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THE ECONOMICS OF THE POULTRY ENTERPRISE ON KANSAS FARMS

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TABLE OF CONTENTS

Part of a 300-hen Kansas farm flock of White Plymouth Rock hens with a good type of 20′ × 70′ laying house.

THE ECONOMICS OF THE POULTRY ENTERPRISE ON KANSAS FARMS[1]

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INTRODUCTION

The poultry enterprise is found on more Kansas farms than any other single enterprise. Of the 156,327 farms in Kansas reported in the 1940 census, 135,468 or 87 percent reported chickens on hand on April 1. While Kansas has relatively few specialized poultry farms, the large proportion of farms that produce poultry makes this enterprise important.

The poultry flock provides a steady source of income to the farm family throughout the year. The income may be, and usually is used to pay the running expenses of the household. In addition, the poultry enterprise provides a significant quantity of the food consumed by the farm family.

The Kansas cash farm income from the marketings of chickens and eggs in 1940 was $20,333,000, an average of $150 for each farm reporting chickens on hand on April 1 that year. In addition to the cash income from marketings, farm families consumed poultry products valued at $7,411,000, an average of $55 per farm reporting chickens. The gross farm income from poultry in 1940 was $27-744,000, an average of $205 per farm reporting chickens. The poultry enterprise accounted for approximately 8 percent of the cash farm income from marketings and 6.5 percent of the gross farm income in Kansas in 1940.

Poultry and egg production in the United States has tended to shift from the Corn Belt and small grain states to the East and South during the past ten years. Figure 1 shows the increase or decrease in the production of eggs by states during the past ten years. Undoubtedly, one of the principal reasons for this shift was the drought period of the 1930's which seriously affected the small grain states and the western part of the Corn Belt. The development of a marketing system in the eastern states which pays a price differential for quality in poultry products has been another factor contributing to the shift in poultry production. Associated with this development has been the growth of large scale commercial poultry enterprises in those areas producing high quality products.

The loss of the cotton export market and the tendency toward self-sufficient agriculture in the South has resulted in increased poultry and egg production in that area. Since most of the increase in pro-

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duction in the South will be consumed in that area, the increase is not particularly important from a market standpoint at this time.

Kansas has been a large producer of poultry and eggs for several decades. According to the 1930 census, Kansas ranked fourth in the number of chickens on farms, fifth in the number of chickens raised, and seventh in the number of eggs produced. According to the 1940 census, however, Kansas had dropped to ninth in the number of chickens on farms, ninth in the number of chickens raised, and tenth in the number of eggs produced. The percentage decrease in the number of chickens raised was greater in Kansas than in any other

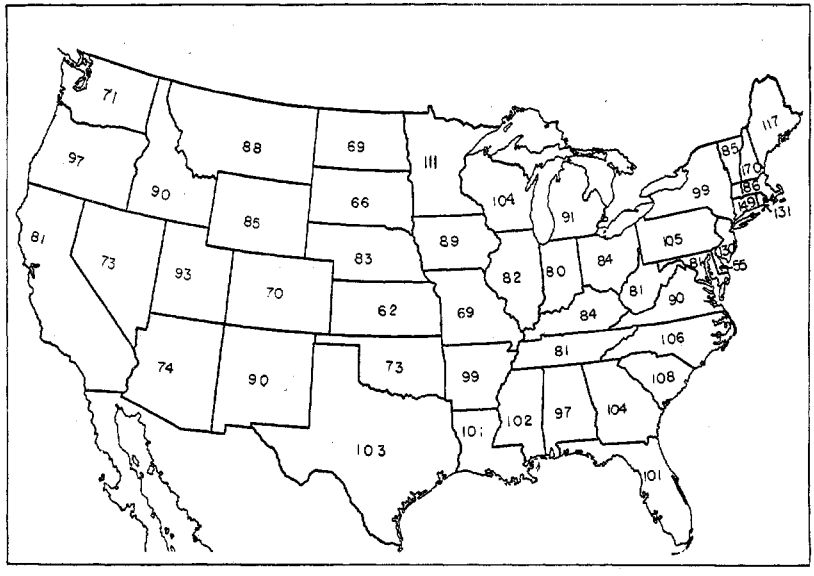

FIG. 1.—Increase or decrease in the production of eggs by states from 1930 to 1940.

state, and the percentage decrease in the number of eggs produced was greater than in any other state except Delaware, which has shifted from egg production to the production of market poultry.

With the return of more nearly normal weather conditions it should be possible to expand materially poultry and egg production in Kansas. Developments in recent years have pointed to the need for increased poultry and egg production in the United States, not only for export but also for domestic consumption. Kansas farms have certain natural advantages which make poultry production more efficient than in many other areas. Certain disadvantages also must be recognized.

Some information regarding the poultry enterprise was obtained from the 1941 record books and from a completed questionnaire returned by 71 poultrymen who are members of the Kansas Poultry

Improvement Association. The poultry enterprise was the main source of income on only a few of the farms on which the 71 flocks were located.

The costs and returns of these 71 flocks do not represent the conditions of an average Kansas poultry enterprise, but are typical of the enterprises of the better small poultry producers; they are especially typical of the poultrymen who sell part of their eggs to a hatchery. The costs above labor on these enterprises would not be greatly different from the average good poultry enterprise in the state. The returns probably would be higher, however, because of the premiums paid by the hatchery to the producer for all eggs delivered to the hatchery. Much of the influence on the returns by the premiums paid may be removed by assuming that all eggs were sold at the current market price. The principles established by the various relationships between the enterprises may be applied by most poultrymen in the state.

The records cover the year beginning October 1, 1940, and ending September 30, 1941. For most poultrymen, this was a profitable year, especially the latter part. As a result of an increasing consumer demand and large government purchases for shipment abroad, egg prices began to strengthen during March and remained well above average the remainder of the year.

The purpose of this bulletin is to present information on some of the economic phases of the poultry enterprise which should be helpful to those who produce poultry products.

GEOGRAPHICAL DISTRIBUTION OF THE POULTRY ENTERPRISE IN KANSAS

The poultry population in Kansas per county is the greatest in the north-central and eastern sections of the state. In western Kansas and the Bluestem area, the poultry population is relatively small (Fig. 2).

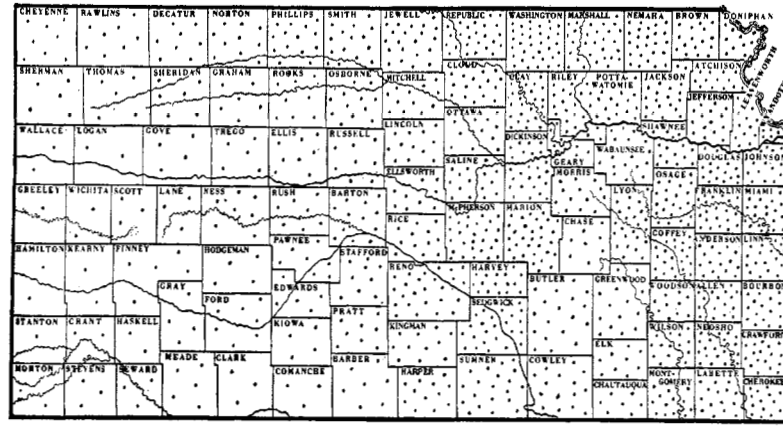

FIG. 2.—Number of chickens per county in Kansas, April 1, 1940. Each dot represents 10,000 chickens. (Source: Bureau of Census statistics.)

Counties with small farms tend to have a higher poultry population than counties with large farms. Poultry production is dependent to a large extent on the production of feed grains. Those counties that produce small quantities of feed grain tend to have small poultry numbers. Although wheat is important in the poultry ration, there is little relationship between wheat production and poultry population. Poultry population seems to be associated with diversified types of agriculture, where farms are relatively small and feed grain production is relatively large and certain.

The average size of the poultry flock is the greatest in the north-central part of the state and tends to decrease to the west, south, and east. Flocks average largest in Washington and Clay counties (Fig. 3). Clay, Riley, and Marion counties lead in the production

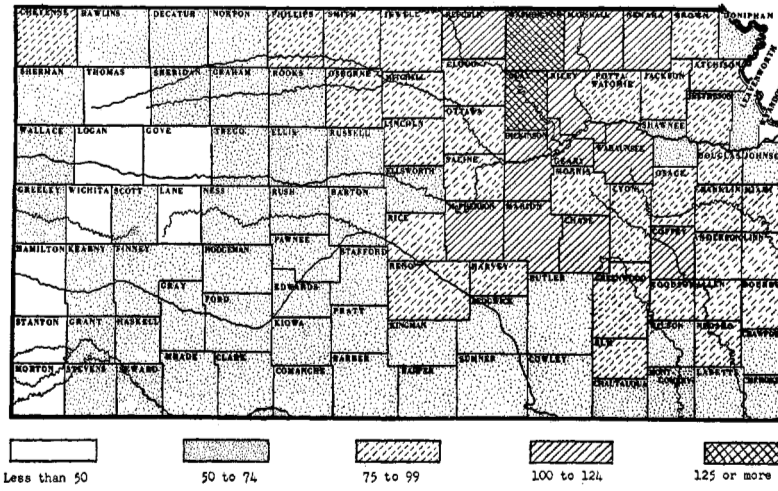

FIG. 3.—Average number of chickens per farm in Kansas, April 1, 1940, by counties. (According to Bureau of Census figures.)

of eggs per farm. Egg production per farm tends to follow the number of chickens per farm although there is considerable variation in the ratio of chickens to eggs produced.

Local prices received for eggs is an important factor affecting the location of the poultry enterprise. Average egg prices received by farmers during January, February, and March are shown in Figure 4. These prices were obtained through the coöperation of producers who sent in average monthly price quotations in their community. The highest prices were paid for eggs in the immediate vicinity of Kansas City. The other areas of relatively high prices are in the south-central and southeastern parts of the state. The lowest prices were paid in the northwestern and north-central parts of the state. The average prices paid ranged from 17.7 cents per dozen in Wyandotte county to 13.4 cents per dozen in Decatur county.

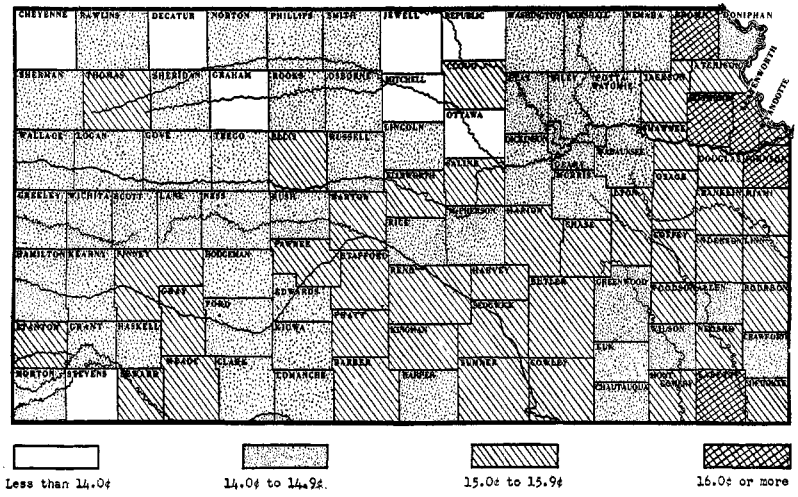

FIG. 4.—Average egg prices received by Kansas farmers during January, February and March, 1938-'41.

INVESTMENT IN THE POULTRY ENTERPRISE

The poultry industry on most Kansas farms requires a small investment in chickens, buildings, and equipment as compared to the investment for other livestock. According to the Thirty-second Biennial Report of the Kansas State Board of Agriculture, there were 16,321,000 chickens valued at $7,181,000 on farms in Kansas on January 1, 1940. The average number of chickens per farm was 104, valued at $46. This was approximately one-fourth of that invested in horses and mules, one-sixth of that in dairy cattle, one-tenth of that in other cattle and two-thirds of that invested in hogs. It is about twice as much as the investment in sheep and lambs.

The inventory of chickens on 71 Kansas farms with a poultry enterprise in 1940-'41 is shown in Table 1. The producers with general-purpose breeds had a total of 235 chickens valued at 81 cents each at the beginning of the year and 289 chickens valued at 87 cents each at the close of the year. This group of producers increased the number of pullets and decreased the number of old hens in their flocks. The value of the flocks increased $59.67 during the year. Of the general-purpose breeds, White Plymouth Rocks were kept by 16 producers; Rhode Island Reds by 8; White Wyandottes by 3; Buff Orpingtons by 2; New Hampshires by 2; Barred Plymouth Rocks by 2; and 5 producers kept other breeds.

