Effect of Marketing Services On Costs and Returns To Oklahoma Egg Producers

By Bruce Hottel and K. C. Davis
Department of Agricultural Economics

Bulletin B-572
March, 1961

CONTENTS

Procedure ---- 3

Results ---- 6

Size and Production of Flocks ---- 6

Market Services ---- 6

Cooling of Eggs ---- 6

Cost of Cooling ---- 8

Cleaning Eggs ---- 9

Cost of Cleaning ---- 10

Grading of Eggs ---- 11

Cost of Grading ---- 12

Packaging of Eggs ---- 13

Delivery of Eggs ---- 14

Distance to Markets and Frequency of Marketing ---- 15

Cost of Delivering Eggs ---- 15

Types of Markets ---- 16

Markets According to Services Performed ---- 18

Marketing Services Group 1
(Grading, Cleaning, Cooling, Delivering) ---- 19

Marketing Services Group 2
(Cleaning, Cooling, Delivering) ---- 19

Marketing Services Group 3 (Cleaning, Cooling) ---- 21

Analysis of Marketing Costs and Returns ---- 21

Marketing Services Group 1 ---- 22

Marketing Services Group 2 ---- 22

Marketing Services Group 3 ---- 23

Summary and Conclusions ---- 24

Effect of Marketing Services On Costs and Returns to Oklahoma Egg Producers

Bruce Hottel and K. C. Davis

Department of Agricultural Economics

Poultry flocks in Oklahoma are becoming larger and more commercialized. Managers of these flocks have found it necessary in some instances to perform certain marketing functions such as cooling, cleaning, candling, sizing, and delivering eggs to particular markets. However, other market outlets, which may be less complex, do not require all these services.

Because of the additional expense and labor involved in performing these marketing functions, producers have raised questions concerning the effect of such services upon the quality-price relationship of market eggs. Questions have also risen concerning the effect of marketing functions on returns to the enterprise during low and high seasonal production periods. Although the seasonal variation in egg production has become less extreme in the past few years, seasonality continues to characterize egg production (Figure 1).

This bulletin reports results of a study made to evaluate the marketing practices of egg producers in Oklahoma. The study was designed to determine if it is profitable for egg producers to perform marketing services such as cleaning, grading, packaging, storing and delivering eggs and to determine the effect of performing these services during certain seasons of the year.

Procedure

The categories, noncommercial and commercial flocks, as developed by Agricultural Census, provided the basis for classifying flocks in this survey. Categories were as follows:

A. Noncommercial Farm Flock
   1. Flocks of less than 100
   2. Flocks of 100 to 399

Research reported herein was done under Oklahoma Station project No. 1036.

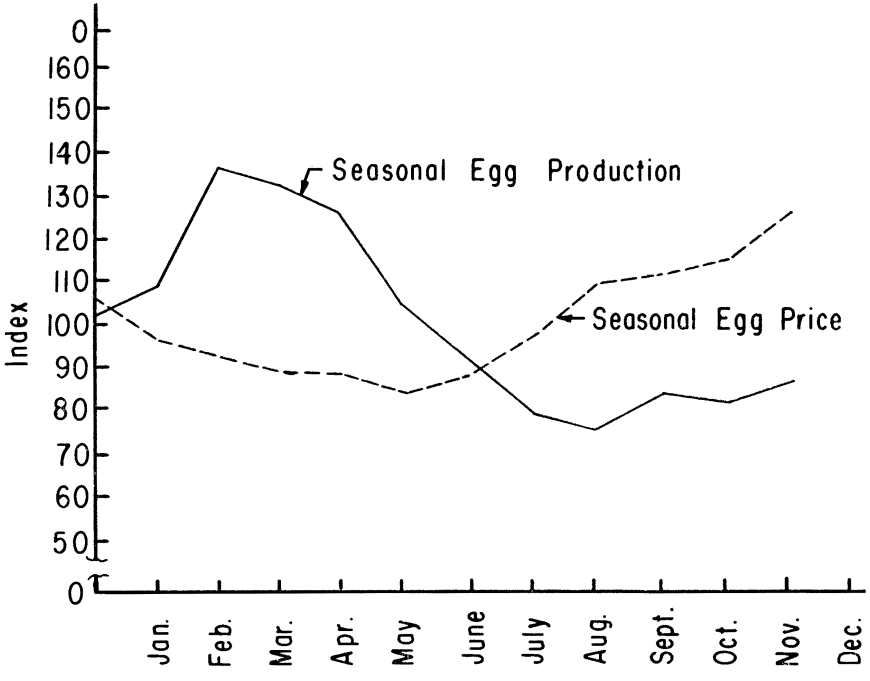

Figure 1. Seasonal Variation in Egg Production and Prices Received, Oklahoma, 1950-1958

Source: *Handbook of Poultry Statistics for the South*, Southern Regional Poultry Marketing Memorandum, No. 29, May 11, 1959.

B. Commercial Farm Flock
   1. Flocks from 400 to 799
   2. Flocks from 800 to 1,599
   3. Flocks of 1,600 and greater

Data for this study were obtained during the summer of 1959. Forty-two commercial poultry producers selling market eggs were selected from 25 counties. Thirty-one noncommercial producers were also selected (Figure 2). The counties were selected from a northeast-southwest diagonal and a northwest-southeast diagonal across the state.

County agents, vocational agriculture teachers, and feed dealers were contacted in each of the 25 counties to obtain a listing of all commercial poultry producers with 400 hens or more. Producers appearing on two or more of these listings were selected for the sample. Selections were also made according to the number and size of flocks from each county.

