TRENDS IN GEOGRAPHIC
CONCENTRATION OF SELECTED
AGRICULTURAL COMMODITIES
IN THE UNITED STATES: 1958-1972

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A Report to

Preface

This manuscript was completed as part of Texas A&M Research Foundation Project 0964, "The Movement of Selected Agricultural Commodities by Regulated and Non-Regulated Motor Carriers: A Comparative Analysis." The research reported herein completes sub-objective one of Project 0964 and was completed for the Texas Transportation Institute.

The purpose of the investigation is to identify spatial concentration propensities over the 1958 to 1972 period of manufacturing and/or processing establishments in the following commodities: (1) processed poultry and eggs, (2) redried tobacco, (3) shelled peanuts, (4) processed milk products and (5) processed fish. In addition, spatial concentration propensities for this same period in the cattle feeding industry are identified. Where available, Census of Manufacturing data were analyzed for each of the processed commodities. Data for the cattle industry were obtained from the U.S. Department of Agriculture. In most instances, the unit of analysis is regions and divisions within regions for the United States.

An additional area of analysis is trends in domestic per capita consumption of each of the processed commodities listed above as well as beef. Per capita consumption trends were investigated for the 1950 to 1972 period on a national basis. Data were obtained from the U.S. Department of Agriculture.

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INTRODUCTION

The profound changes which have occurred in the United States over

the past two decades toward industrialization of the economy, urbaniza-

tion of the society, and integration in marketing, all have

had an impact on agriculture. Many economic forces explain the geographic

location of manufacturing industries. Documentation of long run spatial

concentration propensities in a specialized agricultural processing

sector can provide important information for businesses supplying inputs

and services to that specialized industry.

The purpose of this manuscript is to identify spatial concentration

propensities in a number of agricultural processing or manufacturing

sectors. The investigation includes analyses relating to spatial con-

centration, entropy measures, and per capita consumption of selected

agricultural commodities. The majority of the analysis pertains to the

period 1958 through 1967. The commodities analyzed are: (1) processed

poultry and eggs, (2) redried toabcco, (3) shelled peanuts, (4) processed

milk products and (5) processed fish. In addition, spatial concentration

propensities for this same period in the cattle feeding industry are

identified. The last portion of the manuscript analyzes changes which

have occurred in the domestic civilian per capita consumption of these same commodities.

METHODOLOGY

Temporal analysis of spatial concentration propensities was accomplished using secondary data from Census of Manufacturers. The Census of Manufacturers is completed every five years. Thus, the years included in the analysis were the census years of 1958, 1963 and 1967. The Census of Manufactures reports data on number of establishments, value added by manufacture, value of output, number of employees, and payroll for each industry designated by a Standard Industrial Classification (SIC) code. However, there are only four of the previously listed five commodities which are designated by a four-digit SIC code. These commodities are processed poultry and eggs, redried tobacco, processed milk and processed fish.

The SIC code definitions for each of these commodities are as follows:

Processed poultry and eggs: This industry comprises establishments primarily engaged in slaughtering, dressing, packing, freezing, and canning poultry, rabbits and other small game for their own account or on a contract basis for the trade. This industry also includes the drying, freezing and breaking of eggs. The four-digit SIC code for this industry is 2015.

Re-dried tobacco: This industry comprises establishments primarily engaged in the stemming and re-drying of tobacco. Establishments which sell leaf tobacco as merchant wholesalers, agents or brokers, and which also may be engaged in stemming tobacco, are not included in this industry. Leaf tobacco warehouses which are engaged in stemming tobacco are not included in this industry. The SIC code for this industry is 2141.

Processed milk: This industry comprises establishments engaged primarily in manufacturing condensed and evaporated milk and related products, including ice cream mix and ice milk mix made for sale, and dry milk products. The SIC code classification for this industry is 2023.

Processed fish: This industry comprises establishments primarily engaged in preparing fresh and raw or cooked frozen packaged fish and other sea food. This industry also includes establishments engaged in the shucking and packing of fresh oysters in non-sealed containers. The SIC code classification for this industry is 2036.

The Census of Manufactures does not report data on a four-digit SIC code basis for shelled peanuts. As a consequence, comparable data are not available on shelled peanuts compared with the other aforementioned four commodities. Only a limited amount of data are available on shelled peanuts, which has been included in this report, Appendix B.

Data for the cattle industry were obtained from the U.S. Department of Agriculture. Most sources of information were the Crop Reporting Board of the Statistical Reporting Service, Livestock and Meat Statistics, Agricultural Statistics and Calf Crop, and finally, Crop Production reports. Another source of information was a published report by Raymond Dietrich [1].

The technique for analysis of the secondary data sources listed above was primarily absolute and percent changes in data such as the number of establishments and value of output. In addition, selected indices were calculated to aid in interpretation of temporal analysis of spatial concentration. Where appropriate, entropy measures were calculated as a further technique for analysis of the temporal aspects of concentration. However, the entropy technique requires a substantial amount of data. As

is demonstrated later in this manuscript, entropy measures can be
meaningfully interpreted only for the data on processed milk and
processed poultry and eggs.

The overall organization of this report is to present a commodity by
commodity analysis of manufacturing concentration by industrial sectors.
After this, changes in per capita consumption of these commodities is
analyzed.

PROCESSED POULTRY AND EGGS

Chicken Broilers

The poultry industry has undergone more extensive changes in
production, processing and marketing during the 1950 to 1970 period
than any other commodity analyzed in this report. Of course, the primary
basis for the processed poultry industry is the chicken broiler industry.
The chicken broiler industry has changed dramatically from being one of
small, widely scattered chicken farms, to one that is large, concentrated,
and efficient. More than 95 percent of broilers produced are grown under
contract and by integrated firms. About 84 percent of all production is
concentrated in only ten states.

Concentration and efficiency of the United States chicken broiler
industry has grown steadily since 1935, when broilers first emerged as
an important source of farm income. Vertical coordination or the linking
together of successive stages of production and marketing through ownership
or contracting has spread rapidly.

Georgia, Arkansas, Alabama, and North Carolina ranked highest, in that order, in 1969 production of broilers. Forty-three percent of all broilers were produced on farms raising 100,000 or more birds a year, according to the 1964 Census of Agriculture. California, Mississippi, Maryland, Delaware and Texas were the leading states in percentage of 1964 output from farms producing this many birds. Twenty-three percent of broilers are produced on farms raising 60,000 to 999,999 birds a year and 23 percent on farms raising 30,000 to 59,999.

The number of processing plants under federal inspection slaughtering all types of poultry dropped from 288 in 1962 to 231 in 1969. However, during this period, the volume of young chickens slaughtered increased from six billion to nine billion pounds live weight. The average slaughter of young chickens per plant increased from 2.6 million pounds in 1962 to 39.0 million pounds in 1969. All major regions showed gains in volume of slaughter in 1962 to 1969. Average monthly slaughter varied from 82 to 117 percent of the annual monthly average. The high months were May through October and the low months were November through April.

Poultry Processing

There are 36 states which have establishments processing poultry and eggs. These 36 states composed nine divisions, and in 1967 represented 843 establishments, Table 1. This represents a decline of 390 establishments from the high of 1,233 in 1958. In terms of total number of establishments, the United States total declined steadily over the period 1958 to 1967, and so did each division, without exception.

Table 1. Number of establishments processing poultry and eggs, selected years

Geographic Area and State	Total			With 20 employees or more		
	1958	1963	1967	1958	1963	1967
	number			number		
United States	1,233	967	843	594	559	514
New England Division	55	28	16	23	13	8
Maine	18	9	6	7	5	4
Massachusetts	18	10	8	4	3	3
Connecticut	7	---a/	2	7	---	1
Middle Atlantic Division	118	102	88	42	46	43
New York	53	36	27	15	15	11
New Jersey	15	18	17	8	9	10
Pennsylvania	50	48	44	19	22	22
East North Central Division	227	175	142	82	73	55
Ohio	---	60	55	---	21	20
Indiana	48	38	30	21	18	14
Illinois	---	32	23	---	14	9
Michigan	26	21	14	7	8	3
Wisconsin	26	24	20	11	12	9
West North Central Division	197	136	123	126	95	90
Minnesota	33	24	31	22	20	26
Iowa	45	30	28	32	23	17
Missouri	57	39	33	37	26	25
South Dakota	5	5	2	4	3	1
Nebraska	22	19	15	16	13	11
South Atlantic Division	213	181	169	120	122	121
Delaware	---	7	9	---	7	7
Maryland	28	22	17	10	14	13
Virginia	27	22	17	17	14	12
North Carolina	63	51	46	38	37	28
South Carolina	12	13	13	7	9	11
Georgia	42	41	42	30	32	35
Florida	13	18	18	6	8	14
East South Central Division	78	77	72	41	60	52
Kentucky	---	9	8	---	4	5
Tennessee	---	12	10	---	10	6
Alabama	27	33	33	17	25	24
Mississippi	22	23	21	16	21	17

Table 1. continued

Geographic Area and State	Total			With 20 employees or more		
	1958	1963	1967	1958	1963	1967
	number			number		
West South Central Division	158	116	109	85	83	81
Arkansas	39	37	34	24	27	31
Louisiana	14	8	11	6	6	9
Oklahoma	20	9	7	7	5	5
Texas	85	62	57	48	45	36
Mountain Division	39	33	22	14	11	8
Idaho	---	5	3	---	3	2
Colorado	12	11	7	4	3	2
Utah	9	11	7	7	5	4
Pacific Division	148	119	102	61	56	56
Washington	---	19	15	---	10	9
California	98	89	75	42	39	39

a/Data for these years are not available.

Source: Census of Manufactures, Volume II, Industry Statistics, U. S. Department of Commerce, 1958, 1963, 1967.

Considering only large establishments processing poultry and eggs (establishments with 20 employees or more) the United States total declined from 594 in 1958 to 514 in 1967. In general, the smaller establishments have declined over this ten-year period at a more rapid rate than larger firms, Figure 1. The 1958 percent of establishments which had 20 employees or more was 48, compared with the 1967 percent of 61. This indicates that the larger establishments are becoming a larger proportion of the total number of establishments.

In terms of value added by manufacture, processed poultry and egg establishments had a total value added by manufacture in 1958 of just over 310 million dollars, Table 2. This compares with a 1967 value added by manufacture of 588 million dollars. A similar trend occurred in the value of output for establishments processing poultry and eggs, Table 2. The 1958 value of output was slightly more than 1,888 million dollars in 1958 and increased to 2,936 million dollars in 1967. Value of output increased in every division from the 1958 to 1967 period except for the New England and East North Central Divisions. The value of output in the New England Division declined from just over 104 million dollars in 1958 to 80.5 million dollars in 1967. Over this same time frame, the East North Central Division declined to 188.9 million dollars in 1967 from the 1958 value of output of 232.1 million dollars.

The number of employees engaged in establishments processing poultry and eggs in 1958 was 62,400 compared to the 1967 figure of 85,200, Table 3. The total United States payroll for these employees increased from just under 161 million dollars in 1958 to slightly over 317 million dollars in 1967.
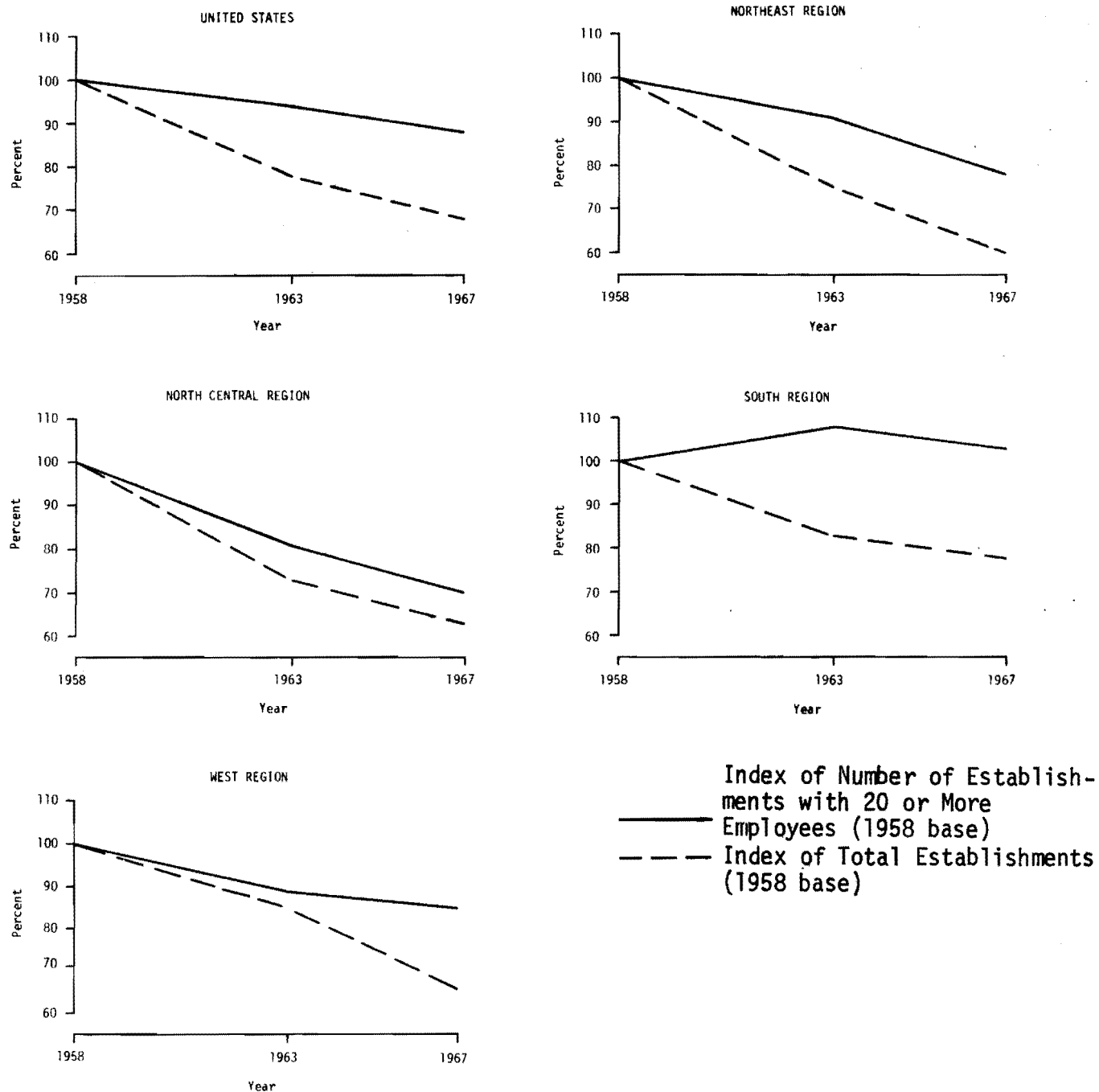
Figure 1. Change in establishments with 20 or more employees and total establishments processing poultry, by region, 1958-1967.

Table 2. Value added by manufacture and value of output for establishments processing poultry and eggs, selected years

Geographic Area and State	Value Added by Manufacture			Value of Output		
	1958	1963	1967	1958	1963	1967
	million dollars			million dollars		
United States	310.5	410.9	588.0	1,888.2	2,240.9	2,936.1
New England Division	17.2	18.6	13.8	104.2	91.1	80.5
Maine	9.0	10.8	---a/	53.9	57.3	---
Massachusetts	3.9	2.7	4.0	18.2	13.5	22.8
Connecticut	2.5	---	---	19.5	---	---
Middle Atlantic Division	20.2	24.7	37.4	124.3	132.2	174.4
New York	7.2	8.5	6.9	41.4	38.0	30.1
New Jersey	2.3	3.8	5.5	12.2	16.8	20.8
Pennsylvania	10.7	12.4	24.9	70.7	77.4	123.5
East North Central Division	39.1	32.9	39.0	232.1	168.7	188.9
Ohio	---	7.8	7.8	---	42.6	49.2
Indiana	9.1	8.3	12.4	56.4	37.8	52.6
Illinois	---	5.9	8.9	---	29.5	27.8
Michigan	5.2	2.3	1.7	17.4	9.5	5.7
Wisconsin	4.9	8.6	8.3	41.3	49.3	53.7
West North Central Division	59.2	62.7	86.3	345.6	343.2	405.5
Minnesota	14.7	20.7	26.8	91.8	122.6	139.8
Iowa	10.4	11.9	---	71.6	62.5	---
Missouri	13.9	12.4	19.6	90.9	73.0	96.2
South Dakota	2.6	0.9	---	11.8	8.6	---
Nebraska	8.3	11.4	19.4	40.5	43.3	62.2
South Atlantic Division	76.9	120.8	186.3	509.1	668.7	966.4
Delaware	---	8.7	---	---	54.0	---
Maryland	11.0	20.4	22.7	60.0	105.0	123.2
Virginia	9.2	15.0	18.3	57.0	67.2	111.6
North Carolina	15.2	29.3	43.6	105.0	161.1	224.6
South Carolina	1.4	2.3	10.8	8.0	16.6	41.2
Georgia	31.8	40.4	62.3	205.7	237.0	333.7
Florida	1.4	3.9	12.0	14.4	24.0	50.6
East South Central Division	26.2	48.2	65.5	169.8	280.7	357.1
Kentucky	---	2.6	1.4	---	16.7	15.2
Tennessee	---	8.1	7.3	---	44.0	42.3
Alabama	11.4	23.2	38.7	80.2	126.2	192.1
Mississippi	8.7	14.2	18.0	57.8	93.7	107.5

Table 2. continued.

Geographic Area and and State	Value Added by Manufacture			Value of Output		
	1958	1963	1967	1958	1963	1967
	million dollars			million dollars		
West South Central Division	38.9	54.8	99.6	230.0	328.7	484.8
Arkansas	14.5	23.6	51.1	80.8	151.0	253.4
Louisiana	4.4	5.4	11.5	20.1	30.5	61.1
Oklahoma	3.9	2.3	5.4	24.3	17.8	20.3
Texas	16.1	23.5	31.7	104.7	129.3	150.0
Mountain Division	5.0	3.3	6.6	20.7	24.1	27.3
Idaho	—	1.1	—	—	6.2	—
Colorado	1.4	1.5	2.3	5.0	7.6	11.6
Utah	2.4	0.5	2.2	10.2	9.8	8.1
Pacific Division	27.7	44.8	53.5	152.3	203.3	251.2
Washington	—	7.1	5.6	—	26.3	32.1
California	18.9	34.9	43.3	109.7	162.8	195.9

a/ Data for these years are not available.

Source: Census of Manufactures, Volume II, Industry Statistics, U.S. Department of Commerce, 1958, 1963, 1967.

Table 3. Number of employees and total payroll for establishments processing poultry and eggs, selected years

Geographic Area and State	Employees			Payroll		
	1958	1963	1967	1958	1963	1967
	(000)			million dollars		
United States	62.4	70.1	85.2	160.8	204.4	317.1
New England Division	3.0	2.4	2.2 b/	8.7	8.1	9.3 a/
Maine	1.2	1.5	EE	4.4	5.0	---
Massachusetts	0.5	0.3	0.5	1.6	0.9	1.9
Connecticut	0.6	---	BB	1.6	---	---
Middle Atlantic Division	3.8	4.1	4.6	11.2	13.8	19.4
New York	1.2	1.2	0.9	3.5	4.5	3.9
New Jersey	0.5	0.6	0.6	1.4	1.7	2.1
Pennsylvania	2.2	2.3	3.1	6.3	7.6	13.4
East North Central Division	7.6	5.4	5.7	21.2	14.8	22.3
Ohio	---	1.2	1.5	---	3.7	5.7
Indiana	1.8	1.5	1.7	5.2	3.8	6.0
Illinois	---	0.9	1.0	---	2.8	4.3
Michigan	0.7	0.5	0.3	1.8	1.0	1.1
Wisconsin	1.2	1.3	1.3	3.2	3.6	5.1
West North Central Division	12.1	10.9	12.7	30.4	31.5	46.9
Minnesota	3.7	3.9	4.7	9.2	11.4	17.2
Iowa	2.2	1.8	EE	5.5	4.9	---
Missouri	2.9	2.3	2.7	6.9	6.3	10.2
South Dakota	0.4	0.3	AA	0.8	0.7	---
Nebraska	2.0	2.0	2.4	5.3	6.3	8.6
South Atlantic Division	16.3	20.7	29.1	39.6	58.7	104.3
Delaware	---	1.4	EE	---	4.6	---
Maryland	1.8	3.4	3.7	4.8	10.3	13.7
Virginia	2.1	2.3	2.8	5.0	5.7	10.2
North Carolina	3.6	4.8	6.7	7.6	12.3	22.4
South Carolina	0.3	0.6	2.1	0.6	1.5	7.4
Georgia	6.3	7.3	9.8	15.4	21.9	36.6
Florida	0.5	0.8	1.5	1.2	2.0	4.8
East South Central Division	5.6	9.5	10.1	13.3	24.3	36.3
Kentucky	---	0.5	0.4	---	1.3	1.5
Tennessee	---	1.3	1.2	---	3.7	4.6
Alabama	2.9	4.5	5.0	6.7	10.8	18.2
Mississippi	1.9	3.2	3.5	4.1	8.4	12.0

Table 3. continued

Geographic Area and State	Employees			Payroll		
	1958	1963	1967	1958	1963	1967
	(000)			million dollars		
West South Central Division	8.3	10.9	14.0	18.9	29.0	47.4
Arkansas	3.1	5.2	7.6	7.8	14.5	26.4
Louisiana	0.6	0.9	1.6	1.3	2.5	5.3
Oklahoma	0.7	0.6	0.6	1.9	1.6	1.9
Texas	3.8	4.2	4.2	8.0	10.4	13.7
Mountain Division	0.9	1.0	0.8	2.0	2.5	2.8
Idaho	---	0.2	AA	---	0.7	---
Colorado	0.2	0.3	0.2	0.5	0.8	1.1
Utah	0.6	0.5	0.3	1.0	1.0	0.9
Pacific	4.6	5.1	6.1	15.5	21.5	28.4
Washington	---	0.8	0.9	---	3.5	4.7
California	3.1	3.8	4.4	10.5	16.1	20.6

[a/] Data for these years is not available.

[b/] General statistics for some producing states have to be withheld to avoid disclosing figures for individual companies. The employment size range is indicated by any of the following symbols.

AA - less than 250 employees   EE - 1,000 - 2,499 employees
BB - 250 - 499 employees   FF - 2,500 employees and over
CC - 500 - 999 employees

Source: Census of Manufactures, Volume II, Industry Statistics, U. S. Department of Commerce, 1958, 1963, 1967.

In an effort to analyze the size of firms by geographic area, the value
of output per establishment for establishments processing poultry and eggs
was computed for each state and each division, Table 4. The value of output
per establishment for the United States increased from 1.53 million dollars
in 1958 to 2.32 million dollars in 1963, with a further increase to 3.48
million dollars in 1967.

Some rather dramatic differences exist in individual state and division
value of output per establishment figures over this 1958 to 1967 period. The
New England Division comprised of Maine, Massachusetts, and Connecticut
showed the greatest increase in value of output per establishment. This
means that establishments in the New England Division increased relatively
more in size than any other division within the United States. The division
which showed the least gain in terms of size is the East North Central
Division (composed of Ohio, Indiana, Illinois, Michigan, and Wisconsin).
Value of output per establishment increased from 1.02 million dollars per
establishment in 1958 for this division to only 1.33 million dollars in 1967.

In terms of absolute size, the largest firms are found in the South
Atlantic Division. In 1967 firms in the South Atlantic Division had a
value of output per establishment of 5.72 million dollars. This division
is composed of Delaware, Maryland, Virginia, North Carolina, South Carolina,
Georgia, and Florida. The largest firms are in Maryland, Georgia, and
Virginia. Georgia has the highest value of output per establishment of any
state within the continental United States with a value of output of nearly
8 million dollars per establishment. For the states for which data were
reported, the smallest firms are found in New York state and Utah.

Table 4. Value of output per establishment for establishments processing poultry and eggs, selected years

Geographic Area and State	Value of Output per Establishment[b]		
	1958	1963	1967
	million dollars		
United States	1.53	2.32	3.48
New England Division	1.89	3.25	5.03
Maine	2.99	6.37	—[a]
Massachusetts	1.01	1.35	2.85
Connecticut	2.78	—	—
Middle Atlantic Division	1.05	1.30	1.98
New York	0.78	1.06	1.11
New Jersey	0.81	0.93	1.22
Pennsylvania	1.41	1.61	2.80
East North Central Division	1.02	0.96	1.33
Ohio	—	0.71	0.89
Indiana	1.18	0.99	1.75
Illinois	—	0.92	1.21
Michigan	0.67	0.45	0.41
Wisconsin	1.59	2.05	2.68
West North Central Division	1.75	2.52	3.30
Minnesota	2.78	5.11	4.51
Iowa	1.59	2.08	—
Missouri	1.59	1.87	2.92
South Dakota	2.36	1.72	—
Nebraska	—	—	—
South Atlantic Division	2.39	3.69	5.72
Delaware	—	7.71	—
Maryland	2.14	4.77	7.25
Virginia	2.11	3.05	6.56
North Carolina	1.67	3.16	4.88
South Carolina	0.67	1.28	3.17
Georgia	4.90	5.78	7.94
Florida	1.11	1.33	2.81

Table 4. continued

Geographic Area and State	Value of Output per Establishment[b]		
	1958	1963	1967
	million dollars		
East South Central Division	2.18	3.64	4.96
Kentucky	—	1.86	1.90
Tennessee	—	3.67	4.23
Alabama	2.97	3.82	5.82
Mississippi	2.63	4.07	5.12
West South Central Division	1.46	2.83	4.45
Arkansas	2.07	4.08	7.45
Louisiana	1.44	3.81	5.55
Oklahoma	1.22	1.98	2.90
Texas	1.23	2.08	2.63
Mountain Division	0.53	0.73	1.24
Idaho	—	1.24	—
Colorado	0.42	0.69	1.66
Utah	1.13	0.89	1.16
Pacific Division	1.03	1.71	2.46
Washington	—	1.38	2.14
California	1.12	1.83	2.61

a/ Data for these years are not available.

b/ This value is computed by dividing the value of output (in millions) by the total number of establishments in the United States.

