Costs of Raising Pullets On New York Farms, 1947

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Most laying hens have a useful life of about one year in the laying flock, which means that many of them must be replaced every year to maintain the flock. The poultryman's problem in raising replacements is therefore an important one, relatively more important than, for instance, the dairyman's problem in replacing his cows about every five years. Since most poultrymen raise their own pullets and use a considerable proportion of their resources in doing so, any reduction in costs in this phase of his business is important in increasing his income.

THE STUDY

It is the purpose of this study to: (1) measure technological changes in raising pullets, (2) determine costs of raising pullets on commercial poultry farms in New York in 1947, and (3) to evaluate the important factors which affect these costs.

Selection of Farms

The state was divided into five areas according to the extent to which poultry production had become commercialized and specialized: eastern, northern, central, southwestern and western. The eastern area is the area of the large commercial flocks as shown in table 1. The central area is next in importance in large scale commercial production, followed closely by the western area. The southwest has smaller flocks, and in the northern area there is little commercial poultry production with most of the chickens in small flocks for home use.

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This is one phase of a broader cooperative study conducted by the Cornell Agricultural Experiment Station, several other Agricultural Experiment Stations, and the Bureau of Agricultural Economics. The objectives of the broader study are 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 N.Y. were taken by: C.D. Kearl, A.H. Kantner, W.G. Earle, E.N. Searls, 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.

TABLE 1. PERCENTAGE DISTRIBUTION OF FARMS BY NUMBER OF CHICKENS, 1945

Area	Number of chickens				
	None	Less than 100	100 to 400	400 to 1000	Over 1000
	Percentage of farms				
Eastern	16	55	20	6	3
Central	24	50	18	6	2
Western	17	51	25	6	1
Southwestern	25	56	15	3	1
Northern	23	68	8	1	-
New York State	21	54	18	5	2

Source: 1945 Census data for New York master sample farms.

Four of the five areas in the state were selected for study. The northern area was omitted because of the relatively small importance of poultry. The farms selected within each of the four areas were chosen to reflect insofar as possible the characteristics of the area as determined by study of census data on poultry production. That is, in the eastern area more of the farms selected had flocks of 1,000 or more birds, and in the southwestern area more had flocks of 400 birds or less. No farms were included with flocks of less than 100 birds. In all, records were obtained from 167 poultry farms that had a rearing enterprise in 1947.

Description of Farms Studied

Most of the farms studied had enterprises other than poultry, such as dairying, fruit or cash crops. The average number of work units per farm on poultry was 247, or 54 per cent of the total, (table 2). Several of the poultry farms included in the study were operated by men employed full time in other jobs and who operated the poultry business as a part-time farm. The dairy-poultry combination was a common one, but on these farms either one or the other of the two enterprises was usually of minor importance in the total farm business. In the western area the poultry enterprise was frequently combined with fruit on farms in the fruit belt along Lake Ontario. The specialized poultry farms were concentrated in the eastern area. Incubation enterprises were found on few farms.

TABLE 2. WORK UNITS ON VARIOUS ENTERPRISES
167 New York Farms, 1947

Enterprise	Average work units per farm *
Layers	182
Pullets	60
Incubation	5
Livestock	99
Fruit	18
Cash crops	25
Outside labor	34
Other	31
Total	454
Per cent work units on poultry	54

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

The farms included in this study had an average man equivalent of a little less than two (table 3). The average work units per farm totalled 454, or 252 per man. Most of the farms had some cropland. On some of the larger specialized poultry farms no cropland was used at all, and on others the land was kept in a hay crop which was sold.

TABLE 3. SIZE OF BUSINESS MEASURED BY VARIOUS FACTORS
167 New York Poultry Farms, 1947

Item	Average per farm
Work units	454
Man equivalent	1.8
Acres of crops	30
Number of layers	904
Dozens of eggs produced	13,140
Number of pullets raised	1,279

On farms where dairy herds were kept along with poultry the cropland was used in the production of roughage for the cattle. Fruit and cash crops were more important uses for cropland in the western area. Grain crops were common on farms in the central, western, and southwestern areas, but the amount of grain produced was a small proportion of the total used.

