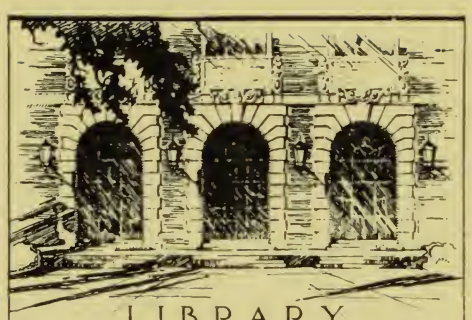

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THE LIVESTOCK FEED-MEAT BALANCE IN THE ST. LOUIS TRADE TERRITORY

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CONTENTS

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The Livestock Feed-Meat Balance in the St. Louis Trade Territory

Emer E. Broadbent, Royce A. Hinton, and Carlos Vender Droguett[1]

Representatives of the livestock and meat industry in the St. Louis trade territory have been increasingly concerned about the declining terminal livestock receipts and slaughter and the changing distribution channels for meat. The abandonment of packing facilities and the redirection of flow of livestock and meat have modified the marketing structure. The University of Illinois, Southern Illinois University, and the University of Missouri were asked to evaluate basic changes and trends in livestock marketing as they related to the production and flow of livestock and meat and the use of feed resources.

The purpose of the study was to develop information about the changes in production and marketing that would help clarify the possibilities of expanding the livestock-meat business in the St. Louis trade territory. The territory consists of 49 counties in southwestern Illinois and 62 counties in eastern Missouri (Fig. 1). The St. Louis livestock market is the dominant market force in the area. Counties with the primary direction of flow toward St. Louis were designated as the primary trade area. Counties which patronize St. Louis market firms more than others but which also look to other markets were classified as the secondary trade area.

This study recognizes that the St. Louis trade territory cannot be isolated from the influence of the flow of agricultural products beyond the territory and that many other segments of agriculture are important in the territory. However, it is limited to an evaluation of the livestock feed-meat balance that has developed over the past quarter century in the St. Louis area.

SOURCES OF DATA

The basic data for this study were obtained mostly from the 1939, 1949, and 1959 censuses of agriculture. Additional data were obtained from statistical bulletins published by the Agricultural Marketing Service and the Economic Research Service, both of the U.S. Department

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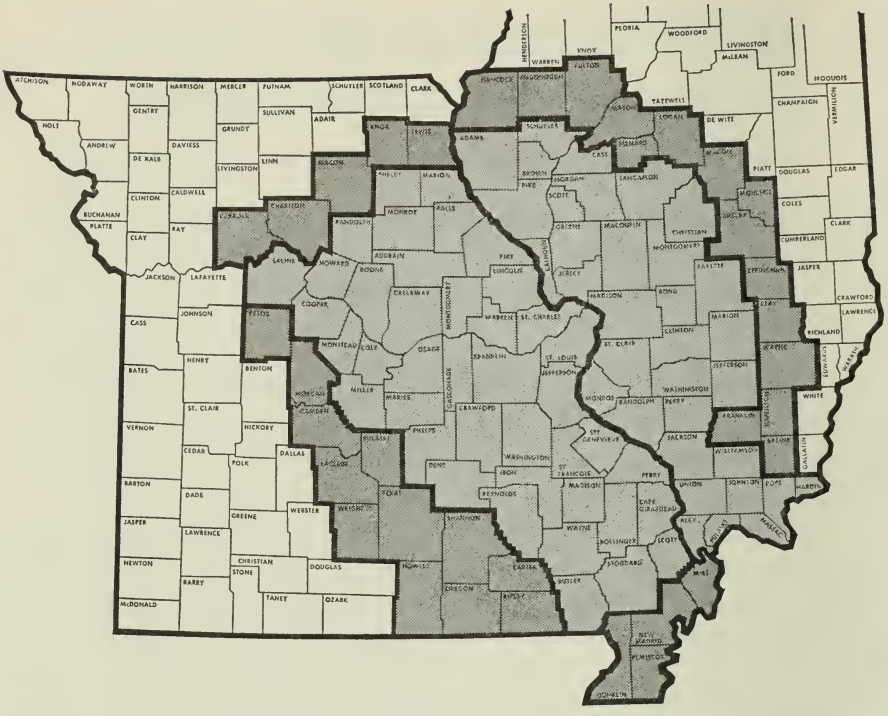


The St. Louis trade territory. Primary areas of the territory are shown in the lighter shading, secondary areas in the darker. (Fig. 1)

of Agriculture, and by the Illinois Cooperative Crop Reporting Service. Summaries of farm records from the University of Illinois Department of Agricultural Economics (Projects 301 and 302) provided supporting data on farm production practices and resource needs. Data on the flow of livestock and meat were obtained for 1963 through interviews with and questionnaires from the National Stock Yards Company, major packers, chain-store organizations, and meat wholesalers in the St. Louis market area.

Gathering data from the above sources involved several complex and tedious procedures. An explanation of methods used may be found in *A Market Evaluation and Determination of the Livestock Feed-Meat Supply Balance in the St. Louis Trade Territory,* an unpublished Master's thesis by Carlos Vender Droguett, University of Illinois, 1964. Interested persons may also direct questions to the authors by writing them at the University of Illinois, Department of Agricultural Economics, Urbana.