Source: Tables 1 and 3 .

Temporal Index

In order to gain insight into the change in number of establishments over time for a particular geographic area, a temporal index of number of establishments was computed. For any given geographic area, if the temporal index is increasing over time, it indicates that the area is increasing in terms of number of establishments. On the other hand, if the temporal index is declining, the geographic area is suffering decreases in number of establishments. The rate of change in the temporal index indicates the rapidity with which the number of establishments in that particular geographic area is changing.

For the processed poultry and egg industry, the temporal index of establishments was computed from Census of Manufactures data for each division and region which has establishments. For the United States, the temporal index of establishments with 20 or more employees was 94 percent in 1963 and 87 percent in 1967, Table 5. These percentages are relative to the 1958 base. Over the ten-year period covered by the Census of Manufactures data, the temporal index indicates a decline of 13 percent overall in number of establishments. The rate of decline during the first five-year period was nearly the same as the rate of decline in the second five-year period.

The temporal index is most useful for indicating those divisions or regions that are suffering the largest decline in number of establishments, or those increasing at the most rapid rate. The New England Division, consisting of Maine, Massachusetts, and Connecticut, declined more rapidly over the 1958 to 1967 period than any other division. In 1963 the New

Table 5. Temporal index of number of establishments by region, establishments processing poultry and eggs, selected years

Geographic Area by Regions and Divisions	Temporal Index for Establishments With 20 or More Employees [a]	
	1963	1967
	percent	
United States	94	87
Northeast Region	91	78
New England Division	56	35
Middle Atlantic Division	109	102
North Central Region	81	70
East North Central Division	89	67
West North Central Division	75	71
South Region	108	103
South Atlantic Division	102	101
East South Central Division	146	127
West South Central Division	98	95
West Region	89	85
Mountain Division	78	57
Pacific Division	92	92

a/ This value is computed using 1958 as the base.

Source: Table 1.

England Division had only 56 percent of the number of establishments that it had in 1958, and in 1967 had only 35 percent of the 1958 establishments. Thus, the New England Division, in terms of large establishments (establishments with 20 or more employees) declined in importance more rapidly than any other division. The next most rapidly declining division was the Mountain Division, consisting of Idaho, Colorado and Utah. In 1967 the Mountain Division had only 57 percent of the 1958 establishments.

Divisions that have been increasing in importance include the Middle Atlantic Division, the South Atlantic Division and the East South Central Division. Thus, only three of the nine divisions actually increased (in terms of large establishments) over this time period. The greatest gain occurred in the East South Central Division, consisting of Kentucky, Tennessee, Alabama, and Mississippi. In 1967, this division had 127 percent of the number of establishments that it had in 1958. The other two divisions, Middle Atlantic and South Atlantic, showed slight increases in number of establishments, with 102 percent and 101 percent, respectively, over their 1958 base.

A significant difference exists in the temporal index for the East South Central Division from 1963 to 1967. This index for 1963 was 146 percent and only 127 percent for 1967. Thus, for the years 1958 to 1963, there was nearly a 50 percent increase in number of establishments processing poultry and eggs. However, the number of establishments actually declined from 1963 to 1967.

The only region of the four regions which increased in number of establishments was the South Region. Even this increase was slight, to 103 percent in 1967. In general, the only divisions which are either remaining stable or increasing in terms of establishments are the Middle Atlantic Division, the South Atlantic Division, and the East South Central Division.

An additional method for analyzing the importance of each division or region over time is based on the temporal index for value of output. The temporal index for value of output indicates the viability of the industry within a division or region in terms of sales over time. As would be expected, the value of output index leads to somewhat different conclusions concerning the importance of the industry than does the temporal index of establishments.

The value of output index (of establishments processing poultry and eggs for the United States) increased 19 percent in 1963 compared to 1958 and increased 55 percent in 1967 compared to 1958, Table 6. Some rather significant propensities toward concentration are indicated by the temporal index for value of output. The greatest rate of increase in value of output occurred in the South and West Region, Figure 2. In the South Region, the West South Central Division and East South Central Division have both more than doubled their value of output from 1958 to 1967. The East South Central Division had a value of output of 210 percent while the West South Central Division had a value of output of 211 percent for 1967, both compared to the 1958 base. In addition, the South Atlantic Division had a temporal index of 190 percent for 1967 over its 1958 base.

Table 6. Temporal index for value of output, by region, establishments
processing poultry and eggs, selected years

Geographic Area by Regions and Divisions	Temporal Index for Value of Output a/	
	1963	1967
	percent	
United States	119	155
Northeast Region	98	112
New England Division	87	77
Middle Atlantic Division	106	140
North Central Region	89	103
East North Central Division	73	81
West North Central Division	99	117
South Region	141	199
South Atlantic Division	131	190
East South Central Division	165	210
West South Central Division	143	211
West Region	131	162
Mountain Division	116	132
Pacific Division	133	165

a/ This value is computed by using 1958 as the base.

Source: Table 3.
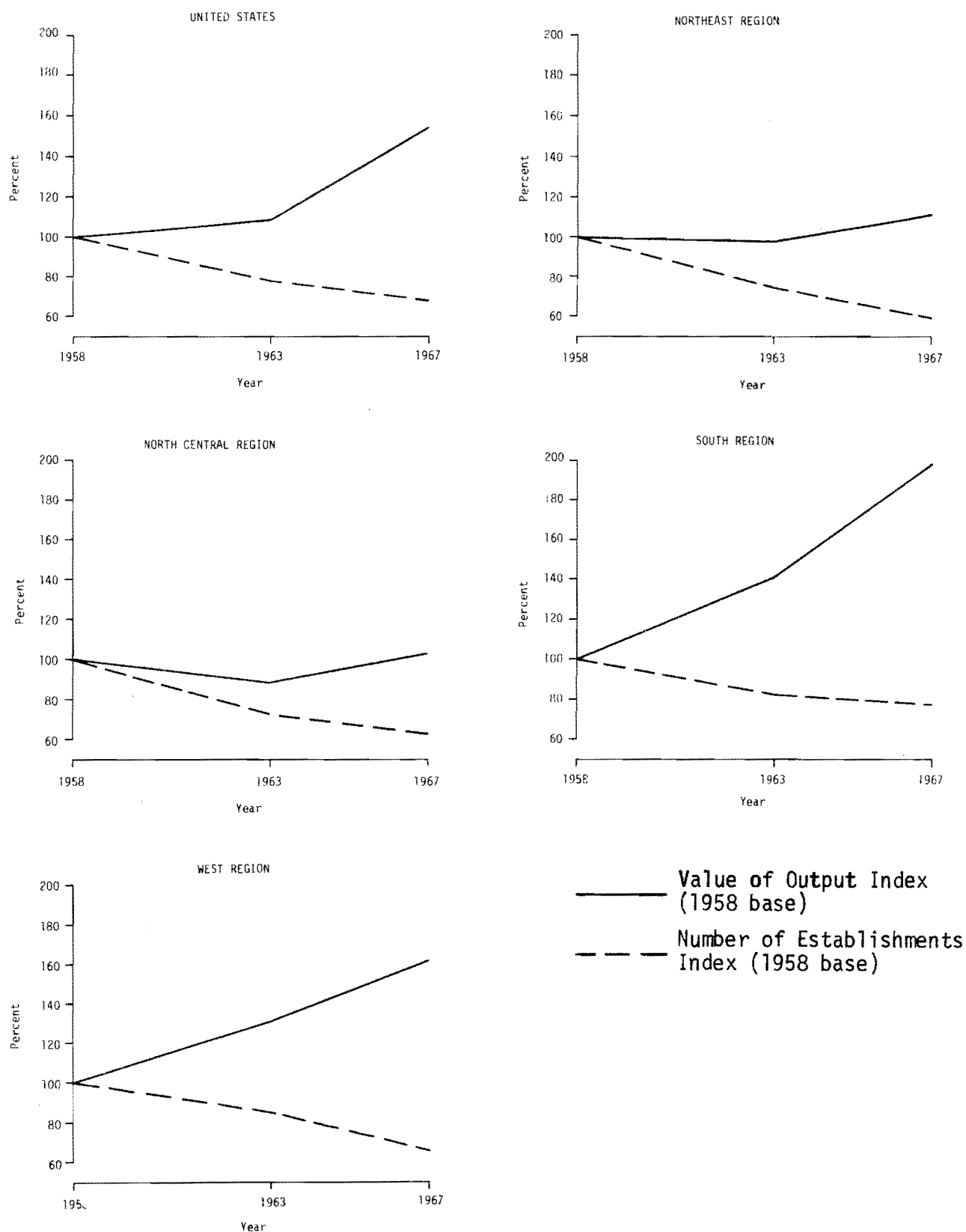
Figure 2. Change in value of output and number of establishments processing poultry, by regions, 1958-1967.

Comparison of the establishments index with the value of output index reveals that the increases in the South Region are more pronounced in terms of value of output than number of establishments, Figure 2. Also, the West Region realized a greater increase in output than establishments. Even though the West Region declined in establishments, it increased in output. This latter index indicates that the West Region is certainly a viable poultry and egg processing region.

The only decline in value of output occurred in the New England and East North Central Divisions. These divisions declined to 77 and 81 percent of their 1958 bases, respectively. These divisions declined in establishments and output.

The other divisions which show some increase in output are the Middle Atlantic, West North Central, Mountain and Pacific Divisions. Although these divisions have increased in terms of value of output over the 1958 base, the increases have not been as dramatic as the increases in the previously mentioned divisions.

Relative Importance of Regions

In order to obtain an indication of the relative importance of regions, two indices were computed. The index of relative importance of regions or divisions essentially shows the share of the United States market which belongs to that particular region or division. The index of relative importance can be computed using either the number of establishments or the value of output. Since the index is computed using the United States total as the base, each of the three census years allows an index computation.

In terms of the establishments index, only one region shows an increase in share, Table 7. This is the South Region, which increased its share of establishments processing poultry and eggs from 41.4 percent of the 1958 total to 49.4 percent of the 1967 total. Thus, nearly half of all establishments processing poultry and eggs were located in the South Region in 1967. The Northeast and West Regions both exhibit a fairly stable share of number of establishments over the 1958 to 1967 period. The Northeast Region lost 1 percentage point in share from 1958 to 1967, while the West Region was nearly identical, dropping from 12.6 to only 12.4 percent.

Within regions, there is some difference in terms of changes in establishment shares. The South Region increased more than any other region. Within the South Region, the South Atlantic Division (consisting of Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia and Florida) increased in establishments share from 20.2 percent in 1958 to 23.5 percent in 1967. This represents the greatest increase for any division within the South Region. The East South Central Division initially represented 6.9 percent of the total number of establishments processing poultry and eggs in the United States. In the next census, this division represented 10.7 percent of the total establishments, but declined to only 10.1 percent in 1967. The West South Central Division increased slowly but steadily from 14.3 percent in 1958 to 15.8 percent in 1967.

The North Central Region declined in establishments share from 35.0 percent to 28.2 percent from 1958 to 1967. Both divisions within this region declined in terms of share. Nearly stable regions over the ten-year period were the Northeast and West Regions. Each of these regions consists of two

Table 7. Relative importance of regions, by number of establishments processing poultry and eggs, selected years

Geographic Area by Regions and Divisions	Index of Establishments a/		
	1958	1963	1967
	percent		
United States	100.0	100.0	100.0
Northeast Region	10.9	10.6	9.9
New England Division	3.9	2.3	1.6
Middle Atlantic Division	7.0	8.3	8.3
North Central Region	35.0	30.0	28.2
East North Central Division	13.8	13.0	10.7
West North Central Division	21.2	17.0	17.5
South Region	41.4	47.4	49.4
South Atlantic Division	20.2	21.8	23.5
East South Central Division	6.9	10.7	10.1
West South Central Division	14.3	14.8	15.8
West Region	12.6	12.0	12.4
Mountain Division	2.4	2.0	1.6
Pacific Division	10.2	10.0	10.8

a/ This value is computed by dividing the number of establishments with twenty or more employees by the United States total of establishments with twenty or more employees.

Source: Table 1 .

divisions, one of which increased in relative importance while the other declined. For the Northeast Region, the New England Division declined while the Middle Atlantic Division increased somewhat. For the West Region, the Mountain Division declined slightly while the Pacific Division increased slightly.

In terms of the relative importance of regions by value of output, the same general pattern holds, Table 8. The South Region made a significant gain while the North Central Region declined precipitously. The West Region remained relatively stable while the Northeast Region declined somewhat.

The South Region increased from 48.1 percent of the total value of output in 1958 to 61.6 percent in 1967. The rate of increase from 1963 to 1967 slowed somewhat compared to the previous five-year period for this region. On a value of output basis, the South Region was more important in 1967 than an establishments basis. The region contained only about half of the establishments, but accounted for nearly 60 percent of the total value of output.

The West Region and each division within it was nearly stable in terms of output share from 1958 to 1967. The Northeast Region declined about 2 percent in output share from 1958 to 1967. At the same time the North Central Region lost about 10 percent, declining from 30.6 percent in 1958 to 20.2 percent in 1967. Decline in the North Central Region slowed significantly during the latter five years compared to the previous five. Both the East North Central and West North Central Divisions declined in importance.

Table 8. Relative importance of regions by value of output of establishments processing poultry and eggs, selected years

Geographic Area by Regions and Divisions	Index of Value of Output [a]		
	1958	1963	1967
	percent		
United States	100.0	100.0	100.0
Northeast Region	12.1	10.0	8.7
New England Division	5.5	4.1	2.7
Middle Atlantic Division	6.6	5.9	6.0
North Central Region	30.6	22.8	20.2
East North Central Division	12.3	7.5	6.4
West North Central Division	18.3	15.3	13.8
South Region	48.1	57.0	61.6
South Atlantic Division	27.0	29.8	32.9
East South Central Division	9.0	12.5	12.2
West South Central Division	12.1	14.7	16.5
West Region	9.2	10.1	9.5
Mountain Division	1.1	1.1	.9
Pacific Division	8.1	9.0	8.6

[a] This value is computed by dividing the total amount of value of output (million dollars) in the United States by the value of output in each particular area.

Source: Table 3.

The three divisions within the South Region all showed increases in their share of value of output during the 1958 to 1967 period. The greatest increase was in the South Atlantic Division which gained nearly 6.0 percent over the 10 year span. This was followed by the West South Central Division and East South Central Division, gaining 4.5 percent and 3.2 percent, respectively. The latter division actually declined in relative importance from 1963 to 1967; however, this decline was only from 12.5 percent to 12.2 percent.

Entropy Measures of Spatial Concentration Propensities

The purpose of this section is to suggest a method for further investigation of spatial concentration propensities in a specialized industrial sector, such as processed poultry and eggs. Analysis of intertemporal change in disaggregated relative entropy measures is suggested as a technique which allows spatial concentration propensities to be identified. Methodology for the entropy measure is given in Appendix A. Each entropy measure is applied to investigate spatial concentration in poultry processing.

Relative entropy, $R(\theta)$, is an index between zero and 100 which measures geographic dispersion. It is a measure of the extent to which the industry under study is attaining the maximum possible geographic dispersion in firm or output shares given the number of geographic regions. Analysis of intertemporal change in $R(\theta)$ provides information concerning spatial concentration propensities.

Relative entropy, $R(\theta)$, may be disaggregated into between-region entropy, $R_o(\theta)$, and within-region entropy, $R_m(\theta)$. Both are indices which measure

geographic disperion, like $R(\theta)$. $R_0(\theta)$ is a measure of the extent to which the industry under study is attaining maximum possible between-region geographic dispersion in shares, given the number of regions. $R_m(\theta)$ is a measure of the extent to which the industry is attaining maximum possible within-region geographic dispersion in shares given the number of divisions within regions.

Entropies in the Poultry and Egg Processing Industry

As an illustration of the above methodology, both absolute and relative entropies are computed for the poultry and egg processing industry. Investigation of the spatial concentration propensities in terms of number of establishments shares by regions and value of output shares by region is presented.

Data on number of establishments and value of output for poultry and egg processing are reported by Census of Manufacturers [2]. Shares by divisions and regions of the United States total were computed for each of the last three available census years, Table 9. Total and between-region relative entropies are computed from these shares regarding regions as 4 sets ($m = 1, \ldots 4$), Table 10. Divisions within regions provide the base for relative within-region entropies, Table 10.

Table 9. Shares of number of establishments and value of output for poultry and egg processing by divisions and regions, selected years

| Geographic Area by Regions and Divisions | Shares[1] | | | | | |
| | 1958 | | 1963 | | 1967 | |
	Establishment Shares	Output Shares	Establishment Shares	Output Shares	Establishment Shares	Output Shares
	percent					
United States	100.0	100.0	100.0	100.0	100.0	100.0
Northeast Region	14.0	12.1	13.4	10.0	12.4	8.7
New England Division	4.5	5.5	2.9	4.1	2.0	2.7
Middle Atlantic Division	9.6	6.6	10.5	5.9	10.4	6.0
North Central Region	34.4	30.6	32.2	22.8	31.4	20.2
East North Central Division	18.4	12.3	18.1	7.5	16.8	6.4
West North Central Division	16.0	18.3	14.1	15.3	14.6	13.8
South Region	36.5	48.1	38.7	57.0	41.4	61.6
South Atlantic Division	17.3	27.0	18.7	29.8	20.0	32.9
East South Central Division	6.3	9.0	8.0	12.5	8.5	12.2
West South Central Division	12.9	12.1	12.0	14.7	12.9	16.5
West Region	15.2	9.2	15.7	10.1	14.7	9.5
Mountain Division	3.2	1.1	3.4	1.1	2.6	.9
Pacific Division	12.0	8.1	12.3	9.0	12.1	8.6

[1] Includes all establishments regardless of size.

Source: Computed from Census of Manufactures

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Table 10. Entropy measures for number of establishments and value of output shares by census years

Entropy Measure or Geographic Region	Census Year					
	1958		1963		1967	
	Establishment Shares	Output Shares	Establishment Shares	Output Shares	Establishment Shares	Output Shares
Relative total geographic dispersion, $R(\Theta)$	94.5	90.4	94.1	88.7	92.9	86.0
Relative Between-regions geographic dispersion, $R_o(\Theta)$	93.5	85.8	93.2	80.7	91.6	76.3
Northeast, $R_m(\Theta)$[a]	90.0	99.4	75.4	97.7	63.7	89.4
North Central, $R_m(\Theta)$	99.7	97.2	98.9	91.4	99.7	90.1
South, $R_m(\Theta)$	93.3	89.6	94.7	93.0	94.7	91.8
West, $R_m(\Theta)$	74.3	52.8	75.4	49.7	67.3	45.2

[a] $R_m(\Theta)$ is the relative within-region geographic dispersion.

Source: Computed from Table 9.

Establishment Shares

Examining the intertemporal change in $R(\circ)$ reveals that geographic concentration in terms of establishments shares increased from 1958 to 1967 but the rate of change has not been substantial. Less than a 2 percent decline in $R(\circleddash)$ over a 10 year period substantiates how slow this change in geographic concentration has been. Also the magnitude of $R(\circleddash)$ suggests that the industry was about 93 - 95 percent of maximum possible dispersion during this period.

Turning to the intertemporal change in $R_o(\circleddash)$, about the same propensity toward concentration of establishments between regions is revealed as for the total. The rate of change in $R_o(\circ)$ over the 10 year period is just at 2 percent. The rate of change in $R_o(\circ)$ did accelerate from 1963 to 1967 compared to the previous 5 year change.

Intertemporal change in the relative within-region entropy, $R_m(\circleddash)$, shows the greatest propensity toward within-region concentration over the 10 year period occurred in the Northeast Region, followed by the West. During this same period the South Region actually became more disperse among divisions in terms of establishments while the Northeast dispersion among divisions remained constant. The estimates of $R_m(\circleddash)$ also suggest that for the most recent year, the North Central Region is near maximum dispersion within the region while the Northeast and West Regions are 60 - 70 percent of maximum.

Output Shares

Entropy measures based on output shares are more important than establishments shares for some purposes since size of establishments is reflected in the former shares but not in the latter.

Propensity toward geographic concentration for output shares has been more pronounced than for establishments shares, Table 10. The rate of change in relative total entropy, $R(\theta)$, was about 5 percent from 1958 to 1967 based on output shares. This compares to less than 2 percent rate of change in $R(\theta)$ over the same period based on establishments shares.

An even more striking difference exists in the intertemporal changes in between-region entropy, $R_0(\theta)$, for the two share types. For the 10 year period, output shares between-region entropy, $R_0(\theta)$, rate of change was slightly over 11 percent compared to 2 percent for the comparable statistic based on establishments shares. This indicates that geographic concentration in terms of size of establishment occurred substantially faster than in number of establishments. The rate of change in output concentration between regions did slow slightly from 1963 to 1967 compared to the previous 5 years. This is contrary to the rate of change in $R_0(\theta)$ based on establishments shares which increased from 1963 to 1967.

The within-region relative entropies, $R_m(\theta)$, show marked changes over the 3 census years, Table 10. The greatest within-region concentration increase was the West followed by the Northeast and North Central regions. The South, as with $R_m(\theta)$ based on establishments, was more geographically disperse among divisions in 1967 than in 1958.

Output shares concentration is greater within-region in the South and
West than the concentration of establishments shares. This is especially
pronounced comparing $R_m(\Theta)$ in 1967 for the two shares. In the North Central
and South Regions the within-region entropies are similar for either share
type.

Conclusions

Spatial concentration may be quantified by adapting the entropy measure
of information theory. Intertemporal comparisons of entropy allow concentra-
tion propensities to be investigated. Relative entropy is more useful for
spatial analysis than absolute entropy since regions are of different size
and equal shares are not expected.

The disaggregation property of total entropy into between-set and within-
set entropies is particularly useful for analysis of data reported by divisions
and regions. Entropies for the poultry and egg processing industry document a
slight propensity toward increased concentration between regions and a relatively
rapid propensity toward within-region concentration for the Northeast and West.

MILK PROCESSING

Eight geographic divisions reported milk processing establishments during
the 1958 to 1967 Census of Manufactures years. In 1958, there were 313 establish-
ments processing milk in the United States, Table 11. This total declined by
32 establishments from 1958 to 1963. However, establishment numbers subse-
quently increased by 10 from 1963 to 1967.

Table 11. Number of establishments processing milk, selected years

Geographic Area and State	Total			With 20 employees or more		
	1958	1963	1967	1958	1963	1967
	number			number		
United States	313	281	291	202	166	169
Middle Atlantic Division	—a/	—	46	—	—	26
New York	31	—	28	17	—	12
East North Central Division	122	108	101	86	71	63
Ohio	—	12	13	—	11	9
Indiana	9	8	9	6	3	4
Illinois	—	24	19	—	15	10
Michigan	—	19	16	—	12	9
Wisconsin	52	45	44	34	30	31
West North Central Division	55	57	55	40	32	31
Minnesota	35	34	26	27	20	18
Iowa	8	—	14	4	—	5
Missouri	8	8	9	5	5	6
South Atlantic Division	20	16	18	11	8	9
Virginia	4		4	4		3
East South Central Division	21	17	22	12	11	13
Tennessee	8	7	10	4	5	6
West South Central Division	10	10	7	7	7	4
Mountain Division	11	8	9	6	4	4
Pacific Division	25	26	28	14	14	17
California	15	15	19	10	10	14

a/ Data for these years are not available.

Source: Census of Manufactures, Volume II, Industry Statistics, U. S. Department of Commerce, 1958, 1963, 1967.

A similar pattern prevails for larger establishments (20 or more employees), Table 11. The total number of establishments with 20 employees or more declined by 36 from 1958 to 1963. For the 1963 to 1967 period, this number increased by 3.

In general, there is no dramatic change in the total number of establishments processing milk for any of the reported divisions during the three census years. The only exception to this is the East North Central Division which declined in total number of establishments by 21, Table 11. This division slowed in terms of decline in number of establishments during the most recent five year period compared to the previous five year period. The other divisions, for practical purposes, are relatively stable in terms of total number of establishments.

For disclosure reasons, complete data are not available for the Middle Atlantic Division. Consequently, no temporal analysis can be performed for this division.

For establishments with 20 employees or more, a somewhat more substantial pattern for change occurs than for total establishments, Figure 3. The most precipitous change among larger establishments occurred in the East North Central Division, from 86 establishments in 1958 to only 63 establishments in 1967. Also, the West Central Division declined from a high of 40 establishments in 1958 to 32 establishments in 1963, with a decline of one more to 31 in 1967. The Pacific Division actually increased by three establishments from 1963 to 1967, after remaining stable for the period of 1958 to 1963.

The number of employees and total payroll for establishments processing milk follows a similar pattern to the number of establishments, Table 12.