The producers with egg breeds had a total of 520 chickens valued at 68 cents each at the beginning of the year and 480 chickens valued at 82 cents each at the close of the year. There was considerable reduction in the number of old hens but only a small increase in the number of pullets. The total value of the flocks in-

TABLE 1.—*Inventory of chickens on 71 Kansas farms with poultry enterprises in 1940-1941.*

	General-purpose breeds.			Egg breeds.		
	Number per farm.	Value per bird.	Total value.	Number per farm.	Value per bird.	Total value.
	Beginning inventory.					
October 1, 1940:						
Hens	125	$0.815	$101.88	260	$0.683	$177.62
Pullets	93	.746	69.41	226	.617	139.44
Males	17	1.164	19.79	34	1.169	39.75
Total or average	235	$0.813	$191.08	520	$0.685	$356.81
	End inventory.					
September 30, 1941:						
Hens	93	$0.833	$77.49	204	$0.77	$157.08
Pullets	170	.831	141.27	238	.798	189.95
Males	26	1.230	31.99	38	1.162	44.16
Total or average	289	$0.868	$250.75	480	$0.815	$391.19

creased $34.38, due entirely to the increase in the value per chicken. There were 32 of these producers who kept White Leghorns and 1 who kept White Minorcas.

Ordinarily, one would expect a greater difference between the values of 87 cents for the general-purpose breed hens and 82 cents for the egg-breed hens. The small spread is partly due to the relative better grade of egg-breed chickens than the general-purpose breeds. Also, since egg prices increased so substantially during the

TABLE 2.—*Inventory of poultry buildings and equipment on the average of 71 Kansas farms for the 1941 season.*

ITEM.	Value.	Percent.
Land	$23.20	4.6
Laying house	339.74	67.2
Brooder house	47.25	9.3
Other buildings	5.50	1.1
Incubators	37.54	7.4
Brooders	10.96	2.2
Feeders	6.45	1.3
Water containers	2.10	.4
Other equipment	32.83	6.5
Totals	$505.57	100.0
Depreciation	29.99	5.9

year studied, the values of all hens increased. However, the values of the egg breed increased relatively more than the general-purpose breed because of the ability of the egg-breed chickens to lay more eggs.

The value of the poultry buildings and equipment on the 71 enterprises studied was $505.57 per farm, or $212.43 per 100 hens (Table 2). The depreciation on the buildings and equipment for the year was $29.99 per farm, or $12.60 per 100 hens. The value of the laying house accounted for two-thirds of the total. The other investments of high value were the brooder house, incubators, and land.

PRODUCTION AND DISTRIBUTION OF EGGS

During 1939 Kansas produced 126.5 million dozens of eggs. Of this amount, 78 percent were sold, 20 percent were consumed in the households of the producers, and 2 percent were used for farm hatching. In the entire United States about 22 percent of the eggs were consumed in the households of the producers.

In 1939, Kansas farmers received an average of 12.8 cents a dozen for the eggs they sold. Except for Nebraska, this was the lowest average price of all states. The average price in the United States was 17.4 cents a dozen. Producers in the North Atlantic area received the highest prices, 24.2 cents a dozen (nearly twice the Kansas price). In the west north central area, consisting of Minnesota,

TABLE 3.—*Seasonal distribution of egg production in the United States, 1930, and monthly averages for 1939, 1940, and 1941.**

MONTH.	Produced monthly, 1930.			Monthly averages, 1939-1941.		
	North Atlantic States.	Kansas.	Total United States.	North Atlantic States.	Kansas.	Total United States.
	Percent.	*Percent.*	*Percent.*	*Percent.*	*Percent.*	*Percent.*
January	5.8	4.4	4.6	8.2	6.1	6.6
February	7.3	4.6	5.8	8.4	7.7	7.8
March	10.2	14.2	12.2	10.9	12.5	11.8
April	12.9	15.1	14.3	11.1	14.0	13.0
May	13.1	13.8	13.7	10.8	12.7	12.2
June	11.4	12.1	11.5	9.2	10.2	10.0
July	9.3	9.8	9.5	8.3	8.4	8.6
August	8.6	7.3	7.8	7.4	7.1	7.4
September	7.3	6.0	6.6	6.4	6.1	6.3
October	5.7	5.5	5.8	5.9	5.3	5.6
November	3.9	3.5	4.2	5.9	4.5	4.9
December	4.5	3.7	4.0	7.5	5.4	5.8
Totals	100.0	100.0	100.0	100.0	100.0	100.0

* Source: 1930 Yearbook of Agriculture; 1931; U. S. Dep't Agriculture. 1939-'41 Poultry and Egg Production Reports; U. S. Dep't Agriculture.

Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas, the average price per dozen was the lowest in the United States. The principal reason for the low prices in this region is the distance between these states and the large egg-consuming center of the eastern part of the United States.

In 1939, the average number of eggs produced per layer in Kansas was 107. This was higher than the average production per layer in any of the middle-western and southern states except Ohio, Indiana, Michigan, and Wisconsin. The North Atlantic area had the highest production in the United States 129 eggs per hen—and the western area had the second highest production—122 eggs per hen. Egg production of 151 eggs per hen in New Hampshire was the highest average rate for any state.

The seasonality of egg production in Kansas, the North Atlantic states, and in the total United States is shown in Table 3. There was less seasonal variation in the North Atlantic states than in any section of the United States. In most areas the peak of production occurred during April with the low point in production usually during November. In 1930 the difference between the low point and the high point in production was 9.2 points in the North Atlantic states, 11.6 points in Kansas, and 10.3 points in the United States. Because of better management practices, the seasonality in all areas had been decreased by 1939. This was accomplished principally by maintaining egg production during the spring and increasing it during the fall and winter. The producers thereby in-

TABLE 4.—*Number of eggs produced and chickens kept on 71 Kansas farms with a poultry enterprise, 1940-1941.*

Month.	General-purpose breeds.			Egg breeds.		
	Number of hens per farm.	Average number of eggs per hen.	Dozens of eggs per farm.	Number of hens per farm.	Average number of eggs per hen.	Dozens of eggs per farm.
October	190	7.7	123	454	8.2	310
November	191	7.8	124	433	8.3	299
December	184	8.8	135	414	9.0	309
January	177	10.6	156	355	13.6	402
February	171	13.4	191	363	15.1	457
March	165	18.7	257	346	19.2	552
April	158	18.9	249	330	20.1	553
May	144	18.6	223	312	20.3	526
June	134	15.3	170	273	18.1	412
July	121	13.6	137	251	17.0	356
August	110	12.4	114	240	14.4	289
September	109	11.7	106	217	12.8	231
Total or average	154	157.5	1,985	335	176.1	4,696

creased their total egg production and also benefited from seasonally higher egg prices. In the 1939-'41 period the difference between the low point and the high point in production had decreased to 5.2 percent in the North Atlantic states, 9.5 percent in Kansas, and 8.1 percent in the United States as a whole.

The number of eggs produced and the number of hens kept on the 71 Kansas farms are indicated in Table 4. Laying flocks were largest in October and November. Pullets are usually added to the flock at this time and from then until the following fall numbers gradually decrease from the sale of old hens and the mortality of layers. The abrupt drop in average number of eggs per hen from September to October was caused principally by the addition of the pullets and to a minor degree by the mature birds moulting. Highest production per hen was obtained in March, April, and May. The egg breeds produced an average of 176 eggs per hen during the year and the general-purpose breeds produced 158 eggs per hen.

TABLE 5.—*Eggs marketed and home-used per 100 hens by 71 Kansas poultrymen, by months, 1940-1941.*

MONTH.	Market eggs sold.		Hatching eggs sold.		Eggs used in home.	
	Number of dozens.	Price per dozen.	Number of dozens.	Price per dozen.	Number of dozens.	Price per dozen.
	General-purpose breeds.					
October	56.4	$0.17	10.6	$0.26	6.7	$0.17
November	62.5	0.21	9.6	0.29	6.2	0.19
December	63.6	0.21	11.9	0.31	5.3	0.20
January	48.0	0.15	38.0	0.25	5.9	0.15
February	26.7	0.15	72.7	0.24	4.9	0.13
March	34.1	0.17	105.2	0.26	6.3	0.15
April	45.6	0.19	105.5	0.29	6.2	0.18
May	75.4	0.19	57.1	0.30	6.4	0.19
June	85.2	0.23	16.9	0.29	7.5	0.22
July	65.3	0.21	12.3	0.32	6.0	0.21
August	47.9	0.24	21.4	0.32	7.2	0.22
September	69.4	0.24	19.8	0.35	6.3	0.24
Total or average	680.1	$0.20	481.0	$0.29	74.9	$0.19
	Egg breeds.					
October	82.3	$0.19	2.2	$0.32	5.2	$0.17
November	80.7	0.20	3.5	0.33	4.1	0.18
December	80.2	0.22	6.5	0.30	4.6	0.20
January	94.9	0.16	15.6	0.25	4.8	0.15
February	57.9	0.13	62.6	0.26	4.4	0.13
March	45.1	0.17	97.8	0.27	5.3	0.15
April	54.2	0.19	88.7	0.30	5.5	0.17
May	95.9	0.20	50.7	0.28	5.7	0.18
June	111.3	0.23	9.4	0.27	5.7	0.21
July	93.0	0.22	3.1	0.35	4.9	0.21
August	70.2	0.24	9.1	0.28	5.4	0.23
September	71.9	0.26	8.6	0.28	4.7	0.23
Total or average	937.6	$0.20	357.8	$0.29	60.3	$0.18

The largest number of eggs sold to hatcheries by 71 Kansas poultrymen was during March and April (Table 5.) A small number of eggs were sold to hatcheries during all other months of the year. The average price paid by hatcheries was 29 cents a dozen while the price for eggs sold to the regular markets was 20 cents a dozen. The poultrymen that kept the general-purpose breeds sold about 55 percent of their eggs as market eggs, 39 percent as hatching eggs, and used about 6 percent in their homes. The poultrymen keeping egg breeds sold about 69 percent as market eggs, 26 percent as hatching eggs, and used 5 percent.

PRODUCTION AND DISPOSITION OF POULTRY

In 1939, there were 31,183,000 chickens produced in Kansas. In the same year 11,096,000 chickens were consumed in the households of farm producers. The average price received per pound for the chickens sold was 10.2 cents Except for North Dakota this was the lowest average price received in any state. The highest average price of 17.2 cents was received in the North Atlantic states. Poultry prices are low in the west central area for the same reason egg prices are; that is, because of the distance from the principal eastern consuming centers.

On the poultry enterprises studied the producers with general-purpose breeds sold, per 100 hens kept, 60.6 mature hens and males at an average price of 75 cents each and 107 broilers and springs at 54 cents each. There were 19.7 chickens consumed in the home and 17.7 chickens died, a total disposal of 205 birds (Table 6). The producers with egg breeds sold, per 100 hens kept, 50.2 mature hens and males at an average price of 47 cents each and 58.4 broilers and springs at 45 cents each. There were 18.3 chickens consumed and 26.4 chickens died, a total disposal of 153.3 birds. This is a disposal of 52 fewer chickens of the egg breeds per 100 hens than for the general-purpose breeds. Most of the difference is accounted for in the larger number of sales of young chickens of the general-purpose breeds.

The old hens and males were sold throughout the year. The largest number of springs and broilers on these farms were sold during June. The largest number were eaten on the farms during July. Mortality of the layers was heaviest, during the winter and spring months.

BROODING PRACTICES

Records on brooding practices were available for 31 poultrymen keeping the general-purpose breeds and for 28 poultrymen keeping the egg breeds.

GENERAL PURPOSE BREEDS

To maintain the general-purpose flocks at the average size of 154 hens, the producers started an average of 482 chicks. The mortality rate was 5 percent to 3 weeks and 12 percent to 6 months. The death loss to 3 weeks ranged from 0 percent to 35 percent and to 6 months it ranged from 1 percent to 40 percent.

TABLE 6.—*Disposition of poultry per 100 hens by 71 Kansas poultrymen, 1940-1941*

MONTH.	Mature hens and males.		Broilers and springs.		Number used in home.	Number died.
	Number of birds.	Value per bird.	Number of birds.	Value per bird.		
	General-purpose breeds.					
October	10.0	$0.67	9.1	$0.51	1.2	0.7
November	6.4	0.55	4.3	0.55	0.9	0.7
December	4.3	0.61	0.7	0.77	0.6	1.1
January	1.8	0.69	1.2	0.65	0.2	2.1
February	2.2	0.75	0.0	0.00	0.3	1.7
March	2.3	0.79	0.1	0.42	0.3	2.0
April	3.2	0.84	4.8	0.35	0.2	2.1
May	8.5	0.81	18.8	0.48	2.4	2.0
June	4.7	0.73	28.0	0.50	3.9	1.6
July	8.2	0.86	17.6	0.61	4.3	1.6
August	4.1	0.80	14.2	0.51	3.2	1.0
September	4.9	0.84	8.2	0.61	2.2	1.0
Total or average	60.6	$0.75	107.0	$0.54	19.7	17.6
	Egg breeds.					
October	7.6	$0.38	2.0	$0.58	1.2	1.2
November	3.3	0.41	0.7	0.60	0.9	1.6
December	2.9	0.31	0.5	0.67	0.7	2.8
January	6.1	0.43	0.1	0.42	0.3	3.1
February	1.0	0.43	1.4	0.42	0.4	2.1
March	0.6	0.51	0.0	0.00	1.0	3.0
April	1.2	0.55	0.0	0.00	0.5	2.7
May	3.5	0.52	7.7	0.30	1.7	2.4
June	8.0	0.60	24.3	0.39	2.6	2.3
July	5.3	0.47	9.0	0.42	3.7	1.7
August	4.8	0.48	8.9	0.53	2.6	1.8
September	5.9	0.58	3.8	0.58	2.7	1.5
Total or average	50.2	$0.47	58.4	$0.45	18.3	26.2

The average hatching date for these chicks was March 22. Some producers hatched their chicks as early as February 3 and others as late as May 18, more than one-half being hatched during March. March is the recommended month for hatching general-purpose breeds. Of the 31 producers, 11 used their own hatching eggs, 15 bought chicks from a hatchery, and 5 used both sources. All of the eggs originated from pullorum-tested flocks.

