduction in total feed consumption. This, of course, was related to the 14 per cent decline in egg production from Spring to Summer.

TABLE 12. SEASONAL COSTS AND RETURNS WITH LIGHT BREEDS
82 New York Farms, 1946-47

Item	Fall	Winter	Spring	Summer	Year
Average number layers	1164	1141	1028	1033	1095
Percentage mortality	15	16	16	15	15
Hours labor per farm	560	565	544	517	2186
Minutes labor per layer	29	30	32	30	120
Minutes labor per dozen eggs	9.1	7.9	7.6	8.4	8.2
Cwt. feed per farm	307	327	293	262	1189
Pounds feed per layer	26.4	28.7	28.5	25.4	108.6
Pounds feed per dozen eggs	8.3	7.6	6.8	7.1	7.2
Eggs produced per farm	44,251	51,736	51,369	44,471	191,827
Eggs produced per layer	38	45	50	43	175
<u>Dollars</u>					
Per farm:					
Costs	2141	2164	2067	1999	8371
Returns	2116	2246	2308	2165	8835
Profit	-25	82	241	166	464
<u>Dollars</u>					
Per layer:					
Costs	1.84	1.90	2.01	1.94	7.64
Returns	1.82	1.97	2.25	2.10	8.07
Profit	-.02	.07	.24	.16	.43
<u>Cents</u>					
Per dozen eggs:					
Costs	58.1	50.2	48.3	53.9	52.4
Returns	57.4	52.1	53.9	58.4	55.3
Profit	-.7	1.9	5.6	4.5	2.9
<u>Dollars</u>					
Labor returns	328	440	581	490	1839
Return per hour labor	.59	.78	1.07	.95	.84

Although egg prices declined from Fall to Spring (see also table 8), total returns were highest in the Spring because the rate of lay was at a peak, 55 per cent, and the largest proportion of the eggs produced, 84 per cent, were large sized (see also table 7). Total returns were lowest in the Fall because of the relatively low rate of lay, average 42 per cent, and the relatively low proportion of large eggs produced, 48 per cent.

As with returns, total profits were largest in the Spring, \$241, and lowest in the Fall, -\$25. Profits in the Winter months averaged \$82 while those in the Summer amounted to \$166. Total labor returns showed the same relationship with the seasons, ranging from a high of \$581 in the Spring months to a low of \$328 in the Fall.

Heavy Breeds

The number of layers on farms with heavy breeds, unlike that for light breeds, changed considerably between seasons. This fact alone was responsible for most of the change in total costs per farm which was highest, \$1,512, in the Fall when the number of layers averaged 797 (table 13).

TABLE 13. SEASONAL COSTS AND RETURNS WITH HEAVY BREEDS
53 New York Farms, 1946-47

Item	Fall	Winter	Spring	Summer	Year
Average number layers	797	645	406	542	614
Percentage mortality	16	16	18	18	16
Hours labor per farm	428	393	290	302	1413
Minutes labor per layer	32	37	43	33	138
Minutes labor per dozen eggs	9.6	8.3	9.9	9.6	8.2
Cwt. feed per farm	240	202	119	150	711
Pounds feed per layer	30.1	31.3	29.4	27.6	116.8
Pounds feed per dozen eggs	9.0	7.1	6.8	7.9	7.5
Eggs produced per farm	32,052	34,253	21,092	22,603	110,000
Eggs produced per layer	40	53	53	43	179
<u>Dollars</u>					
Per farm:					
Costs	1,512	1,264	851	1,085	4,712
Returns	1,409	1,397	906	1,036	4,748
Profit	-103	133	55	-49	36
<u>Dollars</u>					
Per layer:					
Costs	1.90	1.96	2.10	2.01	7.68
Returns	1.77	2.16	2.23	1.91	7.74
Profit	-.13	.20	.13	-.10	.06
<u>Cents</u>					
Per dozen eggs:					
Costs	56.6	44.3	48.4	57.6	51.4
Returns	52.8	48.9	51.5	55.0	51.8
Profit	-3.8	4.6	3.1	-2.6	.4
<u>Dollars</u>					
Labor returns	163	377	235	137	912
Return per hour labor	.38	.96	.81	.45	.65

By Winter, the number of layers had declined to 645 and total costs had declined to \$1264. The number of layers reached a low of 406 in the Spring; costs also reached a low at that time. With the addition of pullets, numbers of layers rose to 542 in the Summer months and costs rose to \$1085.