The average number of layers on the farms included in the study was 904. These layers produced 13,140 dozen eggs during the year for an average of 174 eggs per hen. The number of pullets raised was 1,279 per farm. The term "pullets raised" as used here and later as a measure of the size of rearing flock means number of pullets raised to maturity. On farms where some pullets were sold or eaten before reaching laying age, they were equated to maturity on the basis of feed consumption.

DESCRIPTION OF REARING ENTERPRISE

The size of the rearing enterprise varied widely (table 4). The average number of chicks started was 1,896 from which 1,279 pullets were raised. The difference between these two figures is made up of cockerels, pullets died, and pullets sold or eaten before reaching maturity. The number raised on each farm varied from 204 to 11,025.

TABLE 4. DISTRIBUTION OF FARMS BY NUMBER OF PULLETS RAISED
167 New York Farms, 1947

Number of pullets raised	Number of farms	Percentage of farms
Less than 300	11	7
300-599	45	27
600-899	33	20
900-1199	17	10
1200-1499	16	10
1500-1999	17	10
2000-2999	10	6
3000-3999	10	6
4000-4999	5	3
5000 or more	3	1

Sex of Chicks

Seventy per cent of all chicks started for rearing were sexed-pullets (table 5). Straight-run chicks made up 27 per cent of all chicks and sexed-male chicks to be used for breeding cockerels accounted for the other 3 per cent. The sexing of chicks by hatcheries is a relatively new development. In a study of commercial poultry farms made in 1942, only 32 per cent of the chicks started were sexed-pullets. /1 In still earlier studies covering the period 1926 to 1933 no sexed-pullets were reported. /2

/1 Darrah, L. B. "Costs of Incubation and Rearing on Commercial Poultry Farms, 1940-41". Cornell University, Agricultural Experiment Station Bulletin 797. 1943.

/2 Misner, E. G. and Lee, A. T. M. "Economic Studies of Poultry Farming in New York. I. Commercial Poultry Farms, 1926,1929, 1930,1931,1932,1933". Cornell University, Agricultural Experiment Station Bulletin 684. 1937.

The starting of sexed chicks allows farmers to specialize to a greater extent; they can raise young stock for the laying flock without having to produce an equal number of broilers as a minor enterprise which may not be profitable. The question of profit on broilers is especially important with Leghorns. Only five farms included in the study started all Leghorn straight-run chicks. The practice of starting only pullet chicks makes possible the rearing of more pullets with the same facilities, feed and labor. Where these factors are limited and the operator is interested in producing the largest number of replacements for his laying flock, sexed-pullets may be the answer to his problem. Hence more and more rearing flocks are getting away from broiler production and concentrating their resources on pullets.

TABLE 5. SEX OF CHICKS
167 New York Farms, 1947

Sex	Number of farms *	Total chicks started	Percentage of all chicks started
Sexed-pullets	147	222,597	70
Straight-run	52	85,244	27
Sexed-cockerels	24	8,842	3
Total		316,683	100

* Some farms started more than one sex class of chicks.

Breed of Chicks

On the farms surveyed, 50 per cent of the chicks started were Leghorns and 50 per cent heavy breeds and heavy cross-breeds (table 6). The most common heavy breeds were New Hampshires, Rhode Island Reds, and Barred Plymouth Rocks. The cross-breeds were all heavies, mostly Red-rocks.

TABLE 6. BREED OF CHICKS
167 New York Farms, 1947

Breed	Number of farms *	Total chicks started	Percentage of all chicks started
Heavy	52	76,344	24
Heavy cross-breeds	54	82,147	26
Leghorn	107	158,192	50
Total		316,683	100

* Some farms started more than one breed.

Month Chicks Started

Most commercial poultrymen start their chicks in time to have the pullets in production to take advantage of high fall egg prices. Compared with 1941, more chicks were started early in 1947. Thirty-five per cent of the chicks on the farms studied in 1947 were started before March (table 7). In 1941, only 26 per cent of the chicks were started before March. Sixty-three per cent of the chicks were started during the three-month period of February, March and April. March and April were the most popular starting months.

Chicks started the last of March will mature about the last of August or the first half of September, depending on breed. With larger flocks it often becomes necessary or desirable to start chicks at two or more times. Most of the farms in the study started young stock during two or more months, and some spread out the rearing season over most of the year. Starting chicks at different times often makes possible more efficient use of equipment, since the same equipment can be used for two broods instead of one. Also, poultrymen starting chicks at times other than in the spring gain the advantage of using their laying facilities more efficiently, because they can replace hens died or culled during the season and keep their laying houses more nearly filled to capacity.