UNITED STATES

NORTH CENTRAL REGION

SOUTH REGION

WEST REGION

——— Index of Number of Establish-
ments with 20 or more
Employees (1958 base)

— — — Index of Total Establishments
(1958 base)
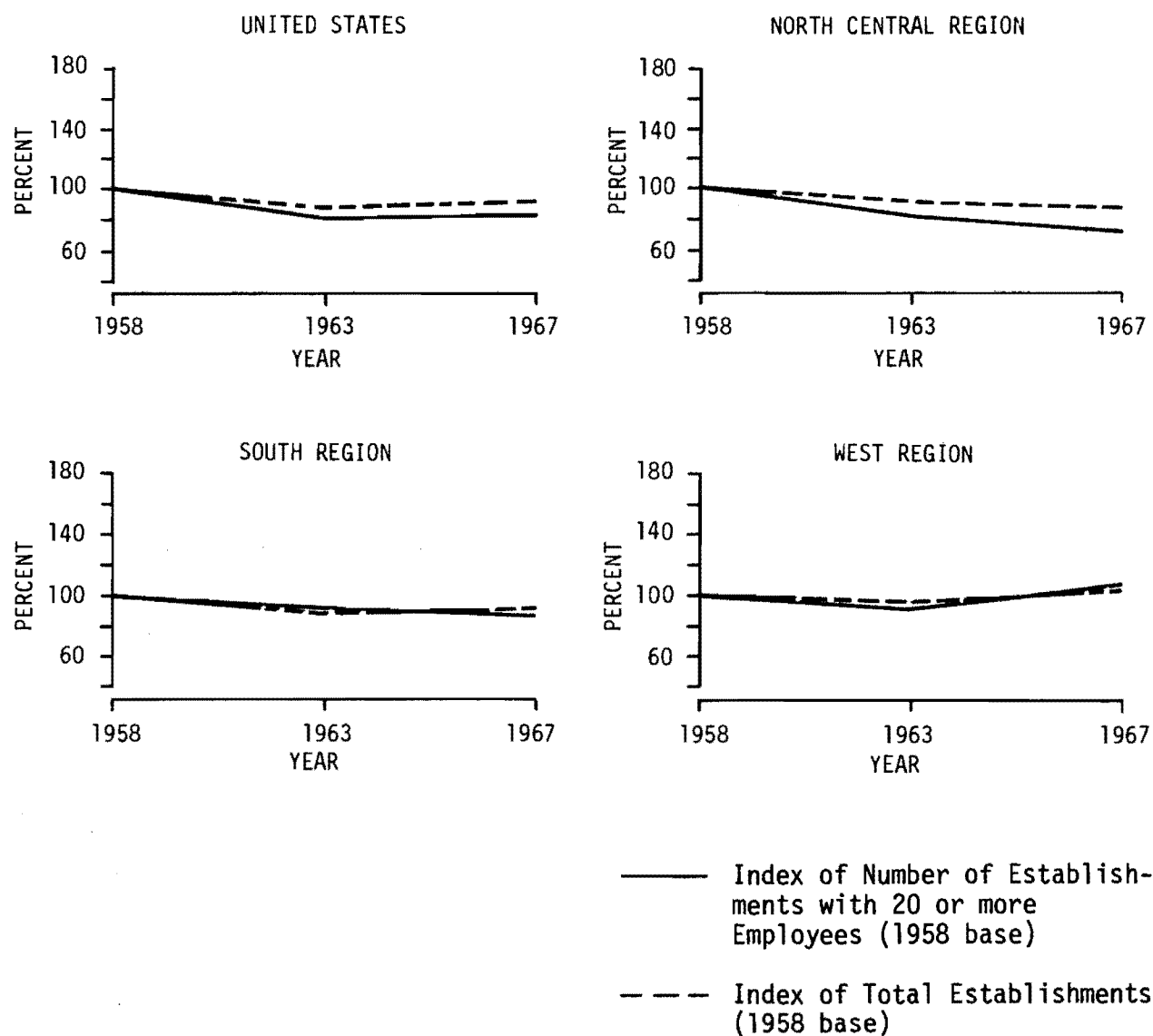
Figure 3. Change in establishments with 20 or more employees and total
establishments processing milk, by region, 1958-1967.

Table 12. Number of employees and total payroll for establishments processing milk, selected years

Geographic Area and State	Employees			Payroll		
	1958	1963	1967	1958	1963	1967
	number (1,000)			million dollars		
United States	13.4	12.3	13.2	61.4	67.0	83.4
Middle Atlantic Division	—a/	—	—	—	—	—
New York	.8	—	.8	3.7	—	4.7
East North Central Division	6.3	5.5	5.6	29.9	30.2	36.8
Ohio	—	.9	.8	—	5.0	5.0
Indiana	.4	.2	ccb/	1.7	1.2	—
Illinois	—	.9	cc	—	5.0	—
Michigan	—	1.1	1.0	—	6.5	6.7
Wisconsin	2.6	2.3	2.5	11.9	12.7	16.0
West North Central Division	2.4	2.9	2.9	10.2	15.2	17.6
Minnesota	1.5	1.5	1.2	6.3	7.9	6.7
Iowa	.2	—	cc	.8	—	—
Missouri	.4	.8	.9	1.8	4.3	5.5
South Atlantic Division	.7	.6	.6	3.0	3.0	3.6
Virginia	.2	—	22	1.0	—	—
East South Central Division	1.2	1.0	1.0	5.2	5.3	5.6
Tennessee	.5	.5	.5	2.1	2.4	2.7
West South Central Division	.3	.3	.3	1.2	1.5	2.0
Mountain Division	.4	.2	.2	1.6	1.2	1.3
Pacific Division	.9	.8	.9	4.6	5.6	7.1
California	.7	.6	.7	3.4	4.0	5.7

a/ Data for these years are not available.

b/ General statistics for some producing states have to be withheld to avoid disclosing figures for individual companies. The employment size range is indicated by any of the following symbols:

aa - Less than 250 employees ee - 1,000 - 2,499 employees
bb - 250 - 499 employees ff - 2,500 employees and over
cc - 500 - 999 employees

Source: Census of Manufactures, Volume II, Industry Statistics, U. S. Department of Commerce, 1958, 1963, 1967.

Over the entire ten year period the number of employees in the processing milk industry remained relatively stable, showing a decline of only 200 persons over the ten years from 1958 to 1967. Initially, there was a decline of 1100 persons from 1958 to 1963, but the last five year period exhibited an increase of 900 persons employed. The payroll increased from $61.4 million to $67.0 million in 1963. The second five years, 1963 to 1967, payroll substantially increased from $67 million to $83.4 million.

The value added by manufacture increased for the United States from $202.7 million in 1958 to $373.1 million in 1967, Table 13. The rate of increase in value of manufacture was substantially larger for the 1963 to 1967 period than it was for the previous five years. A similar pattern is exhibited for total value of output. This increased from $820.6 million in 1958 to $1,260 million in 1967. The rate of increase was again greater in the second five years than it was in the first five years.

In terms of value of output per establishment processing milk, the average establishment for the United States increased from $2.62 million of output per establishment in 1958 to $4.34 million in 1967, Table 14. For the five years from 1958 to 1963, compared to the five years from 1963 to 1967, the rate of increase of value in output per establishment was greater in the latter period. The only division counter to this trend of larger establishments was the East South Central Division. This division increased from $4.1 million to $4.9 million during the 1958 to 1963 period, then declined to about $4 million in 1967.

Table 13. Value added by manufacture and value of output for establishments processing milk, selected years

Geographic Area and State	Value Added by Manufacture			Value of Output		
	1958	1963	1967	1958	1963	1967
	million dollars			million dollars		
United States	202.7	236.2	373.1	820.6	937.9	1263.0
Middle Atlantic Division	—a/	—	—	—	—	—
New York	10.3	—	19.6	43.3	—	75.3
East North Central Division	98.7	118.7	184.8	376.5	389.9	515.6
Ohio	—	18.5	19.7	—	63.4	59.4
Indiana	4.7	2.5	—	21.9	13.4	—
Illinois	—	20.8	—	—	65.4	—
Michigan	—	26.7	28.6	—	75.6	76.6
Wisconsin	40.5	50.1	74.2	166.5	172.1	240.8
West North Central Division	24.7	38.3	85.8	131.9	231.3	335.7
Minnesota	13.1	18.8	14.8	80.7	119.8	133.6
Iowa	1.7	—	—	15.5	—	—
Missouri	7.4	9.9	13.8	24.3	51.6	76.0
South Atlantic Division	14.5	11.2	9.6	53.0	52.5	53.2
Virginia	4.9	—	—	16.7	—	—
East South Central Division	25.5	25.8	28.0	86.0	83.4	87.8
Tennessee	9.5	9.3	11.1	34.5	33.5	35.9
West South Central Division	4.0	3.8	7.3	16.9	14.8	26.4
Mountain Division	5.4	5.8	7.7	22.1	17.7	24.3
Pacific Division	12.7	15.6	16.8	57.7	72.9	88.0
California	8.7	10.0	12.5	42.4	53.3	67.1

a/ Data for these years are not available.

Source: Census of Manufactures, Volume II, Industry Statistics, U. S. Department of Commerce, 1958, 1963, 1967.

Table 14. Value of output per establishment for establishments
processing milk, selected years

Geographic Area and State	Value of Output per Establishment[b]		
	1958	1963	1967
	million dollars		
United States	2.62	3.34	4.34
Middle Atlantic Division	—a/	—	—
New York	1.40	—	2.69
East North Central Division	3.09	3.61	5.10
Ohio	—	5.28	4.57
Indiana	2.43	1.68	—
Illinois	—	2.73	—
Michigan	—	3.98	4.79
Wisconsin	3.20	3.82	5.47
West North Central Division	2.40	4.06	6.10
Minnesota	2.30	3.52	5.14
Iowa	1.94	—	—
Missouri	3.04	6.45	8.44
South Atlantic Division	2.65	3.28	2.96
Virginia	4.18	—	—
East South Central Division	4.10	4.90	3.99
Tennessee	4.31	4.78	3.59
West South Central Division	1.69	1.48	3.77
Mountain Division	2.01	2.21	2.70
Pacific Division	2.31	2.80	3.14
California	2.83	3.55	3.53

a/ Data for these years are not available.

b/ This value is computed by dividing the value of output (in millions)
by the total number of establishments in the United States.

Source: Tables 16 and 18.

The trend toward fewer but larger establishments was most pronounced in the West Central Division, consisting of, among other states, Minnesota, Iowa and Missouri. In this division the value of output per establishment increased dramatically from $2.4 million in 1958 to $4.1 million in 1963, then increased again to $6.1 million in 1967. Thus, the average value of output per establishment more than doubled in the West Central Division over this ten year span. All other divisions except the East South Central Division, as noted above, increased in average size of establishment. However, this was not as dramatic as in the West Central Division.

Temporal Index

The temporal index is used to identify changes that occur over time in a particular geographic area. As before, two temporal indices were computed, one on the basis of number of establishments, the other on the basis of value of output. The temporal index for number of establishments processing milk, using 1958 as a base, increased slightly from 1963 to 1967, Table 15. After an initial decline of large establishments (with twenty or more employees), the number in 1967 was only 84 percent of the 1958 base. The rate of decline during the first five year period was 18 percent.

The region suffering the largest decline in the number of establishments with twenty or more employees was the North Central Region with a 25 percent decline from 1958 to 1967. The second largest decline in region number of establishments occurred in the South. The initial decline from 1958 to 1967 was 13 percent, but no further decline occurred from 1963 to 1967. Two regions, the East and West, actually increased in number of

Table 15. Temporal index of number of establishments, by region, establishments processing milk, selected years

Geographic Area by Regions and Divisions	Temporal Index for Establishments With 20 or more employees b/	
	1963	1967
	percent	
United States	82	84
Northeast Region	73	108
Middle Atlantic Division	a/	—
North Central Region	82	75
East North Central Division	82	73
West North Central Division	80	78
South Region	87	87
South Atlantic Division	73	82
East South Central Division	92	108
West South Central Division	100	57
West Region	90	105
Mountain Division	67	67
Pacific Division	100	121

a/ Data for these years are not available.

b/ This value is computed using 1958 as the base.

Source: Table 11.

establishments. The East gained 8 percent over its 1958 base, while the West gained 5 percent. A significant change occurred in the number of establishments processing milk in the Northeast Region during the ten year period. This region initially declined to only 73 percent of its 1958 base but then increased to 108 percent of its 1967 base. Thus, the Northeast Region experienced the greatest percentage gain in number of establishments processing milk from 1963 to 1967.

The divisions which increased over their 1958 base were the Pacific Division and the East South Central Division. The Pacific Division increased by 21 percent from 1958 to 1967, while the East South Central Division increased by 8 percent over the same time span. Within the West Region, a significant difference existed in the number of establishments processing milk by divisions. The Mountain Division declined from the 1958 to 1963 period by 33 percent but remained stable from 1963 to 1967. This was contrary to the change of the Pacific Division noted above.

In general the number of larger size establishments (with 20 or more employees) has increased in the Northeast and West Regions but declined in the North Central and South Regions. The West South Central Division declined by the greatest amount, losing nearly half of the 1958 number of establishments. With the exception of the two previously mentioned divisions, all other divisions declined in number of establishments of large size by anywhere from 13 to 43 percent.

Turning to the temporal index for value of output for establishments processing milk, a somewhat different picture emerges, Table 16. The aggregate index for value of output increased from the 1958 base by 14 percent in 1963, with a further increase to 54 percent of the 1958 base in 1967, Figure 4. This represents a substantial increase in value of output for establishments processing milk for the entire United States.

The greatest increase in the temporal index for value of output among regions occurred in the Northeast and North Central Regions. The Northeast Region exhibited an increase of 73 percent in value of output over its 1958 base, while the North Central Region increased by 67 percent over this time span. The West Region also increased from its 1958 base by 41 percent, while the South Region increased to 107 percent of its 1958 base, Figure 4. Thus, each region shows an increase in value of output over time, even though the number of establishments actually declined in two of the four regions. There are two possible reasons for this occurrence. One is that the value of output is increasing primarily due to a greater price associated with the same or smaller output. A second is that the establishments processing milk are actually increasing in size. Thus, even though establishment numbers are declining, the average size of each establishment is increasing.

On the basis of value of output, the West Central Division has shown the most dramatic increase in importance over time. This division increased by 154 percent in terms of value of output from 1958 to 1963. This increase was nearly evenly divided over the ten year period, showing a 75 percent increase from 1958 to 1963, with an additional 79 percent increase from 1963
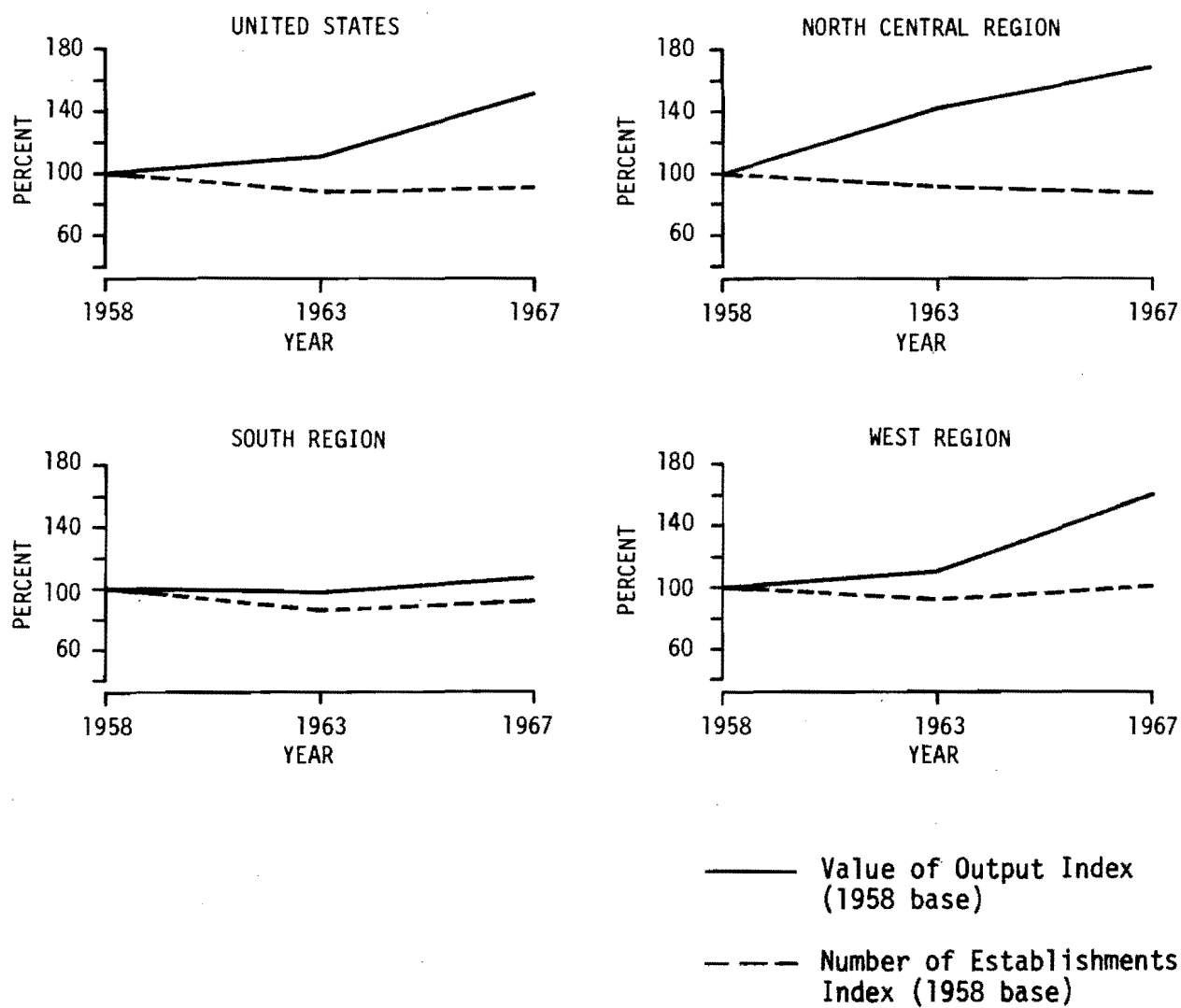
Figure 4. Change in value of output and number of establishments processing milk, by region, 1958-1967.

Table 16.   Temporal index for value of output by region, establishments
            processing milk, selected years

Geographic Area by Regions and Divisions	Temporal Index for Value of Output b/	
	1963	1967
	percent	
United States	114	154
Northeast Region	98	173
Middle Atlantic Division	—a/	—
North Central Region	122	167
East North Central Division	104	137
West North Central Division	175	254
South Region	97	107
South Atlantic Division	99	100
East South Central Division	97	102
West South Central Division	88	156
West Region	113	141
Mountain Division	80	110
Pacific Division	126	152

a/ Data for these years are not available.

b/ This value is computed using 1958 as the base.

Source: Table 13.

to 1967. There is no doubt that the average size of establishments in the West Central Division increased dramatically over the ten year period.

In general, the Northeast and North Central Regions show the largest increases in total value of output. The West Region also shows a 41 percent increase from 1958 to 1967 in value of output. Within this region, the Pacific Division increased in importance more than the Mountain Division. Significantly, all divisions increased or at least were stable in terms of output from 1958 to 1967. Some divisions did show a slight decline from the 1958 to 1963 period in value of output; however, all divisions were at least on par with their 1958 value of output in 1967.

Relative Importance of Regions

An indication of the relative importance of regions can be obtained by comparison of this index based on establishments and on value of output. These indices show the division or region share of the United States total.

In terms of the establishments index, the North Central Region had well over half of all establishments in 1958, and was by far the most important of the four regions, Table 17. The other three regions, Northeast, South and West, had a 1958 total share of establishments smaller than the North Central Region by itself. Within the North Central Region, the East North Central Division had the majority of establishments. The East North Central Division in 1958 had nearly 43 percent of the total establishments processing milk in the United States. The dominance of the North Central Region faded some during the 1958 to 1967 period, however. Gains

Table 17.   Relative importance of regions, by number of establishments
            processing milk, selected years

Geographic Area by Regions and Divisions	Index of Establishments b/		
	1958	1963	1967
	percent		
United States	100.0	100.0	100.0
Northeast Region	12.9	11.4	16.6
Middle Atlantic Division	8.4	— a/	15.4
North Central Region	62.4	62.0	55.6
East North Central Division	42.6	42.8	37.3
West North Central Division	19.8	19.3	18.3
South Region	14.8	15.7	15.4
South Atlantic Division	5.4	4.8	5.3
East South Central Division	5.9	6.6	7.7
West South Central Division	3.5	4.2	2.4
West Region	9.9	10.8	12.4
Mountain Division	3.0	2.4	2.4
Pacific Division	6.9	8.4	10.0

a/ Data for this year is not available.

b/ This value is computed by dividing the number of establishments with
twenty or more employees by the United States total of establishments with
twenty or more employees.

Source: Table 11.

in relative importance in regions were recorded for each of the other three, the Northeast, South and West. However, change has been slow in the South and West Regions, while there was a substantially faster increase in the importance of the Northeast Region.

Even though data were not available for the Middle Atlantic Division for the 1963 census year, from the 1963 and 1967 data, it is clear that the division dominates the entire Northeast Region. In the 1967 census year, the Northeast Region accounted for 16.6 percent of the number of establishments in the United States processing milk, while the Middle Atlantic Division within this region accounted for 15.4 percent of all establishments. Thus, nearly 93 percent of all establishments in the Northeast Region were in the Middle Atlantic Division.

Two of the four divisions within the South Region increased in United States share of establishments over the 1958 to 1967 period. These were the South Atlantic and East South Central Divisions. The West South Central Division declined from 3.5 percent of all establishments to 2.4 percent in 1967. Within the West Region, the Pacific Division gained a substantial share of establishments while the Mountain Division declined slightly from 3 percent of the total to 2.4 percent over the 1958 to 1967 period. Both divisions within the North Central Region declined in total share of establishments. However, they remained equal in terms of their importance to the region.

Turning to the relative importance of regions on a value of output basis reveals a substantially different picture than that obtained from the establishments basis, Table 18. The share of United States output attributable

Table 18. Relative importance of regions, by value of output of establishments processing milk, selected years

Geographic Area by Regions and Divisions	Index of Value of Output[a/]		
	1958	1963	1967
	percent		
United States	100.0	100.0	100.0
Northeast Region	9.3	8.0	10.5
Middle Atlantic Division	—a/	—	—
North Central Region	62.0	66.2	67.4
East North Central Division	45.9	41.6	40.8
West North Central Division	16.1	24.7	26.6
South Region	19.0	16.1	13.2
South Atlantic Division	6.4	5.6	4.2
East South Central Division	10.5	8.9	7.0
West South Central Division	2.0	1.6	2.8
West Region	9.7	9.7	8.9
Mountain Division	2.7	1.9	1.9
Pacific Division	7.0	7.8	7.0

a/ Data for these years are not available.

b/ This value is computed by dividing the total amount of value of output (million dollars) in the United States by the value of output in each particular area.

Source: Table 13.

to each region declined in two, but increased in the remaining two. The two regions that increased were the Northeast and North Central Regions. However, growth was unequal in these two regions. The North Central Region gained the most, increasing by 5.4 percent to 67.4 percent in 1967. This occurred while the Northeast Region increased over this same period by only 1.2 percent in share of value of output.

The other two regions, the South and West, declined in terms of share of value of output. The South Region declined substantially by 5.8 percent to a low of only 13.2 percent in 1967. The West Region declined only slightly by 0.8 percent from 1958 to 1967. Thus, based upon share of output, the North Central Region increased in terms of importance while the Northeast and West Regions remained relatively stable, and the South Region declined.

In terms of relative change for divisions in share of output, a dramatic change occurred between the two divisions of the North Central Region. The East North Central Division declined from 46 percent of the share of output in 1958 to nearly 41 percent in 1967. This occurred while the West Central Division increased dramatically its share from 16.1 percent in 1958 to 26.6 percent in 1967. Most of this 10.5 percent increase in value of output for the West Central Division occurred during the first five year period.

Each division within the South Region changed relatively little over the 1958 to 1967 period. The South Atlantic Division declined by 2.2 percent in terms of output, while the East South Central Division declined 3.5 percent, and the West South Central Division increased by 0.8 percent. However, since the share for the region declined, the relative importance of divisions within the South Region remained relatively constant from 1958 to 1967.

Within the West Region, the Mountain Division declined by 0.8 percent from 1958 to 1967. The Pacific Division increased slightly from 1958 to 1963, but then declined slightly to its original 7.0 percent by 1967. The relative importance of the divisions within the West Region has shifted marginally in favor of the Mountain Division over the ten year time span.

In summary, the processing milk industry has undergone a change similar to that of many other industries during this time period. That change is simply a trend toward fewer but larger firms. There is a perceptible change in geographic concentration for the three census years reported. The West Central Division of the North Central Region has clearly increased in importance, and become more geographically concentrated relative to other divisions. The East North Central Division, although still the most dominant division within the United States, has declined in importance over the 1958 to 1967 period.

Entropies in the Processing Milk Industry

Spatial concentration propensities in the milk processing industry, as was done for the poultry and egg processing industry, are further analyzed by the use of relative entropies. Entropies for processing milk are computed in terms of number of establishment shares by regions and value of output shares by regions.

Data on number of establishments and value of output for milk processing are reported by Census of Manufactures [2]. Shares by divisions and regions of the United States total were computed for each of the last three

available census years, Table 19. Total and between-region relative entropies are computed from these shares regarding regions as four sets $(m = 1, \ldots 4)$, Table 20. Divisions within regions provide the base for relative within-region entropies, Table 20. Most important for analysis are the estimates of $R(\Theta)$, $R_0(\Theta)$, and $R_m(\Theta)$.

