SEASONALITY OF PRICES, MARKETINGS AND CASH PRODUCTION COSTS OF BROILERS IN THE 10-COUNTY SHENANDOAH VALLEY AREA, 1951-1956

by

Charles Elwood Williams

Thesis submitted to the Graduate Faculty of the

Virginia Polytechnic Institute

in candidacy for the degree of

MASTER OF SCIENCE

in

Agricultural Economics

APPROVED:

Director of Graduate Studies

APPROVED:

Head of Department

Dean of Agriculture

Supervisor or Major Professor

1957

Blacksburg, Virginia

ACKNOWLEDGEMENTS

The writer desires first of all to express his deepest thanks and appreciation to the Department of Agricultural Economics for the opportunity of doing graduate work, and to Dr. Harry M. Love, Department Head, whose assistance and encouragement made this study possible.

The writer's greatest indebtedness goes to Dr. John T. Buck, Major Professor, for his assistance in selecting this project, for his guidance, and for constructive criticism throughout the course of the study. He wishes also to thank the other members of his committee, Dr. Carl W. Allen and Dr. Maynard C. Conner, for their constructive criticism and valuable suggestions offered. Appreciation is extended to other staff members and to the secretaries of the Department of Agricultural Economics for their kind cooperation and help throughout this study. His warmest appreciation is extended to who so willingly typed and helped in the final preparation of this manuscript.

Recognition is given to the feed dealers in the Shenandoah Valley Area of Virginia and West Virginia for their cooperation in making available the data used in this study.

Special thanks are given to my wife, , for her patience and understanding during the many hours spent away from home on this study, and for her help in collecting the original data, and her assistance in the initial calculations.

TABLE OF CONTENTS

TABLE OF CONTENTS (cont'd)

LIST OF TABLES

LIST OF TABLES (cont'd)

LIST OF FIGURES

LIST OF FIGURES (cont'd)

LIST OF FIGURES (cont'd)

LIST OF APPENDIX TABLES

LIST OF APPENDIX TABLES (cont'd)

SEASONALITY OF PRICES, MARKETINGS AND CASH PRODUCTION COST OF BROILERS IN THE 10-COUNTY SHENANDOAH VALLEY AREA, 1951-1956

INTRODUCTION

Seasonal variations are evident in the patterns of marketings and prices of most all types of agricultural products. A study of market reports over a period of time for any major marketing area will usually show regular seasonal movements year after year. A knowledge of these patterns is important in that it will provide an explanation for some of the fluctuations in marketings and prices.

Wide fluctuations in the market price of commercial broilers is often cited as one of the major risks involved in the production and marketing of broilers. Some doubt exists as to whether broiler prices show any true seasonal pattern. How much of the variation in broiler prices is related to the seasonality of marketings is unknown. The influence of production cost items on the market supply of broilers in different seasons is undetermined. When the seasonal movement of broiler prices follows a well defined pattern year after year and that pattern is known, production can be planned to take advantage of it, and marketing and production may be carried out with a minimum of risk. When the seasonal movement varies greatly among years, it introduces considerable risk into these operations. If a significant seasonal pattern of prices and marketings is found to exist, and if a significant seasonal relationship is evident between the seasonal patterns of marketings and production cost, then growers, feed dealers, hatcherymen, processors, and others can use these findings along with other outlook information

in working out a more orderly and stable production and marketing pattern.

Purpose of Study

This study is an attempt to explain the influence, if any, of time of year on the market supply and the market price of commercial broilers in the Shenandoah Valley Area. The relationship of the seasonal patterns of chick placements and cash production costs to market supply are also considered.

More specifically, the purpose of this study is:

(1) To determine whether significant variations in the marketings of commercial broilers are associated with the time of year.

(2) To determine whether significant seasonal variation is found in the farm price of commercial broilers.

(3) To determine the relationship between the seasonal variation in the number of broilers marketed and the seasonal variation in the farm price of commercial broilers.

(4) To determine whether significant seasonal variations occur in the cash cost of broiler production, and the relationship of these variations in cost to seasonal variations in the number of broilers marketed.

Method of Study

This study is limited to the 10-County Shenandoah Valley Area which is the most important broiler producing area of both Virginia and West Virginia. Another reason for selecting this area was its uniform nature

with respect to production, marketing, and climatic factors.

The years, 1951-1956, were selected as the period to be covered by the data used for the analysis. This was a period of rapid technological advances and a time span free from government controls on poultry. In view of this and the fact that the broiler industry is changing rapidly year by year, it was believed that this period of time would be the most indicative of the current situation as well as the future trends in the industry in the Valley.

Data on weekly chick placements, broiler marketings, and broiler prices were supplied by the Virginia Cooperative Crop Reporting Service. A weekly index of seasonal variation was constructed for each of these items for the six-year period, 1951-1956, and for each of the two three-year periods, 1951-1953, and 1954-1956. It was assumed that the indexes computed for the two three-year periods would give some evidence as to whether or not a change in the seasonal patterns had taken place during the six-year period.

Individual broiler flock records were obtained from selected feed dealers in order to examine the influence of the time of year on production cost items, namely, feed, chicks, fuel, medicine, and litter, and on physical production factors such as the feed conversion ratio, average weight, age at sale, daily rate of gain and mortality. The influence of each of these physical factors on cash production cost was also considered.

In drawing the sample, the area was divided into six sections in order to select the appropriate number of feed dealers in proportion to the volume of broilers raised in that section. A table of random

numbers was used in the selection of feed dealers in each section. A total of 17 feed dealers was included in the sample. The sampling plan was originally set up to obtain a minimum of 25 flocks and 100,000 birds each week for the period, 1951-1956. Because detailed information was not available, data for many of the weeks in the earlier years fell short of this goal. For this reason, the indexes of feed cost, chick cost, fuel cost, medicine cost, and litter cost were constructed for only the period, 1954-1956. The number of flocks with the total number of broilers making up these flocks is given for each index constructed in this study. Data from the individual broiler flock records were coded and recorded on IBM cards for tabulation and analysis. From these data, a weekly index of seasonal variation was constructed for each of the items considered. Throughout the study, the various computed indexes are shown graphically; the actual data used in the construction of the indexes are presented in tabular form also.

In order to help explain the seasonal pattern of marketings, a correlation between the seasonal indexes of cash production cost and marketings was determined for the periods, 1951-1956, 1951-1953, and 1954-1956. The seasonal index of feed conversion ratios and the seasonal indexes of various cost items of feed, chicks, fuel, medicine, and litter were correlated with the seasonal index of cash production cost per pound. A correlation was also determined between the seasonal indexes of feed conversion ratios and various items such as average weight, average age at sale, average daily rate of gain, and mortality.

Two statistical methods were employed in the construction of weekly indexes: (1) the link relative method, and (2) the simple average method.

Wherever possible, the link relative method was used for computing the index of seasonal variation. By this method, the value for each week is expressed as a percentage of that for the preceding week. The computing procedure automatically adjusts for any trend in the data, leaving the seasonal pattern for study. The index figure computed for each week represents the typical position of that week with respect to the average and with respect to any other week.1/

The simple average method of calculating seasonal variation was used where the data did not lend itself readily to calculation by the link relative method. In this method, a total is obtained for all of the first weeks in the series and corresponding totals for the other 51 weeks. These totals are summed and divided by 52. Each weekly total is divided by this average weekly total, and the results in each case are multiplied by 100 to obtain index numbers of seasonal variation.2/

An analysis of variance technique was used to test the significance of the seasonal variation of the various items. Simple correlation was used to measure the association between the various indexes.

Review of Related Literature

The writer is unaware of any previous publication dealing specifically with weekly variations in market supply and prices and cost of

---

1/ Pearson, F. A. and Bennett, K. R., Statistical Methods, Third Edition, 1949, p. 95.

Waugh, A. E., Elements of Statistical Method, Second Edition, 1943, pp. 337-341.

2/ Thomsen, F. L. and Foote, R. J., Agriculture Prices, Second Edition, 1952, pp. 324, 326.

production of commercial broilers.

Plaxico made a limited study of monthly variations in prices and in the cost of production of broilers in 1954, and reported that no apparent statistically significant pattern of broiler price movements by months was evident in Virginia.1/ He reported seasonal variations in fuel cost but no strong seasonal movement of feed requirements.

Plaxico concluded that since the data examined did not show any significant relationship between price and season of the year or between cost (other than fuel) and time of year, it appeared that the time of the year in which the birds are produced is of minor importance as a factor determining profits.

Because of the persistent belief that there are important seasonal fluctuations in many of these factors, it was considered desirable to further analyze the problem. The absence of a significant seasonal variation in the reported mid-monthly broiler prices used in Plaxico's analysis may have been due to the reported mid-monthly prices not adequately reflecting prices in the individual markets. Weekly data were thought to be more conducive to testing the validity of seasonal movement of prices and costs.

1/ Plaxico, J. S., "Monthly Variations in Prices and the Cost of Production of Broilers", Virginia Farm Economics, No. 138, May, 1954, pp. 6-8.

IMPORTANCE OF BROILER PRODUCTION IN THE 10-COUNTY SHENANDOAH VALLEY AREA

The Shenandoah Valley Area combines the largest broiler producing areas of Virginia and West Virginia. In 1956, this area accounted for 55% of the broilers produced in Virginia and 70% of the broiler production in West Virginia.

This area, one of the oldest established commercial broiler producing areas, is composed of Augusta, Frederick, Page, Rockingham, and Shenandoah Counties of Virginia; and Berkeley, Grant, Hampshire, Hardy and Pendleton Counties of West Virginia (Figure 1). The growth of the area has been steady but not as rapid as that of some other commercial areas.

The early development of the Shenandoah Valley poultry industry began around Harrisonburg, located in Rockingham County.1/ In 1911, a hatchery was established in this community and equipped with the Newton Giant Incubators which were among the first incubators for mass incubation of chicks. Meat poultry shows and 4-H judging contests held in Harrisonburg during the 1920's created interest in the growing of a meat-type chicken. Also during this period a processing plant was established in Harrisonburg. The discovery of Vitamin D to control rickets made it possible to grow chicks artificially and to produce broilers and fryers the year round. Previous to this time, produce companies closed their dressing plants after the last turkeys were shipped for the Christmas

---

1/ Much of the information presented in this section was obtained from personal conversations with Harry L. Moore, Head, Poultry Husbandry Department, Virginia Polytechnic Institute, and with various members of the poultry industry in the 10-County Shenandoah Valley Area. Some data based on personal observations of the author are also included.

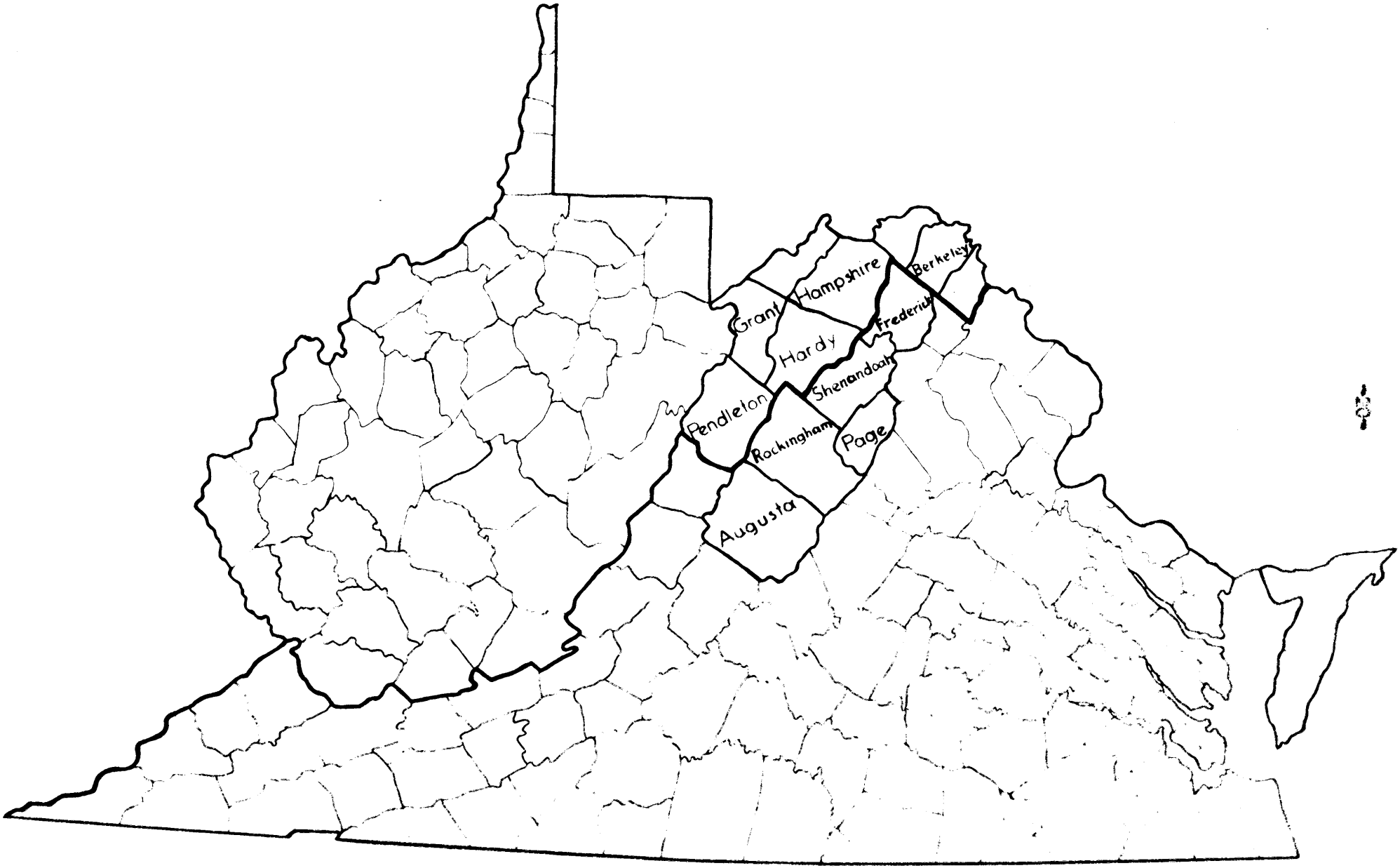

Figure 1. Location of the 10-County Shenandoah Valley Broiler Area.

market and remained closed until the following summer when the surplus supply of farm chickens was ready. Soon they found enough artificially brooded broilers ready throughout the year to justify keeping their plants open the year round.

The hatchery operators and other leading poultrymen in the Harrisonburg area early recognized that the future of their business depended upon the expansion of broiler production and the improvement of the quality and productiveness of the chicks they sold. This program led to the development of the Virginia Poultry Improvement Plan in 1925. Soon after, rapid maturing strains of New Hampshire Reds were brought into the area to improve both the meat and egg production. Intensive poultry breeding farms were developed and more hatcheries contributed to the expansion of the broiler industry during the 1930's. When the smaller farmers observed the returns obtained by the large commercial broiler raisers, they began building broiler houses and following the improved methods of growing chickens.

The big impetus came during the 1930's. A method of contract financing of broiler production was developed in this period. A plan evolved in which the feed dealer or hatcheryman furnished the feed, chicks, medicine, litter, fuel, and other necessary production items to the grower. The grower in turn furnished the broiler house, equipment, and the labor necessary to grow the birds to marketable age. From the net proceeds of the broilers, the charges for feed, chicks, fuel, and other items were first deducted. The remaining proceeds were divided according to some pre-arranged share such as a 75-25 (75% to the grower and 25% to the dealer), 80-20, or 90-10. If the proceeds from the broiler sales were

less than the charges made for the items supplied by the dealer, the dealer stood the loss. Although in this situation the grower received no returns for his labor or for the use of his buildings and equipment, his risk of losing out-of-the-pocket cash was eliminated. Such a contract system of growing broilers gave a great stimulus to the expansion of the broiler industry in Rockingham County and surrounding counties. It is estimated that 95% of the broilers raised in the 10-County Area today are under some type of contractual arrangement.

During the 1930's, a great influx of related industries such as feed mills, hatcheries, equipment companies and processing plants moved into these counties. The most rapid expansion period came during and after World War II. The Rockingham Poultry Marketing Cooperative was established in the Broadway-Timberville area in 1940. It was very instrumental in developing the marketing system of the Valley Area as well as promoting Shenandoah Valley Area broilers in the large city markets.

In the late 1930's, broiler production moved across the state line into the adjoining counties of West Virginia. Large numbers of broiler flocks were first grown in the Lost River area of Hardy County and later moved to the areas around Moorefield in Hardy County and Petersburg in Grant County. Broiler production expanded rapidly in these areas after the entrance of contract financing in 1937. Broilers became a new source of cash income to the mountain farmers whose annual average cash income was as low as $300. A Rockingham Poultry Marketing Cooperative plant located in Moorefield in 1945 provided a much-needed market outlet

for the area. "Live buyers" were also instrumental in developing market outlets in outside areas, particularly in Pennsylvania and Ohio. In the years following, new feed stores, feed mills, and hatcheries were established, all of which played an important part in the expansion of broiler production in the West Virginia section of the area.

Today, broiler production in the 10-County Area is the leading source of farm income. Its many related enterprises provide employment for hundreds of non-farm workers. In recent years, since 1952 particularly, the Valley Area has met strong competition from other producing areas. This has encouraged many changes in production, processing, and management practices. Such changes are under way at present and more will follow as technology progresses. For example, the New Hampshire Red was the most common type broiler up until 1952, but since then the area has changed over to white breeds and white cross broilers. Production efficiency contracts have almost entirely replaced the old 80-20 and 90-10 contracts.

The Valley Area is widely known for its cooperative dressing plants which dominate the area's processing operations. Most of the broilers are processed in the area and sold in ready-to-cook form. Shenandoah Valley Area broilers are well known along the Eastern Seaboard and Northeastern States; large quantities are sold in the New York, Philadelphia, Baltimore, Washington, and Norfolk areas.

The future of the Valley as a broiler area will depend upon how well all segments of the industry can function together as a whole in producing and promoting a better and more competitive Shenandoah Valley Area broiler.

SEASONAL VARIATION IN BROILER CHICK PLACEMENTS

Chick Placements

Chick placement reports were started for the Shenandoah Valley Area in 1945. Broiler chick placements in the area have increased from 20 million to 54 million birds or an increase of 163% during the 12-year period, 1945-1956 (Table 1). Chick placements have increased each year during this period with the exception of the two years, 1946 and 1954.

Table 1. Broiler Chick Placements in the 10-County Shenandoah Valley Area, 1945-1956.

Year	Broiler Chicks Placed	Change From Previous Year
	Thousands	Percent
1945	20,500*	
1946	16,730	-18.4
1947	20,948	+25.3
1948	26,982	+28.8
1949	34,721	+28.7
1950	35,460	+ 2.1
1951	38,936	+ 9.8
1952	42,460	+ 9.0
1953	48,689	+14.7
1954	48,291	- .8
1955	53,462	+10.7
1956	53,959	+ .9

* Data were available for only 34 weeks in 1945. The total for these weeks was expanded to a 52-week total.

Source: Virginia Cooperative Crop Reporting Service

The rate of growth of chick placements in the Valley Area has slowed down in recent years. The average yearly increase from 1945 to 1950 was

14.6% while the period 1951 to 1956 showed an average yearly increase of 10.4%. A major factor in this slower rate of growth has been rapid expansion of other commercial areas of broiler production and the resulting strong competition among areas. New and rapidly expanding broiler producing areas possess the opportunities of selecting and establishing the most efficient broiler houses, equipment, feed mills, processing plants, and other facilities. In general, this makes for more efficient operations. In contrast, some of the older areas have large capital investments in existing facilities which makes it more difficult for these areas to effect the latest innovations.

However, there are certain factors now operating which will tend to either expand placements or keep them at the present levels. At present, over 90% of all broilers grown in the Valley are probably under some form of production efficiency or incentive contract. Because of the incentives offered, efficient producers have a chance to make a stable income the entire year. This has the effect of keeping broiler houses full, which in turn brings about a more uniform flow of placements with less variation among weeks of the year.

Feed dealers who have been in business for several years normally will have accumulated a large amount of information on the capabilities of individual growers in the surrounding area. Over time, dealers tend to select growers having the best capabilities and to drop those who are unsatisfactory. Once a dealer has acquired a satisfactory group of growers, he is reluctant to reduce his size of operation and lose his better growers who would likely be picked up by other feed dealers. This

reluctance is further increased by the prevailing idea among dealers that the best way to protect their interests with growers is to deal with the ones who prove to be dependable and efficient.

The trend in the Shenandoah Valley Area is toward some form of mutual cooperation where the various segments of industry—hatcheryman, feed dealer, and processor—have fixed commitments to meet for each other. Under such an arrangement, the area should have a more stable and orderly flow of broilers both weekly and yearly.

Seasonal Pattern of Chick Placements in the Shenandoah Valley Area

The record of weekly chick placements in specialized broiler areas forecasts the approximate period during which birds will be coming to market. The number of chicks placed at any one time, with proper allowance for mortality, determines the approximate number of broilers coming to market 9-11 weeks later. The seasonal pattern of chick placements is treated at this point in order to help explain the patterns of marketings and prices in the sections to follow.

Table 2. Analysis of Variance of Seasonality of Chick Placements, 1951-1956.

Source of Variation	D. F.	S. S.	M. S.	F-Ratio
Between Means of Weeks	51	4,397,604	86,228	14.65**
Remainder, Interaction	255	1,500,645	5,885	

** Highly Significant

Seasonal variation in chick placements was found to be highly significant for the six-year period, 1951-1956 (Table 2). A test of significance based on analysis of variance was computed using the original

weekly chick placement data. The sums and sums of squares of the weekly observations were calculated for both years and weeks. The F-ratio for between means of weeks was obtained by dividing the mean square for weeks by the mean square of interaction. The calculated F-value was compared with the table F-value expected at the 1% point, using the appropriate degrees of freedom for the two items used in computing the ratio.

For the six-year period of chick placements considered, the calculated F-value of 14.65 was higher than the table F-value of 1.62 expected at the 1% point. Seasonality is considered "significant" if the calculated F-value is equal to or above the table F-value expected at the 1% point. This means that the variation between means of weeks is sufficiently great so that an F-value of this magnitude would be obtained less than 1% of the time in sampling from a population for which there were no differences between the means of the weeks.1/

The same test is used in testing the significance of seasonal variations of the other items considered in this report. The results from each item tested are presented in an analysis of variance table. "Highly significant" is indicated by two asterisks placed by the calculated F-ratio; "significant" by a single asterisk.

The typical seasonal pattern of chick placements for the six-year period, 1951-1956, is illustrated in Figure 2. The index of chick placements usually starts its seasonal rise the middle of January and increases gradually through the first quarter to the season's peak the

---

1/ Foote, R. J. and Fox, K. A., Seasonal Variation: Method of Measurement and Test of Significance, Agriculture Handbook, No. 48, United States Department of Agriculture, 1952, pp. 8-11.

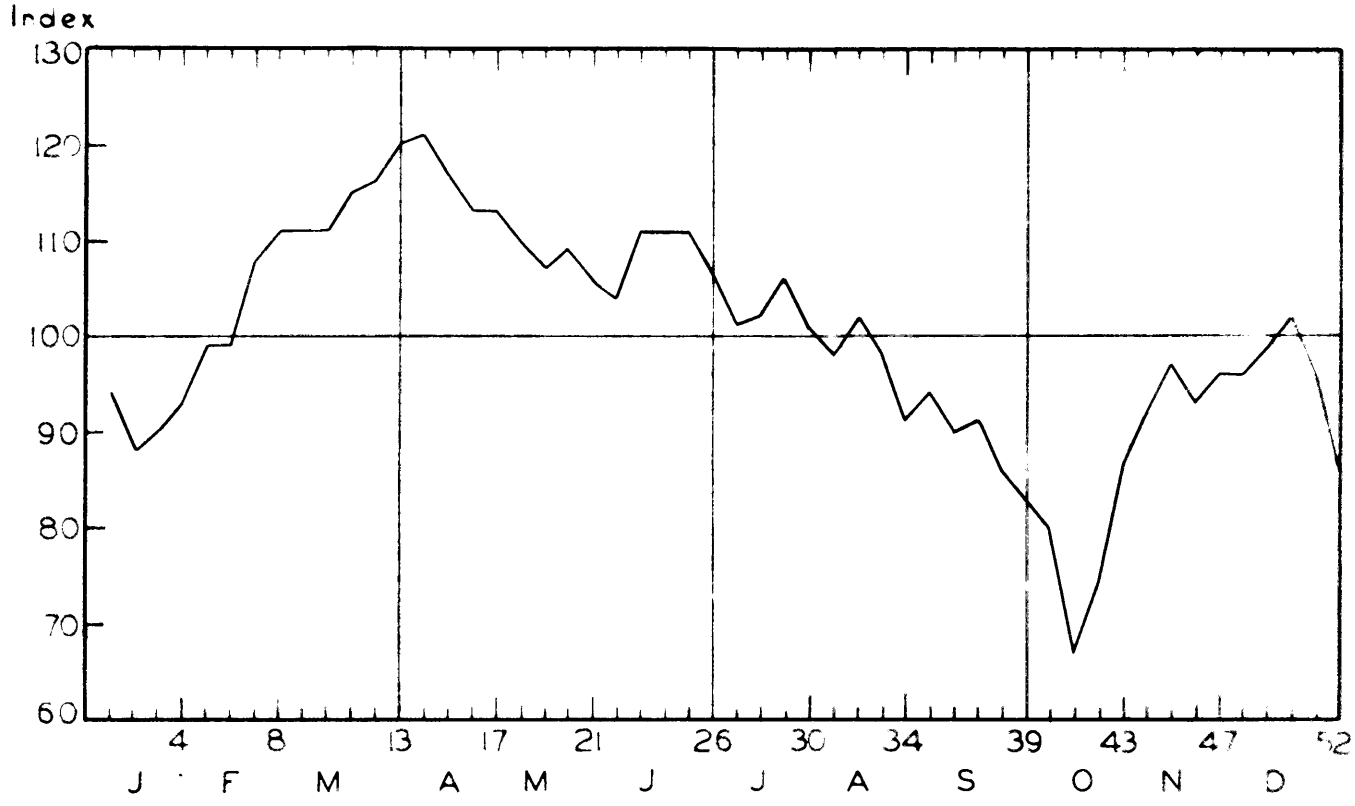

Figure 2. Seasonal Variation in Broiler Chick Placements in the 10-County Shenandoah Valley Area, 1951-1956 (Source: Table 3).

Table 3 . Broiler Chick Placements with the Index of Seasonal Variation, in the 10-County Shenandoah Valley Area, by Weeks, 1951-1956.

Week	Year						Seasonal Index, 1951-56*
	1951	1952	1953	1954	1955	1956	
	Thousands						Percent
1	636	741	851	909	748	1,098	94
2	585	738	878	879	684	939	88
3	587	736	922	950	741	927	90
4	650	698	926	944	978	976	93
5	762	873	840	1,020	1,036	949	99
6	730	889	853	1,004	1,104	1,023	99
7	910	973	1,000	1,019	1,011	1,112	103
8	871	998	1,036	1,071	1,148	1,140	111
9	967	995	1,066	1,089	1,035	1,115	111
10	923	1,016	1,047	1,099	967	1,125	111
11	939	1,081	1,086	1,163	992	1,182	115
12	995	1,054	1,032	1,069	1,029	1,308	116
13	1,037	957	1,072	1,160	1,175	1,196	120
14	1,037	985	1,099	1,136	1,189	1,201	121
15	1,001	907	1,117	1,060	1,172	1,175	117
16	978	909	1,067	1,135	1,123	1,093	113
17	939	932	1,046	1,128	1,177	1,095	113
18	949	915	1,036	1,093	1,136	1,075	110
19	878	878	933	1,081	1,146	1,158	107
20	940	854	955	1,098	1,166	1,055	109
21	828	816	974	1,086	1,128	1,123	106
22	857	707	986	943	1,087	1,169	104
23	806	823	1,069	1,003	1,159	1,216	111
24	815	859	981	999	1,180	1,144	111
25	803	953	1,045	985	1,169	1,150	111
26	765	851	971	1,038	1,148	1,130	107
27	699	761	964	1,045	1,166	973	101
28	698	738	995	981	1,159	1,056	102
29	729	835	843	1,044	1,225	990	106
30	703	758	796	1,146	1,172	1,026	101
31	670	702	806	1,139	1,052	1,102	98
32	715	747	802	1,175	999	1,154	102
33	638	779	769	1,139	965	1,091	98
34	646	652	730	1,020	1,016	1,044	92
35	661	660	753	929	894	1,139	94
36	616	614	763	933	913	970	90
37	602	625	886	798	941	966	91
38	571	615	848	656	978	892	86
39	497	613	793	753	918	939	83

Table 3. (cont'd)

Week	Year						Seasonal Index, 1951-56*
	1951	1952	1953	1954	1955	1956	
	Thousands						Percent
40	474	682	894	477	916	825	90
41	407	574	854	409	762	720	67
42	499	517	949	456	820	641	74
43	454	715	958	598	885	780	86
44	577	817	989	635	937	807	92
45	600	865	1,003	677	908	914	97
46	739	852	958	775	844	874	93
47	720	893	984	820	863	812	96
48	788	882	889	710	884	890	96
49	814	916	944	648	910	863	99
50	831	938	969	670	968	980	102
51	779	900	784	527	1,021	992	96
52	674	805	970	768	950	683	86
Total	38,936	42,460	48,689	48,291	53,462	53,002	

Source of Data - Virginia Cooperative Crop Reporting Service

* Index computed by the link relative method.

first week in April. The magnitude of this fluctuation is seen in the rise from 12% below to 21% above the average for the year. From the season's peak the index of placements in the Valley drops sharply to the first week in June, although it still remains 4% above the average for the year. Placements rise again during June and decline seasonally from July to October, reaching the season's low of 33% below the average for the year during the second week of October. After the low week in October, which usually falls 10 weeks before Christmas week, placements increase rapidly to the second week in November. The index continues to remain below the average for the year with the exception of the third week in December. Placements drop off sharply the week before Christmas and remain below the average for the year until the beginning of the seasonal rise in late winter. Looking at the entire year, the index of chick placements is above the average for the year from the middle of February to the middle of August. For the remaining part of August and until February, the index of chick placements is below the average for the year.

Indexes were constructed for the two three-year periods, 1951-1953 and 1954-1956, in order to find out whether or not a shift in the seasonal pattern of placements had taken place during the six-year period studied. Both indexes showed essentially the same seasonal pattern, although some differences were evident. Differences occurred in the timing of the seasonal rise in the first quarter and the seasonal drop in the third quarter and in the magnitude of the two indexes. The index of chick placements in the 1954-1956 period rose sharply five weeks later

in the first quarter and remained above the average five weeks longer in the third quarter (Figure 3). The peaks and valleys were less pronounced in the 1954-1956 period with exception of the low week in October. Since the test of significance of seasonality by analysis of variance assumes no pronounced change during the period covered, a test of significance was run for the most recent three-year period, 1954-1956. The seasonal variation of chick placements for this period proved to be highly significant (Table 4).

Table 4. Analysis of Variance of Seasonality of Chick Placements, 1954-1956.

Source of Variation	D. F.	S. S.	M. S.	F-Ratio
Between Means of Weeks	51	3,295,725	64,622	5.49**
Remainder, Interaction	102	1,200,203	11,767	

** Highly significant

The typical seasonal pattern of placements for the two three-year periods may be compared in Figure 3. In the earlier period, 1951-1953, the index of chick placements showed a sharp increase during the weeks of February. Placements were relatively stable during March. The seasonal peak occurred on the first week in April which was 30% above the average for the year. From the season's peak, placements decreased sharply to the last week in May, but continued to remain above the average for the year. Placements showed a sharp increase again during June before starting the gradual decline to the season's low which fell during the second week in October. At this low week, placements were 33% below the average for the year. From the seasonal low, the index of

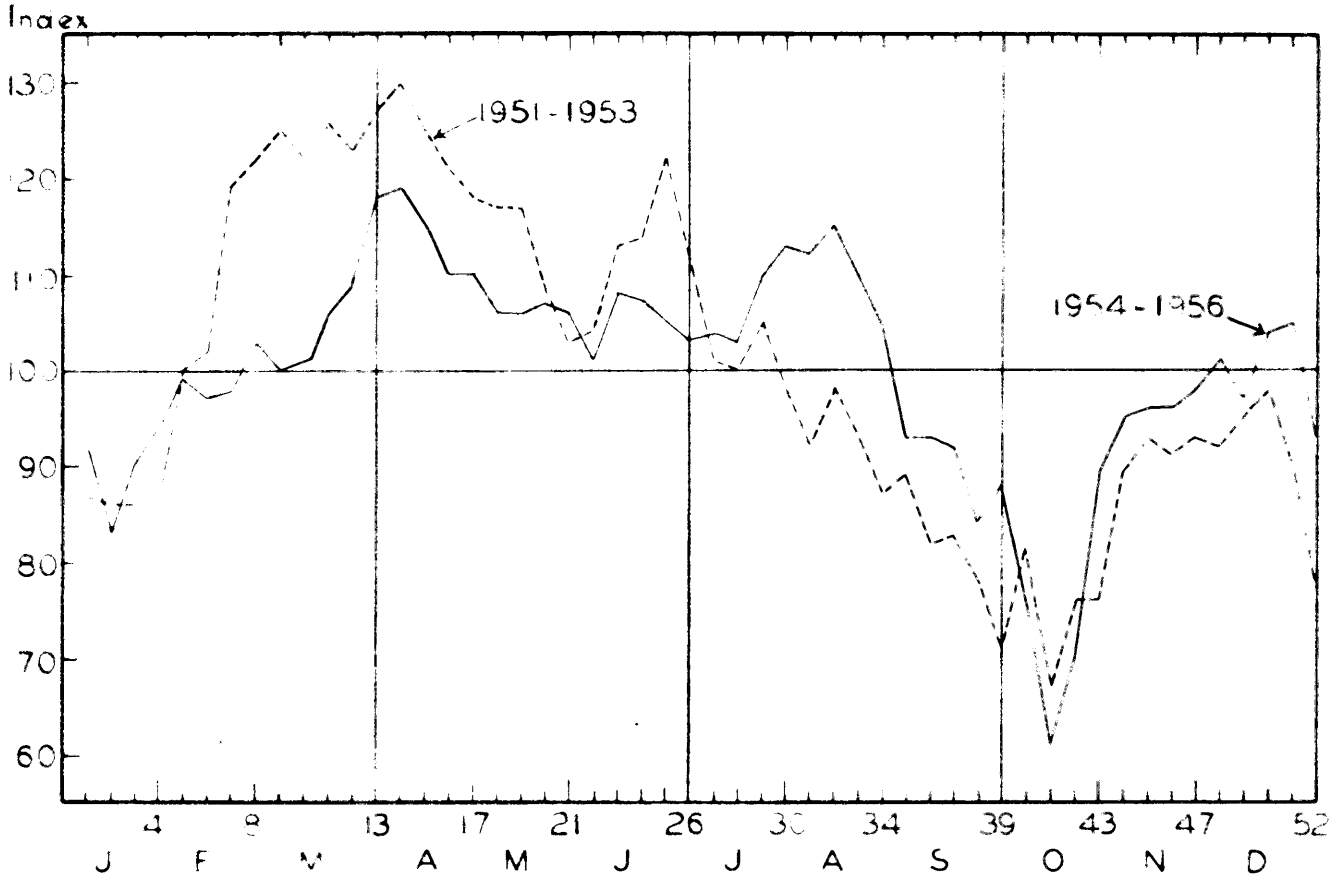

Figure 3. Seasonal Variation in Broiler Chick Placements in the 10-County Shenandoah Valley Area, 1951-1953 and 1954-1956 (Source: Appendix, Tables 1 and 2).

chick placements increased sharply to the middle of November and then gradually leveled off before making a sharp decline the week before Christmas (Figure 3).