Total returns were highest in the Fall months, \$1409, when the numbers of layers was highest. In the Winter months they remained practically as high because a 32 per cent increase in rate of lay offset the effect of a 20 per cent reduction in number of layers and the usual seasonal decline in prices of eggs.

From Winter to Spring total returns dropped primarily because of a decline in number of layers. In the Summer season, with the addition of new pullets and the seasonal increase in egg prices, returns increased even though the rate of lay declined.

The season of highest profits was Winter with \$133. They declined to \$55 in the Spring and \$49 in the Summer. The lowest point was reached in the Fall when total costs exceeded total returns by \$103. The labor returns ranged from a low of \$137 in the Summer to a high of \$377 in the Winter.

MANAGEMENT PRACTICES AND SEASONAL COSTS AND RETURNS

Poultrymen have recognized some aspects of the seasonality of costs and returns in poultry and egg production and have to some extent been adapting the management of their flocks to seasonal changes in egg prices. The two important practices being followed are (1) starting chicks earlier in the year, and (2) selling of the laying flock after egg prices begin to decline seasonally.

Season of Starting Chicks

Increasing numbers of poultrymen are starting their chicks early to take advantage of high egg prices in the Fall months. Of the farms with light breeds there were 23 on which the chicks were started in January and February. These were compared with 22 farms on which the chicks were started in March, April and May to determine the relative profitableness of housing pullets early.

The farms which started their chicks early had somewhat larger flocks averaging 1,256 as compared to 796 for those that started their chicks late (table 14). The rate of lay and mortality were about the same for each. Considerably more labor and slightly more feed were required per dozen eggs for those that started their chicks late than for those that started them early. The average cost per hundredweight of feed was less for those that started chicks early.

The costs for feed, labor and other items were all less for those farms which started their chicks early. The average cost per dozen eggs for the year was 47.3 cents as compared to 51.1 cents, a difference of 3.8 cents. Not only was the cost less for the early flocks but the returns per dozen eggs produced were higher, averaging 55.3 cents as compared to 53.9 cents, a difference of 1.4 cents.

TABLE 14. ANNUAL COSTS AND RETURNS FOR FARMS THAT STARTED CHICKS
EARLY, AND FARMS THAT STARTED CHICKS LATE, LIGHT BREEDS
45 New York Farms, 1946-47

Item	Early (Jan.,Feb.)	Late (Mar. April,May)
Number of farms	23	22
Average number of layers	1,256	791
Eggs produced per layer	176	175
Percentage mortality	16	17
Pounds of feed per dozen eggs	7.1	7.4
Minutes of labor per dozen eggs	7.9	9.5
Cost per hundred pounds of feed	\$4.28	\$4.48
<u>Cents</u>		
Costs:		
Labor	8.5	10.3
Feed	29.7	30.6
Other	9.1	10.2
Total	47.3	51.1
Returns	55.3	53.9
Profit	8.0	2.8
<u>Dollars</u>		
Return per hour of labor	1.19	.62

The profit for the farms which started chicks early was 8.0 cents per dozen, while for the farms with late flocks it was 2.8 cents. The return per hour of labor for the former was \$1.19; for the latter, \$0.62.

The poultrymen who started their chicks early had the advantage of somewhat higher production during the Fall when egg prices were high, but did not have their pullets in early enough to have full advantage of Fall prices and large eggs. Also they were unable to take advantage of the high Summer prices. On the farms where the chicks were started late, the pullets came into production during the late Summer and early Fall months. Thus, they obtained less advantage from the seasonally high prices than those that started chicks earlier.