The average brooder floor space used per operator to raise the 482 chicks was 193 square feet. One-third of the operators used more than one house. The most common size of brooder house was 10 feet by 12 feet.

EGG BREEDS

To maintain the egg flocks at the average size of 335 hens, the producers started an average of 733 chicks. The mortality rate was 4 percent to 3 weeks, and 13 percent to 6 months of age. The death

loss to 3 weeks ranged from 1 to 15; to 6 months, from 4 to 25 percent.

The average hatching date for these chicks was April 3. The earliest date of hatch was February 24 and the latest was May 15. More than one-half of the producers hatched chicks during April. April is the recommended month for hatching chicks of the egg breeds. Of the *28* producers, 18 bought their chicks from a hatchery, 8 used their own hatching eggs, and 2 used both sources. All of the eggs originated from pullorum-tested flocks.

The average brooder floor space used per operator to raise the 733 chicks was 279 square feet. One-half of the operators used more than one house, The most common size of house used was 10 ft. by 12 ft.; 12 ft. by 14 ft. was the next most common size.

GENERAL PRACTICES

Of the 59 producers who furnished brooding records, 52 disinfected their brooding houses with hot lye water, 2 used other disinfectants, and 5 used no disinfectants. The chicks were reared on clean ground by 41 producers; the other 18 producers reared their chicks on ground on which they had chicks the preceding year. It is much easier to raise healthy chickens on clean ground than on ground which chickens have contaminated the preceding year.

There were 16 types of litter used in the brooder houses by these producers. Twenty-four of the 59 producers used peat, 12 used straw, 7 used pulp, 6 used hardware cloth, and 3 used sand. The other types of litter used were chopped hay, cane fiber, oat hulls, ground stalks, ground corn cobs, sawdust, and papers.

The chicks were started on an all-mash feed by 54 of the producers, on an all-grain feed by two, and on a combination of the two by three producers. Forty producers purchased commercially mixed feed, 15 mixed their own feed, and 4 used both. Twenty of the 59 producers used KPIA feed (ration recommended by the Kansas Poultry Improvement Association), and the remainder used one of 19 different brands.

The average price per pound received for the general-purpose breed cockerels was 15.8 cents. The price received ranged from 13 cents to 20 cents per pound. The average price per pound received for the egg-breed cockerels was 14.4 cents, or 1.4 cents per pound less than for the heavier breeds. The price received per pound for the egg-breed cockerels ranged from 10 cents to 18 cents.

To ascertain the net cash cost of producing pullets to 6 months of age, the receipts from cockerels were deducted from the total cash cost of producing the cockerels and pullets. The average net. cash cost of producing the general-purpose pullets was 32.5 cents; for the egg-breed pullets, 38.9 cents. The net cash cost ranged from 0 to 55 cents per pullet. A low net cash cost per pullet was accompanied by low mortality, economical gains in the weight for both cockerels and pullets, and a relatively high price per pound for the cockerels sold. In addition to the cash costs of producing the cockerels and

pullets there are additional costs that should be considered. The most important of these are labor, building tax, and interest costs. These usually amount to an additional 30 to 35 percent of the total costs.

RECEIPTS FROM THE POULTRY ENTERPRISE

The poultry industry on most farms is a minor enterprise but it contributes a steady income throughout the year. The receipts from the poultry enterprise consist of cash sales of eggs and poultry and the value of eggs and poultry used in the farm home. The proportion of the total receipts from each source is influenced by type of breeds and size of flock.

Receipts per 100 hens by months are shown in Table 7 for the 38 general-purpose breed enterprises. Receipts from eggs amounted to about two-thirds of the total; the other one-third consisted principally of receipts from the poultry marketed and a small amount from the sale of breeding stock. The receipts from eggs were about equally divided between market eggs and hatching eggs. Total receipts from eggs amounted to $286.31 per 100 hens. Receipts from poultry marketed were about equally divided between mature birds and young birds. Total receipts from poultry amounted to $111.72 per 100 hens. The average amount received for breeding stock sold was $19.04 per 100 hens. Total receipts from all sources were $417.07 per 100 birds—or $4.17 per hen.

Table 8 shows receipts per 100 hens by months for the 33 egg-breed enterprises. Receipts from eggs amounted to about three-fourths of the total. Poultry sold accounted for the remainder of the receipts. The receipts from eggs were about two-thirds from the sale of market eggs and about one-third from the sale of hatching eggs. Total receipts from eggs amounted to $299.95 per 100 hens. Receipts from poultry marketed were about equally divided between mature and young stock sold. Total receipts from poultry amounted to $57.14 per 100 hens. The average value of breeding stock sold was $41.29 per 100 hens. The total receipts from all sources were $398.38 per 100 birds, or $3.98 per hen. This was 19 cents per hen less than the receipts for the general-purpose breeds.

In the 71 enterprises receipts from market eggs were the highest in June and were highest from hatching eggs in April. April egg receipts were the highest and October receipts were the lowest. Receipts from mature birds were irregular throughout the year. The heaviest receipts for young stock were during June. The largest number of day-old chicks was sold during March, April, and May. Most of the mature breeding stock was sold during September. Receipts from all sources were the heaviest during April, May, and June and the lightest during October, November, December and January. On the enterprises with general-purpose breeds the monthly receipts per 100 hens ranged from a high of $52.82 in May to a low of $21.57 in December. On the enterprises with egg breeds the range of receipts per 100 hens was from $55.61 in April to $21.53 in October.

TABLE 7.—*Receipts per 100 hens on 38 Kansas poultry enterprises with general purpose breeds, by months, 1940-1941.*

MONTHS.	Number of hens.	Eggs marketed and used.				Poultry marketed and used.				Breeding stock.		Total operating receipts.
		Market eggs.	Hatching eggs.	Eggs used in home.	Total.	Hens and males sold.	Broilers and springs.	Used in home.	Total.	Day-old chicks.	Other.	
October	123	$9.81	$2.72	$1.13	$13.66	$6.74	$4.62	$0.62	$11.98	.....	$0.03	$25.67
November	124	13.02	2.76	1.19	16.97	3.51	2.36	0.52	6.39	.....	0.34	23.70
December	119	13.08	3.65	1.04	17.77	2.62	0.54	0.38	3.54	.....	0.26	21.57
January	115	7.27	9.33	0.88	17.48	1.22	0.75	0.11	2.08	$2.40	0.26	22.22
February	111	3.90	17.40	0.63	21.93	1.65	0.33	0.19	2.17	2.14	.....	26.24
March	107	5.71	27.85	0.96	34.52	1.77	0.06	0.17	2.00	3.45	0.02	39.99
April	102	8.56	30.48	1.10	40.14	2.71	1.67	0.14	4.52	3.09	0.14	47.89
May	93	14.62	17.15	1.21	32.98	6.87	8.92	1.15	16.94	2.60	0.30	52.82
June	87	19.80	4.96	1.64	26.40	3.47	14.00	1.88	19.35	1.21	0.63	47.59
July	78	13.89	3.99	1.24	19.12	7.06	10.69	2.37	20.12	.73	.....	39.97
August	71	11.47	6.93	1.62	20.02	3.26	7.18	1.77	12.21	.11	0.07	32.41
September	70	16.87	6.92	1.53	25.32	4.12	5.00	1.30	10.42	.....	1.26	37.00
Total per 100 hens	100	138.00	134.14	14.17	286.31	45.00	56.12	10.60	111.72	15.73	3.31	417.07
Total per farm	154	212.52	206.57	21.82	440.91	69.30	86.43	16.33	172.06	24.22	5.10	642.29

TABLE 8.—*Receipts per 100 hens on 33 Kansas poultry enterprises with egg breeds, by months, 1940-1941.*

MONTHS.	Number of hens.	Eggs marketed and used.				Poultry marketed and used.				Breeding stock.		Total operating receipts.
		Market eggs.	Hatching eggs.	Eggs used in home.	Total.	Hens and males sold.	Broilers and springs.	Used in home.	Total.	Day-old chicks.	Other.	
October	137	$15.30	$0.71	$0.87	$16.88	$2.86	$1.19	$0.59	$4.64	.....	$0.01	$21.53
November	130	16.31	1.15	0.75	18.21	1.35	0.41	0.31	2.07	.....	1.35	21.63
December	125	17.40	1.96	0.89	20.25	.91	0.34	0.27	1.52	.....	.....	21.77
January	107	15.47	3.92	0.70	20.09	2.62	0.05	0.13	2.80	.....	0.28	23.17
February	109	7.64	16.21	0.57	24.42	.42	0.60	0.15	1.17	.....	.....	25.59
March	104	7.63	25.67	0.79	34.09	.33	.....	0.48	.81	$5.15	0.91	40.96
April	99	10.02	26.44	0.95	37.41	.65	0.08	0.22	.95	14.66	2.59	55.61
May	94	18.88	14.40	1.05	34.33	1.85	2.33	0.72	4.90	10.75	1.00	50.98
June	82	25.16	2.59	1.19	28.94	4.80	9.49	1.00	15.29	.....	0.83	45.06
July	76	20.73	1.09	1.04	22.86	2.48	3.75	1.57	7.80	.....	0.32	30.98
August	72	16.91	2.52	1.23	20.66	2.31	4.75	1.15	8.21	.....	0.01	28.88
September	65	18.33	2.40	1.08	21.81	3.41	2.24	1.33	6.98	.....	3.43	32.22
Total per 100 hens	100	189.78	99.06	11.11	299.95	23.99	25.23	7.92	57.14	30.56	10.73	398.38
Total per farm	335	635.75	331.86	37.23	1,004.84	80.35	84.53	26.53	191.41	102.36	35.97	1,334.58

EXPENSES OF THE POULTRY ENTERPRISE

The expenses of the poultry enterprise may be divided into cash and noncash costs. The cash expense items are purchased feed, breeding stock, brooder fuel, hired labor, and similar items. The noncash expenses consist principally of the operator's labor, the use of poultry houses and equipment, the home-grown feeds, and similar items. Cash expenses usually are held to a minimum on Kansas farms since most of the feed is produced on the farm and little labor is hired to care for the poultry.

The expenses per enterprise and per 100 hens by months for the general-purpose breeds and for the egg breeds are shown in Tables 9 and 10. Total expenses per enterprise were more than twice as large for the egg breeds as for the general-purpose breeds because the number of hens kept per enterprise was slightly more than doubled in the egg-breed flocks. There was not a great deal of difference in expenses between the two types of breeds on a 100-hen basis. The chief difference was that the general-purpose producers used more feed for their young stock and less feed for their layers than did the egg-breed producers. This was reflected in the receipts, the general-purpose producers depending more on the income from young stock and less on the income from the layers.

The feed expense for the laying flock is least during the summer months when the hens' regular feed is supplemented with green feed and with waste grain around the farm yard. Feed, except corn, is also the lowest in price during these months. The greatest feed expense for young stock occurs during the late spring and summer months. The small amount of labor hired usually was for the purpose of culling the flock. The greatest total expenses occurred during March, April, and May. The smallest was during the late fall and winter months.

LABOR

An estimate of the number of hours spent in caring for their flocks was obtained from 51 of the 71 producers. The time spent was divided between rearing the young stock and taking care of the laying flock.

On this group of farms 36 percent of the labor was performed by the husband, 43 percent by the wife, 9 percent by the sons, 7 percent by the daughters, 2 percent by hired labor, and 3 percent by other labor. At least 50 percent of the labor on the poultry enterprise was performed by either the wife or daughters.

