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The Cost of Producing Eggs in Utah, 1946

By

Chall Allred

Thesis

Submitted in Partial Fulfillment of the Requirements for the
Degree of

MASTER OF SCIENCE

in

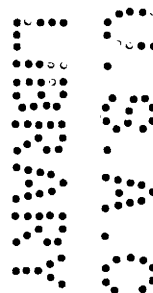
Agricultural Economics

Graduate School

of the

Utah State Agricultural College

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Head of Department

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Dean of Graduate School

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COST OF PRODUCING EGGS IN UTAH, 1946

INTRODUCTION

The production of poultry and poultry products is one of Utah's major agricultural industries. In 1945, 22 percent of the farm income in Utah was derived from poultry and poultry products. About 10 percent of the total farm income was from eggs (1).

With the termination of the war and a likelihood of reduced egg prices in the future, the costs and efficiency in producing eggs or likely to play an important part in the future success of the poultry industry in Utah.

Since 1931 sufficient data have not been obtained to determine the costs of egg production for representative commercial egg producing units in the state.

OBJECTIVE

It is the purpose of this study to assemble and analyze the expenses, the receipts and the profits of a representative section of commercial egg producers in Utah, and also to determine as far as possible the factors that are associated with profitable egg production.

REVIEW OF LITERATURE

The agricultural economics department of the Utah State Agricultural College made an economic study of the poultry industry in Utah for the period 1929 to 1931. That study analyzed the costs, receipts and net profits

from egg production, the entire poultry enterprise and also the entire farming enterprise. The results of that survey are reported in Utah Experiment Station Bulletin No. 224 (Thomas, W.P. and Clawson, Marion (2)), Economic Factors Affecting Poultry Production and Marketing in Utah. Since that time no detailed study has been made of the economics of egg production in Utah.

Numerous studies have been conducted in other states to determine average egg production costs and returns and average profits of commercial egg producing flocks during recent years. However, except for methods of procedure, and as basis for comparison these have little or no application to Utah.

SOURCE OF DATA AND METHOD OF PROCEDURE

Most of the data used in this study were obtained from 66 commercial egg producers, located in Cache, Salt Lake and Utah counties. Ten producers were in Cache, 35 in Salt Lake and 21 in Utah county. These counties were selected because of their proximity and because they received approximately half of the income in the state that is derived from the poultry business (3).

The data were obtained by means of a personal visit to each producer and recorded on special survey forms which were designed to secure information on the organization and on the management practices of egg producing farms, as well as all the physical and monetary costs and returns. Data were taken from the producers' records whenever possible: most producers had records for some of the data asked for. The data that were not available from records were given from memory or estimated by the producers.

Approximately 88 percent of the operators marketed their eggs through the Utah Poultry Producers Association or the Draper Egg Producers Association, and for those producers the quantities and value of eggs marketed were obtained from records of the association. For all other producers the number of dozens of eggs sold and the prices and amounts received were obtained from the producers' records.

Since the study was concerned only with costs and returns from eggs, information was secured only on those items which affected the laying flocks. The costs of growing out flock replacements were not obtained but the replacements were charged against the flock at the current market price of the replacements.

All records were taken in February 1947. Nearly all records were for the period January 1 to December 31, 1946 but for those producers who had their business records set up on an October to October basis that period was used.

Producers from whom records were obtained were not specially selected in any pre-arranged way but were accepted as they were found by the enumerators in a flock to flock tour of the chosen counties. The only restrictions in selecting the flocks were that they must be operated as a commercial unit. A commercial flock was considered to be any flock where the laying flock was kept the full year, the flocks must have consisted of at least 500 hens at some time during the year and the eggs must have been sold primarily at wholesale rather than retail or for special purposes.

This report is presented in three divisions; (1) Description and requirements of the laying flocks; (2) Financial analysis of egg production; and (3) Factors influencing profits from egg production.

DESCRIPTION AND REQUIREMENTS OF THE LAYING FLOCKS

This section includes a general description of the organization and the material, labor, feed, and other requirements and the rates of production and management practices of the poultry enterprise.

Size and Composition of the Flocks

This study included 96,824 laying hens on a year long basis, or an average of 1,467 layers for each of the 66 flocks (Table 1). The number of hens in the flocks varied considerably during the year as a result of culling, and death loss which went on more or less continuously throughout the year, whereas, the additions to the flocks were almost all made during September or October.

The average number of hens for each flock was computed by averaging the number of layers in the flock on the first of the 12 months and the close of the production year, or on an average of 13 monthly inventories. The number of hens per flock ranged from 357 to 4,807 hens. There was a tendency for the number of hens per flock to concentrate around 800 hens. Thirty-three flocks had less than 1,100 hens, and 33 flocks had 1,100 hens or more. The larger number of hens per flock in the larger units pushed the average of all flocks considerably above the most common sized flock. Although 50 percent of the flocks had less than 1,100 hens per flock, only 26 percent of all hens were in those flocks. Twenty-five percent of the flocks had between 1,100 and 2,000 hens each and also 25 percent of the total hens were in this group. Flocks consisting of 2,000 to 4,807 hens made up only 25 percent of the number of flocks but they contained 49 percent of the total number of hens.

The average number of hens per flock at the beginning of the year was 1,642 hens, and at the close of the year the average was 1,599 hens. The number of hens per flock was greatest during September and October when the replacements were first added to the flock. The flocks were smallest in size

during July and August immediately before the replacements were added. This was because of the number of hens that had been eaten, sold, or had died since the replacements had been made to the flock the previous year.

Table 1. Frequency distribution of flocks by size

Number of hens per flock:		Number of	Total number	Percent of total	
Range	Average	flocks	of hens	Flocks	Hens
number	number	number	number	percent	percent
357 to 499	437	4	1,750	6	2
500 to 799	632	15	9,475	23	10
800 to 1,099	932	14	13,053	21	14
1,100 to 1,399	1,204	7	8,431	11	9
1,400 to 1,699	1,501	2	3,001	3	3
1,700 to 1,999	1,832	7	12,829	11	13
2,000 to 2,299	2,131	6	12,788	9	13
2,300 to 2,599	2,462	5	12,309	7	12
2,600 to 4,807	3,865	6	23,188	9	24
TOTAL OR AVERAGE		66	96,824	100	100

Flock composition. At the beginning of 1946 approximately 60 percent of the total layers were pullets and 40 percent were hens. The hens were mostly one year old although some flocks contained some hens two years old or older. The additions to the flocks were mostly pullets, although a small proportion of the operators purchased year-old hens for flock replacements. The percent of the total layers that were pullets was approximately the same at the end of 1946 as at the beginning.

Feed Requirements

The most important item influencing the cost of producing eggs in Utah in 1946 was the feed cost. During the year a near record high was reached in the price of both mash and scratch feeds.

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The composition of the rations fed varied considerably among the producers, depending to a large extent upon what feeds could be obtained by the operator at the price he considered to be the most reasonable. Mash and wheat were the major ingredients in the rations. (Table 2). Small quantities of barley, corn, and oats were also commonly fed. Other feeds that were occasionally fed included skim milk, buttermilk, alfalfa, semi-solid, potatoes, fish, and special vitamin feeds. The total amount of these feeds, however, was small.

Table 2. Amount, value, and percent of each feed fed per hen

Kind of feed	Per hen			Percent of total pounds percent	Percent of total value percent
	Amount pounds	Price dollars per cwt.	Value dollars		
<u>Scratch</u>					
Wheat	29.7	3.14	0.93	31	29
Barley	5.0	2.89	0.14	5	4
Corn	4.2	3.69	0.16	4	5
Oats	0.8	3.18	0.02	1	1
Total scratch	39.7	3.15	1.25	41	39
Total mash	51.0	3.73	1.86	52	58
Total scratch & mash	90.7	3.48	3.11	93	97
Other feeds*	2.2	3.10	0.07	2	2
Calcite & other grits	4.4	0.65	0.03	5	1
TOTAL ALL FEEDS	97.3	3.47	3.21	100	100

* Includes feeds such as buttermilk, milk, semi-solid, potatoes, alfalfa, fish and vitamin feeds.