To see what difference housing pullets at various times would make in the costs, returns and profits, and what the most profitable time for housing would be, the operation of one of the farms studied was adjusted so that the pullet flock was housed in each of the months of the year.

The numbers of layers, amounts of feed and labor used, and the dozens and sizes of eggs produced were assumed to be the same as for the actual 1946-47 year, but the month or season in which they were used or

produced was adjusted to correspond with pullets entering the laying flock in each of the other months. The prices used were those which were actually paid or received during the actual month or season of the year.

Although the cost varied somewhat with the adjustment of the operation to various months of housing pullets because different prices were charged in different months, there was no tendency to have widely different costs regardless of housing dates (table 15). The maximum difference was \$244 as between the high cost month of housing pullets, August, and the low cost month of housing pullets, October.

TABLE 15. EFFECT ON COSTS, RETURNS AND PROFITS OF ADJUSTING SEASON OF HOUSING PULLETS

Month of housing	Total cost	Returns:				Total	Profit
		Large eggs	Medium eggs	Other eggs	Other		
September	\$6779	\$7077	\$2088	\$628	\$108	\$ 9,901	\$3122
October	6596	7262	2038	579	108	9,987	3391
November	6673	7451	2021	605	108	10,185	3512
December	6792	7531	2048	650	108	10,337	3545
January	6733	7552	2100	669	108	10,429	3696
February	6762	7543	2128	689	108	10,468	3706
March	6763	7522	2175	706	108	10,511	3748
April	6809	7535	2285	690	108	10,618	3809
May	6836	7309	2394	693	108	10,504	3668
June	6736	7194	2405	712	108	10,419	3683
July	6713	7082	2322	689	108	10,201	3488
August	6840	7006	2200	640	108	9,954	3114

The returns, however, showed a definite tendency to increase from a low with Fall housing to a high with Spring housing. September was the low month with returns of \$9,901 and April was high with \$10,618. This was an increase of \$717. Housing in the months of February, March and May gave average returns of about \$10,500.

Most of the increase in total returns from Fall to Spring housing came from the sale of a larger proportion of large and medium eggs. Returns other than eggs were assumed to be the same. Sales of other than large and medium eggs increased from \$579 with October housing to \$712 with June housing, but the maximum difference was only \$133. The increase in returns for large eggs between the low with August housing of \$7006 and the high for January housing of \$7552 amounted to \$546. For the medium eggs the lowest return was with October housing and the highest with housing in June. In each case the returns were high because the season of high production of these two sizes came at the time when the prices for such sizes were seasonally high, rather than low, which usually happens with Fall housing. Considering both large and medium eggs, April housing gave the highest returns.

The profit was highest, \$3809, with April housing. Regardless of whether they were housed earlier or later, the profit declined from the April high to a low with August and September housing of about \$3120. This difference in profit, about \$700, was primarily due to differences in returns for eggs rather than differences in costs.

Selling of Flock

A second method of adapting the poultry farming operation to the seasonality in egg prices is by selling the flock following the break in egg prices which usually occurs in the Fall or Winter months. This is seldom done with light breeds but is frequently practiced with heavies.

Of the 53 poultrymen with heavy breeds, 15 sold their flocks during the year. Twelve of these farms were matched according to beginning number of layers with 16 farms on which the flock was kept the entire year. To secure greater comparability only all-pullet flocks were included.

The average beginning number of layers was about the same for each group, with 1047 for those which kept their flock the entire year, and 1085 for those which sold their flock (table 16). The annual average, because of the greater length of time the hens were kept, was higher for the former with 844 as compared to 614 for those which sold their birds.

The labor required per layer for the first group was 2.9 hours as compared to 2.1 hours for the latter. The amount of feed required, based on the average number of layers for the year, was the same for each with 117 pounds.