The labor spent per 100 hens, by months, is shown in Table 11. The labor necessary to rear the replacements for a laying flock of 100 hens was 149.8 hours per year. Daily chores required 114.1 hours (76 percent of the total), cleaning houses required 25.4 hours, and disposing of young stock 10.3 hours per year. The labor spent per 100-hen laying flock was 348.2 hours per year. Of this time 62 percent of the total—217.1 hours—was spent on the daily chore of feeding and caring for the flock; 14 percent—48.3 hours—was spent

TABLE 9.—*Expenses per 100 hens on 38 Kansas poultry enterprises with general-purpose breeds, by months, 1940-1941.*

MONTH.	Average number of hens per month.	Laying flock.		Young stock.		Breeding stock.		Labor hired.	Brooder fuel.	Total operating expenses.
		Grain and mash.	Grit, shells, litter, etc.	Grain and mash.	Grit, shells, litter, etc.	Hatching chicks.	Pullets and breeding stock.			
October	123	$10.54	$0.27	$0.70	.....	$0.38	$0.56	$2.53	$0.14	$15.12
November	124	10.89	0.13	0.48	.....	.....	.....	0.84	0.06	12.40
December	119	11.61	0.24	0.13	.....	1.71	.....	0.39	0.71	14.79
January	115	11.78	0.23	0.04	.....	.....	0.08	0.02	0.66	12.81
February	111	10.95	0.23	0.59	$0.18	3.62	.....	0.01	1.10	16.68
March	107	11.98	0.20	5.34	0.48	7.97	.....	0.78	2.77	29.52
April	102	10.78	0.23	10.92	0.33	2.42	0.62	.....	2.34	27.64
May	93	9.19	0.20	13.78	0.14	1.17	0.34	.....	0.78	25.60
June	87	8.17	0.16	10.80	0.08	.....	1.26	0.02	0.25	20.74
July	78	7.28	0.08	10.92	0.08	.44	.....	0.03	0.15	18.98
August	71	7.80	0.15	10.52	0.06	.....	.....	0.27	0.28	19.08
September	70	9.18	0.15	10.88	0.08	.....	.....	0.47	0.58	21.34
Total per 100 hens	100	120.15	2.27	75.10	1.43	17.71	2.86	5.36	9.82	234.70
Total per farm	154	185.04	3.50	115.66	2.20	27.27	4.40	8.25	15.12	361.45

TABLE 10.—*Expenses per 100 hens on 33 Kansas poultry enterprises with egg breeds, by months, 1940-1941.*

MONTH.	Average number of hens per month.	Laying flock.		Young stock.		Breeding stock.		Labor hired.	Brooder fuel.	Total operating expenses.
		Grain and mash.	Grit, shells, litter, etc.	Grain and mash.	Grit, shells, litter, etc.	Hatching chicks.	Pullets and breeding stock.			
October	137	$12.28	$0.22	$0.77	.....	$0.23	.....	$0.89	$0.89	$14.56
November	130	12.04	0.20	0.01	.....	.....	$0.52	0.79	0.32	13.88
December	125	11.60	0.20	0.03	.....	.....	.....	1.10	0.42	13.25
January	107	12.89	0.30	.....	$0.01	.....	.....	0.49	0.67	14.36
February	109	11.56	0.28	0.25	.....	0.76	0.30	0.02	0.76	13.93
March	104	12.02	0.38	2.15	0.25	5.81	0.71	0.70	1.64	23.66
April	99	11.75	0.24	7.61	0.22	6.17	0.34	1.07	2.36	29.77
May	94	11.67	0.21	10.32	0.08	0.97	0.24	0.76	0.86	25.11
June	82	9.54	0.21	9.60	0.17	0.24	0.69	0.24	0.10	20.79
July	76	7.72	0.43	8.78	0.21	1.57	.....	0.19	0.40	19.30
August	72	7.50	0.18	7.65	0.05	0.06	.....	0.46	0.32	16.22
September	65	8.86	0.12	7.19	0.04	.....	0.04	0.69	0.20	17.14
Total per 100 hens	100	129.43	2.97	54.36	1.03	15.81	2.85	7.40	8.22	222.07
Total per farm	335	433.60	9.95	182.09	3.44	52.98	9.54	24.79	27.53	743.94

TABLE 11.—*Labor used per month per 100 hens on 51* Kansas farms, 1940-1941.*

ITEM.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Total.
	hours	*hours*	*hours*	*hours*	*hours*	*hours*	*hours*	*hours*	*hours*	*hours*	*hours*	*hours*	*hours*
Rearing:													
Daily chores	0.6	0.5	0.6	0.6	1.5	10.1	22.2	20.6	16.4	14.5	13.7	12.8	114.1
Cleaning houses and range	0.1	0.1	0.1	0.2	0.7	4.6	4.9	3.9	3.0	2.6	2.7	2.5	25.4
Disposing of surplus young stock,	0.1	0.1	.....	.....	.....	0.2	0.4	1.6	2.1	2.0	1.7	2.1	10.3
Totals	0.8	0.7	0.7	0.8	2.2	14.9	27.5	26.1	21.5	19.1	18.1	17.4	149.8
Laying flock:													
Daily chores	18.5	18.4	19.4	20.5	18.7	20.3	19.2	17.6	16.4	16.1	16.1	15.9	217.1
Cleaning houses and range	4.5	4.0	4.6	4.7	4.1	4.3	3.9	4.0	3.1	3.5	3.7	3.9	48.3
Cleaning, packing, and storing eggs	3.4	3.8	4.1	4.6	5.1	6.4	6.3	6.3	4.4	3.7	3.6	3.4	55.1
Marketing eggs	1.3	1.4	1.4	1.6	1.7	2.1	2.0	1.8	1.5	1.5	1.5	1.4	19.2
Disposing of surplus stock	2.0	0.8	0.7	0.5	0.6	0.5	0.4	0.7	0.7	0.4	0.5	0.7	8.5
Totals	29.7	28.4	30.2	31.9	30.2	33.6	31.8	30.4	26.1	25.2	25.4	25.3	348.2
Total labor	30.5	29.1	30.9	32.7	32.4	48.5	59.3	56.5	47.6	44.3	43.5	42.7	498.0
Hours per day	0.98	0.97	1.0	1.05	1.16	1.56	1.98	1.82	1.59	1.43	1.40	1.42	1.36

* Data not complete for 20 enterprises.

on cleaning houses and range; 16 percent—55.1 hours—was spent on cleaning, packing, and storing eggs; 6 percent—19.2 hours—was spent on marketing eggs; and 2 percent—8.5 hours—of the total time was spent on disposing of surplus stock. The estimated total time required to care for a laying flock of 100 hens and to rear the replacements for the flock was 498 hours per year—an average of 1 hour and 22 minutes per day.

The time required to care for the flock varies from about 1 hour a day during October, November, December, and January to about 2 hours a day during April and May. It requires about 1 hour a day to care for the 100 hens; the additional time was required to care for the young stock. Less time per 100 hens was required for the large flocks than for the small flocks. More labor per 100 hens was probably spent on these flocks than the average farm or commercial flock because of the extra care required for handling the hatching eggs and the extra care given the hens to get maximum production of eggs from them.

PROFITS FROM THE POULTRY ENTERPRISE

Most farm flocks are kept as a side line to the major enterprises of the farm, but there are few if any enterprises that pay as well as poultry for the time, effort, and expense involved. Poultry often make use of labor which would otherwise be unemployed or only partially employed. This is especially true during the winter months. Feeds which would otherwise be wasted are picked up and utilized by the poultry. It is only under unusual circumstances that the farm flock does not bring returns for labor.

A summary of the 71 Kansas farms for the 1941 season on which poultry was regarded as one of the major enterprises is shown in Table 12. Any comparison between the two types of breeds should be made on the basis of 100-hen flocks since the average size of the egg-breed flocks is twice the size of the general-purpose breed flocks.

On the basis of 100 hens the capital invested amounted to about $350. The average labor required for the general-purpose breeds was 1.8 hours per day and that for the egg breeds was 1.0 hours per day, or only about one-half as much. This difference was caused partially by the larger number of young stock raised per 100 hens by the general-purpose breeders and partially by economies in labor due to the larger size of the egg-breed flocks.

Total receipts per 100 hens were $455.82 for the producers with general-purpose breeds and $409.54 for the producers with egg breeds. Expenses also were slightly higher for those with the general-purpose breeds. The total expenses per 100 hens amounted to $251.14 for the general-purpose breeds and $233.76 for the egg breeds.

The poultry enterprise income was computed by deducting the expenses from the receipts. Interest on the capital investment was then deducted from this figure to get the poultry labor income. This income represents the amount of money that the producer receives

TABLE 12.—*Summary of the poultry enterprises on 71 Kansas farms for the 1941 season.*

ITEM.	Summary per enterprise.		Summary per 100 hens.	
	General purpose breeds.	Egg breeds.	General purpose breeds.	Egg breeds.
Number of enterprises	38	33	.....	.....
Number of hens	154	335	100	100
Capital invested:				
Flock	$221	$374	$144	$111
Buildings and equipment	320	688	207	205
Totals	$541	$1,062	$351	$316
Labor per day:				
Rearing (hours)	0.8	1.0	0.5	0.3
Laying flock (hours)	1.9	2.4	1.3	0.7
Totals	2.7	3.4	1.8	1.0
Financial returns:				
Receipts from sales and home use	$642.29	$1,334.58	$417.07	$398.38
Increase in stock inventory	59.67	34.38	38.75	10.26
Increase in supply inventory	.....	3.00	.....	.90
Total receipts	$701.96	$1,371.96	$455.82	$409.54
Current expenses	361.45	743.94	234.70	222.07
Decrease in supply inventory	2.62	.....	1.70	.....
Depreciation of buildings and equipment	22.68	39.15	14.74	11.69
Total expenses	$386.75	$783.09	$251.14	$233.76
Poultry enterprise income	315.21	588.87	204.68	175.78
Interest @ 6 percent on capital	33.08	63.72	21.48	18.96
Poultry labor income	282.13	525.15	183.20	156.82
Returns per hour	0.28	0.42	0.28	0.42

for the time he spent in caring for the flock. The average poultry labor income for the flock owners who had the general-purpose breeds was $282.13 per enterprise and $183.20 per 100 hens. The poultry labor income for the egg-breed flock owners was $521.76 per enterprise and $155.75 per 100 hens. On a 100-hen basis the general-purpose flocks paid $27.45 more than the egg breeds. The income per hour of labor was 42 cents for the egg-breed producers and for the general-purpose breed producers the income was 28 cents per hour. Although the general-purpose breed producers had the highest returns for labor, they had to spend more time per 100 hens in caring for their flocks than did the egg-breed flock owners.

VARIATION IN LABOR INCOME

The poultry labor income on the 71 farms ranged from $34 to $2,505. About 75 percent of the incomes ranged from $100 to $500. Because 1941 was such a favorable year for poultry producers, all of these producers received some returns for their labor. About 10 percent received less than $100; 16.9 percent received $100 to $199; 26.8 percent received $200 to $299; 16.9 percent received $300 to $399; and 14.1 percent received $400 to $499. The remaining 15.4 percent of the producers received returns of more than $500 (Table 13).

TABLE 13.—*Distribution of poultry labor income on 71 Kansas farms, for the 1941 season.*

LABOR INCOME.	Number of farms.	Percent.
$0– 99	7	9.9
100–199	12	16.9
200–299	19	26.8
300–399	12	16.9
400–499	10	14.1
500–599	3	4.2
600–699	1	1.4
700–799	1	1.4
800–899	2	2.8
900–999	1	1.4
1,000–and more	3	4.2
Totals	71	100.0

FACTORS AFFECTING LABOR INCOME

Some important factors affecting the poultry labor income are: (1) Management, (2) markets, (3) size of enterprise, (4) type of breed, and (5) rate of production.

In the analysis, some of these factors could be measured only in part. The managerial ability of the owner is one of the more difficult factors to measure statistically. However, there is a close relationship between this factor and rate of production. Usually, the good managers have flocks with a high rate of production so that when the effect of rate of production on labor income is studied, managerial ability is largely included. The effects of the other factors on labor income were measured approximately.

SIZE OF FLOCK

Large businesses efficiently operated make the largest labor incomes. The average number of hens kept by producers with general-purpose breeds was 154 (Table 14.) Those producers who kept an average of 101 hens received a total labor income of $176.43 on their enterprises. This compares with the labor income of $387.83 for the producers keeping an average of 207 hens. The producers with the large-size flocks had a larger income per 100 liens kept The small-flock owners made an income of $174.68 per 100 hens while the large-flock owners made an income of $187.36 per 100 hens. The small-flock owners averaged a return of 33 cents per hour for the labor they spent in caring for their flocks and the large-flock owners averaged 44 cents per hour.

TABLE 14.—*Relationship of the size of flock to poultry labor income on Kansas farms, for the 1941 season.*

ITEM.	General-purpose breeds.			Egg breeds.		
	Less than 150 hens.	150 hens or more.	Average.	Less than 285 hens.	285 hens or more.	Average.
Number of flocks	19	19	19	16	17	16.5
Size of flocks	101	207	154	195	467	335
Eggs per hen	155.0	157.7	156.4	178.8	174.6	176.6
Hours per hen	5.27	4.25	4.83	3.47	3.03	3.28
Percent sold to hatchery,	43.2	43.8	43.5	27.4	30.2	28.9
Poultry labor income	$176.43	$387.83	$282.13	$261.82	$766.41	$521.76
Income per 100 hens	$174.68	$187.36	$183.20	$134.27	$164.11	$155.75
Returns per hour of labor,	$0.331	$0.441	$0.379	$0.387	$0.542	$0.475

The average number of hens kept by producers with egg breeds was 335. Those producers with an average of 195 hens received a labor income of $261.82 on their poultry enterprise and the producers with an average of 467 hens received a labor income of $766.41. The producers with the smaller size flocks made an income of $134.27 per 100 hens compared to an income of $164.11 per 100 hens for the larger flocks. The return of the small-flock owners averaged 39 cents for every hour of labor spent on the poultry enterprise and large-flock owners received a return of 54 cents per hour.

Producers with large enterprises made more profit on the average than those with small enterprises for several reasons. (1) A larger number of units were sold; that is, if a profit was made on one hen, those producers with a large number of hens obviously made more total profit than the producers with a small number of hens. (2) There are advantages gained in both costs and returns, The large-flock owners can more efficiently use their facilities and make savings in large-quantity purchases. The owners of larger flocks often can get a better market outlet for their products because of the large quantity of products which they have to sell. If the returns of the poultry flock are an important part of the farmer's income, he is likely to take more interest in caring for his flock correctly. (3) Because less time has to be spent per hen and because total returns are higher, returns per hour of labor are higher for the large flocks. Labor may be used more efficiently on the large enterprises.

