

A STUDY OF AGRICULTURAL PRICES
IN NORTH CAROLINA

(A Report of Progress: February 1 to May 31, 1950)

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1. Introduction.

The report which follows is a detailed account of work done on A Study of Agricultural Prices in North Carolina since January 31, 1950, the date of the last report.

The general objective of the study is to investigate the efficiency of modern sampling methods in price reporting, with special reference to the accuracy, cost, and types of problems to be expected, when sampling methods are used to provide price data of the kind needed by the Bureau of Agricultural Economics. The study is being conducted in North Carolina by the Institute of Statistics of the University of North Carolina in cooperation with the North Carolina and United States Departments of Agriculture. The two phases of the study are:

- (a) A preliminary study (Survey I) to define channels through which North Carolina farmers buy and sell.
- (b) Quarterly enumerations, over a period of one year, of a sample of North Carolina dealers patronized by farmers, to obtain price information on a selected list of commodities bought by farmers and on another list of commodities sold by farmers.

The first phase, definition of marketing channels, was described in the previous progress report. Since that time, the first of the four quarterly price enumerations (hereafter called Survey II) comprising the second phase has been completed. A report on that enumeration is contained herein, together with an analysis of its implications for the remaining three surveys and for the general objectives of the study.

2. Sampling Plan, Survey II.

In devising a sampling plan for Survey II, the first quarterly price enumeration in March, the following problems were considered:

- (a) Maximum total number of interviews possible within budget limitations.
- (b) Allocation of interviews to towns of different sizes.
- (c) Selection of individual towns to be entered in each size class.
- (d) Allocation of interviews to dealers of various kinds.
- (e) Allocation of interviews to dealers mentioned and not mentioned in Survey I.
- (f) Selection of individual dealers to be interviewed, giving consideration to (i) size of town, (ii) kind of dealer, (iii) "mention" status in Survey I.
- (g) Selection of farmers to be interviewed.
- (h) Selection of block samples from maps of large cities.

Budget considerations put the upper limit of number of interviews in the March enumeration at about 1500, allowing \$2.00 per interview. Cost estimates were insubstantial because of inability to predict with any assurance (i) the amount of information to be obtained per interview, and (ii) the number of urban interviews to be expected per enumerator-day. The above figures were taken, however, as the best available.

The original plan had been to use the results of Survey I to provide a basis for allocating enumeration effort among towns of different sizes, proportional to the importance of the town-size groups in the North Carolina farm marketing picture. Results of Survey I indicated, however, as was shown in the previous progress report,

that both purchases and sales by farmers were so concentrated in the small towns that a strictly proportional allocation would result in the collection of too little information from the larger towns. The proportional allocation plan was therefore abandoned in favor of a plan which would better represent the large towns, while reducing the unnecessarily heavy emphasis on small towns. The proper weights, as obtained from Survey I, could then be attached to the quotations from various townsize strata to develop an overall price estimate.

On the above basis, it was decided to take one A town from each of the twenty-seven sample counties, plus one additional A town at large from each Crop Reporting District, a total of 35 A towns; sixteen B towns were selected, 2 being taken at large in each Crop Reporting District, subject to the restriction that in no CRD should the two B towns fall within the same county; seven C towns, one per CRD, were selected (CRD 1 contained no town large enough to fall into the C stratum); and three D towns were selected from the State.^{1/} This method of selection meant that the B, C, and D towns could (and did) fall in many counties outside the original sample counties.

The A towns to be entered were selected in the 27 sample counties at random from those mentioned in Survey I, with equal probabilities; B and C towns were separately selected within each stratum, randomly, and with probabilities proportional to their frequencies of mention as farm marketing centers in Survey I, whether they fell in the 27 sample counties or not; the D towns were selected at random, one from the west, one from the north central, and one from the south central part of the State. No cities in Size Stratum D occur in Eastern North Carolina.

The selection of establishments to be visited within selected towns was a separate problem. The goal was to provide a single list of establishments to be

^{1/} A towns were of population less than 1,000; B, from 1,000 to 4,999; C, from 5,000 to 39,999; and D, 40,000 or more, as given in the 1940 Census of Population.

visited, such that an average price could be obtained for each important type of dealer in each town-size stratum for every one of the commodities studied. The small towns were completely enumerated, as the numbers of establishments per town were small. Similarly, since the numbers of buyers from farmers were so few compared with the numbers of sellers to farmers, they also were completely enumerated; moreover, concentration of farm production was such that it seemed advisable to take all the buyers of a given commodity in an area of concentration, because in many areas no buyers would be found. The population of establishments to be sampled then consisted of the remainder: those selling to farmers in B, C, and D towns.

From Survey I it had been found that the main types of establishments to be enumerated were Independent Stores, Farm Cooperatives, Chain Stores, and Mail Order Houses. These were sampled separately for each commodity group in the three largest town-size strata, B, C, and D.^{2/}

In the selected towns the establishments fell into two groups: those mentioned by farmers in Survey I, and those not mentioned. In the B towns, a check against telephone directories and Dun and Bradstreet listings showed that in most cases over one-half of all establishments had been mentioned. The proportion of establishments mentioned declined as town size increased. It was thus necessary to give the "non-mentions" a chance to be represented in the sample, particularly in the large towns.

For Independent Stores, the sample for each commodity group consisted of the following:

Size of town:	Number of independent establishments selected:			Total independent establishments per commodity group, all B, C, and D towns
	Number of towns selected:	Mentioned in Survey I	Not mentioned in Survey I	
B	16	2	1	48
C	7	2	2	28
D	3	2	2	12
All towns	26	X	X	88

^{2/} Commodity groups were groups of related items, like Feed, which included several individual feed items.

The total number of establishments per town in the B, C, and D towns, was set at 3 and 4 because (i) approximately equal numbers were desired per town in each town-size stratum, and an average of about four were expected from the complete enumeration of an A town; and (ii) it was estimated that this figure would provide the desired minimum of 100 quotations in each commodity group. The 2-1 division between mentions and non-mentions in B towns, giving a minimum representation to non-mentions, was made because so large a part of all establishments had been mentioned; in C and D towns, the division was equal because, within the limits of the fixed total, it was felt that the mentions could not be reduced below 2 per town. The mentions, it is to be remembered, were known to be places at which farm business was conducted, while the non-mentions were unknown in this characteristic. To weight the non-mentions too heavily was thus to run the risk of finding little farm business and hence few useable quotations.

Having decided on numbers of establishments needed within selected towns, the selection of individual independent stores for enumeration remained. From Survey I, all mentioned dealers, with the frequency of mention of each, had been tabulated for each commodity group in each town mentioned. From these tabulations for the selected towns, the required number of independent stores were drawn, with probability of selection proportional to the frequency of their mention by farmers on Survey I. The non-mentions were selected at random, with equal probabilities, from the establishments listed in telephone directories and Dun and Bradstreet, after those mentioned in Survey I had been removed from the lists.

The procedure outlined above was followed for each commodity group. The separate lists of establishments so drawn were then composited and duplications were removed.

The selection of Cooperatives was simplified by the fact that most towns had only one. In such towns, of course, that one was selected. When more than one cooperative was found in a selected town, those mentioned were assigned probabilities

of selection proportional to frequency of mention, and non-mentions were added to the list, with probabilities of selection equal to that assigned the least frequently mentioned cooperative on the mentioned list. One cooperative was then drawn from this combined list.

Chain Stores were of importance only in the sale of furniture and furnishings and clothing, among the commodity groups considered in this study. Selection of one chain for each of these groups was made in B, C, and D strata in the same way as was described for cooperatives, above.

Only in the sale of clothing were Mail Order Houses of importance, and virtually all purchases by farmers were reported through one firm. This firm was contacted at its one mail order plant in the state.

It was indicated above that Prices Received by farmers were taken from all the dealers the enumerator could reach, whether mentioned on Survey I or not. There were, however, certain commodities of which farmers sold important amounts to consumers, truckers, other farmers, or other agencies not obtainable in a sample of business establishments (See Progress Report on Survey I). Of the commodities marketed in this way by farmers, only eggs and apples were being sold in March. A sample of farmers was drawn to provide information on these items moving through non-business channels to supplement the information from business establishments.

The sample was drawn at random from farmers interviewed in Survey I. Sixty farmers were included, allocated to the sample counties in proportion to the quantities of the commodity farmers reported sold through non-business channels, with not less than two farmers selected in any county.^{3/}

The "mentions" in Survey I, to which several references have been made, were establishments which farmers listed as the most important with which they did business in a particular commodity group. Theoretically, if all farmers in a town did

^{3/} In counties where less than two were indicated on a proportional basis, none were selected.

51% of their business with Establishment A, and 49% of their business with Establishment B, then Establishment B would never be mentioned. Actually farmers tended to do most of their business for a particular commodity in one store, as shown in Survey I. It was nonetheless felt necessary to represent the non-mentions in Survey II, as indicated above. They were, however, given an arbitrarily chosen probability of selection. Additional representation, on a purely random basis, was given to the non-mentions by the enumeration of 629 establishments from a randomly selected sample of 25 city blocks in each of the three selected D cities.

3. Survey II Results.

Twenty enumerators gathered the data in Survey II in the period, March 13-25. From a total of 1738 establishments visited, 968 were eligible for the survey; 40 of these did not, for various reasons, give records; a total of 928 establishments provided useful records. By size of town, those were distributed as follows:

Table 1. Establishments Visited in Survey II from a Sample of Establishments in 58 Towns and 10 Rural Areas of North Carolina. Price Study, March, 1950.

Size of town ^{a/}	Number of towns	Number of establishments visited	Number of establishments visited	Number of eligible establishments visited	Number of non-cooperators	Number of establishments from whom records were obtained
A (Less than 1000)	32	470	300	6	294	
B (1000 - 4999)	16	314	314	20	294	
C (5000 - 39,999)	7	187	187	7	180	
D (40,000 or more)	3	76	76	7	69	
D (Map Segments)	(3) ^{b/}	629	60(5) ^{c/}	0	60(5)	
Farms (Rural areas)	10 areas	62	31	0	31	
Total	58	1738	968	40	928	

^{a/} Population according to 1940 U.S. Census.

^{b/} Map sampling was used to supplement the regular sampling plan. The same three cities in Size Class D were used for both the map and regular samples.

^{c/} The five establishments in parentheses were duplicates which were not enumerated from the map segments, as they had already been included in the regular list.

The disparity between establishments visited and records obtained is seen to be greatest in the A towns and in the map segments of D towns. In the A towns, which were completely enumerated, enumerators were instructed to visit all establishments, whether their names appeared on the sample lists or not. Only establishments reporting business with farmers in the commodities studied were enumerated. In the D town map segments, no lists of names were provided; enumerators were instructed to visit all establishments in the designated blocks, and to enumerate, as in A towns, those reporting business with farmers in the commodities studied. Less than 10% of establishments proved to be eligible in these map segments. In the B, C, and D towns, the regular sampling plan provided no ineligibles, as only known dealers in commodities studied were included.

A. Prices Received. Before considering the analysis of the commodities which can be examined in detail, we turn briefly to the price quotations obtained on all the Prices Received commodities. (See Table 2.) It is apparent that little detailed analysis of the March data on Prices Received can be made, except in the case of eggs, and, to a lesser degree, hens, sweet potatoes, and hogs, because too few quotations are available to warrant the necessary sub-grouping.

The close correspondence between (i) numbers of complete quotations of both price and quantity and (ii) total numbers of quotations including price-quantity and price alone, should be noted. The attempt was made, of course, to get prices and quantities for all commodities. On Prices Received it was relatively easy to get the complete data, but, as will be indicated below, the quantities of Prices Paid items were considerably more difficult to obtain than their prices. The problem of specification is also acute on several commodities.

The specification problem in Corn is typical, in that what appears to be a fairly large number of establishments giving quotations (60), is seen on closer

Table 2. Prices Received by Farmers From a Sample of North Carolina Establishments. Survey II, Price Study, and BAE, March, 1950.