The average amount of feed fed per hen was 92.9 pounds (Table 2). Among the flocks it varied from 79 to 119 pounds. However, 53 percent of the flocks were fed between 85 and 95 pounds of feed per hen and 73 percent of the flocks were fed between 80 and 100 pounds of feed each. Mash was the most expensive feed fed, costing the producer \$3.73 per hundred pounds. All prices quoted for feed are net prices to the producer; the cost of sacks, hauling expense, and other charges have been deducted. The value of scratch feeds averaged \$3.15 per hundred pounds. The value of the component parts of

the scratch feeds per hundred pounds was : wheat \$3.15, barley \$2.89, corn \$3.69, and oats \$3.18. The combined cost of mash and scratch was \$3.48 per hundred pounds. Miscellaneous feeds cost the producer an average of \$3.10 and grits 65 cents per hundred pounds for an average value per hundred pounds for all feeds of \$3.47.

The average pounds of mash fed per hen was 51 pounds at a cost to the producer of \$1.86. An average of 39.7 pounds of scratch was fed at a value of \$1.25 per hen. Scratch feeds consisted principally of wheat, of which an averaged of 29.7 pounds was fed per hen at a cost of 93 cents. Barley was fed at the rate of 5 pounds per hen at a cost of 14 cents, and corn was 4.2 pounds at a value of 16 cents. Oats and other feeds amounted to 3.0 pounds per hen and were valued at 9 cents per hen. Grits fed were 4.4 pounds per hen valued at 3 cents per hen the cost of all feed averaged \$3.21 per hen.

The high price of corn throughout the year discouraged most producers from using it in any large quantities. Some producers did substitute corn in the ration in equal quantities to wheat in November and December.

The percent of the total feed cost that was chargeable to each of the feeds did not vary greatly from the ration composition percentage. The cost of mash constituted 58 percent of the total feed cost, wheat 29 percent, barley 4 percent, corn 5 percent, oats 1 percent, and other feeds 2 percent. By weight the feed fed consisted of 52 percent mash, 31 percent wheat, 5 percent barley, 4 percent corn, 1 percent oats, 2 percent other feeds, and 5 percent was grits.

Most of the producers purchased their mash as a prepared feed. A few operators grew or purchased the mash ingredients and prepared their own mixtures. Feeds were purchased principally from the poultry association, but many operators produced some or all of their scratch feeds, and some purchased feed from farmers in their own or adjoining communities, while some feed was purchased from retail feed stores.

Labor Requirements

The hours of labor spent in caring for the laying flock and in marketing the eggs were obtained from the operator in response to questions of how much time was used daily, or by some other specified interval, to perform specific tasks. The value placed on labor was the hourly wage rate being paid in the community to do work comparable to that of working with the chickens. The value of labor charged to the flock by most operators was approximately 65 cents per hour.

Average man labor required per hen. The average number of man hours of labor required per hen was 1.45 (Table 3). The time required per hen ranged from 0.83 of an hour for the flock using the least amount of labor to 2.9 hours for the flock using the most labor. On 41 percent of the flocks the labor requirements ranged from 1.25 to 1.75 hours of man labor per hen, and on 67 percent of the flocks labor requirements ranged between one hour and two hours per hen.

The average number of hours required per flock to perform the daily chores was 1,791 hours or 1.22 hours per hen. This amounted to 84 percent of the total time requirements. The cleaning of pens was the next most important time-consuming operation, though the time spent in marketing eggs and hauling feed was not greatly less.

Table 3. Average man labor requirements per flock and per hen
(Average number of hens per flock, 1,467)

Tasks	: Hours : per flock	: Hours : per hen	: Percent : of total
	hours	hours	percent
Daily chores*	1,791	1.22	84.1
Marketing eggs, hauling feed	102	.07	5.0
Cleaning pens**	129	.09	6.1
Cleaning drop boards	66	.04	3.0
Culling flock	15	.01	.7
Miscellaneous	27	.02	1.1
TOTAL	2,130	1.45	100.0

* Includes feeding, watering chickens and gathering and preparing eggs for market.

** Includes removing and replacing litter, spraying and disinfecting.

Influence of size of flock. The total amount of labor required to care for a hen decreased quite rapidly as the number of hens per flock increased (Table 4). On the farms where the flocks ranged from 357 to 859 hens, the labor required to care for a hen for one year was 1.71 hours. For flocks with from 860 to 1,741 hens, the labor required per year per hen was 1.61 hours, and for the flocks with 1,742 to 4,807 hens, 1.32 hours were required for an average for all sized flocks of 1.45 hours per hen. The largest reduction in labor demand as the size of the flock increased was in daily chores where it was found that the amount of labor required daily to care for a flock did not increase proportionally to the number of hens. The amount of time required per hen to perform such tasks as cleaning pens, cleaning drop boards, culling the flock, and marketing the eggs was not decreased to any important degree by increasing the size of the flock.

Table 4. Distribution of man labor per hen for flocks of various sizes

Duties	: Small : flocks*	: Medium : flocks**	: Large : flocks***	: All : flocks
	<u>hours</u>	<u>hours</u>	<u>hours</u>	<u>hours</u>
Daily chores	1.45	1.35	1.10	1.22
Marketing eggs, hauling feed	.10	.10	.05	.07
Cleaning pens	.10	.10	.09	.09
Miscellaneous	<u>.06</u>	<u>.06</u>	<u>.08</u>	<u>.07</u>
TOTAL	1.71	1.61	1.32	1.45

* 357 to 859 hens

** 860 to 1,741 hens

*** 1,742 to 4,807 hens

Proportion of labor performed by the operator. As the size of the flock increased, the operator performed more hours work per flock, but the percent of the total labor on the laying flock that the operator performed remained

fairly constant regardless of flock size (Table 5). The amount of labor the operator's family did per flock increased as the size of the flock increased, but the percent this was of the total labor decreased rapidly as the size of the flock increased. The amount and percent of hired labor increased as the size of the flock increased. This was especially true as the size of the flock increased beyond 2,000 hens.

Table 5. Hours and percent of total labor performed by operator, family, and hired labor

Size of flock	Operator labor		Family labor		Hired labor		Total labor
	hours	percent	hours	percent	hours	percent	
Small flocks*	673	63	363	34	32	3	1,068
Medium flocks**	1,282	69	503	27	80	4	1,865
Large flocks***	<u>2,302</u>	<u>67</u>	<u>663</u>	<u>19</u>	<u>489</u>	<u>14</u>	<u>3,454</u>
All flocks	1,420	67	510	24	200	9	2,130

* 357 to 859 hens

** 860 to 1,741 hens

*** 1,742 to 4,807 hens

On the farms where the flocks were small, the operator and his family did 97 percent of all labor required by the enterprise. The operator did 63 percent of the work, and his family 34 percent, with 3 percent of the labor being hired. The operator's wife, in preparing the eggs ready for market, performed most of the labor performed by the operator's family. For the medium size flocks, 69 percent of the labor was performed by the operator, 27 percent by his family, and 4 percent was hired labor. The operators of the largest flocks performed 67 percent of the labor required, their families 19 percent, and 14 percent was hired labor. For all flocks 67 percent of the labor was done by the operator, 24 percent by the family, and 9 percent

was hired labor. Hired labor was used largely for such tasks as cleaning the laying pens. In only a few cases, and those were the large flocks, was full-time hired help used.

For those flocks with less than 860 hens per flock, 1,068 man hours of labor were required yearly to care for all the tasks associated with the laying flock. For those flocks with 860 to 1,741 hens, 1,865 hours were required yearly; and for the larger units with 1,742 to 4,807 hens per flock, 3,454 man hours were required; or an average requirement of 2,130 man hours per flock for all units.

In performing the tasks of caring for the laying flock, of marketing the eggs, and of hauling the feed of those flocks with less than 860 layers, the operator worked an average of approximately two hours per day and his family about one hour. This meant that in addition to the poultry enterprise the operator and his family were probably occupied at other work on a full- or part-time basis. Some operators had farm enterprises other than poultry, some did not. For those flocks of between 860 and 1,741 layers the operator worked an average of approximately $5\frac{1}{8}$ hours daily with the layers and received between $1\frac{1}{2}$ and $1\frac{3}{4}$ hours assistance from his family per day. For those flocks having more than 1,742 layers the operator spent an average of between 6 and $6\frac{1}{2}$ hours daily in performing the tasks connected with the operation of the laying flock, and his family worked slightly less than 2 hours in assisting him.