The average number of eggs produced per layer was 187 for the flocks which were kept the entire year and 177 for those which sold out. This was because birds in the latter flocks were coming into production during a higher proportion of the time they were kept in the flock. This is also reflected in the percentage of eggs that were large. The average for the farms that sold was 51 per cent as compared to 72 per cent for those that did not.

The costs for depreciation and labor were higher per dozen eggs for the flocks in which the layers were kept the entire year. These higher costs, however, were offset by lower feed, buildings and equipment and other costs. The average total cost was 52.4 cents per dozen eggs produced for the flocks kept the entire year as compared to 52.3 for those which sold out.

The average return per dozen eggs was 53.3 cents for those flocks in which the layers were kept the entire year and 51.2 cents where they were not. Because the costs were about the same and the returns higher for the first group, the profit per dozen was higher for the farms that kept the birds the entire year. The average was 0.9 cent as compared to minus 1.1 cents, a difference of 2.0 cents per dozen eggs.

TABLE 16. COSTS AND RETURNS PER DOZEN EGGS FOR HEAVY BREED FLOCKS
WHICH DID AND DID NOT KEEP BIRDS THE ENTIRE YEAR
(Farms matched for beginning number of layers and
percentage pullets)
28 New York Farms, 1946-47

Item	Flocks kept entire year	Flocks sold out during year
Number of farms	16	12
Beginning number of layers	1,047	1,085
Average number of layers	844	614
Percentage mortality	16	19
Total hours of labor	2,116	1,190
Hours of labor per layer	2.9	2.1
Pounds of feed per layer	117	117
Eggs produced per layer	187	177
Percentage production Sept.-Nov.	40	51
Percentage of total eggs produced Sept.-Nov.	20	51
Percentage of eggs sold market	96	91
Percentage of eggs produced, large	72	51
Percentage pullets	100	100
<u>Cents</u>		
Costs:		
Depreciation	4.9	1.9
Labor	9.7	8.2
Feed	31.2	33.6
Buildings and equipment	3.4	4.6
Other	3.2	4.0
Total	52.4	52.3
Returns:		
Eggs	52.5	50.5
Other	.8	.7
Total	53.3	51.2
Profit	.9	-1.1
Return per hour of labor	66.1	51.7
<u>Dollars</u>		
Profit on enterprise	123	-100
Total returns for labor	1,399	615

The farms that sold out did not start their pullets early enough to secure highest production and highest proportion of large eggs during the Summer and Fall seasons of high egg prices. They sold their flocks just as they were at a high level of production of large eggs and were unable to secure enough advantage in lower depreciation and labor costs to offset their higher costs for feed, buildings and equipment and miscellaneous items. It is possible that some of the poultrymen who sold their flocks did so because of poor flock performance. If such occurred, the sale was made promptly because the effects of such are not readily apparent. Their average returns per dozen eggs were lower and, consequently, their profits less than for the flocks that were kept the entire year.

A SUGGESTED MANAGEMENT SYSTEM

The results found in the study of the effect of special methods of management, which were aimed at obtaining higher profits through taking advantage of the seasonality of egg prices, indicates that profitable seasonal adjustments might be made by many poultrymen in New York State.

Since April housing of pullets, based on the assumptions previously discussed, proved to be the most profitable, a suggested system of operation would be to start the chicks in November and put the pullets into the laying houses in the latter part of April. During the period in which they would be coming into production and would be producing a relatively high proportion of medium and pullet eggs, the prices for such eggs would be higher relative to large eggs than in the Fall months when pullets usually come into production. The flock would reach a high rate of production and would be producing mostly large eggs during the Summer and Fall when egg prices are high and when the differential between the price of large eggs and the prices of the other sizes of eggs is greatest.

The flock could be culled heavily and the best layers kept on through the Winter or the entire flock sold in the Winter after the seasonal decline in prices takes place. This would permit the use of laying house space and labor for rearing pullets during the Winter.