The pattern of placements in the latter period, 1954-1956, showed a more gradual increase to the season's peak which fell also on the first week in April. The sharp rise in placements occurred six weeks later than in the earlier period. The peak in this period reached 18% above the average for the year compared to 30% in the period, 1951-1953. The decrease in placements from the seasonal peak was gradual to the first week in June. The number placed increased irregularly to another peak in August before starting a sharp seasonal decline to the second week in October. The pattern for the remainder of the year followed very closely the pattern of the earlier period, 1951-1953.

Comparison of Seasonality of Placements in the Shenandoah Valley Area With That in Major Broiler Areas

The seasonal pattern of chick placements in other major broiler producing areas is of great importance to the Valley Area. The day is waning when one area can cut back their chick placements and appreciably affect the price of broilers in that area or other areas.

Figure 4 compares the weekly index of chick placements in the Valley with the index of placements in the major broiler areas for the period, 1951-1956. The main differences in the two indexes occurred in the second and fourth quarters. The dip in the Valley placements in the second quarter is perhaps due to a large placement of turkey poults taking up broiler house capacity. The violent dip for the Valley in the

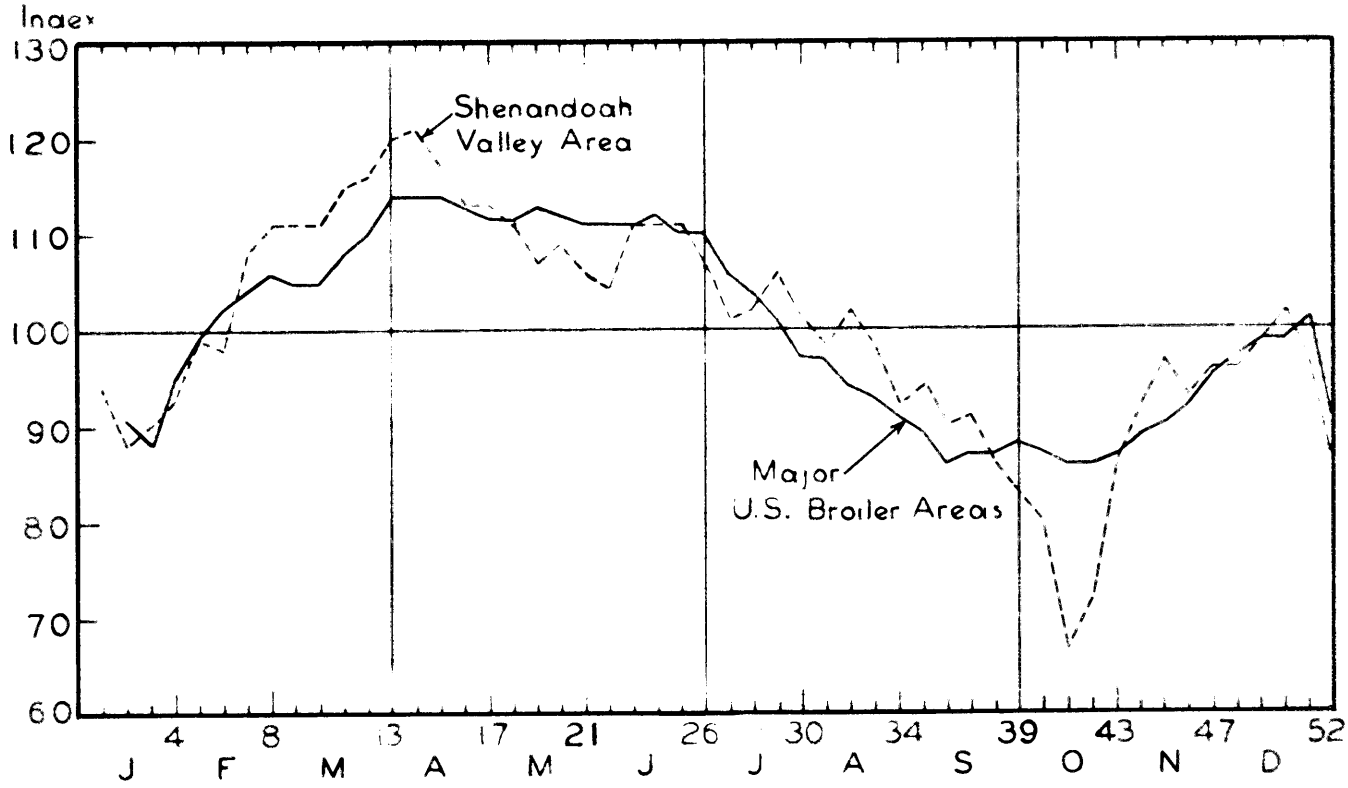

Figure 4. Seasonal Variation in Broiler Chick Placements in the 10-County Shenandoah Valley Area and in the Major Commercial Broiler Areas of the United States, 1951-1956 (Source: Table 3 and 5).

Table 5. Broiler Chick Placements with the Index of Seasonal Variation, in the Major Commercial Broiler Areas of the United States, by Weeks, 1951-1956.

Week	Year						Seasonal Index, 1951-56*
	1951	1952	1953	1954	1955	1956	
	Thousands						Percent
1	8,805	11,946	14,143	15,075	15,420	21,109	**
2	9,033	12,056	14,295	14,913	14,964	21,186	91
3	8,905	10,632	13,885	14,172	15,383	20,671	88
4	9,756	11,554	13,840	13,807	17,425	22,039	95
5	9,877	12,546	14,162	14,451	19,039	22,741	99
6	10,642	13,299	13,884	14,911	20,016	23,306	102
7	11,299	14,039	14,187	14,804	20,148	23,628	104
8	11,605	14,144	14,573	14,896	20,687	23,716	106
9	11,321	14,067	15,152	14,891	20,382	23,644	105
10	10,970	14,268	15,037	15,143	19,779	24,217	105
11	11,235	13,791	15,710	15,531	19,964	24,350	108
12	11,596	13,135	15,924	15,679	20,745	25,681	110
13	12,211	12,595	15,490	16,267	21,637	29,915	114
14	12,252	12,449	15,882	16,074	21,839	26,313	114
15	12,267	12,271	15,630	16,062	22,306	26,719	114
16	12,104	12,048	16,077	16,404	22,149	26,662	113
17	12,176	12,096	15,937	15,984	22,406	26,449	112
18	12,159	11,535	16,097	15,408	22,518	26,503	112
19	12,247	11,584	15,840	15,854	22,571	26,882	113
20	11,933	11,491	15,507	16,138	22,767	26,963	112
21	12,152	11,210	15,261	15,206	22,607	26,989	111
22	12,141	10,768	15,425	14,355	22,694	27,487	111
23	11,826	10,770	15,375	14,396	22,774	27,522	111
24	11,619	11,231	15,389	14,690	23,294	27,714	112
25	11,532	11,429	15,163	15,341	22,619	27,293	110
26	11,450	11,380	14,327	15,447	22,701	27,212	110

Table 5. (cont'd)

Week	Year						Seasonal Index, 1951-56*
	1951	1952	1953	1954	1955	1956	
	Thousands						Percent
27	11,139	10,862	14,218	15,441	22,054	25,745	106
28	11,231	10,663	13,751	15,136	22,351	25,300	104
29	10,956	10,194	13,319	15,018	22,099	24,651	101
30	10,528	8,668	12,769	14,328	21,700	23,825	97
31	10,526	8,657	12,289	14,487	20,799	23,956	97
32	10,288	9,449	12,053	13,915	20,159	23,676	94
33	9,644	9,349	12,600	13,834	19,429	23,577	93
34	9,409	8,617	12,502	13,998	18,349	23,362	91
35	9,312	9,554	11,793	13,782	17,652	22,633	89
36	9,074	8,865	11,397	13,302	17,605	21,594	86
37	9,020	9,100	11,764	13,488	17,659	21,005	87
38	9,171	9,054	12,185	13,006	17,708	21,198	87
39	8,976	9,337	12,326	12,952	17,998	21,504	88
40	8,686	9,521	11,866	12,819	18,176	21,193	87
41	8,596	9,892	12,087	11,586	18,238	21,030	86
42	8,627	9,656	12,584	11,337	18,596	19,977	86
43	8,917	10,237	13,340	11,426	18,780	20,141	87
44	9,270	10,384	13,757	11,659	18,982	20,667	89
45	9,330	10,675	14,193	11,674	19,023	21,292	90
46	9,580	10,809	14,458	11,722	19,595	21,270	92
47	10,088	11,249	14,868	12,618	19,534	21,132	95
48	10,565	11,053	15,071	12,193	20,276	21,536	97
49	10,628	11,421	15,355	12,459	20,447	22,149	99
50	10,721	11,691	15,330	11,518	20,505	21,380	99
51	11,026	11,950	15,700	11,342	20,737	21,887	101
52	10,033	10,770	13,219	11,847	20,584	17,201	91
Total	548,519	579,016	737,034	739,485	1,062,617	1,230,912	

* For footnotes see Appendix, Tables 3 and 4.

fourth quarter is probably caused from a tendency on the part of the feed contractors to adjust the supply to the anticipated decreased broiler demand during December and in consideration of the fact that the processors in the area are busy at that time moving the large volume of holiday turkeys. Both indexes show very similar patterns for the seasonal rise in the first quarter and the seasonal decline in the third quarter. As would be expected, the Valley index of placements showed a larger week-to-week variation than did the index of placements in the major areas.

Figure 5 gives the placement indexes for the major broiler areas for the periods, 1951-1953, and 1954-1956. A comparison of these two indexes clearly indicates (1) a five-week lag for the seasonal rise of placements in the latter period, and (2) a five-week lag in the seasonal decline of placements for the latter period. This change in the seasonal movement of placements was very similar to the seasonal change in placements in the Valley. For the major broiler areas, the peak week has shifted from March to July and the low week from September to October. Weekly fluctuations are somewhat less pronounced during the latter period, 1954-1956.

Factors Affecting Seasonality of Broiler Chick Placements

Producers in the Shenandoah Valley Area and in other major broiler areas place most broiler chicks in the spring and fewest in the fall. Since a significant pattern of chick placements does occur, it seems reasonable to assume the existence of some causative factors which may be determined and analyzed.

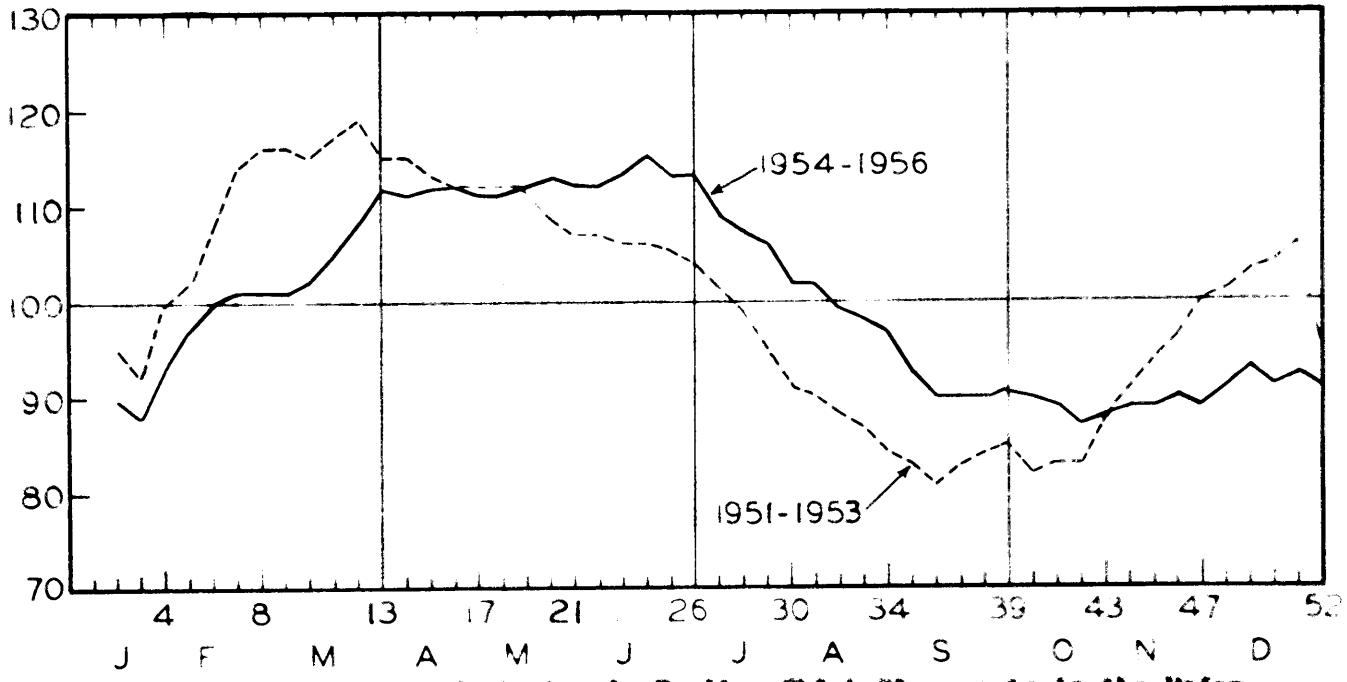

Figure 5. Seasonal Variation in Broiler Chick Placements in the Major Commercial Broiler Areas of the United States, 1951-1953 and 1954-1956 (Source: Appendix, Tables 3 and 4).

The Shenandoah Valley broiler area is unique in that it operates concomitantly with a large turkey industry. Many of the broiler growers in the area supplement their operations with one or more flocks of turkeys each year. The same broiler houses and equipment are used to brood the turkeys up to the time when they can be put on the range which is usually 8-12 weeks. The drop in the index of placements from the season's peak in April may be caused by the increased placement of turkey poults in the area (Figure 6).

Figure 6 shows the index of the typical seasonal variation in placements and in turkey hatchings for the period, 1954-1956.1/ The bulk of turkey hatchings occur during an 18-week period from the middle of April to the middle of August. The volume hatched in this period amounted to 65% of the total yearly poult hatch in 1956 and approximated 338,000 poults hatched per week. Although some these are shipped to other areas and to other states, the largest percentage is placed in the Valley Area. It is evident that chick placements in the Valley show a drop corresponding to the 18-week period of peak turkey hatchings.

The supply of hatching eggs for broiler chicks is plentiful in the spring but decreases from July through October as the total output of eggs declines. This decreased output results mainly from the annual change over from the old hen laying flock to the new pullet laying flock.

1/ Unfortunately, for this study, the turkey hatching report is for the entire state of Virginia and not the 10-County Area. However, approximately 80% of the turkeys raised in Virginia and 90% of the turkey production in West Virginia are raised in the 10-County Area studied. A large percentage of the turkeys raised in the West Virginia counties come from hatcheries in Virginia.

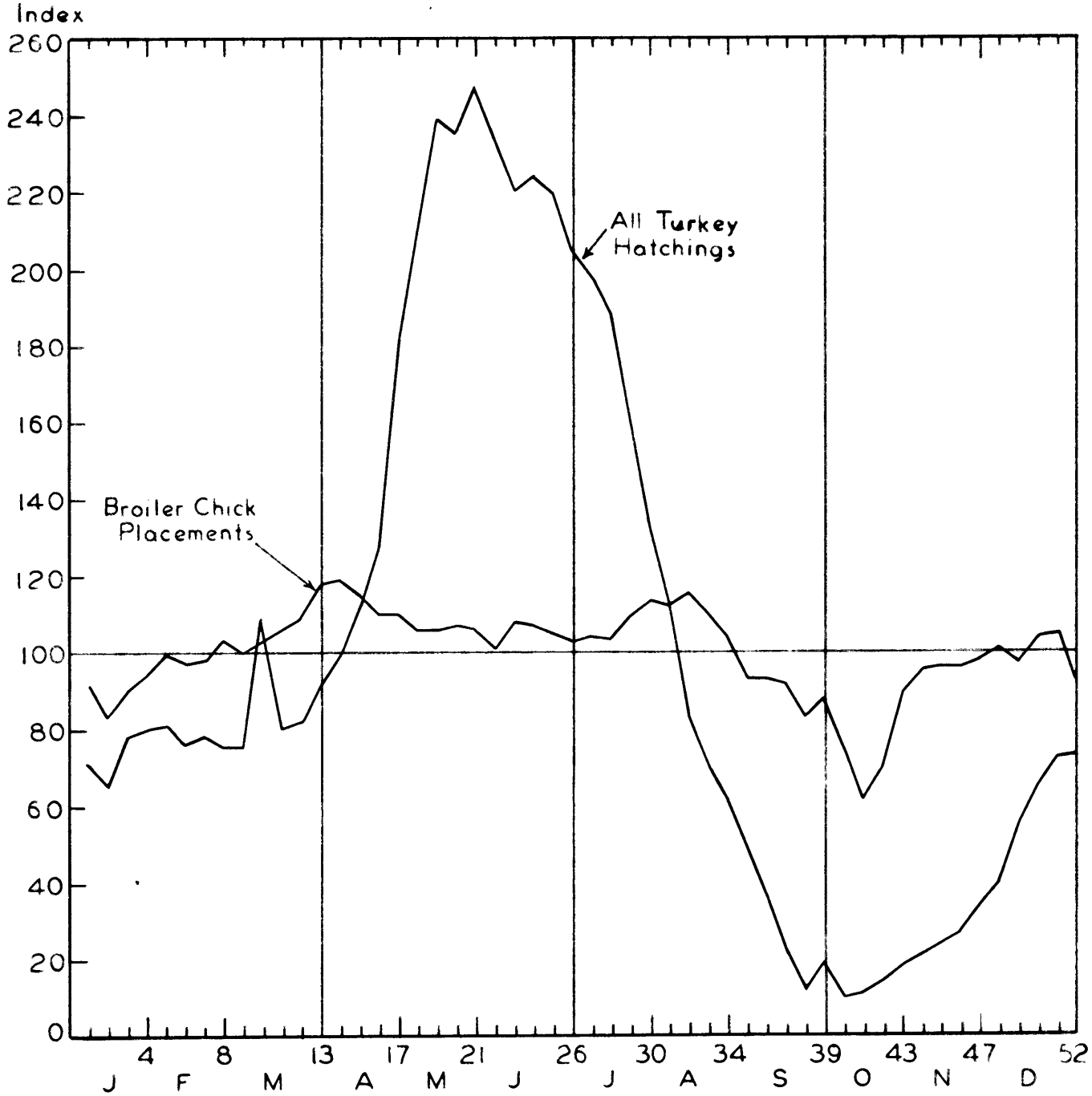

Figure 6. Seasonal Variation in Broiler Chick Placements in the 10-County Shenandoah Valley Area and in Total Turkey Hatchings in Virginia, 1954-1956 (Source: Appendix, Tables 2 and 5).

As the old laying hens approach the end of the laying season, the rate of lay and the percentage of fertile eggs decline. The volume of large eggs is lower due to pullets coming into production. High temperatures in the latter part of the summer also reduce the rate of lay and percentage of fertile eggs. Consequently, the supply of chicks in the fall is reduced unless specific practices are undertaken to assure a steady supply of hatching eggs. However, these practices increase cost and occur at a time when the broilers grown from such placements would often bring prices below the annual average. Under these conditions, much of the incentive for producing hatching eggs at this season of the year is eliminated.

A major factor influencing the seasonal pattern is the attractive July-August market in which broilers usually bring higher average prices due to an increased summer demand. Summer is also the time of year of low marketings and higher seasonal prices for red meats which places broilers in a better competitive position in the consumer food budget.

Various holidays also have an effect on chick placements. The top of the seasonal peak in the second week of April may reflect the demands of the July 4 market. Likewise, the rise of placements in June is probably timed for the Labor Day week end. The latter part of the decline from July to October is gauged to the decrease in demand for broilers in December. In the Shenandoah Valley Area the decline in placements may be to allow for the anticipated heavy turkey movement in the months of November and December. The low week

in October is probably designed to reduce the number of broilers going to market during Christmas week.

Several other factors affect the seasonal pattern of chick placements, many of which are responsible also for the episodic and other short time movements. Some of these factors are discussed below, although not in any order of importance.

(1) Another factor generally accepted by men associated with the industry is that the current demand for chicks is influenced to a large degree by the current price of broilers. When the price of broilers is good, there seems to be more incentive for producers to put in chicks. By similar reasoning, when the price is low, growers become pessimistic about the situation and frequently do not put in another flock. Many in the past have canceled orders for chicks when such a low price condition developed. This type of action on the part of producers is not fully justified because the price 9-10 weeks from the time chicks are placed is the price which determines profit or loss.

A correlation of the seasonal index of chick placements and the seasonal index of broiler prices was calculated for the periods, 1951-1956 and 1954-1956. In both periods, the r-values were statistically significant at the 1% level. In the first period, 28% of the variability in the index of chick placements was associated with the variability in the index of broiler prices, while the latter period showed a 29% association (Table 6). Although there is a significant relationship between the index of chick placements and the

index of broiler prices for the two periods, the analysis indicates that the seasonal pattern of chick placements is associated with factors other than weekly broiler prices.

Table 6. Correlation of Index of Chick Placements and Index of Broiler Prices, 1951-1956 and 1954-1956.

Indexes Correlated	r	D. F.	Level of Significance	r^2
Prices and Placements, 1951-1956	.5259	50	1%	.2766
Prices and Placements, 1954-1956	.5382	50	1%	.2897

(2) It is suggested also that many contractors play the game of "follow the leader" as a method of determining when to increase their chick placements. One or two large feed contractors may fill the houses of their growers. Other contractors will then reason that the larger operator has some inside information, hence, he too will place chicks with his growers. Along the same line, government forecasts and press releases affect the practices of certain contractors and growers.

(3) A large number of commercial broiler producers do not produce broilers during the summer months when other farm enterprise requirements command more attention. This type of producer generally raises only two lots of broilers a year, one in the winter, the other in the spring, resulting in a heavier demand for chicks during that season. This situation is probably not as important in the Valley as in some other commercial areas where specialized cash crops are widely grown.

(4) Along this same line, many producers and growers show a reluctance to growing broilers in the winter because of higher fuel cost, increased labor requirements and other reasons. Many dislike the

starting and tending of chicks through the Christmas and New Year's holidays. Placements usually drop sharply during these weeks and remain below the average for the year through January until the contractors can line up their booking of chicks. This period of refilling broiler houses creates a variable supply when the broilers start to market 10 weeks later. This fluctuating weekly supply results in the loss by processors of many retail and wholesale outlets each spring since they are unable to meet their demands. Buyers turn to other areas which offer a more uniform week-to-week supply of broilers.

(5) Production costs undoubtedly have an influence on placements and the resulting marketings. If the cost of production items vary seasonally, they may offer some explanations for the fluctuations in broiler chick placements. The effects of these are discussed in a later section of this report.

SEASONAL VARIATION IN BROILER MARKETINGS

The supply of marketable-age broilers in the Shenandoah Valley Area at any given time is largely determined by the volume of chicks placed in the area during the previous 9-12 weeks, less a certain percentage mortality loss. The average time interval between placements and marketings varied from approximately 11 1/2 weeks in 1951 to 10 weeks in 1956.

Most of the broilers raised in the Shenandoah Valley Area are processed in the area. The remaining supply is moved predominately by "live buyers" into other areas of Virginia and the surrounding states of Pennsylvania, Ohio, and Maryland.

A considerable volume of broilers from adjoining and outlying counties are marketed in the 10-County Shenandoah Valley Area. This inflow fairly well balances the outflow handled by "live buyers". Also, considerable movement is found within different sections of the area which helps to balance out supplies between processors. At various times when the price spread is large enough to pay transportation cost, broilers move into the Valley from other commercial areas.

Seasonal Pattern of Broiler Marketings

The seasonal variation in broiler marketings was highly significant for the period, 1951-1956 (Table 7). Figure 7 shows the typical weekly pattern of broiler marketings for the period, 1951-1956. Extreme weekly fluctuations are evident in the seasonal pattern throughout the year, especially before and after holidays.

Table 7. Analysis of Variance of Seasonality of Broiler Marketings, 1951-1956.

Source of Variation	D. F.	S. S.	M. S.	F-Ratio
Between Means of Weeks	51	2,707,088	53,080	7.06**
Remainder, Interaction	255	1,917,249	7,519	

** Highly significant

Broiler marketings for the first quarter show a rise and drop corresponding to the rise and drop in the number of chicks placed between the low week in October and the week before Christmas. During the entire first quarter the typical market supply remains below the average for the year.

At the beginning of the second quarter the number of broilers marketed increases sharply up to the week before Memorial Day. The rise in the index of broiler marketings is from 22% below the average for the year to 17% above the average for the year. After the sharp drop during Memorial Day week, marketings increase rapidly up to another peak the last week of June. The number of broilers going to market drops violently during the week of the July 4th holiday. The index of marketings increases sharply after the July 4th holiday and reaches the season's peak in the last week of July.

A sharp decline takes place from the season's peak in the last week of July to the second week in September. This declining volume corresponds to the decrease in chick placements from the peak week in April to the first week in May which perhaps in turn is caused by the increased number of turkey placements. The volume of birds going to market is heavy after Labor Day and remains relatively so until the

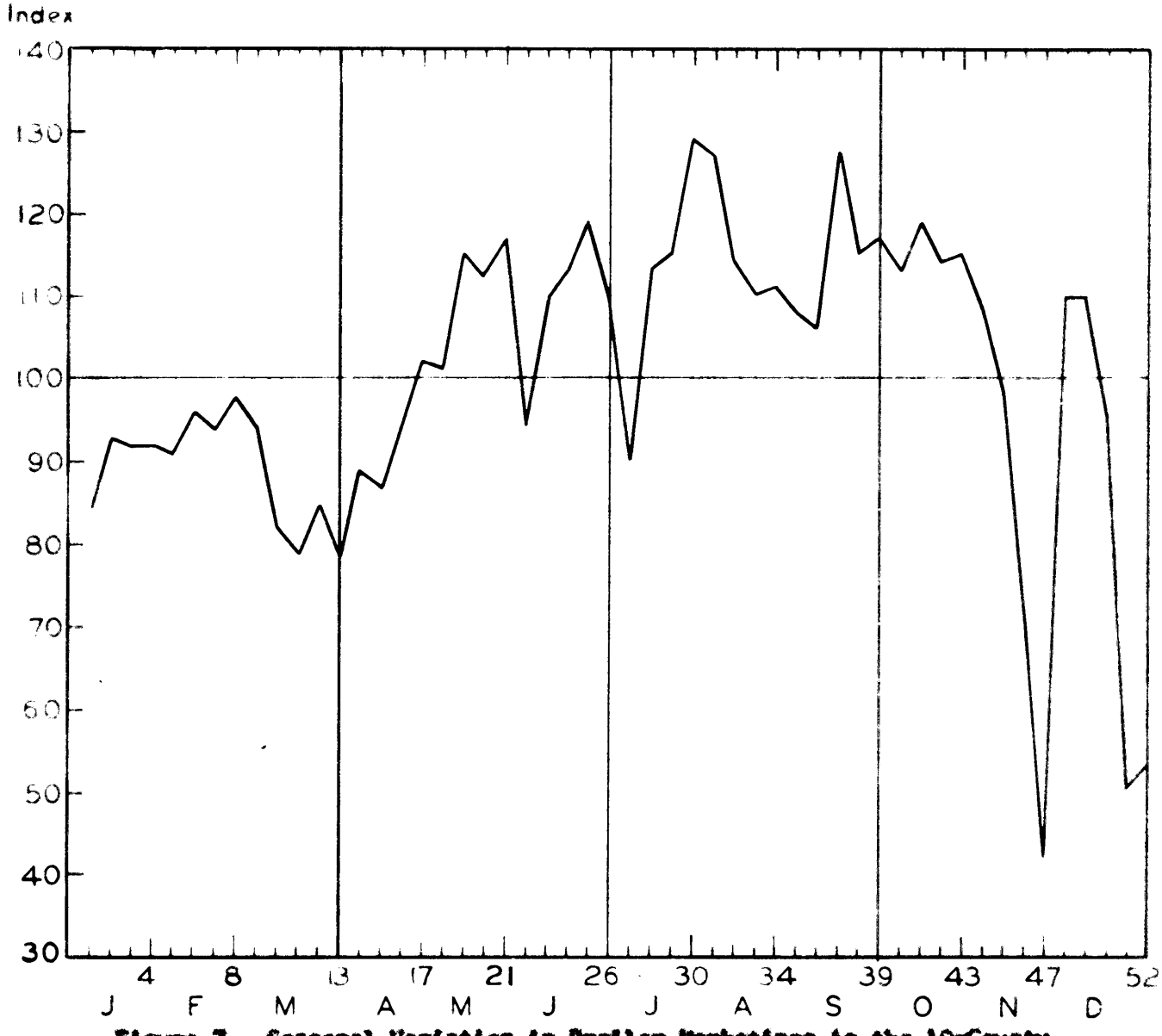

Figure 7. Seasonal Variation in Broiler Marketings in the 10-County Shenandoah Valley Area, 1951-1956 (Source: Table 8).

Table 8. Broiler Marketings with the Index of Seasonal Variation, in the 10-County Shenandoah Valley Area, by Weeks, 1951-1956.

Week	Year						Seasonal Index, 1951-56*
	1951	1952	1953	1954	1955	1956	
	Thousands						Percent
1	423	277	594	760	390	650	84
2	467	389	663	805	515	582	93
3	464	432	666	632	398	875	92
4	518	465	592	588	576	636	92
5	480	483	576	645	423	684	91
6	437	441	683	756	556	656	96
7	422	533	648	762	612	611	94
8	431	518	732	811	517	687	98
9	498	493	632	735	515	767	94
10	443	532	518	631	559	674	82
11	414	510	602	615	443	754	79
12	477	542	615	685	474	740	85
13	245	517	687	604	533	674	78
14	437	573	730	700	611	661	89
15	411	593	623	558	635	819	87
16	407	626	715	600	702	889	94
17	477	551	739	729	789	809	102
18	405	564	731	805	794	759	101
19	499	699	739	840	765	929	115
20	469	717	784	775	810	786	112
21	505	617	795	731	897	958	117
22	408	521	857	609	680	789	94
23	558	550	931	632	819	975	109
24	503	612	973	646	864	952	113
25	549	667	904	700	877	880	119
26	494	663	766	627	861	942	110
27	310	514	852	599	634	674	90
28	491	560	705	784	929	763	113
29	525	596	753	666	874	745	115
30	522	636	801	708	769	868	129
31	503	589	775	720	773	883	127
32	463	531	739	589	818	804	114
33	450	508	662	578	867	780	110
34	410	517	734	701	802	858	111
35	446	490	794	537	724	879	108
36	449	473	674	568	752	769	100
37	526	559	854	644	819	967	128
38	479	519	834	606	739	811	115
39	479	559	823	632	778	695	117

Table 8. (cont'd)

Week	Year						Seasonal Index, 1951-56*
	1951	1952	1953	1954	1955	1956	
	Thousands						Percent
40	510	564	768	730	732	643	113
41	471	565	842	642	885	877	119
42	550	545	823	604	662	885	114
43	552	584	769	616	700	811	115
44	435	536	777	506	865	802	108
45	425	511	776	574	742	733	98
46	282	467	631	430	569	622	72
47	230	426	386	438	275	329	42
48	488	263	600	762	663	764	110
49	501	582	584	696	747	785	110
50	443	522	530	450	682	551	94
51	319	504	354	268	426	359	50
52	204	277	554	324	372	449	53
Total	23,354	27,542	36,889	33,353	35,213	39,214	

Source of Data - Virginia Cooperative Crop Reporting Service

* Index computed by the link relative method.

beginning of the decline in marketings in November. With the approach of Thanksgiving, the volume of marketings decreases rapidly. The processors and "live buyers" are usually busy handling a large volume of turkeys in the Valley at this time. The drop during Thanksgiving week is 58% below the average for the year. Broiler marketings increase sharply to 10% above the average for the year during the two weeks following Thanksgiving. After remaining at 10% above the average for two weeks, marketings drop back to 50% below the average for the year during Christmas week.