Seven counties located in the diagonals were not included in the study of commercial flocks. Oklahoma County was not considered representative for the state as a whole, and six other counties had an insufficient number of commercial flocks to justify the additional expense of obtaining the information. This method of eliminating certain counties left the commercial producers in the sample concentrated in Lincoln, Canadian, Caddo, and Pottawatomie counties. Producers of less than commercial size flocks were selected at random throughout the counties comprising the diagonals.

Data obtained in a prior study of the poultry enterprise were supplemented by relevant marketing data secured by personal interviews with producers and marketing agencies.[1] Marketing services performed by these producers and the costs of such services were determined from this sample. These costs were measured in terms of both capital and labor requirements.

Comparable marketing services performed by the producers during two specific periods, the first week in November and the first week in April, were analyzed. Producers in each of the five flock size groups performing identical marketing services were grouped to determine comparable fixed and variable costs in order to establish partial budgets for these services.

The quality of eggs sold and prices received at various markets were analyzed to determine the quality-price relationships that existed for different marketing services. Added returns from these services in the different markets were compared with costs for performing these services.

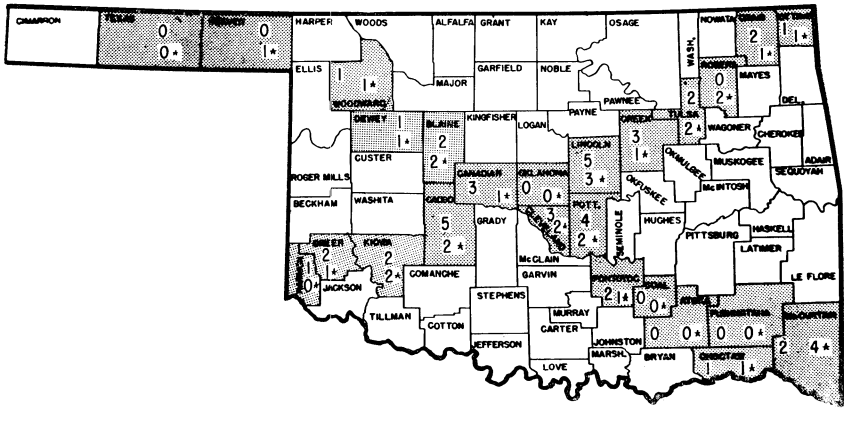

Figure 2. Counties Selected and Number of Producers of Commercial Size Flocks.

Note: Asterisks denote producers of non-commercial size flocks.
No asterisks denote producers of commercial size flocks.

Results

Size and Production of Flocks

The average size of flock, rate of lay, production and number of eggs marketed during the weekly periods studied were determined from the flocks surveyed.[1]

The average size of flock in the spring period was less than the fall period for all size groups except the 1,600 and greater size group; this group showed an increase of ten percent in the spring. The percentage change in the number of layers from fall to spring was greatest for the group with fewer than 100 layers. As the average size of flocks increased, there was a tendency to maintain a larger percentage of hens housed from fall to spring (Table I).

The increased marketings from noncommercial producers and the decreased marketings from commercial producers from fall to spring periods were partially explained by the production practices of each group. Commercial producers tended to cull and replace layers early in the fall which resulted in a high rate of lay per hen during the fall period. Commercial producers also maintained a relatively stable rate of lay from fall to spring.

Noncommercial producers tended to bring layers into production later in the fall than commercial producers. These producers generally did not practice replacement of layers during the season, and flock size decreased from fall to spring. The rate of lay for noncommercial flocks was considerably higher for the spring than in the fall (Table I).

Results indicated that the increased volume of eggs marketed by noncommercial producers in the spring period was largely due to the production practices followed.

Market Services

Cooling of Eggs

Most commercial producers used some type of mechanical egg cooling. The majority of the noncommercial producers used either natural cooling or kitchen refrigerators. (Natural cooling refers to storing eggs in cellars, basements or caves.)

[1]K. C. Davis and Gene Mathia, *Farm Characteristics and Production Practices Associated with Commercial Egg Production in Oklahoma.* Okla. Agri. Exp. Sta. Bulletin B-554.

[2]Rate of lay indicates the average annual number of eggs produced by each layer.

Table I.—Differences in Flock Size, Production, Marketings, and Rate of Lay by Size Groups and Between Fall and Spring Periods.

Item	Size Groups				
	Less Than 100	100-399	400-799	800-1,599	1,600 and Greater
Total Number Flocks	15	16	18	15	9
Fall, 1958					
Average Size Flocks	76	196	520	1,004	2,130
Production, Dozen (All Flocks)	312	954	3,519	5,796	7,018
Marketing, Dozen (All Flocks)	256	892	3,415	5,694	6,943
Rate of Lay, Percent	48	47	64	63	63
Spring, 1959					
Average Size Flocks	52	178	485	980	2,177
Percentage Change*	−32	−9	−7	−2	+ 10
Production, Dozen (All Flocks)	336	1,005	3,429	5,137	6,540
Percentage Change	+11	+11	−3	−12	− 7
Marketings, Dozen (All Flocks)	284	946	3,394	5,038	6,461
Percentage Change	+11	+11	−1	−12	− 7
Rate of Lay, Percent	61	62	68	61	57
Percentage Change	+13	+13	+10	−3	− 9

*The percentage change between fall and spring periods of production.

Various types and sizes of mechanical cooling units were used for cooling eggs. The units were classified into two size groups for the purposes of this study. One group had cooling capacities ranging from two to 10 cases of eggs. The second group included large walk-in type coolers with cooling capacities ranging from 11 to 25 cases of eggs.