For these reasons it is recommended that farmers should keep either a flock just large enough for the family's needs or, if poultry is to become one of the farm's cash income producing enterprises, a flock of 300 or more hens should be kept.

EGG PRODUCTION PER HEN

To make high incomes, it is particularly important that a producer have good rates of production from his hens. Flock owners with general-purpose breeds had an average production per hen of 156 eggs.[3] The producers who had an average production of 138 eggs per hen made an income of $150.76 per 100 hens (Table 15.) Those flocks which had an average production of 174 eggs per hen produced a labor income per 100 hens of $213.60, or $62.84 higher for every 100 hens. More time was necessary to care for the higher-producing hens, but in spite of this, the labor return per hour for the low-producing flocks was 34 cents and for the high-producing flocks it was 41 cents.

TABLE 15.—*Relation of egg production per hen to the poultry labor income on Kansas farms, for the 1941 season.*

ITEM.	General-purpose breeds.			Egg breeds.		
	Less than 155 eggs per hen.	More than 155 eggs per hen.	Average.	Less than 175 eggs per hen.	More than 175 eggs per hen.	Average.
Number of flocks.....	19	19	38	17	16	33
Eggs per hen.....	138.5	174.2	156.4	158.6	195.7	176.6
Size of flock.....	149	159	154	360	308	335
Hours per hen.....	4.49	5.18	4.83	2.73	3.88	3.28
Percent sold to hatchery,	51.3	35.7	43.5	28.9	28.8	28.9
Poultry labor income....	$224.63	$339.63	$282.13	$474.98	$571.46	$521.76
Income per 100 hens.....	$150.76	$213.60	$183.20	$131.94	$185.54	$155.75
Returns per hour of labor,	$0.336	$0.412	$0.379	$0.483	$0.478	$0.475

The producers who kept egg breeds had an average production per hen of 177 eggs. The producers who had a production of 157 eggs per hen made an income of $131.94 per hundred hens and those with a production of 196 eggs per hen had an income of $185.54, or $53.60 higher than the flock owners with low-producing hens. The return per hour of labor was about 48 cents per hour for both groups.

COMBINATION OF FACTORS

Measuring the effect of one factor on the labor income by the method used in Tables 14 and 15 is difficult because the other variable factors are not held constant. (In Tables 14 and 15 the variation happens to be at a minimum.) By using multiple correlation analysis, this difficulty largely is overcome. The relationship of the poultry labor income to the percent of eggs sold to a hatchery, to

3. When these flocks were separated into high-producing and low-producing groups, the average size of flock differed considerably between the groups. The difference in size also influenced labor income. This difficulty was overcome largely by putting the labor income on a 100-hen basis.

the number of hens and to the egg production per hen is shown in Table 16.[4]

Table 16 shows a variety of different conditions. For example, a flock owner selling 20 percent of his eggs to a hatchery, with a 100-hen flock and with a production per hen of 150 eggs, could expect to make a labor income of about $39. If this flock owner had an egg production per hen of 200 instead of 150, he could expect a labor income of about $228. Now, if this producer increased the percent,

TABLE 16.—*The relation of the poultry labor income to the percent of eggs sold to a hatchery, to the number of hens and to the egg production per hen.*

Percent of eggs sold to a hatchery.	Number of hens.	Egg production per hen.		
		150 eggs.	175 eggs.	200 eggs.
		Poultry labor income.		
20	100	$39	$133	$228
	150	127	221	316
	200	215	310	404
	300	392	486	581
40	100	$101	$195	$290
	150	189	283	378
	200	277	372	466
	300	454	548	643
60	100	$163	$257	$352
	150	251	346	440
	200	339	434	528
	300	516	610	705

of his eggs sold to a hatchery from 20 to 60, the 100-hen flock with a production of 150 eggs per hen could be expected to return about $163. If production were stepped up to 200 eggs per hen, the producer's income would increase to about $352.

In using this table to estimate future income from the poultry enterprise, it is well to keep in mind that these figures were based on 1941 conditions and on above-average poultry enterprises. The extent to which the actual returns from the poultry enterprise for the individual farmer will vary from the estimated returns depends upon the individual's managerial ability and on some special advantages or disadvantages that he may have that are not common to the 71 enterprises used in the study.

4. Coefficient of multiple correlation = .917
Regression equation was $X_1 = 1.76485X_2$ plus $3.78129X_3$ plus $3.10607X_4$ minus 767.24
Standard error of estimate—plus or minus $112.

FACTORS AFFECTING THE PRICE OF EGGS

YEARLY VARIATION

The fluctuations in egg prices from year to year are caused principally by the variations in the supply of eggs and by the forces which cause a change in the general price level. The index of wholesale prices was used as an indication of the price-making forces that cause a change in the general price level. A very high correlation was found to exist between the price of eggs and general wholesale prices. This indicates that the same price-determining forces which cause prices in general to advance also cause egg prices to advance. The supply of eggs is of minor importance as a price-determining force. The relationship of the average United States egg price to the index of wholesale prices and to the total eggs sold is shown in Table 17.[5] As indicated in the table, a change in the level of whole-

TABLE 17.—*Relationship of the average United States egg price per dozen to the index of wholesale prices and to the total eggs sold, 1910-1939.**

Index of wholesale prices in the United States.†	Total eggs sold in United States.		
	20 millions.	25 millions.	35 millions.
90	.16	.16	.15
100	.18	.18	.17
110	.20	.20	.19
120	.23	.22	.21
130	.25	.24	.23
140	.27	.26	.25
150	.29	.28	.28
160	.31	.30	.30
170	.33	.32	.32
180	.35	.35	.34
190	.37	.37	.36

* Data from which this table was calculated were obtained from *Agricultural Statistics*, 1940, U. S. Dep't Agriculture.
† Base, 1910-1914 = 100.

sale prices influences egg prices more than a change in the number of eggs sold.

Between 1910 and 1939 the total number of eggs sold per year in the United States ranged between 20 and 30 billion eggs. At any given price level a change of 10 billion eggs sold would cause a change of only 1 to 2 cents per dozen in the selling price. On the other hand, a change of 10 points in the price level would cause a

5. Coefficient of multiple correlation equals .969
Regression equation was X_1 equals $0.13948X_2$ plus $0.30861X_3$ plus 0.0018
Standard Error of Estimate equals plus or minus 1.8 cents.

change of 2 to 3 cents in the average yearly price of eggs. The price level fluctuates much more than the number of eggs sold.

SEASONAL VARIATION

The marketing of eggs and poultry is highly seasonal because of climatic and biological factors. Since the supplies of eggs and poultry are much larger during certain seasons of the year, prices usually are relatively low when large supplies are available and relatively high when supplies are light. The progressive poultryman attempts to take maximum advantage of this situation by planning his marketing program accordingly.

TABLE 18.—*Index of seasonal egg price variation on the Kansas City market, by ten-day periods, 1924-1940.**

DATE.	Index of egg prices.	DATE.	Index of egg prices.
January 1–10	116	July 1–10	82
11–20	110	11–20	85
21–30	104	21–30	88
February 1–10	98	August 1–10	90
11–20	92	11–20	93
21–28	88	21–30	97
March 1–10	85	September 1–10	100
11–20	83	11–20	105
21–30	82	21–30	109
April 1–10	81	October 1–10	113
11–20	81	11–20	118
21–30	81	21–30	125
May 1–10	81	November 1–10	136
11–20	81	11–20	146
21–30	81	21–30	145
June 1–10	81	December 1–10	134
11–20	81	11–20	128
21–30	81	21–30	121

* Average of central five items of the percentage ratio of ten-day average prices to thirty-six period moving average, centered, corrected to base of 100.

The index of seasonal egg price variation on the Kansas City market by ten-day periods during 1924-1940 is shown in Table 18. The index of prices for eggs ranged from a low of 81 percent during April and May to a high of 146 percent in November. Egg prices have more seasonality than prices of poultry. In general, egg prices move opposite to poultry prices. Egg prices are below the average yearly price for about seven months of the year and above the average price for only five months of the year. The seasonal decline in prices was 20 percent, while the seasonal rise was 45 percent. The seasonally high prices usually do not last very long.

STORAGE

Because there is so much difference between the seasonal high and seasonal low of egg prices, it often is profitable to buy eggs during the period of low prices and store them for sale when prices are at their peak. This operation has the effect of removing from

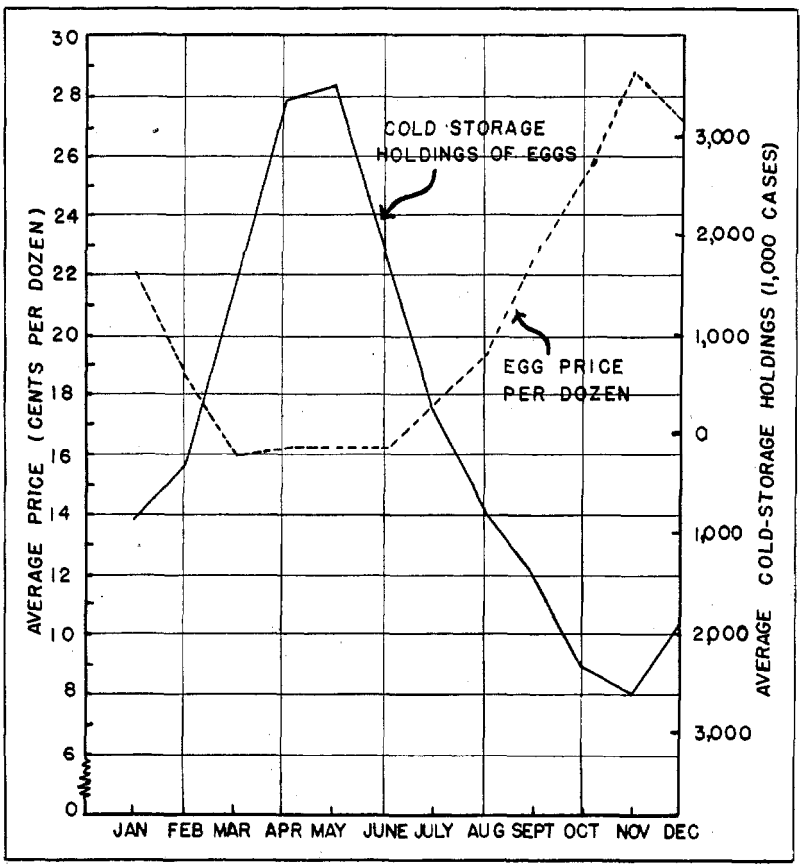

FIG. 5.—Relation of seasonal price to quantity of eggs moved into or out of storage—1930-'41.

the market some of the large supplies during the months of heavy production, thereby tending to support prices. When egg production is seasonally low, the stored eggs are sold, thereby tending to keep prices from going as high as they otherwise would. The storage operation tends to benefit both the producer and the consumer.

The relationship between the seasonal price of eggs to the quantity of eggs moved into or out of storage is shown in figure 5. The net movement into storage usually occurs during February, March,

April, May, and June, with the largest number of eggs going into storage during April and May. The peak out-of-storage movement usually occurs in November when fresh egg prices are the highest.

Eggs are stored either in the shell or broken out of the shell and frozen or dried. The number of eggs stored in the United States as frozen eggs increased from 867,920 cases per year during 1918-1929 to 2,379,750 cases per year during 1930 to 1941. This was an average yearly increase of about 126,000 cases. Eggs stored in the shell decreased from 9,040,830 cases during 1918-1929 to 7,955,420 cases during 1930-1941. This was an average yearly decrease of about 90,000 cases each year.

During the period 1918-1941 there was an average of about 10,023,540 cases of eggs stored each year. The quantity stored has increased only slightly during the period. The quantity of eggs stored from year to year fluctuates with the price. During years of relatively low prices there are fewer eggs stored than during periods of relatively high prices.

In April, 1941, the United States Government adopted the policy of exporting large quantities of food to aid the United Nations in the war effort. One of the most important of these exports was dried eggs. Within a year following the inauguration of the lend-lease program egg drying facilities in the United States expanded about sixfold. To keep these plants running the maximum length of time during the year, quantities of eggs are frozen and stored during the period of heavy fresh supplies and then dried later when fresh supplies are much lighter. The big expansion in drying of eggs has come as a direct result of the need for a concentrated product to ship abroad. It remains to be seen whether the industry will continue to export as large quantities after the war as at present.

GRADE PRICE CURVE[6]

As shown in Table 3, about 50 percent of the total number of eggs produced in Kansas during the year go to market during the four months of peak production; namely, March, April, May, and June. At this season the general quality is good and, because of a plentiful supply of high-quality eggs, the premiums paid for them often are disappointing to producers. Producers must consider the price differentials paid during the entire year to evaluate properly the advantages that may be obtained from a graded market for eggs. Most producers recognize that worthwhile premiums for quality are paid during the summer and fall months. However, if too many of them are unable to resist the temptation of straight-run prices during the spring months, their buying agencies may close for lack of volume at that time and no graded market will be available when it really means something in the way of price differential.