Commodity	Number of establishments giving quotations	Price only	Price and quantity	Unit in which price is quoted	Quantity	Price is based on	Prices quoted, sample survey			B A E Price Report
							Lowest	Highest	Modal	
	(no.)	(no.)	(unit)	(unit)	(units)	price is based on	Lowest	Highest	Modal	Survey I : Survey II : weights c/ : weights d/ : Report
Corn: All	62	60	Bu.	26,669	\$.80	\$ 1.30	\$ 1.52	\$ 1.20	\$ 1.23
yellow: ear	20	20	Bu.	3,427		.80	1.40	1.25	---	---
shelled	32	31	Bu.	11,863		1.00	1.50	1.40	---	---
white: ear	21	21	Bu.	3,126		.80	1.30	1.25	---	---
shelled	22	22	Bu.	8,253		1.00	1.65	1.23	---	---
Wheat	14	13	Bu.	4,140		1.75	2.50	2.10	---	2.10
Oats	17	15	Bu.	4,315		.30	1.50	.90	---	.92
Cotton	14	14	Lb.	831 bales		.265	.330	.313	---	.29
Soybeans	12	12	Bu.	1,670		1.75	4.00	1.85	---	1.96
Peanuts	5	5	Cwt.	45		3.00	13.50	12.00	---	11.40
Cowpeas	6	6	Bu.	262		4.00	4.50	4.00	---	3.90
Lespedeza hay	14	14	Ton.	61		25.00	45.00	26.00	---	29.60
Lespedeza seed										
Korean	14	14	Cwt.	604		5.00	10.00	5.50	---	6.00
Kobe	17	17	Cwt.	310		5.50	14.50	11.00	---	9.90
Irish Potatoes	11	11	Bu.	201		1.20	2.10	1.44	---	1.65
Sweet Potatoes	53	53	Bu.	579		1.25	4.50	4.50	2.25	2.35

a/, b/, c/, d/ See end of table for footnotes.

Table 2, Continued.

Commodity	a/ Number of estab- lishments giving quotations	Price only and price-	Price and price-	Quantity upon which survey is based	Unit in which price is quoted	Prices quoted, sample survey			B A E Price Report	
						Lowest	Highest	Modal		
		b/ quantity	c/ quantity			d/ weights	e/ weights	f/ weights		
Chickens: All	53			471,333	Ib.	\$.11	\$.50	\$.31	.293	.274
broilers: alive	20			345,553	Ib.	.30	.34	.31	.311	.300
dressed	4			294	Ib.	.41	.50	.50	.450	---
Hens: alive	41			119,464	Ib.	.19	.26	.23	.235	---
dressed	7			239	Ib.	.40	.50	.50	.460	---
Roosters: alive	11			5,788	Ib.	.11	.20	.15	.150	---
Eggs	259			40,487	Doz.	.25	.45	.30	.317	.328
Turkeys: All	2			5,930	Ib.	.30	.50	.50	.496	.400
Alive	1			130	Ib.	.30	.30	.30	.300	---
dressed	1			5,300	Ib.	.50	.50	.50	.500	---
Hogs	13			3,354	Cwt.	10.00	22.00	16.00	14.02	15.40

a/ No quotations were received on Apples, Peaches, Potatoes, or Capons.

b/ The figures given here include incomplete quotations in which dealers were able to quote price, but could not give a quantity estimate; in the next column, "Price and Quantity," only the complete quotations of both price and quantity are given.

c/ Mean of prices reported, weighted by quantities reported sold at each price, Survey II.

d/ Mean of prices reported, Survey II, weighted by quantities reported sold through various marketing channels in towns of different sizes, Survey I.

examination to be about half as many establishments each quoting one or more of several separate items: yellow ear corn, yellow shelled, white ear, and white shelled. While the price difference due to color does not appear important, there is a difference between ear (\$1.22) and shelled corn (\$1.34). Since these are essentially different commodities, it was not considered justifiable to combine them into one analysis, and there were too few quotations on any single item to warrant separate analyses.

Eggs were the most widely-quoted of all the Prices Received commodities. Reports were received from 259 establishments, on over 40 thousand dozens. This is an adequate coverage to permit an extended analysis.

Prices quoted for eggs ranged from 25 to 45 cents per dozen, as shown in the following tabulation. The correspondence is seen to be very close between the distribution of quotations on Survey II and those concurrently collected by the routine BAE mail questionnaires.

The partitioning of sums of squares in the analyses of variance is done on two bases: (i) "Weighted," referring to the fact that each respondent's price quotation was given a weight proportional to the quantity the respondent reported sold, and (ii) "Unweighted", referring to the fact that no weighting by quantity was done, each quotation carrying the same weight. In the analyses of variance that follow, the terms, weighted, and unweighted, will be used in that sense.

Because the sample plan made use of both random (indicating the need for the weighted analysis) and "PPS" (probability proportional to frequency of mention on Survey I, indicating the need for an unweighted approach) sampling methods neither the weighted nor the unweighted analysis gives unbiased estimates of variance. As the analyses show, however, the interpretations based on the two methods are not appreciably different. The degrees of freedom for the weighted analysis are based on the number of quotations of both price and quantity. There were in most cases several additional quotations of prices with no quantity, which were added to the data for use in the unweighted analysis, since the quantity data were not there essential. Hence, the differences between the degrees of freedom shown for the weighted and unweighted analyses. No adjustments for disproportionate frequencies are shown in the analyses, but it is believed that such adjustments would not change the conclusions.

Table 3. Distribution of Egg Price Quotations. Survey II, North Carolina Price Study, Compared with BAE Price Reports, March, 1950.

Price quoted cents per dozen	Number of dozens Survey II	Number of quotations	
		Survey II	BAE price report
25	251	6	2
26	0	0	1
27	0	0	0
28	1,660	11	5
29	90	2	1
30	18,327	112	62
31	630	4	2
32	8,612	24	5
33	2,772	19	3
34	180	3	1
35	5,910	56	25
36	90	2	0
37	1,185	5	2
38	255	3	4
39	0	0	0
40	505	10	12
41	0	0	0
42	0	0	0
43	0	0	0
44	0	0	0
45	20	2	4
Total	40,437	259	129
Average prices per dozen:	31.7 cents (Survey II weighted by dozens)	32.1 cents (Survey II weighted by quotations)	32.8 cents (BAE)

One of the objectives of this study was to analyze prices received by farmers, to determine insofar as possible the sources of price variation. The sources considered were (i) geographical (size of town in which eggs are sold, and location within the state), (ii) trade channel through which eggs moved, and "mention"

status in Survey I, ^{4/} (iii) services performed by farmer, i.e., grading, packing, etc., (iv) location of sale.

A significant tendency for prices to increase from east to west and from north to south was observed. There did not appear to be any significant differences between the quotations in different town-size strata. Even the inclusion as a separate stratum of quotations from farmers, who reported several retail sales direct to consumers at a somewhat above-average price, did not bring about a significant between-strata difference because so few dozens were reported in this category. Absence of statistically significant differences between strata merely reflects the large within-stratum differences in prices as compared with the between-stratum differences. Average prices are given in Table 4, below.

Table 4. Average Prices Reported for Eggs in North Carolina Towns of Various Sizes, by Crop Reporting Districts. Price Study, Survey II, March, 1950.

Crop reporting: District <u>a/</u>	: Number of dozens reported	Size of town					
		: Under : 1,000 - : 1,000	: 1,000 - : 4,999	: 5,000 - : 39,999	: 40,000 - : or more	: Farmers	: All strata
2	1,437	32.0	29.5	<u>b/</u>	37.0	35.7	31.8
3	1,915	30.3	30.0	35.0	<u>b/</u>	30.0	30.5
4	3,340	31.3	32.8	34.4	31.8	<u>b/</u>	32.8
5	11,564	31.3	30.0	30.0	<u>b/</u>	32.6	30.6
6	5,843	29.9	29.0	30.2	<u>b/</u>	37.8	30.0
8	12,318	32.3	32.4	31.0	33.5	<u>b/</u>	33.1
9	3,520	31.6	30.0	36.4	<u>b/</u>	<u>b/</u>	32.3
All CRD's	XXX	31.5	30.6	31.5	33.4	34.9	31.7
Number of dozens	40,437	11,994	12,346	6,731	9,205	211	XX

a/ No quotations were received from CRD 1; there is no CRD numbered 7 in North Carolina.

b/ No quotations available in these cells.

4/ The analysis of "mention" status consists of a comparison of prices reported by establishments which had been mentioned by farmers as market outlets in Survey I, and establishments which were not so mentioned, but were added to the Survey II sample. Reasons for supplementing the sample of "mentions" are detailed in the section of this report which deals with the Sampling Plan.

The presence of eight empty cells (indicated by b/) in this tabulation of 259 reports suggests the limitations on analysis imposed by the concentration of data into a few cells. Concentration is characteristic in the commodities studied, and, with fewer than 100 quotations in most cases, the large number of empty cells renders analysis difficult.

The unadjusted contributions of the various criteria of classification to the total sum of squares is as follows:

Source of variation	Degrees of freedom	Sum of squares (weighted)	Sums of Squares (unweighted)
Between Crop Reporting Districts	6	63,337	244
Between counties in CRD's	24	79,271	875
Between towns in counties	29	20,564	670
Between types of dealers in towns	30	19,072	926
Between mentions in dealers	15	9,040	
Between services in mentions	27	27,311	
Within services	<u>127</u>	<u>23,702</u>	<u>2715</u>
	258	242,847	

While no tests of significance can be made from this analysis, because it includes an assortment of random, e.g. county, and fixed, e.g. crop reporting district, effects, the last line gives an unbiased estimate of the error after all the above effects have been removed.

The "nested" analysis, without consideration of effects due to type of dealer, mention status, or type of handling, can be shown by using the first three lines of the above table as they are, and combining the remaining lines to give a "within towns" sum of squares. It appears from this that about one-third of the total sum of squares is "within towns," as is shown specifically in the unweighted analysis.

The only adequate analysis appears to be a complete least squares solution, in which adjustment for the fixed effects could be made, and the importance of the random effects evaluated. With the highly disproportionate frequencies, and the necessity for weighting each observation by the number of dozens sold, the least squares analysis would be a very long and expensive one. It is estimated that as much as two months of a computer's time might be required to do the job on each commodity. It has therefore not been possible to work out a least squares solution in time to include it in this report.

Recognizing that the unadjusted figures are not entirely satisfactory bases upon which to form conclusions, we are giving below the results of separating out the effects associated with types of dealers, mentions, types of services, and town-size strata, respectively.

Source of variation	Degrees of freedom	Weighted		Unweighted	
		Sum of squares	Mean squares	Sum of squares	Mean squares
TYPES OF DEALERS * Between types of dealers					
	2	23,920	11,985	189	95
Within dealers					
	256	218,877	855	2,526	10
Total					
	258	242,847	---	2,715	---

Source of variation	Degrees of freedom	Weighted		Unweighted	
		Sum of squares	Mean squares	Sum of squares	Mean squares
MENTION STATUS, SURVEY I* Between mentioned and non-mentioned					
	1	111	111	7	7
Within mention status					
	257	242,736	944	2,708	11
Total					
	258	242,847	---	2,715	---

Source of variation	Degrees of freedom	Weighted		Unweighted	
		Sum of squares	Mean squares	Sum of squares	Mean squares
TYPES OF SERVICES* Between services					
	3	24,376	8,125	202	74
Within services					
	255	218,471	857	2,513	10
Total					
	258	242,847	---	2,715	---

Source of variation	Degrees of freedom	Weighted		Unweighted	
		Sum of squares	Mean squares	Sum of squares	Mean squares
TOWN SIZE STRATA * Between strata					
	4	57,164	14,291	373	93
Within strata					
	254	185,683	731	2,342	9
Total					
	258	242,847	---	2,715	---

* Since all egg quotations included quantities, the degrees of freedom for weighted and unweighted analyses are identical.

From the foregoing unadjusted analyses, there are suggestions that mention status is not a significant contributor to egg price differences, and that town-size strata, type of dealer and type of service are significant. These must be tentative conclusions, however, because the interactions are so complex that definite statements must wait until something is known of their composition.

For the analysis of effects attributable to types of dealer, the dealers were grouped into three classes: Retail outlets, including grocery stores and general stores; Wholesale outlets, including feed dealers, hatcheries, cooperatives, and produce dealers; and Others, including consumers, cafes, and bakeries. The average prices paid by each type are shown below, Table 5, sub-divided by mention status on Survey I.

Table 5. Prices Received by Farmers for Eggs in North Carolina from Various Types of Buyers, Mentioned and Not Mentioned in Survey I. Price Study, Survey II, March, 1950.