Table 1. — Meat Requirements Needed to Satisfy the St. Louis Market Trade Territory, 1939, 1949, 1959, and 1969 Projected[a]

	1939	1949	1959	1969 projected[b]	
				15% increase	20% increase
			(millions)		
Population	3.1	3.2	3.7	4.3	4.5
Meat					
Beef, lb	170.5	207.6	302.0	390.7	407.6
Veal, lb	23.7	28.9	21.2	22.2	23.2
Lamb and mutton, lb	20.6	13.3	17.8	19.2	20.0
Pork, lb	201.7	219.9	251.0	277.5	289.6
Total red meat, lb	416.5	469.7	592.2	709.6	740.4
Lard, lb	39.6	38.3	32.7	31.2	32.5
Total meat and lard, lb	456.1	508.1	624.8	740.8	773.0
Total poultry, lb	51.7	74.4	130.7	166.1	173.3

[a] Calculated by multiplying population times U.S. average rates of consumption per capita as reported by USDA. See Appendix Table 1 for data on per capita consumption.
[b] Assuming U.S. meat consumption per person equal to 1963 rate.

CHANGES IN CONSUMPTION AND PRODUCTION OF MEAT

Consumption and production of the classes of carcass meat were estimated for the trade territory for 1939, 1949, and 1959. The summaries in the tables of this report include data for the total St. Louis trade territory, for the primary and secondary areas, and for the Illinois and Missouri parts of the trade territory.

Consumption of Meat

The amount of red meat consumed in the trade territory increased by nearly half from 1939 to 1959, while the amount of poultry consumed more than doubled. These increases were partly caused by increases in population and partly by changes in food-consumption patterns. In 1959 population of the St. Louis trade territory was 3.7 million, an increase of 19 percent over the 1939 figure (Table 1). The population increased only 6 percent in the Illinois part of the territory, while it increased 32 percent in the Missouri part.

Per capita consumption of red meat and poultry increased from 1939 to 1963 (Appendix Table 1). Consumption of red meat increased from 133.6 pounds per person in 1939 to 159.5 pounds in 1959 and 169.3 pounds in 1963. The major increase was for beef: per capita consumption was 54.7 pounds in 1939, 63.9 in 1949, 81.4 in 1959, and 94.2 in 1963. Pork consumption increased from 64.7 pounds in 1939 to

79.5 pounds in 1944, but decreased to 67.7 in 1949 and 65.3 in 1963. Consumption of poultry meat increased steadily from 16.6 pounds in 1939 to 37.5 pounds in 1963.

Meat requirements for 1969 were projected on the basis of a 15- and 20-percent increase over the 1959 population figure and the 1963 rates of meat consumption (Table 1). If population continues to increase as it has, there will be over 4 million people in the St. Louis trade territory by 1969. An increasing rate of per capita meat consumption similar to that of the past ten years means an even greater demand for meat.

Production of Meat

Production of all carcass meat for the trade territory is given in Tables 2 and 3. Total production of red meat increased 77 percent from 1939 to 1959. Production increased more in the primary area (84 percent) than in the secondary area (64 percent). In the Illinois part of the trade territory production increased 83 percent, while in the Missouri part it increased 70 percent.

Pork production showed the greatest absolute and relative increase. There were 473 million more pounds of pork in 1959 than in 1939 — an increase of 91 percent. Beef increased 289 million pounds (68 percent) and poultry increased 26 million pounds (46 percent). Increases in beef production were uniform throughout the trade territory. Pork production increased more in the primary area (104 percent) than in the secondary area (67 percent). The Illinois part of the territory had a 101-percent increase in pork production, while the Missouri part had a 77-percent increase. Poultry production increased more in the secondary area (71 percent) than in the primary area (34 percent). In the Missouri part of the territory there was a 96-percent increase in poultry production. Production in the Illinois part decreased 15 percent.

Not all of the carcass meat marketed was produced in the trade territory. Some of the livestock marketed from feedlots was imported feeder stock, but it was not possible to discover the actual number. Table 4 indicates the relation of inshipments of livestock to the marketing of livestock for the whole states of Illinois and Missouri for 1939, 1949, and 1959. A significant portion of the beef and lamb and mutton marketed was made up of imported feeder stock. Only a small amount of the pork marketed was produced outside the area.

Meat Balance

Meat balance is production less consumption requirements (Tables 2 and 3). In 1939 there was a surplus of all classes of meat in the trade territory. The surplus of total red meat increased. From 1939 to 1959

Table 2. — Meat Requirements,[a] Production,[b] and Balance for the St. Louis, Primary, Secondary, Illinois, and Missouri Trade Territories, 1939, 1949, and 1959 (1,000,000 pounds of carcass meat)