To determine what such practices might have meant if followed in 1946-47, three farms were selected and their operations adjusted so that their pullets were started in November and added to the laying flock the last of April.

Selected Examples

Some poultry farms are less profitable than others. To see what an adjustment in time of housing pullets would mean to a poultryman who obtained very little for his time in caring for chickens, a farm with a heavy breed flock somewhat below average in size and rates of production and with a fairly high mortality rate was selected.

This farm had a total cost of \$4194 for the year 1946-47 (table 17). The returns were \$3122. The profit was minus \$1072 and the return for labor \$20.

When the business was adjusted so that the pullets were housed in April instead of August, all costs were the same except feed, which, even though the amount consumed was assumed to be the same, increased by \$32 because of different amounts being used at different prices.

The receipts from eggs after the adjustment was \$3365 as compared to the actual amount of \$3112. Although the costs increased somewhat the increase in returns was far more. The return for labor increased by \$221.

TABLE 17. EFFECT OF CHANGING TIME OF HOUSING PULLETS ON LAYING FLOCK PROFITS OF FARMER WITH SMALL HEAVY BREED FLOCK

Item	1946-47 operation	Suggested operation
	Pullets housed in August	Pullets housed in April
Average number of layers	485	485
Percentage mortality	25	25
Eggs produced per layer	163	163
<u>Dollars</u>		
Costs:		
Depreciation	327	327
Labor	1092	1092
Feed	2413	2445
Buildings and equipment	166	166
Other	196	196
Total	4194	4226
Returns:		
Eggs	3112	3365
Other	10	10
Total	3122	3375
Profit	-1072	-851
Return for labor	20	241
Return per hour of labor	.01	.18

The second farm was a part-time poultry farm with a light breed flock of 960 layers (table 18). The rate of lay was 188 eggs per hen and the average mortality 22 per cent.

The total cost for the flock during the actual 1946-47 year was \$6515. The returns were \$8129. The profit was \$1614 and the return for labor was \$2178.

When the farm was revised so that the pullets were housed in April the costs for depreciation and feed increased somewhat. The total cost was \$6686 or \$171 more than the actual cost. The returns were \$8463 as compared to \$8129 for the actual year. This was an increase of \$334. Because the returns increased more than the costs, the profits with the new system were \$1777. This was an increase of \$163. The return for labor was increased to \$2341, or about 10 per cent.

TABLE 18. EFFECT OF CHANGING TIME OF HOUSING PULLETS ON LAYING FLOCK
PROFITS OF PART-TIME FARMER WITH LIGHT BREED FLOCK

Item	1946-47 operation Pullets housed in August	Suggested operation Pullets housed in April
Average number of layers	960	960
Percentage mortality	22	22
Eggs produced per layer	188	188
<u>Dollars</u>		
Costs:		
Depreciation	1,046	1,133
Labor	564	564
Feed	4,079	4,163
Buildings and equipment	384	384
Other	442	442
Total	6,515	6,686
Returns:		
Eggs	8,129	8,463
Other	---	---
Total	8,129	8,463
Profit	1,614	1,777
Return for labor	2,178	2,341
Return per hour of labor	2.39	2.57

The third poultry enterprise was part of a good dairy-poultry farm business similar to many farming operations found in New York State. The management was somewhat above average. The farm was selected to indicate what effect such shifts could have on the profits for a business of this type.

In the actual operation the flock at the beginning of the year was composed of 1072 pullets and 326 old hens (table 19). The old hens were sold after three months. The size of flock averaged 1069 layers in 1946-47. The mortality rate was 7 per cent and the average rate of lay was 217 eggs per hen. The same size and kind of flock was used in the revised operation.

The total cost under the actual 1946-47 operations was \$6840. The returns were \$9954. The profits were \$3114; the returns for labor \$3790 and the return per hour of labor \$4.15.