The average investment in cooling units of the 2- to 10-case capacity was $42.50 for the 100-399 group, $100.55 for the 400-799 group, and $90.83 for the 800 to 1,599 group. The average investment in coolers of the 11- to 25-case capacity was $339.80 for the 400-799 group, $303.00 for the 800-1599 group, and $481.89 for the 1,600 and greater group (Table II).

Table II.—Percentage of Producers Using Certain Types of Cooling and Average Investment in Cooling Equipment by Size Groups.

Flock Size	Natural Cooling	Kitchen Refrigerator*	2 to 10 Case Cooling Units**		11 to 25 Case Cooling Units**	
	Percent Producers	Percent Producers	Percent Producers	Avg. Invest.	Percent Producers	Avg. Invest.
Less than 100***	33	54	--	--	--	--
100-399	56	31	13	$ 42.50	--	--
400-799	22	--	50	$100.55	28	$399.80
800-1,599	--	--	40	$ 90.83	60	$303.00
1,600 and Greater	--	--	--	--	100	$481.89

*Eggs cooled by units in conjunction with the farm household were not considered as additional cooling facilities and average investment was not determined.

**Cooling units of 2 to 10 case capacity included evaporative coolers and used kitchen refrigerators. Units with 11 to 25 case capacity included large walk-in coolers.

***Thirteen percent of the producers in this group used no cooling.

Cost of Cooling

The cost of cooling eggs was calculated for units of the 2- to 10-case capacity and the 11- to 25-case capacity. Average cost per dozen did not vary greatly between the fall and spring periods for those producers cooling eggs by mechanical refrigeration. Average cost was greater for producers in the small flocks and decreased as the size of the flocks increased (Table III).

Excluding the cost of labor, electricity was the only variable cost of any significance in the two classifications of coolers. Cost of electricity was estimated by multiplying the kilowatt hours used during the week by a rate of three cents per kilowatt hour.[3] Under the assumption of once-a-week marketing, the cooling cost per dozen was determined by dividing the marketings of eggs for the week into the weekly cost of electricity.

Annual fixed costs for each of the different classifications of coolers were based upon a percentage of first costs. Depreciation expenses on the 2- to 10-case units were based upon a life expectancy of three years, since most of these coolers were used household coolers of various sizes and types. A life expectancy of 15 years was used for the 11- to 25-case units. Annual interest on investment was based upon three percent of the original cost. The annual cost of repairs and maintenance was estimated as two percent of the original cost.

[3]Kilowatt hours were estimated by the formula:

$$\frac{\text{Motor rating (in watts)} \times \text{hours in use}}{1{,}000} = \text{Kilowatt hours}$$

Cleaning Eggs

Eggs were cleaned by both hand and mechanical methods. Hand cleaning was done either by wiping eggs with a damp rag, dry buffing, and/or rinsing with clear water.

Two types of mechanical washers were used. One was a 15 dozen capacity unit and the other a 50 dozen unit. These washers were equipped with electric heating units and the eggs in wire gathering baskets were immersed and cleaned by the water agitating and circulating about them.

Five producers in the 400-799 size group and two producers in the 800-1,599 size group used the small mechanical washers. The average investment was $30.00 for these washer units. Two producers in the 800-1,599 size group and five in the 1,600 and greater group used the larger mechanical washer. The average investment per unit for these washers was $157.50 and $137.00, respectively.

Table III.—Estimated Average Cost Associated with Operating Two Sizes of Egg Cooling Units. (Cents Per Dozen)

Flock Size By Periods	Cooling Units			
	2 to 10 Case Units		11 to 25 Case Units	
	No. Producers	Average Cost Per Dozen*	No. Producers	Average Cost Per Dozen*
Fall, 1958				
Less than 100	0	--	0	--
100-399	2	0.82	0	--
400-799	9	0.62	5	0.95
800-1,599	6	0.41	9	0.45
1,600 and Greater	0	--	9	0.30
Spring, 1959				
Less than 100	0	--	0	--
100-399	2	1.05	0	--
400-799	9	0.64	5	0.66
800-1,599	6	0.49	9	0.51
1,600 and Greater	0	--	9	0.32

*Average cost included variable and fixed costs. Variable costs were slightly higher than fixed costs but each made up approximately one-half of the average cost of cooling.

Cost of Cleaning

The costs of hand cleaning eggs consisted of labor and cleaning materials. Labor cost was estimated at $1.00 per hour. Labor costs were based on the number of eggs marketed rather than eggs cleaned. Labor time per dozen for hand cleaning tended to decrease considerably per dozen as the size of flock or the percentage of eggs cleaned increased.

Materials included detergents, sand paper and other supplies purchased. The material cost per dozen became greater with increased flock size because producers in the larger size groups were cleaning a larger percentage of total eggs marketed. The total cost of materials was spread over total marketings rather than for only those eggs cleaned. Smaller producers, in some instances, used buffer types of dry cleaning which were less expensive than detergents. Producers in the less-than-100 size group used clear water to clean eggs and had no material cost other than water.

Total costs for hand cleaning varied little between fall and spring periods. Total costs for hand cleaning in the two noncommercial groups were 1.47 and 1.18 cents per dozen in the fall and 1.52 and 0.97 cents in the spring. Total costs for commercial producers were 2.44 cents in the fall and 2.3 cents in the spring for producers in the 400 to 799 size group, 1.06 and 1.01 cents in the 800-1,599 size group and 0.60 cents and 0.65 cents per dozen for producers in the largest size group (Table IV).