Figure 8 illustrates the weekly seasonal pattern of marketings for the period, 1951-1953, and 1954-1956. Violent weekly fluctuations are evident in both indexes. Apparently, there were no pronounced shifts in the seasonal pattern of marketings for the two periods, in spite of the fact that there has been some change in the seasonal movement of chick placements. But since there is some evidence of change in the seasonality of broiler marketings, a test of significance was run for the latter period, 1954-1956. The seasonal variation of broiler marketings was found to be highly significant for this period (Table 9).

Table 9. Analysis of Variance of Seasonality of Broiler Marketings, 1954-1956.

Source of Variation	D. F.	S. S.	M. S.	F-Ratio
Between Means of Weeks	51	2,004,305	39,300	3.71**
Remainder, Interaction	102	1,081,374	10,602	

** Highly significant

In both periods, the market supply for the first quarter fluctuates widely and remains below the average for the year. The two periods

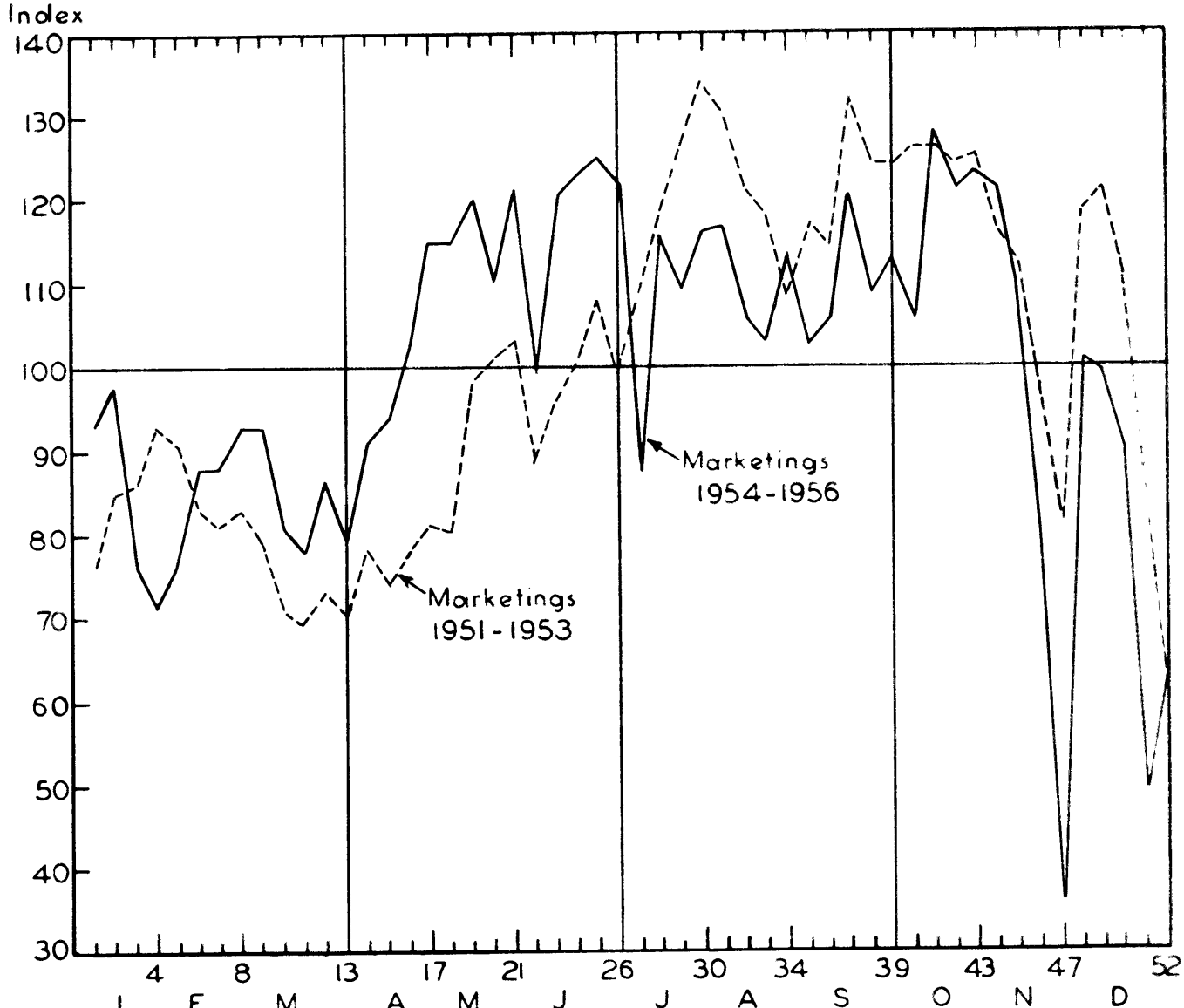

Figure 8. Seasonal Variation in Broiler Marketings in the 10-County Shenandoah Valley Area, 1951-1953 and 1954-1956 (Source: Appendix, Tables 6 and 7).

showed a similar seasonal rise beginning at the second quarter. However, in the latter period, 1954-1956, the rise occurred more rapidly than in the earlier period. This indicates that a larger proportion of birds are coming to market in the second quarter.

In both periods marketings were above the average for the year from the second week in July to the second week in November. Both periods show similar drops at Thanksgiving and Christmas weeks with the latter period, 1954-1956, being the most pronounced. During Thanksgiving week, marketings were 19% below the average for the year in 1951-1953 compared to 65% below the average for the year in 1954-1956.

The peak week of marketings between Thanksgiving and Christmas in 1951-1953 was 22% above the average for the year as compared to 1[illegible] above the average in 1954-1956. Both periods showed a drop of approximately 40% below the average for the year at Christmas. The main difference found between the seasonal patterns of the two periods was in the timing of the rise in marketings in the second quarter which in this case came earlier in the latter period, 1954-1956.

Factors Affecting Seasonality of Broiler Marketings

Producers place chicks in order to have birds ready for market at some specified period later on. Several factors affecting the seasonal index of chick placements were listed earlier. Since the number of broilers coming to market at any one time is determined for the most part by the number of chick placements in some previous period with proper adjustments for mortality, it would be reasonable to assume that

that the same factors affecting the seasonal index of chick placements also affect the seasonal index of broiler marketings some 9-11 weeks later. In other words, a week or two of heavy placements will be followed almost surely by a week or two of heavy marketings some 10 weeks later. A good example of this is illustrated by a comparison of the index of placements during the low week in October and the index of marketings at Christmas week (Figures 2 and 7).

However, this time period between placements and marketings may be either shortened or extended depending upon the "feeling" about the price movement at or near the time of sale. If contractors and producers have any reason to believe that the price of broilers will go up in the near future, they may hold the largest part of their birds for a week or two in order to benefit from the expected higher prices. Likewise, if they have reason to believe that prices are on the down swing, they may sell the largest percentage of their broilers a week or two earlier in order to take advantage of the price before it drops any further. No doubt, such movements have been the cause of some of the violent weekly fluctuations in the indexes of marketings shown in Figures 7 and 8. Such movements are particularly true before and after holidays. These practices, however, can be followed only within certain economic limits because of the influence of age and weight on production efficiencies.

The market supply of commercial broilers is least in the winter and spring and greatest in the summer and fall. Placements from October to December are generally below the average for the year,

consequently, the number of birds coming to market in January, February, and March is below the average for the year.

Summer is the time of peak marketings. This results from the large volume of placements in March, April, and May. Despite typically large marketings at that time, prices then are usually above the average for the year. This phenomenon, as mentioned earlier, is attributed to the increased demand for broilers during the warmer months. Marketings of meat animals are seasonally low at this time and prices are seasonally high.

Placements in the Valley Area are apparently gauged in order to have fewer broilers coming off during November and December, particularly at Thanksgiving and Christmas weeks. Along with decreased demand the number of broilers going to market is slowed also in order for the processors to handle a greater volume of turkeys at this time.

The effect of prices and production cost items on the seasonal index of marketings will be discussed later in this report.

SEASONAL VARIATION IN BROILER PRICES

Factors affecting the total supply and demand for broilers set the general level of live broiler prices in all of the commercial broiler producing areas. Variations in the prices of broilers among areas are determined in part by the volume of birds raised in an area, the distance from major markets, the number and type of market outlets, and the quality of birds sold. Other factors, unique to each area, may also influence the price.

In the Valley Area, the current market price for broilers is established by bids and offers between broiler feed dealers and the various buyers in the market—mainly processors and "live buyers".1/ Prices in the Valley Area are quoted on the basis of broilers sold and weighed at or near the farm and delivered to the plant by the buyer. In many of the commercial broiler areas prices are quoted on the basis of broilers weighed at the plant by the buyer. Since birds lose weight between the farm and processing plant, the loss due to the "drift" is absorbed by the processors in the Valley Area where in some of the other areas the producers absorb this loss.

1/ Broiler prices furnished by the Market News report of the Virginia Cooperative Crop Reporting Service are based on information gathered from a large number of feed dealers, processors, and "live buyers". Each day between 9:00 and 11:00 a.m. the market news reporter contacts various buyers and sellers relative to the trading during the previous 24 hours. Information is supplied by the processors as to the prices they are offering for broilers, and by the feed dealers as to the prices they have received for birds sold. The volume of broilers which have been bought or sold is also obtained. On the basis of the volume sold at different prices, a "mostly price" for broilers is reported.

Evidence from market reports indicate that prices in the West Virginia counties are usually higher than those in the Virginia counties of the Shenandoah Valley Area. This probably results from the nature of bidding among the large number of "live buyers" in that section of the area.

Seasonal Pattern of Broiler Prices

The seasonality of broiler prices was found to be highly significant (Table 10). On the basis of the farm prices of broilers reported for the 10-County Shenandoah Valley Area, the typical seasonal movement of broiler prices for the period, 1951-1956, is shown in Figure 9. The index of broiler prices rose gradually the first quarter ranging from 7% below the average for the year during the first week in January to 7% above the average for the year during the fourth week of March. From this peak week on through the second quarter, the index of prices was relatively stable.

Table 10. Analysis of Variance of Seasonality of Broiler Prices, 1951-1956.

Source of Variation	D. F.	S. S.	M. S.	F-Ratio
Between Means of Weeks	51	885	17.35	3.75**
Remainder, Interaction	255	1,181	4.63	

** Highly significant

The seasonal peak of the index of prices is reached during the week following July 4th and again during the first week in August at a point 10% above the average for the year. The seasonal decline starts from this peak week in August and continues through Christmas week which

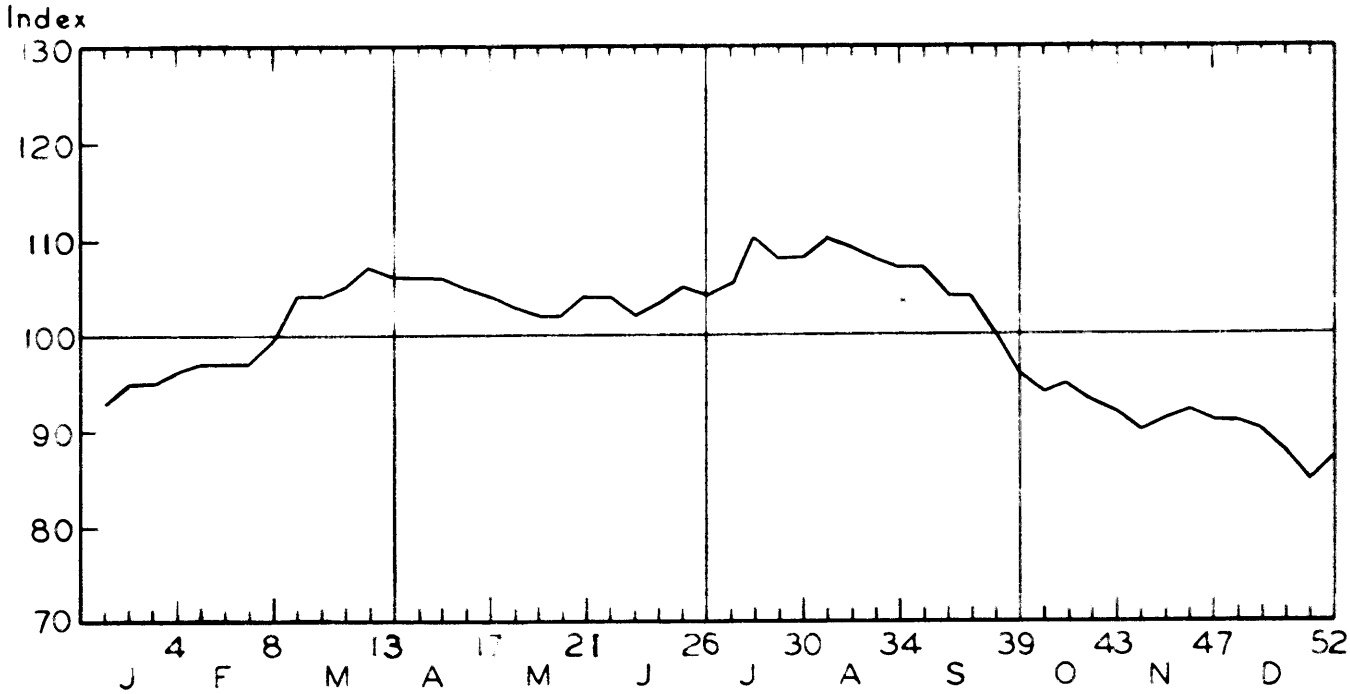

Figure 9. Seasonal Variation in the Farm Price of Broilers in the 10-County Shenandoah Valley Area, 1951-1956 (Source: Table 11).

Table 11. Average Farm Price of Broilers with the Index of Seasonal Variation, in the 10-County Shenandoah Valley Area, by Weeks, 1951-1956.

Week	Year						Seasonal Index, 1951-56*
	1951	1952	1953	1954	1955	1956	
	Cents Per Pound						Percent
1	21.5	28.3	27.6	21.2	24.4	20.9	93
2	25.0	28.9	26.9	22.8	24.9	19.2	95
3	24.9	29.0	25.9	23.0	27.1	18.9	95
4	26.8	29.2	25.9	21.8	25.3	21.0	96
5	27.2	29.7	25.9	20.7	25.0	22.0	97
6	28.1	29.8	25.7	19.8	23.2	22.8	97
7	27.5	28.3	26.6	21.1	23.6	20.7	97
8	28.0	28.1	26.6	21.4	24.9	21.3	99
9	29.6	27.4	26.9	22.8	28.2	22.1	104
10	28.7	26.2	27.0	23.5	28.9	21.8	104
11	29.2	26.6	26.3	22.3	30.1	21.9	105
12	29.6	28.1	27.6	22.6	29.3	21.9	107
13	29.1	26.7	27.6	23.2	29.8	21.5	106
14	29.7	26.6	26.6	25.3	29.6	20.2	106
15	30.4	26.9	26.7	25.1	28.1	19.3	106
16	30.7	26.3	26.3	22.4	25.1	19.5	105
17	30.2	26.1	25.9	21.4	23.3	21.1	104
18	30.3	25.1	25.6	21.0	24.4	20.5	103
19	29.6	22.6	25.5	22.8	25.6	20.0	102
20	27.9	21.8	25.4	23.6	26.8	20.3	102
21	27.1	25.9	25.2	24.0	27.8	20.5	104
22	26.9	26.3	25.1	24.1	27.6	19.7	104
23	27.0	25.5	24.2	24.1	27.1	19.1	102
24	28.3	25.7	24.4	24.1	26.8	18.8	103
25	29.4	25.0	26.0	24.7	27.1	19.3	105
26	28.0	25.1	25.8	24.3	25.2	20.1	104
27	27.7	25.2	26.4	24.2	25.0	21.7	105
28	29.4	27.2	28.9	25.2	26.1	21.7	110
29	28.0	28.0	28.2	24.3	26.6	21.1	108
30	28.6	27.8	27.0	24.5	27.2	19.8	108
31	29.4	27.9	28.0	24.7	27.2	20.0	110
32	28.7	30.8	29.1	24.4	26.6	19.8	109
33	29.3	31.1	27.8	23.9	26.7	18.6	108
34	28.7	32.0	27.2	23.7	26.6	18.1	107
35	28.7	32.0	26.7	23.2	26.1	18.7	107
36	28.7	31.2	25.5	23.0	25.0	17.6	104
37	28.7	31.9	26.5	22.4	24.8	17.1	104
38	27.8	29.5	26.2	20.8	22.9	18.2	100
39	26.7	28.0	25.9	19.6	20.6	18.4	96

Table 11. (cont'd)

Week	Year						Seasonal Index, 1951-56*
	1951	1952	1953	1954	1955	1956	
			Cents Per Pound				Percent
40	26.0	28.1	25.3	18.2	20.3	16.7	94
41	25.5	28.0	25.2	18.3	18.9	16.9	95
42	24.7	27.4	24.7	20.6	20.4	16.5	93
43	24.4	27.2	24.3	22.5	18.7	16.2	92
44	23.6	28.1	24.1	20.6	16.9	15.5	90
45	24.1	30.3	24.1	18.0	18.3	14.9	91
46	24.8	32.0	24.3	16.6	21.3	16.0	92
47	24.9	32.4	23.9	16.0	19.5	16.1	91
48	23.3	30.7	23.6	16.9	20.6	16.0	91
49	23.0	31.3	22.2	18.1	19.6	15.4	90
50	23.4	30.3	18.6	17.7	17.1	17.0	88
51	23.9	27.6	17.5	16.9	16.6	15.4	85
52	24.3	27.6	18.2	21.6	21.0	15.8	87
Average	27.3	28.0	25.6	21.9	24.4	19.1	

Source of Data - Virginia Cooperative Crop Reporting Service

* Index computed by the link relative method.

is 15% below the average for the year. The seasonal drop in the index of broiler prices is extremely rapid after Labor Day week to the first week in October. From here on to Christmas, the drop is more gradual with a slight increase occurring before Thanksgiving. The weekly movements of the index of prices are less pronounced than those of the index of placements or marketings. During the six-year period, 1951-1956, a marked change occurred in the seasonal pattern of broiler prices (Figure 10). For this reason, a test of significance was made for both periods, although the seasonal pattern of prices for the six-year period, 1951-1956, was significant at the 1% level. The seasonality of broiler prices was not significant (at the 5% level) for the earlier period, 1951-1953 (Table 12). The seasonal variation of prices for the latter period, 1954-1956, was highly significant (Table 12).

Table 12. Analysis of Variance of Seasonality of Broiler Prices, 1951-1953 and 1954-1956.

Source of Variation	D. F.	S. S.	M. S.	F-Ratio
1951-1953				
Between Means of Weeks	51	316	6.20	1.22
Remainder, Interaction	102	520	5.10	
1954-1956				
Between Means of Weeks	51	583	11.43	1.79**
Remainder, Interaction	102	652	6.39	

** Highly significant

The main differences in the seasonal pattern of prices are found in the time that the period of high and low prices occur and the extent of the weekly fluctuations. In the earlier period the index of prices rose

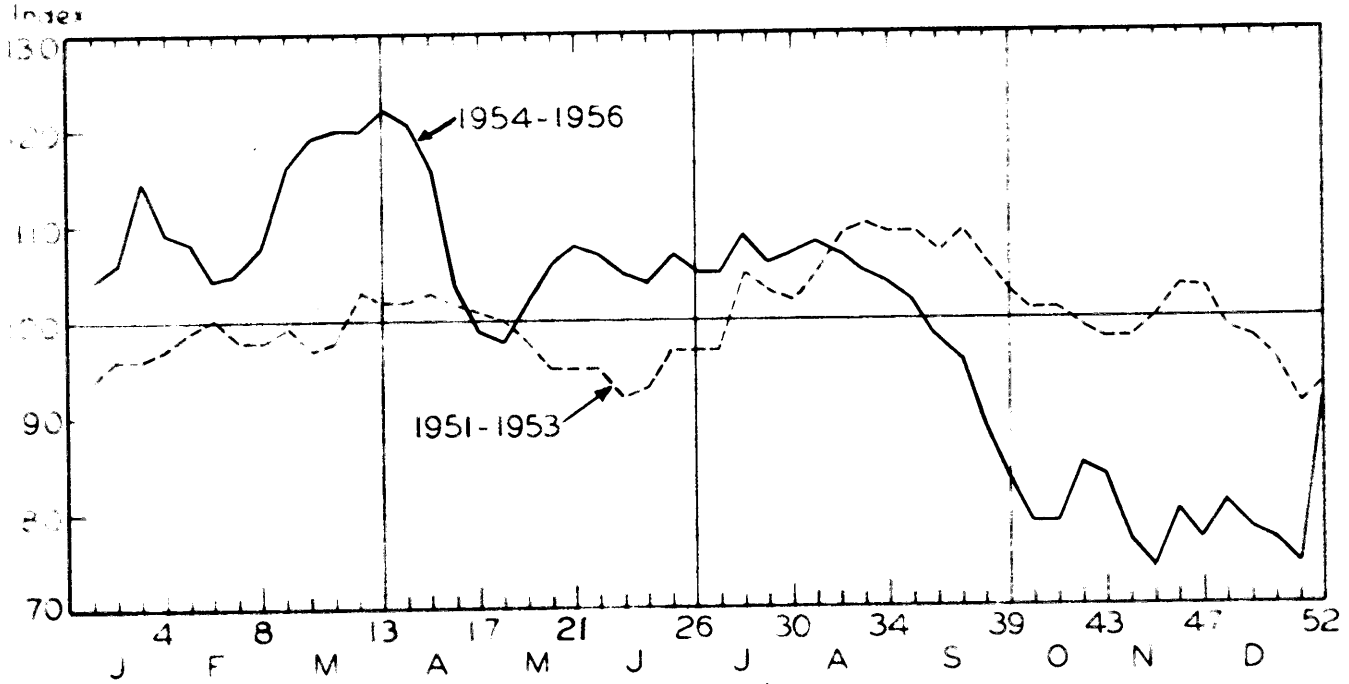

Figure 10. Seasonal Variation in the Farm Price of Broilers in the 10-County Shenandoah Valley Area, 1951-1953 (Source: Appendix, Tables 8 and 9).

gradually up to the fourth week in March. This rise was from 6% below to 3% above the average for the year. The price index was relatively stable and above the average for the year up to the first week in May. From this point, the index of prices declined to 8% below the average for the year during the second week in June. The increase after the second week in June was rapid up to the season's peak during the third week of August. The range in the increase was from 8% below to 10% above the average for the year. The index of prices remained relatively stable from the season's peak in August to the third week in September. The seasonal decline was gradual from the third week in September to the first week in November. The price index then rose to 3% above the average for the year the week before Thanksgiving. The price drop after Thanksgiving was quite rapid, reaching 9% below the average for the year during Christmas week, the low week for the year.

The seasonal pattern for the latter period, 1954-1956, showed more pronounced fluctuations. The season's high which fell on the last week in March was 22% above the average for the year, compared to a high of 10% above the average for the year during the third week in August in the earlier period (Figure 10). The season's low occurred during Christmas week in both periods. But during the earlier period there were two other weeks of almost equally low prices—the first week of January and the second week of June. For the 1951-1953 period, the index of prices at the low point was only 10% below the average for the year compared to 26% below the average for the year during the latter period.

The 1954-1956 price index for the first quarter showed two peaks—the smaller one occurring in the third week in January, and the larger one in the last week in March. The index of prices decreased sharply from the season's peak reaching a low point of 2% below the average for the year during the second week in May. The rise from this point was rapid up to the last week in May. From the last week in May until the first week in August, the index of broiler prices remained rather steady.

The seasonal price decline was rapid from the second week in August to the first week in October. The magnitude of the decrease varied from 7% above the average to 21% below the average for the year. The seasonal index of prices continued below the average for the year for the remaining part of the fourth quarter.

Relationship Between the Seasonality of Broiler Marketings and Broiler Prices

To what extent is the seasonal movement of broiler prices associated with the seasonal variation in broiler marketings? Figures 11, 12, and 13 show the index of seasonal variation in broiler prices plotted with the index of broiler marketings for the six-year period, 1951-1956, and for the two three-year periods, 1951-1953, and 1954-1956.

A correlation of the weekly index of prices with the weekly index of marketings for the six-year period, 1951-1956, gave a positive r-value significant at the 1% level (Table 13). The r-value for the period, 1951-1953, was significant at the 1% level but the r-value for the 1954-1956 period was not significant even at the 5% level. Although

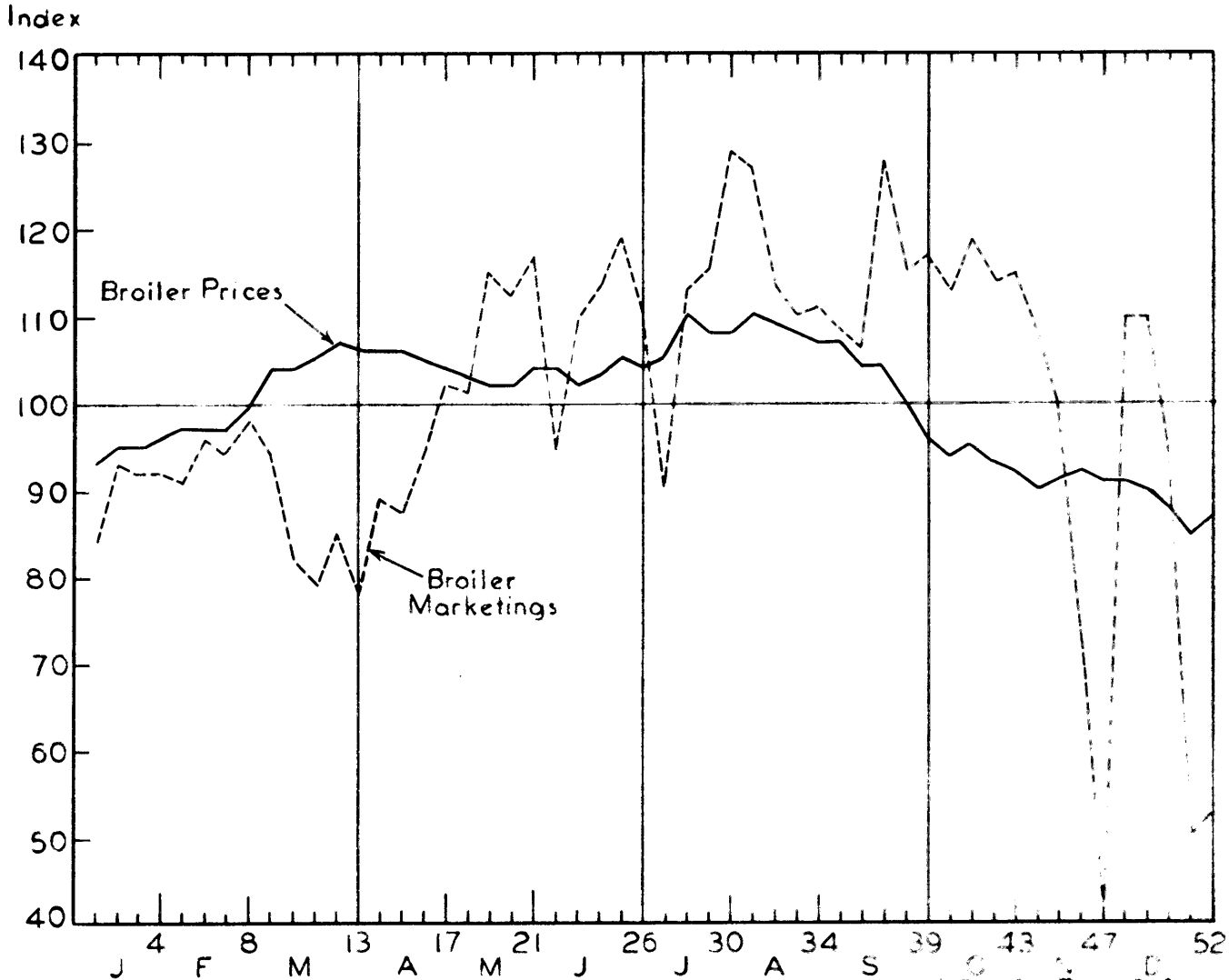

Figure 11. Seasonal Variation in Broiler Marketings and in the Farm Price of Broilers in the 10-County Shenandoah Valley Area, 1951-1956 (Source: Tables 8 and 11).

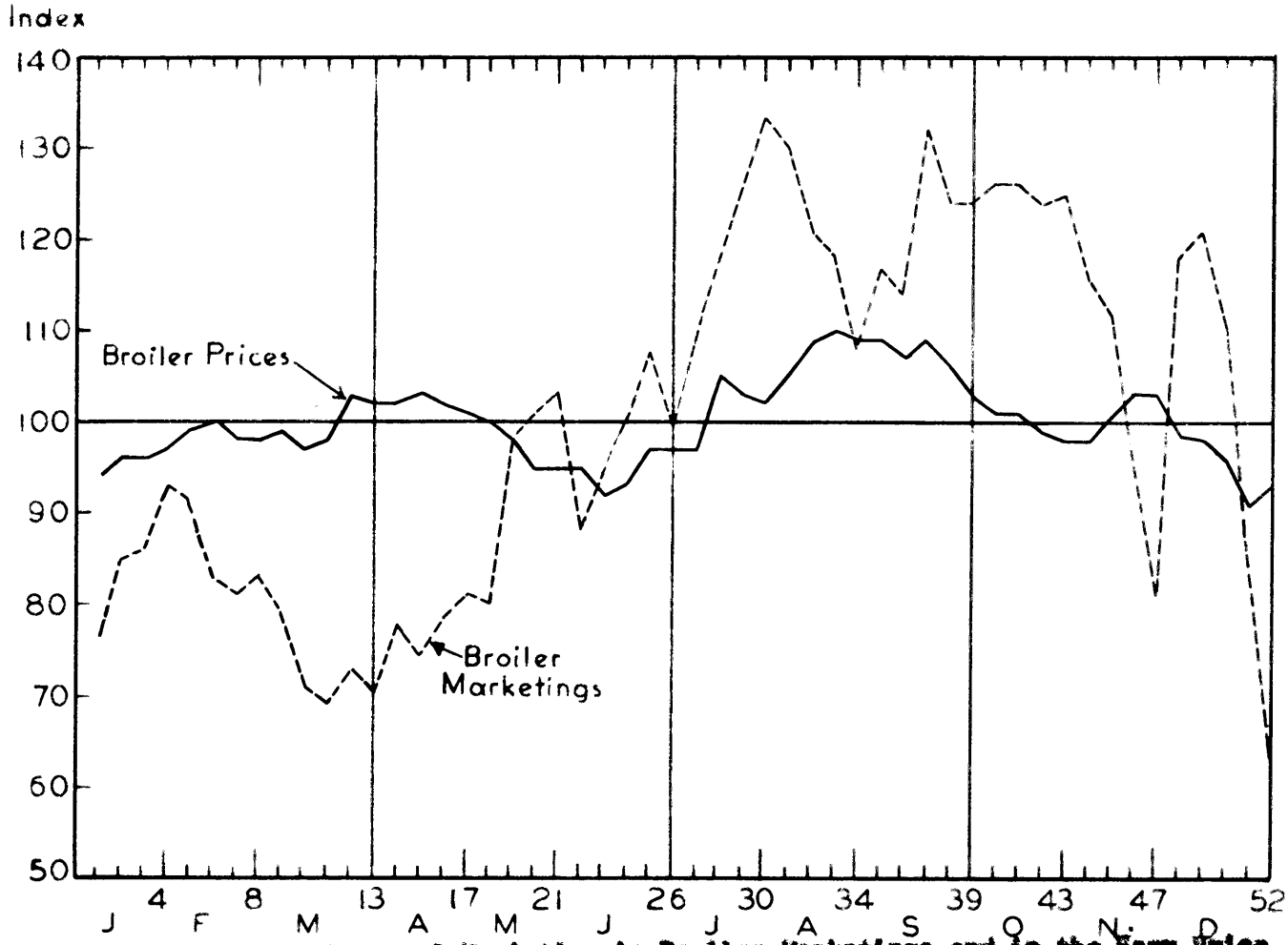

Figure 12. Seasonal Variation in Broiler Marketings and in the Farm Price of Broilers in the 10-County Shenandoah Valley Area, 1951-1953 (Source: Appendix, Tables 6 and 8).