Under the revised operation, i.e., pullets housed in April, the depreciation cost was less, the feed cost more and the total cost \$6,809, or \$31 less than for the actual operation.

TABLE 19. EFFECT OF CHANGING TIME OF HOUSING PULLETS ON LAYING FLOCK PROFITS OF FARMER WITH DAIRY-POULTRY FARM

Item	1946-47 operation	Suggested operation
	Pullets housed in August, 326 old hens kept 3 months	Pullets housed in April, 326 old hens kept 3 months
Average number of layers for year	1,069	1,069
Percentage mortality	7	7
Eggs produced per layer	217	217
Total eggs produced	19,298	19,298
<u>Dollars</u>		
Costs:		
Depreciation	1,216	1,081
Labor	676	676
Feed	4,108	4,212
Buildings and equipment	382	382
Other	458	458
Total	6,840	6,809
Returns:		
Eggs	9,846	10,510
Other	108	108
Total	9,954	10,618
Profit	3,114	3,809
Return for labor	3,790	4,485
Return per hour of labor	4.15	4.91

The returns amounted to \$10,618 which was \$664 more than the actual returns in 1946-47. Because of the higher returns and lower costs, the profits were \$3809 or \$695 more. The returns for labor were \$4485 and the return per hour of labor was \$4.91, an increase of 76 cents.

Problems Involved

This system of starting chicks in November and housing pullets in April is not too different from that practiced on several New York farms. Previous studies and contacts with poultrymen have indicated that the starting of chicks in December is common, especially in the Southeastern part of the State. The starting of chicks in November requires permanent brooding houses, and may call for different management practices to obtain the same results from the birds. Breeding programs may need to be altered; feeding and lighting methods may need to be changed. In any case, proper management practices need to be determined before this system of poultry farming can be generally adopted.

Nevertheless, the opportunity to shift the season of starting chicks and producing eggs offers a real opportunity to increase profits for many poultrymen, not through reducing costs but by increasing returns. The obstacles to overcome in doing this are no greater than many of the production problems that poultry husbandry has already solved. Thus, it is likely that the technological changes in poultry production in the immediate future will make practical the starting of chicks in November.

SUMMARY AND CONCLUSIONS

1. The study of seasonal costs and returns was made from records on 172 New York poultry farms for the year 1946-47. Eighty-two of these had light breeds; 53, heavy; and 37, mixed breeds.
2. The highest profits in producing eggs when pullets were housed in the late Summer and early Fall months were in the Winter, Spring and Summer seasons and not in the Fall as is often thought. Some factors that explain this situation are:
 - a. It requires some time after the pullets are housed before they reach a high rate of lay.
 - b. A larger proportion of eggs are peewee, pullet and medium-sized during the early part of the laying period than after the birds have been laying for several months.
 - c. Summer and Fall are the seasons of highest egg prices. However, the discount for small-sized eggs is greatest at that time.
3. Since there are definite seasonal patterns of egg prices, sizes and production, it is possible to organize a poultry farm to take full advantage of the seasonal differences in prices of eggs and, as a result, increase total returns for the year. To do this, chicks should be started in November, and pullets transferred to the laying flock in April. This means that the small eggs will be produced when the price discount for such is small, and that large eggs will be produced in the Fall when all prices are seasonally high and the premium for large eggs especially high. In addition, the rate of production would be highest in the Fall months.

Based on this study, the shifting of the date of starting chicks from the Spring months back to November is likely to increase profits by at least 10 per cent.

This system of management is different from that which has been practiced in the past on most farms. For this reason production problems connected with the system must be worked out before it can be generally advocated.

4. There does not seem to be any particular advantage in the practice of selling the flock after the winter break in egg prices occurs over that of keeping the flock for the entire year when the pullets are housed in the Summer and Fall. With the housing of pullets in the Spring the flock may be sold in December or kept for a few more months. The decision as to which practice to follow will depend upon the performance of the flock, market outlets, and the relation of the laying flock to the rearing flock and other farm business.