For the large flocks the operator's full time was usually occupied in caring for his laying and rearing flocks unless a large proportion of the labor in caring for the flock was done by the operator's family or by hired help.

Depreciation in Laying Flock

As only laying flocks were considered in this survey, pullets were given a value at the time they were put in the laying pens of an amount equal to what it would have cost the operator to purchase them at that time. Value of hens sold was the actual price received by the operators. Death losses were deducted from the flock monthly as they occurred. Number of hens eaten were deducted in a like manner. A value per hen was placed on hens eaten that was approximately equal to what the sale value was on hens sold from the flock.

The number of hens per flock at the beginning of the year averaged 1,643 hens with a value of \$1,922 per flock or \$1.17 per layer (Table 6). The number of layers added per flock was 1,145 at a value of \$1,598 per flock or \$1.40 per layer. The value of the layers on hand at the beginning of the year plus the value of those added during the year was \$3,520 per flock or an average of \$1.26 per layer.

Table 6. Changes in flock inventories and amount of depreciation in value

Item	: All		: Average		: Value
	: flocks		: per flock		
	: Amount	: Value	: Amount	: Value	: per
	number	dollars	number	dollars	hen
Beginning inventory all layers	108,401	126,879	1,643	1,922	1.17
Layers added	75,582	105,486	1,145	1,598	1.40
Total to account for	<u>183,983</u>	<u>232,365</u>	<u>2,788</u>	<u>3,520</u>	<u>1.26</u>
Hens eaten	1,370	1,115	21	17	0.81
Hens sold	50,162	42,853	760	649	0.85
Hens died	26,946	--	408	--	--
Ending inventory	105,505	122,616	1,599	1,858	1.16
Total accounted for	<u>183,983</u>	<u>166,584</u>	<u>2,788</u>	<u>2,524</u>	<u>.91</u>
Amount of flock depreciation		65,781		996	.68*

* Based on average number of hens in flock during the year

At the close of the year the average number of layers per flock had decreased to 1,599 hens, with a value of \$1,858 per flock or \$1.16 per layer. At the end of the year the number of layers per flock was 44 less than at the beginning of the year, or approximately a 3 percent decrease. The total number of all layers at the beginning of the year plus the replacements added was 2,788 hens per flock. Of the 2,788 hens that were in the flock at some time during the year 1,599 were left in the flock at the end of the year, 760 hens had been sold, 408 had died, and 21 had been eaten.

Of the \$3,520 that was invested in layers during the year \$1,858 was accounted for in the value of the flock at the end of the year. The value of the hens sold was \$649 per flock at a price of approximately 85 cents per hen. The value of hens eaten was \$17 per flock at a value of about 81 cents per hen. As there was no value received for those hens that died the value accounted for per flock at the end of the year was \$2,524 or a depreciation in the value of the beginning inventory plus the value of the replacements of \$996 per flock, or expressing the cost of flock depreciation on a per hen basis the loss was 68 cents per hen based on the average number of layers in the flock during the year, which was 1,467 hens.

Egg Production

The production of eggs per hen based on the yearly average number of hens for the year was 163.7 eggs. Among flocks the production ranged from 91.1 eggs per hen for the lowest producing flock, to 241.1 eggs per hen for the highest egg-producing flock. Fifty of the 66 flocks surveyed had a production between 125 and 200 eggs, and 60 of the flocks had a production between 100 and 225 eggs per hen.

Sale of Eggs

Of the 66 enterprises surveyed, 40 sold their eggs through the Utah Poultry Producers Association, 18 sold through the Draper Egg Producers Association and

8 sold to other agencies. Those producers selling their eggs to Utah Poultry Producer Association or the Draper Egg Producers Association received an average of 43.0 cents per dozen while those producers selling their eggs elsewhere received 43.1 cents per dozen. The average for all flocks was 43.0 cents per dozen.

The price received for eggs sold through the cooperatives is the price received by the producers at the plant after plant handling charges have been deducted and patronage refunds and plant retains have been added. The cost of hauling the eggs has been included in expenses and has not been deducted from the value received for the eggs. For those producers who sold their eggs other than to the cooperatives the egg price represents the price received by the producer at his farm or at the purchasers assembling point. If hauling charges were incurred they were included in the expenses and have not been deducted from the value received for the eggs.

Most of the producers sold their eggs to only one agency during the year. Ninety-seven percent of the producers sold essentially all of their eggs through one outlet. However, nearly all producers sold a few dozen eggs to neighbors or friends. Of all eggs produced 98 percent were marketed and 2 percent were eaten in the home of the operator.

FINANCIAL ANALYSIS OF EGG PRODUCTION

The year 1946 saw near-record high prices paid for eggs. Using 1935 to 1939 as a base period the price index for eggs in Utah in 1946 was 204 (1). However, the cost of feed, labor, and capital supplies was proportionately high and many poultry enterprises suffered losses or realized exceptionally small dividends for their time and investment.

In this section the investments, receipts, expenses, and net return per flock, per hen, and per dozen eggs are presented.

Capital Investment

The total investment in the factors of production used directly by the laying flock was \$5,423 or an average investment per hen of \$3.70 (Table 7). The average investment in buildings was \$2,640, in hens \$1,890, in feed and supplies \$498, in land \$248, and in equipment \$147.

The investment in buildings was \$1.80 per hen, \$1.29 for the flock, 34 cents for feed and supplies, 17 cents for land, and 10 cents per hen for equipment.

Table 7. Average investment per flock and per hen

Item	: Average : per flock	: Average : : per hen :	Percent of total investment
	<u>dollars</u>	<u>dollars</u>	<u>percent</u>
Buildings	2,640	1.80	48.6
Chickens	1,890	1.29	34.8
Feed and supplies	498	0.34	9.0
Land	248	0.17	4.6
Equipment	<u>147</u>	<u>0.10</u>	<u>3.0</u>
TOTAL	5,423	3.70	100.0

The valuation of land, buildings, and equipment was estimated by the operators on the basis of pre-war prices. As a representative year, 1940 was suggested. Where new buildings had been built or equipment purchased during 1946, the actual cost was used. The investment in hens was arrived at by asking the operator the market value per head of his pullets and of his 1 and 2 year old hens at the beginning of the year and also at the end of the year. The value of each flock at the beginning and at the end of the year

was computed and from the average of these two values the flock investment for the year was obtained. The investment in feed and in supplies such as straw, egg cases, and flats and fillers represents the operators estimate of the market value of the feed and supplies he had on hand December 31, 1946.

Of the total capital investment, the investment in buildings was 48.6 percent, the investment in the laying flock was 34.8 percent, in feed and supplies 9 percent, in land 4.6 percent, and in equipment 3 percent. (Figure 1).

The value per hen January 1, 1946, was \$1.17. The value per hen decreased fairly constantly from January to August or September when the value of the flock was increased because the replacements were added at an average value of \$1.40 each. The value per hen December 31, 1946, was \$1.16. Based on the average number of hens in the flock for the year, the average per hen value derived from an average of the beginning and the closing flock inventory values, was \$1.29 per layer.