Establishment Shares

Examining the intertemporal change in $R(\Theta)$ shows geographic concentration in terms of establishments shares actually declined from 1958 to 1967 but the rate of change was slow, Table 20. Less than a 2 percent increase in $R(\Theta)$ over a ten year period substantiates how slow this change toward dispersion has been. Also the magnitude of $R(\Theta)$ suggests that the industry was about 84 - 86 percent of maximum possible dispersion during this period.

Intertemporal change in the relative within-region entropy, $R_m(\Theta)$, shows some propensity toward within-region concentration over the ten year period occurred in the West Region, followed by the South, Table 20. During this same period the North Central Region actually became more disperse among divisions in terms of establishments. The estimates of $R_m(\Theta)$ also suggest that for the most recent year, the North Central and South Regions are near maximum dispersion within the region while the West Region is 80 percent of maximum.

Output Shares

Propensity toward geographic concentration for output shares was very slight, Table 20. The change in relative total entropy, $R(\Theta)$, was less than

Table 19. Share of number of establishments and value of output for milk processing by divisions and regions, selected years.

Geographic Area by Regions and Divisions	Shares[a]					
	1958		1963		1967	
	Establishment Shares	Output Shares	Establishment Shares	Output Shares	Establishment Shares	Output Shares
	percent					
United States	100.0	100.0	100.0	100.0	100.0	100.0
Northeast Region	15.7	9.3	13.9	8.0	17.5	10.5
Middle Atlantic Division	9.9	[b]	—	—	15.8	—
North Central Regions	56.5	62.0	58.7	66.2	53.6	67.4
East North Central Division	39.0	45.9	38.4	41.6	34.7	40.8
West North Central Division	17.6	16.1	20.3	24.7	18.9	26.6
South Region	16.3	19.0	15.3	16.1	16.2	13.2
South Atlantic Division	6.4	6.4	5.7	5.6	6.2	4.2
East South Central Division	6.7	10.5	6.0	8.9	7.6	7.0
West South Central Division	3.2	2.0	3.6	1.6	2.4	2.8
West Region	11.5	9.7	12.1	9.7	12.7	8.9
Mountain Division	3.5	2.7	2.8	1.9	3.1	1.9
Pacific Division	8.0	7.0	9.3	7.8	9.6	7.0

[a] Includes all establishments regardless of size.

[b] No data available.

Source: Computed from Census of Manufactures [2].

Table 20. Entropy measures for number of establishments and value of output shares by census years, milk processing

Entropy Measure or Geographic Region a/	Census year					
	1958		1963		1967	
	Establishment Shares	Output Shares	Establishment Shares	Output Shares	Establishment Shares	Output Shares
Relative total geographic dispersion, $R(\Theta)$	84.2	79.2	93.6	78.4	85.5	78.7
Relative between-region geographic dispersion, $R_o(\Theta)$	83.5	76.3	81.5	71.8	86.3	71.1
North Central, $R_m(\Theta)$ b/	89.3	92.6	93.0	95.2	93.6	96.8
South, $R_m(\Theta)$	95.8	84.8	97.9	94.1	91.5	93.7
West, $R_m(\Theta)$	88.7	85.3	78.0	71.4	90.2	74.8

a/Since only one division within the Northeast Region was reported, no within-region entropies exist for the Northeast Region.

b/$R_m(\Theta)$ is the relative within-region geographic dispersion.

Source: Computed from Table 19.

one percent from 1958 to 1967 based on output shares. This compares to a 2 percent change in R(Θ) toward more dispersion over the same period based on establishments shares. Neither change is likely significant.

For the ten year period, output shares between-region entropy, $R_0(\Theta)$, declined slightly under 7 percent compared to an increase of 3.4 percent for the comparable statistic based on establishments shares. This indicated geographic concentration in terms of size of establishment occurred while actual number of establishments were slightly more geographically disperse. The rate of change in output concentration between regions did slow substantially from 1963 to 1967 compared to the previous five years. This is contrary to the rate of change in $R_0(\Theta)$ based on establishments shares which increased from 1963 to 1967.

The within-region relative entropies, $R_m(\Theta)$, show slight changes over the three census years, Table 20. The greatest within-region concentration increase was the West followed by the South. The North Central Region, as with $R_m(\Theta)$ based on establishments, was more spatially disperse among divisions in 1967 than in 1958.

Output shares concentration is greater within-region only in the West (compared to establishments shares). In the North Central and South Regions the within-region entropies are similar for either share type.

Conclusions

Entropies for the milk processing industry document that almost no change has occurred in spatial concentration between regions.

PROCESSING REDRIED TOBACCO

There are seven principal states involved in the redried tobacco industry. These are Pennsylvania, Virginia, North Carolina, South Carolina, Florida, Kentucky, and Tennessee. These seven states comprise only three divisions and three regions. The regions involved are the Northeast Region, containing the Middle Atlantic Divisions. The South Region is composed of the South Atlantic Division and the East South Central Division. Compared to either the poultry processing industry or the milk processing industry, redried tobacco is geographically concentrated.

There were only 119 establishments processing redried tobacco in 1967 in the entire United States, Table 21. This was down by 25 establishments from the 1958 census year, or a decline of 17.4 percent. Most of this decline occurred from 1963 to 1967. For large establishments (with 20 employees or more) a similar decline was experienced. The large establishments amounted to 80.7 percent of total establishments in 1958. These large establishments declined by 23 percent over the 1958 to 1967 period. Thus, establishments with 20 or more employees actually declined at a slightly faster rate than did total establishments. Consequently, in the aggregate, no long term trend toward increasing establishment size is evident.

Even though there was a decline in total number of establishments processing tobacco, total employees in the industry increased by 1,000 from 1958 to 1967, Table 22. During the first five years the number of employees increased by 2,000, but then declined in the second five years by 1,000, for a total employment of 15,900 persons in this industry.

Table   21.   Number of establishments processing redried tobacco, selected years

Geographic Area and State	Total			With 20 employees or more		
	1958	1963	1967	1958	1963	1967
	number			number		
United States	144	136	119	122	110	96
Middle Atlantic Division	13	15	21	10	10	14
Pennsylvania	13	—a/	18	10	—	13
South Atlantic Division	81	81	60	79	72	56
Virginia	17	22	17	17	19	15
North Carolina	52	—	37	50	—	35
South Carolina	—	—	2	—	—	2
Florida	5	4	3	5	4	3
East South Central Division	39	32	30	27	23	23
Kentucky	—	24	24	—	19	19
Tennessee	—	8	6	—	4	4
All Other Divisions	11	8	—	6	5	—

a/ Data for these years are not available.

Source: Census of Manufactures, Volume II, Industry Statistics, U. S. Department of Commerce, 1958, 1963, 1967.

Table 22. Number of employees and total payroll for establishments processing redried tobacco, selected years

Geographic Area and State	Employees			Payroll		
	1958	1963	1967	1958	1963	1967
	number (1,000)			million dollars		
United States	14.9	16.9	15.9	46.7	61.1	66.2
Middle Atlantic Division	0.7	0.7	ccb/	2.2	2.4	—a/
Pennsylvania	0.7	—	cc	2.2	—	—
South Atlantic Division	11.8	13.9	12.2	35.4	46.8	47.6
Virginia	3.0	3.5	2.6	8.4	11.3	12.0
North Carolina	7.8	—	ff	24.7	—	—
South Carolina	—	—	bb	—	—	—
Florida	0.7	0.5	cc	1.3	0.9	—
East South Central Division	2.1	2.2	ff	8.2	10.9	—
Kentucky	—	2.0	ee	—	10.0	—
Tennessee	—	0.2	cc	—	0.9	—
All Other Divisions	0.3	0.2	—	0.9	0.9	—

a/ Data for these years are not available.

b/ General statistics for some producing states have to be withheld to avoid disclosing figures for individual companies. The employment size range is indicated by any of the following symbols:

aa - Less than 250 employees   ee - 1,000 - 2,499 employees
bb - 250 - 499 employees   ff - 2,500 employees and over
cc - 500 - 999 employees

Source: Census of Manufactures, Volume II, Industry Statistics, U. S. Department of Commerce, 1958, 1963, 1967.

The payroll for the industry increased dramatically from 46.7 million in 1958 to 66.2 million in 1967, a 41.8 percent jump.

Value added by manufacture for redried tobacco increased from 85.6 million dollars in 1958 to 133.1 million dollars in 1967, Table 23. This is an increase of 47.5 million dollars in value added by manufacture or an increase of 55.5 percent. The rate of increase from 1963 to 1967 was slightly higher than for the previous five year period.

Total output for the industry was nearly 1.2 billion dollars in 1958, and 1.4 billion in 1967. By far the greatest increase in value of output occurred during the first five years. Slightly over 16 percent increase in value of output was experienced from 1958 to 1963, compared to less than one percent from 1963 to 1967. Thus, the rate of change slowed dramatically.

Turning to size of establishments, the value of output per establishment increased 41.2 percent from 1958 to 1967, Table 24. The industry experienced an increase of 22.4 percent in the first five year period compared to an increase of 15.0 percent in the second five year period. Even though establishments are larger on the basis of output per establishment in 1967 compared to 1958, the measure of firm size on the basis of number of employees does not substantiate a trend toward larger establishments of the three primary divisions involved in redried tobacco. The South Atlantic Division has the largest establishments in terms of value of output per establishment. Furthermore, establishments in the South Atlantic Division changed rapidly. In 1967 this division had an average value of output per establishment of 16.5 million dollars. This represented an increase of 31.5 percent over the value of output per establishment in 1963, or about twice the national increase in

Table 23. Value added by manufacture and value of output for establishments processing redried tobacco, selected years

Geographic Area and State	Value Added by Manufacture			Value of Output		
	1958	1963	1967	1958	1963	1967
	million dollars			million dollars		
United States	85.6	103.3	133.1	1176.7	1366.6	1373.1
Middle Atlantic Division	5.9	4.5	—a/	23.5	24.8	—
Pennsylvania	5.9	—	—	23.5	—	—
South Atlantic Division	64.2	72.9	96.3	854.8	1015.4	988.7
Virginia	14.3	17.7	21.4	201.9	277.3	271.7
North Carolina	45.9	—	—	625.3	—	—
South Carolina	—	—	—	—	—	—
Florida	2.0	1.0	—	6.7	4.3	—
East South Central Division	12.0	21.5	—	290.3	317.5	—
Kentucky	—	20.4	—	—	308.2	—
Tennessee	—	1.1	—	—	9.3	—
All Other Divisions	3.4	4.3	—	8.1	8.9	—

a/ Data for these years are not available.

Source: Census of Manufactures, Volume II, Industry Statistics, U. S. Department of Commerce, 1958, 1963, 1967.

Table 24. Value of output per establishment for establishments processing redried tobacco, selected years

Geographic Area and State	Value of Output per Establishment[b/]		
	1958	1963	1967
	million dollars		
United States	8.17	10.00	11.54
Middle Atlantic Division	1.81	1.65	—[a/]
Pennsylvania	1.81	—	—
South Atlantic Division	10.55	12.53	16.48
Virginia	11.88	12.60	15.98
North Carolina	12.02	—	—
South Carolina	—	—	—
Florida	1.34	1.08	—
East South Central Division	7.44	9.92	—
Kentucky	—	12.84	—
Tennessee	—	1.16	—
All Other Divisions	.74	1.11	—

a/ Data for these years are not available.

b/ This value is computed by dividing the value of output (in millions) by the total number of establishments in the United States.

Source: Tables 21 and 23.

in value of output for such firms. This indicates a tendency towards substantial concentration (in terms of size) in the South Atlantic Division. This division is composed of Virginia, South Carolina, and Florida.

Temporal Index

As before, a temporal index on the basis of both establishments and output was computed, Table 25. The establishment temporal index reveals there were only 90 percent of total establishments with 20 or more employees in 1963 compared to 1958. A further decline to 79 percent of the 1958 base was experienced in 1967. This national trend masks some substantial differences by geographic area, however.

The Middle Atlantic Division of the Northeast Region increased their number of establishments by 40 percent from the 1963 to 1967 period, and remained stable from 1958 to 1963. The South Atlantic Division declined in total establishments to only 91 percent of its 1958 establishments in 1963, and experienced a further decline to 71 percent of its 1958 establishments in 1967. The decline was less evident in the East South Central Division with this division declining in 1963 to 85 percent of its 1958 base and remaining stable thereafter. The output temporal index reveals that the change from 1958 to 1963 was 16 percent with no change from 1963 to 1967. Data were not available for complete comparisons of the output temporal index by regions or divisions.

Table 25. Temporal index of number of establishments, by region, establishments processing redried tobacco, selected years

Geographic Area by Regions and Divisions	Temporal Index for Establishments With 20 or more employees	
	1963	1967
	percent	
United States	90	79
Northeast Region	-a/	—
Middle Atlantic Division	100	140
South Region	—	—
South Atlantic Division	91	71
East South Central Division	85	85
All Other Divisions	83	—

a/ Data for these years are not available.

b/ This value is computed using 1958 as the base.

Source: Table 21.

Table 26.   Temporal index for value of output, by region, establishments
            processing redried tobacco, selected years

Geographic Area by Regions and Divisions	Temporal Index for Value of Output b/	
	1963	1967
	percent	
United States	116	116
Northeast Region	—a/	—
Middle Atlantic Division	105	—
South Region	—	—
South Atlantic Division	119	116
East South Central Division	109	—
All Other Divisions	110	—

a/ Data for these years are not available.

b/ This value is computed by using 1958 as the base.

Source: Table 23.

Relative Importance of Regions

As indicated previously, the South Atlantic is the most important division of the three divisions involved with processing redried tobacco, Table 27. This division accounted for about half the total number of establishments in the United States for any of the three census years. However, this division has declined in relative importance from 64.8 percent of total establishments in 1958 to 58.3 percent in 1967. The South Region accounted for 82.3 percent in 1967. The other division of the South Region is the East South Central Division which accounted for about another 24 percent of total establishments in 1967. This represents a slight increase from 22.1 percent of all establishments in 1967. Thus, the South Region accounts for over 80 percent of all establishments processing redried tobacco. The Northeast Region accounted for another 16.7 percent of all establishments in 1967. Also, all other divisions accounted for only about one percent of total establishments processing redried tobacco.

Because of incomplete census data over the three census years constituting this analysis, temporal analysis of value of output or establishments by regions cannot be performed. However, the data which are available are reported in Table 28.

In summary, for the redried tobacco industry, substantial geographical concentration of processing establishments is evident. The most important states are Virginia, North Carolina, South Carolina and Florida which constitute the South Atlantic Division. The South Region, consisting of the South Atlantic Division and East South Central Division, has become more

Table 27. Relative importance of regions, by number of establishments processing redried tobacco, selected years

Geographic Area by Regions and Divisions	Index of Establishments[b]		
	1958	1963	1967
	percent		.
United States	100.0	100.0	100.0
Northeast Region	—[a]	—	16.7
Middle Atlantic Division	8.2	9.1	14.6
South Region	—	—	82.3
South Atlantic Division	64.8	65.4	58.3
East South Central Division	22.1	20.9	23.9
All Other Divisions	4.9	4.5	—

[a] Data for these years are not available.

[b] This value is computed by dividing the number of establishments with twenty or more employees by the United States total of establishments with twenty or more employees.

Source: Table 21.

Table 28. Relative importance of regions, by value of output of establishments processing redried tobacco, selected years

Geographic Area by Regions and Divisions	Index of Value of Output [b/]		
	1958	1963	1967
	percent		
United States	100.0	100.0	100.0
Northeast Region	—[a/]	—	—
Middle Atlantic Division	2.0	1.8	—
South Region	—	—	—
South Atlantic Division	—	—	97.0
East South Central Division	24.7	23.2	—
All Other Divisions	.7	.6	—

a/ Data for these years are not available.

b/ This value is computed by dividing the total amount of value of output (million dollars) in the United States by the value of output in each particular area.

Source: Table 23.

important over time than any of the other divisions. Contrary to most other processing industries, the redried tobacco industry does not show a trend toward larger establishments as measured by number of employees per establishment.

FISHERY PRODUCTS

There are 16 principal states involved in processing fishery products. These states compose eight divisions and four regions. Substantial variation existed between the first five years and the second five years in terms of number of establishments processing fishery products, Table 29. The first five years witnessed an increase of 107 establishments while the second five years witnessed a decline of 50 establishments. Thus, over the entire period a net increase of 57 establishments occurred.

In terms of large establishments (those with 20 employees or more), the trend is similar to total establishments. For the first five years an increase of 32 establishments occurred while the second five years witnessed a decline of 14 establishments. As with the redried tobacco, no trend is evident toward larger establishments in the processing fishery products industry as measured by employees. Large establishments accounted for 50 percent of total establishments in 1958 and about 48.5 percent in 1967. Thus, a slight but nearly insignificant decline occurred in the proportion of total establishments which had 20 employees or more.

Both the total employees and payroll of the processing fishery industry have increased over the census period, Table 30. Employees increased by 3,900 from 1958 to 1967, while the payroll increased by 36.3 million dollars

Table 29. Number of establishments processing fishery products, selected years

Geographic Area and State	Total			With 20 employees or more		
	1958	1963	1967	1958	1963	1967
	numbers			numbers		
United States	440	547	497	223	255	241
New England Division	68 a/	77	65	39	37	35
Maine	--- a/	---	12	---	---	8
Massachusetts	52	56	46	32	28	23
Middle Atlantic Division	44	45	36	17	13	18
New York	20	25	17	5	5	7
New Jersey	16	12	14	7	4	7
Pennsylvania	8	8	5	5	4	4
East North Central Division	---	---	7	---	---	4
West North Central Division	---	---	6	---	---	2
South Atlantic Division	192	249	218	103	127	98
Maryland	55	69	52	34	39	28
Virginia	80	89	80	39	47	35
North Carolina	12	19	28	4	6	6
Georgia	8	14	12	7	10	9
Florida	29	48	36	17	21	17
East South Central Division	11	10	8	7	6	4
West South Central Division	42	52	49	24	25	24
Louisiana	20	26	27	9	10	10
Texas	22	26	22	15	15	14
Pacific Division	66	81	105	28	35	55
Washington	27	29	34	11	14	16
Oregon	12	18	16	7	9	10
California	27	34	29	10	12	12
Alaska	---	---	24	---	---	17

a/Data for these years are not available.

Source: Census of Manufactures, Volume II, Industry Statistics, U. S. Department of Commerce, 1958, 1963, 1967.

Table 30. Number of employees and total payroll for establishments processing fishery products, selected years

Geographic Area and State	Employees			Payroll		
	1958	1963	1967	1958	1963	1967
	number (1,000)			million dollars		
United States	17.5	20.0	21.4	40.9	56.5	77.2
New England Division	3.4 a/	3.3	3.3	10.9	13.4	16.1
Maine	--- a/	---	.7	---	---	2.9
Massachusetts	2.7	2.6	2.4	8.9	11.0	12.6
Middle Atlantic Division	1.3	1.0	1.5	3.5	3.8	7.3
New York	.3	.3	.4	.9	1.3	1.9
New Jersey	.5	.3	CC b/	1.0	.7	---
Pennsylvania	.4	.4	CC	1.6	1.7	---
East North Central Division	---	---	BB	---	---	---
West North Central Division	---	---	AA	---	---	---
South Atlantic Division	8.4	9.3	9.3	14.4	18.9	27.5
Maryland	1.8	1.9	1.7	2.8	3.3	4.2
Virginia	2.6	2.2	2.1	4.6	4.4	5.7
North Carolina	.2	.4	BB	.2	.7	---
Georgia	2.0	2.2	2.3	3.0	4.8	6.9
Florida	1.7	2.3	2.7	3.4	5.3	9.4
East South Central Division	.2	.3	AA	.3	.6	---
West South Central Division	2.0	2.8	FF	4.1	5.7	---
Louisiana	.5	.8	.6	1.0	1.5	1.6
Texas	1.6	2.0	FF	3.1	4.2	---
Pacific Division	1.8	---	FF	6.5	---	---
Washington	.9	1.1	CC	3.7	6.5	---
Oregon	.4	.6	.6	1.1	1.5	1.5
California	.5	1.0	1.0	1.6	3.2	4.0
Alaska	---	---	.8	---	---	4.5

a/ Data for these years are not available.

b/ General statistics for some producing states have to be withheld to avoid disclosing figures for individual companies. The employment size range is indicated by any of the following symbols.

AA - less than 250 employees   CC - 500-999 employees
BB - 250-499 employees   EE - 1,000-2,499 employees
FF - 2,500 employees and over

Source: Census of Manufactures, Volume II, Industry Statistics, U. S. Department of Commerce, 1958, 1963, 1967.

over this same time span. There was a decline in the rate of increase in the number of employees during the second five year period compared to the first. Total payroll, however, increased at an increasing rate over the entire period.

Value added by manufacture increased dramatically from 82.4 million dollars in 1958 to 164.9 million dollars in 1967, Table 31. Thus, value added doubled over the period. Total value of output for the industry increased 27 percent during the first five year period, and increased by about 43 percent in the second five year period.

Value of output per establishment increased dramatically from 1963 to 1967, compared to the earlier five year period, Table 32. Value of output per establishment was 700,000 dollars in 1958 compared to 720,000 dollars in 1963, and 1.1 million dollars in 1967. For the New England and Middle Atlantic Divisions both had average value of output per establishment substantially greater than the national average. However, a comprehensive analysis by divisions is impossible due to incomplete census data by divisions for this industry.

Temporal Index

As previously indicated, an initial increase in establishment numbers was realized from 1958 to 1963, but the 1963 to 1967 period actually witnessed a decline, Table 33. Large establishments (20 or more employees), increased by 14 percent in 1963 over the 1958 base, but only by 8 percent in 1967, Figure 5.

Table 31. Value added by manufacture and value of output for establishments processing fishery products, selected years

Geographic Area and State	Value added by Manufacture			Value of Output		
	1958	1963	1967	1958	1963	1967
	million dollars			million dollars		
United States	82.4	118.4	164.9	307.4	391.2	557.4
New England Division	22.0	27.3	38.1	81.0	91.0	115.2
Maine	----a/	----	3.9	----	----	9.3
Massachusetts	17.9	24.1	32.9	72.3	83.4	103.2
Middle Atlantic Division	8.3	13.4	17.4	23.4	34.6	49.3
New York	2.0	5.0	4.9	7.7	12.5	14.8
New Jersey	2.0	1.3	----	4.4	3.8	----
Pennsylvania	4.2	7.1	----	11.3	18.3	----
East North Central Division	----	----	----	----	----	----
West North Central Division	----	----	----	----	----	----
South Atlantic Division	27.2	38.5	43.4	94.3	114.7	163.3
Maryland	5.1	7.0	7.2	16.3	20.3	18.3
Virginia	8.4	7.7	10.3	23.8	22.4	27.6
North Carolina	.4	1.2	----	1.0	3.0	----
Georgia	6.5	11.7	9.9	22.2	34.5	43.3
Florida	6.2	10.0	13.6	29.1	32.0	68.2
East South Central Division	.9	1.4	----	2.5	5.0	----
West South Central Division	8.7	10.2	----	45.7	49.8	----
Louisiana	1.6	2.5	3.4	6.3	8.6	9.8
Texas	7.1	7.7	----	39.4	41.2	----
Pacific Division	13.0	----	----	49.2	----	----
Washington	7.6	11.3	----	33.6	40.2	----
Oregon	.9	2.3	2.6	5.2	5.9	7.9
California	4.4	7.2	9.0	10.4	22.6	27.4
Alaska	----	----	8.7	----	----	19.5

a/Data for these years are not available.

Source: Census of Manufactures, Volume II, Industry Statistics, U. S. Department of Commerce, 1958, 1963, 1967.

Table 32. Value of output per establishment for establishments processing fishery products, selected years

Geographic Area and State	Value of Output per Establishment[b]		
	1958	1963	1967
	million dollars		
United States	.70	.72	1.12
New England Division	1.19[a]	1.18	1.77
Maine	----[a]	----	.78
Massachusetts	1.39	1.49	2.24
Middle Atlantic Division	.55	.77	1.37
New York	.38	.50	.87
New Jersey	.28	.32	----
Pennsylvania	1.41	2.29	----
East North Central Division	----	----	----
West North Central Division	----	----	----
South Atlantic Division	.49	.46	.75
Maryland	.30	.29	.35
Virginia	.30	.25	.34
North Carolina	.08	.16	----
Georgia	2.78	2.46	3.61
Florida	1.00	.67	1.89
East South Central Division	.23	.50	----
West South Central Division	1.09	.96	----
Louisiana	.32	.33	.36
Texas	1.79	1.58	----
Pacific Division	.75	----	----
Washington	1.24	1.39	----
Oregon	.43	.33	.49
California	.38	.66	.94
Alaska	----	----	.81

[a] Data for these years are not available.

[b] This value is computed by dividing the value of output (in millions) by the total number of establishments in the United States.

Source: Tables 29 and 31.

Table 33. Temporal index of number of establishments, by region, establishments processing fishery products, selected years.

Geographic Area by Regions and Division	Temporal Index for Establishments With 20 or more employees b/	
	1963	1967
United States	114	108
Northeast Region	89	95
New England Division	95	90
Middle Atlantic Division	76	106
North Central Region	140	120
South Region	118	94
South Atlantic Division	123	95
East South Central Division	86	57
West South Central Division	104	100
West Region	___a/	---
Pacific Division	---	196

a/Data for these years are not available.

b/This value is computed using 1958 as the base.