TABLE 7. MONTHS CHICKS STARTED
167 New York Farms, 1947

	Number of farms *	Total chicks started	Percentage of all chicks started
Before February 1	41	59,051	19
During February	44	49,959	16
During March	74	74,923	24
During April	70	73,967	23
May 1 or later	64	58,783	18
Total		316,683	100

* Some farmers started chicks in more than one month.

Disposal of Chicks

Of the total chicks started for rearing, 71 per cent were raised as pullets, 15 per cent were raised as cockerels, and the remaining 14 per cent died (table 8). Practically all the pullets were kept for layers. About 3 per cent were sold for laying, and almost 5 per cent were culls sold for meat.

TABLE 8. DISPOSAL OF CHICKS
167 New York Farms, 1947

Method of disposal	Number per farm	Value per farm	Percentage of pullets or cockerels	Percentage of all chicks
Pullets:				
Meat sales	64	$ 97	5	3
Sold for breeders or layers	37	36	3	2
Added for layers	596	1300	44	31
On hand at end of season	657	1293	48	35
Eaten	2	2	0	0
Total	1356	$2728	100	71
Cockerels:				
Sold for meat, alive	182	$ 203	67	10
Sold for meat, dressed	39	59	14	2
Sold for breeders	1	2	0	0
On hand	33	47	12	2
Kept for breeders	17	58	6	1
Eaten	4	4	1	0
Total	276	$373	100	15
Died or lost	264			14
Grand total	1876	$3101		100

Mortality

The mortality for the sexed Leghorn chicks averaged 13 per cent (table 9). For sexed heavy breeds the average mortality was 10 per cent. These mortality rates were practically the same as in the 1941 study, when the mortality rate for sexed Leghorns and heavy breeds was 12 and 9 per cent, respectively.

The mortality on straight-run heavy breeds was 23 per cent, which is much higher than for sexed chicks of either light or heavy breeds. In 1941, the same relationship existed. Because of the trend away from the rearing of straight-run Leghorn chicks there were too few farms with such chicks to permit comparison.

TABLE 9. RELATION OF BREED AND SEX TO MORTALITY OF CHICKS
102 New York Farms, 1947

Breed and sex of chicks	Number of farms	Number of chicks started	Number of chicks died	Percentage mortality
Leghorn, sexed	52	57,013	7,560	13
Heavy, sexed	38	62,074	6,064	10
Heavy, straight-run	12	16,165	3,736	23

Feed Used

The feed consumption per pullet on 137 farms where itemized feed costs were available averaged 33.5 pounds (table 10). The cost of this feed was $1.53 per pullet, and the average value of all feed was $4.57 per hundredweight. Less than 4 per cent of all feed used by the rearing flock was homegrown. Starting mash was the most important item fed to the young stock. Fifty-eight per cent of the feed required by rearing flocks was mash, starting mash and growing mash; and 30 per cent was grain: corn, wheat, cracked corn and scratch.

TABLE 10. FEED USED BY REARING FLOCK
137 New York Poultry Farms, 1947 *

Kind of feed	Amount per pullet	
	Pounds	Value
Homegrown:		
Corn	.2	$ .01
Wheat	.5	.02
Milk products		
Other	.5	.02
Total homegrown	1.2	$ .05
Purchased:		
Corn	1.4	$ .06
Wheat	.9	.04
Cracked corn	.8	.03
Starting mash	12.7	.58
Growing mash	7.0	.33
Scratch	6.1	.28
Grit and shell	.1	
Milk products		.01
Other	3.3	.15
Total purchased	32.3	$ 1.48
Total feed	33.5	$ 1.53

* 30 farms on which itemized feed used was not available were omitted.

COSTS AND RETURNS

Method of Computing Costs

The method of computing the cost per pullet in this study was to divide the cost for the rearing flock by the number of pullets raised to maturity. Thus all feed, labor and other costs for cockerels in flocks with straight-run chicks was included in cost per pullet. The returns for cockerels, manure, and eggs laid on range were subtracted from the total cost to obtain the net cost of the pullets. The cost computations were made in this way because of the difficulties involved in allocating the various

costs in the rearing enterprise to cockerels or pullets when there were both in the same flock. Then too, most of the poultrymen who raise cockerels with pullets do so to reduce the cost of the pullets.