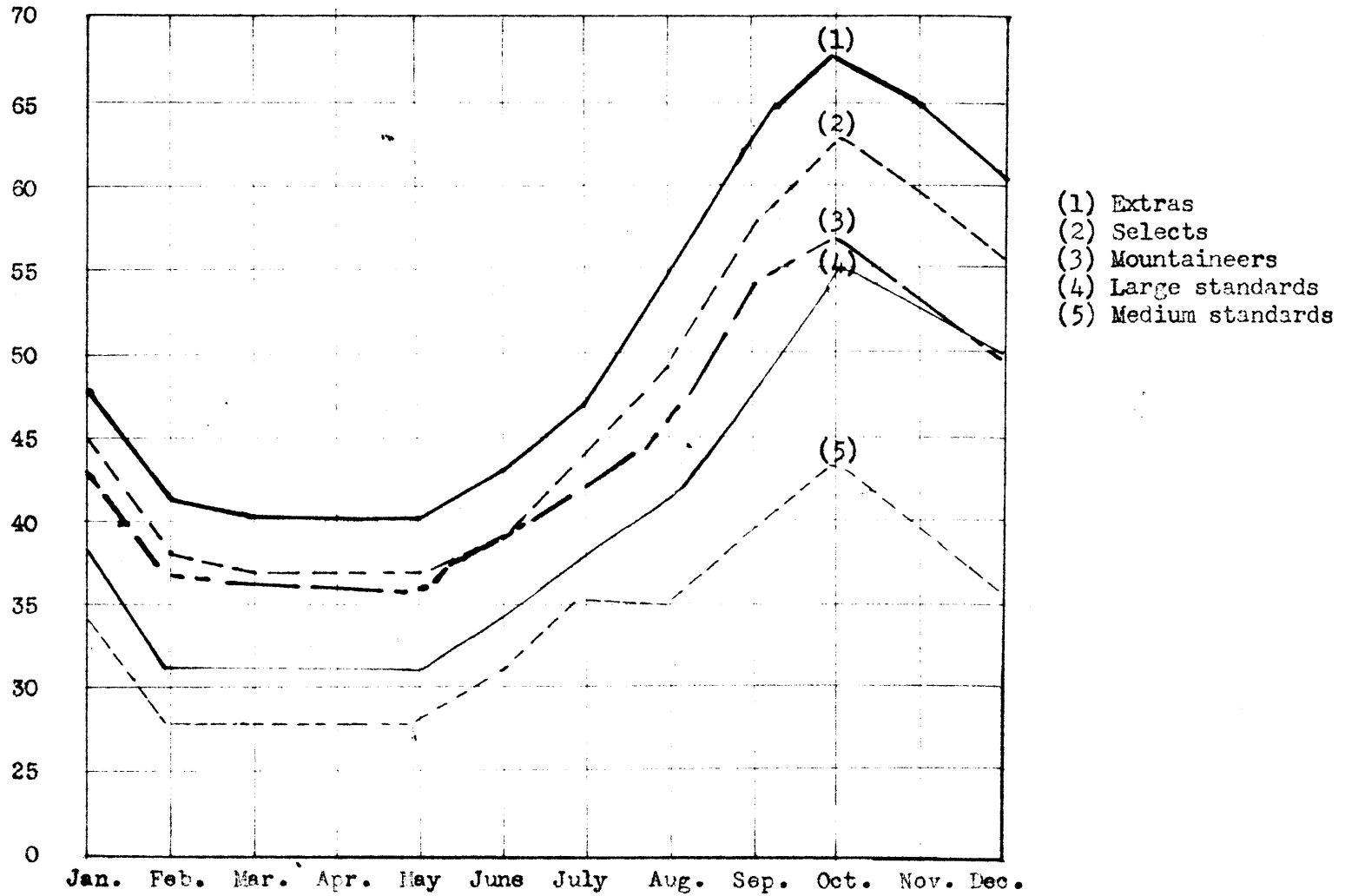
Receipts

The sale of eggs returned 99 percent of all the income received from the laying flock (Table 8). The receipts from eggs are the net receipts to the producer for the eggs delivered at the receiving plant and include any patronage refunds and plant retains. The cost of hauling the eggs, or having them hauled, was considered as a separate expense and was not deducted from the receipts.

Miscellaneous receipts were derived from sale of manure or from trading manure for litter. If the manure was sold, the value received was used; if it was traded for litter, the value of the litter was credited to miscellaneous receipts. If the manure was used by the operator on his farm as a fertilizer, the operator's estimate of its value to him was accepted and if the manure was given away or was not utilized in any way, no value was given it. The amount the producers received from miscellaneous receipts was very small,

Figure 2. Relative prices paid for the top five grades of eggs by Utah Poultry Producers in 1946

Price per dozen



and on a basis of per dozen eggs produced, the amount was negligible.

The value of the cull hens sold or those eaten was not included under receipts but has been accounted for in the depreciation of the flock. Total egg receipts for the 66 flocks were \$568,300; miscellaneous receipts were \$4,427; for a total of all receipts of \$572,727. Egg receipts per flock were \$8,611; Miscellaneous receipts were \$67; for a total of \$8,678 per flock. Egg receipts per hen were \$5.87 and miscellaneous receipts 5 cents per hen. Total receipts per hen were \$5.92 or \$.434 per dozen.

Table 8. Receipts from the poultry enterprise

Item	: Total : 66 : flocks	: Average : per : flocks	: Average : per : hen	: Average : per dozen : eggs	: Percent : of total : receipts
	<u>dollars</u>	<u>dollars</u>	<u>dollars</u>	<u>dollars</u>	<u>percent</u>
Receipts from eggs	568,300	8,611	5.87	0.430	99
Miscellaneous receipts	4,427	67	0.05	0.004	1
Total receipts	572,727	8,678	5.92	0.434	100

Expenses

The total gross expense to produce the eggs and miscellaneous receipts for all flocks surveyed was \$526,000, the average gross expense per flock was \$7,967, per hen \$5.42, and per dozen eggs \$0.398 (Table 9).

Of the total expenses for the year 59.1 percent was accounted for by the cost of feed. The prices charged for feed were the amounts paid by the operator if the feed was purchased and a comparable price if the feeds were grown by the operator.

The value of the feed consumed per flock was \$4,710. The consumption of feed per hen was 92.9 pounds, at a cost to the producer of \$3.21 per hen or \$0.235 per dozen eggs.

Table 9. Total expenses of the laying flock

Item	: All : flocks	: Per : flock	: Per : hen	: Per : dozen	: Percent : of total
	dollars	dollars	dollars	dollars	percent
Feed	310,891	4,710	3.21	0.235	59.1
Labor	91,044	1,379	0.94	0.068	17.3
Litter	6,270	95	0.06	0.005	1.2
Flats and fillers	5,610	85	0.06	0.004	1.1
Auto, truck, tractor, horse use	4,965	75	0.05	0.004	.9
Sprays, disinfectants, veterinarian, medicine	4,150	63	0.04	0.003	.8
Property tax, water tax	3,412	52	0.03	0.003	.7
Cost of lights	1,926	29	0.02	0.001	.4
Fees, telephone, insurance	1,514	22	0.02	0.001	.3
Hauling eggs and feed	1,373	21	0.02	0.001	.3
Miscellaneous	593	8	0.01	0.001	.1
Total current cash expenses	431,748	6,539	4.46	0.326	82.2
Depreciation of flock	66,786	1,012	0.68	0.051	12.6
Interest on investment	17,896	271	0.18	0.014	3.4
Depreciation on buildings and equipment	9,579	145	0.10	0.007	1.8
Total gross expenses	526,009	7,967	5.42	0.398	100.0

Second only to feed as an expense to the egg producers in 1946 was labor. Although much of the labor performed on the poultry farm was labor that may not otherwise have added to the operator's or his family's income, the market value was equal to 17.3 percent of the total expenses for the year.

The cost of labor per flock was \$1,379, or an average of 94 cents per hen. The cost of labor for the year averaged 64.8 cents per hour. All labor associated with the operation and maintenance of the laying flock and in the marketing of the eggs was charged against the flock whether it was performed by the operator, his family, or by hired help.

Cost of property tax and water tax was obtained from the operators records when possible. When accurate records were not kept, the operators estimation

was accepted. Cost of lights, telephone, insurance, cost of veterinarian, and other incidental expenses were obtained in a like manner. The cost of auto and truck use was calculated from the actual or estimated miles the auto and truck was used and an estimated cost per mile. Cost of flats and fillers were actual costs if records were available, and if records were not available 25 cents per case of eggs sold was charged unless flats and fillers were furnished without charge by the egg purchasers.

The total current cash expenses were \$6,559 per flock, \$4.46 per hen, and \$0,326 per dozen. Cash expenses amounted to 82.2 percent of the total expense for the year. Non-cash expenses, that is, depreciation on the flock, interest on investment, and depreciation on buildings and equipment were \$1,428 per flock, 96 cents per hen, or \$0,072 per dozen. The non-cash expenses were 17.8 percent of the total expense of the laying flock for the year.

Flock depreciation amounted to 12.6 percent of the total expense incurred by the laying flock in 1946 (Table 9). The relatively high cost of feed and labor in 1946 reduced the percentage of expense chargeable to flock depreciation. The average depreciation was \$996 per flock or a depreciation per hen of 68 cents.