	1939			1949			1959		
	Req.	Prod.	Balance	Req.	Prod.	Balance	Req.	Prod.	Balance
St. Louis trade territory									
Beef and veal	194	426	232	236	519	283	323	715	392
Pork (excl. lard)	202	521	319	220	727	507	251	994	743
Pork (incl. lard)	241	653	412	258	912	654	284	1,246	962
Lamb and mutton	21	29	8	13	25	12	18	21	3
Total red meat	416	976	560	470	1,272	802	592	1,730	1,138
Poultry	52	57	5	74	57	−17	130	83	−47
Primary area									
Beef and veal	140	286	146	177	347	170	250	481	231
Pork (excl. lard)	146	338	192	164	490	326	195	690	495
Pork (incl. lard)	174	424	250	193	615	422	220	865	645
Lamb and mutton	15	19	4	10	16	6	14	13	*
Total red meat	301	644	343	351	853	502	459	1,184	725
Poultry	37	38	1	56	40	−16	101	52	−49
Secondary area									
Beef and veal	54	140	86	60	173	113	73	234	161
Pork (excl. lard)	56	182	126	55	236	181	56	303	247
Pork (incl. lard)	67	229	162	65	296	231	64	381	317
Lamb and mutton	6	9	3	3	8	5	4	8	4
Total red meat	115	332	217	118	418	300	133	546	413
Poultry	14	18	4	18	17	−1	29	31	−2
Illinois trade territory									
Beef and veal	102	221	119	121	261	140	154	364	210
Pork (excl. lard)	106	302	196	122	406	294	119	606	487
Pork (incl. lard)	127	379	252	132	510	378	135	760	625
Lamb and mutton	11	11	*	7	8	1	8	10	2
Total red meat	219	534	315	240	676	436	281	979	698
Poultry	27	25	−2	38	24	−14	62	22	−40
Missouri trade territory									
Beef and veal	92	205	113	116	259	143	170	352	182
Pork (excl. lard)	96	219	123	107	320	213	132	388	256
Pork (incl. lard)	114	274	160	126	402	276	149	486	337
Lamb and mutton	10	18	8	7	17	10	9	10	1
Total red meat	197	442	245	230	596	366	311	751	440
Poultry	25	32	7	36	33	−3	69	62	−7

[a] Calculated by multiplying population times U.S. per capita consumption rates as reported by USDA.
[b] Calculated by multiplying number of each species of livestock sold as reported in agricultural census adjusted to the Crop Reporting Service's estimate of total marketings times the average carcass weight. See Appendix Tables 2, 3, and 4. * Less than 1,000,000 pounds.

the production of red meat increased by 77 percent, while the consumption of red meat increased only 42 percent. In 1959 the surplus of red carcass meat in the territory was over one billion pounds. This was double the amount needed for all consumers in the territory and was greater than the total production in 1939. The Illinois part of the trade territory contributed 698 million pounds of carcass meat to the 1959 surplus of red meat, while the Missouri part supplied 440 million

Table 3. — Index of Meat Requirements, Production, and Balance for the St. Louis, Primary, Secondary, Illinois, and Missouri Trade Territories, 1949 and 1959

	1949			1959		
	Requirements	Production	Balance	Requirements	Production	Balance
			(index 1939 = 100)			
St. Louis trade territory						
Beef and veal	122	122	122	167	168	169
Pork (excl. lard)	109	140	159	124	191	233
Pork (incl. lard)	107	140	159	118	191	234
Lamb and mutton	65	85	136	87	72	35
Total red meat	113	130	143	142	177	203
Poultry	144	100	*	253	146	*
Primary area						
Beef and veal	126	121	116	179	168	158
Pork (excl. lard)	113	145	169	133	204	257
Pork (incl. lard)	111	145	169	127	204	258
Lamb and mutton	67	83	136-	93	67	*
Total red meat	117	133	146	152	184	211
Poultry	149	103	*	271	134	*
Secondary area						
Beef and veal	111	123	131	135	167	187
Pork (excl. lard)	99	130	143	101	167	196
Pork (incl. lard)	97	130	143	96	166	196
Lamb and mutton	59	90	182	70	80	127
Total red meat	102	126	138	115	164	190
Poultry	131	94	*	205	171	*
Illinois trade territory						
Beef and veal	118	118	117	150	164	176
Pork (excl. lard)	115	135	150	112	201	249
Pork (incl. lard)	104	135	150	106	201	248
Lamb and mutton	63	75	633	78	91	709
Total red meat	110	126	138	128	183	222
Poultry	140	95	*	228	85	*
Missouri trade territory						
Beef and veal	126	126	127	184	172	161
Pork (excl. lard)	113	146	173	138	177	208
Pork (incl. lard)	110	146	172	131	177	210
Lamb and mutton	67	92	122	96	60	16
Total red meat	116	135	150	158	170	180
Poultry	148	105	*	280	196	95

* Negative balance.

Table 4. — Inshipments of Livestock in Illinois and Missouri

	Illinois			Missouri		
	Marketings	Inshipments	Inshipments as % of total marketings	Marketings	Inshipments	Inshipments as % of total marketings
Cattle and calves	(1,000 head)			(1,000 head)		
1939	1,524	763	50.0	1,189	430	36.1
1949	1,801	995	55.2	1,568	503	32.0
1959	2,199	1,308	59.4	1,724	359	20.8
Hogs						
1939	5,596	90	1.6	3,592	53	1.4
1949	7,914	67	.8	4,953	61	1.2
1959	11,236	270	2.4	5,767	56	1.0
Sheep and lambs						
1939	891	531	59.5	1,151	429	37.2
1949	605	329	54.3	1,031	302	29.2
1959	742	345	46.4	679	155	22.8

pounds. The surplus was not uniform for all types of red meat. Nearly 85 percent of it was made up of pork and lard.

In 1939 there was a surplus of poultry meats in the trade territory; in 1959 there was a deficit. Production increased by nearly half, but consumption requirements increased by two and a half. The deficit in the Illinois part of the territory has been increasing because the consumption of poultry is increasing and the production decreasing. Production doubled in the Missouri part from 1949 to 1959, but there was a deficit by 1959 because of the increasing population and rate of poultry consumption.

Even at current levels of production, the surplus is more than adequate to meet the total quantity of the red meat requirements projected for 1969. The surplus may not be adequate to meet the quality of meat demanded, however, unless there is a willingness to produce higher quality meat. The demand for poultry has been greater than the increase in poultry production has been able to meet. More poultry will have to be imported to satisfy market needs.