Source: Table 29.
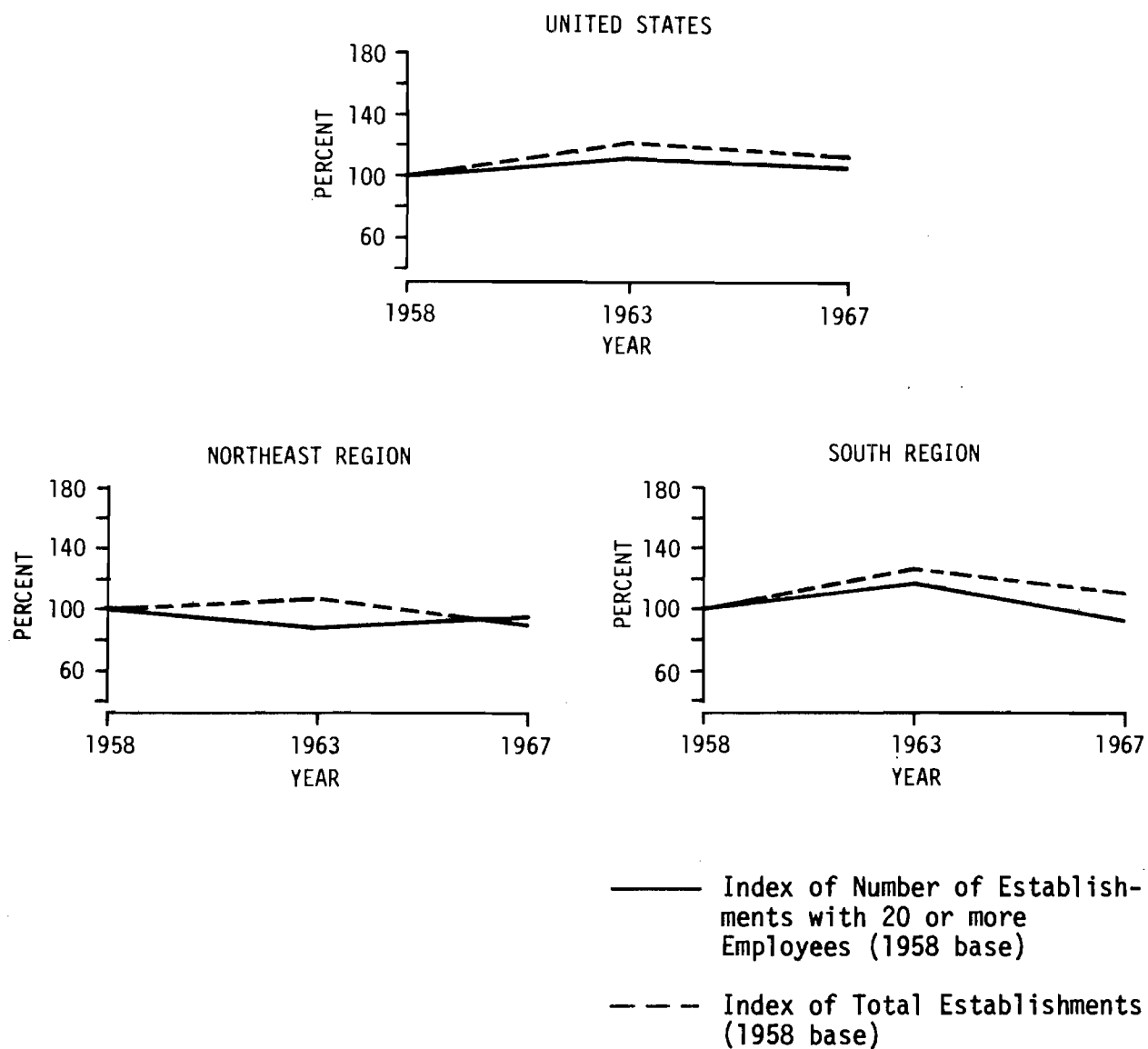
Figure 5. Change in establishments with 20 or more employees and total establishments processing fish, by region, 1958-1967.

The Northeast Region was contrary to the national trend, with only 89 percent of its 1958 base number of establishments processing fishery products in 1963. However, a slight increase was recorded to 95 percent in 1967. This was primarily due to a substantial increase between 1963 and 1967 in the Middle Atlantic Division number of establishments.

The North Central Region initially increased in number of establishments from 1958 to 1963, but subsequently only declined to a 20 percent increase in number of establishments from 1958 and 1967. A similar trend occurred in the South Region with an initial increase of 18 percent from 1958 to 1963. However, the 1967 number of establishments was only 94 percent of the 1958 number of establishments. Within the South Region, the South Atlantic Division and East Central Division both lost establishments over the ten year period. The West South Central Division remained stable over this period. The South Central Division lost nearly half of their 1958 establishments.

In summary, the North Central Region experienced the favorable change in number of establishments relative to other regions. The East and South Regions were comparable in terms of rate of change in number of establishments, both experiencing some decline. Only the Middle Atlantic Division actually experienced an increase in number of establishments from 1958 to 1967. The West South Central Division remained stable. All other divisions declined in terms of number of large establishments.

Value of output increased in the aggregate by 81 percent from 1958 to 1967, Table 34. The North Central Region was substantially greater in terms

Table 34. Temporal index for value of output, by region, establishments processing fishery products, selected years

Geographic Area by Regions and Division	Temporal Index for Value of Output b/	
	1963	1967
United States	127	181
Northeast Region	120	158
New England Division	112	142
Middle Atlantic Division	148	211
North Central Region	201	267
South Region	119	186
South Atlantic Division	122	173 a/
East South Central Division	200	--- a/
West South Central Division	109	---
West Region	---	---
Pacific Division	---	---

a/ Data for these years are not available.

b/ This value is computed using 1958 as the base.

Source: Table 31.

of rate of output over this same time period, Figure 6. This region increased by 167 percent over the 1958 to 1967 period. The South Region followed with an increase of 86 percent. The Northeast Region also increased but at a slower rate (58 percent from 1958 to 1967). Within the Northeast Region unequal division performance has occurred. The Middle Atlantic Division increased value of output by 111 percent while the New England Division increased by only 42 percent.

Relative Importance of Regions

The South Region accounted for slightly over 60 percent of all establishments in 1958 and 52 percent in 1967, Table 35. Thus, even though the South Region is the most predominant in terms of number of establishments processing fishery products, it has declined in relative importance. Gains have occurred mostly in the West Region, which accounted for 23.2 percent of all establishments in 1967 compared to only 15.7 percent in 1963.

Within the South Region the most important division is the South Atlantic, with about 41 percent of all establishments in 1967. This division accounted for nearly 78 percent of all establishments in the South Region. The smallest division in the South Region is the East South Central. Also, the West South Central is relatively small accounting for only 10.4 percent of 1967 total establishments. A general trend is that the East South Central Division has declined in importance while the West South Central Division has remained relatively stable over the three census years. The South Atlantic Division, while declining slightly in importance, is still the dominant division of the South Region.

UNITED STATES

NORTHEAST REGION

SOUTH REGION

——— Value of Output Index
(1958 base)

— — — Number of Establishments
Index (1958 base)
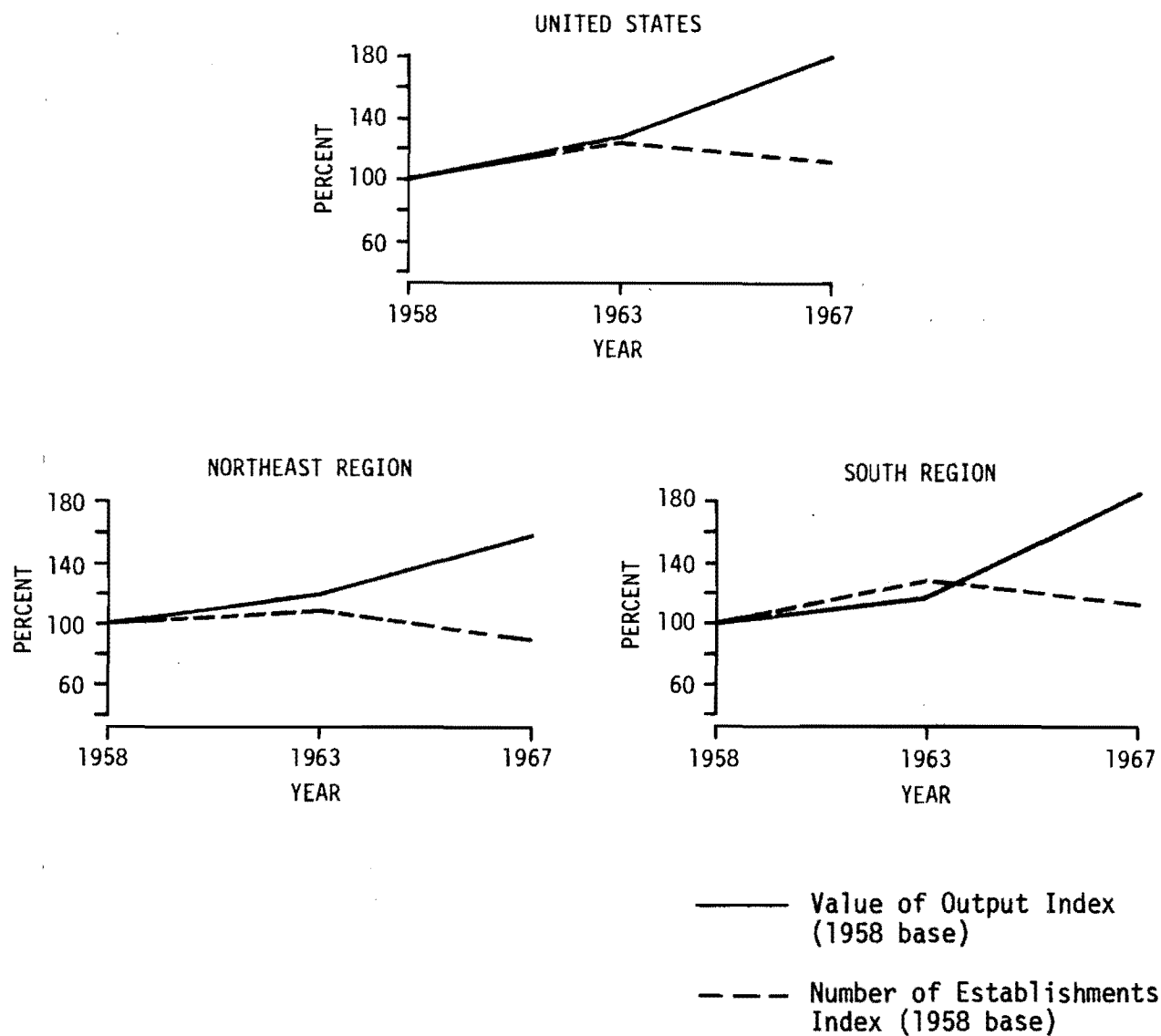
Figure 6. Change in value of output and number of establishments
processing fish, by region, 1958-1967.

Table 35. Relative importance of regions, by number of establishments processing fishery products, selected years

Geographic Area by Region and Division	Index of Establishments [b]		
	1958	1962	1967
	percent		
United States	100.0	100.0	100.0
Northeast Region	25.1	19.6	22.0
New England Division	17.5	14.5	14.5
Middle Atlantic Division	7.6	5.1	7.5
North Central Region	2.2	2.7	2.5
South Region	60.1	62.0	52.3
South Atlantic Division	46.2	49.8	40.7
East South Central Division	3.1	2.4	1.6
West South Central Division	10.8	9.8	10.4
West Region	---[a]	15.7	23.2
Pacific Division	12.6	---	22.8

[a] Data for these years are not available.

[b] This value is computed by dividing the number of firms with 20 or more employees by the U.S. total of firms with 20 or more employees.

Source: Table 29.

The Northeast Region and the West Region are both similar in terms of their importance as measured by number of establishments. The North Central Region is the least important, accounting for less than 3 percent of all establishments processing fishery products. Further, there is no tendency toward increased importance for this North Central Region. The most dramatic increase in relative importance in number of establishments, as previously mentioned, occurred in the West Region.

In terms of the relative importance of regions by value of output, a similar situation prevails as with establishments. The share of United States value of output for establishments processing fishery products attributable to the South Region is 47.5 percent, Table 36. The South Region, as with establishments, represents by far the most important region. The within-region importance of divisions for the South Region is also similar. The South Atlantic Region accounted for 29.3 percent of total value of output in 1967, or about 61.7 percent of the entire output for the South Region. The East South Central Division and West South Central Division are both relatively small and fairly stable over the 1958 to 1967 time span.

The Northeast Region has had a slight tendency toward a loss of output share, declining from 34 percent of the total to just under 30 percent of the total in 1967. Within this Northeast Region, the New England Division accounted for 26.4 percent of 1958 United States output value compared with 20.7 percent in 1967. Relatively speaking, the Middle Atlantic Division has gained in importance compared to the New England Division within the Northeast Region. In 1967, the New England Division accounted for 70.2

Table 36. Relative importance of regions by value of output of establishment processing fishery products, for selected years.

Geographic Area by Region and Division	Index of Value of Output[a/]		
	1958	1963	1967
	percent		
United States	100.0	100.0	100.0
Northeast Region	34.0	32.1	29.5
New England Division	26.4	23.3	20.7
Middle Atlantic Division	7.6	8.8	8.8
North Central Region	3.7	5.8	5.4
South Region	46.4	43.3	47.5
South Atlantic Division	30.7	29.3	29.3
East South Central Division	.8	1.3	--- a/
West South Central Division	14.9	12.7	---
West Region	---	18.8	17.5
Pacific Division	16.0	---	---

[a/]Data for these years are not available.

[b/]This value is computed by dividing the total amount of value of output (million dollars) in the United States by the value of output in each particular area.

Source: Table 31.

percent of the total value of output for the Northeast Region, compared to 77.6 percent of the output of this region in 1968. Thus, the Middle Atlantic Division has increased somewhat in importance both in terms of total United States output and in terms of its importance to the Northeast Region. The North Central Region is relatively more important on an output basis than it is on an establishment basis. The North Central Region accounted for 5.5 percent of 1967 output but less than 3 percent of 1967 establishments.

Just the reverse is true, however, of the West Region where establishment share is a higher percent than output share. In 1967 the West Region accounted for 17.5 percent of the value of output, which was a decline of 1.3 percent from 1963. This compares to 23.2 percent of establishments in 1967, a gain of 7.5 percent from 1963. Thus, the West Region has increased in relative importance measured on the basis of number of establishments and declined in importance measured on the basis of output. This suggests that establishments in the West Region have been gaining in number but tend to be smaller than the national average.

In summary, the South Region is the most important region of the four to the processing fishery products industry. This region accounts for over half of all the establishments and nearly half of all value of output. The concentration within this division is substantial, with the South Atlantic Division accounting for 29.3 percent of all value of output in the entire United States. The other two divisions are relatively small, although the West South Central Division is fairly important with somewhere around 10 to 15 percent of the total value of output, and about 10 percent of the number of establishments. The next most important region is the Northeast,

and within that the New England Division. The Northeast Region and South Region combined accounted for nearly three-fourths of all establishments. The West Region and North Central Region are of much less importance. No substantial trend toward spatial concentration is evident, either on the basis of number of establishments or value of output. Some shift appears to be occurring from the Northeast Region to the South Region. However, this shift is not dramatic.

SPATIAL ANALYSIS OF CATTLE FEEDING INDUSTRY

Some substantial changes have occurred in the cattle feeding-fed-beef economy over the last decade. Most of this section is based upon a report entitled "Interregional Competition in the Cattle Feeding Economy" by R. A. Dietrich [1]. This study analyzed the commercial cattle feeding industry for the United States.

Major differences exist among regions of the United States with respect to the location and concentration of cattle feedlot operations and the accompanying commercial cattle slaughter production. The majority of the United States fed cattle have been and are still produced in the North Central Region, Table 37. Although the numbers of cattle and calves on feed January 1 increased in the North Central Region from 1955 to 1970, the proportion of the cattle and calves on feed declined from 72 percent in 1955 to 52 percent in 1973. During recent years the rate of growth of cattle feeding has been lower in the North Central Region than it has for the United States. The Southern Plains area, consisting of Texas and Oklahoma,

Table 37. Cattle and calves on feed as a percent of United States totals, selected feeding areas, January 1, 1955-73

Areas	1955	1960	1965	1970	1973
			percent		
Southern Plains	3.5	4.2	6.0	12.4	17.4
Texas	2.3	3.3	4.9	10.7	15.5
Oklahoma	1.2	.9	1.1	1.7	1.9
North Central[1]/	72.4	64.5	63.4	59.0	52.4
Iowa	21.2	19.9	18.6	16.7	13.7
Nebraska	10.8	8.8	10.3	11.1	10.9
Illinois	10.5	9.1	7.9	5.7	4.0
Other North Central	29.9	26.7	26.6	25.5	23.8
Western Region[2]/	22.7	25.4	25.1	24.8	26.6
Arizona	2.9	3.5	3.5	3.8	4.5
Colorado	4.8	5.3	5.3	6.0	7.2
California	8.1	8.8	9.2	7.8	8.2
Other Western States	6.9	7.8	7.1	7.1	6.7
Other States	1.4	5.9	5.5	3.8	3.6
United States	100.0	100.0	100.0	100.0	100.0

[1]/Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska and Kansas.

[2]/Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Washington, Oregon, California and Nevada.

Source: "Cattle on Feed", U.S.D.A., Statistical Reporting Service, Crop Reporting Board, January 8, 1973.

has registered dramatic increases in the percent of cattle and calves on feed as a proportion of the United States total. The Southern Plains now accounts for 17.4 percent of the total, while it accounted for only 3.5 percent in 1955. The Western Region has increased somewhat, but not as dramatically as the Southern Plains. The increase experienced in the Western Region was from 22.7 percent in 1955 to 26.6 percent in 1973.

Feedlots with less than 1,000 head capacity represented about 98 percent of the total feedlots in the ten leading cattle feeding states in 1972, Table 38. These states annually account for about 80 percent of the fed cattle marketed in the United States. Number of feedlots with less than 1,000 head capacity declined 24 percent in these states from 1969 to 1972, and marketings from these small feedlots also declined 11 percent. During the same period, numbers of feedlots with 1,000 head and over capacity increased by just under 1 percent while marketings from these large feedlots increased by more than one-third. These data reveal that the expanding large feedlots have been increasing in size and small feedlots have been declining both in terms of number of marketings and number of lots during the most recent period from 1969 to 1972. This is contrary to an earlier trend of the 1964 to 1969 period, when small feedlots declined in number but increased in terms of cattle marketed.

There has been a very rapid decline in the number of small feedlots over the 1969 to 1972 period in California, Colorado and Illinois. The number of cattle marketed has also declined dramatically from the small feedlots in California, Colorado and Illinois. Texas has remained stable from the 1969 to 1972 period in terms of number of small feedlots but the

Table 38. Number of feedlots and number of fed cattle marketed, by size group, ten leading cattle feeding states and percentage change, under 1,000 head, 1964-72

Item	Under 1,000 Head				
	1964	1969	1972	Percentage Change 1964-69	Percentage Change 1969-72
	Number	Number	Number	Percent	Percent
Number of Lots:					
Iowa	45,949	43,839	35,830	- 4.6	-18.3
Nebraska	24,110	20,719	16,629	-14.1	-19.7
Texas	1,527	1,300	1,300	-14.7	0.0
California	281	173	94	-38.4	-45.7
Colorado	1,152	1,226	1,226	6.4	-49.3
Kansas	13,444	8,874	8,874	-34.0	-16.9
Illinois	31,934	24,964	16,440	-21.8	-34.1
Arizona	27	8	8	-70.4	-12.5
Minnesota	21,060	19,868	13,965	- 5.7	-29.7
Missouri	17,984	17,968	12,974	- 0.1	-27.8
Total	157,468	138,939	105,229	-11.8	-24.3
	1,000 Head	1,000 Head	1,000 Head	Percent	Percent
Cattle Marketed:					
Iowa	2,853	4,194	3,556	47.0	-15.2
Nebraska	1,496	1,552	1,615	3.7	4.0
Texas	122	111	98	- 9.0	-11.7
California	50	17	8	-66.0	-52.9
Colorado	315	311	183	- 1.3	-41.1
Kansas	376	550	489	46.3	-11.1
Illinois	1,139	1,132	886	- 0.6	-21.7
Arizona	24	3	2	-87.5	-33.3
Minnesota	666	755	883	13.4	17.0
Missouri	435	662	556	52.2	-16.0
Total	7,476	9,287	8,276	24.2	-10.9

number of cattle marketed from these lots has declined by about 12 percent. All states have either remained stable or declined in number of lots and number of cattle marketed except two. These states are Nebraska and Arizona, gaining 4 and 17 percent, respectively, in number of cattle marketed from small feedlots.

The large feedlots have increased dramatically in Illinois, Colorado and Nebraska, Table 39. Declines occurred from 1969 to 1972 in Texas, California, Arizona and Missouri in number of lots. However, in terms of cattle marketed from large feedlots, every state except Missouri shows a substantial increase from 1969 to 1972. The greatest increase occurred in Kansas with the second largest increase occurring in Texas.

More than 80 percent of the United States feed grains were produced in the North Central Region in 1972, Table 40. Two North Central states, Iowa and Illinois, account for about 31 percent of the United States feed grain production. Texas, the principal non-North Central state that produces a substantial volume of feed grain annually, averages about 6 percent of United States production.

The United States calf crop is produced primarily in the South Central and West Central states, Table 41. Texas, the leading state in terms of cow numbers two years and older annually accounts for about 11 to 12 percent of the United States calf crop. The East North Central area has been steadily declining in share of United States calf crop produced from 1955 to 1972. Most other areas have remained relatively stable over this period.

The North Central Region accounts for more than half of the United States commercial cattle slaughter, Table 42. Slaughter plants in the West North

Table 39. Number of feedlots and number of fed cattle marketed, by size group, ten leading cattle feeding states and percentage change, over 1,000 head, 1964-72

	Over 1,000 Head				
	1964	1969	1972	Percentage Change 1964-69	Percentage Change 1969-72
	Number	Number	Number	Percent	Percent
Number of Lots:					
Iowa	51	163	170	219.6	4.3
Nebraska	330	489	543	48.2	11.0
Texas	207	300	230	44.9	-23.3
California	323	281	214	- 13.0	-23.8
Colorado	81	120	191	48.1	59.1
Kansas	56	126	131	125.0	4.0
Illinois	66	36	60	- 45.5	66.7
Arizona	82	54	46	- 34.1	-14.8
Minnesota	20	32	35	60.0	9.4
Missouri	16	32	26	100.0	-18.8
Total	1,232	1,633	1,646	32.5	0.8
	1,000 Head	1,000 Head	1,000 Head	Percent	Percent
Cattle Marketed:					
Iowa	116	424	340	265.5	19.8
Nebraska	940	1,770	2,375	88.3	34.2
Texas	849	2,595	4,210	205.7	62.2
California	2,011	2,040	2,054	1.4	0.7
Colorado	636	1,446	2,108	127.4	45.8
Kansas	310	1,124	1,916	262.6	70.5
Illinois	101	84	117	-16.8	39.3
Arizona	576	844	897	46.5	6.3
Minnesota	37	48	52	29.7	8.3
Missouri	61	69	48	13.1	-30.4
Total	5,637	10,444	14,117	85.3	35.2

Table 40. U.S. feed grain production and percentage distribution, by selected regions and major cattle feeding states, 1967-72

Distribution by Region or State	1967	1968	1969	1970	1971	1972
				percent		
Southern Plains	6.3	7.0	6.4	7.5	5.2	5.7
Texas	5.8	6.3	5.7	6.5	4.5	5.0
Oklahoma	.5	.7	.7	1.0	0.7	0.7
North Central[1]	77.3	78.8	77.1	76.2	80.1	80.2
Illinois	17.6	15.4	15.8	12.5	14.2	13.8
Iowa	16.7	16.2	15.8	15.6	16.3	17.1
Minnesota	7.6	8.3	7.9	9.3	8.8	8.3
Nebraska	7.5	7.0	9.0	7.6	7.6	9.3
Kansas	3.6	4.2	4.5	4.0	4.8	4.8
Missouri	3.5	4.4	3.2	3.2	4.2	3.4
Other North Central	20.8	23.3	20.9	24.0	37.0	23.5
Western Regions[2]	4.9	5.0	5.5	7.0	5.2	5.2
California	1.8	1.8	1.5	1.7	1.3	1.3
Colorado	.7	.7	.8	1.1	0.8	0.9
Arizona	.5	.5	.4	0.4	0.3	0.2
Other Western	1.5	2.0	2.8	4.5	2.8	2.8
Other States	11.5	9.2	11.0	9.4	9.4	8.9
United States	100.0	100.0	100.0	100.0	100.0	100.0

[1] Includes Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska and Kansas. However, not all North Central States reported production for each of these crops.

Table 40. Continued

2/ Includes, Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Washington, Oregon, California and Nevada. However, not all Western States reported production for each of these crops.

Source: "Crop Production", U.S.D.A., Crop Reporting Board, Statistical Reporting Service, January 15, 1973.