Interest on the average of the beginning and closing investment in land, buildings, equipment, chickens, and feed and supplies was charged at a rate of 5 percent per annum. This amounted to 3.4 percent of the total expense for the year. The cost per flock was \$271 or 18 cents per hen.

Poultry buildings were generally depreciated at 3 percent per annum, and the equipment at an annual rate of 10 percent. The cost of depreciation of buildings and equipment was 1.8 percent of the total expense of the laying flock. The cost per flock was \$145, for an average expense per hen \$0.10, or approximately \$0.007 per dozen eggs produced.

Net cost of producing eggs. The total gross expense of \$526,009 incurred by the laying flocks produced not only eggs but also miscellaneous receipts in the amount of \$4,427. In order to obtain the cost of producing eggs the value of the miscellaneous receipts were subtracted from the gross expenses. This left \$521,582 as the cost of producing eggs (Table 10). This resulted in a net cost of producing a dozen eggs of \$0.394.

Table 10. Net cost of producing eggs

Item	: All : flocks	: Per : flock	: Per : hen	: Per : dozen
	dollars	dollars	dollars	dollars
Total expenses	526,009	7,967	5.42	0.398
Receipts other than eggs	4,427	67	0.05	0.004
Net cost of producing eggs	521,582	7,900	5.37	0.394

Net Income

The net income to the operator was \$711 per flock, \$0.50 per hen, and \$0.036 per dozen (Table 11). The net income the operator received was his return after all expenses, including payment of wages to himself and family for the labor they performed with the laying flock, had been deducted from total receipts. The net income is the return the operator receives for managing the enterprise and assuming the risks involved in its operation. The amount of net income became a measure of the financial success of the enterprise.

Table 11. Net income from producing eggs

Item	: All : flocks	: Per : flock	: Per : hen	: Per : dozen
	dollars	dollars	dollars	dollars
Total receipts	572,727	8,678	5.92	0.434
Total expenses	526,009	7,967	5.42	0.398
Net income	46,718	711	0.50	0.036

Variations in net incomes. The net income or loss per flock for 45 of the 66 flocks was between a minus \$1,000 and a gain of \$1,000. However, the profit or loss per flock ranged from a loss of \$2,593 for one flock to a net income of \$6,309 for the most profitable flock. Both the most profitable and the least profitable flock was in the large sized flock group (Table 12)

Table 12. Variation in incomes by size of flock

Amount of net returns :	Small : flocks*	Medium : flocks**	Large : flocks***	All : flocks
<u>dollars</u>	<u>numbers</u>	<u>number</u>	<u>number</u>	<u>number</u>
-2,001 and over****		1	2	3
-2000 to -1,001	1	4	1	6
-1,000 to 0	8	3	4	15
0 to 999	9	4	3	16
1,000 to 1,999	2	10	2	14
2,000 to 2,999	2		4	6
3,000 to 3,999			2	2
4,000 to 4,999			2	2
Over 5,000*****	—	—	2	2
Total flocks	22	22	22	66

* 357 to 859 hens

** 860 to 1,741 hens

*** 1,742 to 4,807 hens

**** Losses were -\$2,091, -\$2,343, and -\$2,593

***** Net returns were \$5,591 and \$6,309

On a net income or loss per hen basis, the concentration was between a loss of \$1 and a gain of \$1 per hen with 52 of the flocks falling in this group. The large flocks showed the least variation in profit or loss per hen with all flocks having a net gain or loss between a minus \$1 and a net gain of \$3 per hen. Some of the smaller flocks had net losses of between \$1 and \$2 and net gains of between \$3 and \$4 per hen (Table 13).

Table 13. Net profit or loss per hen for all flocks

Profit or loss per hen :	Small : flocks*	Medium : flocks**	Large : flocks***	All : flocks
<u>dollars</u>	<u>number</u>	<u>number</u>	<u>number</u>	<u>number</u>
-2.00 to -1.01	2	3		6
-1.00 to 0	7	5	7	18
0 to 0.99	6	5	8	19
1.00 to 1.99	3	8	4	15
2.00 to 2.99	3	1	3	7
3.00 to 3.99	<u>1</u>	—	—	<u>1</u>
Total flocks	22	22	22	66

* 357 to 859 hens

** 860 to 1,741 hens

*** 1,742 to 4,807 hens

FACTORS INFLUENCING PROFITS FROM EGG PRODUCTION

In this section an analysis is made of the association between various production and management factors and the profitableness of the egg enterprise. The relationship of the amount and value of feed consumed, labor used, death loss of layers and production of eggs per hen to net returns are analyzed to show the influence of these factors on the profitableness of the laying flock.

The profitableness of the egg enterprise is measured by the returns on a per flock, per hen, and per dozen eggs basis. The net returns are a direct function of receipts and expenses which are also presented on a per flock, per hen, and per dozen basis.

Influence of flock size on profitableness of egg production

The cost of feed per hen was greatest in the large flocks, being \$5.19 per layer (Table 14). The cost of feed per hen in the medium and small size flocks was the same being \$3.01 per layer. The proportion of the cost of the ration that was chargeable to mash and the proportion that was chargeable to scratch remained fairly constant for all size flocks.

Table 14. Effect of size of flock on influencing the cost factors of egg production per hen

Size of flock	: Number : recorded: <u>number</u>	: Average : no. hens: <u>number</u>	: Cost of : feed* <u>dollars</u>	: Cost of : labor <u>dollars</u>	: Depreci- : ation <u>dollars</u>	: Death : loss <u>percent</u>
357 to 859 hens	22	625	3.01	1.11	0.60	22.3
860 to 1,741 hens	22	1,156	3.01	1.04	0.63	31.0
1,742 to 4,807 hens	22	2,620	3.19	0.86	0.73	27.7
All flocks	66	1,467	3.11	0.94	0.68	27.8

*Includes mash and scratch feeds only

The size of the flock greatly influenced the amount of man hours of labor required per hen and consequently the cost of labor per hen. The value of the man labor required per hen in the large flocks was \$0.86, in the medium flocks it was \$1.04 and in the small flocks the value per hen was \$1.11. Thus there was a savings of 25 cents per hen in labor costs on the large flocks as compared with the small flocks.

The rate of depreciation per hen increased as the size of the flock increased. For those flocks with 357 to 859 hens, the depreciation per hen was 60 cents; for the flocks with 860 to 1,741 hens, the depreciation was 63 cents per hen; and for the flocks with 1,742 to 4,807 hens, the depreciation per hen was 73 cents. The depreciation per hen for all flocks was \$0.68.

The cost of depreciation on buildings and equipment was not influenced to an important extent by the change in flock size, and was a minor cost item for all flocks. The average cost of buildings and equipment depreciation for all flocks was \$0.099 per hen.

The death loss of layers was not closely correlated with the number of hens per flock. The medium sized flocks had the highest death losses while the smallest flocks had the lowest.

Although the expense per hen was greatest in the large flocks the operators of the largest flocks were able to produce eggs at less cost per dozen than the

operators of the smaller size flocks. The cost to produce eggs in the large flocks was \$5.47 per hen and \$0.0393 per dozen as compared to \$5.36 per hen and \$0.0413 per dozen in the medium size flocks and \$5.42 per hen and \$0.0395 per dozen in the small flocks (Table 15).

The large flocks had the highest egg production per hen and returned the highest receipts per hen. The medium flocks were the lowest egg producers and had the lowest receipts per hen. Receipts from the small flocks were \$5.86 per hen, on the medium flocks \$5.63 per hen, and on the large flocks \$6.05 per hen.

Table 15. Influence of size of flock on expense, receipts, and net income

Size of flock	Eggs	Receipts	Expense	Expense	Net income
	: per hen number	: per hen dollars	: per hen dollars	: per dozen: dollars	: per hen dollars
357 to 859 hens	164.7	5.86	5.42	0.0395	0.46
860 to 1,741 hens	156.0	5.63	5.36	0.0413	0.29
1,742 to 4,807 hens	166.8	6.05	5.47	0.0393	0.61
All flocks	163.7	5.92	5.42	0.0398	0.50

The net income per hen was highest in the large flocks being 61 cents per hen. For the medium size flocks it was 29 cents and for the small flocks 46 cents per hen. The large flocks were the most profitable principally because the cost of labor per hen was less and the egg receipts were highest. Receipts were largest as a result of the egg production per hen in the large flocks being highest.