CHANGES IN PRODUCTION OF CROPS AND UTILIZATION OF FEEDS BY LIVESTOCK

Information on the livestock feed balance (that is, the relation between feed production and its utilization by livestock) is basic for planning by the livestock industry.

Production of Major Crops and Feeds for Livestock

Total crop production in the St. Louis trade territory increased greatly from 1939 to 1959. Table 5 gives acreage, per acre yields, and total production of the major grain and forage crops. Grain production increased mainly because of greater yields per acre and partly because of greater acreage planted. Corn production increased more than 74 percent with only 21 percent more acreage. On the other hand, soybean production increased because of an extraordinary increase in acreage. In 1939 there were about 764,000 acres in soybeans in the trade territory. In 1959 there were about 3,997,000 acres — an increase of 423 percent. Soybean yields, however, increased only 4.4 percent. Both acreage and total production of oats decreased from 1939 to 1959. Production of other small grains essentially remained the same.

Total production of harvested forage increased but the acreage decreased. Hay production decreased 13.6 percent, while silage production increased more than 300 percent. Total acreage pastured decreased 30.3 percent from about 15,773,000 to 10,379,000 acres. Production and use of grain silages have increased despite unharvested hay and pasture crops.

The supply of major protein supplements also increased (Table 6). This protein supply was available from soybean meal, meat scraps and tankage, and cottonseed meal and cake produced in the area. In 1959 urea was included as a source of protein because of its increasing importance in rations for ruminants. Other secondary protein sources were not included.

Livestock Feed Consumption

Livestock numbers reported in the Census and feed-consumption coefficients were used to estimate the amount of feed used by livestock. Livestock inventory numbers are given in Table 7. The total number of cattle and hogs increased. Hog numbers showed the greatest absolute and relative gain; they increased more in the Illinois part of the trade territory than in the Missouri part. Cattle numbers increased uniformly throughout the territory. The number of sheep and lambs decreased as did the number of horses and mules. Chickens 4 months old and older also decreased. Production of broilers and other chickens increased, however. The Illinois part of the territory showed a decline in both chickens 4 months old and older and in broilers. The Missouri part showed a decline in chickens 4 months old and older and an increase in broilers and other chickens.

Table 5. — Acreage, Acre Yields, and Production in the St. Louis Trade Territory

	1939			1949			1959		
	1,000 acres	Acre yield (bu. or T.)	Production (1,000 bu. or T.)	1,000 acres	Acre yield (bu. or T.)	Production (1,000 bu. or T.)	1,000 acres	Acre yield (bu. or T.)	Produc tion (1,000 bu. or T
Corn									
Primary area	2,856	38.8	110,701	3,127	43.0	134,594	3,569	54.5	194,51
Secondary area	1,722	40.2	69,217	1,827	45,7	83,572	1,959	60.6	118,83
Trade territory	4,579	39.3	179,919	4,955	44.0	218,166	5,528	56.7	313,35
Soybeans									
Primary area	366	22.0	8,046	1,386	23.7	32,812	2,391	23.5	56,10
Secondary area	399	23.6	9,423	908	24.4	22,183	1,615	24.1	38,96
Trade territory	764	22.8	17,470	2,274	24.2	54,994	3,997	23.8	95,06
Wheat									
Primary area	1,790	19.4	34,827	1,651	20.3	33,465	1,320	26.2	34,54
Secondary area	599	19.1	11,472	578	20.6	11,884	577	25.1	14,48
Trade territory	2,389	19.4	46,299	2,228	20.4	45,349	1,897	25.8	49,02
Oats									
Primary area	840	24.4	20,521	812	29.3	23,780	353	27.5	9,70
Secondary area	468	26.4	12,335	588	32.8	19,313	263	31.7	8,33
Trade territory	1,308	25.1	32,856	1,400	30.8	43,093	616	29.3	18,04
Barley									
Primary area	74	25.8	1,923	43	25.0	1,076	115	26.6	3,06
Secondary area	26	19.3	495	8	19.4	150	23	24.2	58
Trade territory	100	26.6	2,418	51	25.2	1,226	138	26.0	3,59
Rye									
Primary area	37	12.2	450	29	12.3	355	29	17.5	49
Secondary area	31	12.2	374	22	12.6	271	25	12.4	62
Trade territory	68	17.5	499	50	18.3	464	54	17.9	96
Hay[a]									
Primary area	1,863	1.2	2,339	1,569	1.4	2,202	1,213	1.6	1,93
Secondary area	1,049	1.1	1,118	874	1.2	1,091	689	1.5	1,05
Trade territory	2,912	1.2	3,457	2,448	1.3	3,293	1,922	1.6	2,98
Silage[b]									
Corn									
Primary area	.....	....	245	.....	....	420	.....	....	1,01
Secondary area	.....	....	88	.....	....	135	.....	....	38
Trade territory	.....	....	333	.....	....	555	.....	....	1,38
Sorghum									
Primary area	.....	....	139	.....	....	59	.....	....	16
Secondary area	.....	....	62	.....	....	38	.....	....	11
Trade territory	.....	....	201	.....	....	97	.....	....	28
Land pastured									
Cropland									
Primary area	4,196	....	.....	2,365	....	.....	2,171	....	.....
Secondary area	2,301	....	.....	1,356	....	.....	1,168	....	.....
Trade territory	6,497	....	.....	3,721	....	.....	3,339	....	.....
Woodland[c]									
Primary area	2,745	....	.....	2,889	....	.....	2,573	....	.....
Secondary area	1,303	....	.....	1,702	....	.....	1,469	....	.....
Trade territory	4,048	....	.....	4,591	....	.....	4,043	....	.....
Other									
Primary area	3,314	....	.....	2,406	....	.....	1,911	....	.....
Secondary area	1,914	....	.....	1,225	....	.....	1,087	....	.....
Trade territory	5,228	....	.....	3,631	....	.....	2,997	....	.....
Total									
Primary area	10,255	....	.....	7,660	....	.....	6,655	....	.....
Secondary area	5,518	....	.....	4,283	....	.....	3,724	....	.....
Trade territory	15,773	....	.....	11,943	....	.....	10,379	....	.....