Mention status, Survey I	Number of quotations	Number of dozens	Type of buyer		
			Retail (cents)	Wholesale (cents)	Other (cents)
Mentioned	71	6,715	31.9	30.9	35.5
Not mentioned	100	33,772	32.0	31.4	35.3
Mentioned and not mentioned	259	40,487	32.0	31.4	35.4
Number of quotations	259	XXX	106	47	26
Number of dozens	XXX	40,487	10,491	20,503	1,493

Turning to the analysis of services performed on eggs prior to sale, one finds that over two-thirds of the quotations, and about two-fifths of the eggs, were nest run, no services being performed by the farmer-producer. The categories of services studied are shown in Table 6, together with average prices and quantities reported in each.

Table 6. Average Prices Received by Farmers for Eggs in North Carolina. Price Study, Survey II, March, 1950.

Item	Types of services				
	: Nest run	: Packed ^{a/}	: Sized and/or graded	: Packed, sized, and graded	: All eggs
Average price, cents per dozen	30.7	32.0	34.3	35.0	31.7
Number of quotations	183	46	23	7	259
Number of dozens	16,837	22,065	818	767	40,487

^{a/} Includes 1-dozen boxes and 30-dozen cases; there was no price difference between the two methods of packing.

Analysis of the effect of place of sale had to be limited because all but four of the quotations, representing all but 1,320 dozens, were reported as prices at the buyers' places of business. Average price per dozen for these eggs, which the farmer sold at the farm, packed in 30-dozen cases, was 31.1 cents per dozen, but the quantity was so small (3%) that, like non-cash eggs, it exerted no important effect on the general average price.

It is often said that large quantities of eggs are traded for groceries, or move in other non-cash channels in North Carolina. That statement should be qualified if the results of this survey truly represent the situation. Although 28% (72) of the enumerated establishments reported receiving non-cash eggs, only 6% (2,652 dozens) of the eggs were reported to have been purchased on a non-cash basis. Three-fourths of these eggs moved in the A towns. As regards influence of non-cash trading on price, the effect is even less than the figures above indicate, because only 652 of the 2,652 dozens of non-cash eggs were traded by farmers for a price different from the cash price. In these cases, a premium of from two to five cents per dozen was paid, but the premium, applied to only 1 1/2% of the eggs, had no appreciable effect on prices received by farmers.

Weighting. One of the uses to which Survey I data was to be put was to weight the prices obtained in Survey II, to insure that prices in the different town-size strata and by different types of dealers would be properly represented. A comparison of the weights for eggs from Survey I with those from Survey II is given below:

Dealer	Survey I					All towns	Survey II					All towns
	Town size				All towns		Town size					
	A	B	C	D			A	B	C	D		
Retail	16	6	6	2	30	15	7	3	.5	25.5		
Wholesale	46	7	6	4	63	14	23	12	22	71.0		
Other	4	2	1	0	7	1	.5	2	0	3.5		
All	66	15	13	6	100	30	30.5	17	22.5	100.0		

Overall weights of the types of dealers were about the same in the two surveys, but were quite different for different town-size strata. The large towns apparently were over-represented, in Survey II at the expense of the smallest towns. Since there were no significant differences between strata or between dealers, however, these weights mean little. When weighted by Survey II, the average price is 31.7 cents per dozen; Survey I weights produce an average of 31.6 cents per dozen.

Hatching eggs. The foregoing analysis of egg prices has excluded hatching eggs from consideration. Although only 9 reports were received on hatching eggs, those accounted for 14,650 dozens, bringing an average price of 62.9 cents per dozen. No data were obtained in Survey I on hatching eggs, so no weights were available for use in preparing a price estimate. The reports were so few and so

varying (one of the nine was of 9,000 dozens and another was of 3,300 dozens) that no analysis was possible. If the 40,487 dozen market eggs at 31.7 were composited with the 14,650 dozen hatching eggs at 62.9, the overall average price received by farmers for all eggs would be 40.0 cents per dozen.

Sweet potatoes, though not moving in large volume at the time of the March survey, were represented by 53 reports and 579 bushels. One report of 300 bushels, however, dominated the survey data on this item. Except for that report, representing over 50% of the sweet potatoes in the survey, no price above \$3.00 per bushel was reported, but the price for the 300 bushels was \$4.50. No specific reason exists for discarding this report, but its validity is highly questionable, especially in view of the fact that these 300 bushels were said to have been bought ungraded, unwashed, and unsacked. A summary of the sweet potato data follows in Table 7.

Table 7. Prices Received by Farmers from Different Types of Dealers, Numbers of Quotations, and Quantities, of Sweet Potatoes Reported in Different-Sized Towns. Survey II, Price Study, March, 1950.

Type of dealer:	Item	Size of town				Farmers	Total
		A	B	C	D		
Retail ^{a/}	Average price received by farmers	\$2.43	\$2.36	\$2.00	--	--	\$2.40
	Number of quotations	28	9	1	0	--	38
	Number of bushels	66	30	2	--	--	98
Wholesale ^{b/}	Average price received by farmers	2.09	2.50	2.25	\$4.34 ^{d/}	--	4.25
	Number of quotations	2	2	1	2	--	7
	Number of bushels	8	4	3	320	--	335
Other ^{c/}	Average price received by farmers	2.21	--	--	--	--	2.21
	Number of quotations	4	0	0	0	--	4
	Number of bushels	17	--	--	--	--	17
Farmer	Average price received	--	--	--	--	\$1.80	1.80
	Number of quotations	--	--	--	--	4	4
	Number of bushels	--	--	--	--	129	129
Total	Average price received by farmers	2.36	2.38	2.15	4.34	1.80	3.33 ^{e/}
	Number of quotations	34	11	2	2	4	53
	Number of bushels	91	34	5	320	129	579

^{a/} Includes grocery stores, general stores, fruit stands.

^{b/} Includes produce shippers and/or buyers, cooperatives, and truckers.

^{c/} Includes cafes, service stations, and other miscellaneous buyers.

^{d/} Includes one report of 300 bushels at \$4.50.

^{e/} If the 300 bushel report at \$4.50 is removed, the overall average price is reduced from \$3.33 to \$2.07. These figures are comparable to (i) the \$2.35 released by BAE, and (ii) the \$2.25 obtained when the prices above are weighted by Survey I quantities. Wholesale dealers in D towns had a Survey I weight of .4%, so the atypical quotation of Survey II lost its importance when weighted by Survey I.

No sales were reported at the farm.

The distribution of reports according to the services performed on sweet potatoes was as follows:

Services performed prior to sale	Number of quotations	Number of bushels	Average price
No services	29 ^{a/}	171 ^{a/}	\$2.01 ^{a/}
Washing and/or sacking	23	108	2.17
All sweet potatoes	52	279	2.07

^{a/} Excluding the one atypical quotation of 300 bushels at \$4.50.

This is the kind of difference to be expected, although the size of the spread is not great.

These data reemphasize the seriousness of the concentration-of-data problem. Only two cells (Table 7) contain as many as 5 reports, and over half of all reports occur in one cell. Moreover, the large number of empty cells occurs even after the originally reported dozen-odd types of buyers have been grouped into only the three classes shown. Despite what appears to be a respectable number (53) of quotations, therefore, little or no statistical analysis is possible.

Chickens were reported purchased from farmers by 53 establishments, reporting a total of nearly a half-million pounds. The largest volume of purchases was of live broilers (20 reports, 345,553 pounds), but the largest number of reports was for live hens (41 reports, 119,464 pounds). Eleven reports totalling 5,788 pounds were received on roosters.

Because of concentration of data similar to that encountered in sweet potatoes, the analysis of broiler prices was of necessity very simple. The range of prices was from 30 to 34 cents per pound, the quotations being summarized below.

Table 8. Prices Received by Farmers and Quantities of Live Broilers Reported Bought in Towns of Different Sizes. Price Study, Survey II, and BAE Price Report, March, 1950.

Price (cents per pound)	Item	Price study, Survey II					BAE price report
		Size of town					
		A	B	C	D	towns ^{a/}	
18	Number of quotations						2
19	"						0
20	"						1
21	"						0
22	"						4
23	"						3
24	"						2
25	"						4
26	"						0
27	"						3
28	"						5
29	"						2

30	Number of quotations	0	0	0	1	1	16
	Number of pounds	-	-	-	10,000	10,000	-
31	Number of quotations	4	5	1	3	13	2
	Number of pounds	35,950	133,600	30,000	83,550	283,100	-
32	Number of quotations	0	2	0	2	4	4
	Number of pounds	-	10,500	-	39,283	49,783	-
33	Number of quotations	0	1	0	0	1	0
	Number of pounds	-	70	-	-	70	-
34	Number of quotations	0	0	1	0	1	0
	Number of pounds	-	-	2,600	-	2,600	-

35	Number of quotations						6
36	"						0
37	"						1
(No prices above 34 cents were reported in Survey II.)							
All live broilers	Number of quotations	4	8	2	6	20	55
	Number of pounds	35,950	144,170	32,600	132,933	345,553	---
Average price (cents per pound)		31.0	31.1	31.2	31.2	31.1	30.0

^{a/} None of the farmers interviewed reported selling live broilers.

The table shows that four-fifths of the broilers were reported sold by farmers at one price. Obviously no analysis of price differences is possible under this circumstance. When further subdivision is attempted by size of town or type of buyer, the situation is even less hopeful.

There were four reports for a total of 294 pounds of broilers sold dressed. The average price for dressed broilers was 45 cents per pound.

Practically all broilers (all but 292 pounds reported by 3 cafes and grocery stores) were reported sold by farmers at the farm to large-scale poultry buyers, including feed dealers, hatcheries, dressing plants, and cooperatives. This undoubtedly explains the very narrow range of prices reported. The slight apparent tendency for prices to increase in larger towns, based on so few reports, is of no statistical significance, and, being of such small magnitude, is of no practical significance.

Reports on live hens were received from 41 establishments, on a total of 119,464 pounds, ranging in price from 19 to 26 cents per pound. Hens, which are not quoted separately by BAE, are examined here only because they represent one of the very few cases among Prices Received in which a reasonable number of quotations was received. The distribution of the data is given in Table 9.

Table 9. Prices Received by Farmers, and Quantities of Live Hens Reported, in Towns of Different Sizes. Price Study, Survey II, March, 1950.

Price (cents per pound)	Item	Size of town				Farmers	All reports
		A	B	C	D		
19	Number of quotations	0	1	0	0	0	1
	Number of pounds	-	100	-	-	-	100
20	Number of quotations	7	3	0	1	3	14
	Number of pounds	3,445	600	-	4,500	63	8,608
21	Number of quotations	1	0	1	0	0	2
	Number of pounds	430	-	50	-	-	480
22	Number of quotations	1	3	2	0	1	7
	Number of pounds	50	880	26,500	-	156	27,536
23	Number of quotations	2	1	1	0	0	4
	Number of pounds	1,272	650	30,000	-	-	31,922
24	Number of quotations	1	3	0	1	0	5
	Number of pounds	400	6,400	-	2,000	-	8,800
25	Number of quotations	0	3	1	1	0	5
	Number of pounds	-	12,400	28	9,000	-	21,428
26	Number of quotations	0	0	0	3	0	3
	Number of pounds	-	-	-	20,540	-	20,540
All live hens	Number of quotations	12	14	5	6	4	41
	Number of pounds	5,597	21,030	56,578	36,040	219	119,464
Average price (cents per pound)		21.1	24.3	22.5	24.9	21.4	23.5

To apply weights from Survey I necessitated classification of these prices according to the type of dealer to whom the farmers sold as well as by size of town. This classification is given in Table 10.

Table 10. Price Quotations on Live Hens, by Type of Dealer and Size of Town. Price Study, Survey II, March, 1950.

Dealer	Item	Size of town				
		A	B	C	D	All towns
^{a/} Retail	Average price, Survey II	.21	.20	*	*	.207
	Weight, Survey I	.06	.05	-	-	.11
^{b/} Wholesale	Average price, Survey II	.22	.25	.22	.25	.231
	Weight, Survey I	.41	.28	.15	.04	.83
^{c/} Other	Average price, Survey II	*	.20	.25	*	.206
	Weight, Survey I	-	0	.01	-	.01

* No quotations available.

^{a/} Includes grocery stores, markets, and general stores.