Table 41. Calf crop, U.S. production, and percent distribution, by geographic regions, 1955-72

Distribution by Region	1955	1960	1965	1970	1972
			percent		
North Atlantic[1]	7.2	7.2	6.0	5.1	4.8
East North Central[2]	15.5	14.6	12.7	11.0	10.8
West North Central[3]	26.7	26.2	27.1	27.0	28.0
South Atlantic[4]	7.7	7.5	7.7	7.8	8.2
South Central[5]	25.9	26.8	28.3	30.4	30.2
Texas	9.9	10.4	10.6	11.7	11.4
Oklahoma	3.6	3.7	4.3	4.5	4.6
Other South Central	12.4	12.7	13.4	14.2	14.1
Western[6]	17.0	17.7	18.2	18.7	18.0
United States	100.0	100.0	100.0	100.0	100.0

[1] Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Pennsylvania.

[2] Ohio, Indiana, Illinois, Michigan and Wisconsin.

[3] Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska and Kansas.

[4] Delaware, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia and Florida.

Table 41. Continued.

$\underline{5/}$Kentucky, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma and Texas.

$\underline{6/}$Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Washington, Oregon and California.

Source: "Cattle", U.S.D.A., Statistical Reporting Service, Crop Reporting Board, February 1, 1973.

Table 42. Commercial cattle slaughter, and percent distribution, by geographic regions, 1960, 1968, 1969 and 1972

Item	1960	1968	1969	1972
	- - - - - - - - - - 1,000 Head - - - - - - - - - -			
U.S. Slaughter	25,224.3	35,026.4	35,236.9	35,842.4
Distribution by Region:	- - - - - - - - - - - % - - - - - - - - - - - - -			
North Atlantic[1]	7.7	4.8	4.7	3.8
East North Central[2]	19.7	14.7	14.5	13.1
West North Central[3]	34.8	41.2	40.5	41.9
South Atlantic[4]	5.0	3.9	3.8	3.2
South Central[5]	12.9	15.3	15.6	15.4
Texas	5.9	7.9	8.5	9.8
Oklahoma	1.3	2.0	2.0	1.7
Other South Central	5.7	5.4	5.1	3.9
Western[6]	19.9	20.1	20.9	22.3
United States	100.0	100.0	100.0	100.0

[1] New England, New York, New Jersey and Pennsylvania.

[2] Ohio, Indiana, Illinois, Michigan and Wisconsin.

[3] Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska and Kansas.

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Table 42. continued

4/Delaware, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia and Florida.

5/Kentucky, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma and Texas.

6/Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Washington, Oregon and California.

Source: "Livestock Slaughter", U.S.D.A., Statistical Reporting Service, April 1973.

Central Region alone generally account for more than 40 percent of the United
States cattle slaughter. The Western Region accounted for another 22 per-
cent of United States cattle slaughter in 1972 as compared to 15 percent
for slaughter plants in the South Central Region. Commercial cattle
slaughter increased sharply in Texas since 1960 with the recent construction
of large shipper-type cattle slaughtering plants near the concentrated
cattle feeding areas in the Northern Texas Panhandle. Commercial cattle
slaughter has declined in the North Atlantic and the East North Central
Regions.

To gain insights into the potential longer-run adjustments in the cattle
feeding-beef economy, a model was developed by Dietrich to incorporate
estimated changes in regional feedlot size while regional cattle feeding
and slaughter levels were permitted to be established on a least-cost basis
without capacity restrictions. Unlimited regional feeding and slaughter
capacities assume that cattle feeding and slaughtering firms have ample time
and resources to adjust capacity to optimum levels.

Results of this model are summarized in Figure 7. This figure reveals
that regions with the highest competitive advantage in cattle feeding are
concentrated in an area encompassing the Texas-Oklahoma Panhandle, New
Mexico, Arizona, Colorado, Kansas-Nebraska, Iowa-Illinois, portions of
the eastern corn belt and Kentucky-Tennessee. Numbers of cattle fed in
the cattle feeding belt accounted for 97 to 98 percent of the total required
to meet the United States fed cattle demand. According to data reported by
the United States Department of Agriculture, states in the cattle feeding
belt accounted for about 70 percent of the United States fed cattle marketings

Figure 7. Cattle feeding belt as defined by regions with greatest competitive advantage in cattle feeding
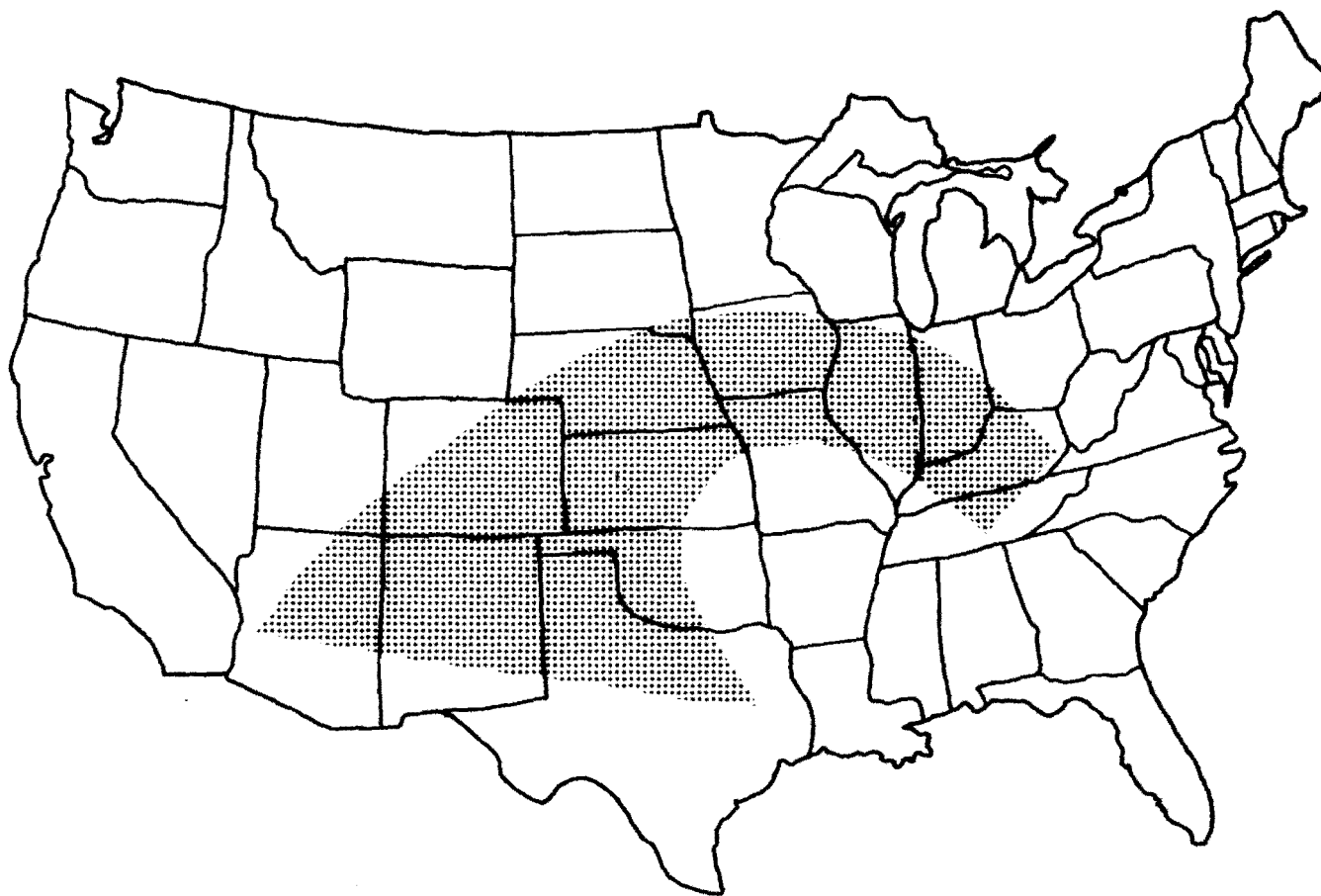
Source: Dietrich [1, p. 29].

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during 1958. Figure 7 depicts graphically these areas where concentration is most likely to occur in the future.

The potential for the Kentucky and Tennessee area is somewhat surprising based upon historic importance. However, this area enjoys locational advantages with respect to surplus feed grain supplies in the corn belt, surplus feeder cattle production in the South and a large deficit fed beef market in the South.

The concentration of cattle feeding activities among a relatively few states, as depicted in Figure 7, has important economic implications for feeder cattle and calf producers as well as input suppliers to this industry. The least-cost shipment patterns of feeder cattle reveal that feeder cattle producing states in the Northwest and parts of the deep South would be most disadvantaged if firms comprising the cattle feeding-fed-beef industry were located on a least-cost production basis. Regions with unfed feeder cattle, including states in the Northwest, Florida, and the North and South Carolina area, imply a relatively greater locational disadvantage for these areas compared to competing areas in shipping feeder cattle to feedlots in the least-cost cattle feeding belt.

The West Texas-Western Oklahoma area is likely to become one of the most important shippers of fed beef to the Northeastern markets, the West Coast and the Southeast. The Texas-Oklahoma Panhandle will emerge as a strong competitor for the deficit Northeast, with Kansas and Nebraska. Other important outlets will include the Middle Atlantic States, the Eastern Corn Belt, Missouri and North Dakota-South Dakota.

California will likely remain a deficit fed beef market. The primary supplier for this deficit area will be New Mexico, Arizona, and the West Texas - Western Oklahoma area. The Kentucky-Tennessee area, in addition to supplying its own fed beef requirements, will find advantage in shipping fed beef to the Mississippi-Alabama-Georgia markets.

Out of state shipments from Colorado move to the intermountain states of Montana-Idaho-Wyoming and Utah-Nevada. Fed beef production in Washington-Oregon will likely be limited to the consumption within that area.

Cattle feeders in corn belt states like Iowa and Illinois, the major feed grain producing states in the United States, enjoy competitive advantages over most other cattle feeding areas resulting from relatively lower feed grain prices. This competitive advantage, however, is offset to a large extent by diseconomies in feedlot operation. Such diseconomies are evident in generally higher fixed feeding costs, less specialized management and feeding practices, and lower degree of feedlot utilization when compared with the large, commercial feedlots which have adopted big business techniques.

Historic data suggest that substantial increases should occur in cattle feeding in the western and eastern corn belt and the Lake States with increases in regional feedlot size to 5,000 head capacity, or the adoption of regional cost saving techniques to offset current diseconomies of feedlot size. Such increases in cattle feeding in the corn belt and Lake States apparently will have severe repercussions on the Kansas and Nebraska areas. Competitive advantages accruing to the corn belt and Lake States over Kansas and Nebraska, in this situation, stem primarily from locational advantages in shipping fed beef to the deficit fed beef markets in the Northeast and Middle Atlantic

states. The Southern Plains, at the same time, enjoys a locational advantage over Kansas and Nebraska in shipments to deficit fed beef markets in the South.

Generally greater concentration of cattle feeding activity in the Texas-Oklahoma Panhandle and Kansas-Nebraska areas compared with the corn belt is likely. This is because those regions enjoy substantial advantages in economies of size in cattle feeding along with adequate feeder cattle and feed grain supplies or accessability to them. Thus, these states can expect relatively greater growth and expansion in feedlot activity in the future. This does not indicate that the cattle feeding industry in the corn belt will eventually be replaced by cattle feeders in the Texas-Oklahoma Panhandle or Kansas-Nebraska. However, it does suggest that farmer-feeders in the corn belt, who do not adopt cost saving techniques resulting from economies of size, will be faced with increasingly less favorable competitive positions in the future.

Regions like California which are far removed from available sources of feed grain and feeder cattle, face severe competitive disadvantages and will find it increasingly difficult to compete for resources in the cattle feeding-fed-beef economy. With the exception of Kentucky and Tennessee, cattle feeders in the South face severe disadvantages resulting primarily from deficit feed grain production and diseconomies of size in feedlot operations. Competitive advantages accruing to the Kentucky and Tennessee cattle feeding economy compared to other states in the South stem primarily from locational advantages.

Fed cattle slaughter and packing plants will continue to locate near concentrated cattle feeding areas to realize cost advantages associated with acquisition costs and to assure adequate slaughter supplies. This belt of concentrated cattle feeding is summarized in Figure 7.

TRENDS IN PER CAPITA CONSUMPTION

The purpose of this section is to briefly examine the per capita consumption trends for the United States, for each one of the previously analyzed agricultural commodities. The time period is 1950 to 1971. Information on per capita consumption was drawn from Food Consumption, Prices, and Expenditures bulletin of the United States Department of Agriculture.

Processed Poultry and Eggs

The trend in per capita consumption of processed poultry and eggs has been dramatically upward over the 1950 to 1971 period, Table 43. The increase has been from 20.6 pounds of chicken per capita in 1950 to 41.6 pounds per capita in 1971. Thus, consumption of chicken on a per capita consumption has more than doubled over this time span. The average rate of increase over this time period has been just over one pound per capita per year.

Turkey consumption has also increased dramatically over this period of time, although there is a substantial difference in the level of consumption. The 1950 consumption of turkey was 4.1 pounds per capita compared to 8.5 pounds in 1971. Again, consumption doubled. The average rate of increase in per capita consumption of turkey has been 0.22 pounds. The combined

Table 43. Per capita consumption of processed poultry and eggs, United States, 1950 - 1971

Year	Poultry a/		Eggs b/	Total Poultry
	Chicken	Turkey		
		pounds		
1950	20.6	4.1	—	24.7
1951	21.7	4.4	—	26.1
1952	22.1	4.7	—	26.8
1953	21.9	4.8	—	26.7
1954	22.8	5.3	—	28.1
1955	21.3	5.0	3.2	26.3
1956	24.4	5.2	3.0	29.6
1957	25.5	5.9	3.4	31.4
1958	28.1	5.9	3.3	34.0
1959	28.9	6.3	4.2	35.2
1960	28.1	6.1	3.6	34.2
1961	30.0	7.4	3.8	37.4
1962	30.0	7.0	3.8	37.0
1963	30.7	6.8	3.6	37.5
1964	31.1	7.4	3.8	38.5
1965	33.4	7.5	3.6	40.9
1966	36.1	7.8	3.8	43.9
1967	37.2	8.6	4.4	45.8
1968	37.5	7.9	4.1	45.4
1969	39.1	8.3	3.9	47.4
1970	41.4	8.2	4.3	49.6
1971	41.6	8.5	4.4	50.1

a/ Dressed weight.

b/ Shell egg equivalent.

Source: U. S. Department of Agriculture, Food Consumption Prices Expenditures, Supplement to Agricultural Economic Report No. 138, Economic Research Service, 1972.

increase in poultry consumption from 1950 to 1971 has averaged 1.25 pounds per capita per year.

The annual per capita consumption of eggs has increased from about 3.2 pounds in 1955 to 4.4 pounds in 1971. Data are not available for the 1950 through 1954 period. The average annual rate for increase in per capita consumption of eggs from 1955 through 1971 was 0.07 pounds.

Processed Milk

In general, the per capita consumption of processed milk has tended to decline over the 1950 to 1971 time span, Table 44. However, some differences do exist among the various types of processed milk. The two major divisions of processed milk are condensed or evaporated and dry. The trends in per capita consumption for condensed and evaporated are shown in Table 44, while the trend for dry milk is shown in Table 45. Evaporated whole milk constitutes the largest component of the condensed and evaporated processed milk category. In 1950 evaporated whole milk was 18.1 pounds per capita compared to 5.6 pounds per capita in 1971. The average annual rate of decline in evaporated whole milk consumption has been 0.6 pounds.

Evaporated and condensed skimmed milk has also declined from 1950 to 1971, although the decline has not been nearly as dramatic as it has been for evaporated whole milk. The evaporated and condensed skimmed milk category has declined from 5.1 pounds in 1950 to 4.8 pounds in 1971. In general, the evaporated and condensed skimmed milk change in per capita consumption has not been significant over this time period. The best characterization of the trend is that per capita consumption for this category was stable.

Table 44. Per capita consumption of processed milk (condensed and evaporated), United States, 1950 - 1971

| Year | Evaporated Whole Milk | Evaporated and Condensed Skim Milk | Condensed Whole Milk | | | Total |
			Sweetened	Unsweetened	Total	
			pounds			
1950	18.1	5.1	0.5	1.5	2.0	25.2
1951	16.3	4.8	0.5	1.5	2.0	23.1
1952	15.7	4.7	0.4	1.5	1.9	22.3
1953	15.4	4.8	0.5	1.5	2.0	22.2
1954	14.8	4.9	0.4	1.6	2.0	21.7
1955	14.2	4.7	0.4	1.6	2.0	20.9
1956	13.6	4.5	0.4	1.8	2.2	20.3
1957	13.1	4.6	0.4	1.9	2.3	20.0
1958	12.3	4.2	0.5	2.0	2.5	19.0
1959	11.9	4.6	0.4	2.1	2.5	19.0
1960	11.2	4.5	0.4	2.1	2.5	18.2
1961	10.7	4.8	0.4	2.2	2.6	18.1
1962	10.1	4.8	0.5	2.0	2.5	17.4
1963	9.4	4.5	0.4	1.8	2.2	16.1
1964	9.0	4.8	0.5	1.8	2.3	16.1
1965	8.4	5.0	0.5	1.7	2.2	15.6
1966	7.7	5.4	0.5	1.5	2.0	15.1
1967	7.1	5.0	0.5	1.4	1.9	14.0
1968	6.8	4.8	0.6	1.5	2.1	13.7
1969	6.2	5.0	0.5	1.2	1.7	12.9
1970	5.9	5.0	0.4	0.8	1.2	12.1
1971	5.6	4.8	0.4	0.8	1.2	11.6

Source: U. S. Department of Agriculture, Food Consumption Prices Expenditures, Supplement to Agricultural Economic Report No. 138, Economic Research Service, 1972.

Table 45. Per capita consumption of processed milk (dry), United States, 1950 - 1971

Year	Non Fat Dry Milk	Dry Whole Milk	Dry Butter Milk	Dry Whey	Malted Milk	Total
			pounds			
1950	3.7	0.3	0.2	0.2	0.2	4.6
1951	4.2	0.3	0.1	0.1	0.2	4.9
1952	4.6	0.5	0.2	0.2	0.2	5.7
1953	4.2	0.2	0.2	0.2	0.2	5.0
1954	4.5	0.2	0.2	0.2	0.2	5.3
1955	5.5	0.2	0.2	0.2	0.2	6.3
1956	5.2	0.3	0.3	0.2	0.2	6.2
1957	5.3	0.2	0.3	0.3	0.2	6.3
1958	5.6	0.3	0.4	0.3	0.2	6.8
1959	6.2	0.3	0.4	0.3	0.1	7.3
1960	6.2	0.3	0.4	0.3	0.1	7.3
1961	6.2	0.3	0.4	0.3	0.1	7.3
1962	6.1	0.3	0.4	0.4	0.1	7.3
1963	5.8	0.3	0.4	0.4	0.1	7.0
1964	5.9	0.3	0.4	0.5	0.1	7.2
1965	5.6	0.3	0.4	0.6	0.1	7.0
1966	5.9	0.3	0.3	0.7	0.1	7.3
1967	5.6	0.3	0.3	0.8	0.1	7.1
1968	5.8	0.2	0.3	0.8	0.1	7.2
1969	5.8	0.2	0.3	0.8	0.1	7.2
1970	5.3	0.2	0.2	0.9	0.1	6.7
1971	5.5	0.2	0.2	1.0	0.1	7.0

Source: U. S. Department of Agriculture, Food Consumption Prices Expenditures, Supplement to Agricultural Economic Report No. 138, Economic Research Service, 1972.

For the condensed whole milk category, per capita consumption was approximately 2 pounds per capita in 1950 compared to 1.4 pounds in 1971. This category has experienced an overall average annual rate of decline in per capita consumption of about 0.02 pounds.

The total condensed and evaporated milk category has declined from a high of 25.2 pounds in 1950 to the low of 11.6 pounds in 1971. Of course, the decline in the total condensed and evaporated processed milk category is largely due to the percipitous decline in the evaporated whole milk component. The total evaporated and condensed milk category has declined at an average annual rate of 0.6 pounds per person from 1952 to 1971.

The per capita consumption of dry milk, consisting of non-fat dry, dry whole, dry buttermilk, dry whey, and malted milk, has generally increased from 1950 to 1971, Table 45. The non-fat dry milk component is the largest of these categories. The consumption of non-fat dry milk was about 3.4 pounds per person in 1950 compared to 5.5 pounds in 1971. The average annual rate of increase in non-fat dry milk has been 0.07 pounds per person from 1950 to 1971.

Dry whole milk, dry buttermilk, dry whey, and malted milk, all constitute relatively unimportant components of the total dry milk consumption in the United States. These per capita consumptions are very small and have tended to be stable to slightly downward during the 1950 to 1971 period.

The total dry processed milk category has increased from 4.6 pounds in 1950 to 7.0 pounds in 1971. The average annual rate of increase in total dry milk has been 0.11 pounds per capita from 1950 to 1971.

Considering total dry and total condensed and evaporated categories,
the total processed milk consumption has declined at an average annual
rate of 0.48 pounds from 1950 to 1971. This indicates that the consumption
of processed milk has steadily declined over roughly the last two decades
and is likely to continue to decline.

Tobacco

Per capita consumption of tobacco has steadily declined from 1950 to
1971, Table 46. The 1950 consumption was slightly over 12 pounds per capita
compared to a 1971 per capita consumption of about 9.5 pounds. The average
annual rate of decline for this time span has been 0.13 pounds per capita.

Processed Fishery Products

The consumption of fishery products has remained relatively stable over
the period of 1950 to 1971, Table 49. There are some differences by individual
category within the total fishery products category, however, these differences
are slight.

The total per capita consumption of canned fish has been between 4 and
5 pounds per capita from 1950 to 1971. A slight downward trend is occurring
but it is not significant in terms of any substantial per capita change over
the 1950 to 1971 time span.

Shell fish per capita consumption has increased relatively more than
any other component of the total fishery products category. The consumption
of shell fish in 1950 was 1.6 pounds per person compared to 2.3 in 1971. The
total cured category trended downward slightly from 0.6 pounds per person in
1950 to 0.4 pounds in 1971. However, this is such a small component of the

Table 46. Per capita consumption $\underline{a/}$ of tobacco, United States, 1950 - 1971

Year	Tobacco	Year	Tobacco
	pounds		pounds
1950	12.29	1961	11.94
1951	12.59	1962	11.72
1952	13.10	1963	11.78
1953	12.95	1964	11.54
1954	12.11	1965	11.51
1955	11.98	1966	11.12
1956	11.64	1967	10.80
1957	11.38	1968	10.59
1958	11.66	1969	10.04
1959	11.64	1970	9.68
1960	11.77	1971	9.52

$\underline{a/}$ Eighteen Years and Over.

Source: U. S. Department of Agriculture, Tobacco Situation, Economic Research Service, 1964 and 1973.

Table 47. Per capita consumption of fishery products, United States, 1950 - 1971

Year	Total Canned	Shellfish	Total Cured	Total Fishery
		pounds		
1950	4.9	1.6	0.6	7.1
1951	4.3	1.7	0.6	6.6
1952	4.3	1.7	0.7	6.7
1953	4.3	1.7	0.7	6.7
1954	4.3	1.7	0.7	6.7
1955	3.9	1.7	0.7	6.3
1956	4.0	1.7	0.7	6.4
1957	4.0	1.7	0.7	6.4
1958	4.3	1.6	0.6	6.5
1959	4.4	1.8	0.6	6.8
1960	4.0	1.9	0.6	6.5
1961	4.3	2.0	0.5	6.8
1962	4.3	1.9	0.5	6.7
1963	4.4	2.0	0.5	6.9
1964	4.1	2.1	0.5	6.7
1965	4.4	2.2	0.5	7.1
1966	4.3	2.2	0.5	7.0
1967	4.3	2.2	0.5	7.0
1968	4.3	2.2	0.5	7.0
1969	4.2	2.2	0.4	6.8
1970	4.5	2.4	0.4	7.3
1971	4.3	2.3	0.4	7.0

Source: U. S. Department of Agriculture, Food Consumption Prices Expenditures, Supplement to Agricultural Economic Report No. 138, Economic Research Service, 1972.

total fishery products category that its movement or trend over the 1950 to 1971 is relatively unimportant. For total fishery products, in general, per capita consumption has been relatively constant at around 7 pounds. There is no substantial trend in either direction in terms of processed fishery products.

Beef

The per capita consumption of total red meat in the United States has trended upward quite substantially from 1950 to 1971, Table 48. In 1950 the total per capita consumption of red meat was 135 pounds compared to 168 pounds in 1971. The per capita consumption of beef has trended upward also, becoming a larger share of total red meat consumption, Table 49. The per capita consumption of beef in 1950 was 50.1 pounds compared to 84.8 pounds in 1971. The consumption of beef as a percent of total red meat increased from 37 percent in 1950 to 50.6 percent in 1971. From about 1965 to 1971 beef as a total percent of red meat has been around 50 percent. The average annual per capita change in total red meat has been 1.2 pounds per person. A similar trend is evident for the per capita consumption of beef.

Table 48. Per capita consumption of meat, United States, 1950 - 1971

Year	Total Red Meat [a]	Year	Total Red Meat [a]
	pounds		pounds
1950	135.5	1961	142.8
1951	130.0	1962	144.6
1952	137.0	1963	149.5
1953	144.0	1964	153.2
1954	142.4	1965	145.8
1955	149.6	1966	148.9
1956	152.3	1967	155.8
1957	144.1	1968	159.9
1958	136.9	1969	158.9
1959	144.0	1970	162.1
1960	144.3	1971	167.6

[a] Retail weight excluding game.