[a] Includes hay and hay equivalent.
[b] Acres of silage not reported separately.
[c] Data for woodland pastured in 1939 and for other land pastured in the Missouri area also in 1939 w not reported. Data for 1945 were used instead.

Table 6. — Supply of Major Protein Supplements in the St. Louis Trade Territory[a]

	Primary area			Secondary area			Total		
	1939	1949	1959	1939	1949	1959	1939	1949	1959
Illinois	(1,000 tons)			(1,000 tons)			(1,000 tons)		
Soybean meal	169	585	884	200	337	494	369	922	1,378
Livestock byproducts	13	15	30	7	7	15	20	22	46
Urea	...	...	7	...	...	4	...	...	12
Total	183	600	922	207	344	513	390	945	1,436
Missouri									
Soybean meal	9	148	374	9	161	383	19	310	758
Livestock byproducts	11	13	25	5	6	11	17	20	37
Urea	...	...	8	...	...	3	...	...	11
Cottonseed meal and cake	13	16	17	66	64	70	79	81	88
Total	34	179	426	81	232	468	116	411	895
St. Louis trade territory									
Soybean meal	179	734	1,258	210	498	877	389	1,232	2,136
Livestock byproducts	25	28	56	13	14	26	38	43	83
Urea	...	...	16	...	...	7	...	...	23
Cottonseed meal and cake	131	16	17	66	64	70	79	81	88
Total	217	779	1,349	289	577	982	507	1,356	2,332

[a] The supplies of soybean and cottonseed meal were the meal proportion of the annual production of grain and seed harvested less seed used. Livestock byproducts supply was estimated from ratio of total U.S. production to total live weight of livestock marketed and then prorated on basis of live weight of livestock production in the trade area. Supply of urea was the consumption of urea at the U.S. rate of use per unit of live weight of cattle, calves, and sheep sold. All supplements have been converted to a standard 44-percent content equivalent.

Coefficients of feed consumption per head of livestock reported on farms by the Census were developed from summaries of Illinois farm business records of feeds fed to livestock[1] and from experimental feeding standards. These coefficients were cross-checked with the estimates used by the USDA to reconcile total U.S. production with the disappearance of feeds.[2] The coefficients reflect both changes in kinds of livestock fed and changes in feeding practices. The cattle inventory, for example, included milk cows, milk heifers, beef cows, beef heifers, and beef steers. The feed for each type of cattle is different; the rations fed and the proportion of animals receiving grain have changed. The coefficients represent the weighted average annual ration fed this composite of cattle per head on hand at the date of the Census (Appendix Table 5).

Livestock Feed Balance

After determining the production of major feeds and the amount of feed required to produce the livestock, the net balance of each feed was determined for the St. Louis trade territory and its subdivisions (Tables 8-10).

[1] *Annual Report of the Illinois Farm Bureau Farm Management Service,* 24th-36th reports, 1948-1960, Univ. of Ill. Dept. Agr. Ec., and *Annual Summary of Illinois Farm Business Records,* 37th and 38th summaries, 1961 and 1962, Univ. of Ill. Coop. Ext. Serv. Circs. 853 and 874.

[2] Earl F. Hodges, *Consumption of Feed by Livestock, 1940-1959,* Prod. Res. Rep. 79, U.S. Dept. Agr., March, 1964.

Table 7. — Livestock Numbers in St. Louis Trade Territory, 1939, 1949, and 1959

	1939	1949	1959	1959 as % of 1939	1959 as % of 1949
	(1,000 head)				
Cattle and calves on hand					
Trade territory	2,053	2,474	2,985	145	121
Primary area	1,332	1,613	1,980	148	123
Secondary area	721	851	1,005	139	118
Illinois	891	1,054	1,276	143	121
Primary area	579	686	840	145	122
Secondary area	312	358	436	140	121
Missouri	1,162	1,420	1,709	147	120
Primary area	753	927	1,140	151	123
Secondary area	409	493	569	139	115
Hogs and pigs on hand					
Trade territory	2,353	4,244	5,654	240	133
Primary area	1,521	2,885	3,996	262	138
Secondary area	832	1,359	1,658	199	122
Illinois	1,189	2,348	3,180	267	135
Primary area	757	1,543	2,176	287	141
Secondary area	432	805	1,004	232	125
Missouri	1,164	1,896	2,474	212	131
Primary area	764	1,342	1,820	238	136
Secondary area	400	554	654	164	118
Sheep and lambs on hand					
Trade territory	814	673	518	64	77
Primary area	519	436	318	61	73
Secondary area	295	237	200	68	84
Illinois	238	226	245	103	108
Primary area	150	143	145	97	101
Secondary area	88	83	100	115	120
Missouri	576	447	273	47	61
Primary area	369	293	173	47	59
Secondary area	207	154	100	48	65
Chickens, 4 months and older, on hand					
Trade territory	18,614	16,184	11,007	59	68
Primary area	12,814	10,923	7,981	62	73
Secondary area	5,800	5,261	3,026	52	58
Illinois	8,719	8,034	5,860	67	73
Primary area	5,857	5,311	4,198	72	79
Secondary area	2,862	2,723	1,662	58	61
Missouri	9,895	8,150	5,147	52	63
Primary area	6,957	5,612	3,783	54	67
Secondary area	2,938	2,538	1,364	46	54
Broilers and other chickens sold					
Trade territory	11,463	12,891	19,619	171	152
Primary area	7,684	9,121	12,842	167	141
Secondary area	3,779	3,770	6,777	179	180
Illinois	5,494	5,821	4,097	74	70
Primary area	3,486	3,864	2,789	80	72
Secondary area	2,008	1,957	1,308	65	67
Missouri	5,969	7,070	15,522	260	220
Primary area	4,198	5,257	10,053	240	191
Secondary area	1,771	1,813	5,469	309	302
Horses and mules on hand					
Trade territory	672	361	83	12	23
Primary area	443	229	56	13	24
Secondary area	229	132	27	12	20
Illinois	320	162	32	10	20
Primary area	218	100	22	10	22
Secondary area	102	62	10	10	16
Missouri	352	199	51	14	26
Primary area	225	129	34	15	26
Secondary area	127	70	17	13	25