Total costs for mechanical cleaning were evaluated in the same way as costs for hand cleaning, except for the addition of a fixed cost

Table IV.—Estimated Costs for Hand Cleaning Eggs. (Cents Per Dozen)

Size	Producers	Fall, 1958		Spring, 1959	
		Labor Costs @ $1.00 Hr.*	Avg. Cost**	Labor Costs @ $1.00 Hr.*	Avg. Cost**
	Number	**Cents**	**Cents**	**Cents**	**Cents**
Less than 100	15	1.47	1.47	1.52	1.52
100-399	16	1.16	1.18	0.95	0.97
400-799	13	2.39	2.44***	2.26	2.31***
800-1,599	11	0.93	1.06	0.95	1.01
1,600 and Greater	4	0.45	0.60	0.40	0.65

*Labor was valued at $1.00 per hour. Estimated labor requirements in minutes per dozen for hand cleaning were based upon total eggs marketed (not just eggs cleaned).

**This includes labor and costs for cleaning material such as sand paper or sanitizing detergents.

***The costs of cleaning for this group were higher than for the noncommercial groups because producers cleaned a higher percentage of total marketings.

for the mechanical washers. Annual fixed costs for small and large washer units were based on a percentage of first cost. Depreciation cost on the small washer units was based on a life expectancy of five years and for the large units a life expectancy of ten years. Interest on investments was based on three percent of the original cost. Variable cost was based on an estimated expense for labor and upon the amount of electricity and detergents used. Total costs of mechanical cleaning were generally less than costs for hand cleaning for those producers in the same size groups. Cleaning costs changed little from fall to spring periods (Table V).

Grading of Eggs

The grading and sizing of eggs was more prevalent among commercial than noncommercial producers. Both hand and mechanical methods of candling were used. Hand candling consisted of holding eggs before a candling light to determine interior quality; the weight of the eggs was determined by the feel of the eggs in the grader's hand, with eggs of doubtful weight checked on egg scales.

Table V.—Estimated Costs for Mechanical Cleaning of Eggs. (Cents Per Dozen)

Flock Size	Small Mechanical Units			Large Mechanical Units		
	Producers	Labor Costs @ $1.00 Hr.*	Avg. Cost**	Producers	Labor Costs @ $1.00 Hr.*	Avg. Cost**
	Number	Cents	Cents	Number	Cents	Cents
Fall, 1958						
Less than 100	0	--	--	0	--	--
100-399	0	--	--	0	--	--
400-799	5	1.23	1.40	0	--	--
800-1,599	2	0.40	0.60	2	0.53	0.74
1,600 and Greater	0	--	--	5	0.49	0.71
Spring, 1959						
Less than 100	0	--	--	0	--	--
100-399	0	--	--	0	--	--
400-799	5	1.39	1.55	0	--	--
800-1,599	2	0.40	0.60	2	0.51	0.84
1,600 and Greater	0	--	--	5	0.49	0.71

*Labor was valued at $1.00 per hour. Estimated labor requirements in minutes per dozen were based upon total eggs marketed (not just eggs cleaned).

**This includes labors fixed costs and costs for electricity and sanitizing detergents.

Table VI.—Method of Candling and Average Investment in Candling Equipment.

Flock Size	Hand Candling*		Mechanical Candling**		Average Investment	
	Producers		Producers		Hand*	Mechanical**
	No.	**Percent**	**No.**	**Percent**	**Dollars**	**Dollars**
Less than 100	0	--	0	--	--	--
100-399	5	31	0	--	5.00	--
400-799	15	83	0	--	11.60	--
800-1,599	7	46	5	33	8.25	205.50
1,600 and Greater	0	--	5	55	--	190.00

*Hand operated candlers and scales.

**The term "mechanical" implied mass candling equipment. Eggs were candled by the operator while passing over a candling light and sizing was done mechanically.

Investments in hand candling equipment consisted of a set of scales and a candling light. The average investment in hand candling equipment ranged in value from $5.00 to $11.60.

Mechanical candling was not practiced for producers with less than 800 layers. All producers with more than 1,600 layers used mechanical candling (Table VI). Producers who mechanically candled eggs used equipment which passed the eggs over a candling light. The equipment mechanically sized the eggs into various holding trays. The capacity of these machines was approximately four cases per hour.

Cost of Grading

Variable costs of egg grading included labor, electricity, and light bulb replacements. Labor was estimated at $1.00 per hour. Cost of electricity was calculated by determining the kilowatt hours used during the week and multipling by a rate of three cents per kilowatt hour. Light bulbs were replaced at a rate of two each year.

Annual fixed cost of grading equipment was based on a percentage of the first cost. Depreciation expenses for the hand candler and scales were based on a life expectancy of five years. A life expectancy of ten years was used for determining the depreciation expense of mechanical equipment. Annual interest on the investment was based on three percent of the original cost (Table VII).

Table VII.—Costs for Hand and Mechanical Egg Candling. (Cents Per Dozen)

Flock size	Hand Candling			Mechanical Candling		
	Producers	Labor Costs @ $1.00 Hr.*	Avg. Cost**	Producers	Labor Costs @ $1.00 Hr.*	Avg. Cost**
	Number	Cents	Cents	Number	Cents	Cents
Fall, 1958						
Less than 100	0	--	--	--	--	--
100-399	5	2.70	2.75	0	--	--
400-799	15	1.24	1.24	0	--	--
800-1,599	7	0.65	0.67	5	0.53	0.65
1,600 and Greater	0	--	--	5	0.63	0.74
Spring, 1959						
Less than 100	0	--	--	0	--	--
100-399	5	2.70	3.07	0	--	--
400-799	15	1.16	1.20	0	--	--
800-1,599	7	0.83	0.85	5	0.72	0.87
1,600 and Greater	0	--	--	5	0.71	0.82

*Estimated labor requirements in minutes per dozen for grading can be calculated by moving of the decimal two places to the right.