Spreads between different quality eggs in wholesale egg prices for the New York market are given in Figure 6. The Extra-Fancy

6. Data collected by C. E. Dominy, Extension Marketing Specialist, Kansas State College.

grade is about the best that could be produced in Kansas under present conditions, Firsts are average eggs, and Dirties are under grades. During February, March, April, and May, the spread between Extra-Fancies and Firsts was 2.0-3.0 cents and that between Firsts and Dirties was 1.0-2.0 cents. During the months of September, October, and November—the months of light production—the spread between Extra Fancies and Firsts increased to at least 8.0 cents and that between Firsts and Dirties to at least 3.0 cents.

Data have been obtained from a Kansas market buying eggs directly from producers on a three-way grade that is roughly equiva-

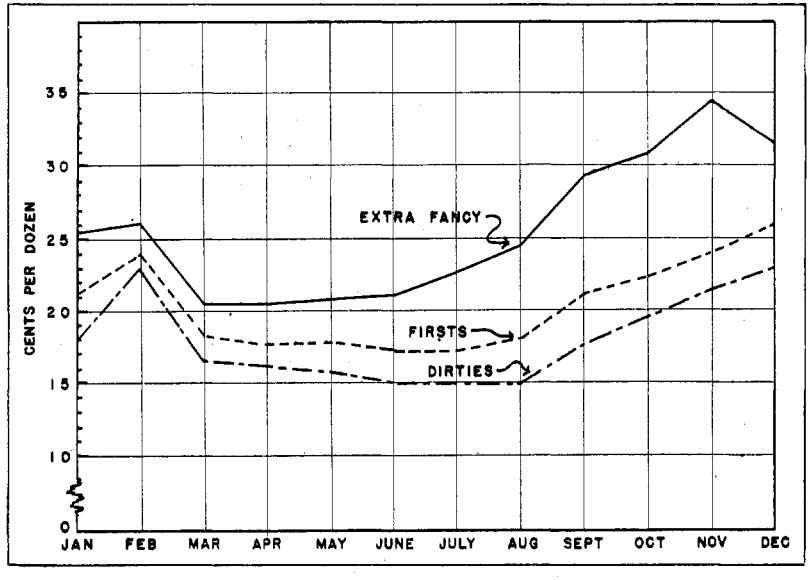

FIG. 6.—New York wholesale egg prices, 1940.

lent to the New York grades shown in Figure 6. These spreads are shown graphically in Figure 7. The seasonal pattern of the price movements is about the same as on the New York market. During the months of heavy production the spread between each grade was 2 cents per dozen. However, during the fall months, when production was light, the spread between Extras and Firsts increased to about 6 cents per dozen and between Firsts and Undergrades to about 4 cents per dozen. The spreads between the top grades fluctuated more on the New York market than on the Kansas market.

Even under the best production practices not all eggs will be high-quality eggs. The Kansas market from which data were obtained buys all eggs on a graded basis and has done considerable educational work with producers. Yet, during 1940, the highest percent-

age of top grades in any one month was 67 percent and the lowest month showed a percentage of only 42 percent. The proportion of eggs in each of the three grades during the year is indicated in Figure 8.

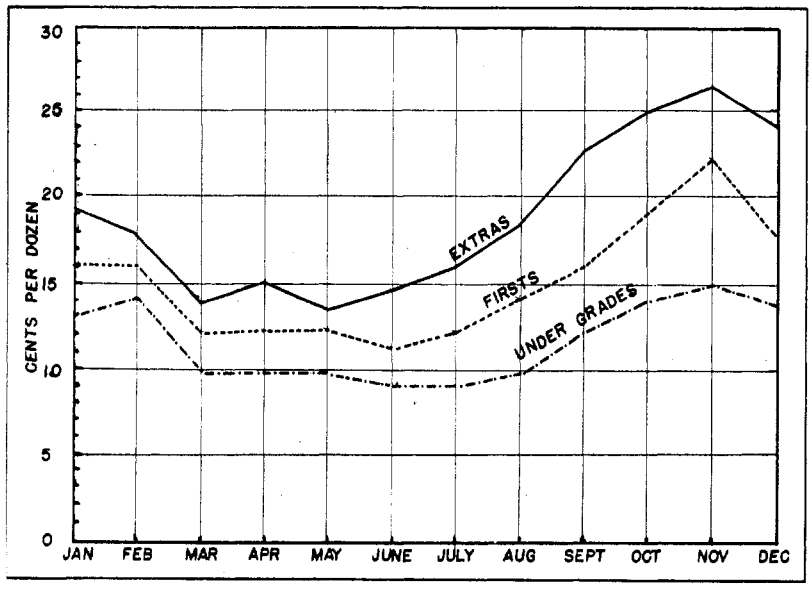

FIG. 7.—Spread between grades—a Kansas graded market, 1940.

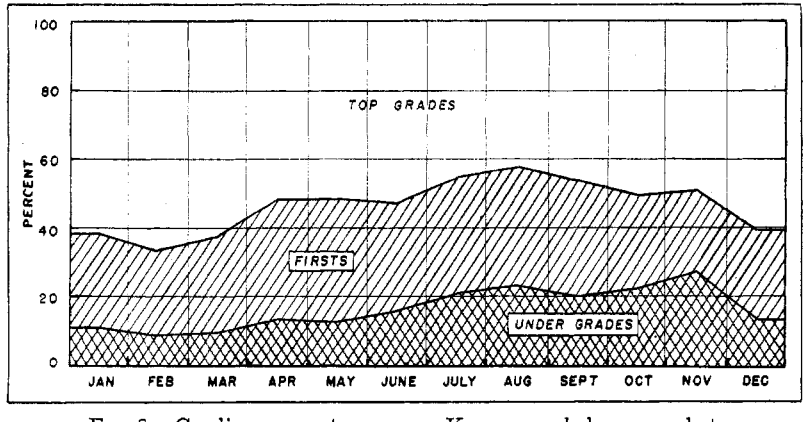

FIG. 8.—Grading percentages on a Kansas graded egg market.

A weighted average price for this graded market, taking grading percentages into consideration, indicated that producers as a whole received an advantage in comparison with straight-run prices paid in another territory having similar quality. The difference in price

is indicated in Figure 9. The advantage was the smallest during March, April, and May and the greatest during August, September, October, and November. The advantages received by each individual producer varied with the quality that he marketed.

Another factor that should be recognized is that the price data on which this study was based were Kansas prices received on a comparatively small volume. Experiences in other areas have demonstrated that if a large volume of uniform, high-quality Kansas eggs could be marketed, the volume factor alone would be important in determining higher prices.

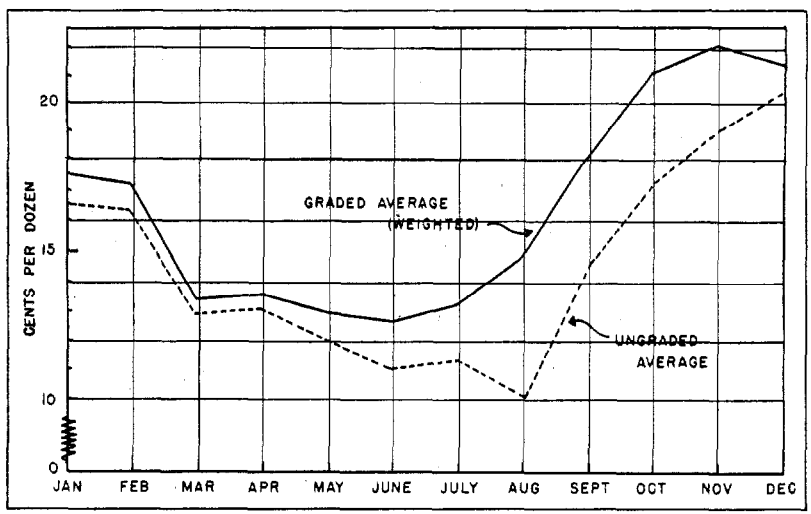

FIG. 9.—Graded and ungraded egg prices on two Kansas markets, 1940.

FACTORS AFFECTING THE PRICE OF POULTRY

YEARLY VARIATION

The relationship between poultry prices and general wholesale prices is shown graphically in Figure 10. The movements of both price levels are closely related, with the poultry prices fluctuating more than the general wholesale price level. The same price-making forces which cause the general level of prices to fluctuate also cause poultry prices to fluctuate.

Another important factor affecting poultry prices is the quantity of poultry sold. However, it is difficult to ascertain the effect since poultry production for meat purposes is a short-time proposition and if poultry prices are high, the available quantity may be considerably increased within three or four months. This is particularly true in the case of broilers.

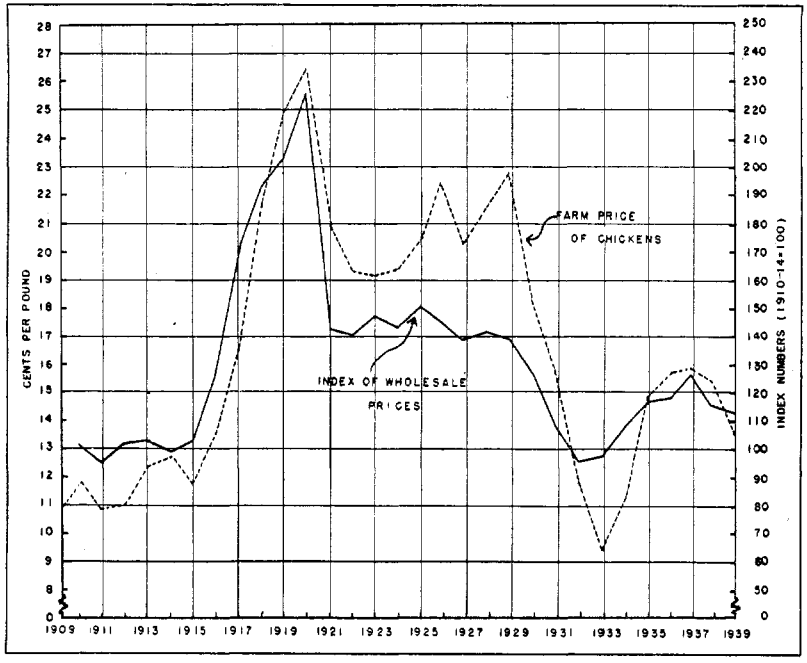

FIG. 10. Relation of farm price to index of wholesale prices.

Prices of competing meat products influence the general level of poultry prices. There is considerable substitution of one type of meat for another in most people's diets, depending upon the relative prices of the meats. Hence, if poultry is relatively scarce (with high prices) and pork or beef is relatively plentiful (with low prices), many consumers quit buying their usual supply of poultry and buy more pork or beef.

SEASONAL VARIATION

The index of seasonal price variation on the Kansas City market for broilers, springs, light and heavy hens by ten-day periods during 1924-1940 is shown in Table 19.

The index of broiler prices ranged from a seasonal low of 90 to 95 percent from June to January inclusive to a seasonal high of 123 percent in March (Figure 11.) The index of prices for springs ranged from a low of about 80 percent during the late fall months to a high of 132 percent in April. There was less seasonality in prices of broilers than in prices of springs.

The index of prices of light hens ranged from a low of 82 in December to a high of 131 in March (Figure 12). Prices of heavy hens have the least seasonality. Peaks occur during January, April, and September. The highest price index of 111 percent occurs in March

and the lowest price index of 91 percent occurs in July. The fluctuations between the high and the low was only 20 points for heavy hens compared to more than 50 points for eggs, springs, and light hens.

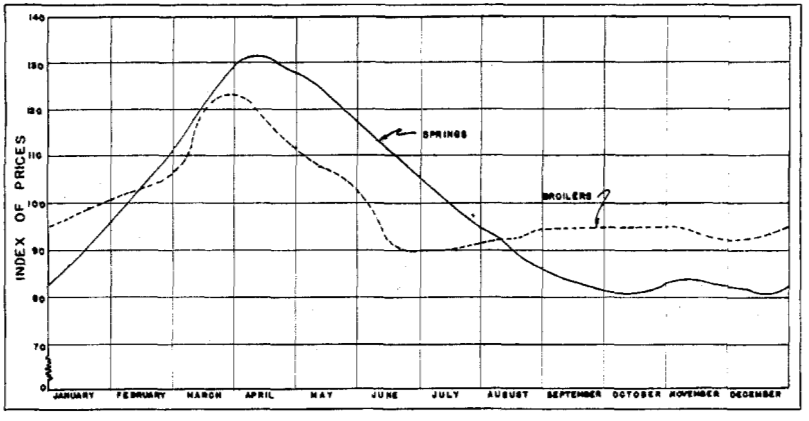

FIG. 11.—Seasonal index of Kansas City broiler and spring chicken prices, 1924-'40.