Table 8. — Livestock Feed Balance for the St. Louis Trade Territory

	Feed[a]	Feed consumption requirements: Cattle and calves	Hogs	Sheep and lambs	Poultry	Horses and mules	Total consumption requirements	Production	Surplus
		(1,000 bushels or tons)							
		Primary Area							
1939	Silage	367	.....	16	.....	.....	383	384	.....
	Corn	16,336	40,930	976	26,116	5,315	89,671	110,701	21,030
	Oats	8,749	.....	...	.....	5,315	14,064	20,521	6,457
	Protein	68	102	2	137	.....	309	217	91
	Roughages	4,273	128	776	.....	2,268	7,445	.....	.....
1949	Silage	469	.....	9	.....	.....	478	488	.....
	Corn	22,203	56,890	576	22,325	2,748	104,741	134,594	29,852
	Oats	10,279	.....	...	.....	2,748	13,026	23,780	10,754
	Protein	87	141	1	120	.....	349	780	430
	Roughages	4,127	178	404	.....	1,172	5,880	.....	.....
1959	Silage	1,173	.....	7	.....	.....	1,180	1,182	.....
	Corn	22,247	76,187	444	15,907	671	115,457	194,517	79,060
	Oats	6,253	.....	...	.....	671	6,925	9,708	2,783
	Protein	81	263	*	92	.....	436	1,350	913
	Roughages	4,751	203	324	.....	286	5,565	.....	.....
		Secondary Area							
1939	Silage	140	.....	9	.....	.....	149	150	.....
	Corn	8,988	21,750	517	11,922	2,760	45,938	45,718	23,280
	Oats	4,681	.....	...	.....	2,760	7,441	12,335	4,894
	Protein	37	54	*	63	.....	155	289	134
	Roughages	2,295	68	424	.....	1,178	3,964	.....	.....
1949	Silage	155	....	5	.....	.....	172	173	.....
	Corn	12,729	27,350	311	10,551	1,585	52,526	83,572	31,047
	Oats	5,612	.....	...	.....	1,585	7,197	19,313	12,117
	Protein	48	68	*	56	.....	163	577	414
	Roughages	2,528	85	219	.....	676	3,509	.....	.....
1959	Silage	487	.....	4	.....	.....	491	493	.....
	Corn	12,508	33,438	266	6,916	336	53,463	118,837	65,373
	Oats	3,737	.....	...	.....	336	4,072	8,335	4,263
	Protein	46	115	*	41	.....	203	983	780
	Roughages	2,821	89	198	.....	143	3,251	.....	.....
		Trade Territory							
1939	Silage	507	.....	25	.....	.....	532	534	.....
	Corn	25,323	62,680	1,493	38,038	8,075	135,609	179,919	44,310
	Oats	13,430	.....	...	.....	8,075	21,505	32,856	11,351
	Protein	106	156	3	199	.....	464	507	280
	Roughages	6,568	196	1,199	.....	3,445	11,409	.....	.....
1949	Silage	625	.....	13	.....	.....	638	652	.....
	Corn	34,933	84,240	887	32,875	4,331	157,267	218,166	60,899
	Oats	15,891	.....	...	.....	4,331	20,222	43,093	22,871
	Protein	134	209	2	176	.....	512	1,357	845
	Roughages	6,656	263	622	.....	1,848	8,640	.....	.....
1959	Silage	1,660	.....	11	.....	.....	1,671	1,676	.....
	Corn	34,754	109,625	709	22,823	1,007	168,920	313,354	144,433
	Oats	9,990	.....	...	.....	1,007	10,997	18,043	7,046
	Protein	127	378	1	133	.....	639	2,332	1,693
	Roughages	7,572	292	522	.....	430	8,816	.....	.....

Measures: Silage in tons, corn and oats in bushels, protein supplements in tons of 44 percent protein content, and hay and pasture in tons of hay equivalents.

[a] Silage includes corn and sorghum silage. Protein supplements include only proteins given as supplements, such as commerical protein supplements, soybean meal, meat scraps, urea, etc. (protein content of grains, silage, hay, and pastures is excluded). Roughages include hay and pastures.

* Less than 1,000.