Since costs for pullets raised to maturity are not comparable with costs for pullets raised to an age less than maturity, some method had to be used to place all pullets on a common basis. This was done by using the measure "pullet equivalent". Leghorn pullets were considered mature in 22 weeks, and heavy breed pullets were considered mature in 24 weeks. The number of pullets in the rearing flock less than 22 or 24 weeks was adjusted to a mature pullet equivalent on the basis of feed consumed at their age relative to what a mature pullet would have consumed. For example: A 10-week old heavy breed pullet has consumed on the average only one-fourth as much feed as a mature heavy breed pullet. Thus, 4 pullets 10 weeks old are equivalent to one pullet raised to maturity. Although the cost pattern for feed is not entirely representative for other costs, it was used because feed is the most important cost item and exact data were available.

In determining the effect of sex and breed, the farms were divided first by sex of chicks started and then by breed. Only farms with all sexed Leghorns, sexed heavy breeds, straight-run Leghorns, or straight-run heavy breeds were included, eliminating all farms with either mixed sexes or breeds. There were only 5 farms with all Leghorn straight-run chicks, which was too few for comparisons. Thus all the comparisons of sex are made between sexed heavy breeds and straight-run heavy breeds, and all the comparisons of breed are made between sexed Leghorns and sexed heavy breeds.

Costs of Raising Pullets

The net cost of raising sexed Leghorn pullets in 1947 was $2.27 (table 11). As an average, each pullet required 32 minutes of labor valued at 35 cents per pullet, and 25 pounds of feed valued at $1.17. The cost of chicks per pullet raised was 44 cents. The average mortality of sexed Leghorn chicks was 13 per cent. The feed used, labor required and rate of mortality for sexed Leghorn chicks in 1947 was practically the same as in 1941.

With sexed heavy breed chicks, the cost per pullet was $2.49, or 22 cents more than the cost of sexed Leghorn chicks. The labor requirement was the same as with Leghorns. Thirty-four pounds of feed valued at $1.56 was used per pullet. This was 9 pounds more than pullets from sexed Leghorn chicks used. The mortality averaged 10 per cent of the number started.

Straight-run heavy breed pullets cost the same as sexed Leghorn pullets, $2.27, and 22 cents less than sexed heavy breed pullets. The feed used, 50 pounds per pullet, and labor required, 50 minutes per pullet, would indicate that the cockerels in

straight-run heavy breed chicks consume about 16 pounds of feed and require about 17 minutes of labor each. The profit made on the sale of these cockerels more than offset their costs, so the net cost of straight-runs was lower than sexed even though the mortality rate was more than twice as high. The profit from cockerels with straight-run chicks is dependent on the relation between feed prices and broiler prices which varies materially from time to time.

TABLE 11. COST OF REARING PULLETS, BY SEX AND BREED
167 New York Farms, 1947

Item	Sexed-pullets		Straight-run	All farms*
	Leghorn	Heavy breeds	Heavy breeds	
Number of farms	52	38	12	167
Chicks started per farm	1096	1634	1347	1896
Pullets raised to maturity	792	1055	428	1279
Percentage mortality	13	10	23	14
Labor (minutes) per pullet	32	33	50	33
Feed (pounds) per pullet	25	34	50	32
Cost per pullet:				
Chicks	$ .44	$ .38	$ .50	$ .47
Labor	.35	.34	.54	.35
Feed	1.17	1.56	2.37	1.46
Buildings and equipment	.17	.12	.20	.18
Other	.18	.16	.33	.18
Total cost per pullet	$ 2.31	$2.56	$3.94	$2.64
Returns other than pullets	.04	.07	1.67	.36
Net cost per pullet	$ 2.27	$2.49	$2.27	$2.28

* This includes some farms who started both breeds and sexes of chicks.