^{b/} Includes poultry and produce buyers, feed dealers, etc.

^{c/} Includes cafes, and other miscellaneous buyers.

The price weighted by Survey II quantities is, as was shown in Table 2, 23.5 cents; when the weights from Survey I are used on the Survey II prices, the price is 22.8 cents. The prices to which Survey I weights can be applied, however, are based on so few quotations that the results would be difficult to defend.

In addition to the live hens, there were seven reports received on dressed hens, averaging 46.2 cents per pound. As in the case of broilers, most of the hens were bought at the farm. Only one dealer reported paying a premium--he paid 2¢ per pound--for hens delivered to his place of business.

The data on Hogs provide an interesting example of the degree of consistency of reporting by respondents. The interviewers asked first for the "average live-weight price paid yesterday" for hogs; then at a later point in the interview they asked for the quantities bought in different weight classes and the average prices in each class. In the cases of the six buyers from whom weight-class data were obtained it was thus possible to compute an average price from the individual weight-class prices, to be compared with the reported overall average price. In these cases, where the information necessary for the computations was available, the computed average could reasonably be assumed to be the more realistic price. The comparison of quoted and computed prices is shown in Table 11, below.

Table 11. Comparison of "Average Liveweight Price" for Hogs with a Computed Average Price, Based on Prices and Quantities Reported for Individual Weight Classes. Price Study, Survey II, March 1950.

Hog buyers reporting	Quantity reported (cwt.)	Quoted average price	Computed average price	Quoted minus computed
<u>Buyers who gave data on weight-class distributions of purchases</u>				
A	10.8	\$ 13.50	\$ 13.63	- .13
B	239.9	14.50	15.74	- 1.24
C	228.2	14.75	15.26	- .51
D	246.0	15.00	14.72	.28
E	60.3	15.75	14.91	.84
F	865.3	15.84	15.84	0
Average	275.1	15.35	15.53	- .18
<hr style="border-top: 1px dashed black;"/>				
<u>Buyers who did not give data on weight-class distributions of purchases</u>				
G	6.5	10.00	X	X
H	1,200.0	11.25	X	X
I	75.0	14.00	X	X
J	5.0	15.00	X	X
K	386.4	16.00	X	X
L	24.0	16.00	X	X
M	2.8	20.00	X	X
N	2.5	20.00	X	X
O	1.3	22.00	X	X
Average	189.3	12.57	X	X

Of the fifteen hog buyers interviewed, only six could give data on quantities and prices in different weight-classes, and only one (a packing plant) had

actually computed its overall average price based on weight-class prices.^{5/} The average size of operations of buyers who gave weight-class distributions was notably higher than the size of those who did not give such data. The latter group was exceedingly variable, including the largest and smallest buyers as well as the buyers who paid the highest and lowest prices.

For the six who gave data upon which to base a comparison, there were considerable differences between quoted and computed average prices of individual buyers; yet the averages of all buyers were not significantly different.

There appeared to be a large difference between prices paid per hundredweight for hogs bought by the head (\$11.43) and for those bought by weight (\$15.60). One of the four buyers reporting accounted for 1,200 of the 1304 cwt. bought by the head, however, so little reliance can be placed on this figure. Somewhat more confidence can be put on the weight-class prices, based on a slightly larger number of reports. They are as follows:

Weight-class	Number of quotations ^{a/}	Average price per cwt.
Less than 140 lbs.	6	\$ 13.62
140 - 179 lbs.	9	14.85
180 - 239 lbs.	8	16.02
240 - 299 lbs.	7	13.94
Over 300 lbs.	5	13.74

^{a/} Includes buyers who did not give detailed weight-class distributions. For example, a buyer could have reported buying 10 cwt. of "mixed hogs" whose average weight was, say, 190 lbs.; his price report would have been included in the 180 - 239 group for the computation above.

^{5/} The fifteen hog records are said to have been taken from hog "buyers." They include, however, agencies like auction markets, which do not buy, but which do constitute a channel through which farmers sell. For convenience they are referred to as buyers.

The small number of buyers (15) from whom records were obtained on hogs makes an extensive statistical analysis impractical for reasons explained for other commodities above. In the case of hogs, the numbers of quotations from the various town-size strata are: A - 4, B - 3, C - 2, D - 3, Farmers - 3.

Prices Received by Farmers: Concluding Remarks. With a few exceptions, the commodities studied in the March survey were not being marketed in substantial quantities in March. Hence the numbers of quotations obtained were in most cases too small to warrant more than the simplest statistical treatment. In general the mean prices from the survey were in close agreement with those released by BAE in the price report. Studies of sources of variation in prices received must in most cases be deferred until the seasons in which more data can be obtained. The geographic concentration of production of a given commodity in a few areas of the State, the areas for one commodity being different from those for another, makes difficult the designing of a single sample which will adequately represent several commodities simultaneously. Whether the sampling job can be done satisfactorily within the available funds will be shown by the data from the June and later surveys. The concentration of data is not, however, only geographic. There is also the characteristic heavy concentration of observations in a few marketing channels and in a few sizes of towns. This adds to the difficulties of using a single overall sample plan for several commodities.

The only appropriate analysis appears to be a complete least squares solution, but this involves a very heavy computation load. It is doubtful in most cases whether it can be justified on these data with so few reports, and so many sources of variation to be investigated.

B. Prices Paid. The list of commodities farmers buy which was selected for study in Survey II consisted of more than forty items, falling into eight groups: clothing, furniture and furnishings, building materials, farm machinery, feed, fertilizer, seed, and motor vehicles. A summary of the data received on these items is given in Table 12, together with a comparison of the survey mean prices and the BAE prices. All survey mean prices in Table 12 are weighted by quantity sold at each price.

In connection with Prices Received, the observation was made that quantities of items sold by farmers could be obtained from buyers without much difficulty. Quantities of items bought by farmers were not nearly as easily obtained, as an examination of the first two columns of Table 12 indicates. Items like food, sold mainly to farmers, offered no trouble. Items like clothing and furniture, however, for which farmers are only a portion of the customers, were difficult to enumerate completely. Prices of these items could be obtained, but in many cases the quantities or proportions of all sales, going to farmers were difficult to get. This suggests the need for more research on the applicability of the concept of "prices paid by farmers," to items also bought widely by non-farmer segments of the population.

The specification problem in items bought by farmers was more acute than it was in items sold by farmers. One instance will illustrate this point. One of the items studied in Survey II was specified on the schedules as "Lift pumps, 3-inch iron cylinder, with standard pipe and rod, each." Prices ranging from \$4.50 to \$210.00 were quoted on this item. As shown in Table 12, however, those quotations could be broken up into three distinct sub-groups, as follows:

Table 12. Prices Paid by Farmers at a Sample of North Carolina Establishments, Survey II, Price Study, and BAE, March, 1950.

Commodity	Number of establishments		Units	Quantity	Prices from sample survey				Average of N.C. Board reports	Prices by BAE
	giving quotations	in which			upon which	price	is	survey		
	Price only	Price and quantity	is	price is	Lowest	Highest	Modal	Survey I	Survey II	Survey I of N.C. Board
	quantity	quantity	quoted	based	price	price	price	weights	weights	weights
<u>Clothing</u>										
Men's suits	64	63	each	4,647	\$19.94	\$60.00	\$45.00	\$40.92		\$34.50
Women's light weight coats	69	49	each	285	5.93	55.00	25.00	20.53		13.00
House dresses	72	58	each	706	1.94	3.93	2.93	3.12		2.80
Men's work shoes	135	115	pair	1,355	3.50	15.95	4.93	5.33	\$5.77	5.60
Step-ins	120	97	each	1,725	.25	1.93	.49	.57	.53	.59
Percale yard goods	79	60	yard	6,306	.25	.59	.39	.40		.42
<u>Farm Machinery</u>										
Plows	51	45	each	361	67.50	500.00	157.00	191.64		197.00
Disk harrows	24	21	each	241	84.50	365.00	190.00	104.23		113.00
Spiketooth harrows	69	62	each	637	15.00	95.00	50.00	42.76		25.50
Corn-cotton planters	56	43	each	336	24.00	300.00	33.50	75.00		36.00
Manure spreaders	55	43	each	242	250.00	449.00	365.00	364.90		(366.00)
<u>Fertilizer</u>										
3-9-6	111	e/	ton	e/	37.15	43.00	42.00	42.08	42.14	42.20

See end of table for all footnotes.

Lift pumps	Low	High	Mean
Pitcher pumps (a)	\$4.50	\$7.25	\$5.45
Deep well stands (b)	18.00	34.50	18.50
Power pumps (c)	165.00	210.00	200.60

The lack of clarity in the specifications is indicated by a comparison of the March prices recommended by BAE for lift pumps in N.C. (\$22.00) and the average of the North Carolina mail questionnaire returns (\$7.82). It appears that the adopted official price refers to deep well stands (b), while the mail returns received in North Carolina were mainly on Pitcher pumps (a).

This was one of the extreme cases. There were other commodities, like 16-foot 2" x 4" 's, which were not available for sale in any significant quantities, 16" disk harrows, which were practically obsolete in North Carolina, and others, which will be discussed below.

Difficulties arising from these situations, combined with the problem of concentration of data into a few cells in almost any useful classification, made statistical analysis generally less satisfactory than might have been desired. The within-group variation was so large that between-group differences were difficult to detect.

Survey I weights on specific commodities bought by farmers were used in some cases, although, unlike the weights for items sold by farmers, the prices paid weights applied only to the commodity groups. It was not practical in Survey I to ask farmers where they bought each individual commodity, so they were asked, for example, where they bought clothing. To the extent that the same weights are applicable to all the clothing items, they are useful. Failure of the weights to be entirely satisfactory for individual items, however, is not a serious deficiency

because the between-dealer and between-town-size-strata differences did not in most cases appear to be significant. Hence weights would not have improved the price averages.

Clothing items studied included Men's suits, Women's lightweight coats, House dresses, Men's work shoes, Step-ins or panties, and Percale yard goods. Variations in the prices reported for each of these items was very large; for example, the prices of the women's lightweight coats most often bought by farm people ranged from \$5.93 to \$55.00 at different stores.

Less than a half-dozen sellers of clothing reported offering delivery, and these offered it without charge, mainly restricted to within the city limits.

The distribution of credit services offered by the clothing stores reporting sales of men's work shoes is shown below, Table 18. Men's work shoes are examined first because the largest number of reports (135) was received on them.

Table 13. Credit Services Offered by a Sample of North Carolina Clothing Stores Reporting Sales of Men's Work Shoes. Price Study, Survey II, March 1950.

Term of credit	Charge for credit					Flat : carrying : charge	No : credit : offered	Credit : status : not : reported	Totals
	: None	: 5%	: 6%	: 10%	:				
Up to 2 months	29	0	1	0	0	X	X	30	
3 to 8 months	12	0	3	0	1	X	X	16	
9 to 14 months	1	2	0	2	0	X	X	5	
15 or more months	2	0	0	0	1	X	X	3	
"Fall"	2	0	1	9	0	X	X	12	
No specified term	1	0	0	0	3	X	X	4	
All stores offering credit	47	2	5	11	5	X	X	70	
No credit offered	X	X	X	X	X	30	X	30	
Credit status not reported	X	X	X	X	X	X	35	35	
Totals	47	2	5	11	5	27	35	135	

Credit was offered by about one-half of the establishments reporting, but no significant differences in the prices of men's work shoes could be shown between stores offering and those not offering credit. The average price per pair for the shoes was \$5.75 in stores not offering credit and \$6.17 in stores offering it, but the within-group variation was too high to permit detection of a "real" difference as small as 42 cents between groups.

When the establishments offering credit were subdivided into two groups, those making a charge and those not making a charge for credit, there was, similarly, no significant difference in price.

A noteworthy observation can be made on the basis of the reported charges for credit. Twelve establishments reported extending credit until the time of the fall harvest; nine of these reported charging 10% on the accounts. Only two other reports of interest in excess of 6% were received. Since the "fall" term is used mainly by tenants and croppers, this is not without its significance.

The data on step-ins were examined next. The distribution of prices was as follows:

Price	Number of quotations	Number of step-ins
\$.25 - .34	3	73
.35 - .44	12	199
.45 - .54	33	633
.55 - .64	15	311
.65 - .74	12	172
.75 - .84	10	251
.85 - .94	3	38
.95 or more	9	48
All prices	97	1,725

By size of town, type of dealer, and mention status, the average prices are shown in the table below.