Table 9. — Livestock Feed Balance in the Illinois St. Louis Trade Territory

	Feed[a]	Feed consumption requirements: Cattle and calves	Hogs	Sheep and lambs	Poultry	Horses and mules	Total consumption requirements	Production	Surplus
		(1,000 bushels or tons)							
		Primary Area							
1939	Silage	214	.....	5	.....	.....	219	220	.....
	Corn	7,344	22,459	327	11,458	2,611	44,120	69,555	25,355
	Oats	4,744	.....	...	.....	2,611	7,355	13,078	5,723
	Protein	34	56	*	60	.....	151	184	33
	Roughages	1,894	70	252	.....	1,114	3,331	.....	.....
1949	Silage	264	.....	3	.....	.....	267	267	.....
	Corn	9,688	30,260	195	10,463	1,201	51,807	89,946	38,138
	Oats	5,078	.....	...	.....	1,201	6,279	17,111	10,831
	Protein	40	75	*	56	.....	172	601	428
	Roughages	2,060	95	137	.....	513	2,804	.....	.....
1959	Silage	559	.....	3	.....	.....	562	563	.....
	Corn	10,158	43,980	207	7,500	267	62,112	124,159	62,047
	Oats	3,368	.....	...	.....	267	3,635	5,535	1,901
	Protein	40	152	*	40	.....	231	923	692
	Roughages	1,546	117	150	.....	114	1,927	.....	.....
		Secondary Area							
1939	Silage	66	.....	3	.....	.....	68	69	.....
	Corn	3,924	12,361	164	5,819	1,231	23,499	48,884	25,385
	Oats	2,323	.....	...	.....	1,231	3,554	8,145	4,591
	Protein	17	31	*	31	.....	78	207	129
	Roughages	971	39	129	.....	525	1,663	.....	.....
1949	Silage	79	.....	2	.....	.....	80	81	.....
	Corn	5,499	15,880	109	5,394	750	27,631	65,650	38,019
	Oats	2,359	.....	...	.....	750	3,109	15,275	12,166
	Protein	20	39	*	29	.....	88	345	257
	Roughages	1,020	50	77	.....	320	1,467	.....	.....
1959	Silage	175	.....	2	.....	.....	178	179	.....
	Corn	5,710	20,490	136	3,297	125	29,757	84,643	54,886
	Oats	1,162	.....	...	.....	125	1,287	6,710	5,423
	Protein	181	71	*	17	.....	106	514	407
	Roughages	1,150	55	95	.....	53	1,353	.....	.....
		Trade Territory							
1939	Silage	279	.....	8	.....	.....	287	289	.....
	Corn	11,268	34,820	491	17,278	3,842	67,699	118,439	50,740
	Oats	7,066	.....	...	.....	3,842	10,909	21,222	10,313
	Protein	51	87	*	91	.....	229	391	162
	Roughages	2,865	109	381	.....	1,639	4,994	.....	.....
1949	Silage	331	.....	5	.....	.....	336	348	.....
	Corn	15,186	46,140	304	15,857	1,951	79,438	155,596	76,158
	Oats	7,437	.....	...	.....	1,951	9,388	32,386	22,997
	Protein	60	115	*	85	.....	260	945	685
	Roughages	3,080	144	214	.....	833	3,521	.....	.....
1959	Silage	734	.....	5	.....	.....	739	742	.....
	Corn	15,868	64,470	343	10,797	392	91,869	208,802	116,933
	Oats	4,530	.....	...	.....	392	4,922	12,246	7,324
	Protein	58	222	*	57	.....	338	1,437	1,099
	Roughages	2,696	172	245	.....	167	3,280	.....	.....

Measures: Silage in tons, corn and oats in bushels, protein supplements in tons of 44 percent protein content, and hay and pasture in tons of hay equivalents.

[a] Silage includes corn and sorghum silage. Protein supplements include only proteins given as supplements, such as commercial protein supplements, soybean meal, meat scraps, urea, etc. (protein content of grains, silage, hay and pastures is excluded). Roughages include hay and pastures.

* Less than 1,000.