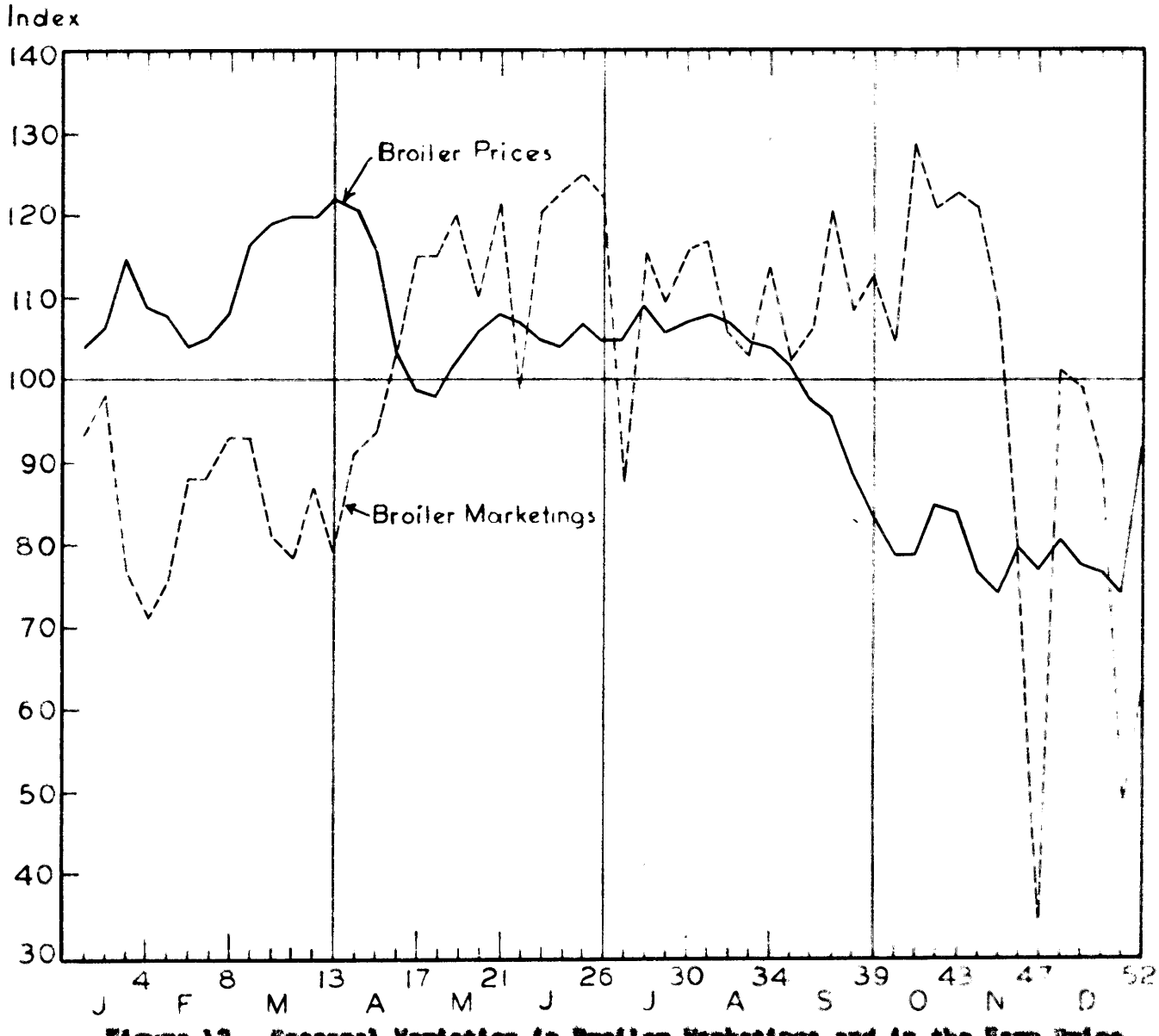

Figure 13. Seasonal Variation in Broiler Marketings and in the Farm Price of Broilers in the 10-County Shenandoah Valley Area, 1954-1956 (Source: Appendix, Tables 7 and 9).

the r-values were significant for the six-year period, 1951-1956, and for the earlier period, 1951-1953, the percent of association between the weekly index of broiler prices and the weekly index of broiler marketings gave r^2-values of only 15.69% and 16.75%, respectively (Table 13).

Table 13. Correlation of Index of Broiler Prices and Index of Broiler Marketings, 1951-1956, 1951-1953, and 1954-1956.

Indexes Correlated	r	D. F.	Level of Significance	r^2
Prices and Marketings, 1951-1956	.3961	50	1%	.1569
Prices and Marketings, 1951-1953	.4093	50	1%	.1675
Prices and Marketings, 1954-1956	-.0288	50		.0008

This analysis indicates that factors other than the seasonal variation in marketings account for most of the seasonal variation in broiler prices. In other words, during most of the weeks of the year, the typical week-to-week fluctuations in broiler prices do not coincide with week-to-week fluctuations in broiler marketings. A correlation by quarters (first, second, third, fourth) failed to show any improvement in the degree of linear association between the weekly index of broiler prices and the weekly index of broiler marketings.

The amplitude of the peaks and valleys in the index of marketings probably explains the low correlation obtained between the seasonal index of prices and the seasonal index of marketings. As indicated in Figure 7, the number of broilers coming to market by weeks is quite variable, particularly before and after holidays. One of the major reasons for the variable week-to-week marketing lies in the tendency for

producers to look at the very short-run period. It was stated earlier that broilers have a definite economic selling range because of the influence of age and weight on production efficiencies. However, depending upon the "feeling" about which direction the price movement will take, producers in the Valley Area may market a large number of broilers one week and place only a small volume on the market the following week. A slight change in price may result in either a large movement of broilers to market or the holding back of a large proportion of the supply available during any particular week.

The number of broilers sold and the prices paid in other commercial areas has a marked influence on the seasonal variation in marketings and in prices in the Valley Area. Since the total supply of broilers and the overall demand for them determine the price, prices in any one area may not vary to any marked extent from the other areas. During weeks of especially high or low marketings in an area, prices will not vary accordingly. The volume of broilers brought in from the counties surrounding the 10-County area may also affect the price movement in the Valley area. Since factors outside the area have such an influence on marketings, it is not too surprising to find a low degree of association between the index of marketings and the index of prices.

Although the percentage of linear relationship between the indexes of prices and the indexes of marketings was found to be rather small, certain relationships are evident between the typical seasonal movements of the weekly indexes of prices and the weekly indexes of marketings.

Around the first week in March, the indexes of prices and marketings move in opposite directions (Figures 11, 12, and 13). A short

market supply results from the low volume of placements during the latter part of December and through the month of January. Processors, in order to keep their plants running at a reasonable capacity and to supply their customers, have to bid up prices in order to receive a fair share of the existing market supply.

Beginning around the first week in April, however, marketings increase rapidly which in turn has a tendency to force prices down from their spring peak. The market supply continues to increase through May, June, and July. With the approach of the summer season, the demand for broilers also increases. Although the index of marketings continue to move upward, the increase in demand allows prices to move upward also.

After Labor Day prices begin their seasonal decline, but the index of marketings remains well above the average for the year until November. Demand for broilers decreases with the end of the summer vacation period and with seasonal increases in the supply of red meats and turkeys. Because of the decrease in demand and the maintenance of broiler supplies, the weekly index of prices continues below the average for the year during the last quarter.

SEASONALITY OF CASH PRODUCTION COST

Cash costs of broiler production relative to anticipated prices for broilers have a considerable influence on the decision of how many chicks to place and when to place them. If broilers are to be most profitable, they must be produced at lowest cost and be ready for market at the highest price. Variations in the different cash production cost items making up total cash cost may mean the difference between profit and loss.1/ How total cash production costs vary with the time of the year and the relationship between weekly variations in the index of cash production cost and weekly variations in marketings are explored in this section of the report. The seasonal variations in the individual production cost items are analyzed also in order to point out their influence on the seasonal variations of total cash production cost. Various seasonal indexes dealing with physical factors such as age, weight, rate of gain, and mortality are related to the index of feed conversion, the most important factor affecting total cash production cost.

Seasonal Variation in Total Cash Production Cost Per Pound

The seasonal variation in cash production cost proved to be highly significant for the period, 1951-1956 (Table 14).

1/ Cash production cost includes expenditures for feed, chicks, fuel, medicine, litter and miscellaneous items. It does not include labor costs or costs of depreciation on buildings and equipment.

Table 14. Analysis of Variance of Seasonality of Cash Production Cost Per Pound, 1951-1956.

Source of Variation	D. F.	S. S.	M. S.	F-Ratio
Between Means of Weeks	51	375	7.35	10.97**
Remainder, Interaction	255	171	.67	

**Highly significant

Figure 14 shows the typical weekly index of cash production cost per pound of broilers sold in the Shenandoah Valley Area, for the period 1951-1956. The index of cash production cost is below the average for the year from the second week in June to the third week in November and above the average for the year during the other weeks of the year. This indicates that production cost per pound is highest for birds sold during the winter and spring months and lowest for broilers sold in the summer and fall months. The season's peak which occurred during the third week of March and the second week of April was 7% above the average for the year, compared to the season's low of 12% below the average for the year during the last week of September and the first week of October.

Figure 15 compares the indexes of cash production cost for broilers for the periods, 1951-1953 and 1954-1956. Both periods show very similar seasonal patterns with the highest index of cash production cost occurring in the winter and spring months and the lowest index of cash production cost coming during the summer and fall months.1/

1/ Up and down weekly fluctuations are noticeable in each of the production cost indexes, however, this does not invalidate the presence of a seasonal pattern. Such erratic fluctuations may be due in part to the nature of the data. Since the information was obtained from actual records, data in any one week of the year may by chance have come predominately from one feed dealer or it may have been a week with small number of observations.

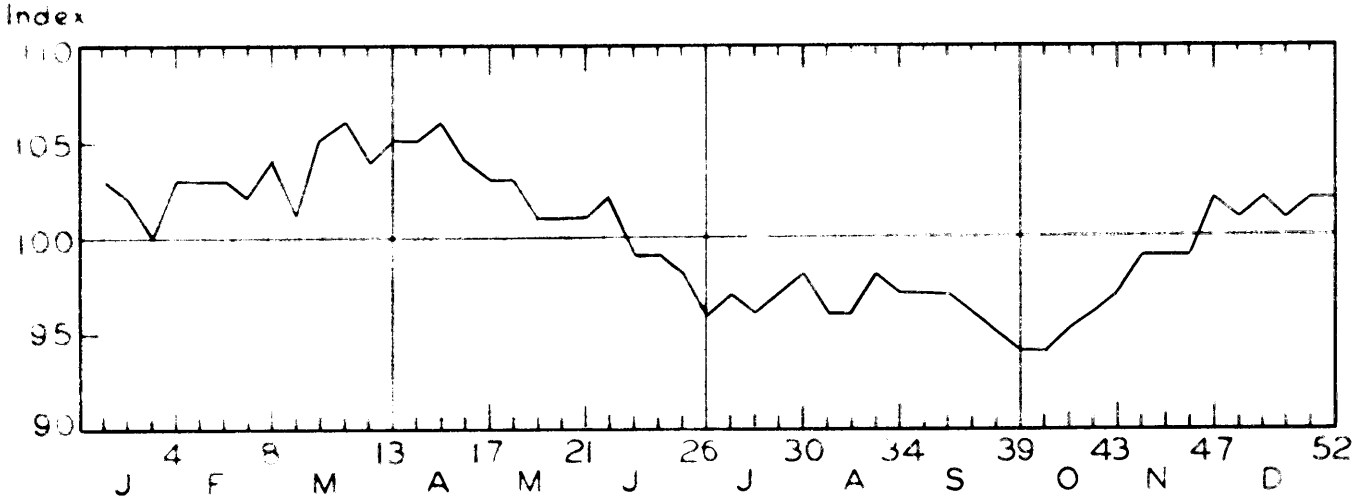

Figure 14. Seasonal Variation in the Cash Production Cost Per Pound of Broiler Sold in the 10-County Shenandoah Valley Area, 1951-1956 (Source: Table 15).

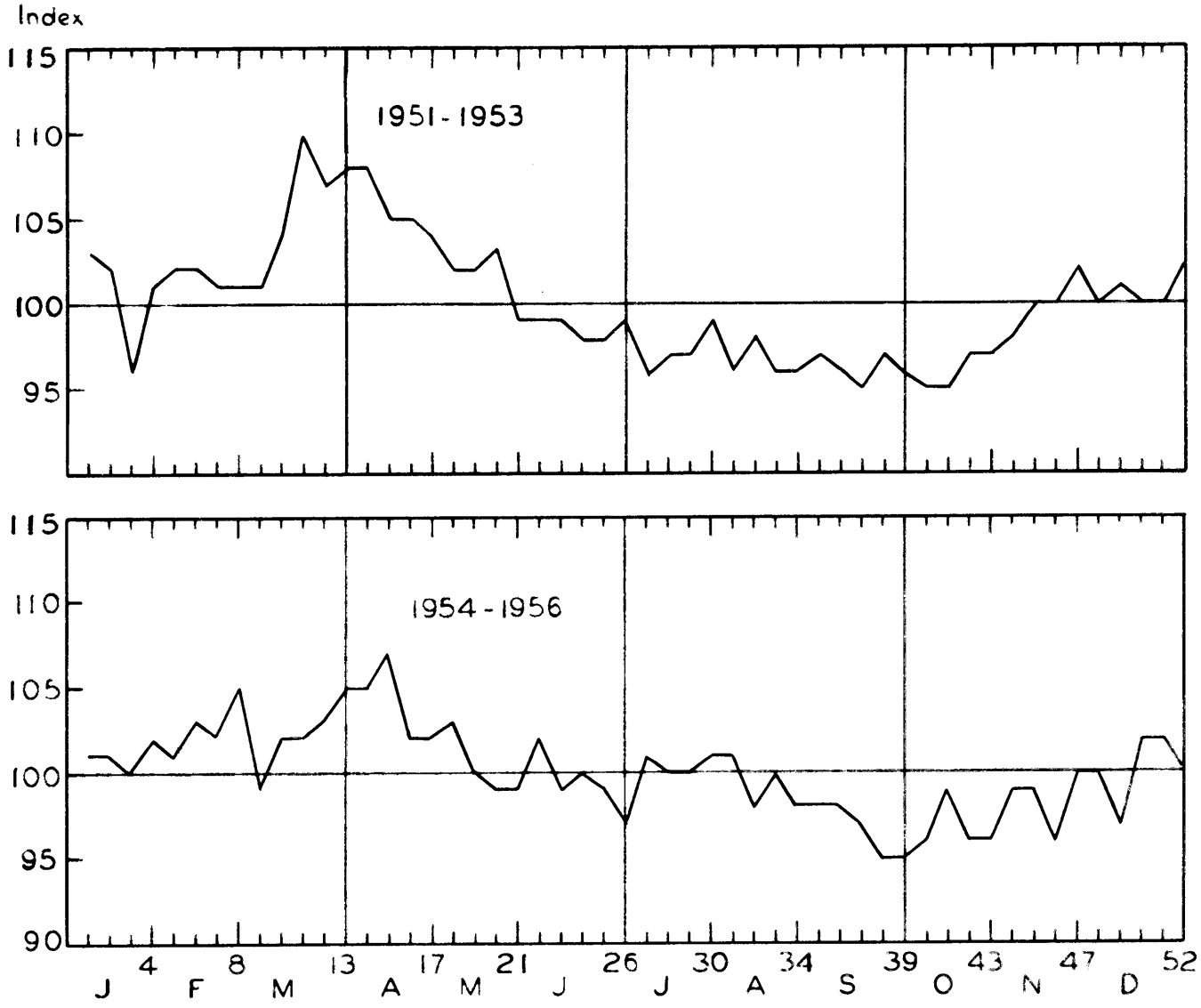

Figure 15. Seasonal Variation in the Cash Production Cost Per Pound of Broiler Sold in the 10-County Shenandoah Valley Area, 1951-1953 and 1954-1956 (Source: Appendix, Tables 10 and 11).

Table 15. Cash Production Cost Per Pound of Broiler Sold with the Index of Seasonal Variation, in the 10-County Shenandoah Valley Area, by Weeks, 1951-1956.

Week	Year						Seasonal Index, 1951-56*
	1951	1952	1953	1954	1955	1956	
	Cents Per Pound						Percent
1	28.572	25.493	26.104	25.305	21.668	22.340	103
2	27.120	26.392	25.787	24.974	23.165	22.267	102
3	23.340	26.131	24.118	24.805	23.344	21.738	100
4	25.911	26.323	25.499	25.753	23.286	22.171	103
5	26.114	26.870	24.965	25.559	23.298	21.986	103
6	25.935	25.341	26.471	26.040	23.931	21.909	103
7	26.816	25.112	25.770	24.995	23.904	21.722	102
8	25.900	26.416	25.635	25.862	24.504	21.258	104
9	28.374	25.826	25.643	24.438	22.493	21.343	102
10	24.184	26.867	26.464	25.146	23.079	21.104	105
11	26.040	28.624	23.903	25.366	21.573	21.217	106
12	24.973	26.685	23.528	25.610	22.052	20.877	104
13	25.232	25.567	23.921	24.632	22.335	21.173	105
14	25.147	26.822	23.468	24.910	22.044	21.277	105
15	24.554	25.001	23.913	25.267	22.439	21.083	106
16	26.203	24.849	23.579	24.036	21.498	20.560	104
17	25.980	26.137	23.276	23.723	21.433	20.637	103
18	25.577	25.312	23.078	23.937	21.445	21.328	103
19	25.469	24.864	23.196	23.725	20.914	20.607	101
20	23.542	25.583	23.339	23.714	20.694	20.454	101
21	25.780	24.353	22.384	23.696	20.645	20.376	101
22	25.645	23.936	22.335	25.302	21.345	20.813	102
23	23.478	25.110	22.470	22.266	20.639	20.493	99
24	25.344	24.745	22.153	22.833	20.311	20.733	99
25	23.353	24.790	22.569	22.457	20.055	19.856	98
26	23.980	24.177	22.629	22.029	19.762	19.445	96
27	22.848	24.058	22.059	22.566	20.578	20.340	97
28	23.066	24.103	21.526	22.450	20.443	19.323	96
29	23.150	23.165	22.552	22.568	19.784	19.647	97
30	23.444	24.473	22.300	21.972	20.329	19.697	98
31	23.132	23.127	21.612	22.240	20.356	19.254	96
32	23.096	24.254	22.007	21.496	19.715	19.558	96
33	24.331	23.880	21.478	21.986	20.582	19.719	98
34	24.457	23.729	21.976	21.791	19.383	19.287	97
35	21.509	24.268	22.171	21.922	20.196	19.072	97
36	26.477	24.059	22.074	21.896	20.050	19.645	97
37	23.287	23.594	23.437	21.711	20.153	19.336	96
38	25.655	24.037	22.014	21.476	19.513	18.976	95
39	24.150	24.649	21.944	21.293	19.297	19.823	94

Table 15. (cont'd)

Week	Year						Seasonal Index, 1951-56*
	1951	1952	1953	1954	1955	1956	
	Cents Per Pound						Percent
40	22.643	24.325	22.094	21.984	19.526	19.175	94
41	24.048	24.103	21.835	23.086	20.158	18.791	95
42	24.554	24.666	22.034	21.934	19.488	19.344	96
43	24.623	24.479	22.587	22.301	19.637	18.819	97
44	23.656	25.401	22.761	22.480	20.441	19.423	99
45	25.101	24.292	23.136	21.780	20.303	19.969	99
46	24.980	24.985	23.111	23.017	19.801	18.427	99
47	24.976	26.051	23.599	23.861	20.636	18.857	102
48	27.117	25.465	22.630	23.544	20.743	19.694	101
49	27.231	25.711	23.781	22.685	20.779	18.713	102
50	26.979	25.783	23.339	21.980	21.847	19.714	101
51	26.189	25.893	24.650	25.855	21.227	19.717	102
52	28.518	25.822	25.074	23.595	20.927	19.721	102
Average	25.108	25.088	23.186	23.302	20.992	20.447	

Based on data from the following records:

Year	No. of Flocks	No. of Birds	Year	No. of Flocks	No. of Birds
1951	237	545,000	1954	965	2,787,000
1952	465	1,260,000	1955	1,396	3,825,000
1953	842	2,316,000	1956	1,112	3,342,000

* Index computed by the link relative method.

Although no apparent change was evident, a test of significance was run for the most recent period, 1954-1956. The seasonal variation of cash production cost in this period also proved highly significant (Table 16).

Table 16. Analysis of Variance of Seasonality of Cash Production Cost Per Pound, 1954-1956.

Source of Variation	D. F.	S. S.	M. S.	F-Ratio
Between Means of Weeks	51	223	4.37	11.50**
Remainder, Interaction	102	39	.38	

** Highly significant

Relationship of Seasonal Variations in Cost of Feed, Chicks, Fuel, Medication and Litter to Seasonal Variation in Total Cash Cost

Total cash production cost is highest for broilers sold in the winter and spring months and lowest for broilers sold in the summer and fall months (Figure 14). Since total cash production cost is composed of several cost items, it is helpful to examine the seasonal variations of the more important cost items in order to give some explanation of the typical seasonal pattern of total cash production cost.1/

Feed Cost

Feed cost, the most important production cost item, accounts for

---

1/ Indexes of the various items were calculated from data of individual broiler flock records obtained in the 10-County Shenandoah Valley Area.

around 70% of the total cash cost of production.1/ The seasonal variation in feed cost per pound was found to be highly significant for the period, 1954-1956 (Table 17). The relationship between the seasonal indexes of feed cost per pound and total cash production cost is shown in Figure 16 for the period, 1954-1956. It can be observed that a high feed cost index as shown in this figure is associated with a high index of cash production cost in the winter and spring; likewise, a low index of feed cost per pound is associated with a low index of cash production cost during the summer and early fall months. Actual feed prices are higher in the summer, but with more efficient feed conversion resulting in lower total feed consumption, the feed cost per pound of broiler produced during the summer period is less than in the winter or spring months.

Table 17. Analysis of Variance of Seasonality of Feed Cost Per Pound, 1954-1956.

Source of Variation	D. F.	S. S.	M. S.	F-Ratio
Between Means of Weeks	51	55	1.07	2.61**
Remainder, Interaction	102	42	.41	

** Highly significant

A correlation of the index of feed cost per pound of broilers sold and the index of total cash production cost gave a positive r-value significant at the 1% level (Table 18). The r^2-value for the period, 1954-1956, showed that 39% of the variability in the seasonal index of

1/ The percentage that individual cost items are of total cash cost is based on data from broiler records obtained and from various cost-of-production studies.

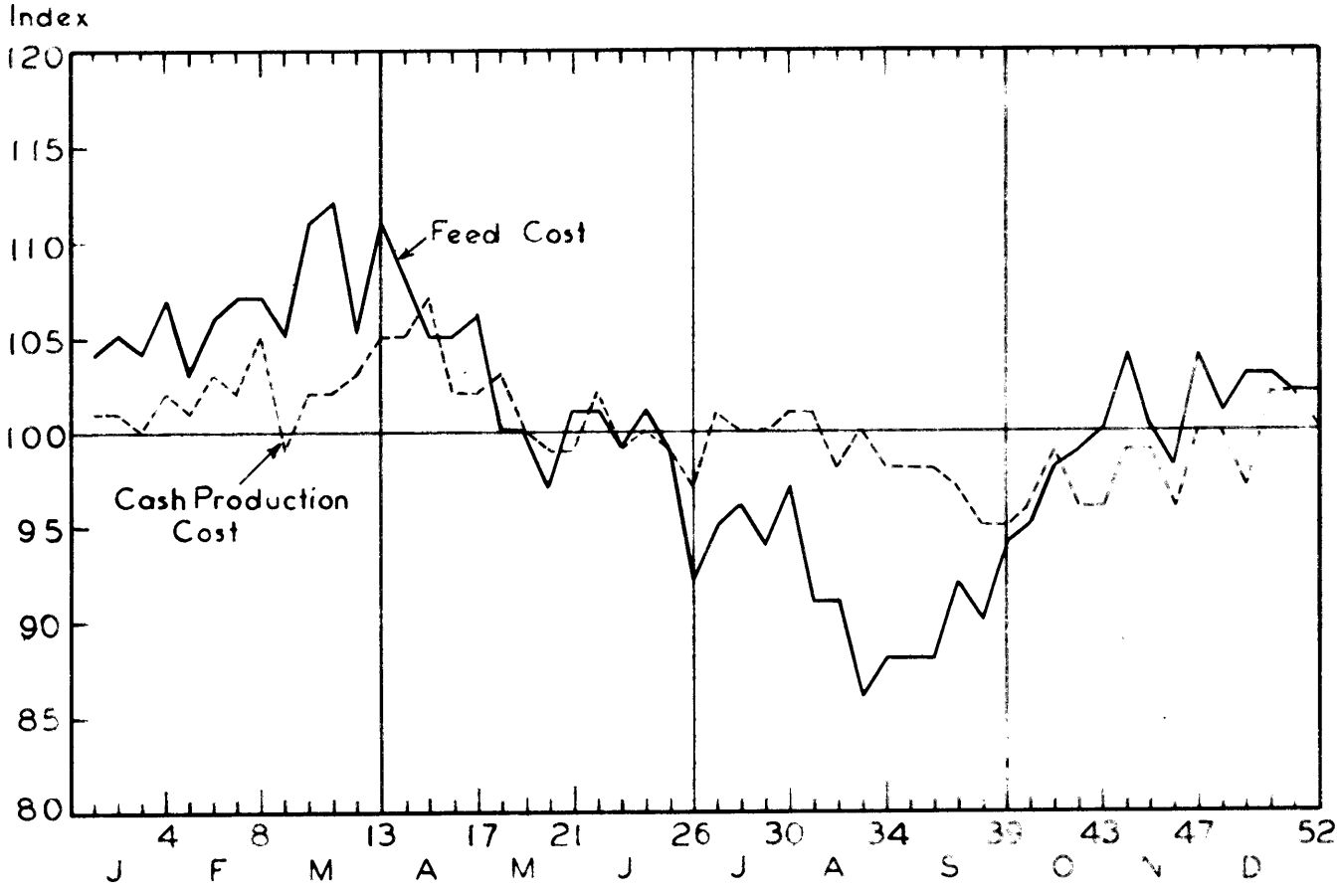

Figure 16. Seasonal Variation in Feed Cost and in Cash Production Cost Per Pound of Broiler Sold in the 10-County Shenandoah Valley Area, 1954-1956 (Source: Appendix, Tables 12 and 11).

cash production cost per pound was associated with the variability in the seasonal index of feed cost per pound.

Table 18. Correlation of Index of Feed, Chick, and Fuel Cost Per Pound with the Index of Cash Production Cost Per Pound, 1954-1956.

Indexes Correlated	r	D. F.	Level of Significance	r^2
Feed Cost Per Pound and Cash Production Cost Per Pound, 1954-56	.6212	50	1%	.3859
Chick Cost Per Pound and Cash Production Cost Per Pound, 1954-56	.5205	50	1%	.2709
Fuel Cost Per Pound and Cash Production Cost Per Pound, 1954-56	.7166	50	1%	.5135

Chick Cost

Chick cost, the second most important cash production cost item, accounts for approximately 22% of the total cash cost of production. Although some decline in the index of chick cost per pound of broiler sold was noticeable during the second quarter, a test for seasonality did not indicate a statistically significant seasonal variation at the 5% level (Table 19).

Table 19. Analysis of Variance of Seasonality of Chick Cost Per Pound, 1954-1956.

Source of Variation	D. F.	S. S.	M. S.	F-Ratio
Between Means of Weeks	51	9.7714	.191596	1.33
Remainder, Interaction	102	14.6339	.143470	

The weekly index of chick cost per pound of broiler sold and the weekly index of total cash production cost per pound are shown in Figure

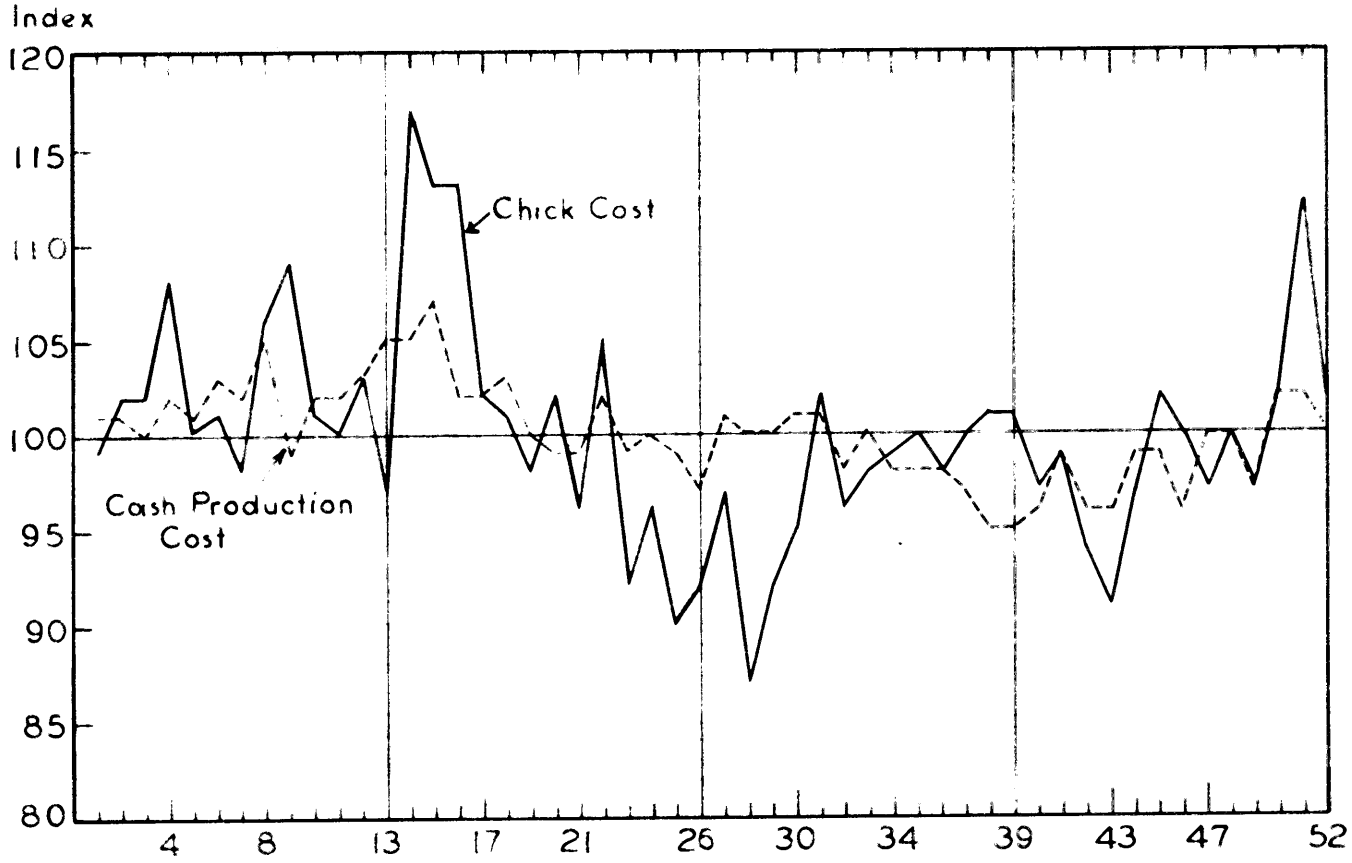

Figure 17. Seasonal Variation in Chick Cost and in Cash Production Cost Per Pound of Broiler Sold in the 10-County Shenandoah Valley Area, 1954-1956 (Source: Appendix, Tables 13 and 11).

17 for the period, 1954-1956. Although the seasonality of chick cost was not statistically significant, the index of chick cost declines apparently during the second quarter and continues lower into mid-summer when the diminishing supply of hatching eggs tends to bring chick prices back up. The demand for chicks is greater in the spring when placements are on the increase. However, the demand for chicks is somewhat less after placements start down from the season's peak in April. The weekly index of chick cost tends to move in the same general direction as the index of cash production cost during the late spring and early summer months.

A correlation of the indexes of chick cost per pound of broiler sold and total cash production cost gave a positive r-value significant at the 1% level. The r^2-value for the period, 1954-1956, showed that 27.09% of the variability in the seasonal index of cash production cost was associated with the variability in the seasonal index of chick cost per pound (Table 18).

Fuel Cost

Fuel cost, the third most important cash cost item, accounts for approximately 4% of the total cash production cost. The seasonal variation in fuel cost per pound was found to be highly significant for the period, 1954-1956(Table 20). The index of fuel cost per pound of broiler sold shows a pronounced drop from winter to summer (Figure 18). The index of fuel cost for birds going to market from the last week in May to the second week in December is below the average for the year

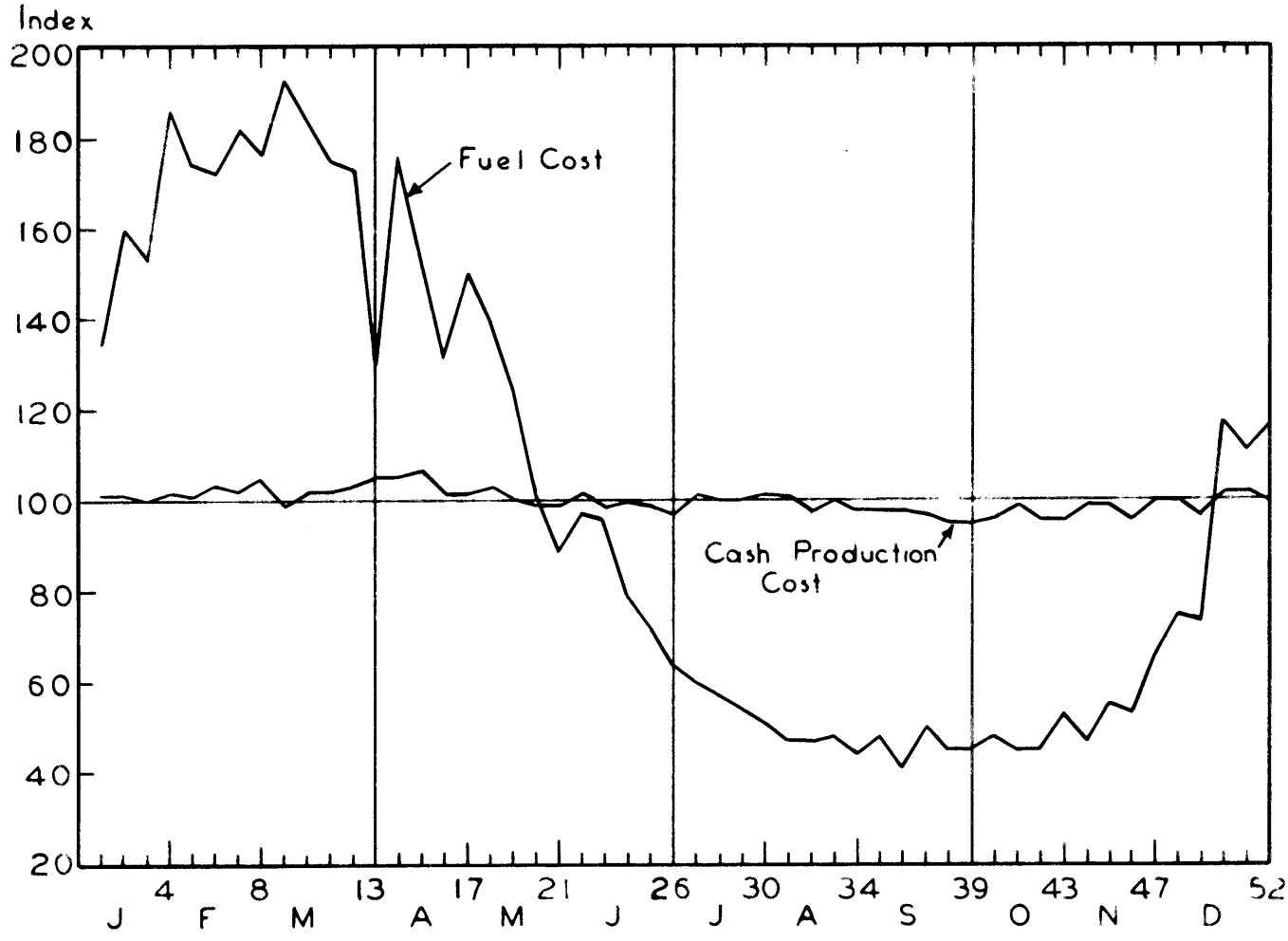

Figure 18. Seasonal Variation in Fuel Cost and in Cash Production Cost Per Pound of Broiler Sold in the 10-County Shenandoah Valley Area, 1954-1956 (Source: Appendix, Tables 14 and 11).

while the fuel cost index for birds moving to market the remainder of the year is above the average for the year.