Based on the above information, formulae can be set up by which a poultryman might approximate an average cost of raising pullets. They are:

1. With sexed Leghorn chicks:

Feed: 25 pounds X _____ price per pound = _____
Labor: 32 minutes X _____ value per minute = _____
Chicks: 1.1 chicks X _____ price per chick = _____
Other items: Add 15% of total cost for feed, labor and chicks = _____

Average net cost of pullets = _____

2. With sexed heavy breed chicks:

Feed:	34 pounds X _____	price per pound	= _____
Labor:	33 minutes X _____	value per minute	= _____
Chicks:	1.1 chicks X _____	price per chick	= _____
Other items:	Add 10% of total cost for feed, labor and chicks		= _____
	Average net cost of pullets		= _____

3. With straight-run heavy breed chicks:

Feed:	50 pounds X _____	price per pound	= _____
Labor:	50 minutes X _____	value per minute	= _____
Chicks:	3.1 chicks X _____	price per chick	= _____
Other items:	Add 17% of total cost for feed, labor and chicks		= _____
	Total		= _____
Subtract:	Price per pound of broilers, _____ X 4.7		= _____
	Average net cost of pullets		= _____

The first two formulas hold true for small numbers of farms, but the third is apt to vary widely because of differences in how poultrymen handle the cockerels. Thus, it can best be used to represent the average of several farms.

FACTORS AFFECTING COSTS WITH SEXED CHICKS

Mortality

Chick mortality is a factor influencing cost of rearing pullets because the money invested in every bird which dies is lost, and the expense must be allocated to the pullets that live. Another important factor is the age at which those chicks die. There is a big difference in the loss between a chick dying at two days of age worth about 30 cents, and one dying at an almost mature age worth about $2.50. In the latter case, not only the value of the chick is lost, but also all the feed, labor, and other expenses which went into the rearing. In relating chick mortality to cost, the assumption must be made that the average age of the chicks that died is about the same for the groups with high mortality as for the groups with low mortality.

In comparing sexed Leghorn flocks with low and with high mortality it should be noted that practically every item of expense was greater for the flocks with high mortality, with the result that with Leghorns the net cost of pullets for flocks with less than 13 per cent mortality was $2.18 as against $2.43 for those flocks with high mortality (table 12). The same relationship was evident for the heavy breeds.

TABLE 12. RELATION OF MORTALITY TO REARING COSTS
90 New York Farms, 1947

Item	Sexed Leghorns		Sexed Heavy Breeds	
	Less than 13 per cent mortality	13 per cent mortality or more	Less than 13 per cent mortality	13 per cent mortality or more
Number of farms	35	17	27	11
Pullets raised to maturity	757	863	1180	747
Percentage mortality	8	22	7	19
Labor (minutes) per pullet	33	29	31	41
Feed (pounds) per pullet	24	27	32	42
Cost per pullet:				
Chicks	$ .41	$ .50	$ .38	$ .38
Labor	.36	.33	.33	.41
Feed	1.12	1.26	1.48	1.90
Buildings and equipment	.16	.21	.12	.12
Interest	.02	.02	.03	.04
Miscellaneous	.14	.17	.11	.14
Total cost per pullet	$2.21	$2.49	$2.45	$2.99
Returns other than pullets	.03	.06	.06	.11
Net cost per pullet	$2.18	$2.43	$2.39	$2.88

Size of Flock

The advantages of having large flocks are found in greater efficiency in use of labor, feed, buildings and equipment, and in lower cost of chicks.

When the farms with all sexed chicks were divided by breed and then into two groups, one with flocks of less than 800 and the other with 800 and more pullets, every item of cost, except the minor one of interest, was less for the large flocks (table 13). However, the cost of labor was substantially less. The cost of chicks was slightly less; the amount of feed consumed and wasted was less so feed costs were not so high; the costs for buildings and equipment and other items also were somewhat lower. The net effect was that Leghorn pullets in large flocks cost 60 cents less per pullet than those in small flocks. For heavy breeds, the difference was 49 cents.

With both breeds, the mortality in large flocks was the same as in small flocks.