**Includes labor, fixed costs, electricity and light bulbs.

Packaging of Eggs

Producers sold eggs in either carton or case containers. Cases generally were standard thirty-dozen cardboard or wooden crates, and cartons consisted of various one-dozen types. Paper sacks or small cardboard boxes were also considered as cartons.

Noncommercial producers sold a higher percentage of eggs in cartons in the fall than in the spring (Table VIII). Commercial producers sold approximately the same proportion of eggs in cartons during both periods. The 400 to 799 layer group sold a larger percentage of eggs in cartons than any other group.

Egg packaging time was presumed not to be greatly different between cartoning and casing eggs. Since producers must package eggs for any market outlet, no estimate was made concerning labor used in performing this service.

Although producers generally had an initial investment in case material, cases were generally exchanged at a particular market and

Table VIII.—Market Eggs Sold in Cartons or Case Containers, Fall and Spring Periods.

Period and Flock Size	Number of Producers	Weekly Marketings	Type of Container	
			Carton	Case
		Dozen	Percent	Percent
Fall, 1958				
Less than 100	15	256	61	39
100-399	16	892	57	43
400-799	18	3,415	76	24
800-1,599	15	5,694	68	32
1,600 and Greater	9	6,943	52	48
Spring, 1959				
Less than 100	15	284	47	53
100-399	16	946	49	51
400-799	18	3,394	76	24
800-1,599	15	5,038	72	28
1,600 and Greater	9	6,461	55	45

cost to producers using this type of packaging was not considered important enough to calculate.

Cost for commercial cartons ranged from two to three cents each depending upon the type. Eggs sold through retail stores had the producer's name label attached to each carton. The labels cost ¼ cent each and were purchased from the State Department of Agriculture. This label identified the producer, gave the date eggs were graded, and the grade and size of eggs.

Delivery of Eggs

Producers delivered a large percentage of eggs to markets themselves. Eggs sold at the farm usually went directly to consumers, but occasionally commercial producers sold directly to jobbers at the farm. Noncommercial producers sold a larger percentage of eggs at the farm than commercial producers. Producers in the 400-799 size group delivered a larger percentage of eggs than any other group (Table IX).

Most producers used either the family car or pickup to transport eggs to market. A few commercial producers used a truck for the dual purpose of delivering eggs and hauling supplies back to the farm.

Table IX.—Eggs Sold at the Farm or Delivered by Producers to Market.

Flock Size	Producers	Fall, 1958		Spring, 1959	
		Eggs Delivered	Eggs Sold At Farm	Eggs Delivered	Eggs Sold At Farm
	No.	**Percent**	**Percent**	**Percent**	**Percent**
Less than 100	15	65	35	70	30
100-399	16	60	40	70	30
400-799	18	89	11	87	13
800-1,599	15	64	36	63	37
1,600 and Greater	9	74	26	78	22

Distance to Markets and Frequency of Marketing

Commercial producers usually marketed twice each week. The range varied from one to six marketings per week. Noncommercial producers indicated that they marketed one to three times each week. Producers indicated no difference in the number of eggs delivered between the fall and spring periods.

Distances to markets ranged from two to 50 miles. Average distance to markets was approximately 10 miles.

Cost of Delivering Eggs

In determining the cost associated with additional delivery service, the following assumptions were made. It was assumed that eggs could normally be sold to produce markets within a distance of ten miles from the farm and that all producers would have delivered eggs once each week. For this once-a-week delivery, producers were allowed 15 minutes to facilitate selling operations, and allowed a maximum time of 20 minutes to travel the 10 miles to market. Based upon these assumptions, any additional number of marketings, miles traveled, or time spent by producers in delivering eggs was considered as additional delivery services performed. A charge of three cents was made for each additional mile in delivering to cover fuel cost, and a charge of $1.00 per hour was made for each additional hour of labor.

The average added cost of transportation did not vary significantly from fall to spring periods. Producers in the smallest noncommercial group had no added transportation cost, as their egg delivering practices were included in the above assumptions. Producers in the 100-399 noncommercial group had the highest average cost per dozen of all

Table X.—Additional Time Required and Added Cost to Producers for Delivering Eggs.

Period and Size Flock	Producers Delivering Eggs	Additional Time Per Dozen Transporting Eggs	Labor Costs @ $1.00 Hr.*	Average Added Costs**
	No.	**Minutes**	**Cents per Dozen**	
Fall, 1958				
Less than 100	9	--	--	--
100-399	11	.84	0.84	1.17
400-799	16	.76	0.76	1.03
800-1,599	11	.65	0.65	0.83
1,600 and Greater	6	.68	0.68	0.87
Spring, 1959				
Less than 100	9	--	--	--
100-399	11	.91	0.91	1.22
400-799	16	.77	0.77	1.02
800-1,599	11	.66	0.66	0.86
1,600 and Greater	6	.78	0.78	0.98

*Estimated
**Also included fuel cost for additional miles in delivering eggs.

groups with 1.17 cents in the fall and 1.22 cents in the spring. Commercial producers had slightly lower costs, ranging from 1.03 to 0.86 cents per dozen in the fall and from 1.02 to 0.98 cents in the spring (Table X).