Table 20. Analysis of Variance of Seasonality of Fuel Cost Per Pound, 1954-1956.

Source of Variation	D. F.	S. S.	M. S.	F-Ratio
Between Means of Weeks	51	21.54	.422	28.13**
Remainder, Interaction	102	1.58	.015	

** Highly significant

A correlation of the index of fuel cost per pound and the index of cash production cost gave a high positive r-value significant at the 1% level. The r^2-value showed a 51.35% relationship indicating a high degree of association between the weekly index of fuel cost and the index of total cash production cost (Table 18).

Medication Cost

Medication and litter cost combined make up approximately 3% of the total cash production cost. The seasonal variation in medication cost per pound was highly significant for the period, 1954-1956 (Table 21). Although wide week-to-week fluctuations are evident in the seasonal pattern of medication cost, the index of medication cost per pound of birds sold during the summer and early fall months tends to be lower (Figure 19). Birds sold during the summer and early fall months have the best weather conditions for growing which results in relatively less disease problems.

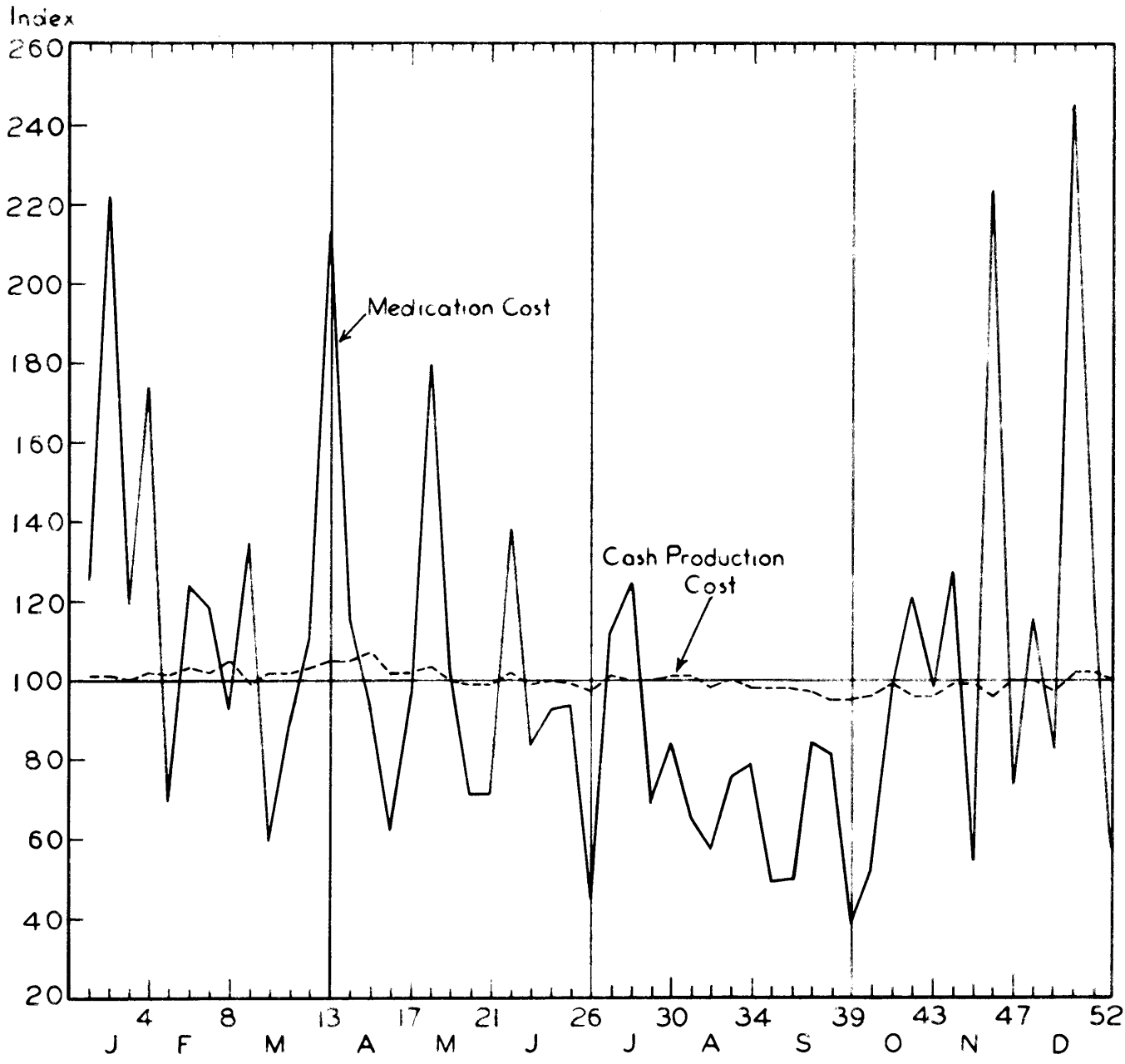

Figure 19. Seasonal Variation in Medication Cost and in Cash Production Cost Per Pound of Broilers Sold in the 10-County Shenandoah Valley Area, 1954-1956 (Source: Appendix, Tables 15 and 11).

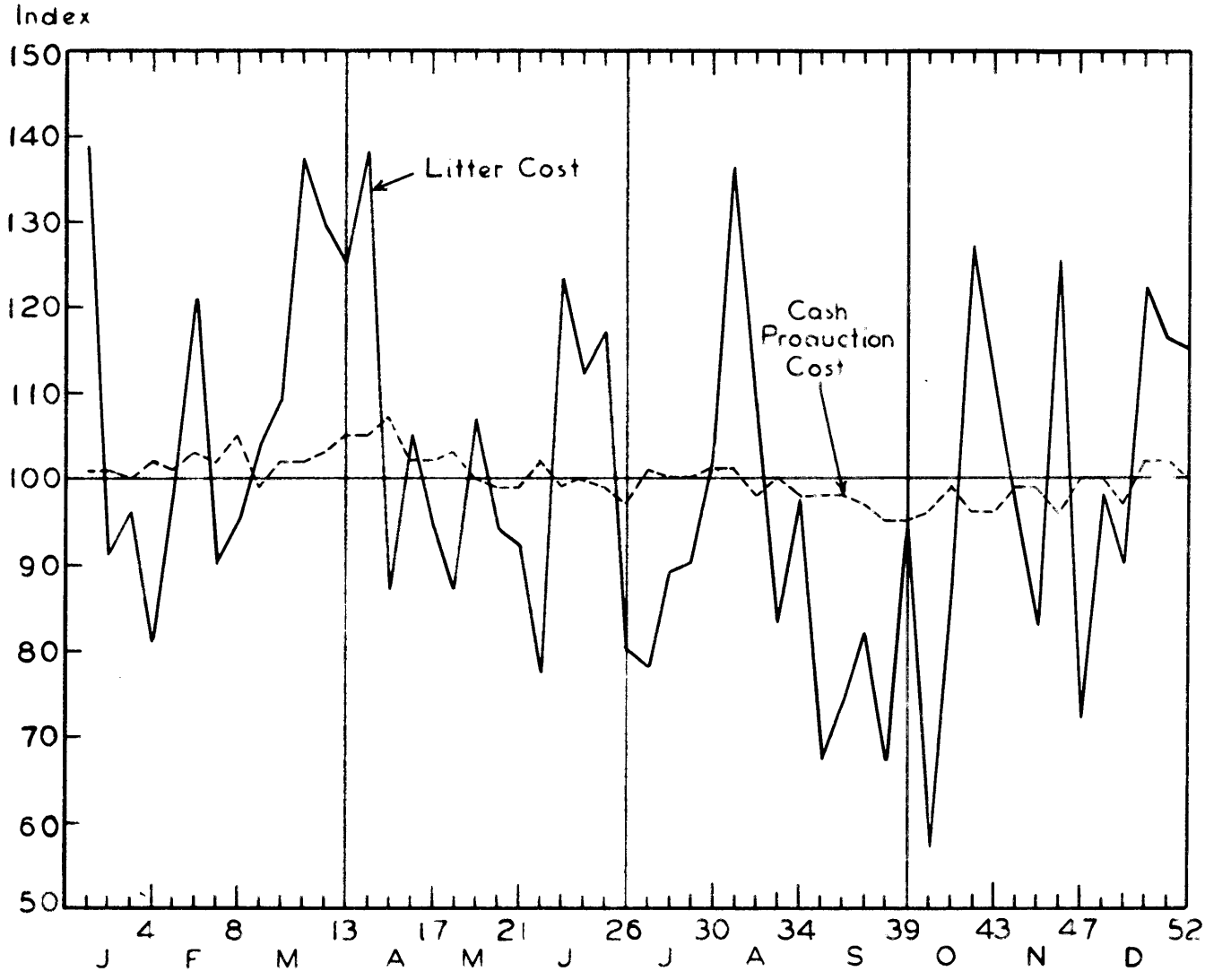

Figure 20. Seasonal Variation in Litter Cost and in Cash Production Cost Per Pound of Broiler Sold in the 10-County Shenandoah Valley Area, 1954-1956 (Source: Appendix, Tables 10 and 11).

Table 21. Analysis of Variance of Seasonality of Medication Cost Per Pound, 1954-1956.

Source of Variation	D. F.	S. S.	M. S.	F-Ratio
Between Means of Weeks	51	4.030445	.079028	1.94**
Remainder, Interaction	102	4.163912	.040823	

** Highly significant

Litter Cost

The seasonal variation in litter cost per pound was not significant at the 5% level (Table 22). As shown in Figure 20, wide fluctuations in the index of litter cost per pound occurred between weeks throughout the year. Due to wet floors, disease problems and other reasons, the amount of litter used in the winter may be somewhat greater; however, this was not reflected in the seasonal index of litter cost per pound.

Table 22. Analysis of Variance of Seasonality of Litter Cost Per Pound, 1954-1956.

Source of Variation	D. F.	S. S.	M. S.	F-Ratio
Between Means of Weeks	51	.482313	.009467	.92
Remainder, Interaction	102	1.053852	.010332	

Effect of Seasonal Variation in Feed Conversion Ratios on Seasonality of Cash Production Cost

With feed cost accounting for approximately 70% of the total cash production cost, the efficiency level at which broilers convert feed into meat is considered an important factor affecting total cash production cost. The seasonal variation of feed conversion was found to be highly significant for the period, 1951-1956 (Table 23). The typical seasonal index of feed conversion ratios is illustrated in Figure 21 for

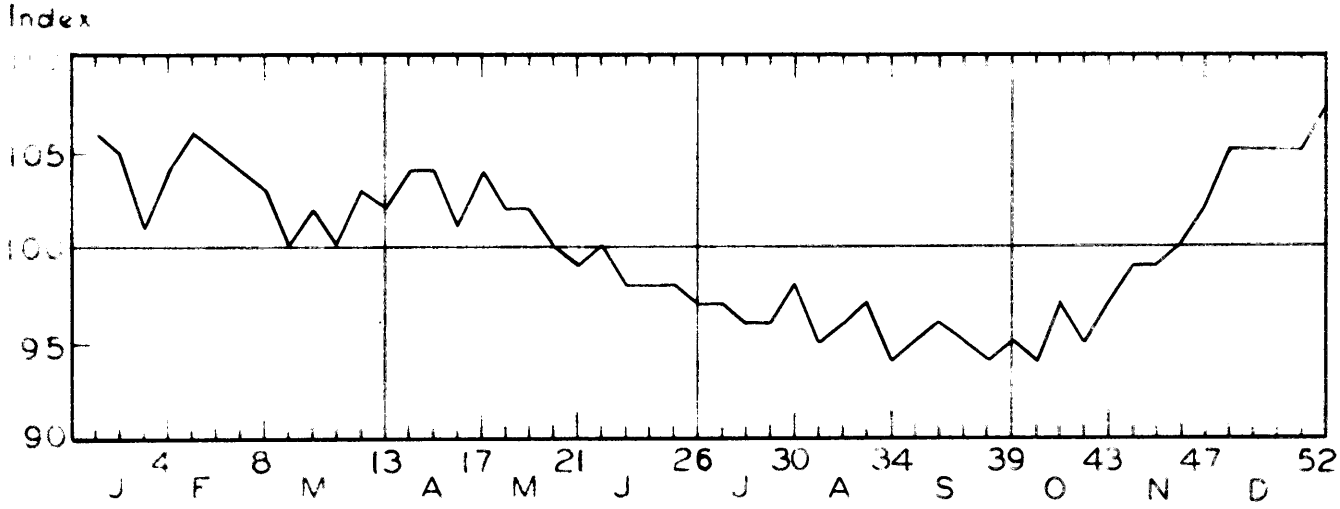

Figure 21. Seasonal Variation in the Broiler Feed Conversion Ratio in the 10-County Shenandoah Valley Area, 1951-1956 (Source: Table 24).

the period, 1951-1956. The index is below the average for the year from the second week in June to the third week in November and above the average for the other weeks of the year. This indicates that broilers moving to market in the summer and fall months have lower feed conversion ratios, while birds going to market in the winter and spring months have higher feed conversion ratios.1/

Table 23. Analysis of Variance of Seasonality of the Feed Conversion Ratio, 1951-1956.

Source of Variation	D. F.	S. S.	M. S.	F-Ratio
Between Means of Weeks	51	5.0210	.0985	7.24**
Remainder, Interaction	255	3.4789	.0136	

** Highly significant

The typical seasonal patterns of feed conversions ratios for the two periods, 1951-1953 and 1954-1956, are shown in Figure 22. Although the two indexes show similar seasonal patterns with the highest feed conversion ratios coming in the winter and spring months and the lowest falling in the summer and fall months, a test of significance was run for the latter period. The seasonal variation of feed conversion ratios was found to be highly significant for this period (Table 25).

Table 25. Analysis of Variance of Seasonality of the Feed Conversion Ratio, 1954-1956.

Source of Variation	D. F.	S. S.	M. S.	F-Ratio
Between Means of Weeks	51	2.772274	.054368	7.72**
Remainder, Interaction	102	.718598	.007045	

** Highly significant

1/ A low feed conversion ratio indicates efficient use of feed; a high ratio means poorer conversion of feed.

Table 24. Broiler Feed Conversion Ratio with the Index of Seasonal Variation, in the 10-County Shenandoah Valley Area, by Weeks, 1951-1956.

Week	Year						Seasonal Index, 1951-56*
	1951	1952	1953	1954	1955	1956	
	Pounds of Feed Per Pound of Broiler (liveweight)						Percent
1	4.066	3.217	3.341	3.391	3.163	3.177	105
2	3.996	3.400	3.328	3.327	3.192	3.041	105
3	3.186	3.174	3.044	3.301	3.211	2.989	101
4	3.447	3.179	3.262	3.472	3.174	2.965	104
5	3.707	3.254	3.306	3.408	3.171	3.078	106
6	3.490	3.147	3.351	3.453	3.219	2.920	105
7	3.507	3.027	3.348	3.324	3.252	2.855	104
8	3.419	3.213	3.110	3.362	3.255	2.816	103
9	3.259	3.145	3.342	3.257	3.042	2.838	100
10	3.338	3.171	3.401	3.263	3.185	2.847	102
11	3.214	3.645	3.055	3.283	2.906	2.859	100
12	3.285	3.283	2.137	3.395	2.997	2.780	103
13	3.254	3.165	3.097	3.241	2.989	2.914	102
14	3.346	3.374	3.201	3.183	3.027	2.818	104
15	3.139	3.143	3.132	3.344	3.072	2.861	104
16	3.366	3.103	3.162	3.138	2.980	2.776	101
17	3.633	3.272	2.994	3.226	3.010	2.820	104
18	3.353	3.084	3.115	3.200	2.933	2.938	102
19	3.286	3.163	3.141	3.193	2.936	2.844	102
20	3.067	3.237	3.143	3.111	2.868	2.775	100
21	3.434	3.076	3.009	3.233	2.855	2.712	99
22	3.370	2.934	3.036	3.443	2.892	2.804	100
23	3.092	3.191	3.128	3.072	2.878	2.735	98
24	3.355	3.130	3.021	3.089	2.825	2.763	98
25	3.141	3.229	3.046	3.060	2.836	2.650	98
26	3.122	3.118	3.067	2.998	2.838	2.634	97
27	2.980	3.073	3.021	3.048	2.866	2.652	97
28	2.965	2.981	2.910	3.004	2.926	2.617	96
29	3.008	2.922	3.059	3.036	2.819	2.590	96
30	3.160	3.116	3.099	3.061	2.846	2.670	98
31	3.059	2.905	2.977	3.003	2.881	2.605	95
32	2.990	3.031	2.990	2.913	2.886	2.613	96
33	3.304	3.065	2.930	2.969	2.907	2.735	97
34	3.217	2.947	3.070	2.901	2.786	2.654	94
35	2.822	3.058	3.069	2.922	2.844	2.637	95
36	3.549	3.117	3.030	2.979	2.853	2.658	96
37	2.996	3.095	3.130	2.962	2.845	2.618	95
38	3.412	3.987	3.108	2.912	2.773	2.541	94
39	3.214	3.235	3.027	2.905	2.846	2.654	95

Table 24. (cont'd)

Week	Year						Seasonal Index, 1951-56*
	1951	1952	1953	1954	1955	1956	
	Pounds of Feed Per Pound of Broiler (liveweight)						Percent
40	3.017	3.106	2.979	2.981	2.818	2.626	94
41	3.236	3.071	3.060	3.063	2.905	2.588	97
42	3.184	3.049	3.000	2.995	2.795	2.650	95
43	3.281	3.088	3.105	3.069	2.858	2.668	97
44	3.148	3.189	3.132	3.162	2.920	2.676	99
45	3.294	3.089	3.277	3.100	2.869	2.698	99
46	3.354	3.104	3.131	3.197	2.871	2.583	100
47	3.323	3.321	3.265	3.291	2.835	2.642	102
48	3.622	3.227	3.310	3.345	3.012	2.787	105
49	3.682	3.265	3.256	3.332	3.021	2.546	105
50	3.572	3.290	3.163	3.278	3.046	2.638	105
51	3.435	3.241	3.442	3.533	2.953	2.695	105
52	3.644	3.340	3.430	3.325	2.935	2.744	107
Average	3.329	3.153	3.123	3.162	2.946	2.767	

Based on data from the following records:

Year	No. of Flocks	No. of Birds	Year	No. of Flocks	No. of Birds
1951	237	545,000	1954	965	2,787,000
1952	465	1,260,000	1955	1,396	3,825,000
1953	842	2,316,000	1956	1,112	3,342,000

* Index computed by the link relative method.

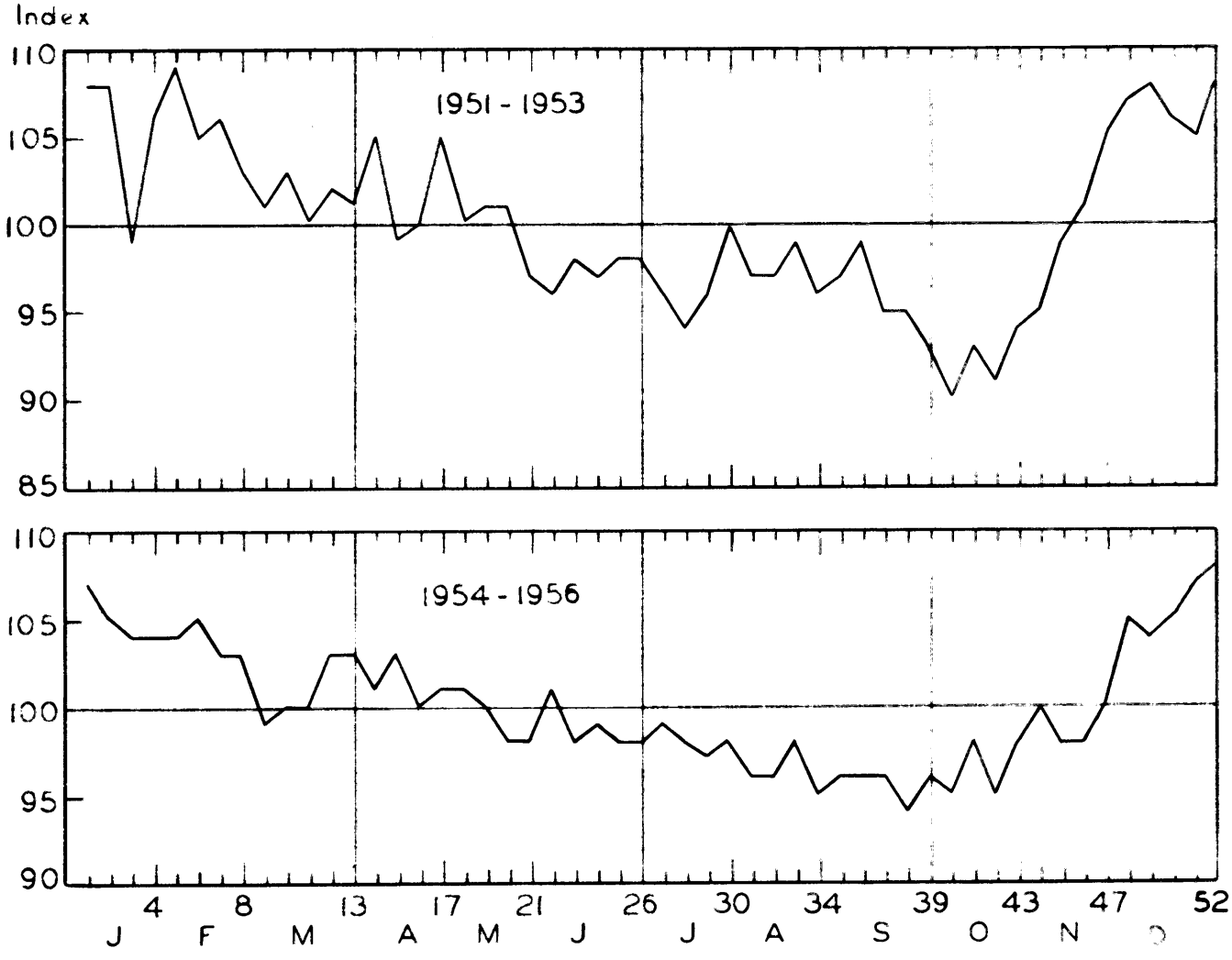

Figure 22. Seasonal Variation in the Broiler Feed Conversion Ratio in the 10-County Shenandoah Valley Area, 1951-1953 and 1954-1956 (Source: Appendix, Tables 17 and 18).

The range in the index of feed conversion ratios was from 9% above the average for the year to 10% below the average for the 1951-1953 period and from 8% above to 6% below the average for the year during the 1954-1956 period.

A close relationship is evident for the seasonal movement of the index of the feed conversion ratio and the index of cash production cost per pound (Figure 23). Both indexes were below the average for the year during the summer and fall months and above the average for the year during the winter and spring months. Figures 24 and 25 show essentially the same seasonal movements between the indexes of cash production cost per pound and feed conversion ratios for the periods, 1951-1953 and 1954-1956.

A correlation of the seasonal index of cash production cost per pound and the index of seasonal feed conversion ratios for the period, 1951-1956, gave a positive r-value significant at the 1% level. The r^2-value was 69.19%, indicating a high degree of association between the index of cash production cost per pound and the index of feed conversion ratios (Table 26).

Table 26. Correlation of Index of Feed Conversion Ratio with the Index of Cash Production Cost Per Pound, 1951-1956.

Indexes Correlated	r	D. F.	Level of Significance	r^2
Feed Conversion and Cash Production Cost, 1951-1956	.8318	50	1%	.6916

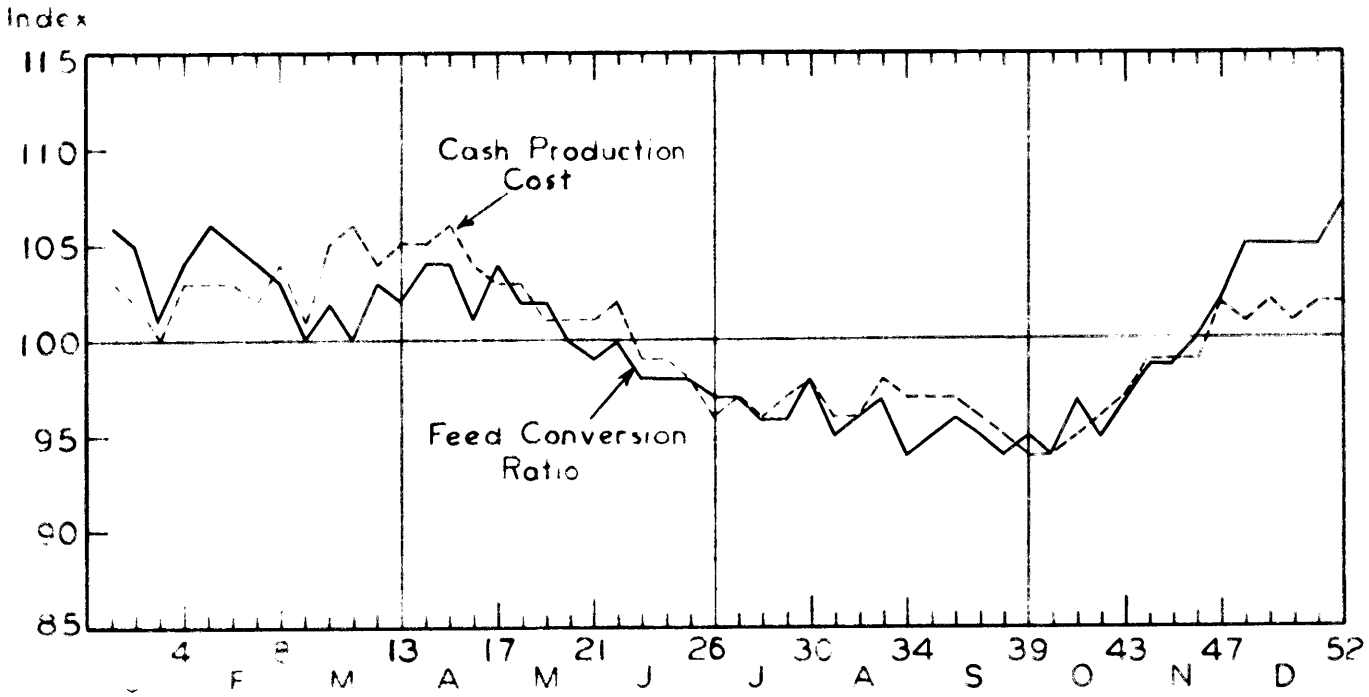

Figure 23. Seasonal Variation in the Feed Conversion Ratio and in Cash Production Cost of Broilers Sold in the 10-County Shenandoah Valley Area, 1951-1956 (Source: Tables 24 and 15).

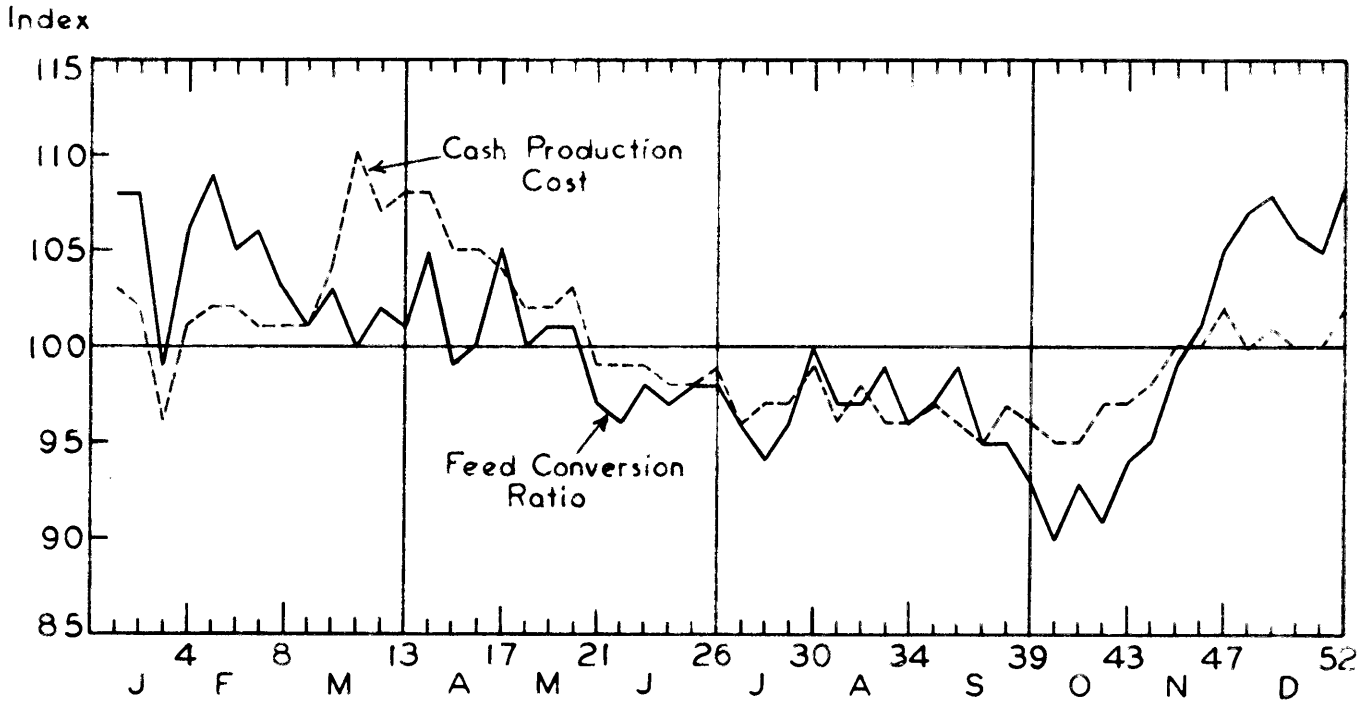

Figure 24. Seasonal Variation in the Feed Conversion Ratio and in Cash Production Cost of Broilers Sold in the 10-County Shenandoah Valley Area, 1951-1953 (Source: Appendix, Tables 17 and 10).

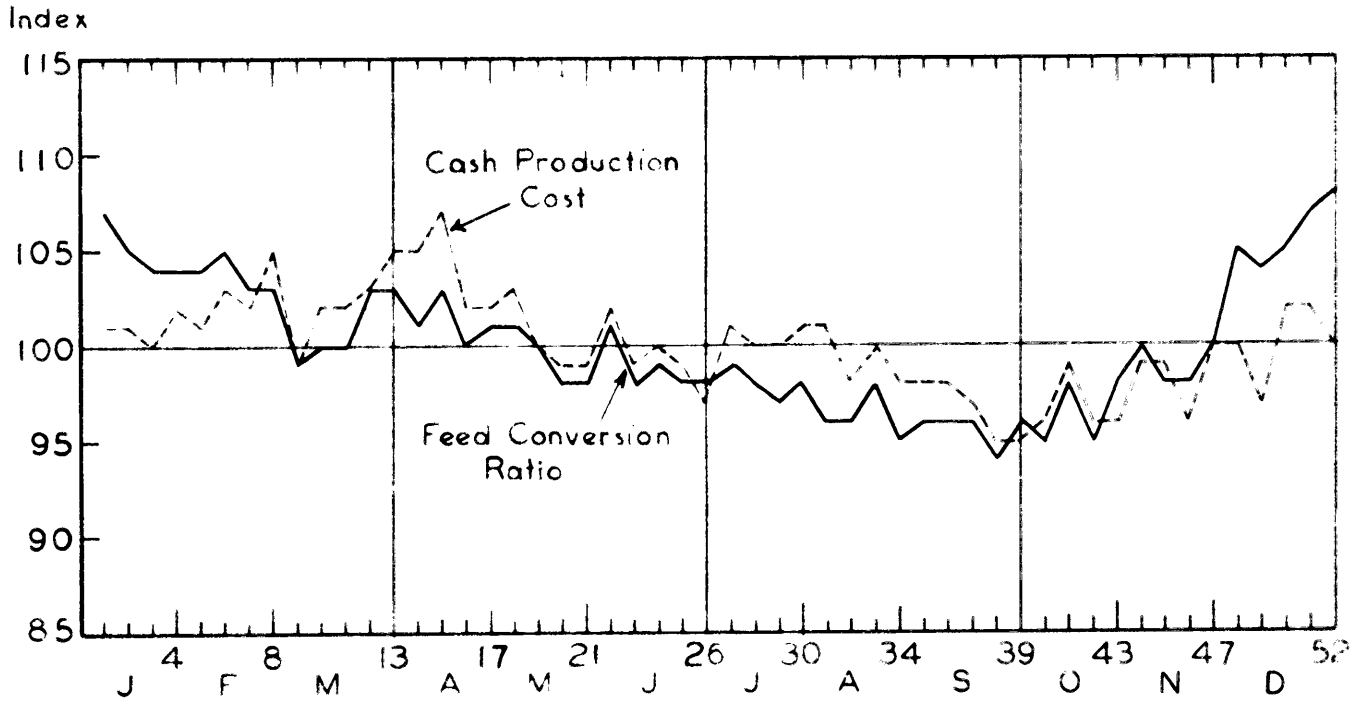

Figure 25. Seasonal Variation in the Feed Conversion Ratio and in Cash Production Cost of Broilers Sold in the 10-County Shenandoah Valley Area, 1954-1956 (Source: Appendix, Tables 18 and 11).