Pounds of Feed Fed

When the flocks were divided into three groups according to the average amount of feed consumed per hen, it was found that as the pounds of feed fed per hen increased the expense and egg receipts per hen also increased.

Receipts and also expenses increased \$1.14 per hen as the feed was increased from less than 87 pounds per hen to more than 93 pounds per hen. However, for those flocks consuming 87 to 93 pounds per hen the receipts were only 3 cents per hen greater than for those hens consuming less than 87 pounds while the expenses were increased 33 cents per hen (Table 16).

For those flocks consuming 86 pounds of feed or less per hen the egg production was 157.8 eggs per hen and the net returns 59 cents per hen. Where the feed consumption was increased to between 87 and 92 pounds per hen the eggs produced decreased to 153.7 eggs per hen and the net returns to 29 cents, but as the feed fed was increased to 93 or more pounds per hen the egg output increased to 181.5 eggs and the net returns were increased to 59 cents.

Table 16. Relationship of pounds of mash and scratch fed to factors influencing profits

Range in pounds	Number of flocks	Pounds feed: per hen	Eggs :per hen:	Egg receipts: per hen	Expenses: per hen	Net returns: per hen	Percent :extras
	<u>number</u>	<u>pounds</u>	<u>number</u>	<u>dollars</u>	<u>dollars</u>	<u>dollars</u>	<u>percent</u>
86 or less	22	81.7	157.8	5.49	4.90	0.59	54.9
87 to 92	21	88.7	153.7	5.52	5.23	0.29	59.5
93 & above	<u>23</u>	<u>103.8</u>	<u>181.5</u>	<u>6.63</u>	<u>6.04</u>	<u>0.59</u>	<u>58.0</u>
Average		90.7	163.7	5.87	5.37	0.50	57.6

The percent of extra grade eggs produced increased from 54.9 percent for those flocks consuming less than 87 pounds of feed per hen to approximately 59 percent for those flocks with hens consuming more than 87 pounds of feed each. This was approximately a 7 percent increase in amount of extra eggs produced.

When the flocks were divided into two groups, those consuming 88 pounds of feed or less per hen and those consuming 89 pounds or more it was found that those flocks being fed the most feed were definitely the most profitable (Table 17). The egg production for those flocks in the group with the lowest

feed consumption was 157.1 eggs, the egg receipts were \$5.52, expenses \$5.08, net returns 44 cents, and the percent of extras was 55.0 percent while for those flocks consuming 89 or more pounds of feed the egg production was 170.3 eggs per hen, the egg receipts were \$6.22, expenses were \$5.67, net returns 55 cents, and the percent of extras 60.5 percent.

Table 17. Relationship of pounds of mash and scratch fed to factors influencing profits

Range in pounds	Number of flocks	Pounds feed per hen	Eggs per hen	Egg receipts per hen	Expenses per hen	Net returns per hen	Percent extras
	<u>number</u>	<u>pounds</u>	<u>number</u>	<u>dollars</u>	<u>dollars</u>	<u>dollars</u>	<u>percent</u>
88 or less	34	84.2	157.1	5.52	5.08	0.44	55.0
89 & above	32	98.8	170.3	6.22	5.67	0.55	60.5
Average		90.7	163.7	5.87	5.37	0.50	57.6

Labor Requirements

In an effort to ascertain whether there was an association between number of man hours of labor per flock and net returns the records were divided into two groups according to size of flock. This was necessary because as has previously been shown the larger flocks required less labor per hen than do the smaller flocks. These groups were then sub-divided into two classes on the basis of the amount of man labor used per hen per year.

There appeared to be some correlation between the amount of man labor applied per hen and the number of eggs the hens produced. For those flocks of less than 1,100 hens that used the least man labor per hen the egg production was 153.6 eggs per hen, while those that used the most labor per hen had a production per hen of 185.2 eggs (Table 18). The large flocks, more than 1,100 layers, that used the least labor per hen produced 158.8 eggs per hen while those that used the most labor produced 167.4 or 8.3 eggs more than the

large flocks using the least labor. Whether or not the higher production resulted from the application of more labor cannot be determined. The average man labor required for the small flocks was 1.76 hours per hen and the average number of eggs produced per hen was 168.1. For the large flocks the average man labor requirements was 1.35 hours per hen for a per-hen egg production of 161.8 eggs.

Table 18. Relationship of man hours of labor to other factors that affect the profitableness of the egg business

Range in hours: labor per hen	Average no. hens	Man hours: per hen	Eggs per hen	Receipts: per hen	Expenses: per hen	Net returns per hen
	<u>number</u>	<u>number</u>	<u>number</u>	<u>dollars</u>	<u>dollars</u>	<u>dollars</u>
Small Flocks (less than 1,100 hens)						
Lower half	791	1.36	153.6	5.44	4.97	0.47
Upper half	<u>676</u>	<u>2.25</u>	<u>185.2</u>	<u>6.62</u>	<u>6.03</u>	<u>0.59</u>
Average	736	1.76	168.1	5.97	5.45	0.52
Large Flocks (more than 1,100 hens)						
Lower half	2,517	1.10	158.8	5.74	5.15	0.59
Upper half	<u>1,859</u>	<u>1.72</u>	<u>167.4</u>	<u>5.98</u>	<u>5.68</u>	<u>0.30</u>
Average	2,198	1.35	161.8	5.84	5.36	0.48

The net return per hen in the small flocks where the least labor was used was 12 cents less than the small flocks where the most labor was applied. However, the large flocks using the least labor had a net return per hen of 29 cents more than the large flocks where the most labor was applied per hen. The increased net returns with the increased labor in small flocks might have been a result of the increased egg production, but there was no such relationship between eggs produced and net returns per hen in the large flocks.

The egg receipts and expenses per hen varied fairly consistently with the man hours per hen and the eggs produced per hen. Where the labor requirement was 1.36 hours per hen the egg receipts per hen were \$5.44 and expenses \$4.97.

For 2.25 hours of labor per hen the egg receipts per hen were \$6.62 and the expenses \$6.03, for 1.10 hours of man labor per hen the egg receipts were \$5.74 and the expenses \$5.15, and for those flocks where 1.72 hours of man labor was required per hen the egg receipts were \$5.98 and the expenses \$5.68. For all small flocks the average receipts were \$5.97 per hen and expenses \$5.45. In the large flocks the average egg receipts were \$5.84 per hen and expenses \$5.36.

The net returns per hen increased in all groups as the number of hours of man labor increased except for those large flocks where an average of 1.72 hours of man labor was applied per hen. In this group the net returns per hen dropped quite sharply as the hours of man labor per hen increased.

Death Loss

Effect of death loss on profits. As the percent death loss in the flocks increased, with the exception of those flocks in the group with a death loss between 26 and 35 percent, the net returns per hen showed a definite decline (Table 19). The net returns declined from 54 cents per hen for those flocks with less than a 10 percent death loss to a net return of 10 cents per hen for those flocks with a death loss in excess of 36 percent. The net returns per hen would normally be expected to decrease as the death rate increased. However, as is the situation in table 19, an extra high production of eggs per hen may compensate for the high death loss.

The eggs produced per hen were fairly constant for most flocks regardless of the percent of death loss. However, in the group having an average death loss of 31.7 percent the eggs produced per hen were in excess of all other groups. Owing to the small number of flocks in the group, four of five heavy egg-producing flocks have influenced the average production of eggs per hen until this group is out of line with the others.

Expenses per hen were not greatly influenced as the percent of death loss increased but for those flocks with a death loss of more than 25 percent the expense per hen was approximately 10 percent greater than in those flocks with a death loss of less than 25 percent.

Table 19. Relationship of percent of death loss to factors influencing profits

Range in : percent :	Number of records :	Average percent: death loss :	Eggs produced per hen :	Expenses per hen :	Net returns per hen :
	<u>number</u>	<u>percent</u>	<u>number</u>	<u>dollars</u>	<u>dollars</u>
Below 15	17	10.5	163.0	5.19	0.54
16 to 25	17	19.3	156.5	5.17	0.46
26 to 35	16	31.7	186.9	5.76	1.03
36 & above	<u>16</u>	<u>49.3</u>	<u>160.0</u>	<u>5.54</u>	<u>0.10</u>
Average		27.8	163.7	5.42	0.50

Egg Production per Hen

The number of eggs produced per hen was the most important factor in determining the successful operation of the laying flock. As the receipts from sale of eggs were the principal income and as the prices received for eggs could not be materially influenced by the operator, the profitableness of the poultry business was largely determined by the costs of production and by the number of eggs that were produced per hen.