Table 14. Prices Paid by North Carolina Farm People for Step-ins. Price Study, Survey II, March 1950.

Type of dealer	Mention status	Size of town				All towns	Number of quotations	Number of step-ins
		A	B	C	D			
Independent	Mentioned	.50	.67	.54	.79	.61	21	133
	Not mentioned	.61	.60	.66	a/	.62	39	567
Chain	Mentioned	.50	.48	.58	.57	.52	17	271
	Not mentioned	.42	.49	.84	.62	.59	20	699
All reports		.52	.53	.63	.61	.57	XX	XXX
Number of quotations		35	34	14	14	XX	97	XXX
Number of step-ins		221	660	281	563	XX	XX	1,725

a/ No quotations available.

While a difference between town-size strata appears to exist, the weighted analysis does not reveal a significant difference.

Table 15. Two weighted analyses of Variance of Prices Paid by Farm People for Step-Ins. Price Study, Survey II, March 1950.

Source of variation	Degrees of freedom	Sum of squares	Mean squares
Crop Reporting Districts	7	1.29	.18
Counties in CRD's	20	16.95	.85
Towns in counties	10	3.19	.32
Within towns	59	22.99	.39
Total	96	44.42	

Source of variation	Degrees of freedom	Sum of squares	Mean squares
Town-size strata	3	3.72	1.18
Type of dealer	1	1.02	1.02
Mention status	1	1.05	1.05
Interaction	10	6.05	.60
Within	81	32.58	.40
Total	96	44.42	

The only close approaches to significance are in the cases of town-size strata and counties, but these are not clear-cut.

The only measure of quality available is the type of weave, i.e., knit or woven. The average price for knit step-ins was .57, while for woven it was .50; there was, however, a large group (19) not reporting weave for which the average price was .62. No significant differences could be shown between these groups.

It is felt that quality differences not measured are contributing to the "within" variances, while the "betweens" are not large in any case. Hence significant differences cannot in most cases be shown.

The data on step-ins were analyzed without quantity weights, with the results shown below.

TABLE 16. Two Unweighted Analyses of Variance of Prices Paid by Farm People for Step-ins. Price Study, Survey II, March 1950.

Source of Variation	Degrees of freedom	Sum of Squares	Mean Squares
Crop Reporting Districts	7	.451	.064
Counties in CRD's	22	1.3714	.062
Towns in Counties	12	.315	.026
Within towns	78	4.427	.057
Total	119	6.564	---

Town-size strata	3	.1918	.0639
Type of dealer	1	.0266	.0266
Mention status	1	.3636	.3636
Interaction	9	.5448	.0605
Within	105	5.4372	.0518
Total	119	6.5640	---

This is one of the very few cases in which mention status appeared to be a significant contributor to the variance, and in this case it arises almost entirely from a single high quotation which, in the weighted analysis was insignificant.

The unweighted mean prices for men's suits, the other item of clothing given detailed study, were, by size of town, type of dealer, and mention status, as follows.

TABLE 17. Prices Paid by North Carolina Farmers for Men's Suits. Price Study, Survey II, March 1950.

Type of dealer	Mention status	Size of town					Number of quotations
		A	B	C	D	All towns	
Independent	Mentioned	\$ 47.95	\$37.77	\$40.35	\$60.00	\$39.57	28
	Not mentioned	34.99	38.05	43.72	57.50	42.19	23
Other	Mentioned	27.95	33.11	37.40	31.48	33.97	23
	Not mentioned	26.23	35.00	55.00	41.20	38.34	10
All reports		33.06	36.32	41.54	43.22	38.61	xx
Number of quotations		6	41	26	11	xx	84

An unweighted analysis of variance of the prices gave the following results.

TABLE 18. Unweighted Analysis of Variance of Prices Paid by North Carolina Farmers for Men's Suits. Price Study, Survey II, March, 1950.

Source of variation	Degrees of freedom	Sum of Squares	Mean Squares
Between Crop Reporting Districts	7	599	85.6
Between Counties in CRD's	19	2762	145.4
Between towns in counties	3	93	31.0
Within towns	54	4134	76.6
Total	83	7588	-----

Town-size strata	3	856	285
Type of dealer	1	596	596
Mention status	1	317	317
Interaction	10	1115	112
Within	68	4704	69
Total	83	7588	-----

None of the geographical differences appear to be significant. The county differences, which seem at first to be large, appear in a better perspective if the "Between-town" portion of the sum of squares is not treated separately. With only 3 d.f. for towns, it is apparent that the between-town comparison does not contribute much. If the Between-town and Within-town sums of squares are pooled into a single Within-county figure, the mean square with which to compare the Between-county value becomes 74.2.

There do appear to be significant differences between town-size strata, type of dealer, and mention status, but these are probably due to such considerations as: (i) farmers buy different kinds of suits in large towns and small towns; (ii) interviewers entered many clothing stores in the block samples of D towns which did very little business with farmers, but sold at above-average prices.

The analysis of clothing items revealed, in general, no appreciable geographic differences, for a given commodity, which was reasonably well-defined, as in the case of women's rayon panties or step-ins, no trade-channel price differences could be detected, but differences did appear in the less well-defined cases like men's suits, probably as a reflection of the fact that different kinds of suits were being sold in the different channels. Mention status was significant in the clothing analysis, mainly because of (i) the inclusion in "non-mentions" of many stores who did very little business with farmers, and (ii) because the clothing business is probably more different from farm to non-farm than are other lines of business studied.

Furniture and Furnishings were, like clothing, subject to great price variations, due mainly to quality differences. The distribution of quotations on felt-base rugs illustrates the kind of variation encountered.

Table 19. Distribution of Prices Paid by North Carolina Farmers for 9' x 12' Felt-base Linoleum Rugs, Price Study, Survey II, March, 1950.

Price	Number of Quotations	Number of rugs
Below \$5.45	2	370
\$5.45 - \$6.44	6	346
6.45 - 7.44	4	587
7.45 - 8.44	6	396
8.45 - 9.44	5	946
9.45 - 10.44	20	2718
10.45 - 11.44	8	663
11.45 - 12.44	9	752
12.45 - 13.44	9	1211
13.45 or more	4	332
All Prices	73	8321

The lack of concentration around one price suggests that several levels of quality are included in these quotations. To investigate this possibility, the rugs were classified according to brand, with the results shown below.

Table 20. Average Prices of Several Brands of Felt-Base Rugs Reported Bought by North Carolina Farmers. Price Study Survey II, March, 1950.^{a/}

Brand name	Number of Quotations	Number of Rugs	Average Prices
Rotarus	2	351	\$5.04
Thriftex	1	18	5.45
Manitex	5	278	5.79
Maddox	1	75	5.95
Bird	1	6	6.50
Harmony House	3	1184	8.68
Sandura	2	375	8.95
Gold Seal	32	2655	10.47
Sloan	2	114	10.62
Armstrong	10	1474	10.92
Pabco	2	988	12.03
Congoleum	3	198	13.13
Richmond	2	30	13.88

^{a/} Based on reports for which both sales to farmers and brand were reported

When quotations on all brands are included in a weighted analysis, the following is obtained.

Table 21. Two Weighted Analyses of Variance of Prices of 9' x 12' Felt Base Rugs. Price Study, Survey II, March, 1950.

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Squares
Between CRD's	7	9505.7	1357.9
Between counties in CRD's	21	8604.7	409.7
Between towns in counties	5	2297.1	459.4
Within towns	39	22,054.8	565.5
Total	72	42,462.3	

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Squares
Town - size strata	3	2567.0	855.7
Types of dealers	1	6.8	6.8
Mention status	1	534.5	534.5
Interaction	8	2493.2	311.6
Within	59	36,860.8	624.7
Total	72	42,462.3	-

Only differences between CRD's appear to be significant in the above analysis of all brands. When, however, one brand is considered separately, the situation is very different. The analysis of Gold Seal quotations is shown below. There were not enough reports to do as extensive an analysis as was done for all brands.

Table 22. Two Analyses of Variance of Prices Paid by North Carolina Farmers for Gold Seal Felt-Base 9' x 12' Rugs. Price Study, Survey II, March, 1950.

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Crop Reporting Districts	7	3816	545.1
Counties in CRD's	11	1412	128.3
Towns in Counties	3	1750	583.3
Within Towns	10	431	43.1
Total	31	7409	-

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Town-size strata	3	1777.5	592.5
Within Strata	28	5631.5	201.1
Total	31	7409.0	-

The unweighted analysis of all felt-base rugs, to be compared with the analysis of Table 21, is as follows:

Source of variation	Degrees of freedom	Sum of Squares	Mean Squares
Between CRD's	7	52	7.43
Between counties in CRD's	22	123	5.59
Between towns in counties	11	66	6.00
Within towns	64	329	5.14
Total	104	570	-----

Town-size strata	3	13	4.3
Types of dealers	1	7	7.0
Mention status	1	5	5.0
Interaction	7	62	8.8
Within	93	481	5.2
Total	104	570	-----

Both weighted and unweighted analyses show the same general results, namely that significant differences do not appear. The analysis of Gold Seal brand suggests the degree to which differences could be found if brand difference effects were removed. This is further indicated by the following unweighted analysis computed from grouped data, showing the contribution of brand differences to the total variance.

Source of variation	Degrees of freedom	Sum of Squares	Mean Squares
Between brand groups	4	264	66
Within brand groups	100	300	3
Total	104	564	-----

Occasional chairs were also given detailed study. The unweighted mean prices, by town-size strata, type of dealer, and mention status, were as follows.

TABLE 23. Mean Prices Paid by North Carolina Farmers for Occasional Chairs. Price Study, Survey II, March, 1950.

Type of Dealer	Mention Status	Size of town					Number of Quotations
		A	B	C	D	All towns	
Independent	Mentioned	\$ 22.59	\$27.25	\$25.21	*	\$26.79	30
	Not mentioned	31.12	26.83	23.63	43.56	30.12	40
Other	Mentioned	28.75	18.50	44.85	39.80	32.02	14
	Not mentioned	39.50	*	30.50	23.80	28.18	8
All reports		29.06	26.09	28.97	37.05	29.15	xx
Number of quotations		19	34	25	14	xx	92

* No quotations available.

The unweighted analysis of variance is given below, in Table 24.

TABLE 24. Unweighted Analysis of Variance of Prices Paid by North Carolina Farmers for Occasional Chairs. Price Study, Survey II, March, 1950.

Source of variation	Degrees of freedom	Sums of squares	Mean squares
Between Crop Reporting Districts	7	2938	420
Between counties in CRD's	21	5246	250
Between towns in counties	8	1525	191
Within towns	55	10703	195
Total	91	20412	---

Town-size strata	3	1192	397
Type of dealer	1	63	63
Mention status	1	41	41
Interaction	8	3040	380
Within	78	16076	206
Total	91	20412	---

No differences, geographic or other, are of any significance in this analysis.

From these studies of furniture, the differences due to quality appear to be so large, as reflected by the big "within" variances, that they over-shadow any other differences that might otherwise be examined.

The specification problems arising from quality differences are very difficult, but there are two other cases in the furniture and furnishings category which can easily be dealt with. The first of these is kitchen ranges, specified as wood or coal burning. Provision should be made for electric ranges, as these appear to be rapidly rising on the list of items often bought by farmers. The second is electric washing machines. The capacity specification in terms of gallons seems to mean less than would a specification in terms of pounds of dry wash. Perhaps both could be used.

Fertilizer offered a problem, in that 3-9-6, the only fertilizer item included in the study, was sold at more than one price level, reflecting at least two different compositions. The higher-priced item, tobacco fertilizer containing cottonseed meal, sold for about \$5.00 per ton above the lower-priced fertilizer containing no cottonseed meal. All the analyses that follow on fertilizer are unweighted.

The distribution of all prices quoted is shown in Table 25 .

Table 25 . Prices Paid by Farmers for 3-9-6 Fertilizer at a Sample of North Carolina Establishments. Price Study, Survey II, March, 1950.