Influence of Seasonality of Average Weight, Days Age at Sale, Daily Rate of Gain, and Mortality on Seasonal Variation in the Feed Conversion Ratio

Many factors cause week-to-week variations in feed conversion ratios. Variations in such physical factors as weight, rate of gain, mortality, and age at sale are important in determining feed conversion ratios.

Average Weight

The seasonal variation of average weight was found to be highly significant for the period, 1951-1956 (Table 27). The indexes of average weights and feed conversion ratios are shown in Figure 26 for the period, 1951-1956. Both indexes follow similar seasonal patterns. Heavier weights and higher feed conversions are found during the winter months while lighter weights and lower feed conversions are associated in the summer months. In cooler weather the total feed intake per bird is greater which probably explains in part the reason that birds weigh heavier in the fall and winter months. Birds are sold at a later age from mid-summer on to the end of the year which also accounts for heavier weights in the fall and winter months.

Table 27. Analysis of Variance of Seasonality of Average Weight, 1951-1956.

Source of Variation	D. F.	S. S.	M. S.	F-Ratio
Between Means of Weeks	51	4.6171	.09053	10.82**
Remainder, Interaction	225	1.8831	.00837	

** Highly significant

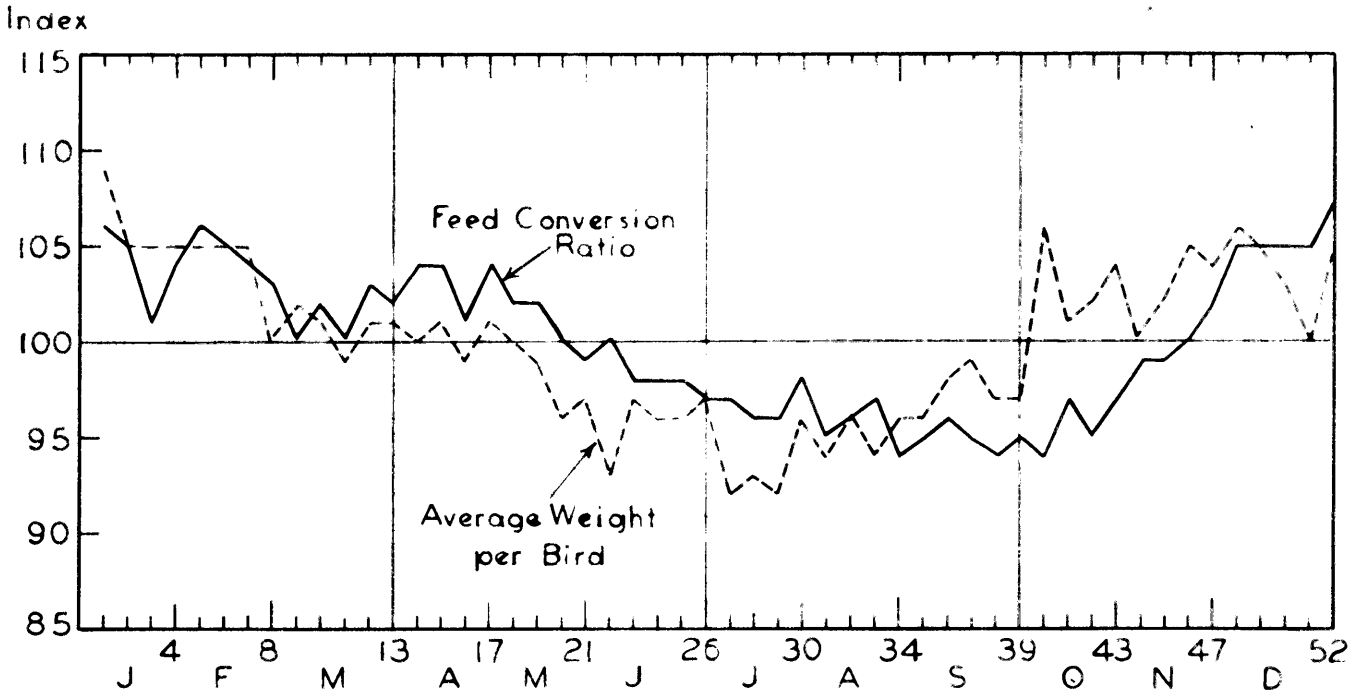

Figure 26. Seasonal Variation in the Average Weight and in the Feed Conversion Ratio of Broilers Sold in the 10-County Shenandoah Valley Area, 1951-1956 (Source: Appendix, Table 19; and Table 24).

However, during the summer months and during hot weather, the total feed consumption is less per bird which results in lighter weights up to marketable age. Also, the market age is somewhat younger in early and mid-summer which helps to explain further the lighter weights at this time. Lighter weights in the summer months, however, are not necessarily an indication of poor feed efficiencies. In fact, the lowest feed efficiencies are found during the summer and fall months (Figure 21). Also credited to the better feed efficiencies at this time are favorable growing conditions, fewer disease outbreaks, and low mortality.

A correlation of the seasonal indexes of the feed conversion ratio and average weights for the period, 1951-1956, gave a positive r-value, significant at the 1% level. The r^2-value gave a 43.88% association between the two indexes (Table 28).

Table 28. Correlation of Index of Feed Conversion Ratio with the Indexes of Average Weight, Days Age at Sale, Daily Rate of Gain, and Percent Mortality, 1951-1956.

Indexes Correlated	r	D. F.	Level of Significance	r^2
Feed Conversion and Average Weight	.6624	50	1%	.4388
Feed Conversion and Average Age at Sale	.2984	50	5%	.0890
Feed Conversion and Average Daily Rate of Gain	.6702	50	1%	.4442
Feed Conversion and Percent Mortality	.5627	50	1%	.3166

Age at Sale

The seasonal variation of average age at sale proved to be highly significant for the period, 1951-1956 (Table 29). The index of average days age at sale and the index of feed conversion ratios are illustrated in Figure 27. The average age of birds sold is below the average for the year during the spring and summer months and above the average for other weeks of the year.

Table 29. Analysis of Variance of Seasonality of Age at Sale, 1951-1956.

Source of Variation	D. F.	S. S.	M. S.	F-Ratio
Between Means of Weeks	51	722	14.157	2.79**
Remainder, Interaction	255	1,295	5.078	

** Highly significant

General evidence shows that the age at which birds are sold affects feed efficiency in two directions. Poorer feed efficiencies are usually obtained when selling at either a too young or too old age. However, the average weight must be considered when deciding the optimum age at sale. As shown in Figure 27, the average age tended to be higher from mid-summer on to the end of the year, yet feed conversion ratios remained below the average for the year until fall. In the fall, broiler prices start their seasonal decline which probably causes a tendency on the part of the growers to hold birds longer in anticipation that prices will rise in the near future. Although the birds sold at this time are older, the effect of cooler growing weather at the end of summer results in more rapid gains and heavier birds. With good growing

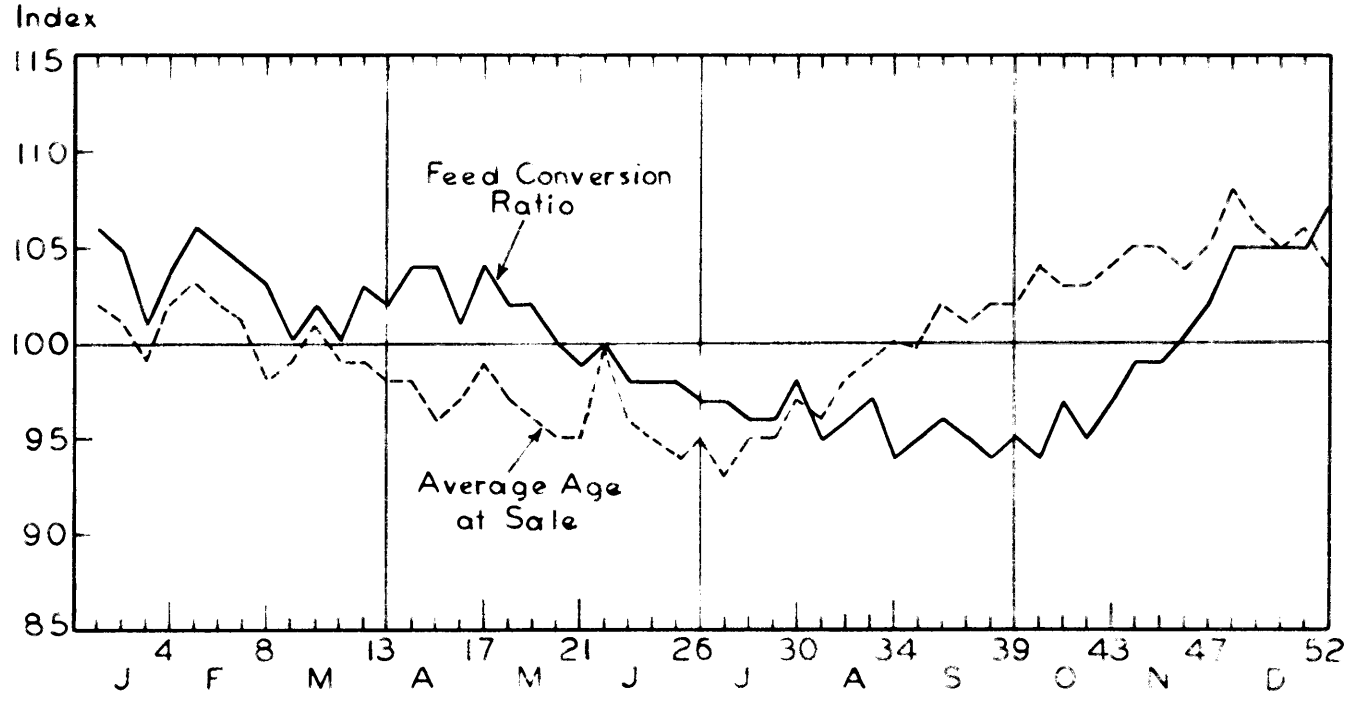

Figure 27. Seasonal Variation in Days Age at Sale and in the Feed Conversion Ratio of Broilers Sold in the 10-County Shenandoah Valley Area, 1951-1956 (Source: Appendix, Table 20; and Table 24).

conditions, relatively less disease problems result and more efficient feed conversions are obtained in the fall months.

A correlation of the seasonal index of the feed conversion ratio and average age at sale for the period, 1951-1956, gave a positive r-value significant at the 5% level (Table 28). However, the two seasonal indexes showed only a 9% association.

Daily Rate of Gain

Table 30. Analysis of Variance of Seasonality of Daily Rate of Gain, 1951-1956.

Source of Variation	D. F.	S. S.	M. S.	F-Ratio
Between Means of Weeks	51	22.279	.4368	2.01**
Remainder, Interaction	255	55.364	.2171	

** Highly significant

Rate of gain, as measured by the daily gain in pounds per 100 birds, is tied in very closely to weight at sale and average age at sale. The seasonal variation of average daily rate of gain was found to be highly significant for the period, 1951-1956 (Table 30). The seasonal index of average daily rate of gain follows very closely the seasonal pattern of feed conversion ratios (Figure 28). Periods of low feed conversion ratios coincide with periods of low daily rate of gains. General evidence indicates, however, that lower feed conversion ratios are usually associated with a higher daily rate of gain. Lighter weights and younger birds in the summer account for the apparent discrepancy.

A correlation of the index of feed conversion ratios and the index of average daily rate of gain gave a positive r-value significant at

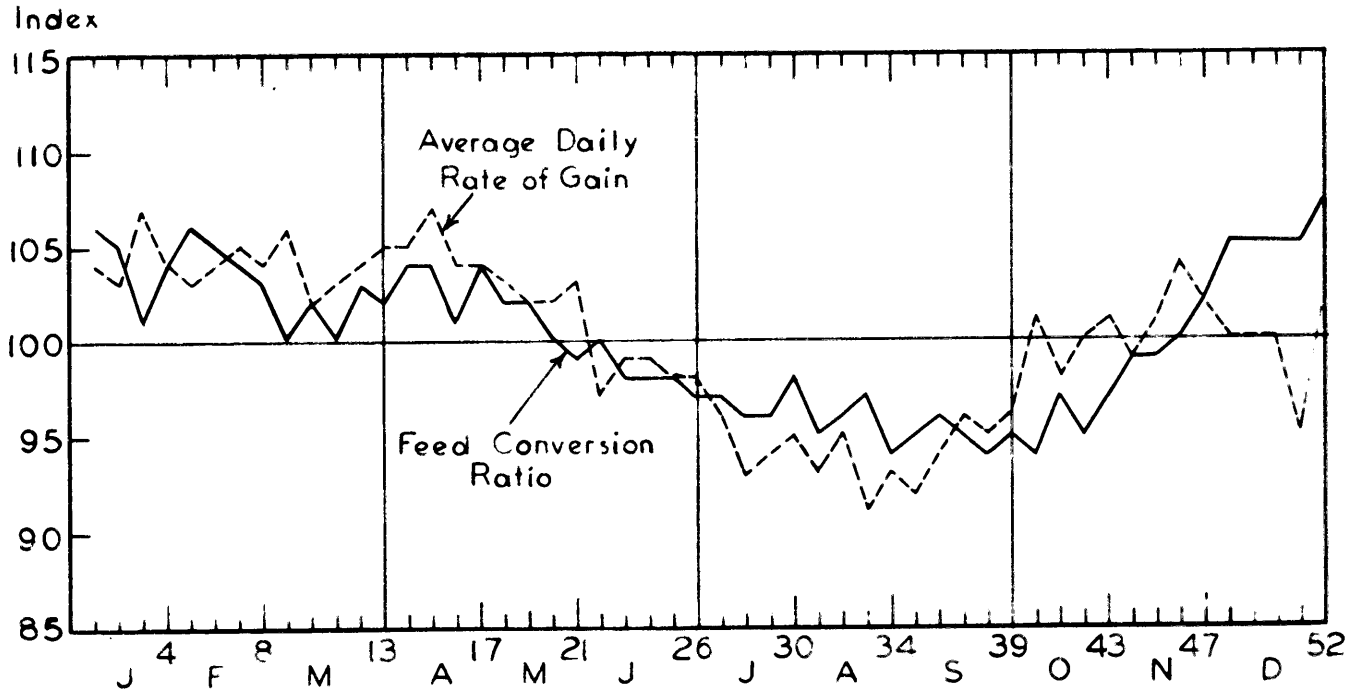

Figure 20. Seasonal Variation in Daily Rate of Gain and in the Feed Conversion Ratio of Broilers Sold in the 10-County Shenandoah Valley Area, 1951-1956 (Source: Appendix, Table 21; and Table 24).

the 1% level. The r^2-value gave a 44.92% association between the two indexes (Table 28).

Percent Mortality

The seasonal variation of percent of mortality was found to be highly significant for the period, 1951-1956 (Table 31). The seasonal index of mortality and the index of feed conversion ratios is shown in Figure 29 for the period, 1951-1956. Although the index of mortality shows wide and erratic weekly fluctuations, a seasonal pattern is evident. The highest percent of mortality occurred in the winter months and the lowest in the summer.

Table 31. Analysis of Variance of Seasonality of Mortality, 1951-1956.

Source of Variation	D. F.	S. S.	M. S.	F-Ratio
Between Means of Weeks	51	452	8.8627	2.02**
Remainder, Interaction	255	1,120	4.3921	

** Highly significant

Percent of mortality has a very definite effect on feed conversion ratios. The amount of feed consumed by the birds lost enters into total feed used when the feed conversion ratio is computed. For this reason, a high rate of mortality is associated with poor feed efficiency or high feed conversion ratios (Figure 29). However, the exact effect of percent of mortality on feed efficiency depends upon the age of the bird at death. A greater feed loss is incurred when older birds die because more feed has been consumed.

A correlation of the index of feed conversion ratios and the index of mortality gave a positive r-value significant at the 1% level. The

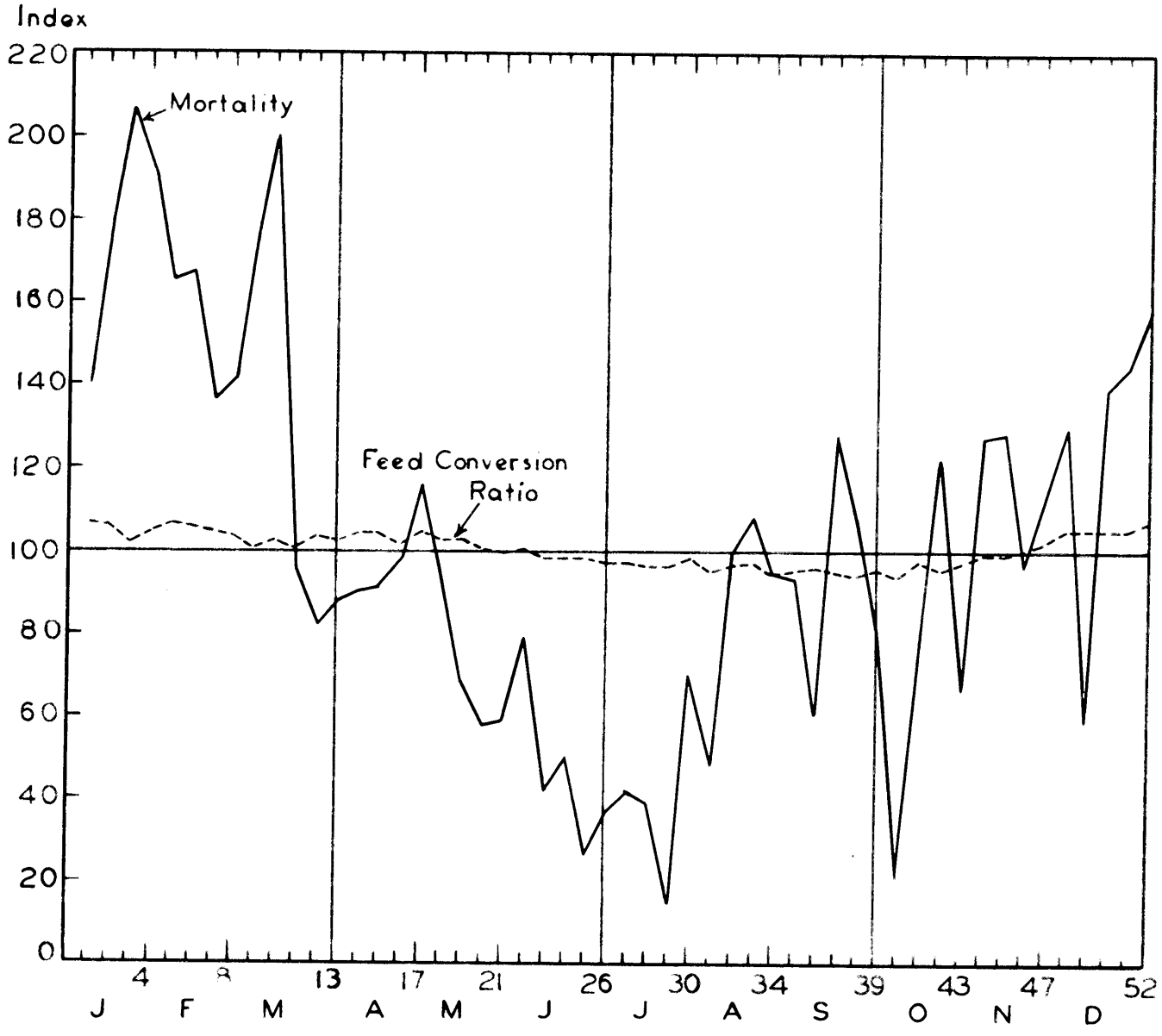

Figure 29. Seasonal Variation in Mortality and in the Feed Conversion Ratio of Broilers Sold in the 10-County Shenandoah Valley Area, 1951-1966 (Source: Appendix, Table 22; and Table 24).

r^2-value showed a 31.66% association between the two indexes (Table 29).

Relationship Between the Seasonality of Cash Production Cost and the Seasonality of Broiler Marketings

A significant seasonal pattern was found for both the index of cash production cost and the index of broiler marketings. The relationship between the weekly index of broiler marketings and the weekly index of total cash production cost per pound of broiler sold is indicated in Figures 30, 31, and 32 for the periods, 1951-1956 and 1951-1953 and 1954-1956, respectively.

All three figures show an inverse relationship between the index of cash production cost and the index of broiler marketings. The high point of the index of total cash production cost in the spring occurs during the low weeks of the index of marketings; likewise, the low cash production cost index in the summer and fall comes at the time when the index of broiler marketings is highest (Figures 30, 31, and 32).

In order to test the degree of association between the weekly index of cash production cost and the weekly index of broiler marketings correlations were run for all three periods, giving negative r-values which were statistically significant at the 1% level (Table 32). The r^2-value was 37.43% for 1951-1956, 64.03% for 1951-1953, and 14.63% for 1954-1956.

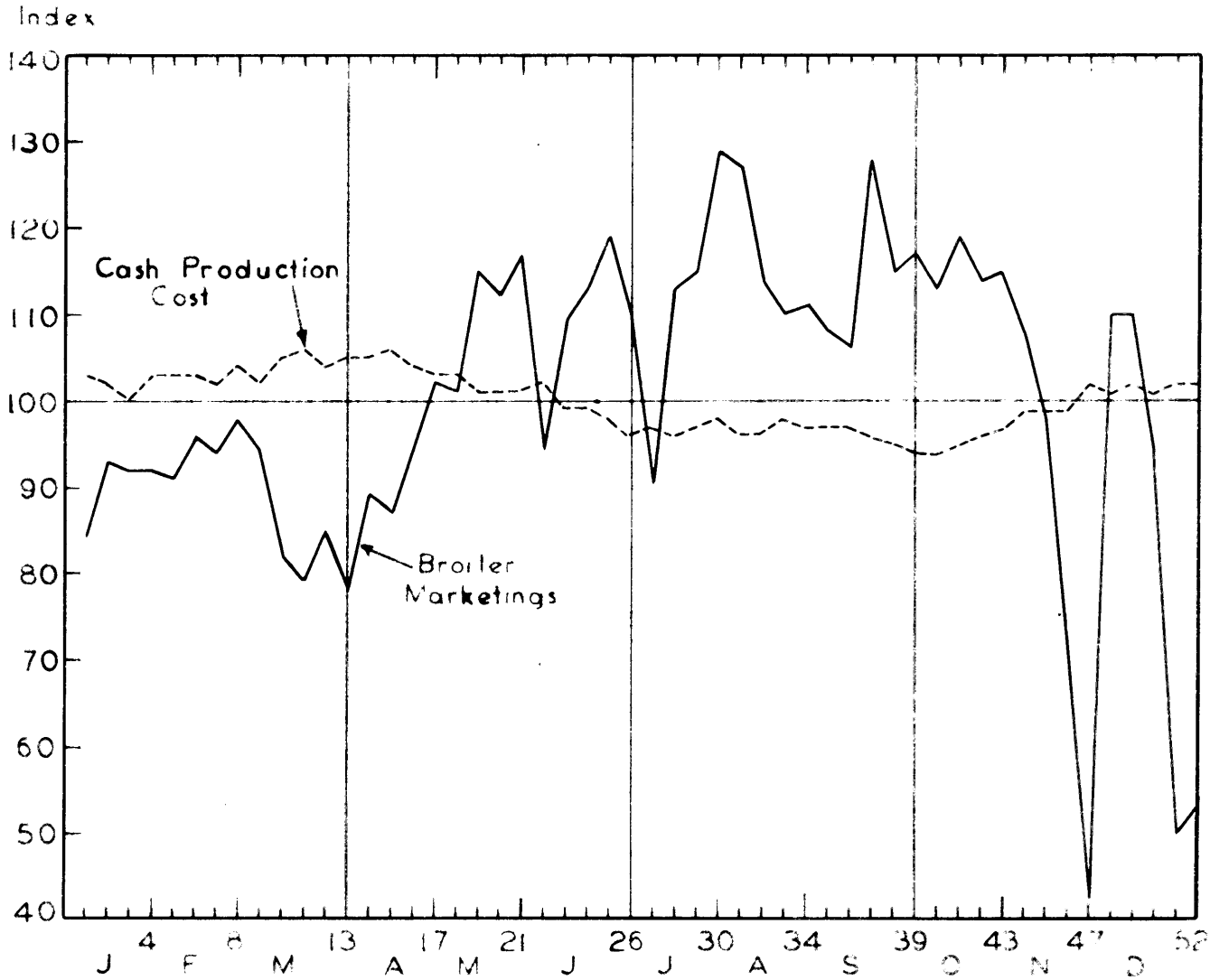

Figure 30. Seasonal Variation in the Cash Production Cost Per Pound of Broiler Sold and in Broiler Marketings in the 10-County Shenandoah Valley Area, 1951-1956 (Source: Tables 15 and 8).

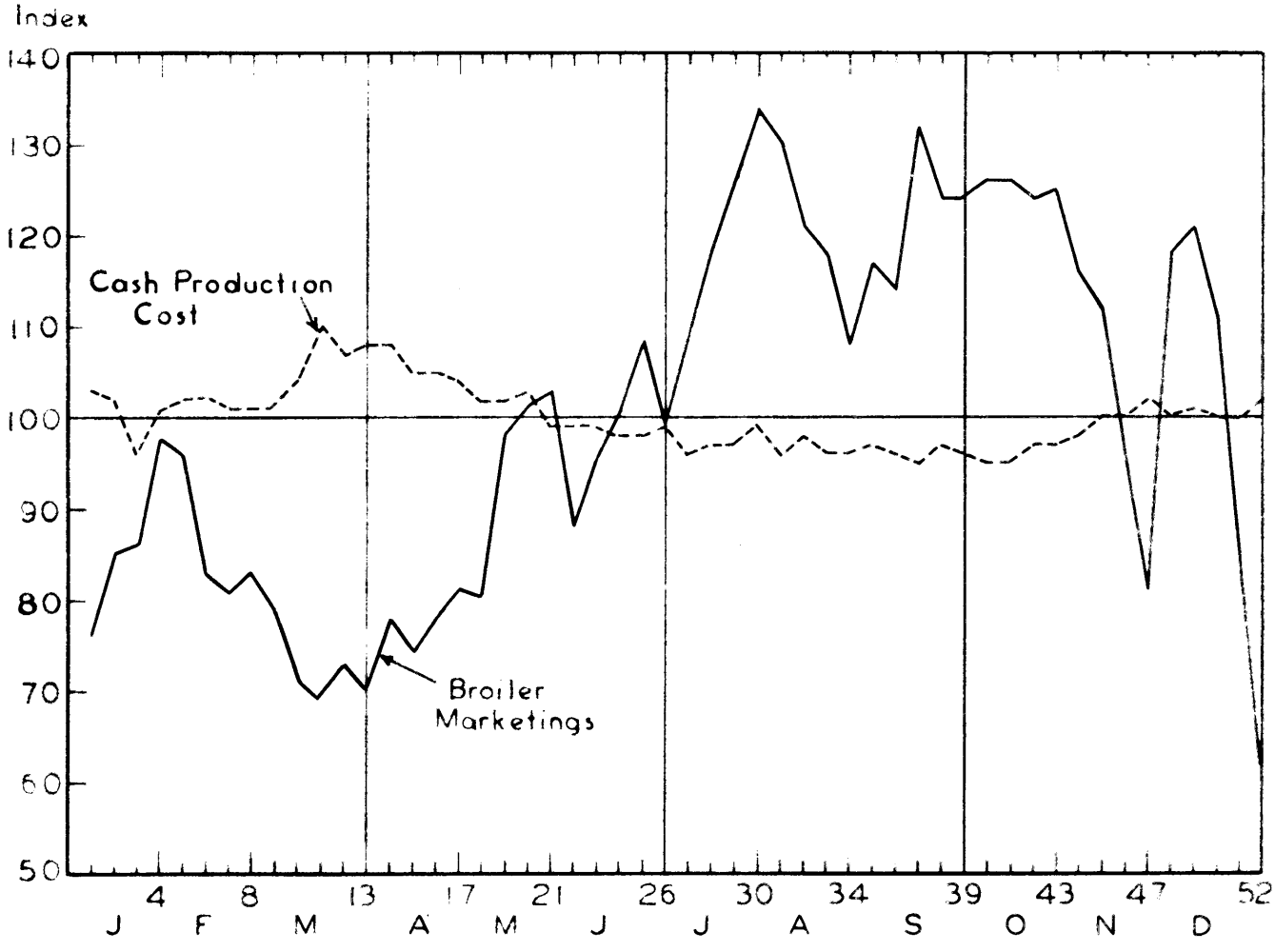

Figure 31. Seasonal Variation in the Cash Production Cost Per Pound of Broiler Sold and in Broiler Marketings in the 10-County Shenandoah Valley Area, 1951-1953 (Source: Appendix, Tables 10 and 6).

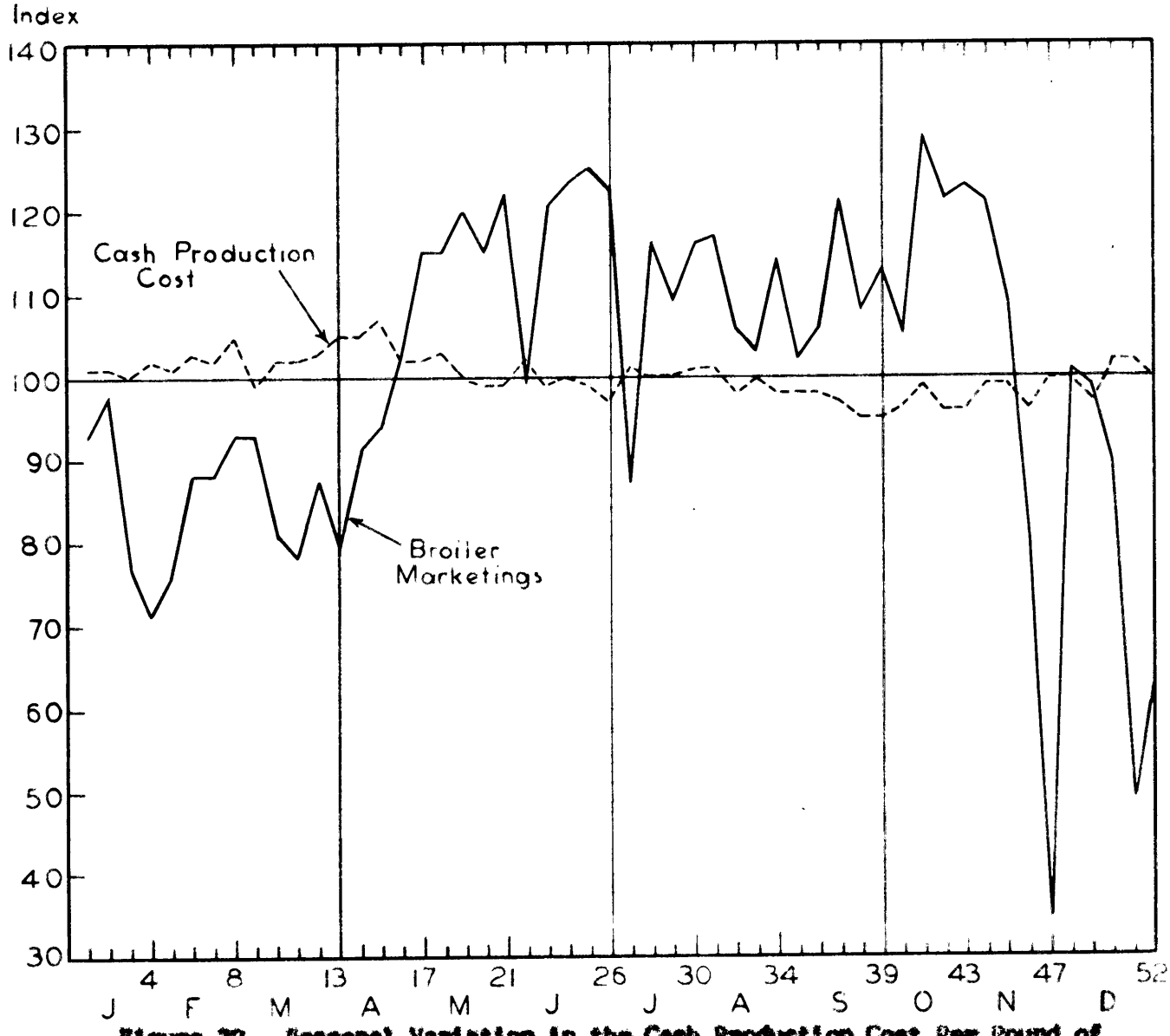

Figure 32. Seasonal Variation in the Cash Production Cost Per Pound of Broiler Sold and in Broiler Marketings in the 10-County Shenandoah Valley Area, 1954-1956 (Source: Appendix, Tables 11 and 7).