Types of Markets

Producers sold eggs to the following types of markets: retail stores, home customers, route customers, cafes, institutions, produce markets, egg breakers, jobbers, and egg handlers[4] (Table XI).

Commercial producers sold eggs to a wider variety of markets than noncommercial producers. This probably was because the commercial producers had a large enough production to supply several different markets and also because they were able to supply the marketing services required at certain markets. Retail stores took a larger percentage of

[4]Jobbers were buyers who picked up eggs at the farm for resale to retail stores or customers on routes. Egg handlers were buyers who normally supplied large chain stores. Institutions included orphan homes, homes for the aged, and hospitals. Home customers or customers at the farm were usually city people who bought small quantities of eggs at the farm.

Table XI.—Percentage of Eggs Sold to Various Markets.
Percent

Period and Flock Size	Retail Store	Customers at the Farm	Customers on Route	Jobbers	Egg Handlers	Cafes and Institutions	Produce Markets	Egg Breakers
Fall, 1958								
Less than 100	23.4	34.8	26.2	--	--	--	15.6	--
100-399	45.9	26.3	--	13.5	--	--	14.3	--
400-799	45.3	11.1	19.9	--	4.6	8.8	10.0	0.3
800-1,599	36.6	22.5	8.9	13.4	3.9	9.7	4.5	0.5
1,600 and Greater	45.8	5.8	.4	1.4	28.9	11.4	6.3	--
TOTALS	42.3	13.9	7.5	5.7	13.9	9.5	7.1	.1
Spring, 1959								
Less than 100	28.5	29.9	16.9	--	--	--	24.7	--
100-399	57.3	20.1	--	9.5	--	--	13.1	--
400-799	42.6	13.1	20.0	--	4.8	8.0	11.2	0.3
800-1,599	36.5	23.1	7.7	13.9	4.7	10.4	2.9	0.8
1,600 and Greater	47.0	7.4	0.4	--	27.6	10.7	6.9	--
TOTALS	43.1	14.7	7.1	4.9	13.6	9.3	7.2	.1

eggs from commercial producers than any other market. Producers in the 400-799 size group sold approximately 45 percent of the eggs to retail stores in the fall and spring. They also sold actively to customers on routes in both periods with approximately 20 percent going to this market. Other markets in the 400-799 size group included customers at the farm, cafes, institutions, produce markets, egg breakers and egg handlers. Producers in the 800-1,599 size group sold a smaller percentage of eggs to retail stores, than producers in the other size groups. Marketings, however, to home customers and jobbers were greater for this group. In many cases, eggs sold to customers at the farm may not have been acceptable at other markets.

Producers in the largest commercial group sold largely to retail stores and egg handlers. These producers generally indicated that sales at the farms or to customers on routes were troublesome and time consuming. Egg handlers took approximately 30 percent of the eggs in the fall and spring from producers in this largest commercial size group. These buyers picked up eggs at the farm or delivery was made by the producer once or twice each week. Egg handlers generally bought the producers' entire marketings and were interested in obtaining a large and steady supply of eggs throughout the year. Producers were paid on a graded basis.

Markets According to Services Performed

Producers who performed certain marketing services were grouped to determine the type of markets related to these services. The groupings were as follows: (1) those producers who cooled, cleaned, graded, packaged and delivered, (2) those who cooled, cleaned, packaged, and delivered but did not grade, (3) those who cooled, cleaned, and packaged eggs but did not grade or deliver. Only two producers in the 800-1,599 size group did not deliver eggs but performed all other services. These two producers sold to customers at the farm and were not included in the analyses of other markets and related services.

In analyzing the returns associated with the above groupings of marketing services, a weighted average price received per dozen by producers was calculated according to the prices received at various markets and the particular grade and volume of eggs marketed.

Marketing Services, Group 1 (Grading, Cleaning, Cooling, Delivering)

Producers performing the first group of marketing services were more prevalent among commercial than noncommercial producers. No producer in the smaller noncommercial group provided all of these services and only about one-third in the 100-399 size group attempted to perform them. Two-thirds or more of the producers in the three large commercial groups performed all of these services (Table XII).

Retail stores were the principal market for producers when these services were performed. Graded eggs were sold in cartons to retail stores, customers at the farm and customers on route. Graded eggs were also sold in case containers to other markets such as egg handlers, cafes, institutions, produce markets, and egg breakers. These markets afforded, in many instances, an outlet for small, extra large, B-grades, odd shaped, and slightly cracked eggs which were not acceptable at retail stores.

The weighted prices received by producers who graded, varied little regardless of the size group. Prices received ranged from 46.62 to 46.95 cents per dozen for producers in the fall and from 36.03 to 38.34 cents in the spring.

Marketing Services, Group 2 (Cleaning, Cooling, Delivering)

Producers performing the second group of marketing services which excluded grading were largely noncommercial producers.

Noncommercial producers sold a large percentage of eggs to small grocery stores in case containers in both fall and spring periods. In some instances, these stores had facilities to grade and carton eggs. Produce markets also took a large percentage of these ungraded eggs, while the remainder was sold directly to customers at farms and on routes, or to jobbers.

Commercial producers who excluded the grading service sold mostly to egg handlers in case containers. A small percentage of eggs, however, did go to customers on route and to retail stores.

Weighted average prices received for eggs not graded varied considerably. Prices received ranged from 34.77 to 40.84 cents per dozen in the fall and from 24.34 to 28.76 cents per dozen in the spring. These prices averaged approximately 10 cents less per dozen than the prices received when grading was performed (Table XII).