The total expenses per hen increased as the number of eggs produced per hen increased (Table 20). The total expenses per hen for those hens producing less than 130 eggs each was \$4.94 and \$6.39 per hen for the hens producing in excess of 210 eggs per year.

However, the receipts per hen from the sale of eggs increased approximately 110 percent from those flocks with a per hen production of less than 130 eggs to those with a production per-hen of over 210 eggs. The receipts per hen increased approximately \$1.40 for each 40 eggs per hen increase in

production while expenses increased only about \$0.45.

The net returns per hen, like receipts, increased as the number of eggs produced per hen increased. Those hens producing less than 130 eggs per year showed a net loss per hen of 96 cents while those flocks with hens producing 130 to 169 eggs showed a net return per hen of 2 cents. The net returns per hen for those hens producing over 210 eggs each was \$1.89 per hen or an average net return per hen for all hens of 50 cents.

Table 20. Relationship of eggs produced per hen to production costs and returns

Eggs per: hen	Ave. No. eggs: per hen	Number of: records	Ave. No.: hens	Expenses: per hen	Egg receipts: per hen	Net returns per hen
	<u>number</u>	<u>number</u>	<u>number</u>	<u>dollars</u>	<u>dollars</u>	<u>dollars</u>
90-129	109.9	11	1,086	4.94	3.91	-0.96
130-169	147.5	26	1,631	5.23	5.22	0.02
170-209	187.1	21	1,553	5.58	6.75	1.20
210-249	<u>225.7</u>	<u>8</u>	<u>1,202</u>	<u>6.39</u>	<u>8.23</u>	<u>1.89</u>
Average	163.7		1,467	5.42	5.87	0.50

As the number of eggs produced per hen increased, the cost of the factors in egg production also tended to increase. Although the cost of the various production factors did not increase proportionally or consistently with the increase in eggs produced, the cost of feed increased 18 percent, the hours of labor 28 percent, and the capital investment per hen increased 21 percent as the production of eggs increased from the lowest producers to the highest. The death loss of layers was highest in the flocks with the highest production but the relationship was not consistent.

The cost of feed per hen showed a definite increase as the number of eggs produced per hen increased (Table 21). For those flocks with a per hen egg production of less than 130 eggs each the cost of feed per hen was \$2.91

and for those flocks with a per hen production of over 210 eggs the cost of feed per hen was \$3.53.

The hours of man labor per hen and the number of eggs produced per hen were not closely correlated. However, producers whose flocks had an egg production of more than 210 eggs per hen applied 1.96 hours of man labor per hen whereas those flocks producing a fewer number of eggs per hen required approximately 1.40 hours of man labor per hen. The average man labor requirement for all flocks was 1.45 hours per hen.

The capital investment per hen increased from \$2.94 to \$3.89 per hen as the number of eggs produced per hen was increased from 90 to 209 eggs per hen, but there was a slight decrease in capital investment per hen for those flocks with a per hen egg production beyond 210 eggs per hen. The average capital investment per hen for all hens was \$3.70.

Table 21. Relationship of eggs produced per hen to factors influencing production costs and returns.

Eggs per hen	Cost of feed per hen dollars	Labor per hen hours	Capital investment per hen dollars	Death loss per hen percent
90-129	2.91	1.41	2.94	28.0
130-169	3.02	1.38	3.76	30.0
170-209	3.20	1.40	3.89	24.0
210-249	<u>3.53</u>	<u>1.96</u>	<u>3.71</u>	<u>35.0</u>
Average	3.21	1.45	3.70	27.8

The percent of death loss of hens tended to increase as the egg production per hen increased. However, the association was not entirely consistent. The flocks with the lowest egg production suffered death losses amounting to 28 percent, compared with 30 percent and 35 percent respectively for the flocks which produced 130 to 169 and more than 210 eggs per hen. The group with production per hen between 170 and 209 eggs suffered only 24 percent death loss, the lowest loss of all.

Production of extras

The net returns per hen increased as the percent of extra grade eggs produced increased. As the percent of extras increased from less than 54 percent to over 63 percent the net returns per hen increased from 32 cents to 55 cents (Table 22). The average net return per hen for all flocks for which a record was available showing the number of eggs produced grading extra was 43 cents.

Table 22. Relationship of percent of extras to other factors affecting profits.

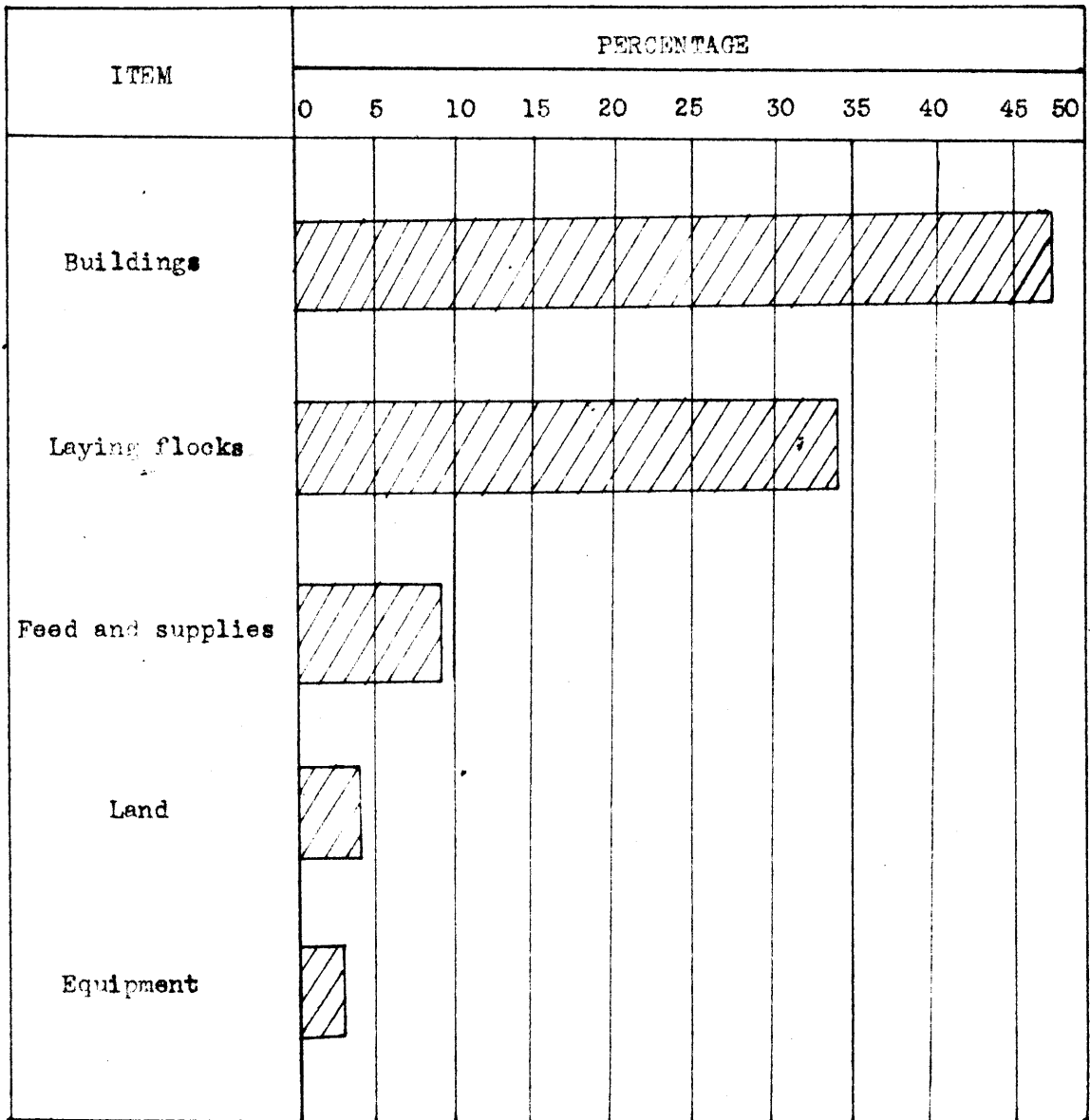
Range in percent	Average percent	Number of records	Ave. No. hens	Expenses per hen	Man hours per hen	Net returns per hen
	<u>Percent</u>	<u>Number</u>	<u>Number</u>	<u>Dollars</u>	<u>Hours</u>	<u>Dollars</u>
Less than 54	48.0	19	1227	5.58	1.56	0.32
55 to 62	58.1	21	1354	5.28	1.48	0.36
Over 63	65.4	18	1600	5.13	1.31	0.55
Average	57.6		1389	5.31	1.45	0.43

The expense per hen and the man labor requirements per hen decreased as the percent of extra grade eggs produced per hen increased. Expenses per hen decreased from \$5.58 to \$5.13 or 45 cents per hen and man labor requirements decreased 26 percent from 1.56 hours to 1.31 hours per hen as the percent of extras produced increased from less than 54 percent to more than 63 percent.