Price per ton	Number of Quotations
\$37.50 or less	4
37.51 to 38.50	6
38.51 to 39.50	9
39.51 to 40.50	19
40.51 to 41.50	15
41.51 to 42.50	16
42.51 to 43.50	5
43.51 to 44.50	7
44.51 to 45.50	16
45.51 to 46.50	10
46.51 to 47.50	2
47.51 or more	2
All prices	111

On the bases of information generally available, and this bimodal distribution of prices, the fertilizer quotations were divided into two groups; those groups, \$43.50 or less, and over \$43.50, represented 3-9-6 without, and 3-9-6 with, cottonseed. The mean prices for the two groups in towns of various sizes and by different types of dealers are shown in Table 26 .

Table 26. Prices Paid by Farmers for 3-9-6 Fertilizer, With and Without Cottonseed Meal, in Various-sized Towns and from Different Types of Dealers. Price Study, Survey II, March, 1950.

Type of dealer	No. of quotations	Size of town				All Towns
		A	B	C	D	
<u>I. With Cottonseed Meal</u>						
Fertilizer dealer	11	\$45.66	\$45.87	\$45.12	*	\$45.57
General farm stores	12	45.31	44.69	45.75	\$46.30	45.42
Cooperatives	4	46.00	44.02	44.60	*	44.66
Other	10	46.80	45.45	45.20	45.50	45.60
All dealers	37	45.65	44.72	45.24	45.90	45.43
<u>II. Without Cottonseed Meal</u>						
Fertilizer dealers	20	38.94	40.78	41.29	41.79	40.27
General farm stores	29	40.42	39.96	39.40	*	40.16
Cooperatives	15	41.50	41.22	41.47	41.79	41.31
Other	10	40.70	40.08	39.66	40.00	40.11
All dealers	74	40.05	40.54	40.58	41.34	40.42
<u>III. All 3-9-6</u>						
Fertilizer dealers	31	41.18	43.32	42.38	41.79	42.15
General farm stores	41	41.98	40.48	41.52	46.30	41.70
Cooperatives	19	43.75	41.84	41.92	41.79	42.02
Other	20	43.75	42.23	42.74	42.75	42.86
All dealers	111	42.00	41.81	42.19	42.86	42.08

*No quotations available.

When the Survey I weights are used, the overall mean price is \$42.14, as compared to the \$42.08 from Survey I. The prices in the two sub-groups are so obviously prices of different commodities that the analysis is done on each group separately.

The unweighted analyses of variance are given below, in Tables 27 and 28.

Table 27: Two Unweighted Analyses of Variance of Prices of 3-9-6 Fertilizer Containing Cottonseed Meal. Price Study, Survey II, March 1950.

Source of Variation	Degrees of freedom	Sums of squares	Mean squares
Town-size strata	3	2.07	.69
Type of dealer	3	2.87	.96
Mentions	1	.05	.05
Interaction	11	12.45	1.13
Within	18	20.75	1.15
Total	36	38.19	--
.....			
Crop reporting district	7	6.58	.94
Counties in CRD's	10	2.56	.26
Towns in counties	4	12.27	3.07
Within towns	15	16.78	1.05
Total	36	38.19	--

Table 28. Two Unweighted Analyses of Variance of Prices of 3-9-6 Fertilizer Containing No Cottonseed Meal. Price Study, Survey II, March 1950.

Sources of variation	Degrees of freedom	Sums of Squares	Mean Squares
Town-size strata	3	9.00	3.00
Type of dealer	3	16.51	5.50
Mentions	1	.12	.12
Interaction	14	42.65	3.04
Within	52	120.67	2.32
Total	73	188.95	-
.....			
Crop-reporting districts	6	30.14	5.02
Counties in CRD's	15	95.80	6.38
Towns in counties	9	18.80	2.09
Within towns	43	44.21	1.03
Total	73	188.95	--

These analyses indicate that the only important and consistent price differences measurable in the data available are geographic differences. Tobacco fertilizer (with cottonseed) prices appear to be significantly different only between Crop Reporting Districts. In the fertilizer without cottonseed, the county and town differences are as large as the between-CRD differences, the latter therefore appearing to be non-significant.

Geographic differences appear to be the most important source of price variation. Size of town, type of dealer, and "mention" status from Survey I, do not appear to influence price to a measurable extent.

Of the 111 quotations received, about one-third carried reports of an additional charge for fertilizer sold on credit. (All prices in the analysis were put on a cash basis; the credit prices were corrected by using the amount of the quoted price which included the credit charge, less the amount reported charged for credit.) The credit charge increased in larger towns, while the proportion of establishments making a specific charge for credit decreased, as shown in the tabulation below.

Table 29. Credit Charge for 3-9-6 Fertilizer. Price Study, Survey II March, 1950

Town Size	Fertilizer Quotations rec'd	No. of quotations which included a credit charge	Ave. credit charge per ton
A	43	21	\$ 4.17
B	33	11	4.77
C	29	4	5.15
D	6	0	-
All towns	111	36	4.46

About one-third (34) of the establishments reported a price difference between delivered and "at-the-store" prices, this difference being an almost invariable \$1.50 per ton. Discounts offered for quantity purchases, which were reported by two-thirds (68) of the establishments, appeared also to be practically constant for a given quantity, ranging from 2% for 10 tons or more, up to 5% for a carload or more.

There were, of course, several reports of deviations from these general patterns in individual cases. When a fertilizer customer was also a big feed customer, for example, he might get a larger discount than 5% on a smaller quantity than 10 tons, and have the fertilizer delivered as well. To examine in detail the implications of such situations is, however, a separate study in itself for each commodity, and cannot be brought within the scope of this project.

Quotations were obtained on only one seed item, Hybrid seed corn. Excluding 3 quotations, by the pound, the 85 prices quoted ranged from \$6.50 to \$11.20 per bushel; two-thirds of the quotations, however, were at three prices, as follows: 16 at \$9.50, 28 at \$10.00, 13 at \$10.50. The mean price of the Survey II reports was \$9.96; when Survey I weights were applied to the Survey II prices, the mean price was \$9.86. By sizes of towns and types of dealers, the mean prices were as shown in Table 30. All the analyses of hybrid seed corn are unweighted.

Table 30. Prices Paid by Farmers for Hybrid Seed Corn. Price Study, Survey II, March 1950.

Type of Dealer	No. of Quotations	Size of town				
		A	B	C	D	All Towns
-----Price per bushel -----						
Seed dealer	19	\$9.59	\$9.93	\$10.00	\$9.67	\$9.81
Other independent	43	10.40	9.75	9.70	10.50	10.04
Cooperative	18	9.92	9.98	9.70	10.00	9.93
Other	5	10.05	9.75	10.00	*	9.92
All dealers	85	10.17	9.85	9.81	10.01	9.96
Number of quotations	xxx	27	37	14	7	85

*No quotations available

No significant price differences could be detected except between town-size strata. The following analyses of variance indicate the contributions of the different sources to the total price variations.

Table 31. Two Unweighted Analyses of Variance of Prices Paid by Farmers for Hybrid Seed Corn. Price Study, Survey II, March 1950.

Sources of variation	Degrees of freedom	Sums of Squares	Mean squares
Crop reporting districts	7	4.14	.59
Counties in CRD's	18	12.10	.67
Towns in counties	12	7.97	.67
Within towns	47	21.07	.45
Total	84	45.28	

Sources of variation	Degrees of freedom	Sums of Squares	Mean squares
Town-size strata	3	5.52	1.81
Types of dealers	3	2.77	.92
Mention status	1	.29	.29
Interactions	14	2.30	.15
Within	63	34.60	.55
Total	84	45.28	---

Although about one-half (43) of the reporting establishments offered credit, only 9 of them reported making a charge for it. The charge in these cases was an almost invariable \$1.00 per bushel, or about 10%.

All but 2 reports were on an "at-the-store" basis; in the two cases where delivery was reported, the charge was 10 cents per bushel.

Despite the fact that on a commodity like seed corn large sales to farmers were fairly rare, 12 establishments reported giving discounts to large buyers. The discounts ranged from 3% to 10% for quantities in some cases as small as 2 bushels.

The building materials studied included 16-foot 2 x 4's, bevel siding, house windows, cement, house paint, wood shingles, steel roofing, wood fence posts, barbed wire, and lift pumps.

Several of these items occasioned some difficulties in enumeration. The case of lift pumps has been discussed above, as one illustration of these difficulties.

Another item which gave poor data was 16-foot 2 x 4's. Several enumerators reported being unable to get quotations on the 16-foot length, and it is believed that some other enumerators accepted quotations on shorter lengths. At any rate, it appears that the 16-foot length is no longer the "most often bought" by farmers in North Carolina.

Bevel siding is often known better as "Gorman siding," but otherwise was satisfactory.

House windows are specified as complete with frame, weights, etc. A check of building suppliers in Raleigh suggested that the most often bought was considerably larger than the presently specified size, and that the price for the complete window was from \$30 to \$40. Apparently the quotations received (ranging from \$12 to \$24) did not cover the complete window, as specified.

Wood shingles are seldom sold, only 3 quotations having been received for them. Differential fire insurance rates offer an incentive to use fire-proof shingles, and some incorporated places prohibit wooden roof shingles; this item is obsolescent.

Steel roofing is sold widely, but dealers rarely know either the weight of the stock or the size of the corrugations. "V-crimp" roofing is at least as common as corrugated. The specifications of roofing should take these facts into account.

The building materials to which detailed study was given were cement and house paint.

One of the most homogeneous of the Prices Paid items was cecont, which ranged in price from \$1.00 to \$1.40, according to the following distribution.

Table 32. Distribution of Prices Paid by North Carolina Farmers for Portland Cement. Price Study, Survey II, March 1950.

Price per bag	Number of quotations	Number of bags
Less than \$1.10	5	6,044
\$1.10 - 1.14	13	20,307
1.15 - 1.19	22	35,301
1.20 - 1.24	5	2,993
1.25 - 1.29	9	5,529
1.30 or more	1	358
All prices	55	71,112

The differences between CRD's were the only ones which appeared significant.

The weighted analyses of variance are as follows.

Table 33. Two Weighted Analyses of Variance of Prices Paid by North Carolina Farmers for Portland Cement. Price Study, Survey II, March 1950.

Source of variation	Degrees of freedom	Sum of squares	Mean squares
Crop Reporting Districts	6	105.2	17.5
Counties in CRD's	13	64.7	3.6
Towns in counties	9	6.0	.8
Within towns	21	52.1	2.5
Total	54	228.0	

Source of variation	Degrees of freedom	Sum of squares	Mean squares
Town-size strata	3	30.0	10.0
Type of dealer	1	7.6	7.6
Mention status	1	2.1	2.1
Interaction	7	5.6	.8
Within	42	183.5	4.4
Total	54	228.8	

The differences between CRD's occurred in a west-low to east-high pattern, as indicated below.

C R D	Number of reports	Number of bags	Average price per bag
1	0	-	-
2	7	9,175	\$ 1.18
3	2	802	1.22
4	5	6,300	1.08
5	7	4,906	1.14
6	3	1,783	1.27
8	19	20,014	1.10
9	12	27,972	1.15
All CRD's	55	71,112	1.14

The unweighted analyses of cement prices showed the following:

TABLE 34. Two Unweighted Analyses of Variance of Prices Paid by North Carolina Farmers for Portland Cement. Price Study, Survey II, March 1950.

Source of variation	Degrees of freedom	Sum of squares	Mean squares
Crop Reporting Districts	6	.039	.0065
Counties in CRD's	21	.178	.0085
Towns in Counties	11	.087	.0079
Within towns	39	.098	.0025
Total	77	.402	

Town-size strata	3	.037	.012
Type of dealer	1	.003	.003
Mention status	1	.002	.002
Interactions	7	.007	.001
Within	65	.348	.005
Total	77	.402	

Neither the weighted nor the unweighted analysis of cement prices shows any significant differences except between Crop Reporting Districts, an effect of the freight differential.

House paint, the second item of building materials examined separately, showed the following unweighted mean prices.

TABLE 35. Prices Paid by North Carolina Farmers for House Paint, Price Study, Survey II, March 1950.

Type of dealer	Mention status	Size of town					Number of quotations
		A	B	C	D	All towns	
Independent	Mentioned	\$ 4.37	\$ 4.83	\$ 4.63	\$5.20	\$ 4.69	36
	Not mentioned	4.73	4.89	4.82	4.28	4.70	58
Other	Mentioned	3.90	4.85	*	*	4.14	4
	Not mentioned	3.92	4.00	4.67	4.54	4.36	15
All reports		4.46	4.80	4.74	4.47	4.63	xx
Number of quotations		33	36	24	20	xx	113

* No quotations available.