Table 32. Correlation of Index of Cash Production Cost Per Pound with the Index of Broiler Marketings, 1951-1956, 1951-1953, and 1954-1956.

Indexes Correlated	r	D. F.	Level of Significance	r^2
Cash Production Cost and Broiler Marketings, 1951-1956	-.6118	50	1%	.3743
Cash Production Cost and Broiler Marketings, 1951-1953	-.8002	50	1%	.6403
Cash Production Cost and Broiler Marketings, 1954-1956	-.3825	50	1%	.1463

These values indicate that a negative relationship exists between the index of the weekly patterns of total cash production cost and broiler marketings. Taking into consideration all the other factors mentioned earlier which affect the seasonality of marketings, it would seem that the above r^2-values point out a reasonable percent of relationship between the index of seasonal variations in marketings and production cost.

The earlier period, 1951-1953, shows a high percent of relationship. Feed dealers and producers in the earlier years may have placed more emphasis on the seasonality of production cost as a factor in planning their placements and market supply. In the past few years, however, broiler production has expanded rapidly, making for greater competition between areas and resulting in reduced margins and broiler profits. In order to make a comparable profit, feed dealers have gone into larger volume operations. Since overhead and fixed costs are important in the

margins of a volume operation, feed dealers are anxious to keep their facilities engaged and to continue their volume operations even though the price of broilers drops a point equal to the cash production cost. This probably has led feed dealers to pay less attention to the seasonality of cash production cost as long as market price is sufficient to cover cash production cost.

Feed efficiency contracts came into the Valley in 1955. Efficient producers are assured of a fairly stable income under such financing arrangements and therefore they tend to keep their houses full the year around, regardless of the season of the year. Growers probably pay less attention to the seasonality of cash production cost under such arrangements.

SUMMARY AND CONCLUSIONS

This study was undertaken to determine the influence of seasonality on marketings, farm price and cash production cost of broilers in the 10-County Shenandoah Valley Area. The association between the seasonal pattern of broiler marketings and the seasonal variation in broiler prices and the relationship of seasonal variations in cash production cost to the seasonal movement of broiler marketings were also determined. Weekly, rather than monthly data were used in the construction of various seasonal indexes.

Seasonal Variation in Broiler Marketings

The seasonal variation in broiler marketings proved highly significant for the six-year period, 1951-1956. The typical seasonal pattern showed the fewest number of broilers marketed in the winter and spring weeks and the largest volume in the summer and fall weeks. Marketings are forecast by chick placements 9-11 weeks earlier. Chick placements showed a significant seasonal movement, being above the average for the year from the middle of February to the middle of August and below the average for the other weeks of the year. A five week lag in the seasonal rise in the first quarter and a five week lag in the seasonal decline in the third quarter was found during the latter half of the period studied as compared with the earlier half of the period. No pronounced seasonal change was evident, however, in marketings in spite of the change in the seasonal pattern of chick placements. This change in the seasonal movement of broiler placements in the Shenandoah Valley was

very similar to that of other major broiler areas. Placements in the Valley Area are reduced somewhat during the late spring and early summer weeks because of the increase in turkey placements.

Seasonality of Broiler Prices

The seasonality of broiler prices proved to be highly significant for the six-year period, 1951-1956. It was not statistically significant for the earlier period, 1951-1953, but was highly significant during the latter years, 1954-1956. The typical index of prices was above the average for the year from the first of March to the last of September and below the average for the fourth quarter and the remaining weeks of the year. The highest prices occurred in the mid-spring and mid-summer weeks. In the earlier three-year period, 1951-1953, the peak price index fell in the latter part of the summer as compared to the mid-spring period for the latter group of years, 1954-1956. The seasonal decline of prices in the latter period began five weeks earlier than in the earlier period.

Relationship Between Seasonal Index of Broiler Marketings and the Seasonal Index of Broiler Prices

A correlation of the seasonal index of prices and the seasonal index of marketings was statistically significant for the period, 1951-1956, however, the percent of association explained was only 16%. A correlation of the two indexes for the earlier period, 1951-1953, was highly significant, but explained only 17% of the association. The correlation for the latter period, 1954-1956, was not statistically significant at the 5% level.

Seasonality of Cash Production Cost

The seasonal variation in cash production cost was found to be significant. The typical seasonal movement showed a high cash production cost in the winter and spring weeks and a low cash production cost in the summer and fall weeks. No apparent seasonal change was evident during the period studied.

The seasonal variation of feed cost, fuel cost, and medication cost each proved highly significant for the period, 1954-1956. Chick cost and litter cost for the same period failed to show a significant seasonal variation at the 5% level. The seasonal patterns of feed cost, fuel cost, and medication cost were similar to that of total cash production cost, in that the period of low production cost came in the summer and fall weeks and the period of high cost occurred in the winter and spring weeks. The index of chick cost per pound, although not statistically significant, showed some decline corresponding with the drop of chick placements from the season's peak in April. The index of litter cost failed to show a true seasonal pattern. A correlation of the seasonal indexes of feed cost, chick cost, and fuel cost with the seasonal index of total cash production cost showed a 51% association for fuel cost, 39% for feed cost, and 29% association for chick cost.

The seasonal variation in the feed conversion ratio proved highly significant. Feed cost, the largest cost item in cash production cost, is determined largely by the feed conversion ratio. The typical seasonal variation in the feed conversion ratio showed a 69% association with the typical seasonal index of cash production cost.

Variations in average weight, age at sale, daily rate of gain, and mortality are known to influence the feed conversion ratio. The typical seasonal movement of the index of each of these factors was similar to that of the index of the feed conversion ratio for the period, 1954-1956. The seasonal index of average weight and daily rate of gain both showed a 44% association with the index of the feed conversion ratio. Only a 9% association was obtained between the seasonal index of average age and the seasonal index of the feed conversion ratio. The index of mortality showed a downward drop from winter to summer. A correlation of the seasonal index of mortality with the seasonal index of the feed conversion ratios gave a 32% association.

Relationship Between the Index of Cash Production Cost and the Seasonal Index of Broiler Marketings

A significant inverse relationship was evident between the seasonal index of cash production cost and the seasonal index of broiler marketings. A high index of production cost and a low index of broiler marketings occurred in the spring weeks; during the summer weeks a low index of production cost occurred during the same period as a high index of broiler marketings. A greater degree of relationship was evident between the seasonal index of cash production cost and the seasonal index of marketings during the earlier years of the period. The latter years, 1954-1956, gave only a 15% association between the two seasonal indexes. This may indicate that feed dealers and producers are placing less emphasis on seasonality of production cost in planning their broiler growing operations.

BIBLIOGRAPHY

Buck, J. T., "An Evaluation of Broiler Financing Methods in Virginia", Virginia Agricultural Experiment Station, Bulletin 470, October 1954.

Foote, R. J. and Fox, K. A., "Seasonal Variation: Method of Measurement and Test of Significance", Agriculture Handbook, No. 48, United States Department of Agriculture, 1952, pp. 8-11.

Gerra, M. J., "Broilers Bring Best Prices When Marketings Are Largest", Agricultural Situation, Volume 40, No. 7, July 1956, pp. 8-9.

Pearson, F. A. and Bennett, K. R., Statistical Methods, Third Edition, Wiley & Sons, Inc., 1949, p. 95.

Plaxico, J. S., "Good Broiler Management Pays", Virginia Agricultural Experiment Station, Bulletin 437, June 1950.

Plaxico, J. S., "Monthly Variations in Prices and the Cost of Production of Broilers", Virginia Farm Economics, No. 138, May 1954, pp. 6-8.

Thomsen, F. L. and Foote, R. J., Agriculture Prices, Second Edition, McGraw-Hill, 1952, pp. 324, 326.

Waite, W. C. and Trelogan, H. C., Agricultural Market Prices, Second Edition, Wiley & Sons, Inc., 1951.

Waugh, A. E., Elements of Statistical Method, Second Edition, McGraw-Hill, 1953, pp. 337-341.

The vita has been removed from the scanned document

APPENDIX

STATISTICAL TABLES

Table 1. Broiler Chick Placements with the Index of Seasonal Variation, in the 10-County Shenandoah Valley Area, by Weeks, 1951-1953.

Week	Year			Seasonal Index, 1951-53*	Week	Year			Seasonal Index, 1951-53*
	1951	1952	1953			1951	1952	1953	
	Thousands			Percent		Thousands			Percent
1	636	741	851	87	27	699	761	964	101
2	585	738	878	86	28	698	738	995	100
3	587	736	922	86	29	729	835	843	105
4	650	698	926	86	30	703	758	796	98
5	762	873	840	100	31	670	702	806	92
6	730	889	853	102	32	715	747	802	98
7	910	973	1,000	119	33	638	779	769	93
8	871	998	1,036	122	34	646	652	730	87
9	967	995	1,066	125	35	661	660	753	89
10	923	1,016	1,047	122	36	616	614	763	82
11	939	1,081	1,086	126	37	602	625	886	83
12	995	1,054	1,032	123	38	571	615	848	78
13	1,037	957	1,072	127	39	497	613	793	71
14	1,037	985	1,099	130	40	474	682	894	81
15	1,001	907	1,117	125	41	407	574	854	67
16	978	909	1,067	121	42	499	517	949	76
17	939	932	1,046	118	43	454	715	958	76
18	949	915	1,036	117	44	577	817	989	89
19	878	878	933	117	45	600	865	1,003	93
20	940	954	955	109	46	739	852	958	91
21	828	816	974	103	47	720	893	984	93
22	857	707	986	104	48	788	882	889	92
23	806	823	1,069	113	49	814	916	944	95
24	815	859	981	114	50	831	938	969	93
25	803	953	1,045	122	51	779	900	784	90
26	765	851	971	112	52	674	805	970	77
					Total	38,936	42,460	48,689	

Source of Data - Virginia Cooperative Crop Reporting Service.

* Index computed by the link relative method.

Table 2. Broiler Chick Placements with the Index of Seasonal Variation, in the 10-County Shenandoah Valley Area, by Weeks, 1954-1956.

Week	Year			Seasonal Index, 1954-56*	Week	Year			Seasonal Index 1954-56*
	1954	1955	1956			1954	1955	1956	
	Thousands			Percent		Thousands			Percent
1	909	748	1,098	92	27	1,045	1,166	973	104
2	879	684	939	83	28	981	1,159	1,056	103
3	950	741	927	90	29	1,044	1,225	990	109
4	944	978	976	94	30	1,146	1,172	1,026	113
5	1,020	1,036	949	99	31	1,139	1,052	1,102	112
6	1,004	1,104	1,023	97	32	1,175	999	1,154	115
7	1,019	1,011	1,112	98	33	1,139	965	1,091	110
8	1,071	1,148	1,140	103	34	1,020	1,016	1,044	104
9	1,089	1,035	1,115	100	35	929	894	1,139	93
10	1,099	967	1,125	101	36	933	913	970	93
11	1,163	992	1,182	106	37	793	941	966	92
12	1,069	1,029	1,308	109	38	656	978	892	84
13	1,160	1,175	1,196	118	39	753	918	939	88
14	1,136	1,189	1,201	119	40	477	916	825	75
15	1,060	1,172	1,175	115	41	409	762	720	61
16	1,135	1,123	1,093	110	42	456	820	641	70
17	1,128	1,177	1,095	110	43	598	835	730	89
18	1,093	1,136	1,075	106	44	635	937	807	95
19	1,081	1,146	1,158	106	45	677	908	914	96
20	1,096	1,166	1,055	107	46	775	844	874	96
21	1,086	1,128	1,128	106	47	820	863	812	98
22	943	1,087	1,169	101	48	710	884	890	101
23	1,003	1,159	1,216	108	49	648	910	863	97
24	999	1,180	1,144	107	50	670	968	980	104
25	985	1,169	1,150	105	51	527	1,021	992	105
26	1,038	1,148	1,130	103	52	763	950	683	92
					Total	48,291	53,462	53,002	

Source of Data - Virginia Cooperative Crop Reporting Service

* Index computed by the link relative method.

Table 3. Broiler Chick Placements with the Index of Seasonal Variation, in the Major Commercial Broiler Areas of the United States, by Weeks, 1951-1953.

Week	Year			Seasonal Index, 1951-53*
	1951	1952	1953	
		Thousands		Percent
1	8,805	11,946	14,143	
2	9,033	12,056	14,295	95
3	8,905	10,632	13,885	92
4	9,756	11,554	13,840	100
5	9,877	12,546	14,162	102
6	10,642	13,299	13,884	108
7	11,299	14,039	14,187	114
8	11,605	14,144	14,573	116
9	11,321	14,067	15,152	116
10	10,970	14,268	15,037	115
11	11,235	13,791	15,710	117
12	11,596	13,135	15,924	119
13	12,211	12,595	15,490	115
14	12,252	12,449	15,882	115
15	12,267	12,271	15,630	113
16	12,164	12,048	16,077	112
17	12,176	12,096	15,937	112
18	12,159	11,535	16,097	112
19	12,247	11,584	15,840	112
20	11,933	11,491	15,507	109
21	12,152	11,210	15,261	107
22	12,141	10,768	15,425	107
23	11,826	10,770	15,375	106
24	11,619	11,231	15,389	106
25	11,532	11,429	15,163	105
26	11,450	11,380	14,327	104
27	11,139	10,862	14,218	101
28	11,231	10,668	13,751	97
29	10,956	10,194	13,319	95
30	10,528	8,668	12,769	91
31	10,526	8,657	12,289	90
32	10,288	9,449	12,053	88
33	9,644	9,349	12,600	87
34	9,409	8,617	12,502	84
35	9,312	8,554	11,793	83
36	9,074	8,865	11,397	81
37	9,020	9,100	11,764	83
38	9,171	9,054	12,185	84
39	8,976	9,337	12,326	85

Table 3. (cont'd)

Week	Year 1951	1952	1953	Seasonal Index, 1951-53*
		Thousands		Percent
40	8,686	9,521	11,866	82
41	8,596	9,892	12,087	83
42	8,627	9,656	12,584	83
43	8,917	10,237	13,348	88
44	9,270	10,384	13,757	91
45	9,330	10,675	14,193	94
46	9,580	10,809	14,458	96
47	10,088	11,249	14,858	100
48	10,565	11,053	15,071	101
49	10,628	11,421	15,355	103
50	10,721	11,691	15,380	104
51	11,026	11,950	15,700	106
52	10,038	10,770	13,219	94
Total	548,519	579,016	737,034	

Source of Data - Crops and Markets, Vol. 28, 29, and 30.

Based on chick placement reports for 11 commercial areas in 1951 and 1952; 14 commercial areas in 1953.

* Index computed by the link relative method.

Table 4. Broiler Chick Placements with the Index of Seasonal Variation, in the Major Commercial Broiler Areas of the United States, by Weeks, 1954-1956.

Week	Year			Seasonal Index, 1954-56*
	1954	1955	1956	
		Thousands		Percent
1	15,075	15,420	21,109	**
2	14,913	14,964	21,186	90
3	14,172	15,383	20,671	88
4	13,807	17,425	22,039	93
5	14,451	19,039	22,741	97
6	14,911	20,016	23,306	100
7	14,804	20,143	23,628	101
8	14,896	20,687	23,716	101
9	14,891	20,382	23,644	101
10	15,143	19,779	24,217	102
11	15,531	19,964	24,850	105
12	15,679	20,745	25,681	108
13	16,267	21,637	29,915	112
14	16,074	21,839	26,313	111
15	16,062	22,306	26,719	112
16	16,404	22,149	26,662	112
17	15,984	22,406	26,449	111
18	15,408	22,518	26,503	111
19	15,854	22,571	26,882	112
20	16,138	22,767	26,963	113
21	15,206	22,607	26,989	112
22	14,355	22,694	27,487	112
23	14,396	22,774	27,522	113
24	14,690	23,294	27,714	115
25	15,341	22,619	27,293	113
26	15,447	22,701	27,212	113
27	15,441	22,054	25,745	109
28	15,136	22,351	25,360	107
29	15,018	22,099	24,651	106
30	14,328	21,700	23,825	102
31	14,487	20,799	23,956	102
32	13,915	20,159	23,676	99
33	13,834	19,429	23,577	98
34	13,998	18,349	23,362	97
35	13,782	17,652	22,633	93
36	13,302	17,605	21,594	90
37	13,488	17,659	21,005	90
38	13,006	17,708	21,198	90
39	12,952	17,998	21,504	91

Table 4. (cont'd)

Week	Year			Seasonal Index, 1954-56*
	1954	1955	1956	
		Thousands		Percent
40	12,819	18,176	21,192	90
41	11,586	18,288	21,030	89
42	11,387	18,596	19,977	87
43	11,426	18,780	20,141	88
44	11,659	18,982	20,667	89
45	11,674	19,023	21,292	89
46	11,722	19,595	21,270	90
47	12,618	19,534	21,132	89
48	12,193	20,276	21,536	91
49	12,459	20,447	22,149	93
50	11,518	20,505	21,380	91
51	11,842	20,737	21,887	92
52	11,847	20,584	17,261	91
Total	730,485	1,062,617	1,230,912	

Source of Data - Crops and Markets, Vol. 31, 32, and 33.

Based on chick placement reports for 14 commercial areas in 1954 and 22 commercial areas in 1955 and 1956.

* Index computed by the link relative method.

Table 5. Total Turkey Hatchings with the Index of Seasonal Variation, in Virginia, by Weeks, 1954-1956.

Week	Year			Seasonal Index, 1954-56*
	1954	1955	1956	
	Thousands			Percent
1	120	128	92	71
2	122	113	79	65
3	162	99	114	78
4	147	110	123	80
5	153	103	126	81
6	140	112	111	76
7	144	95	134	78
8	137	91	131	75
9	131	92	137	75
10	134	103	282	109
11	143	89	157	80
12	127	96	178	82
13	141	113	198	91
14	167	134	193	99
15	148	167	248	111
16	172	266	268	127
17	246	312	344	179
18	281	358	402	208
19	332	382	452	239
20	316	367	424	235
21	309	343	445	247
22	337	343	435	233
23	292	376	418	220
24	292	361	401	224
25	262	320	392	219
26	278	299	383	205
27	273	285	376	193
28	259	282	354	188
29	225	221	259	160
30	221	210	195	133
31	157	152	162	111
32	123	116	128	84
33	119	107	98	70
34	104	84	86	62
35	74	65	82	60
36	62	44	41	37
37	41	26	21	22
38	28	29	0	11
39	30	14	33	19

Table 5. (cont'd)

Week	Year			Seasonal Index,
	1954	1955	1956	1954-56*
		Thousands		Percent
40	33	12	0	10
41	27	20	15	11
42	31	8	18	14
43	44	21	32	18
44	47	22	32	21
45	50	26	41	24
46	49	37	55	27
47	73	37	52	34
48	87	63	67	40
49	121	68	77	55
50	129	74	114	65
51	140	89	134	73
52	113	100	148	74
Total	7,958	7,584	9,296	

Source of Data - Virginia Cooperative Crop Reporting Service

* Index computed by the simple average method.

Table 6. Broiler Marketings with the Index of Seasonal Variation, in the 10-County Shenandoah Valley Area, by Weeks, 1951-1953.

Week	Year			Seasonal Index,	Week	Year			Seasonal Index,
	1951	1952	1953	1951-53*		1951	1952	1953	1951-53*
	Thousands			Percent		Thousands			Percent
1	423	277	594	76	27	310	514	852	109
2	467	389	663	85	28	491	560	705	113
3	464	432	666	86	29	525	596	753	126
4	518	465	592	93	30	522	636	801	134
5	480	483	576	91	31	503	589	775	130
6	437	441	683	83	32	463	531	739	121
7	422	533	648	81	33	450	568	662	118
8	431	518	732	83	34	410	517	734	108
9	498	493	632	79	35	446	490	794	117
10	443	532	518	71	36	449	473	674	114
11	414	510	602	69	37	526	559	854	132
12	477	542	615	73	38	479	519	834	124
13	245	517	687	70	39	479	559	823	124
14	437	573	730	78	40	510	564	768	126
15	411	593	623	74	41	471	565	842	126
16	407	626	715	78	42	550	545	823	124
17	477	551	739	81	43	552	584	769	125
18	405	564	731	80	44	485	536	777	116
19	499	699	739	98	45	425	511	776	112
20	469	717	784	101	46	232	467	631	96
21	505	617	795	103	47	230	426	386	81
22	408	521	857	88	48	488	263	600	118
23	558	550	931	95	49	501	582	584	121
24	503	612	973	100	50	443	522	530	111
25	549	667	904	108	51	319	504	354	85
26	494	663	766	99	52	204	277	554	60
					Total	23,354	27,542	36,889	

Source of Data - Virginia Cooperative Crop Reporting Service

* Index computed by the link relative method.

Table 7. Broiler Marketings with the Index of Seasonal Variation, in the 10-County Shenandoah Valley Area, by Weeks, 1954-1956.

Week	Year			Seasonal Index, 1954-56*	Week	Year			Seasonal Index, 1954-56*
	1954	1955	1956			1954	1955	1956	
	Thousands			Percent		Thousands			Percent
1	760	390	650	93	27	599	634	674	87
2	805	515	582	98	28	784	929	763	116
3	632	396	875	77	29	666	874	745	109
4	588	576	636	71	30	703	769	868	116
5	645	423	684	76	31	720	773	883	117
6	756	556	656	88	32	589	818	804	106
7	762	612	611	88	33	578	867	780	103
8	811	517	687	93	34	701	802	858	114
9	735	515	767	93	35	537	724	879	102
10	631	559	674	81	36	568	752	769	106
11	615	443	754	78	37	644	819	967	121
12	685	474	740	87	38	606	739	811	108
13	604	533	674	79	39	632	778	695	113
14	700	611	661	91	40	730	732	643	105
15	558	635	819	94	41	642	885	877	129
16	600	702	889	102	42	604	662	885	121
17	729	789	809	115	43	616	700	811	123
18	805	794	759	115	44	506	865	802	121
19	840	765	929	120	45	574	742	733	109
20	775	810	786	110	46	430	569	622	80
21	731	897	958	122	47	438	275	329	34
22	609	680	789	99	48	762	663	764	101
23	632	819	975	120	49	696	747	755	99
24	646	864	952	123	50	450	682	551	90
25	700	877	880	125	51	268	426	359	49
26	627	861	942	122	52	324	372	449	63
					Total	33,353	35,213	39,214	

Source of Data - Virginia Cooperative Crop Reporting Service

* Index computed by the link relative method.

Table 8. Average Farm Price of Broilers with the Index of Seasonal Variation, in the 10-County Shenandoah Valley Area, by Weeks, 1951-1953.

Week	Year			Seasonal Index,	Week	Year			Seasonal Index,
	1951	1952	1953	1951-53*		1951	1952	1953	1951-53*
	Cents Per Pound			Percent		Cents Per Pound			Percent
1	21.5	28.3	27.6	94	27	27.7	25.2	26.4	97
2	25.0	28.9	26.9	96	28	29.4	27.2	28.9	105
3	24.9	29.0	25.9	96	29	28.0	28.0	28.2	103
4	26.8	29.2	25.9	97	30	28.6	27.8	27.0	102
5	27.2	29.7	25.9	99	31	29.4	27.9	28.0	105
6	28.1	29.8	25.7	100	32	28.7	30.3	29.1	109
7	27.5	28.3	26.6	98	33	29.3	31.1	27.3	110
8	28.0	28.1	26.6	98	34	28.7	32.0	27.2	109
9	29.6	27.4	26.9	99	35	28.7	32.0	26.7	109
10	28.7	26.2	27.0	97	36	28.7	31.2	25.5	107
11	29.2	26.6	26.3	98	37	28.7	31.9	26.5	109
12	29.6	28.1	27.6	103	38	27.8	29.5	26.2	106
13	29.1	26.7	27.6	102	39	26.7	28.0	25.9	103
14	29.7	26.6	26.6	102	40	26.0	28.1	25.3	101
15	30.4	26.9	26.7	103	41	25.5	28.0	25.2	101
16	30.7	26.3	26.3	102	42	24.7	27.4	24.7	99
17	30.2	26.1	25.9	101	43	24.4	27.2	24.3	98
18	30.3	25.1	25.6	100	44	23.6	28.1	24.1	98
19	29.6	22.6	25.5	98	45	24.1	30.3	24.1	100
20	27.9	21.8	25.4	95	46	24.8	32.0	24.3	103
21	27.1	25.9	25.2	95	47	24.9	32.4	23.9	103
22	26.9	26.3	25.1	95	48	23.3	30.7	23.6	99
23	27.0	25.5	24.2	92	49	23.0	31.3	22.2	98
24	28.3	25.7	24.4	93	50	23.4	30.3	18.6	96
25	29.4	25.0	26.0	97	51	23.9	27.6	17.5	91
26	28.0	25.1	25.8	97	52	24.3	27.6	18.2	93
					Total	27.3	28.0	25.6	

Source of Data - Virginia Cooperative Crop Reporting Service

* Index computed by the link relative method.

Table 9. Average Farm Price of Broilers with the Index of Seasonal Variation, in the 10-County Shenandoah Valley Area, by Weeks, 1954-1956.

Week	Year			Seasonal Index, 1954-56*	Week	Year			Seasonal Index, 1954-56*
	1954	1955	1956			1954	1955	1956	
	Cents Per Pound			Percent		Cents Per Pound			Percent
1	21.2	24.4	20.9	104	27	24.2	25.0	21.7	105
2	22.8	24.9	19.2	106	28	25.2	26.1	21.7	109
3	23.0	27.1	18.9	115	29	24.3	26.6	21.1	106
4	21.8	25.3	21.0	109	30	24.5	27.2	19.8	107
5	20.7	25.0	22.0	108	31	24.7	27.2	20.0	108
6	19.8	23.2	22.3	104	32	24.4	26.6	19.8	107
7	21.1	23.6	20.7	105	33	23.9	26.7	18.6	105
8	21.4	24.9	21.3	108	34	23.7	26.6	18.1	104
9	22.8	28.2	22.1	116	35	23.2	26.1	18.7	102
10	23.5	28.8	21.8	119	36	23.0	25.0	17.6	96
11	22.3	30.1	21.9	120	37	22.4	24.8	17.1	96
12	22.6	29.3	21.9	120	38	20.8	22.9	18.2	89
13	23.2	29.8	21.5	122	39	19.6	20.6	18.4	84
14	25.3	29.6	20.2	121	40	18.2	20.3	16.7	79
15	25.1	28.1	19.3	116	41	18.3	18.9	16.9	79
16	22.4	25.1	19.5	104	42	20.6	20.4	16.5	85
17	21.4	23.3	21.1	99	43	22.5	18.7	16.2	84
18	21.0	24.4	20.5	98	44	20.6	16.9	15.5	77
19	22.8	25.6	20.0	102	45	18.0	18.3	14.9	74
20	23.6	26.8	20.3	106	46	16.6	21.3	16.0	80
21	24.0	27.8	20.5	108	47	16.0	19.5	16.1	77
22	24.1	27.6	19.7	107	48	16.9	20.6	16.0	81
23	24.1	27.1	19.1	105	49	18.1	19.6	15.4	78
24	24.1	26.8	18.8	104	50	17.7	17.1	17.0	77
25	24.7	27.1	19.3	107	51	16.9	16.6	15.4	74
26	24.3	25.2	20.1	105	52	21.6	21.0	15.8	92
					Total	21.9	24.4	19.1	

Source of Data - Virginia Cooperative Crop Reporting Service

* Index computed by the link relative method.

Table 10. Cash Production Cost Per Pound of Broiler Sold with the Index of Seasonal Variation, in the 10-County Shenandoah Valley Area, by Weeks, 1951-1953.

Week	Year			Seasonal Index, 1951-53*
	1951	1952	1953	
	Cents Per Pound			Percent
1	28.572	25.493	26.104	103
2	27.120	26.392	25.787	102
3	23.340	26.131	24.118	96
4	25.911	26.323	25.499	101
5	26.114	26.870	24.965	102
6	25.935	25.341	26.471	102
7	26.816	25.112	25.770	101
8	25.900	26.416	25.635	101
9	28.374	25.826	25.643	101
10	24.184	26.867	26.464	104
11	26.040	28.624	23.903	110
12	24.973	26.685	23.528	107
13	25.232	25.567	23.921	108
14	25.147	26.822	23.468	108
15	24.554	25.001	23.913	105
16	26.203	24.849	23.579	105
17	25.980	26.137	23.276	104
18	25.677	25.312	23.078	102
19	25.469	24.864	23.196	102
20	23.542	25.583	23.339	103
21	25.780	24.353	22.384	99
22	25.645	23.936	22.335	99
23	23.478	25.110	22.470	99
24	25.344	24.745	22.153	98
25	23.853	24.790	22.569	98
26	23.980	24.177	22.629	99
27	22,848	24.058	22.059	96
28	23.066	24.103	21.526	97
29	23.150	23.165	22.552	97
30	23.444	24.473	22.300	99
31	23.132	23.127	21.612	96
32	23.096	24.254	22.007	98
33	24.331	23.880	21.473	96
34	24.457	23.729	21.976	96
35	21.509	24.268	22.171	97
36	26.477	24.059	22.074	96
37	23.287	23.594	23.437	95
38	25.655	24.037	22.014	97
39	24.150	24.649	21.944	96

Table 10. (cont'd)

Week	Year			Seasonal Index, 1951-53*
	1951	1952	1953	
	Cents Per Pound			Percent
40	22.643	24.325	22.094	95
41	24.048	24.103	21.835	95
42	24.554	24.666	22.034	97
43	24.623	24.479	22.587	97
44	23.656	25.401	22.761	98
45	25.101	24.292	23.136	100
46	24.930	24.985	23.111	100
47	24.976	26.051	23.599	102
48	27.117	25.465	22.630	100
49	27.231	25.711	23.781	101
50	26.979	25.783	23.339	100
51	26.189	25.893	24.650	100
52	28.518	25.822	25.074	102
Average	25.108	25.088	23.186	

Based on data from the following records:

Year	No. of Flocks	No. of Birds
1951	237	545,000
1952	465	1,260,000
1953	842	2,316,000

* Index computed by the link relative method.

Table 11. Cash Production Cost Per Pound of Broiler Sold with the Index of Seasonal Variation, in the 10-County Shenandoah Valley Area, by Weeks, 1954-1956.

Week	Year			Seasonal Index, 1954-56*
	1954	1955	1956	
	Cents Per Pound			Percent
1	25.305	21.668	22.340	101
2	24.974	23.165	22.267	101
3	24.805	23.344	21.738	100
4	25.753	23.286	22.171	102
5	25.559	23.298	21.936	101
6	26.040	23.931	21.909	103
7	24.995	23.904	21.722	102
8	25.862	24.504	21.258	105
9	24.488	22.493	21.343	99
10	25.146	23.079	21.104	102
11	25.366	21.573	21.217	102
12	25.610	22.052	20.877	103
13	24.632	22.335	21.173	105
14	24.910	22.044	21.277	105
15	25.267	22.439	21.083	107
16	24.036	21.498	20.560	102
17	23.723	21.433	20.637	102
18	23.937	21.445	21.323	103
19	23.725	20.914	20.607	100
20	23.714	20.694	20.454	99
21	23.696	20.645	20.376	99
22	25.302	21.345	20.813	102
23	22.266	20.639	20.493	99
24	22.833	20.311	20.733	100
25	22.457	20.055	19.856	99
26	22.029	19.762	19.445	97
27	22.566	20.578	20.340	101
28	22.450	20.443	19.323	100
29	22.568	19.784	19.647	100
30	21.972	20.329	19.697	101
31	22.240	20.356	19.254	101
32	21.496	19.715	19.553	98
33	21.986	20.582	19.719	100
34	21.791	19.383	19.287	98
35	21.922	20.196	19.072	98
36	21.896	20.050	19.645	98
37	21.711	20.153	19.336	97
38	21.476	19.513	18.976	95
39	21.293	19.297	19.323	95

Table 11. (cont'd)

Week	Year			Seasonal Index, 1954-56*
	1954	1955	1956	
	Cents Per Pound			Percent
40	21.984	19.526	19.175	96
41	23.086	20.153	18.791	99
42	21.934	19.488	19.344	96
43	22.301	19.637	18.819	96
44	22.430	20.441	19.423	99
45	21.780	20.303	19.969	99
46	23.017	19.801	18.427	96
47	23.361	20.636	18.857	100
48	23.544	20.743	19.694	100
49	22.685	20.779	18.713	97
50	21.980	21.847	19.714	102
51	25.855	21.227	19.717	102
52	23.595	20.927	19.721	100
Average	23.302	20.992	20.447	

Based on data from the following records:

Year	No. of Flocks	No. of Birds
1954	965	2,787,000
1955	1,396	3,825,000
1956	1,112	3,342,000

* Index computed by the link relative method.

Table 12. Feed Cost Per Pound of Broiler Sold with the Index of Seasonal Variation, in the 10-County Shenandoah Valley Area, by Weeks, 1954-1956.