The increase in net returns per hen gained from producing extra grade eggs was a result of the increased price paid the producers for the sale of eggs that graded extra and the decrease in expenses per hen that accompanied the increase in percent of extras produced. For 1946, Utah Poultry Producers Association paid an average of 51 cents per dozen for extras* (Figure 2). A price

* To grade extra, eggs sold through the Utah Poultry Producers Association must weigh not less than 24 ounces per dozen and be free from defects.

Figure 1. Distribution of total investment



of 47 cents per dozen was paid for selects, 44 cents for mountaineers, 40 cents for large standards, and 34 cents for medium standards and youngsters.

Least profitable, most profitable, and average flocks

In an effort to compare incomes from egg production for the least profitable, average, and most profitable producers, a division of the records into three classes was made: (1) Flocks with the lowest income per flock above costs. (2) Those with the highest income per flock above costs, and (3) An average of all flocks (Table 23).

Because the flocks were divided according to the amount of net returns they realized per flock the most pronounced variation between the least profitable and the most profitable flocks was in net returns per flock and per hen. A relatively large difference was also evident in the number of hens per flock and the eggs produced per hen. However, decreased expenses per dozen eggs, the decrease in man hours of labor per hen and the decrease in death loss as well as the increase in receipts and percent of extra grade eggs produced were contributing factors in the success of the most profitable flocks.

The group composing the most profitable flocks tended to be composed principally of the larger flocks having an average of 1667 layers per flock as compared to an average of 1267 layers per flock for the least profitable flocks.

The average net loss per flock was \$584 for the least profitable flocks and \$2,000 for those flocks which were most profitable. The net returns per hen for the least profitable flocks were a minus 46 cents per hen; for the most profitable flocks, the net returns were \$1.20 per hen; and for the average flock 50 cents per hen. The net returns per dozen for the least profitable flocks were approximately a minus 4 cents and for the most profitable flocks a net return of 8 cents per dozen.

Table 23. Various factors affecting net income for least profitable, most profitable and average flocks.

Item	: Least : profitable : flocks*	: Most : profitable : flocks**	: All : flocks
Average net returns per flock	-\$584	\$2,000	\$711
Average number of hen	1,267	1,667	1,467
Eggs per hen	140.0	181.6	163.7
Man labor per hen	1.54	1.59	1.45
Pounds feed per Hen***	95.8	98.6	97.3
Cost of feed per hen***	\$3.10	\$3.30	\$3.21
Investment per hen	\$3.87	\$3.56	\$3.70
Total expenses per hen	\$5.43	\$5.42	\$5.42
Total expenses per dozen	\$0.465	\$0.359	\$0.398
Total receipts per hen	\$4.98	\$6.62	\$5.92
Total receipts per dozen	\$0.427	\$0.438	\$0.434
Net returns per hen	-\$0.46	\$1.20	\$0.50
Net returns per dozen	-\$0.039	\$0.079	\$0.036
Death loss per hen (percent)	32.3	24.4	27.8
Extra grade eggs (percent)	53.5	60.5	57.6

* Flocks having a net income of less than \$500

** Flocks having a net income of more than \$500

*** Includes all feed and grits fed

The production costs per hen were practically the same for all flocks but the larger production of eggs per hen in the most profitable flocks made those flocks far more profitable.

The pounds of feed fed per layer was approximately three pounds less in the least profitable flocks than in those flocks that were most profitable. The cost of the feed fed was approximately 6 percent less per hen for the least profitable flocks than for the most profitable flocks.

The man labor required per hen was about 10 percent less for the most profitable flocks than for the least profitable. The death loss was also least among the most profitable flocks being approximately 25 percent less than among the least profitable flocks.

The investment per hen was approximately 30 cents less for the most

profitable flocks than for those flocks that were least profitable.

The percent of extra grade eggs produced was about 12 percent greater among the most profitable flocks. The production of extras was 60.5 percent for the most profitable flocks and 53.5 percent among the least profitable flocks.

SUMMARY AND CONCLUSIONS

A total of 96,824 laying hens, on a year long basis, were included in this study of 66 commercial egg producing flocks.

The average amount of feed fed per hen was 97.3 pounds which consisted of 51.0 pounds of mash, 39.7 pounds of scratch, 2.2 pounds of miscellaneous feeds, and 4.4 pounds of grits.

The man hours of labor used per hen was 1.45 hours. The operator did 67 percent of the work associated with the laying flock, his family 24 percent and 9 percent was hired. The small flocks required approximately 23 percent more labor per hen than the large flocks.

The depreciation in the value of the layers was \$996 per flock or 68 cents per hen based on the average number of layers in the flock during the year.

The production of eggs per hen, based on the yearly average number of hens, was 163.7 eggs. The range in production was from 91.1 eggs to 241.1 eggs per year.

Capital investment averaged \$5,423 per flock, or an investment of \$3.70 per hen. The investment per hen in buildings was \$1.80, in chickens \$1.29, feed and supplies \$0.34, land \$0.17 and in equipment \$0.10.

The value of the pullets at the beginning of the year averaged \$1.26 each. The average value of one and two year old hens was \$1.12 per bird on an average value at the beginning of the year for all layers of \$1.17. The average value of the pullets added during the year was \$1.40. The value per layer at the end of the year was \$1.16.

Total receipts were \$8,678 per flock, \$5.92 per hen and \$0.434 per dozen eggs. Receipts from sale of eggs were \$8,611 per flock, \$5.87 per hen and \$0.430 per dozen.

Total gross expenses incurred by the laying flock were \$7,967 per flock, \$5.42 per hen and \$0.398 per dozen. This expense produced not only eggs but miscellaneous receipts in the amount of \$67 per flock, \$0.05 per hen and \$0.004 per dozen. The net expense to produce eggs was \$7,900 per flock, \$5.37 per hen and \$0.394 per dozen.

Feed was the major expense item being responsible for 59.1 percent of all expenses of the laying flock. The feed cost per hen was \$3.21. Mash was the most expensive feed at \$1.86 per hen, cost of scratch per hen was \$1.25, miscellaneous feeds \$0.07 and grits \$0.03.

Labor costs averaged \$1,379 per flock, \$0.94 per hen or approximately \$0.07 per dozen. Labor costs the operator 17.3 percent of all his expenses for the year.

Death loss for all flocks was 27.8 percent. Death loss was very important in the decrease in flock numbers as 34 percent of all hens leaving the flock from beginning to closing inventories were death losses, 64 percent were sold and 2 percent were eaten.

Net income was \$711 per flock, \$0.50 per hen and \$0.036 per dozen. The large flocks had the widest variation in profit or loss per flock and the least variation in profit or loss per hen.

The percent of eggs produced that graded extra averaged 57.6 percent. The percent of extras produced per flock tended to concentrate between 54 and 64 percent. However, for all flocks the range was from 35.3 percent to 82.1 percent.

When the flocks were divided into two groups on the basis of net income realized per flock the most profitable flocks had a net income of \$1.20 per hen or \$0.079 per dozen. The least profitable flocks had a net loss of \$0.46 per hen or a loss of \$0.039 per dozen.

The most important factors influencing the cost of producing eggs and the net profits of the producers were number of hens per flock, number of eggs produced per hen, amount of labor used per hen, the percent of death loss and the grade of eggs produced.

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