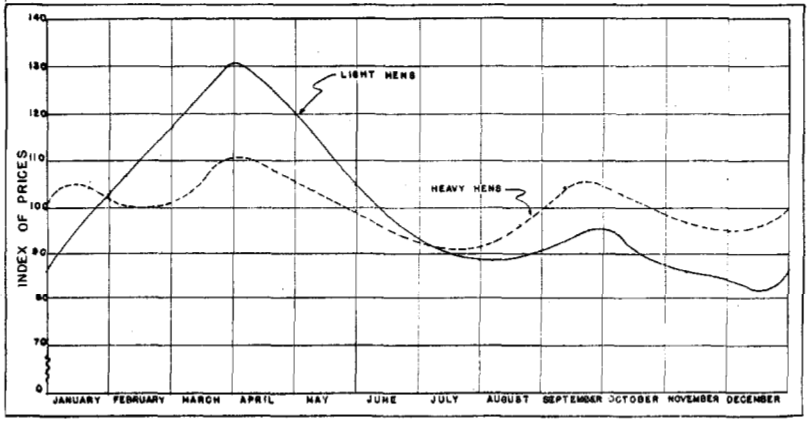

FIG. 12.—Seasonal index of Kansas City light and heavy hen prices, 1924-'40.

With the exception of prices for heavy hens, prices of all poultry had a definite seasonal pattern. All of the prices except those for heavy hens were similar in that they were below the average yearly price for about seven months of the year and above average for only five months. The seasonal decline was 10 to 20 percent and the seasonal rise was about 30 percent.

TABLE 19.—*Index of seasonal price variation for poultry, by ten-day periods, 1924-1940.**

DATE.	Broilers.	Springs.	Light hens.	Heavy hens.
January 1–10	97	87	93	105
11–20	99	91	98	104
21–30	101	96	102	102
February 1–10	102	100	107	100
11–20	104	105	112	100
21–28	107	111	117	101
March 1–10	113	118	122	104
11–20	121	124	128	108
21–30	123	129	131	111
April 1–10	120	132	129	110
11–20	116	130	124	108
21–30	112	128	120	106
May 1–10	109	125	115	103
11–20	106	122	110	101
21–30	103	118	105	99
June 1–10	98	114	101	96
11–20	91	109	97	94
21–30	90	106	93	92
July 1–10	90	102	91	91
11–20	91	98	89	91
21–30	91	95	89	92
August 1–10	92	92	88	93
11–20	93	89	89	96
21–30	94	87	90	98
September 1–10	95	85	92	102
11–20	95	83	94	105
21–30	95	82	95	104
October 1–10	95	81	92	102
11–20	95	81	90	100
21–30	95	83	87	98
November 1–10	94	84	86	97
11–20	94	83	85	96
21–30	93	83	84	95
December 1–10	94	82	83	95
11–20	94	82	82	97
21–30	95	83	86	100

* Average of central five items of the percentage ratio of ten-day average prices to thirty-six period moving average, centered, corrected to base of 100.
Source: Kansas City *Daily Drover's Telegram.*

THE MOST PROFITABLE AGE AND WEIGHT AT WHICH TO MARKET YOUNG STOCK

Practically all poultrymen are confronted with the problem of determining the most profitable age and weight at which to market their surplus males. In general, the problem involves three factors: (1) The cost of producing birds to various weights, (2) the relative prices of the different market classes, and (3) the usual seasonal price trend of each of the market classes and of poultry feed.

Feed costs were calculated by using a standard, recommended poultry ration. The ration consisted of both mash and scratch grain. Farm prices, including a charge for grinding and mixing, were applied to all ingredients in the ration. Figure 13 shows the seasonal

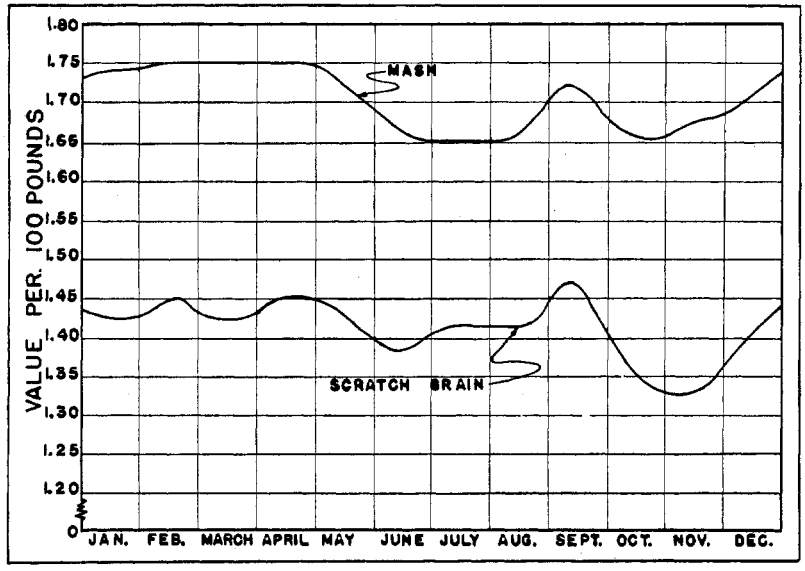

FIG. 13.—Seasonal price movements for 100 pounds of mash and scratch grain on Kansas farms. (Based on farm prices of ingredients, 1935-'39.)

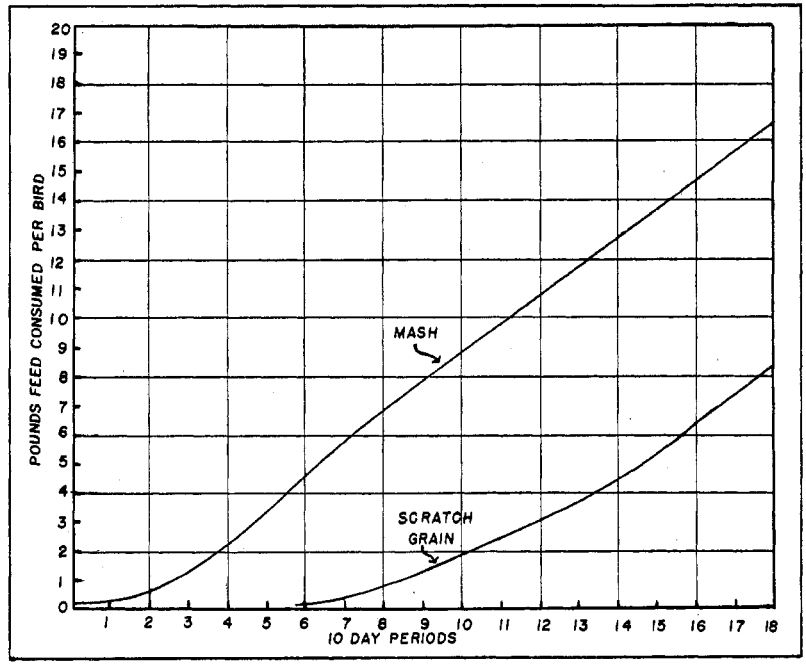

FIG. 14.—Total feed consumption for Plymouth Rock chickens to the end of any 10-day period.

price trends for the mash and scratch grain. Although there are some fluctuations during the season in the cost of poultry feed, the seasonal trends of each of the various ingredients in the ration tend to offset each other.

Chick costs were assumed to be $7 per 100 chicks. Costs of equipment, including brooder fuel, were assumed to be $9 per 100 chicks. Mortality was assumed to be 25 percent for the first six months. The rate of mortality per week was calculated by using results obtained at the Agricultural Experiment Station at Storrs, Conn.[7]

The rate of feed consumption is shown in Figure 14. Mash consumption increases sharply during the early weeks before much scratch grain is consumed. As the scratch grain is consumed at a

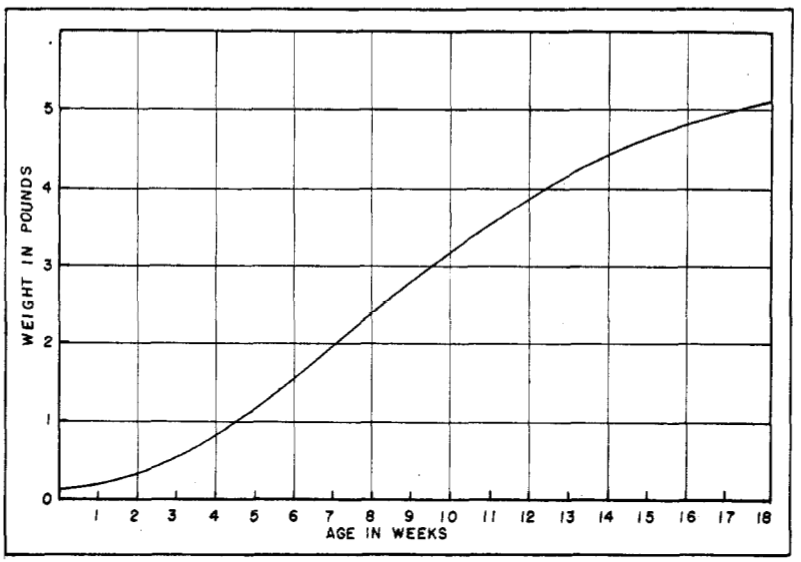

FIG. 15.—Normal growth for White Plymouth Rock chickens.

faster rate, the rate of mash consumption tapers off. To get the total feed consumed, the two curves should be added.

The total costs (except labor) were added together cumulatively. Up to any given age and weight these included the cost of the chicks, feed, equipment, and death loss.

In calculating the value of the birds as they increased in weight, a normal growth curve for White Plymouth Rocks was used (Fig. 15). It may be noted that the rate of growth increases until the chickens weigh from 3 to 4 pounds and then the rate begins to level off.

From the time the birds weighed 1½ to 2½ pounds, they were considered broilers, and the birds weighing 2½ pounds to 5 pounds

7. Rearing Chickens. L. E. Card and W. F. Kirkpatrick. Storrs Agr. Expt. Sta. Bul. 96, 1918.

TABLE 20.—*Income per chicken over all costs except labor.*

TEN-DAY PERIODS.	Feb. 1 hatch.	Feb. 10 hatch.	Feb. 20 hatch.	Mar. 1 hatch.	Mar. 10 hatch.	Mar. 20 hatch.	Apr. 1 hatch.	Apr. 10 hatch.	Apr. 20 hatch.	May 1 hatch.	May 10 hatch.	May 20 hatch.	June 1 hatch.
	cents	*cents*	*cents*	*cents*	*cents*	*cents*	*cents*	*cents*	*cents*	*cents*	*cents*	*cents*	*cents*
March 21–30	0.1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
April 1–10	5.1	0.6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
11–20	9.9	5.3	0.7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
21–30	12.5	9.2	4.7	0.3	.....	.....	.....	.....	.....	.....	.....	.....	.....
May 1–10	17.0	12.5	7.3	3.2	.....	.....	.....	.....	.....	.....	.....	.....	.....
11–20	18.2	14.1	10.0	5.5	1.6	.....	.....	.....	.....	.....	.....	.....	.....
21–30	*18.9**	*16.8*	12.9	9.0	4.4	0.7	.....	.....	.....	.....	.....	.....	.....
June 1–10	18.1	16.3	14.4	10.8	7.2	3.3	.....	.....	.....	.....	.....	.....	.....
11–20	17.6	16.1	*14.5*	*12.7*	9.4	5.9	1.8	.....	.....	.....	.....	.....	.....
21–30	14.6	14.7	13.4	12.0	*10.4*	7.3	4.1	0.3	.....	.....	.....	.....	.....
July 1–10	12.1	12.4	12.6	11.5	10.2	*8.8*	5.9	2.9	0.8	.....	.....	.....	.....
11–20	10.0	10.3	10.6	11.0	9.9	*8.8*	7.5	4.8	1.9	.....	.....	.....	.....
21–30	6.4	8.1	8.5	8.9	9.3	8.4	7.4	6.2	3.6	0.9	.....	.....	.....
August 1–10	.....	4.5	6.2	6.7	7.2	7.6	6.9	6.0	4.9	2.5	.....	.....	.....
11–20	.....	.....	4.0	5.8	6.3	6.8	7.3	6.6	5.7	4.6	2.2	.....	.....
21–30	.....	.....	.....	4.7	6.4	6.9	7.4	7.9	7.1	6.2	5.1	2.6	.....
September 1–10	.....	.....	.....	.....	5.8	7.5	8.0	8.4	8.8	8.0	7.0	5.8	3.2
11–20	.....	.....	.....	.....	.....	6.8	*8.5*	*9.0*	*9.4*	*9.7*	8.8	7.7	6.5
21–30	.....	.....	.....	.....	.....	.....	6.3	8.0	8.4	8.9	*9.2*	*8.4*	*7.3*
October 1–10	.....	.....	.....	.....	.....	.....	.....	4.3	6.0	6.6	7.0	7.5	6.7
11–20	.....	.....	.....	.....	.....	.....	.....	.....	2.4	4.1	4.7	5.2	5.8
21–30	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.1	2.7	3.4	4.0
November 1–10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.1	2.9	3.5
11–20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.8	2.5
21–30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.4

* Italicized figures show highest income per chicken.

were considered springs. Seasonal prices for broilers and for springs were calculated from prices paid for those classes at 10 to 15 local Kansas stations during the period 1935-1939, inclusive. These prices had the same seasonal pattern as the Kansas City prices shown in Figure 11.

The seasonal prices were used in determining the value of the birds at ten-day intervals after reaching marketable weight. From the market values of the bird at the various ages and weights, the cumulative costs of producing the birds to these weights were subtracted to give the net returns above all costs except labor. The results are shown in Table 20.