Table XII.—Eggs Marketed and Weighted Prices Received Per Dozen According to the Group of Market Services Performed.

Period and Flock Size	Group No. 1 of Market Services*			Group No. 2 of Market Services**			Group No. 3 of Market Services***		
	Producers	Eggs Marketed	Prices Received	Producers	Eggs Marketed	Prices Received	Producers	Eggs Marketed	Prices Received
	Percent	**Percent**	**Cents**	**Percent**	**Percent**	**Cents**	**Percent**	**Percent**	**Cents**
Fall, 1958									
Less than 100	--	--	--	60	73.4	35.79	40	26.6	38.75
100-399	31	37.3	46.62	38	35.4	34.77	31	27.3	46.78
400-799	84	88.6	46.95	5	4.6	36.10	11	6.8	37.50
800-1,599	67	69.1	46.79	7	4.2	38.85	13	13.3	41.47
1,600 and Greater	56	64.9	46.70	11	9.5	40.84	33	25.6	40.82
Spring, 1959									
Less than 100	--	--	--	60	72.8	28.76	40	27.2	38.93
100-399	31	33.7	37.27	38	36.0	24.34	31	30.3	28.81
400-799	84	82.9	38.34	5	4.8	27.54	11	12.3	31.58
800-1,599	67	66.1	36.65	7	5.1	28.51	13	13.9	36.10
1,600 and Greater	56	65.1	36.03	11	10.4	25.25	33	24.5	27.28

*Marketing Services included cooling, cleaning, grading, packaging and delivery of eggs by producers.
**Marketing Services included cooling, cleaning, packaging, and delivering ungraded eggs by producers.
***Marketing Services included cooling, cleaning, and packaging ungraded and undelivered eggs by producers.

Marketing Services, Group 3 (Cleaning and Cooling)

Producers performing the third group of marketing services which excluded grading and delivering generally sold a greater percentage of eggs directly in cartons to farm customers or in case containers to jobbers. An exception to this was in the largest commercial group where producers sold a greater percentage to egg handlers.

When only cooling, cleaning and packaging services were provided, the market was limited largely to customers at the farm who were interested in obtaining "fresh country eggs" or to jobbers or egg handlers who picked up eggs at the farm and provided the grading service before resale to others.

The weighted average prices for these eggs and services during the two periods were higher than prices when these eggs were delivered. However, this market was limited and decreased during the critical spring period. Also, there was no consistency in prices received in either fall or spring, as no single price seemed to prevail when eggs were sold ungraded at the farm. Prices received by all groups for these eggs ranged from 37.50 to 46.78 cents per dozen in the fall to 27.27 to 38.93 cents per dozen in the spring (Table XII).

Analysis of Marketing Costs and Returns

Returns from marketing services were measured in terms of the difference between the prices received by producers who performed marketing services and the prices paid at produce markets for current receipt eggs.[5]

Prices at produce markets for the two periods were based on daily price quotations for current receipt eggs by ten stations making regular reports to the Oklahoma State Board of Agriculture. The daily price quotation from these 10 stations for a period in the fall of 1958 and the spring of 1959 were used to establish an average base price for eggs when no marketing services were provided by the producer. The fall period extended from Thursday, October 30 through Wednesday, November 5, 1958 and the spring period from Monday, March 31 through Monday, April 6, 1959.

It was assumed that these base prices would be indicative of prices paid for eggs which received no marketing services other than once a

[5]The term current receipts is a market classification for eggs of unknown quality.

week delivery during the two production periods studied. The average price received for current receipt eggs during the fall period, 1958, was 34.12 cents per dozen and was 21.04 cents per dozen during the spring period of 1959.

The weighted average cost associated with a particular group of services was based on the individual service cost. The weighted average costs for marketing services that could be performed by two different methods, such as hand or mechanical candling, were calculated by weighting the cost of each method of grading by the number of eggs processed. Costs for other services, such as cooling, included only those added costs associated with the services because no costs were assumed for facilities that required no capital or labor inputs. Cooling eggs by kitchen refrigeration or by natural means did not enter into the cost analysis. Packaging costs were also weighted. A two and one-half cent charge was made for each carton container but no cost was assumed for egg cases.

Marketing Services, Group 1

Estimates of net returns received by producers from cooling, cleaning, grading, packaging, and delivering eggs varied from approximately four cents per dozen in the 100-399 noncommercial group to eight cents per dozen in the largest commercial group during the fall period. Net returns for these services were higher during the spring and varied from approximately seven cents per dozen in the 100-399 size group to about ten cents per dozen in the 1,600 and greater size group.

Net returns in the fall, compared with returns in the spring, indicated a greater return per dozen from marketing services in the spring period. The average costs of providing these services changed very little between fall and spring periods. The weighted average prices for quality eggs decreased proportionally less from fall to spring than the current receipt eggs which accounted for more favorable returns to marketing services in the spring (Table XIII).