The non-independent sellers of paint, including mainly chain stores and farm cooperatives, sold at a significantly lower price than the independent dealers. This stands out clearly in the unweighted analysis of variance given below.

TABLE 36. Unweighted Analysis of Variance of Prices Paid by North Carolina Farmers for House Paint. Price Study, Survey II, March 1950.

Source of variation	Degrees of freedom	Sums of squares	Mean squares
Between Crop Reporting Districts	7	4.59	.66
Between counties in CRD's	22	13.66	.62
Between towns in counties	13	7.62	.59
Within towns	70	31.79	.45
Total	112	57.66	---

Town-size strata	3	2.66	.89
Type of dealer	1	2.35	2.35
Mention status	1	.01	.01
Interaction	8	5.14	.64
Within	99	47.50	.48
Total	112	57.66	---

Except for type of dealer, none of the other effects appears to be of any significance in the study of house paint prices.

In summarizing the building materials study, the biggest single fact that emerges is the need for a revision of specifications, to bring the items more closely up to date and into line with the concept of "most often bought by farmers," as indicated specifically above.

The farm machinery items upon which quotations were obtained in March were plows, disk harrows, spiketooth harrows, corn-cotton planters, and manure spreaders. On only spiketooth harrows were more than fifty quotations received for the item most often bought by farmers.

The distribution of prices of these spiketooth harrows was as follows:

TABLE 37. Distribution of Prices Paid by North Carolina Farmers for Spiketooth Harrows. Price Study, Survey II, March 1950.

Price	Number of quotations	Number of harrows
Less than \$25	17	124
\$25 - \$44.99	28	261
45 - 64.99	19	177
65 or more	5	75
All prices	69	637

Although these were supposed to be quotations on single 5-foot sections only, there is a strong suspicion that there was considerable deviation from that specification. There was also variation in numbers of teeth, from 25 to 60. When these types of variation are added to that introduced by differences between manufacturers, it is at once apparent that analysis based on so few quotations cannot reveal the relatively small price differences due to location, trade practice, etc.

Twenty-two different manufacturers of Spike-tooth harrows were represented in the quotations, the most common four or more quotations being as follows:

Make	Number of quotations	Number of Spiketooth harrows	Average price each
International Harvester Co.	9	75	\$ 36.25
John Deere	8	63	40.52
Oliver	6	80	43.48
King	4	49	40.32
Case	4	69	60.52

Unless the individual items are specified in considerably greater detail than could be done in Survey II, it is not possible to determine to what the differences between manufacturers are due, to say nothing of evaluating smaller differences like those between types of dealers.

The nature of the variation in prices is shown in the analysis of variance given below. Since so few quotations were available from any single manufacturer, the only analysis made was on the basis of all manufacturers together.

TABLE 38. Unweighted Analysis of Variance of Prices Paid by North Carolina Farmers for Spiketooth Harrows. Price Study, Survey II, March 1950.

Source of variation	Degrees of freedom	Sums of squares	Mean squares
Between Crop Reporting Districts	6	1903	317
Between counties in CRD's	17	5030	296
Between towns in counties	4	679	170
Within towns	41	9971	243
Total	68	17583	---

Town-size strata	3	2801	934
Type of dealer	1	21	21
Mention status	1	11	11
Interaction	8	1668	208
Within	55	13082	238
Total	68	17583	---

Trade practices for Spiketooth harrows and other farm machinery items exhibited little variation. Credit was almost universally offered, at a practically invariant 6%; trade-ins were accepted in almost all cases, and in only a very few cases were trade-in allowances in excess of market value reported.

The cases of corn-cotton planters, plows, and disk harrows, were all generally comparable to that described for spiketooth harrows. Disk harrows were slightly different in that the specified 16" disk appeared to be less frequently sold than the other farm machinery items studied. Larger disks were widely sold, and, on the basis of the quotations received, one suspects that quotations for them were included under the specified 16" item.

Manure spreaders were reported sold by 48 dealers at prices from \$250 to \$449, in a total of thirteen different makes. Over 5 quotations were obtained for only four makes as follows:

Make of manure spreader	Number of quotations	Number of manure spreaders	Average price each
New Idea	11	84	\$ 370
Oliver	7	30	384
John Deere	6	35	374
International Harvester	6	17	350

The small number of quotations does not permit separate treatment of individual makes; when all quotations are analyzed together, the results are as follows:

TABLE 39. Two Weighted Analyses of Variance of Prices Paid by North Carolina Farmers for Manure Spreaders. Price Study, Survey II, March 1950.

Source of variation	Degrees of freedom	Sum of squares	Mean squares
Town-size strata	3	14462	4820
Mention status	1	3762	3762
Type of dealer	1	1632	1632
Interaction	5	47193	9439
Within	37	172063	4650
Total	47	239112	-----

Source of variation	Degrees of freedom	Sum of squares	Mean squares
Between Crop Reporting Districts	6	11,551	1925
Between counties in CRD's	13	49,511	3808
Between towns in counties	2	43,648	21824
Within towns	26	134,402	5170
Total	47	239,112	-----

Since neither size of town nor type of dealer appears to be a significant contributor to the price variation, Survey I weights would not improve the figures from Survey II.

There was one final specification problem in the study of manure spreaders. The descriptions used by BAE are as follows: (i) Manure Spreaders, 60-70-bushel capacity, each; and (ii) Manure Spreaders, 2 wheel, rubber tires, each. These two descriptions are not mutually exclusive: 2-wheel rubber-tired manure spreaders are tractor-drawn implements, and are made in the 60-70 bushel size. It was, therefore, impossible to adhere to this sub-classification. The manure spreaders quoted here are those quoted within either of the given descriptions.

The only motor vehicle studied other than tractors was Chevrolet 3/4 ton pick-up trucks. Twenty-seven quotations were received, ranging from \$1383 to \$1540, as follows:

TABLE 40. Prices Paid by North Carolina Farmers for New Chevrolet 3/4 Ton Pickup Trucks. Survey II, March 1950.

Price	Number of quotations
Less than \$ 1400	2
\$1400 - 1449	1
1450 - 1474	1
1475 - 1499	13
1500 - 1524	8
1525 or more	2
All quotations	27

The geographic variation did not appear significant. The weighted analysis of variance between Crop Reporting Districts shows the following:

Source of variation	Degrees of freedom	Sums of squares	Mean squares
Between CRD's	7	273020	39,003
Within CRD's	19	343217	18,064
Total	26	616237	---

There was a significant town-size strata difference, as shown by the following tabulation:

Town-size stratum	Average Price 3/4-ton Chevrolet pickup	Number of quotations	Number of trucks
A	\$ 1429	4	38
B	1491	13	182
C	1490	7	151
D	1494	3	97
All	1487	27	468

The weighted variance analysis is as follows:

Source of variation	Degrees of freedom	Sums of squares	Mean squares
Between strata	3	137,344	45,781
Within strata	23	478,893	20,821
Total	26	616,237	-----

It is apparent that the significant price difference is due almost entirely to the difference of the A towns from the others. There were no differences between B, C, and D towns.

An average of \$65 was spent for accessories in addition to the price reported above.

Different dealers reported that up to 85% of their respective sales to farmers were for cash, as follows:

Percent of sales of Chevrolet 3/4-ton pickups to farmers that were for cash	Number of dealers reporting
Less than 10%	3
10% - 29%	6
30% - 49%	3
50% - 69%	10
70% or more	3
Not reported	2
Total	27

Most dealers did not finance credit sales themselves, and hence in many cases their reports were admittedly rather tenuous estimates. The charges reported varied from \$85. to \$165, with one-half of them between \$95 and \$105.

Practices regarding trade-ins were reported to be quite uniform. All dealers interviewed accepted trade-ins, and 16 of the 27 reported allowing market value. Those allowing other than market value reported allowing from "10%" to \$100 in excess of market value.

Quotations were obtained on two sizes of tractors, those of less than 20 horsepower and those of from 20 to 29 horsepower. In both of these categories, the highest quotation was approximately double the lowest quotation. The variation was largely due, however, to differences in manufacturer and model.

An illustration of the kind of differences found is shown below, in the quotations for tractors specified as less than 20 horsepower. (Note that the IH Super A ought not to have been included here at all, as it is rated as over 20 hp.)

Maker	Model	Actual Horsepower	Prices quoted
Allis-Chalmers	B	18	\$1250
			1135
			1160
			1090
			1300
	G	9.3	880
			815
			891
			900
			812
International Harvester Co.	Cub	9.75	985
			935
			940
			925
			950
	Super A	20.5	900
			1465
			1445
			1440
			1475
			1455
			1400

With the wide differences between models, and the fairly homogenous quotations on any given model, it is obvious that between-model differences overshadow any other difference we might wish to investigate. Unlike felt-base rugs, for which sufficient quotations were available to make an analysis of one brand separately, tractor quotations were widely scattered, those given above being the most frequently quoted items. The 34 quotations on small tractors included quotations on 6 different makes, while the 43 reports on the larger tractors were on 9 makes.

The information obtained on attachments and accessories did not include a listing of the items bought; only the total price of the items most often bought by farmers when they bought a tractor was obtained. For the small tractors, these items averaged \$265; for the larger ones, \$381. Both figures were based on reports from about one-half of the dealers interviewed; the others reported either not knowing, or that the items were so different on different sales that they could not give a figure. From the above figures, it is obvious that the attachments include field implements as well as additional equipment for the tractor, such as hitches, air cleaner, etc.

Trade practices regarding credit and trade-ins were about the same as those reported for Chevrolet pickups. The comments made there apply in general to tractors as well.

Quotations on the following feed items were collected: corn, corn meal, bran, cottonseed meal, mixed dairy feed, laying mash, scratch grain, meat scrap, and alfalfa hay.

The data on feed appeared, for three reasons, to be the best prices-paid data collected in the study. The reasons were: (i) there was no confusion in the mind of the respondent as to the exact quotation desired, i.e. specifications were adequate; (ii) farmers were, for all practical purposes, the only purchasers

of feed; (iii) feed items were widely and frequently sold, facilitating greatly the collection of adequate numbers of records within the short period of enumeration. These factors also, of course, operate in favor of the regular mailed questionnaires. The mean prices were consequently almost identical in the Survey II and BAE reports.

Two of the feed items, laying mash and 16% protein dairy feed, were selected for special study because the largest numbers of quotations were received on them.

The unweighted mean prices of hundred-pound bags of laying mash are given below.

TABLE 41. Prices Paid by North Carolina Farmers for 100 Pounds of Laying Mash. Price Study, Survey II, March 1950.

Type of dealer	Mention status	Size of town					Number of quotations
		A	B	C	D	All towns	
Independent	Mentioned	\$ 4.80	\$4.69	\$4.56	\$4.58	\$ 4.71	38
	Not mentioned	4.74	4.77	4.67	4.75	4.74	122
Other	Mentioned	4.93	4.73	4.60	4.45	4.74	14
	Not mentioned	4.72	4.68	4.80	4.70	4.72	24
All reports		4.75	4.74	4.67	4.71	4.73	xx
Number of quotations		96	56	27	19	xx	198

No significant differences appear from this table. The analysis of variance is given below.

TABLE 42. Unweighted Analysis of Variance of Prices Paid by North Carolina Farmers for Laying Mash. Price Study, Survey II, March 1950.

Source of variation	Degrees of freedom	Sums of squares	Mean squares
Between Crop Reporting Districts	6	1.145	.191
Between counties in CRD's	23	3.861	.168
Between towns in counties	20	3.694	.185
Within towns	148	13.770	.093
Total	197	22.470	-----

Town-size strata	3	.135	.045
Type of dealer	1	.001	.001
Mention status	1	.082	.082
Interaction	10	.428	.043
Within	182	21.824	.120
Total	197	22.470	-----

The same sort of non-significance was observed in the case of mixed dairy feeds as indicated in the tabulation of unweighted means shown below.

TABLE 43. Prices Paid by North Carolina Farmers for 100 Pounds of 16% Mixed Dairy Feed. Price Study, Survey II, March 1950.