Week	Year			Seasonal Index, 1954-56*
	1954	1955	1956	
	Cents Per Pound			Percent
1	17.323	17.165	14.884	104
2	17.503	17.029	15.556	105
3	17.930	16.438	15.430	104
4	18.895	16.797	15.254	107
5	17.419	16.183	14.705	103
6	17.783	16.876	14.585	106
7	17.321	17.128	14.599	107
8	18.288	17.149	14.560	107
9	18.021	15.684	14.285	105
10	16.274	17.594	15.106	111
11	19.262	16.116	15.083	112
12	18.080	16.459	13.900	105
13	19.356	16.026	14.712	111
14	18.623	15.483	15.027	108
15	17.823	16.609	14.606	105
16	18.503	14.095	14.527	105
17	18.318	16.651	14.618	106
18	17.208	15.251	15.048	100
19	17.285	15.320	14.859	100
20	17.033	14.739	14.053	97
21	17.874	15.282	14.613	101
22	17.383	15.591	14.670	101
23	16.891	14.796	14.406	99
24	16.896	15.171	15.038	101
25	18.010	14.200	14.671	99
26	16.600	14.846	13.600	92
27	17.239	15.295	13.901	95
28	17.270	15.398	14.236	96
29	16.612	15.224	13.958	94
30	18.644	15.084	14.391	97
31	17.261	13.852	13.953	91
32	16.159	15.435	13.922	91
33	16.805	14.092	13.187	86
34	16.812	14.249	13.443	88
35	16.914	15.022	13.211	88
36	16.810	14.811	13.198	88
37	18.144	15.248	13.877	92
38	16.307	14.804	13.440	90
39	15.715	15.487	14.179	94

Table 12. (cont'd)

Week	Year			Seasonal Index, 1954-56*
	1954	1955	1956	
	Cents Per Pound			Percent
40	16.457	14.680	14.237	95
41	17.323	15.173	14.063	98
42	16.204	15.456	14.280	99
43	16.416	15.091	14.413	100
44	17.547	14.727	14.945	104
45	18.163	15.111	13.648	100
46	17.343	14.695	12.692	98
47	17.208	15.696	14.195	104
48	17.051	15.050	13.758	101
49	17.388	15.463	13.103	103
50	17.576	15.233	12.974	103
51	17.439	15.208	13.897	102
52	17.302	14.211	14.800	102
Average	17.444	15.899	14.414	

Based on data from the following records:

Year	No. of Flocks	No. of Birds
1954	222	512,694
1955	343	829,173
1956	391	1,153,249

* Index computed by the link relative method.

Table 13. Chick Cost Per Pound of Broiler Sold with the Index of Seasonal Variation, in the 10-County Shenandoah Valley Area, by Weeks, 1954-1956.

Week	Year			Seasonal Index, 1954-56*
	1954	1955	1956	
	Cents Per Pound			Percent
1	4.813	4.951	5.847	99
2	5.180	5.129	5.737	102
3	5.546	4.713	5.694	102
4	6.109	4.996	5.854	108
5	6.245	4.605	5.456	100
6	5.362	4.755	5.479	101
7	4.603	4.793	5.310	98
8	5.594	5.034	5.775	106
9	5.790	5.176	5.700	109
10	5.372	4.601	5.635	101
11	5.839	4.158	5.538	100
12	5.087	4.736	5.711	103
13	4.815	4.758	5.260	97
14	5.390	4.954	6.055	117
15	5.471	4.806	5.562	113
16	5.722	4.790	5.192	113
17	5.163	4.288	5.209	102
18	5.097	5.221	5.098	101
19	4.936	4.618	5.097	98
20	5.319	4.775	5.312	102
21	5.017	4.489	5.110	96
22	5.545	4.929	5.194	105
23	4.829	4.068	5.244	92
24	5.046	4.849	5.426	96
25	4.657	4.723	5.057	90
26	5.100	4.864	4.844	92
27	5.361	5.085	5.272	97
28	4.610	4.773	4.720	87
29	4.018	5.070	5.225	92
30	4.632	5.221	4.807	95
31	4.979	5.234	5.289	102
32	4.888	4.669	4.975	96
33	4.612	5.071	5.077	98
34	5.083	5.096	4.800	99
35	4.990	5.157	4.968	100
36	4.803	5.479	4.866	98
37	4.893	5.073	5.690	100
38	5.189	5.139	5.254	101
39	5.249	5.152	5.159	101

Table 13. (cont'd)

Week	Year			Seasonal Index, 1954-56*
	1954	1955	1956	
	Cents Per Pound			Percent
40	5.216	4.927	4.362	97
41	5.271	5.014	4.783	99
42	5.001	4.748	4.839	94
43	4.656	4.950	4.687	91
44	5.120	5.271	4.717	97
45	4.606	5.605	4.996	102
46	5.013	5.147	4.882	100
47	5.037	4.996	4.289	97
48	5.200	4.977	4.991	100
49	4.677	4.788	5.253	97
50	4.949	5.182	5.527	102
51	5.610	5.663	5.727	112
52	5.031	5.481	4.187	100
Average	5.059	4.945	5.234	

Based on data from the following records:

Year	No. of Flocks	No. of Birds
1954	322	818,794
1955	677	1,658,521
1956	618	1,733,809

* Index computed by the link relative method.

Table 14. Fuel Cost Per Pound of Broiler Sold with the Index of Seasonal Variation, in the 10-County Shenandoah Valley Area, by Weeks, 1954-1956.

Week	Year			Average	Seasonal Index, 1954-56*
	1954	1955	1956		
	Cents Per Pound				Percent
1	.942	.821	1.146	.9697	134
2	1.097	1.059	1.318	1.1580	160
3	1.123	1.002	1.181	1.1020	153
4	1.104	1.139	1.790	1.3443	186
5	1.291	1.305	1.169	1.2550	174
6	1.465	1.042	1.212	1.2397	172
7	1.416	1.307	1.228	1.3170	182
8	1.327	1.447	1.041	1.2717	176
9	1.168	1.693	1.329	1.3967	193
10	1.282	1.424	1.282	1.3293	184
11	1.317	1.360	1.117	1.2647	175
12	1.385	1.139	1.218	1.2473	173
13	.758	1.191	.829	.9260	128
14	1.400	1.517	.902	1.2730	176
15	1.189	1.162	.925	1.0920	151
16	.937	1.001	.905	.9477	131
17	1.045	.930	1.270	1.0817	150
18	1.071	.958	.990	1.0063	139
19	.993	.915	.775	.8943	124
20	.719	.715	.767	.7337	102
21	.593	.700	.629	.6407	89
22	.681	.753	.672	.7020	97
23	.593	.814	.647	.6847	95
24	.530	.603	.584	.5723	79
25	.644	.554	.364	.5207	72
26	.530	.441	.424	.4650	64
27	.461	.511	.333	.4350	60
28	.481	.433	.325	.4130	57
29	.442	.420	.307	.3897	54
30	.313	.453	.344	.3700	51
31	.323	.338	.363	.3413	47
32	.347	.345	.328	.3400	47
33	.334	.432	.267	.3443	48
34	.338	.363	.261	.3207	44
35	.469	.359	.202	.3433	48
36	.263	.294	.332	.2963	41
37	.302	.306	.473	.3603	50
38	.244	.318	.417	.3263	45
39	.278	.377	.328	.3277	45

Table 14. (cont'd)

Week	Year			Average	Seasonal Index, 1954-56*
	1954	1955	1956		
	Cents Per Pound				Percent
40	.343	.361	.327	.3437	48
41	.320	.362	.291	.3243	45
42	.332	.283	.350	.3217	45
43	.363	.396	.386	.3817	53
44	.278	.378	.368	.3413	47
45	.349	.384	.462	.3983	55
46	.403	.445	.291	.3797	53
47	.464	.511	.462	.4790	66
48	.554	.492	.576	.5407	75
49	.546	.551	.481	.5260	73
50	.676	.893	.961	.8433	117
51	.839	.764	.802	.8017	111
52	.850	.834	.842	.8420	117
Average	.688	.734	.766		

Based on data from the following records:

Year	No. of Flocks	No. of Birds
1954	857	2,381,032
1955	1,190	3,203,850
1956	990	2,894,925

* Index computed by the simple average method.

Table 15. Medication Cost Per Pound of Broiler Sold with the Index of Seasonal Variation, in the 10-County Shenandoah Valley Area, by Weeks, 1954-1956.

Week	Year			Average	Seasonal Index 1954-56*
	1954	1955	1956		
	Cents Per Pound				Percent
1	.801	.195	.248	.415	125
2	.735	.913	.557	.734	222
3	.352	.434	.398	.395	119
4	.736	.758	.227	.572	173
5	.126	.540	.015	.227	69
6	.326	.592	.308	.409	124
7	.279	.630	.262	.390	118
8	.249	.333	.334	.305	92
9	.512	.375	.441	.443	134
10	.192	.059	.332	.194	59
11	.578	.158	.144	.293	89
12	.446	.324	.333	.368	111
13	1.042	.611	.449	.701	212
14	.270	.432	.445	.382	115
15	.287	.548	.089	.308	93
16	.020	.447	.148	.205	62
17	.318	.412	.224	.318	96
18	.198	1.145	.429	.591	179
19	.312	.437	.283	.344	104
20	.169	.334	.196	.233	71
21	.179	.194	.334	.236	71
22	.462	.553	.342	.452	137
23	.147	.258	.431	.279	84
24	.323	.386	.212	.307	93
25	.369	.337	.231	.312	94
26	.166	.184	.095	.148	45
27	.382	.630	.090	.367	111
28	.106	.607	.533	.415	125
29	.251	.151	.286	.229	69
30	.188	.348	.300	.279	84
31	.158	.310	.185	.218	66
32	.326	.159	.079	.188	57
33	.105	.552	.103	.253	76
34	.270	.392	.128	.263	79
35	.104	.116	.263	.161	49
36	.135	.241	.116	.164	50
37	.354	.305	.171	.277	84
38	.499	.138	.169	.269	81
39	.085	.050	.240	.125	38

Table 15. (cont'd)

Week	Year			Average	Seasonal Index, 1954-56*
	1954	1955	1956		
	Cents Per Pound				Percent
40	.140	.312	.084	.179	54
41	.327	.151	.503	.327	99
42	.420	.641	.143	.401	121
43	.151	.186	.641	.326	98
44	.345	.189	.727	.420	127
45	.175	.188	.175	.179	54
46	.666	1.101	.451	.739	223
47	.225	.351	.159	.245	74
48	.506	.471	.170	.382	115
49	.309	.372	.149	.277	84
50	1.675	.658	.093	.809	244
51	.463	.589	.127	.393	119
52	.081	.113	.127	.107	32
Average	.334	.439	.277		

Based on data from the following records:

Year	No. of Flocks	No. of Birds
1954	165	418,411
1955	287	804,166
1956	216	714,522

* Index computed by the simple average method.

Table 16. Litter Cost Per Pound of Broiler Sold with the Index of Seasonal Variation, in the 10-County Shenandoah Valley Area, by Weeks, 1954-1956.

Week	Year			Average	Seasonal Index, 1954-56*
	1954	1955	1956		
	Cents Per Pound				Percent
1	.449	.516	.200	.388	139
2	.384	.245	.136	.255	91
3	.320	.187	.299	.269	96
4	.197	.239	.240	.225	81
5	.325	.238	.255	.273	98
6	.403	.370	.240	.338	121
7	.221	.294	.242	.252	90
8	.192	.323	.284	.266	95
9	.244	.398	.224	.289	104
10	.296	.264	.354	.305	109
11	.527	.323	.292	.381	137
12	.243	.341	.499	.361	129
13	.343	.431	.277	.350	125
14	.220	.373	.563	.385	138
15	.210	.349	.172	.244	87
16	.345	.280	.249	.292	105
17	.255	.311	.233	.266	95
18	.166	.240	.326	.244	87
19	.340	.309	.247	.299	107
20	.294	.297	.198	.263	94
21	.294	.251	.223	.256	92
22	.117	.319	.207	.214	77
23	.403	.330	.293	.342	123
24	.321	.360	.259	.313	112
25	.387	.251	.342	.327	117
26	.281	.214	.172	.222	80
27	.175	.242	.235	.217	78
28	.213	.276	.257	.249	89
29	.214	.257	.282	.251	90
30	.169	.276	.409	.285	102
31	.210	.679	.249	.379	136
32	.297	.357	.248	.301	108
33	.232	.258	.206	.232	83
34	.299	.201	.323	.274	98
35	.163	.230	.166	.186	67
36	.185	.225	.212	.207	74
37	.281	.171	.233	.228	82
38	.270	.143	.147	.187	67
39	.239	.330	.228	.266	95

Table 16. (cont'd)

Week	Year			Average	Seasonal Index, 1954-56*
	1954	1955	1956		
	Cents Per Pound				Percent
40	.090	.243	.143	.159	57
41	.343	.175	.198	.239	86
42	.566	.275	.221	.354	127
43	.330	.320	.300	.317	114
44	.267	.275	.271	.271	97
45	.231	.236	.226	.231	83
46	.127	.725	.191	.348	125
47	.264	.166	.174	.201	72
48	.252	.412	.157	.274	98
49	.249	.278	.222	.250	90
50	.082	.401	.540	.341	122
51	.469	.276	.228	.324	116
52	.399	.267	.296	.321	115
Average	.257	.296	.261		

Based on data from the following records:

Year	No. of Flocks	No. of Birds
1954	142	318,848
1955	299	768,492
1956	268	785,597

* Index computed by the simple average method.

Table 17. Broiler Feed Conversion Ratio with the Index of Seasonal Variation, in the 10-County Shenandoah Valley Area, by Weeks, 1951-1953.

Week	Year			Seasonal Index, 1951-53*
	1951	1952	1953	
	Pounds of Feed Per Pound of Broiler (liveweight)			Percent
1	4.066	3.217	3.341	108
2	3.996	3.400	3.323	108
3	3.186	3.174	3.044	99
4	3.447	3.179	3.262	106
5	3.707	3.254	3.306	109
6	3.490	3.147	3.351	105
7	3.507	3.027	3.348	106
8	3.419	3.213	3.110	103
9	3.259	3.145	3.342	101
10	3.338	3.171	3.401	103
11	3.214	3.645	3.055	100
12	3.285	3.283	3.137	102
13	3.254	3.165	3.097	101
14	3.346	3.374	3.201	105
15	3.139	3.143	3.132	99
16	3.366	3.103	3.162	100
17	3.633	3.272	2.994	105
18	3.353	3.084	3.115	100
19	3.286	3.163	3.141	101
20	3.067	3.237	3.143	101
21	3.434	3.076	3.009	97
22	3.370	2.934	3.036	96
23	3.092	3.191	3.128	98
24	3.355	3.130	3.021	97
25	3.141	3.229	3.046	98
26	3.122	3.118	3.067	98
27	2.980	3.073	3.021	96
28	2.965	2.981	2.910	94
29	3.003	2.922	3.059	96
30	3.160	3.116	3.099	100
31	3.059	2.905	2.977	97
32	2.990	3.031	2.990	97
33	3.304	3.065	2.930	99
34	3.217	2.947	3.070	96
35	2.822	3.058	3.069	97
36	3.549	3.117	3.030	99
37	2.996	2.995	3.130	95
38	3.412	2.987	3.108	95
39	3.214	3.235	3.027	93

Table 17. (cont'd)

Week	Year			Seasonal Index, 1951-53*
	1951	1952	1953	
	Pounds of Feed Per Pound of Broiler (liveweight)			Percent
40	3.017	3.106	2.979	90
41	3.236	3.071	3.060	93
42	3.184	3.049	3.000	91
43	3.281	3.088	3.105	94
44	3.148	3.189	3.132	95
45	3.294	3.089	3.277	99
46	3.354	3.164	3.131	101
47	3.323	3.321	3.265	105
48	3.622	3.227	3.310	107
49	3.682	3.265	3.256	108
50	3.572	3.290	3.163	106
51	3.435	3.241	3.442	105
52	3.644	3.340	3.430	108
Average	3.329	3.153	3.123	

Based on data from the following records:

Year	No. of Flocks	No. of Birds
1951	237	545,000
1952	465	1,260,000
1953	842	2,316,000

* Index computed by the link relative method.

Table 18. Broiler Feed Conversion Ratio with the Index of Seasonal Variation, in the 10-County Shenandoah Valley Area, by Weeks, 1954-1956.

Week	Year			Seasonal Index, 1954-56*
	1954	1955	1956	
	Pounds of Feed Per Pound of Broiler (liveweight)			Percent
1	3.391	3.163	3.177	107
2	3.327	3.192	3.041	105
3	3.301	3.211	2.989	104
4	3.472	3.174	2.965	104
5	3.408	3.171	3.078	104
6	3.453	3.218	2.920	105
7	3.324	3.252	2.855	103
8	3.362	3.255	2.816	103
9	3.257	3.042	2.838	99
10	3.263	3.185	2.847	100
11	3.283	2.906	2.859	100
12	3.395	2.997	2.780	103
13	3.241	2.989	2.914	103
14	3.183	3.027	2.819	101
15	3.344	3.072	2.861	103
16	3.138	2.980	2.776	100
17	3.226	3.010	2.820	101
18	3.200	2.933	2.938	101
19	3.193	2.936	2.844	100
20	3.111	2.868	2.775	98
21	3.233	2.855	2.712	98
22	3.448	2.892	2.804	101
23	3.072	2.878	2.735	98
24	3.089	2.825	2.763	99
25	3.060	2.836	2.650	98
26	2.998	2.838	2.634	98
27	3.048	2.866	2.652	99
28	3.004	2.926	2.617	98
29	3.036	2.819	2.590	97
30	3.061	2.846	2.670	98
31	3.003	2.881	2.605	96
32	2.913	2.886	2.613	96
33	2.969	2.907	2.735	98
34	2.901	2.786	2.654	95
35	2.922	2.844	2.637	96
36	2.979	2.853	2.658	96
37	2.962	2.845	2.618	96
38	2.912	2.778	2.541	94
39	2.905	2.846	2.654	96

Table 18. (cont'd)

Week	Year			Seasonal Index, 1954-56*
	1954	1955	1956	
	Pounds of Feed Per Pound of Broiler (liveweight)			Percent
40	2.981	2.818	2.626	95
41	3.063	2.905	2.588	98
42	2.995	2.795	2.650	95
43	3.069	2.858	2.653	98
44	3.162	2.926	2.676	100
45	3.100	2.869	2.698	99
46	3.197	2.871	2.588	93
47	3.291	2.885	2.642	100
48	3.345	3.012	2.787	105
49	3.332	3.021	2.546	104
50	3.278	3.046	2.638	105
51	3.583	2.953	2.695	107
52	3.325	2.985	2.744	109
Average	3.162	2.946	2.767	

Based on data from the following records:

Year	No. of Flocks	No. of Birds
1954	965	2,787,000
1955	1,396	3,825,000
1956	1,112	3,342,000

* Index computed by the link relative method.

Table 19. Average Weight of Broilers Sold with the Index of Seasonal Variation, in the 10-County Shenandoah Valley Area, by Weeks, 1951-1956.

Week	Year						Seasonal Index, 1951-56*
	1951	1952	1953	1954	1955	1956	
			Pounds				Percent
1	3.441	3.158	2.951	3.260	3.437	3.448	109
2	3.293	3.086	3.050	3.145	3.272	3.241	105
3	3.132	3.003	3.074	3.317	3.303	3.219	105
4	2.902	3.074	3.168	3.243	3.106	3.388	105
5	3.225	3.095	3.195	3.182	3.162	3.275	105
6	3.279	3.204	3.178	3.148	3.195	3.180	105
7	3.128	3.167	3.175	3.166	3.111	3.290	105
8	3.001	2.995	3.034	3.168	3.016	3.048	100
9	3.014	3.071	3.054	3.046	3.087	3.262	102
10	3.178	3.050	2.973	3.056	3.140	3.240	101
11	2.913	3.185	2.947	2.996	3.083	3.194	99
12	3.093	3.078	3.044	3.107	3.040	3.164	101
13	2.970	3.168	3.000	3.138	3.056	3.341	101
14	3.215	3.116	3.072	3.094	3.050	2.956	100
15	2.897	3.297	3.085	3.041	3.073	3.327	101
16	2.757	3.182	3.054	3.061	3.110	3.271	99
17	3.419	3.074	3.133	3.154	3.174	3.261	101
18	3.060	3.226	3.115	3.118	3.047	3.425	100
19	3.014	3.147	3.092	3.313	3.126	3.317	99
20	3.233	3.245	2.949	3.131	3.058	3.216	96
21	3.514	3.250	2.920	3.149	3.098	3.291	97
22	2.992	2.953	3.123	3.029	2.971	3.285	93
23	3.250	3.109	3.115	3.227	3.033	3.300	97
24	3.218	3.156	2.992	3.096	3.049	3.325	96
25	3.206	3.074	3.039	3.079	3.055	3.020	96
26	3.229	3.236	2.853	3.011	3.115	3.210	97
27	3.000	3.058	2.868	3.071	2.974	3.042	92
28	2.969	2.920	2.994	3.119	3.024	3.091	93
29	3.035	2.900	2.893	3.069	2.958	3.113	92
30	3.165	3.017	2.921	3.190	2.916	3.240	96
31	3.132	2.709	2.883	3.091	2.959	3.130	94
32	3.039	3.054	2.994	3.034	3.071	3.301	96
33	2.956	2.741	2.978	3.075	3.044	3.093	94
34	3.047	2.792	3.013	3.088	3.074	3.286	96
35	3.224	2.783	2.865	3.101	3.086	3.169	96
36	3.078	2.864	3.043	3.245	3.062	3.202	98
37	3.112	3.096	3.050	3.153	3.149	3.116	99
38	2.993	3.025	3.090	3.090	3.181	3.089	97
39	2.971	2.723	3.095	2.942	3.337	3.239	97

Table 19. (cont'd)

Week	Year						Seasonal Index, 1951-56*
	1951	1952	1953	1954	1955	1956	
	Pounds						Percent
40	3.403	3.003	3.216	3.165	3.340	3.546	106
41	3.200	2.956	3.165	2.935	3.406	3.264	101
42	3.093	3.072	3.087	3.136	3.420	3.295	102
43	3.145	3.077	3.230	3.134	3.517	3.375	104
44	3.191	2.970	3.084	3.233	3.304	3.264	100
45	3.192	3.055	3.149	3.554	3.200	3.310	102
46	3.474	3.227	3.250	3.240	3.303	3.227	105
47	3.431	3.018	3.170	3.211	3.265	3.540	104
48	3.596	2.938	3.382	3.337	3.291	3.161	106
49	3.455	3.053	3.173	3.423	3.516	3.033	105
50	3.378	2.986	3.274	3.461	3.264	2.998	103
51	3.275	2.873	3.062	3.066	3.397	3.218	100
52	2.839	3.212	3.200	3.262	3.466	3.797	105
Average	3.18	3.05	3.05	3.18	3.15	3.23	

Based on data from the following records:

Year	No. of Flocks	No. of Birds	Year	No. of Flocks	No. of Birds
1951	237	545,000	1954	965	2,787,000
1952	465	1,260,000	1955	1,396	3,825,000
1953	842	2,316,000	1956	1,112	3,342,000

* Index computed by the link relative method.

Table 20. Average Age of Broilers Sold with the Index of Seasonal Variation, in the 10-County Shenandoah Valley Area, by Weeks, 1951-1956.

Week	Year						Seasonal Index, 1951-56*
	1951	1952	1953	1954	1955	1956	
			Days				Percent
1	81	77	75	82	79	77	102
2	89	77	76	78	78	72	101
3	76	73	73	77	77	71	99
4	86	75	77	79	75	74	102
5	84	76	79	80	75	73	103
6	83	78	76	79	75	71	102
7	82	74	78	76	74	70	101
8	78	75	75	75	73	67	98
9	80	76	75	75	72	69	99
10	81	79	76	77	76	70	101
11	79	81	72	75	72	69	99
12	79	79	76	76	72	68	99
13	75	78	74	78	71	72	98
14	79	81	75	76	71	68	98
15	75	77	73	75	72	70	96
16	76	78	75	75	71	69	97
17	82	78	73	79	72	70	99
18	77	75	76	76	72	72	97
19	79	74	76	78	71	70	96
20	77	77	75	75	70	69	95
21	82	76	74	76	70	69	95
22	77	74	78	78	70	70	100
23	75	78	78	76	71	69	96
24	75	77	75	75	71	71	95
25	78	76	75	75	70	67	94
26	78	78	75	73	71	68	95
27	74	75	74	77	70	66	93
28	76	76	73	75	73	69	95
29	77	72	74	75	71	69	98
30	79	76	75	77	70	69	97
31	77	72	74	76	72	68	96
32	76	73	75	75	74	69	98
33	77	73	77	76	73	70	99
34	78	74	79	75	73	70	100
35	72	77	76	76	73	70	100
36	85	76	78	78	75	69	102
37	76	77	77	76	74	68	101
38	79	78	79	75	74	69	102
39	78	78	77	74	74	70	102

Table 20. (cont'd)

Week	Year						Seasonal Index, 1951-56*
	1951	1952	1953	1954	1955	1956	
			Days				Percent
40	81	78	78	76	76	72	104
41	78	77	82	76	75	69	103
42	78	77	76	74	75	69	103
43	77	75	79	77	76	70	104
44	79	75	79	80	74	69	105
45	81	76	79	82	72	69	105
46	80	76	80	81	71	67	104
47	82	77	79	79	71	70	105
48	90	76	81	81	74	69	108
49	88	78	75	82	73	67	106
50	88	77	78	80	72	65	105
51	84	81	79	81	72	72	106
52	83	79	77	79	74	73	104
Average	80	76	76	78	73	70	

Based on data from the following records:

Year	No. of Flocks	No. of Birds	Year	No. of Flocks	No. of Birds
1951	237	545,000	1954	965	2,787,000
1952	465	1,260,000	1955	1,396	3,825,000
1953	842	2,316,000	1956	1,112	3,342,000

* Index computed by the link relative method.

Table 21. Average Daily Rate of Gain of Broilers Sold with the Index of Seasonal Variation, in the 10-County Shenandoah Valley Area, by Weeks, 1951-1956.

Week	Year						Seasonal Index, 1951-56*
	1951	1952	1953	1954	1955	1956	
	Pounds Per 100 Birds						Percent
1	4.24	4.11	3.94	4.00	4.35	4.50	104
2	3.69	4.03	4.00	4.04	4.21	4.52	103
3	4.12	4.13	4.22	4.30	4.31	4.52	107
4	3.38	4.09	4.11	4.11	4.16	4.59	104
5	3.83	4.05	4.06	3.97	4.21	4.50	103
6	3.94	4.10	4.16	4.00	4.28	4.50	104
7	3.82	4.27	4.06	4.14	4.19	4.72	105
8	3.87	4.01	4.03	4.22	4.12	4.56	104
9	4.31	4.04	4.08	4.04	4.26	4.72	106
10	3.93	3.84	3.89	3.97	4.10	4.64	102
11	2.69	3.94	4.10	4.01	4.26	4.61	103
12	3.90	3.89	4.02	4.08	4.25	4.64	104
13	3.94	4.07	4.07	4.02	4.30	4.66	105
14	4.06	3.83	4.08	4.06	4.29	4.33	105
15	3.88	4.26	4.23	4.07	4.28	4.73	107
16	3.60	4.08	4.06	4.06	4.37	4.73	104
17	4.19	3.92	4.26	3.97	4.43	4.67	104
18	3.99	4.31	4.11	4.13	4.24	4.74	103
19	3.79	4.23	4.06	4.25	4.37	4.72	102
20	4.20	4.21	3.96	4.19	4.36	4.66	102
21	4.29	4.28	3.95	4.15	4.40	4.78	103
22	3.86	3.97	4.01	3.87	4.24	4.67	97
23	4.32	4.00	3.99	4.25	4.27	4.76	99
24	4.28	4.09	4.01	4.10	4.32	4.69	99
25	4.13	4.03	4.05	4.09	4.38	4.50	98
26	4.15	4.15	3.81	4.11	4.39	4.72	98
27	4.03	4.10	3.86	4.01	4.24	4.62	96
28	3.89	3.86	4.07	4.14	4.13	4.49	93
29	3.95	4.05	3.92	4.07	4.17	4.53	94
30	4.01	3.99	3.91	4.15	4.17	4.71	95
31	4.07	3.78	3.91	4.09	4.12	4.57	93
32	4.00	4.19	4.00	4.06	4.18	4.64	95
33	3.82	3.74	3.89	4.07	4.16	4.42	91
34	3.90	3.79	3.82	4.11	4.22	4.68	93
35	4.48	3.63	3.79	4.06	4.22	4.55	92
36	3.64	3.78	3.89	4.17	4.11	4.63	94
37	4.09	4.01	3.96	4.16	4.27	4.58	96
38	3.81	3.90	3.90	4.09	4.32	4.49	95
39	3.82	3.90	4.02	3.96	4.42	4.64	96

Table 21. (cont'd)

Week	Year						Seasonal Index, 1951-56*
	1951	1952	1953	1954	1955	1956	
	Pounds Per 100 Birds						Percent
40	4.22	3.85	4.11	4.17	4.39	4.94	101
41	4.10	3.82	3.88	3.86	4.56	4.74	98
42	3.99	4.01	4.05	4.23	4.56	4.76	100
43	4.07	4.11	4.10	4.05	4.61	4.81	101
44	4.04	3.95	3.92	4.05	4.49	4.71	99
45	3.96	4.04	4.00	4.33	4.42	4.77	101
46	4.32	4.23	4.08	3.98	4.64	4.83	104
47	4.17	3.92	4.01	4.07	4.59	5.09	102
48	4.00	3.87	4.18	4.11	4.45	4.60	100
49	3.92	3.90	4.21	4.16	4.82	4.55	100
50	3.86	3.85	4.19	4.33	4.53	4.59	100
51	3.89	3.55	3.86	3.79	4.69	4.49	95
52	3.90	4.04	4.16	4.14	4.69	5.21	103
Average	3.97	4.01	4.01	4.09	4.33	4.64	

Based on data from the following records:

Year	No. of Flocks	No. of Birds	Year	No. of Flocks	No. of Birds
1951	237	545,000	1954	965	2,787,000
1952	465	1,260,000	1955	1,396	3,825,000
1953	842	2,316,000	1956	1,1[illegible]	3,342,000

* Index computed by the link relative method.

Table 22. Percent Mortality with the Index of Seasonal Variation, in the 10-County Shenandoah Valley Area, by Weeks, 1951-1956.

Week	Year						Seasonal Index, 1951-56*
	1951	1952	1953	1954	1955	1956	
	Percent						Percent
1	2.70	2.56	5.42	8.76	3.75	9.49	140
2	4.78	6.05	5.42	6.67	5.13	6.56	130
3	20.67	3.33	3.85	9.22	8.31	6.18	206
4	7.35	5.45	3.52	9.14	6.20	6.10	191
5	3.76	4.10	3.59	8.37	5.34	6.04	165
6	.63	4.78	4.99	7.28	7.39	4.03	167
7	8.52	2.43	4.32	6.20	6.29	5.97	136
8	.46	4.92	3.90	4.98	7.89	5.11	141
9	9.90	8.23	4.62	7.38	3.69	4.91	175
10	11.55	12.49	9.02	8.13	4.14	4.32	200
11	5.26	6.17	3.57	5.25	3.79	3.92	96
12	5.88	3.90	3.35	7.08	3.54	3.35	82
13	5.83	4.91	3.51	5.63	3.88	3.66	88
14	3.03	6.13	3.23	7.22	3.05	4.31	90
15	4.06	3.88	2.99	10.64	3.44	4.03	91
16	8.60	4.69	3.52	4.92	3.30	2.84	97
17	9.70	8.58	5.94	4.85	3.35	3.28	115
18	2.35	4.20	4.78	6.49	3.29	4.17	92
19	2.97	4.16	3.02	6.23	2.58	3.06	68
20	.59	3.98	5.42	5.97	2.73	2.33	58
21	7.29	2.24	2.90	8.08	1.98	4.60	59
22	3.47	6.17	3.38	9.51	4.15	3.72	79
23	1.06	7.60	5.16	3.73	3.35	2.90	41
24	3.75	3.53	3.32	5.19	2.64	4.25	49
25	2.91	3.35	2.54	5.16	2.62	3.00	26
26	3.27	3.79	3.44	3.28	1.33	3.36	36
27	2.90	4.61	3.01	3.36	3.55	3.72	41
28	2.86	4.88	3.24	3.44	2.40	3.48	38
29	2.69	1.40	4.13	4.96	1.40	2.37	7
30	5.00	4.49	3.31	3.20	3.23	3.03	70
31	1.43	3.10	3.08	5.06	2.71	2.79	44
32	2.66	11.53	4.03	3.32	3.87	2.56	99
33	3.68	3.84	2.04	3.78	3.77	3.24	108
34	2.32	4.23	4.15	4.20	2.44	2.64	94
35	1.07	8.35	2.76	4.62	3.41	2.45	93
36	13.53	2.87	3.17	3.90	3.05	1.61	60
37	4.43	4.34	5.47	4.75	5.64	.99	128
38	8.21	4.31	4.79	3.64	3.56	2.03	106
39	4.53	7.79	4.84	2.99	2.34	3.77	81

Table 22. (cont'd)

Week	Year						Seasonal Index, 1951-56*
	1951	1952	1953	1954	1955	1956	
			Percent				Percent
40	3.32	2.50	3.78	3.15	2.97	1.19	91
41	1.97	3.71	4.59	5.73	3.32	1.06	76
42	5.60	4.25	4.44	4.57	4.83	3.22	121
43	2.86	4.16	6.09	6.04	2.99	2.14	66
44	3.20	2.14	5.43	8.67	4.81	3.18	127
45	5.62	3.00	5.46	5.82	4.45	3.27	128
46	2.00	3.09	7.71	6.03	2.53	2.58	96
47	.70	5.55	8.20	6.48	4.47	1.44	112
48	9.30	3.97	5.40	8.85	3.51	2.79	130
49	4.92	9.76	3.83	6.59	3.80	2.34	60
50	8.00	6.38	6.58	3.18	5.81	2.66	139
51	4.08	4.14	8.26	3.86	4.86	6.56	144
52	5.99	5.07	5.21	4.53	4.66	2.50	148
Average	4.58	4.75	4.33	6.19	3.89	3.69	

Based on data from the following records:

Year	No. of Flocks	No. of Birds	Year	No. of Flocks	No. of Birds
1951	237	545,000	1954	965	2,787,000
1952	465	1,260,000	1955	1,396	3,825,000
1953	842	2,316,000	1956	1,112	3,342,000

* Index computed by the link relative method.