Source: U.S. Department of Agriculture, Food Consumption Prices Expenditures, Supplement to Agricultural Economic Report No. 138, Economic Research Service, 1972.

Table 49. Per capita consumption of beef, United States, 1950-1971.

Year	Pounds (Retail Cut Equivalent)	As Percent of Total Red Meat
1950	50.1	37.0
1951	44.3	34.1
1952	49.1	35.8
1953	61.3	42.6
1954	62.9	44.2
1955	64.0	42.8
1956	66.2	43.5
1957	65.1	45.2
1958	61.6	45.0
1959	61.9	43.0
1960	64.2	44.5
1961	65.8	46.1
1962	66.2	45.8
1963	69.8	46.7
1964	73.9	48.2
1965	73.5	50.4
1966	77.1	51.8
1967	78.8	50.6
1968	81.2	50.8
1969	82.0	51.6
1970	85.2	52.6
1971	84.8	50.6

Source: U.S. Department of Agriculture, Food Consumption Prices Expenditures, Supplement to Agricultural Economic Report No. 138, Economic Research Service, 1972.

REFERENCES

[1] Dietrich, R. A. Interregional Competition in the Cattle Feeding Economy with Special Emphasis on Economies of Size, Bulletin B-1115, Texas Agricultural Experiment Station, College Station, Texas, 1971.

[2] U.S. Department of Commerce, Census of Manufactures, Volume II, Industry Statistics, 1958, 1963, 1967.

APPENDIX A

BASIC ENTROPY MEASURES

Theil's entropy measure from information theory has been employed as an index of industrial concentration in several instances. The basic entropy measure may be utilized whenever data are available on establishment shares (either market shares, physical or dollar output shares, or ration of individual firm employees to total employees). Given an N-firm industry with Θ_i representing the share of the ith firm in that industry, the entropy $H(\Theta)$ is defined as:

$$(1) \qquad H(\Theta) = \Sigma \; \Theta_i \; \log_2 \Theta_i^{-1}$$

The entropy defined in equation (1) is regarded as an inverse measure of concentration since if $\Theta_i = 1$ for one i, zero otherwise, $H(\Theta) = 0$. Also, if all Θ_i are equal, $H(\Theta) = \log_2 N$. Thus, $0 \leq H(\Theta) \leq \log_2 N$ where zero is the maximum degree of share concentration and $\log_2 N$ is the minimum degree of share concentration (maximum dispersion), given N. Of course, since Θ_i represents a share it is constrained such that:

$$(2) \qquad \Theta_i \geq 0 \qquad\qquad \text{for } i = 1, \ldots, N$$

and

$$(3) \qquad \Sigma \; \Theta_i = 1$$

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Adaptation of Entropy to Spatial Concentration

Theil's basic entropy measure may be adapted to provide a spatial concentration measure by regarding Θ_i as the share of the ith geographic region. Thus, Θ_i may be either the ith region's share of total number of firms, share of total output, or share of total employees employed in the industry being studied. In the current instance, the total geographic area is the United States and regions within this total follow the definitions from Census of Manufactures [2].

Spatial analysis obviously requires that the unit of investigation be defined by geographic boundries. Since geographic regions are the basic unit of analysis and regions are of differing size, there is no a priori reason to expect equal shares among regions. This means that $H(\Theta)$ for a particular point in time is without meaning. However, relative entropy measures over time provide a unique and useful means of investigating spatial concentration propensities.

Relative entropy for any time t may be defined as:

$$(4) \qquad R(\Theta) = H(\Theta) \ / \ \log_2 N$$

Thus, relative entropy, $R(\Theta)$, is the ratio of the estimated absolute entropy to the maximum entropy possible. As a result $R(\Theta)$ is an index where $0 \leq R(\Theta) \leq 100$. If concentration is absolute (i.e., $\Theta_i = 1$ for one i, zero otherwise), $R(\Theta) = 0$. When Θ_i are equal for all i, $R(\Theta) = 100$, or the case of greatest possible dispersion.

$R(\Theta)$ is then a measure of the extent to which the industry under study is attaining the maximum possible geographic dispersion in firm or output

shares given the number of geographic regions. Comparison of intertemporal changes in $R(\Theta)$ provide information concerning spatial concentration propensities.

Entropy Disaggregation

A convenient aspect of the total entropy, $H(\Theta)$, is that it may be disaggregated into between-set and within-set entropies. As shown later, this is especially relevant when spatial concentration is considered. Following Theil suppose geographic regions are combined to form M sets of geographic regions. The share of set ψ_m is:

$$(5) \qquad \psi_m = \sum_{i \epsilon \psi_M} \Theta_i \qquad\qquad \text{for } m = 1, \ldots, M.$$

Disaggregated total entropy is:

$$(6) \qquad H(\Theta) = H_0(\Theta) + \sum_{M=1}^{M} \psi_m H_m(\Theta)$$

where

$$(7) \qquad H_0(\Theta) = \sum_{M=1}^{M} \psi_m \log_2 \psi_m^{-1}$$

and

$$(8) \qquad H_m(\Theta) = \sum_{i \epsilon \psi_M} [(\Theta_i / \psi_m) \log_2 (\psi_m / \Theta_i)] \qquad \text{for } m = 1, \ldots, M.$$

Between-set entropy is defined by equation (7) while entropy within-set, ψ_m, is defined by equation (8). Total within-set entropy is $\Sigma \psi_m H_m(\Theta)$.

This disaggregation property is particularly useful when data are available by levels of aggregation such as in Census of Manufactures. Specifically, data for number of establishments and value of output are reported by state, division and region within the United States.

Sometimes data are not reported for all states within a division for disclosure reasons. As a consequence, the least disaggregation which may be consistently attained is divisions. In such a case, regions represent the set ψ_m, with divisions within each set. Total and disaggregated entropies may be computed using these data.

There are relative entropy measures, similar to $R(\theta)$, which may be constructed from the between-set entropy, $H_o(\theta)$, and the within-set entropy, $H_m(\theta)$. These are:

$$(9) \qquad R_o(\theta) \quad = \quad H_o(\theta) \; / \; \log_2 M$$

and

$$(10) \qquad R_m(\theta) \quad = \quad H_m(\theta) \; / \; \log_2 N$$

Of course, both $R_o(\theta)$ and $R_m(\theta)$ are indices and have interpretations similar to $R(\theta)$. That is, $R_o(\theta)$ is a measure of the extent to which the industry under study is attaining maximum possible between-region geographic dispersion in shares given the number of sets, ψ_m. Also, $R_m(\theta)$ is a measure of the extent to which the industry is attaining maximum possible within-region geographic dispersion in shares given the number of divisions within regions.

The only relevant aspect of the total and disaggregated absolute entropies is their change over time. Nevertheless, they are presented, primarily to illustrate the disaggregative property of $H(\theta)$, Tables A1 and A2. More important for analysis are the estimates of $R(\theta)$, $R_o(\theta)$, and $R_m(\theta)$ which are presented in the text. Absolute entropies for poultry are presented in Table A1 and for milk in Table A2.

Appendix Table A1. Entropy measures for number of establishments and value of output shares by census years

| Entropy Measure | Census year | | | | | |
| | 1958 | | 1963 | | 1967 | |
	Establishment Shares	Output Shares	Establishment Shares	Output Shares	Establishment Shares	Output Shares
Total entropy, $H(\theta)$	2.9945	2.8658	2.9830	2.8108	2.9435	2.7248
Between-region entropy, $H_0(\theta)$	1.8705	1.7160	1.8644	1.6148	1.8315	1.5258
Total Within-region entropy, $\Sigma \psi_m H_m(\theta)$	1.1240	1.1498	1.1186	1.1960	1.1120	1.1990

Source: Computed from Table 9.

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Appendix Table A2. Entropy measures for number of establishments and value of output shares by census years, milk processing

| Entropy Measure | Census year | | | | | |
| | 1958 | | 1963 | | 1967 | |
	Establishment Shares	Output Shares	Establishment Shares	Output Shares	Establishment Shares	Output Shares
Total entropy, $H(\Theta)$	2.5251	2.3759	2.5078	2.3508	2.5645	2.3596
Between-region entropy, $H_0(\Theta)$	1.6702	1.5280	1.6299	1.4362	1.7258	1.4213
Total within-region entropy, $\Sigma \, \psi_m H_m(\Theta)$	0.8549	0.8479	0.8779	0.9147	0.8387	0.9383

Source: Computed from Table 19.

APPENDIX B

PEANUTS

Recent reports indicate 119 plants at the sheller level were distributed over 10 states, Table B-1 and Figure B-1. Twenty of these plants were both crushers and shellers. Hill and Nixon report that in 1968 the 10 largest shellers in Georgia bought over half the peanuts in that area, and 71 percent of those classified as commercial peanuts, Table B-2.

A total of 358 peanut product processors were listed in the 1971 U.S.D.A. Statistical Reporting Service list of plants using raw peanuts, Figure B-2. About 46 percent were located in the Northeast and Midwest. These 358 plants include several multiplant firms.

Another U.S.D.A. analysis, indicating 367 processing plants indicates plant size by regions, Table B-3. The Northeast, Midwest, and Central regions half the processing plants, and nearly all the large ones. The Southeast had 25 processing plants but only 10 were large.

During the 1968-69 season, about 58 percent of the shelled peanuts were processed east of the Mississippi River, Table B-4. There are also significant variations in peanut processing by class of product involved, Table B-4.

Location of processors and millers by name are given on the following pages.

Per capita consumption of peanuts has been increasing over the 1950 to 1971 period, Table B-5. Annual per capita consumption increased by one-third over this time span. The average annual consumption increased by 0.09 pounds per person over this period.

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Appendix Table B-1.   Distribution of peanut shellers by geographic regions, 1970-71 season 1/

Region	Plants	Companies 2/
	Number	
U. S.	119 3/	92
Southeast		
Georgia	43	36
Alabama	17	12
Florida	4	4
	64	52 (51 with one company in two states)
Virginia-Carolina		
North Carolina	18	14
Virginia	10	8
South Carolina	1	1
	29	23 (21 with two companies in two states)
Southwest		
Texas	15	12
Oklahoma	5	4
New Mexico	6	6
	26	22 (20 in region)

1/The last list of peanut millers (shellers and crushers) was issued in September 1971 as the government agency responsible no longer makes them available.

2/Number of companies was determined by similarity of names in the list and may actually be fewer due to plant name not including parent company name.

3/There were 120 plants reported; one in California.

Source: U.S.D.A., Peanut Millers (shellers and crushers) Reporting Operations, Agr. Estimates Division, SRS, September 1971, Washington, D. C.

Appendix Figure B-1. Number of peanut shelling plants, by state, 1970-71 season
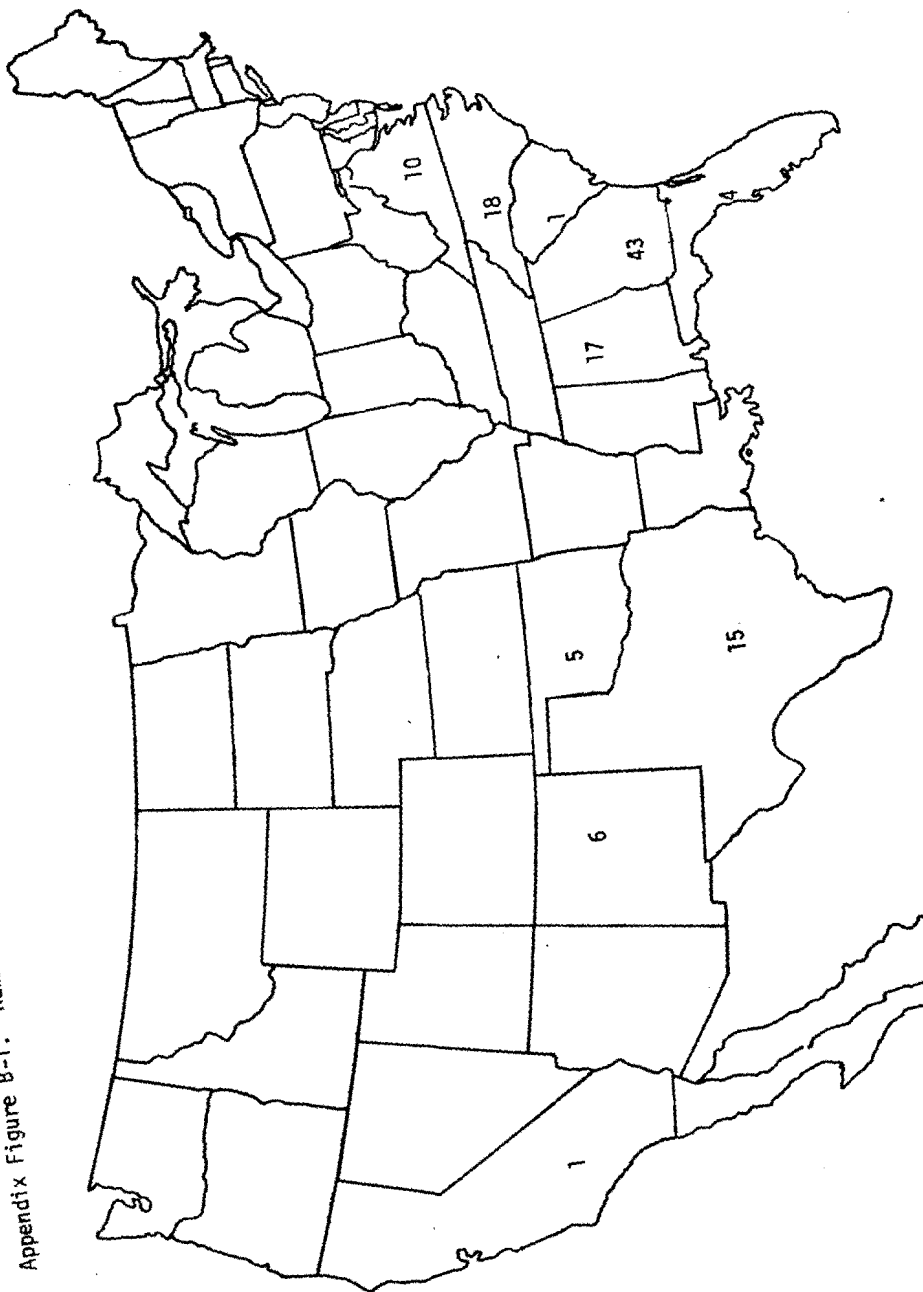
Source: SRS, Agr. Ests. Division. U.S.D.A.

Appendix Table B-2. Volume and percent of total Georgia peanuts purchased by shellers according to size of firm, 1968

	Large firms included[1]		Volume of purchases		
	Number	Percent	Total	Average	Percent of total purchase
			tons	tons	percent
All Peanuts					
Largest:	4	3.96	187,254	46,814	40.67
	10	9.90	236,089	23,609	51.27
	20	19.80	296,662	14,833	64.43
Other firms	81	80.20	163,786	2,022 ·	25.57
Total	101	100.00	460,448	4,559	100.00
Commercial Peanuts					
Largest:	4	4.90	172,682	43,170	55.42
	10	12.20	220,107	22,011	70.64
	20	24.39	269,331	13,467	86.44
Other firms	62	75.61	42,239	681	13.56
Total	82	100.00	311,570	3,800	100.00
Loan Peanuts					
Largest:	4	4.90	22,194	5,549	14.91
	10	12.20	48,788	4,879	32.77
	20	24.39	.78,747	3,937	52.89
Other firms	62	75.61	70,131	1,131	47.11
Total	82	100.00	148,878	1,816	100.00

[1] 19 firms handle commercial peanuts only; 19 firms handle loan peanuts only; 63 firms handle both commercial and loan peanuts.

Source: Hill, Roger and John Nixon, Structural Characteristics and Problems of Peanut Marketing with Special Emphasis on Georgia and the Southeast, Research Report 57, University of Georgia, College of Agriculture Experiment Stations, September 1969, p. 18.

Appendix Figure B-2. Number of peanut processors by states, 1970-71
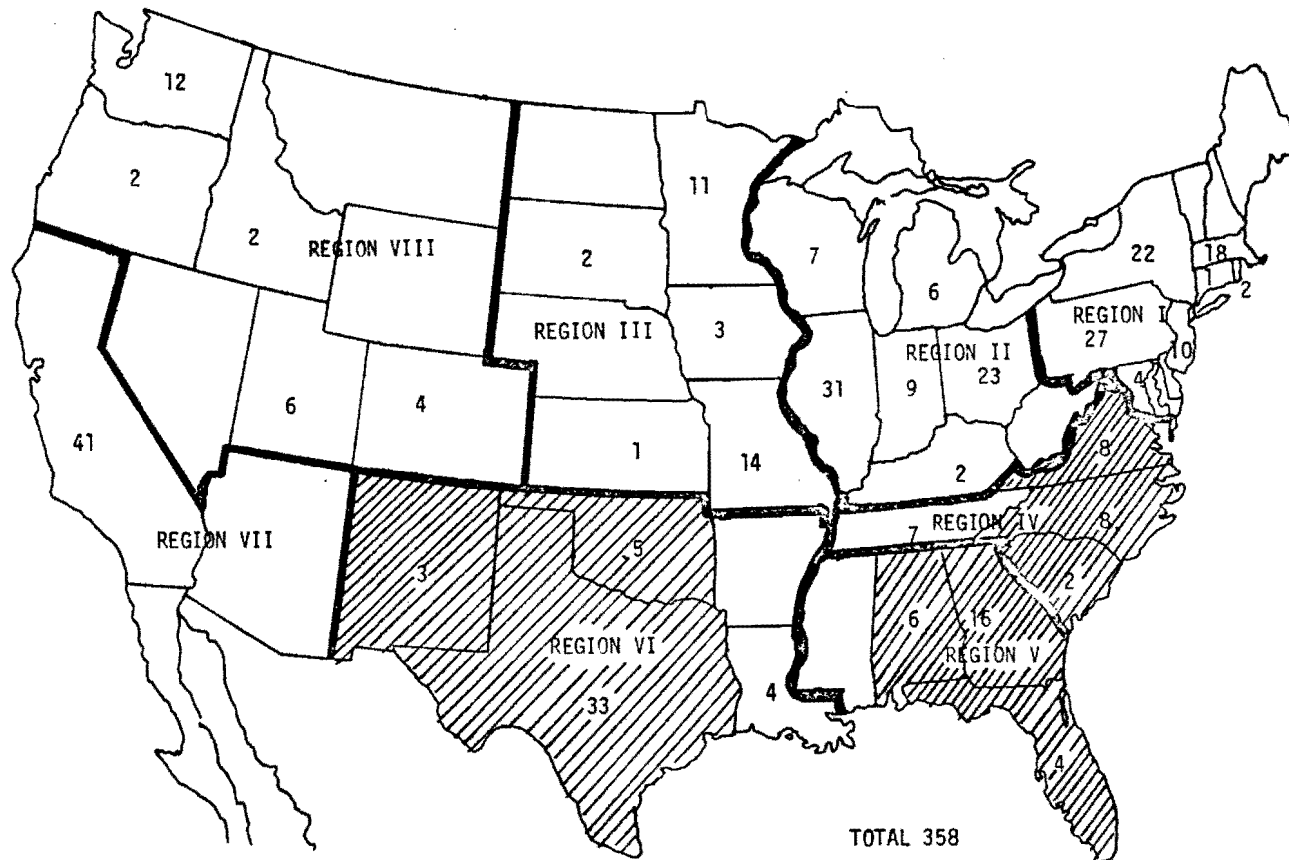
Source: Statistical Reporting Service, U. S. D. A.

Shaded states are those producing peanuts.

TOTAL 358

Appendix Table B-3. Ranking of edible peanut processing plants by size, by region, United States, 1971

	Region	Small	Medium	Large	Total
		Size of firm[1]			
		number of firms			
I	Northeast	46	22	18	86
II	North Central	38	25	18	81
III	Midwest	19	5	7	31
IV	East Central	12	6	9	27
V	Southeast	11	4	10	25
VI	Southwest	39	6	5	50
VII	West	45	13	9	67
Totals		210	81	76	367

[1] Small - less than 1 million pounds annually.
   Medium - 1 million to 5 million pounds annually.
   Large - over 5 million pounds annually.

Source: U.S.D.A., Statistical Reporting Service, unpublished data.

Appendix Table B-4. Edible peanuts: Percentage of total peanuts used for a particular primary product, by region, 1968-69 1/

Region 2/	Total		Peanut butter	Candy	Salted
	Volume of peanuts used	Percent			
	million pounds			percent	
I N. East	140.5	13.6	6.6	32.6	10.9
II N. Central	246.2	23.9	25.6	31.8	12.4
III Midwest	62.5	6.1	6.0	3.0	10.1
IV E. Central	89.2	8.6	10.0	2.6	8.6
V S. East	128.6	12.5	13.8	16.1	5.4
VI S. West	69.9	6.8	11.9	1.8	1.0
VII Cal.-Az.	70.7	6.9	9.6	2.6	5.3
VIII N. West	12.0	1.2	1.5	0.8	1.0
IX (unassigned by regions)	212.1	20.6	15.0	8.7	45.2
U. S. Total	1,031.7	100.0	100.0	100.0	100.0
Percent of total by primary product		100.0	50.86	21.94	23.26

1/ Peanuts used in peanut butter sandwiches and "other" items are omitted.

2/ Regions:
- I Me., N.H., Vt., Mass., R.I., Conn., N.Y., N.J., Pa., Md., Del.
- II Ohio, Ind., Ill., Mich., Wis., W.Va., Ky.
- III Minn., Ia., Mo., N.D., S.D., Neb., Kan.
- IV Va., N.C., S. C., Tenn.
- V Ga., Fla., Ala., Miss.
- VI Ark., La., Okla., Tex., N.M.
- VII Ariz., Calif.
- VIII Mont., Ida., Wyo., Colo., Utah, Nev., Wash., Ore.
- IX Processings by multiple plant firms with plants located in several regions reported in total but not by individual plants.

Source: U.S. Department of Agriculture, unpublished data, SRS.

UNITED STATES DEPARTMENT OF AGRICULTURE
STATISTICAL REPORTING SERVICE
WASHINGTON, D. C. 20250

September 1971

LIST

Peanut Processors

(Users of Raw Peanuts)

1970-71 Season

Symbol	Location	Name
		ALABAMA (63)
B	Birmingham	BAMA Food Products
S.B.	"	Golden Flake, Inc.
R.	"	Peanut Depot
B.	Enterprise	Session Co., Inc.
S.R.	Mobile	A & M Peanut Shoppe
R.	Mobile	Lignos Grocery
		CALIFORNIA (93)
S.B.O.	Anaheim	Laura Scudder's
B.	Alameda	CPC International, Inc.
1/	Burlingame	The Kelling Nut Co.
S.B.O.R.	Cerritos	All American Nut Co., Inc.
B.	City of Industry	Kern Food Products Co.
C.	Colton	Laymon Candy Co.
O.	Compton	Compton Nut Co.
O.	El Monte	Solgonick Bros.
C.S.	Los Angeles	Adams & Brooks Inc.
S.B.O.R.	"	Chunk-E Nut Products Co.
C.S.R.	"	Chippers Nut Hut, Inc.
O.	"	Gilbert Nut Co.
S.B.R.	"	Gust-Picoulas Co.
C.	"	Hoffman Candy Co.
S.R.	"	Los Angeles Nut House
S.B.	"	Magee's
C.O.	"	Market Confections, Inc.
C.	"	The May Co.
R.	"	Mellos Peanut Co.
C.	"	Myerson Candy Co.
C.	"	See's Candies, Inc.
S.R.	"	Torn & Glasser
C.S.O.	Lynwood	D. Lish S. Confections
C.	"	Helen Grace Candies
C.S.	Oakland	Standard Specialty Co.
C.	"	Chiodo Candy Co.
B.R.	"	E. F. Lane & Son
C.	"	Sconza Candy Co.

Symbol	Location	Name
		CALIFORNIA (93) Continued
S.R.	Oakland	Granny Goose Foods
C.S.	"	Mac Farlanes Candies
B.	Pico Rivera	C.H.B. Foods, Inc.
C.S.R.	Richmond	California Peanut Co.
C.S.B.	San Francisco	Circus Foods, Div. of USTCO Products Corp.
1/	"	Reed Candy Co.
1/	"	Planters Peanuts, Div. of Standard Brands, Inc.
R.	"	Wright Popcorn and Nut Co.
C.	South San Francisco	T.A. White Candy Co., Inc.
B.	San Jose	Puritan Preserve Co.
C.	"	Kanda Corp.
B.	San Leandro	Safeway Stores, Inc., Brookside Div.
S.	Santa Fe Springs	Bell Brand Foods
		COLORADO (84)
S.	Denver	Bennett Dist. Co.
S.R.	"	Jerry's Nut House, Inc.
S.R.	Pueblo	McCormick Distributing Co.
C.	Trinidad	The Mason Candy Co.
		CONNECTICUT (16)
R.	Hartford	Fowler & Huntting Co.
1/	Grosvenor Dale	O. S. Allen Division
		FLORIDA (59)
R.	Jacksonville	Roy Smith Co.
S. R.	Miami	Barnard Nut Co.
B.	Orlando	Deep South Products, Inc.
O.S.R.	Williston	Central Florida Peanut
		GEORGIA (58)
1/	Albany	Jewett & Sherman Co.
C.	"	M & M Mars
B.	Atlanta	Atlantic Preserving Co., Inc.
C.	"	Crown Candy Corp.
B.	"	Crown Food Products Co.
1/	"	Sunshine Biscuit Company
C.	"	Johnson-Fluker Co.
C.	"	Sophie Mae Candy Corp.
C.	Augusta	Fine Products Co., Inc.
B.	Cairo	W. B. Roddenbery Co.
S.B.R.	Chamblee	Frito-Lay, Inc.
C.S.B.R.	Columbus	Tom's Foods Ltd.
B.O.	Dawson	Cinderella Foods
C.S.	Eastman	Stuckey's Inc.
O.	Forest Park	R. G. Reynolds Foods, Inc.
S.B.O.	Woodbury	National Biscuit Co.