For example, suppose a pen of chicks was hatched on February 1. Normal rates of growth are made and the usual seasonal prices of chickens prevail. Normal quantities of feed are consumed and seasonal prices are paid for the feeds. If the chickens were marketed the last part of March, when they are two months of age and weigh about 1.5 pounds, the net returns would be about zero. If marketed in late April, when the birds weighed about 2.7 pounds, the returns for labor would be about 12.5 cents per bird. The maximum net income for labor would be in late May when 18.9 cents per bird would be made. After that time, the income would be smaller.

The table indicates that for those chicks hatched before April 1, the greatest income over all costs except labor was obtained by marketing the poultry when they weighed between 3.5 and 4.0 pounds and were 3.5 to 4.0 months of age. The chicks have just finished making their most rapid rate of growth at this weight and age, and seasonal prices of springs decline rapidly.

For chicks hatched after April 1, the time of marketing apparently is more important than the weight at marketing. In all cases, the highest income over all costs except labor was made by marketing between September 10 and September 30. The poultry ranged in weight from 5 pounds for those chicks hatched in April to about 3.5 pounds for those chicks hatched on June 1. The slightly higher price trend in late September apparently offsets the less rapid rate of growth and the higher feed consumption. If labor costs were considered, it is possible that slightly different conclusions would have been reached.

These data also show the higher returns over costs for chicks that are hatched early in the season. The income over all costs except labor declines from 18.9 cents a bird for chicks hatched in February to 7.3 cents a bird for chicks hatched in early June.

FEED-EGG RATIO

The relationship between feed prices and egg prices is one of the more important factors determining the level of profits for all poultrymen during the year. As indicated in Figure 16, the feed-egg ratio has a definite seasonal pattern. It is the least favorable to the poultryman during April, May, and June when between eight and nine dozens of eggs are required to buy 100 pounds of feed. It is

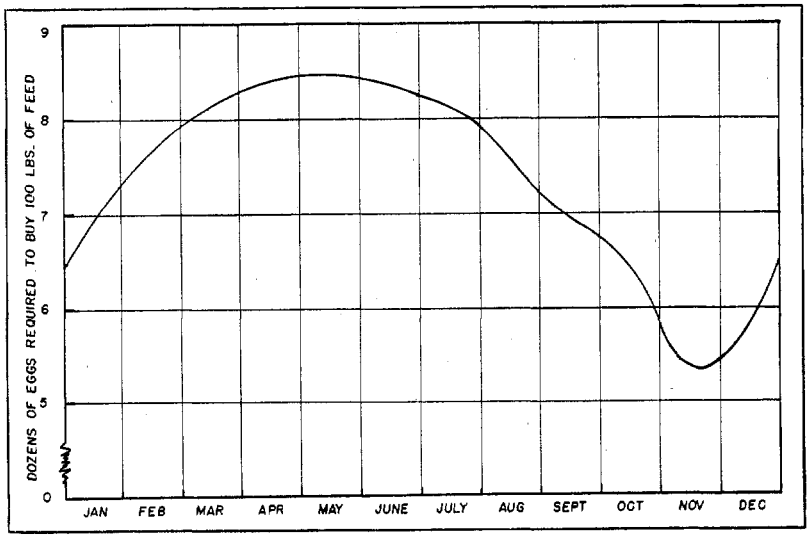

FIG. 16.—Seasonality of feed-egg ratio, Kansas City prices, 1929-'41.

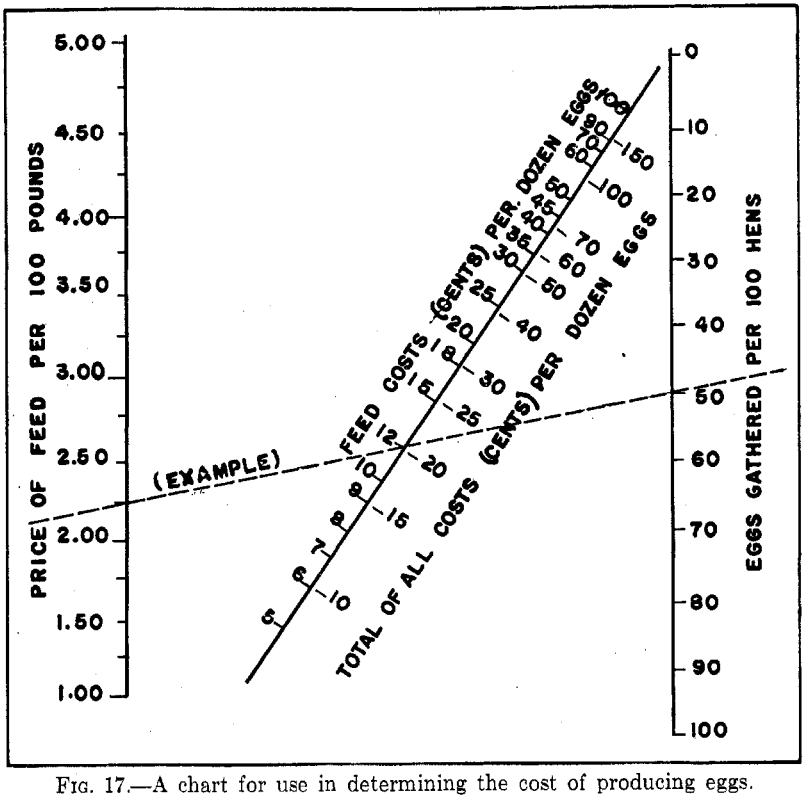

FIG. 17.—A chart for use in determining the cost of producing eggs.

the most favorable during November when only five to six dozens are required to buy 100 pounds of feed.

The seasonality is caused primarily by the change in egg production and prices and to a lesser extent to the change in feed prices during the year.

In Figure 17 is illustrated a convenient chart for estimating the cost of producing eggs when the feed cost and rate of production are known. To use the chart, hold a string or ruler with one end across the left line at the point representing the cost of feed and the other end on the number of eggs gathered daily from 100 hens.

The figure on the left of the line of the intersection represents the feed cost, while the figure on the right of the intersection represents the selling price necessary to cover all costs. In the example illustrated, the feed cost per 100 pounds was $2.25. The number of eggs gathered per 100 hens was 50. By drawing a line between these two figures, the feed cost is estimated to be 12 cents per dozen and all costs to be 20 cents per dozen.

EFFECT OF FEED-EGG RATIO ON NUMBER OF EGGS AND CHICKENS PRODUCED

The price relationship between feed and eggs influences the number of eggs that will be produced. If the ratio is favorable for the poultryman, he not only will keep a larger number of hens but will feed the ones he already has more liberally.

Since 1925, chicken production has fluctuated in fairly regular three-year cycles (Fig. 18). It requires two years to increase num-

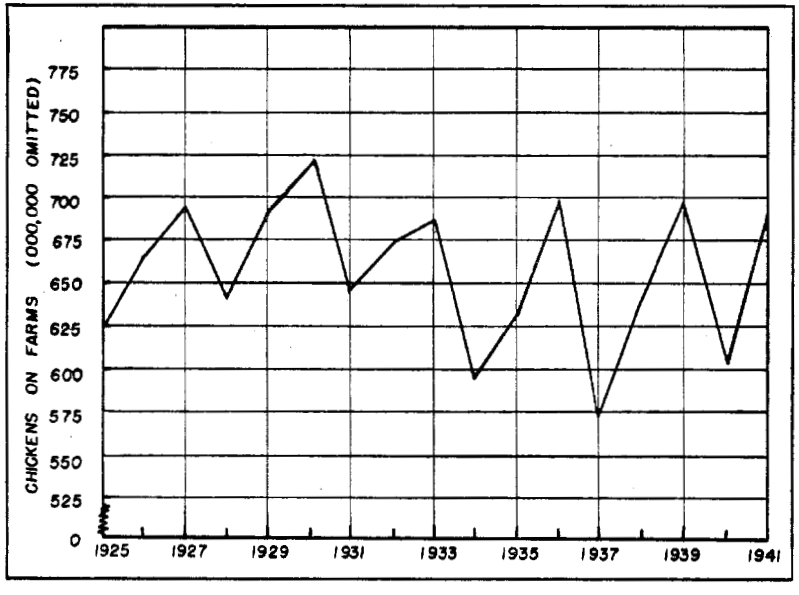

FIG. 18.—Number of chickens produced on farms in U. S., 1925-'41.

bers to the point where they are excessive and one year to reduce them. When the number of chickens and egg production are low, egg prices usually are relatively high in relation to feed prices. The poultrymen usually try to take advantage of this situation by feeding heavier and increasing the number of layers. Usually, it takes them two years to build up the number of layers to the point where egg production is so large that egg prices are low relative to feed prices. When this point is reached, the number of layers usually is reduced.

While one to two years usually are required for changes in the feed-egg ratio to influence the number of eggs produced by changing the number of hens, it requires only a relatively short time for changes in the ratio to affect the number of eggs produced by changing the egg production per layer. When the price relationship between eggs and feed favors the poultryman, he usually feeds more and better quality feed and usually gets an immediate increase in egg production per layer. However, the increase in total egg production by this method is limited since the number of eggs produced per layer will not increase beyond a certain point regardless of the feed fed to the layer. The hens that have not been getting enough of the right feed usually respond the best to increased feeding but their production increases more slowly with further increase in feed until it reaches the capacity limit of the hens at the point where they are getting all of the proper feed they can consume.

SUMMARY

In 1940, poultry was kept on 87 percent of the farms in Kansas. It accounted for about 8 percent of the cash farm income from farm marketings. The poultry industry is primarily a farm enterprise, commercial flocks being relatively unimportant.

The relative position of Kansas as an egg-producing state declined from seventh in 1930 to tenth in 1940. During this period the percentage decrease in the number of chickens raised was greater than in any other state. The decrease may be explained largely by adverse weather conditions. The centers of greatest poultry population and heaviest production are in the central and northeastern parts of the state.

The poultry enterprise on the usual farm does not require a large investment in stock, land, buildings, or equipment as compared to the investment for other livestock. The average investment on 71 Kansas farms with larger than average poultry enterprises was $506.

In 1939, 78 percent of the 126.5 million eggs produced in Kansas were sold, 20 percent were consumed in households of the producers, and 2 percent were used for farm hatching. Of the 31,183,000 chickens produced, 61 percent were sold, and 35 percent were consumed in the households of the producers. The seasonality of egg production in Kansas is greater than in most of the other states. About 50 percent of the total number of eggs were produced during March, April, May, and June. In 1939, Kansas poultry producers

received next to the lowest average price in the United States for their poultry and eggs.

In 1941, poultry receipts from 38 general-purpose breed flocks averaged $4.17 per hen. Poultry receipts from 33 egg-breed enterprises averaged $3.98 per hen. Receipts from hatching and market eggs amounted to about 70 percent of the total receipts and receipts from poultry marketed made up the remainder.

Total operating expenses on the general-purpose flocks were $2.35 per hen and on the egg flocks $2.22 per hen. Expenses on the poultry enterprise were the highest during the spring months while young stock were being raised.

The estimated total time necessary to care for a laying flock of 100 hens and to rear the replacements for the flock was 498 hours per year—an average of one hour and 22 minutes per day. Of this time, 150 hours were spent on rearing the replacements and 348 hours on the laying flock. The most time was required during April and May when the chicks were being started.

The average poultry-labor income for the flock owners with general-purpose breeds was $1.83 per bird. The income for the egg-breed flocks was $1.56 per bird.

Factors affecting the poultry-labor income are management, markets, size of enterprise, type of breed, and rate of production. An increase of 100 hens in the size of the poultry flock increased the labor income $177. A 20 percent increase in the quantity of eggs sold to a hatchery increased the labor income $62 per enterprise. An increase of 25 eggs in the egg production per layer increased the labor income $94 per enterprise.

The two principal factors causing different levels of prices for eggs and poultry from year to year are the changes in the general price level and variations in the supplies of eggs, poultry, and competing meat products. Of the two factors, the changes in the general price level is the more important.

In addition to yearly variation, prices of both eggs and poultry have a large amount of seasonal variation. The index of prices for eggs has a range of 65 percent while the range in the price index for poultry varies from 20 to 51 percent. In general, egg prices move in the opposite direction to poultry prices. Egg prices and most of the poultry prices remain below average for about seven months of the year and are above average only five months.

The practice of storing both poultry and eggs during the periods of heavy production and low prices and selling them during periods of light production and high prices has tended to remove some of the extreme seasonal price fluctuations.

More universal buying and selling of eggs and poultry on a graded basis probably would result in higher returns for Kansas farmers. The spread in prices between grades is least during the months when most eggs are produced and greatest during the months of light production.

The maximum income over all costs except labor for birds hatched

before April 1 was obtained by marketing the poultry when they weighed between 3.5 and 4.0 pounds. For birds hatched after April 1, the greatest income over all costs except labor was received by marketing between September 10 and September 30. Early hatched birds showed a greater income over costs than late hatched birds.

The feed-egg ratio is an important factor determining profits. It is influential in determining the number of eggs that will be produced. If the ratio favors the poultryman, he increases not only the size of his flock but also the rate of production of his layers. The ratio has a definite seasonal pattern, being the most favorable for the poultryman during the fall and the least favorable in the spring.

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