TABLE 13. RELATION OF SIZE OF FLOCK TO REARING COSTS
90 New York Farms, 1947

Item	Sexed Leghorn		Sexed heavy breeds	
	Less than 800 pullets	800 pullets or more	Less than 800 pullets	800 pullets or more
Number of farms	35	17	13	25
Pullets raised to maturity	426	1545	268	1464
Percentage mortality	14	13	10	10
Labor (minutes) per pullet	49	22	55	31
Feed (pounds) per pullet	28	24	40	34
Cost per pullet:				
Chicks	$ .49	$ .42	$ .48	$ .37
Labor	.54	.24	.60	.32
Feed	1.27	1.11	1.85	1.54
Buildings and equipment	.23	.14	.26	.11
Interest	.03	.03	.03	.03
Other	.16	.14	.14	.12
Total cost per pullet	$2.72	$2.08	$3.36	$2.49
Returns other than pullets	.06	.02	.42	.04
Net cost per pullet	$2.66	$2.06	$2.94	$2.45

Labor Efficiency

Labor accounts for 13 per cent of the total cost of rearing pullets, and is the third most important item of cost. Feed is the largest cost item, but since pullets must be fed all they will eat of a good, balanced ration to grow into good layers, there is little opportunity to cut rearing costs here, at least at the level of the individual poultryman. About all he can hope for is to use pasture, and reduce feed waste and mortality to a minimum. Likewise in the second most important item of cost, baby chicks, there is little he can do beyond controlling mortality to cut costs without sacrificing quality. For these reasons, the field of efficiency in the use of labor is one of the best available to the farmer interested in reducing rearing costs.

There are two direct ways of reducing labor per pullet. First, increasing the number of pullets raised, and second, adopting labor-saving practices and equipment. There is still room on most farms to use more labor-saving equipment to advantage, as well as to improve on building arrangements, chore routes, and other methods of cutting down on the use of expensive labor. Labor efficiency was measured in this study by hours of labor used per pullet.

The farms with high efficiency in the use of labor, both for Leghorn and heavy breeds, had larger flocks than those with low efficiency. It was not possible to remove the effect of size in studying the importance of efficiency in the use of labor on costs.

The average net cost for Leghorn pullets was $2.13 on farms with high labor efficiency as compared to $2.76 for those with low efficiency (table 14). For heavy breeds the cost was $2.32 as compared to $2.95. With both sexed Leghorns and sexed heavy breed chicks, the labor charge on the inefficient farms was 2½ to 3 times that on the efficient farms.

TABLE 14. RELATION OF LABOR EFFICIENCY TO REARING COSTS
90 New York Farms, 1947

Items	Sexed Leghorn		Sexed heavy breeds	
	Less than .7 hrs. per pullet	.7 hrs. per pullet or more	Less than .7 hrs. per pullet	.7 hrs. per pullet or more
Number of farms	31	21	19	19
Pullets raised to maturity	1018	457	1529	581
Percentage mortality	13	15	9	12
Labor (minutes) per pullet	21	67	24	58
Feed (pounds) per pullet	25	25	33	39
Cost per pullet:				
Chicks	$ .43	$ .48	$ .37	$ .39
Labor	.23	.74	.24	.61
Feed	1.17	1.15	1.50	1.73
Buildings and equipment	.17	.20	.11	.17
Interest	.03	.03	.03	.03
Other	.14	.18	.11	.18
Total cost per pullet	$2.17	$2.78	$2.36	$3.11
Returns other than pullets	.04	.02	.04	.16
Net cost per pullet	$2.13	$2.76	$2.32	$2.95

SUMMARY AND CONCLUSIONS

1. This study is based on a farm management survey of 167 New York poultry farms in 1947. Technological changes were measured by comparison with a similar study in 1941.

2. The feed and labor requirements for pullets as well as the mortality rate in 1947 were practically the same as in 1941. It would appear then that a poultryman might figure the average costs of producing pullets in any year by applying current prices to the physical quantities involved.

3. More chicks are being started early (before March) now than in 1941. This movement will tend to cause the seasonal peak in egg prices to come earlier in the fall, and reduce the amount of seasonal variation in egg prices.

4. Even though the average cost of raising pullets from straight-run chicks is lower than from sexed chicks, the trend toward the use of sexed chicks has continued at a rapid rate. This is probably due to the need to raise more pullets with the same facilities, or the same number of pullets with less feed and labor.

5. In addition to breed and sex of chicks, important factors that caused the costs of pullets to vary from farm to farm were: mortality, size of flock, and labor efficiency. All of these are largely within the control of the individual poultryman and there are many who have not given these factors sufficient attention.