Type of dealer	Mention status	Size of town					Number of quotations
		A	B	C	D	All towns	
Independent	Mentioned	\$ 3.39	\$3.40	\$3.55	\$3.32	\$ 3.40	26
	Not mentioned	3.38	3.66	3.48	3.25	3.44	77
Other	Mentioned	3.73	3.60	3.30	3.50	3.58	7
	Not mentioned	3.72	3.28	3.54	3.25	3.40	11
All reports		3.39	3.55	3.49	3.29	3.43	xx
Number of quotations		65	30	14	12	xx	121

The analysis of variance, similarly, shows generally similar results in the cases of the two feeds.

TABLE.44. Unweighted Analysis of Variance of Prices Paid by North Carolina Farmers for 16% Protein Mixed Dairy Feed. Price Study, Survey II, March 1950.

Source of variation	Degrees of freedom	Sums of squares	Mean squares
Between Crop Reporting Districts	5	1.78	.36
Between counties in CRD's	17	7.69	.45
Between towns in counties	15	1.26	.08
Within towns	83	7.81	.09
Total	120	18.54	---

Town-size strata	3	1.07	.35
Types of dealers	1	.07	.07
Mention status	1	.05	.05
Interaction	11	.58	.05
Within	104	16.77	.16
Total	120	18.54	---

The distribution of prices on the other feed items showed nothing which would suggest differences between them and the two items studied in detail above.

Trade practices in the sale of feed were dominated by those reported by small independent general stores. About one-fifth of the sellers offered delivery, and these, in almost every case, reported no charge for it. In the few cases reporting a delivery charge, the charge was most often a flat 10¢ per bag, ranging (in only one case) up to 25¢. Quantity discounts were reported in wide ranges and vague terms because of the many intangibles involved. The retail dealers who sell directly to farmers apparently look no farther than their own suppliers and their profit markups for a basis upon which to set their prices. Without exception, the sellers interviewed reported basing their prices on one or both of these factors.

Prices Paid: Concluding Remarks.

The major problem in the statistical analysis of prices paid arose from the BAE practice of collecting data on items "most often bought by farmers." There are good administrative reasons for using this type of specification, but, since farmers buy items over a wide price range, the price quotations on a given item, say men's suits, are often widely varying, because they include items at several quality levels, each quotation representing the most commonly bought item at a given store. Statistical evaluation of small differences of the order of 10% (between stores offering credit and those not offering credit, for example) thus becomes difficult because such small differences are overshadowed by the quality differences, which are often of the order of 100% or larger.

The situation may, however, not be as critical as the above comment suggests. Farmers in North Carolina buy most of their goods in small towns, where trade practices are fairly uniform.

In many cases, the problem of evaluating price differences due to trade practice, type of dealer, etc., is not of great importance because in North Carolina one practice and one market channel often accounts for the movement of the major portion of the product, and hence dominates the price picture. Furthermore, it is apparent from comparison of the survey mean prices and the closely coinciding BAE price reports that both survey and mailed questionnaire methods are giving estimates of the same parameters. Coefficients of variation of the means for a few commodities from the survey show that these means are being estimated with a high degree of precision.

Commodity	Mean Price	Standard error of the mean	Coefficient of variation of the mean	Number of observations
Felt-base rugs	\$ 10.19	.23	2.2 %	105
3-9-6 fertilizer without cottonseed	40.42	.29	.7	74
Hybrid seed corn	9.96	.09	.9	85
Portland cement	1.14	.01	.9	78
Women's rayon panties or step-ins	.61	.02	3.1	120

This list includes items ranging from highly uniform cement to extremely heterogeneous rugs, yet the coefficients of variation are in all cases acceptable. From the operations standpoint, the objective of the price reporting work is to obtain good estimates of mean prices; present evidence of the survey indicates that this objective is being well achieved by the current mail questionnaire and attendant methods. Furthermore, such differences as are observed between survey and BAE prices, especially in prices paid, do not follow a consistent pattern, i.e. the survey means are higher in some cases and lower in others. This suggests that when a very large number of commodities are used in an index, the net effect on the index of several such small deviations from the "true" means will be small.

C. Evaluation of the Map Samples of Large-City Blocks.

In order to supplement the information obtained through list samples in the three "D" cities^{1/} in the March and June surveys, a sample of block segments, as shown on city maps, were enumerated. All retail establishments were contacted in the selected blocks and data obtained from eligible stores^{2/}. Approximately 20 eligible stores were to be contacted in each city. In the March survey it was necessary to enumerate 11 blocks in Asheville, 13 in Charlotte, and 19 in Greensboro while in June 23 blocks were enumerated in Asheville, 19 in Charlotte and 25 in Greensboro. Collection of data on different items explains the difference in numbers in the two surveys. The blocks to be enumerated were a sub-sample of a list of 25 selected blocks. The selected blocks were divided into three sub-groups selected systematically from the list of 25, with complete enumeration provided of as many sub-groups as needed to give the required 20 schedules.

Records were kept of the number and type of establishments in each block. The number of filling stations and retail and service establishments on the city maps was tabulated in the survey, for comparison with the map counts. A comparison between those two counts is given in Table 45.

TABLE 45. Comparison of Numbers of Establishments in Selected City Blocks: Map Count and Survey Count. Price Study, Surveys II and III, March and June, 1950.

City	Date of map	March			June		
		No. Blocks surveyed	Map count	Survey count	No. Blocks surveyed	Map count	Survey count
Asheville	5-47	11	109	145	23	255	326
Charlotte	5-48	13	224	222	19	311	336
Greensboro	6-48	19	253	263	25	347	334
Total		43	586	630	67	913	996

^{1/} Asheville, Charlotte, and Greensboro

^{2/} Stores which sold any of the listed commodities to farmers were eligible.

On the two more recent maps the correspondence between the two counts is much closer than for the Asheville map. The Asheville blocks showed a general increase throughout the city with the west Asheville area being somewhat greater than the remainder of the city. The only blocks in which differences in counts were large were in new residential areas, where the number of stores would tend to increase quite rapidly in a short period of time.

The information obtained from the blocks in the March survey as to type of business was as follows:

<u>Type of Establishment</u>	<u>City</u>			<u>Total</u>
	<u>Asheville</u>	<u>Charlotte</u>	<u>Greensboro</u>	
Banks, Insurance Investment and Real Estate	9	17	24	50
Processing and Distributing	20	20	18	58
Beauty, Barber Shops, Laundry, Shoe shops, etc.	13	19	26	58
Recreation	3	7	4	14
Jewelry, Florists, Books, Photography, Gifts, Music	9	17	18	44
Clothing, Millinery, Shoes	11	32	36	79
Furniture and Electric Appliance	6	25	17	48
Gas Station, Garage, Parking, Auto Accessories, Car Dealers	15	21	21	57
Restaurants and Cafes	14	16	33	63
Newspaper, Radio, and Transportation	11	4	9	24
Medical and Burial Services	3	7	8	18
Hardware, Building Supplies, and Fuel	6	7	9	22
Storage Facilities	2	2	—	4
Groceries	3	9	14	26
Department Stores	6	6	9	21
Drug Stores	6	3	10	19
Offices and Hotels	8	10	7	25
Total	145	222	263	630

For the eligible establishments, the following distribution of records was obtained:

Commodity Group	March Survey			Total
	Asheville	Charlotte	Greensboro	
Feed			1	1
Clothing	14	14(2)*	4(1)	32(3)
Furniture	5	2(2)	6	13(2)
Building Material	2	3	4	9
Farm Machinery			1	1
Other Farm Commodities		1	4	5
Total	21	20(4)	20(1)	61(5)

Commodity Group	June Survey			Total
	Asheville	Charlotte	Greensboro	
Feed	1		2	3
Furniture	12(2)	8(3)	7(1)	27(6)
Food	8(2)	8(1)	5	21(3)
Supplies		3	1	4
Motor Vehicle and Farm Machinery			1	1
Other Farm Commodities		1	4	5
Total	21(4)	20(4)	20(1)	61(9)

* Numbers in parentheses are additional eligible firms whose records were obtained on the list survey.

While all of these schedules included prices paid for commodities purchased by farmers, many of the schedules contained little or no information as to the relative proportion of either overall business or sales of a particular commodity to farmers. In most cases where these data were available, the proportion of total business done with farmers was relatively small. Average prices paid by farmers in March for clothing and furniture items in the list and block samples are given below.

Items	List		Blocks	
	No. quot.	Av. Price	No. quot.	Av. Price
<u>Clothing</u>				
Men's Suits	8	\$ 40.74	3	\$ 49.83
Step-ins	6	.57	14	.58
Women's Light weight coats	5	22.16	15	21.71
Women's Percalo House				
Dresses	4	3.22	7	3.81
Percalo 36" wide	6	.44	6	.41
Men's work shoes	6	5.77	5	4.97

Furniture and Furnishings

Living Room Suites	8	144.50	5	167.50
Occasional Chairs	9	34.92	6	40.57
Dining Room Suites	6	200.74	3	342.83
Kitchen Cabinets	10	60.46	3	57.15
Kitchen Ranges	6	96.69	5	127.94
Electric Washing Machines	10	126.32	10	132.02
Felt Base Rugs, 9 x 12	11	10.16	5	11.95
Bed Sheets, 81" x 90"	4	2.00	2	2.19

From the above tabulation it appears that the average prices reported for almost all furniture items were higher in the block segment stores than were prices in stores taken from lists. Little or no difference was shown in the clothing items.

Costs of obtaining the March data were tabulated. A comparison of costs per schedule obtained from lists and block segments is given below for three cities in which block segments were used.

City	Establishments visited		Number of Schedules				Total Cost		Cost per Schedule	
	List	Block	Prices Received		Prices Paid		List	Block	List	Block
			List	Block	List	Block				
Asheville	32	145	11	0	32	21	\$31.64	\$30.08	\$.74	\$1.43
Charlotte	25	222	11	1	39	19(4)	76.65	44.95	1.53	2.25
Greensboro	19	263	12	4	23	16(1)	32.10	40.91	.92	2.04
All D Cities	76	630	34	5	94	56(5)	140.39	115.94	1.10	1.90

The total cost of the block sample was less than the list sample, although the cost per schedule was higher. Approximately nine times as many establishments were visited in the blocks as in the list group, with 128 schedules being obtained in the list establishments as compared with 61 in the blocks. The bulk of the

schedules in March in the block samples were furniture and clothing, while the list samples included about as many production items as non-production items. The June survey appears to hold about the same relationship as the March survey, with food replacing clothing.

In summarizing these results, it appears that the use of block segments is less efficient than list sampling for obtaining information on farm produce and production commodities. The block segments appear to be useful in obtaining information on such commodities as food, clothing and furniture which are purchased by other consumers as well as farmers. On an overall comparison, the list samples appear to be better when compared on a cost per schedule basis since many more establishments have to be contacted in the block segments than on the lists.

Average prices obtained from the two sampling methods appear to be about the same for clothing items, with the exception of mens suits, and considerably different for furniture, with the block segment establishments having higher prices. Since most of the quotations from block segments were obtained in the downtown areas of the cities, it would appear that the two samples were from different populations. When the relative proportion of business being done with farmers is compared for the block and list stores which have quantity data, it is seen that the list stores have a much greater percentage of their business with farmers than do the block segment stores. It should be recalled that one half of the stores contacted in the list samples were from a list of those stores mentioned by farmers in survey I as places at which they traded.

D. Analysis of Costs.

Complete records of field costs, including training of enumerators were kept to provide information for use in future surveys. With the training period confined to a one-day session and providing separate schools for enumerators in the western and eastern sections of the state, the cost of training was kept down to approximately \$15 per enumerator (no allowance is made for the time and travel of trainers, who were on the office staff). Even with this comparatively low figure, training costs still accounted for about 15 per cent of the total cost, a factor which should be kept in mind in determining sample size in future surveys.

In general, cost per town and cost per schedule, increased with size of town, with both miles traveled and hours enumerating also increasing with size of town. The comparison between D towns in the regular and Map segments has been discussed in the preceding section. The cost of obtaining information from farmers was considerably greater than from dealers in towns, due to the high proportion of ineligibles and the small amount of information obtained from each eligible farmer. Since most of the schedules obtained from farmers were on eggs, for which an ample number of records were obtained from dealers, the value added of such information was in this study, limited.

The detailed cost data are given in Table 46.