Marketing Services, Group 2

The net returns on the group of services which excluded grading were considerably less than the returns where grading was performed. During the fall period, producers in the noncommercial groups and those in the 300-799 commercial group had additional costs in excess of gross receipts and showed a negative return for the group of services

Table XIII.—Added Costs, Gross Receipts, and Net Returns from Cooling, Cleaning, Grading, Packaging and Delivering Eggs. (Cents Per Dozen)

Period and Flock Size	Prices Paid Produce Market	Prices Received All Markets (Weighted Average)	Gross Receipts for Services	Cost of Services (Weighted Average)	Net Returns From Services
Fall, 1958					
Less than 100	--	--	--	--	--
100-399	34.12	46.62	12.50	8.42	4.12
400-799	34.12	46.95	12.83	7.15	5.68
800-1,599	34.12	46.79	12.67	4.84	7.83
1,600 and Greater	34.12	46.70	12.58	4.40	8.18
Spring, 1959					
Less than 100	--	--	--	--	--
100-399	21.04	37.27	16.23	8.81	7.42
400-799	21.04	38.34	17.30	6.94	10.36
800-1,599	21.04	36.65	15.61	5.16	10.45
1,600 and Greater	21.04	36.03	14.99	4.70	10.29

which excluded gradings. However, producers in the 800-1,599 groups and the 1,600 and greater size groups had positive returns of approximately two and five cents per dozen, respectively.

Net returns to producers for these services in the spring were also positive with the exception of producers in the 100-399 noncommercial group. Returns tended to be greater for producers in the spring for these services. This was not consistent for every size group however as producers in the 1,600 and greater size group showed a decrease from 4.78 to 2.97 cents per dozen (Table XIV).

Marketing Services, Group 3

Net returns from only cooling, cleaning, and packaging services varied from a negative two cents per dozen to approximately eight cents per dozen in the fall and from approximately four to 14 cents per dozen in the spring.

Net returns had a tendency to be greater in the spring than in the fall but there was no consistency in returns received by producers in

Table XIV.—Added Costs, Gross Receipts, and Returns from Cooling, Cleaning, Packaging and Delivering Ungraded Eggs. (Cents Per Dozen)

Flock Size	Prices Paid Produce Market	Prices Received All Markets (Weighted Average)	Gross Receipts for Services	Cost of Services (Weighted Average)	Net Returns From Services
Fall, 1958					
Less than 100	34.12	35.79	1.67	2.64	—0.97
100-399	34.12	34.77	0.65	4.04	—3.39
400-799	34.12	36.10	1.98	3.96	—1.98
800-1,599	34.12	38.85	4.73	2.42	2.31
1,600 and Greater	34.12	40.84	6.72	1.94	4.78
Spring, 1959					
Less than 100	21.04	28.76	7.72	2.37	5.35
100-399	21.04	24.34	3.30	4.05	—0.75
400-799	21.04	27.54	6.50	3.75	2.75
800-1,599	21.04	28.51	7.47	2.50	4.97
1,600 and Greater	21.04	25.25	4.21	1.24	2.97

any group. The prices received fluctuated widely among producers when grading was excluded and eggs were picked up at the farm. The inconsistency in net returns from services in the different groups was due largely to fluctuations in market prices with only a small part of the fluctuations due to the variation in costs of marketing services. In some instances the costs of marketing services might not necessarily be as high as those indicated for services to producers in the noncommercial groups and the 400-799 commercial group (Table XV). A large percentage of eggs were sold to customers at the farm in carton containers, and customers often exchanged cartons with the producer.

Summary and Conclusions

Egg producers in this study provided three distinct groups of market services. These services included (1) cooling, cleaning, grading, packaging, and delivery of eggs, (2) cooling, cleaning, packaging, and delivery, and (3) cooling, cleaning, and packaging. The group of services that included both grading and delivery of eggs was provided mainly by commercial producers.

Table XV.—Added Costs and Returns from Cooling, Cleaning, and Packaging Eggs, But Not Graded Nor Delivered. (Cents Per Dozen)

Period and Flock Size	Prices Paid Produce Market	Prices Received All Markets (Weighted Average)	Gross Receipts for Services	Cost of Services (Weighted Average)	Net Returns From Services
Fall, 1958					
Less than 100	34.12	38.75	4.63	3.97	0.66
100-399	34.12	46.78	12.66	3.74	8.92
400-799	34.12	37.50	3.38	5.43	—2.05
800-1,599	34.12	41.47	7.35	1.38	5.97
1,600 and Greater	34.12	40.82	6.70	1.29	5.41
Spring, 1959					
Less than 100	21.04	38.93	17.89	3.33	14.56
100-399	21.04	28.81	7.77	3.14	4.63
400-799	21.04	31.58	10.54	4.67	5.87
800-1,599	21.04	36.10	15.06	1.43	13.63
1,600 and Greater	21.04	27.28	6.24	1.55	4.69

Retail stores were the principal market for graded eggs. The eggs were delivered to retailers in carton containers with the grade and size designated on each carton.

Net returns from marketing services were consistently higher for the group of services which included grading. When grading was not a part of the marketing services or when grading and delivery of eggs were not a part of the marketing service, returns from the remaining services were inconsistent and were generally lower than returns from all services.

Net returns, per dozen, associated with each group of marketing services had a tendency to be greater in the spring when egg prices were low as compared with the fall.

Net returns from the group of services which included grading ranged from approximately four to eight cents per dozen. Net returns in the spring were slightly greater, ranging from seven to ten cents per dozen.

The average costs associated with each group of services were not greatly different between fall and spring periods.

Net returns were higher when neither delivery nor grading services were performed than they were when delivery was made but grading was excluded. Markets were limited, however. This was partially explained by the type of markets to which producers sold eggs. Producers who did not grade and deliver eggs sold to egg jobbers, egg handlers, and customers at the farm. These buyers paid higher prices for ungraded eggs than did retail stores and produce dealers. Egg handlers, however, paid a cent more per dozen for eggs delivered. The jobbers made no distinction in quality and always picked up eggs at the farm.