Symbol	Location	Name
		IDAHO (82)
C.S.	Boise	Idaho Candy Co.
R.	"	Idaho Food Products, Inc.
		ILLINOIS (33)
1/	Ashley	Hollywood Brands
C.S.	Bloomington	Paul F. Beich Co.
S.	"	Shirk Products Co.
C.	Centralia	Hollywood Candy Co.
C.S.	Chicago	Archibald Candy Corp.
C.	"	E.J. Brach & Sons
C.	"	Chesterton Candy Co.
O.	"	The Cracker Jack Co.
C.	"	Curtiss Candy Co.
B.	"	Derby Foods, Inc.
S.	"	Georgia Nut Co.
S.	"	Guidarelli Nut Co.
C.	"	M.J. Halloway
C.	"	Peter Paul, Inc., Johnson Div.
S.	"	Kelling Nut Co.
R.	"	Chicago Produce Shippers Inc.
C.S.R.	"	Peanut Specialty Co.
C.	"	Peerless Confection Co.
C.	"	Reed Candy Company
S.	"	Ricci & Co.
C.	"	Schutter Candy Co.
S.	"	Marshall Field & Co.
B.	"	Oz Food Corp.
R.	"	August Battaglia Processing Co.
S.	"	Mellos Peanut Company
O.	Des Plaines	Chicago Almond Products Co.,
C.	Forest Park	Ferrara Candy Co.
C.	Franklin Park	Melville Confections, Inc.
S.	Melrose Park	Evon Nut Products
B.	Wheeling	Pierce Food Products, Inc.
O.	Villa Park	Ovaltine Food Products
		INDIANA (32)
S.B.O.R.	Evansville	Aster Nut Products Co.
C.	Ft. Wayne	Wayne Candies, Inc.
C.O.	Hammond	Queen Ann Candy Co.
C.	Kendallville	Kraft Food Division
S.	La Porte	American Home Foods, Div. of Am. Home Products Corp.
C.	South Bend	Claeys Candy Co.
B.	Terre Haute	Ann Page, Div. The Great A & P Tea Co., Inc.

Symbol	Location	Name
		INDIANA (32) Continued
S.	Ft. Wayne	Seyfort Nut Products Co., Inc.
C.	Frankfort	Peter Paul, Inc.
		IOWA (42)
C.	Des Moines	Jacobson Candy Co.
C.S.	Sioux City	Palmer Candy Co.
B.	"	Robb-Ross Co.
		KANSAS (47)
S.	Wichita	Nifty Nut House
		KENTUCKY (61)
B.O.	Lexington	Procter & Gamble Mfg. Co.
S.B.O.R.	Louisville	Shedd-Bartush Foods, Inc., Div. of Beatrice Foods Co.
		LOUISIANA (72)
B.	New Orleans	Blue Plate Foods Div.
C.	Ponchatowla	Elmer Candy Corp.
O.	New Orleans	Charles Dennery Co.
R.	"	Blevins Concession Supply
		MARYLAND (52)
B.	Baltimore	Austin Biscuit Co. (Div. of Fairmont Foods Co.)
C.R.	"	Jeppi Nut Company, Inc.
C.R.	"	Virginia Peanut Co.
S.B.R.	College Park	Schindlers Peanut Prod., Inc.
		MASSACHUSETTS (14)
S.	South Boston	American Nut & Chocolate Co.
C.	Boston	Charles N. Miller Co.
C.S.B.O.R.	"	Superior Nut Co., Inc.
C.	Brockton	F. B. Washburn Candy Corp.
C.S.	Cambridge	Fanny Farmer Candy Shops.
C.	"	New England Conf. Co., Inc.
C.S.B.	"	Squirrel Brands Co.
C.	"	Jas. O. Welch Co.
C.	E. Cambridge	Deran Confectionery Co.
C.	Charlestown	W. F. Schrafft & Sons Corp.
C.S.B.R.	Everett	John W. Leavitt Co.
C.	Malden	Edgar P. Lewis & Sons, Inc.
C.S.	Roxbury	Handy Pax
C.S.R.	Shrewsbury	Home of the Hebert Candies, Inc.
S.B.	Somerville	First National Stores, Inc.
S.B.	"	E. F. Kemp Corp.
1/	Boston	Miller & Hollis Corp.
R.	Springfield	John Martinelli, Inc.
		MICHIGAN (34)
S.B.O.R.	Bay City	St. Laurent Bros., Inc.
C.S.B.	Detroit	Fred Sanders Corp.
S.R.	Ferndale	Kar Nut Products Co.

Symbol	Location	Name
		MICHIGAN (34) Continued
R.	Grand Rapids	Ferris Coffee & Nut Co.
S.B.R.	"	Koeze Mfg. Co.
S.	"	The Nut Bar Co.
S.R.	"	Thrift Products Co.
S.B.R.	Livonia	Velvet Peanut Products Co.
		MINNESOTA (41)
C.	Hopkins	Powell Candy
S.O.R.	"	Johnson Nut Co. (Div. of Fairmont Foods)
S.B.	"	Preferred Products Inc.
B.	Minneapolis	Home Brand Inc.
B.	"	CPC International, Inc.
C.S.	"	Fanny Farmer Candy Shops
S.	Round Lake	Sather Cookie Co.
S.R.	St. Paul	Fisher Nut and Chocolate Co.
S.	"	Northern Nut Co.
C.	"	Pearson Candy Co.
S.B.	Willmar	Willmar Cookie Co., Inc.
		MISSOURI (43)
C.S.R.	Eldon	Dye Candy Co.
1/	Kansas City	Circle M. Foods, Inc.
1/	Kansas City	Jewett & Sherman Co.
C.	"	Jianis Bros. Candy Co.
C.S.	"	The Price Candy Co.
S.	Liberty	Guy's Foods, Inc.
C.	St. Joseph	Chase Candy Co.
C.	"	Poe Candy Co.
C.	St. Louis	Mavrakos Candy Co.
R.	"	Prunty Seed & Grain Co.
R.	"	Rethemeyer Coffee Co.
C.	"	Stoll Candy Co.
S.	"	Virginia Style Products Co.
C.S.B.	Springfield	Hallam & Sons
		NEBRASKA (46)
		NEW JERSEY (22)
C.	Clifton	Federal Sweets & Biscuit Co.
C.	Hackettstown	M & M Candies Inc., Div. Food Manufacturers, Inc.
S.	Irvington	Westcott Nut Products Co.
S.B.O.R.	Newark	Aster Nut Products
1/	Paterson	The Kelling Nut Co.
S.B.	Plainfield	Grigsby Nut Kitchen
S.	Rahway	Bettman Nut Co.
S.B.R.	Pennsville	Hygrade Bakery Co.
S.B.R.	Carlstadt	Durey Libby Corp
B.	Elizabeth	Bwrny Biscuit

Symbol	Location	Name

NEW MEXICO (85)

Symbol	Location	Name
R.	Albuquerque	Ramies Nut Co.
C.	Clovis	Leslie Candy Co.
R.	Floyd	Sundale Valley Growers

NEW YORK (21)

Symbol	Location	Name
C.S.B.R.	Albany	Empire State Nut Co., Inc.
C.S.	Binghamton	Flavor Kitchens Inc.
O.	Brooklyn	American Almond Products Corp.
C	"	Banner Candy Co.
C.	"	Candy Corp. of America
O.	"	Havmor Foods Products
S.	"	Jerissa Nut Co. Inc.
S.	"	Manhattan Nut Co.
S.B.R.	Buffalo	Buffalo Nut Shops Inc.
S.R.	"	Louis Onetto
B.	Fredonia	The Red Wing Co. Inc.
C.B.	Horseheads	Ann Page Div., The Great A & P Tea Co., Inc.
C.	Mineola, Long Island	Mason, Au & Magenheimer Conf.
C.S.O.R.	New York	A. L. Bazzini Co. Inc.
O.	"	Bond Baking Co.
C.	"	Frank G. Shattuck Co.
S.B.R.	New York	Sunshine Biscuits Inc.
R.	Bronx	A. J. Trucco, Inc.
S.B.R.	New York	Thomas Zarras
B.	Oswego	Oswego Candy Co.
S.R.	Rochester	Gargano Bros. Inc.
S.	White Plains	Electricooker Division

NORTH CAROLINA (56)

Symbol	Location	Name
C.S.B.R.	Charlotte	Lance, Inc.
C.S.B.	"	Mitchum Inc.
R.	Dublin	Peanut Processors Inc.
C.	Dunn	Wellons Candy Co.
S.O.R.	Edenton	Jimbo's Jumbos Inc.
C.	Elizabeth City	W. H. Weatherly Co.
R.	Raleigh	Redbird Peanut Co.
S.B.R.	"	Taylor Biscuit Co.

OHIO (31)

Symbol	Location	Name
C.	Akron	Arnold's Candies
C.B.	Bryan	Spangler Candy Co.
C.S.B.R.	Canton	Phillips Taffy Co., Inc.
S.	Canton	Heggy Nut Shop
S.R.	Cincinnati	Jansen Nut Co.
C.S.B	"	The Kroger Co.
B.O.	"	Procter & Gamble Mfg. Co.
B.	"	The Procter & Gamble Mfg. Co.
S.R.	Cleveland	Blossom Peanut Co.

Symbol	Location	Name
		OHIO (31) Continued
S.O.R.B.	Cleveland	The Hillson Nut Co.
S.	"	King Nut Co.
C.S.	"	May Co.
S.	"	Peterson Nut Co.
S.B.	Columbus	Krema Products Co.
R.	Doylestown	C. J. Dannemiller Co.
C.	Columbus	P. S. Truesdell Co.
S.R.	Lima	Dome's Nut Shop
B.	Mariemont	Keebler Co. (Cincinnati Bakery)
S.B.O.R.	Tipp City	Trophy Inc.
S.R.	Toledo	Bassett Nut Co.
S.B.R.	"	Tiedke's Div. of Davidson Bros., Inc.
S.R.	"	Hull Nut Co.
O.	Worthington	Worthington Foods, Inc.
		OKLAHOMA (73)
S.	Betheny	Davis Nut Co.
S.	Oklahoma City	Archer Welch, Inc.
B.	"	Bunte Candies, Inc.
C.	"	Liberty Candy Co.
R.	Tulsa	Logan Concession Supply
		OREGON (92)
S.R.	Portland	Hood Sales Co.
S.B.R.	Beaverton	Hoody Corp. & Better Prod.
		PENNSYLVANIA (23)
C.	Altoona	Boyer Brothers
C.	Philadelphia	Whitman's Chocolates Div. Pet Inc.
C.	Bethlehem	Just Born, Inc.
C.	Bridgeport	Minter Candies, Inc.
B.O.R.	Conshohocken	Edwards-Freeman, Inc.
S.	Grove City	Geo. J. Howe Co., Inc.
C.	Hershey	Hershey Foods Corp.
C.	"	H. B. Reese Candy Co.
R.	Lancaster	El Capitan Prod., Inc.
S.	"	Lancaster Salted Nut Co.
C.	McKeesport	Thurman's Inc.
B.	New Bethlehem	H. B. Deviney Co., Inc.
B.R.	Penbrook-Harrisburg	J. S. Zimmerman
C.	Philadelphia	Ward Chocolate Co., Inc.
C.R.	"	E. Cherry Sons & Co. Inc.
C.	"	Goldenberg Candy Co.
C.	"	Plantation Chocolate Co.
C.	Pittsburgh	D. L. Clark Co.
R.	"	Fort Pitt Candy Co.
C.S.R.	"	Pittsburgh Snax Co.
C.	Reading	James P. Linette, Inc.

Symbol	Location	Name
		PENNSYLVANIA (23) Continued
C.	Reading	Ludens Inc.
B.	Souderton	Henry L. Landis Estate-John K. Landis, Prop.
1/	Wilkes-Barre	Planters Peanuts, Div. of Standard Brands, Inc.
S.R.	York	Mike's Place
C.	Jenkintown	Bowers Candies, Div.
S.	Paoli	Betsy Ross Candy Company
		RHODE ISLAND (15)
S.B.O.R.	Providence	Virginia & Spanish Peanut Co.
R.	"	Nathan Warren & Sons Inc.
		SOUTH CAROLINA (57)
S.R.	Columbia	Cromer's Peanuts
S.B.R.	Greenville	C. F. Sauer Company
		SOUTH DAKOTA (45)
R.	Sioux Falls	Park Grant Co.
C.	"	Fenn Brothers, Inc.
		TENNESSEE (62)
C.	Chattanooga	Brock Candy Co.
B.	Collegedale	McKee Baking Co.
B.	Knoxville	J.F.G. Coffee Co.
S.B.R.	Memphis	Wonder Snacks Foods Div.
B.	Nashville	American Tea & Coffee Co., Inc.
B.	"	Fletcher Wilson Foods, Inc.
C.	"	Standard Candy Co.
		TEXAS (74)
C.S.	Amarillo	Camel Candy Factory, Inc.
C.	"	Thorn Candy Co.
B.	Dallas	CPC International Co.
R.	"	Craven Bros.
C.S.B.O.	"	Novelty Peanut Co.
B.	"	Sunny Jim Inc.
S.	"	E. W. Tune Co.
S.B.	Denison	Denison Peanut Co.
1/	"	Safeway Stores, Inc., Brookside Div.
S.	El Paso	Azar Bros., Inc.
C.	Farmersville	McGraw Candies, Inc.
C.	Ft. Worth	C. & C. Candy Co.
S.	"	Mrs. Grubbs Potato Chip Co.
C.	"	King Candy Co.
C.	"	Lone Star Candy Co.
S.	"	L & H Nut House
S.	"	Vending Nut Co.
C.	Garland	Kraft Food Co.
C.	Greenville	Liberty Candy Co.

Symbol	Location	Name
		TEXAS (74) Continued
R.	Houston	Associated Popcorn Dist., Inc.
B.	"	The Bama Co.
R.	"	Houston Popcorn & Supply Co.
C.S.	Jacksonville	Jacksonville Candy Co.
S.B.O.	Lewisville	American Nut Corp.
C.S.	Lubbock	Goodart Candy Co.
C.	Lufkin	Atkinson Candy Co.
C.	Nacogdoches	The Candy House Inc.
C.	Paris	Hearn's Candy Co.
S.	San Antonio	C & S Peanut Co.
S.R.	"	Liberto Specialty Co.
1/	Sulphur Springs	Hollywood Brands
C.S.	Terrell	Terrell Candy Shop
C.	Waco	M. A. Wood Candy Factory
		UTAH (87)
R.	Salt Lake City	Associated Food Stores, Inc.
C.S.	"	Glade Candy Co.
C.	"	Maxfield Candy Co.
C.S.	"	Sweet Candy Co.
S.R.	"	Western States Nut Co.
C.	"	Mrs. J. G. McDonald Chocolate Co.
		VIRGINIA (54)
1/	Boykins	Aster Nut Products
O.R.	Franklin	Sachs Nut Co., Inc.
C.S.B.R.	Norfolk	Old Dominion Peanut Corp.
B.	Portsmouth	CPC International, Inc.
1/	"	Procter & Gamble Mfg. Co.
R.	Richmond	G. R. Unger
S.	Sedley	Hubbard Peanut Co.
S.R.	Suffolk	The Great A & P Tea Co., Natl. Produce Div.
C.S.B.O.R.	"	Planters Peanuts, Div. of Standard Brands, Inc.
S.B.O.R.	"	Producer's Peanut Co., Inc.
		WASHINGTON (91)
B.	Grandview	Safeway Stores, Inc., Brookside Div.
S.R.	Seattle	Crescent Mfg. Co.
B.	"	Pacific Food Products Co.
R.	"	Pacific Fruit & Produce Co.
C.	"	Rogers Candy Co.
C.	"	Societe Candy Co.
C.	"	Vernells Fine Candies
R.	Spokane	Pacific Fruit & Produce Co.
S.R.	"	Powers Candy & Nut Co.

Symbol	Location	Name
		WASHINGTON (91) Continued
S.R.	Spokane	Triangle Nut House
S.B.R.	Tacoma	Adams Food, Inc.
C.	"	Brown & Haley Candy Co.
		WISCONSIN (35)
S.R.	Brookfield	A. E. Schutzman Co.
C.	Cambridge	Melster Candy Co.
C.S.	Milwaukee	Buddy Squirrel's Nut Shops, Inc.
S.	"	Jack Gronik Co.
R.	"	J. H. Stapleton Co.
C.	"	Geo. Ziegler Co.
S.B.R.	Waukesha	Jewett & Sherman Co.

1/ Product breakdown not available; included in consolidated report from main office.

C. - Candy
S. - Salted
B. - Peanut Butter - Includes Peanut Butter Sandwiches
O. - Other
R. - Roaster

UNITED STATES DEPARTMENT OF AGRICULTURE
STATISTICAL REPORTING SERVICE
AGRICULTURAL ESTIMATES DIVISION
WASHINGTON, D. C. 20250

September 1971

LIST
Peanut Millers (Shellers and Crushers) Reporting Operations
1970-71 Season

Symbol	Location	Name
	ALABAMA (63)	
S.	Andalusia	Anderson's Peanuts
S.	Columbia	Dothan Oil Mill Co.
S.-C.	Dothan	Dothan Oil Mill Co.
S.	Enterprise	Enterprise Oil Co.
S.-C.	Enterprise	Sessions Co., Inc.
S.-C.	Eufaula	Eufaula Cotton Oil Co.
S.	Eufaula	Reeves Peanut Co.
S.	Hartford	Anderson's Peanuts
S.	Headland	Dothan Oil Mill Co.
S.	Luverne	Anderson's Peanuts
S.	Newton	Newton Warehouse Co.
S.	Opp	Anderson's Peanuts
S.	Ozark	Columbian Peanut Co.
S.	Red Level	Foshee Milling Co.
S.	Samson	Brooks Peanut Co.
S.	Troy	Alabama Warehouse Co., Inc.
S.	Troy	Thompson Co., Inc.
	CALIFORNIA (93)	
C.	Norwalk	Liberty Vegetable Oil Co.
S.	San Francisco	Earl Fruit Co.
	FLORIDA (59)	
S.	Cottondale	Gilbert Peanut Mill
S.-C.	Graceville	Gold Kist Peanuts
S.	Greenwood	Pender Peanut Corporation
S.	High Springs	Florida Peanut Co.
	GEORGIA (58)	
S.-C.	Albany	Albany Oil Mill, Inc.
S.	Americus	McCleskey Mill, Inc.
S.-C.	Arlington	Arlington Oil Mills
S.	Ashburn	H. C. Williams & Son Peanut Co
S.	Ashburn	Gold Kist Peanuts
S.	Bainbridge	Columbian Peanut Co.

Symbol	Location		Name
		GEORGIA (58) Continued	
S.	Blakely		Blakely Peanut Co.
S.	Blakely		Farmers Gin & Warehouse Co.
S.	Cairo		Cairo Peanut Co.
S.-C.	Camilla		Camilla Cotton Oil Co.
S.	Colquit		Farmers Fertilizer & Milling Co.
S.	Colquit		Fudge Gin Company
S.	Columbus		Tom's Foods Ltd.
S.	Cordele		Gold Kist Peanuts
S.	Cordele		Southern Cotton Oil Div. Hunts Food & Industries, Inc.
S.-C.	Dawson		Dawson Cotton Oil Co. (Steven's Ind.)
S.	Donalsonville		Planters Products Co.
S.	Dublin		Southern Peanut & Storage Co.
S.	Edison		Farmers Gin Co.
S.	Fitzgerald		Dixie Peanut Co.
S.	Fort Gaines		Columbian Peanut Co.
S.	Leary		Harvey Peanut Co.
S.	Leesburg		Cannon Bros. Peanut Co., Inc.
S.	Leesburg		Leesburg Peanut Co.
S.	Leslie		Leslie Peanut & Gin Co. Inc.
S.	Lumpkin		The Singer Co.
S.	Matthews		Barrow & Prescott, Inc.
S.	McRae		The Southern Cotton Oil Co., Inc.
S.-C.	Moultrie		Gold Kist Peanuts
S.	Ocilla		Gray Storage & Dryer Co., Inc.
S.	Ocilla		Weaver Milling Co.
S.	Pelham		Columbian Peanut Co.
S.	Pelham		Pelham Oil & Fertilizer Co.
S.	Quitman		R.L. Cunningham & Sons, Inc.
S.	Sasser		Sasser Seed Shellers
S.	Shellman		Columbian Peanut Co.
S.	Statesboro		Gold Kist Peanuts
S.	Sylvania		Sylvania Peanut Co.
S.	Sylvester		Houston Peanut Co.
S.	Tifton		Gold Kist Peanuts
S.	Waynesboro		Burke County Peanut Co.
S.	Cordele		Williams Peanut Co.
S.	Rochelle		Doster's Bonded Whse.
		NEW MEXICO (85)	
S.	Floyd		Sundale Valley Peanut Growers
S.	Portales		Borden Peanut Co.
S.-C.	Portales		Portales Valley Mills, Inc.
S.	Portales		Randolph Peanut & Grain Co.
S.	Portales		Spra-Green Peanut Co.
S.	Portales		Williams Peanut Co.
		NORTH CAROLINA (56)	
S.	Ahoskie		Columbian Peanut Co.
S.	Aulander		Planters Peanuts (Div. of Standard Brands, Inc.)

Symbol	Location	Name

NORTH CAROLINA (56) (Continued)

Symbol	Location	Name
S.	Battleboro	M. C. Braswell Co.
S.	Bladenboro	Eastern Carolina Peanut
S.	Chadbourn	Jones Peanut Co.
S.	Edenton	Fisher Nut Co.
S.	Elizabethtown	Columbian Peanut Co.
S.	Enfield	Columbian Peanut Co.
S.	Greenville	Keel Peanut Co.
S.-C.	Rocky Mount	Southern of Rocky Mount
S.	Scotland Neck	Columbian Peanut Co.
S.	Severn	Severn Peanut Co.
S.	Tarboro	Columbian Peanut Co.
S.	Williamston	Dixie Peanut Co.
S.	Williamston	Williamston Peanut Co., Inc.
S.-C.	Wilson	Farmers Cotton Oil Co.
S.	Windsor	Gillam Bros. Peanut Shellers,Inc.
S.	Dublin	Peanut Processors

OKLAHOMA (73)

Symbol	Location	Name
S.	Anadarko	Gold Kist Peanuts
S.	Durant	DeLeon Peanut Company
S.-C.	Durant	Gold Kist Peanuts
S.	Madill	The Clint Williams Co., Inc.
S.-C.	Shawnee	Shawnee Processors, Inc.

SOUTH CAROLINA (57)

Symbol	Location	Name
S.-C.	Marion	Marion Cotton Oil Co.

TEXAS (74)

Symbol	Location	Name
S.	Abilene	E.L. Ganey Peanut Co.
S.-C.	Abilene	Paymaster Oil Mill Co.
S.-C.	Brady	Brady Mills, Inc.
S.	Comanche	Gold Kist Peanuts
S.	DeLeon	DeLeon Peanut Company
S.	Denison	Denison Peanut Company
S.-C.	Fort Worth	Chickasha Cotton Oil Co.
S.	Fredericksburg	Quality Peanut Company, Inc.
S.	Giddings	Lee County Peanut Company
S.-C.	Gorman	Gorman Peanuts
S.	San Antonio	Wilson County Peanut Company
S.	San Antonio	Gorman Peanuts Bain Div.
S.	Tyler	Woldert Peanut Co. (Dublin Plt)
S.	Ranger	Gorman Peanuts Ranger Div.
S.	Houston	Gorman Peanuts, Hou - Tex Div.

Symbol	Location	Name
	VIRGINIA (54)	
S.	Courtland	Hancock Peanut Company
S.	Franklin	Birdsong Storage Co., Inc.
S.	Suffolk	Birdsong Storage Co., Inc.
S.	Suffolk	Lummis & Company
S.	Suffolk	Parker Peanut Company
S.-C.	Suffolk	Planters Peanuts (Div. of Standard Brands, Inc.)
S.	Suffolk	Pond Bros. Peanut Co., Inc.
C.	Suffolk	Suffolk Oil Mill
S.	Suffolk	Gold Kist Peanuts
S.	Suffolk	Gold Kist Peanuts Plant #2
S.	Wakefield	Columbian Peanut Co.

****

S. - Sheller

C. - Crusher

Appendix Table B-5. Per capita consumption of peanuts, United States, 1950 - 1971

Year	Peanuts [a]/	Year	Peanuts [a]/
	pounds		pounds
1950	4.5	1961	4.9
1951	4.6	1962	4.9
1952	4.4	1963	5.0
1953	4.4	1964	5.3
1954	4.2	1965	5.6
1955	4.1	1966	5.5
1956	4.4	1967	5.7
1957	4.5	1968	5.8
1958	4.5	1969	5.9
1959	4.7	1970	5.9
1960	4.9	1971	6.0

[a]/ Shelled basis.

Source: U. S. Department of Agriculture, Food Consumption Prices Expenditures, Supplement to Agricultural Economic Report No. 138, Economic Research Service, 1972.