Table 10. — Livestock Feed Balance for the Missouri St. Louis Trade Territory

	Feed[a]	Feed consumption requirements: Cattle and calves	Hogs	Sheep and lambs	Poultry	Horses and mules	Total consumption requirements	Production	Surplus
		(1,000 bushels or tons)							
		Primary Area							
1939	Silage	153	.....	11	.....	.....	164	164	.....
	Corn	8,990	18,472	648	14,658	2,703	45,472	41,146	4,325
	Oats	4,006	.....	...	.....	2,703	6,709	7,443	734
	Protein	35	46	1	76	.....	158	34	124
	Roughages	2,379	58	524	.....	1,153	4,114	.....	.....
1949	Silage	205	.....	6	.....	.....	211	211	.....
	Corn	12,516	26,630	381	11,862	1,545	52,934	44,648	8,286
	Oats	5,201	.....	...	.....	1,545	6,746	6,669	77
	Protein	47	66	*	64	.....	177	179	2
	Roughages	2,067	83	267	.....	659	3,077	.....	.....
1959	Silage	615	.....	4	.....	.....	618	620	.....
	Corn	12,089	32,207	236	8,407	404	53,345	70,358	17,013
	Oats	2,885	.....	...	.....	404	3,290	4,172	882
	Protein	41	111	*	52	.....	205	427	222
	Roughages	3,205	86	174	.....	173	3,637	.....	.....
		Secondary Area							
1939	Silage	75	.....	6	.....	.....	81	81	.....
	Corn	5,064	9,389	354	6,103	1,529	22,438	20,334	2,105
	Oats	2,358	.....	...	.....	1,529	3,887	4,190	303
	Protein	21	23	*	32	.....	76	82	6
	Roughages	1,324	29	295	.....	652	2,301	.....	.....
1949	Silage	89	.....	3	.....	.....	92	92	.....
	Corn	7,231	11,470	202	5,157	835	24,894	17,922	6,972
	Oats	3,253	.....	...	.....	835	4,088	4,038	49
	Protein	28	29	*	27	.....	74	232	158
	Roughages	1,508	36	142	.....	356	2,042	.....	.....
1959	Silage	311	.....	2	.....	.....	314	314	.....
	Corn	6,798	12,948	130	3,619	211	23,706	34,194	10,487
	Oats	2,575	.....	...	.....	211	2,785	1,625	1,161
	Protein	28	45	*	24	.....	96	469	372
	Roughages	1,671	35	103	.....	90	1,898	.....	.....
		Trade Territory							
1939	Silage	228	.....	17	.....	.....	245	246	.....
	Corn	14,054	27,860	1,002	20,761	4,233	67,910	61,480	6,430
	Oats	6,364	.....	...	.....	4,233	10,596	11,634	1,037
	Protein	55	69	2	108	.....	234	116	118
	Roughages	3,704	87	819	.....	1,806	6,415	.....	.....
1949	Silage	294	.....	9	.....	.....	302	304	.....
	Corn	19,746	38,101	583	17,018	2,380	77,829	62,570	15,259
	Oats	8,454	.....	...	.....	2,380	10,834	10,708	127
	Protein	74	95	1	91	.....	252	411	160
	Roughages	3,576	119	409	.....	1,015	5,119	.....	.....
1959	Silage	926	.....	6	.....	.....	932	934	.....
	Corn	18,888	45,155	366	12,027	615	77,051	104,552	27,501
	Oats	5,460	.....	...	.....	615	6,075	5,797	278
	Protein	69	156	*	76	.....	302	895	594
	Roughages	4,876	120	277	.....	262	5,536	.....	.....

Measures: Silage in tons, corn and oats in bushels, protein supplements in tons of 44 percent protein content, and hay and pasture in tons of hay equivalents.

[a] Silage includes corn and sorghum silage. Protein supplements include only proteins given as supplements, such as commercial protein supplements, soybean meal, meat scraps, urea, etc. (protein content of grains, silage, hay, and pastures is excluded). Roughages include hay and pastures.

* Less than 1,000.

Overall, there is a tremendous surplus of grain and protein feed in the territory. The surplus of corn more than tripled from 1939, when it was about 44 million bushels, to 1959, when it was over 144 million bushels. In 1939 surplus production of high-protein feed supplements was about 280,000 tons; by 1959 it was 1,693,000 tons — more than 6 times the 1939 figure. The Illinois part of the territory accounted for 81 percent of the surplus corn and 65 percent of the surplus protein feed in the entire trade area.

There is also a surplus of forage feeds in the territory. Unharvested and unpastured permanent, rotation, and temporary pastures represent the true surplus of feed. Excess supplies of hay or silage correspond to losses or waste and are not true surplus. Estimates of surplus forage feeds were not available for the trade territory itself. They were available for the entire state of Illinois, however, and indicated a surplus of over 50 percent. According to a survey by the Illinois Crop Reporting Service, pasture land was also underutilized.[1]

In 1959 less use was made of hay and pasture despite an increase of forage-consuming animals in the territory. Grain and silage were substituted for hay and pasture in rations of both dairy and beef cattle. New techniques increased yields of grain crops relative to yields of forage crops, and the increase in aggregate production reduced the cost of grain nutrients relative to the cost of forage nutrients. This encouraged producers to feed grain to a greater proportion of cattle, to increase the amount of grain fed per animal, and to increase the production or market weight sold per animal.

The availability of forage in the area appears to offer an opportunity to expand the production of beef cows and feeder stock. Expansion will not occur, however, unless sufficiently large forage acreages are developed to support economic-sized units for beef production.[2]

CHANGES IN THE FLOW OF LIVESTOCK AND MEAT AND IN THE MARKETING STRUCTURE

Over time, the basic feed surpluses are mostly converted into livestock by many small producers. The livestock move to market through many kinds of outlets.

Changes in Concentration of Livestock Production

Although total volume of livestock marketed in the territory is sizable and increasing, production is widely dispersed and in fairly small concentrations. The average number of hogs, cattle and calves, and

[1] *Forage Use in Illinois,* 1956, Ill. Coop. Crop Rptg. Serv. Bul. 60-3.

[2] H. S. Woods and W. D. Buddemeier, *Increasing Production and Earnings on Farms with Beef-Cow Herds in the Unglaciated Area of Southern Illinois.* So. Ill. Univ. School of Agr. Pub. No. 6, 1959.

sheep and lambs marketed per 1,000 acres in counties of the St. Louis trade territory is shown in Figures 2, 3, and 4 for 1949 and 1959.

In 1959 the average number of livestock marketed per 1,000 acres was about 40 cattle and calves, 200 hogs, and 15 sheep and lambs. The areas of greatest concentration and greatest increase in marketings of all livestock were in the northern part of the trade territory. The number of cattle and calves marketed per 1,000 acres was the same in the Missouri and Illinois parts of the territory. More slaughter animals were included in the Illinois marketings. In 1959 hog concentration was 264 head in the Illinois part and 130 in the Missouri part. The increase in marketings was greater in Illinois than in Missouri. The concentration of sheep and lambs was very low. Since 1949 sheep marketings decreased one-third in the Missouri part of the territory.

Changes in the Flow of Livestock

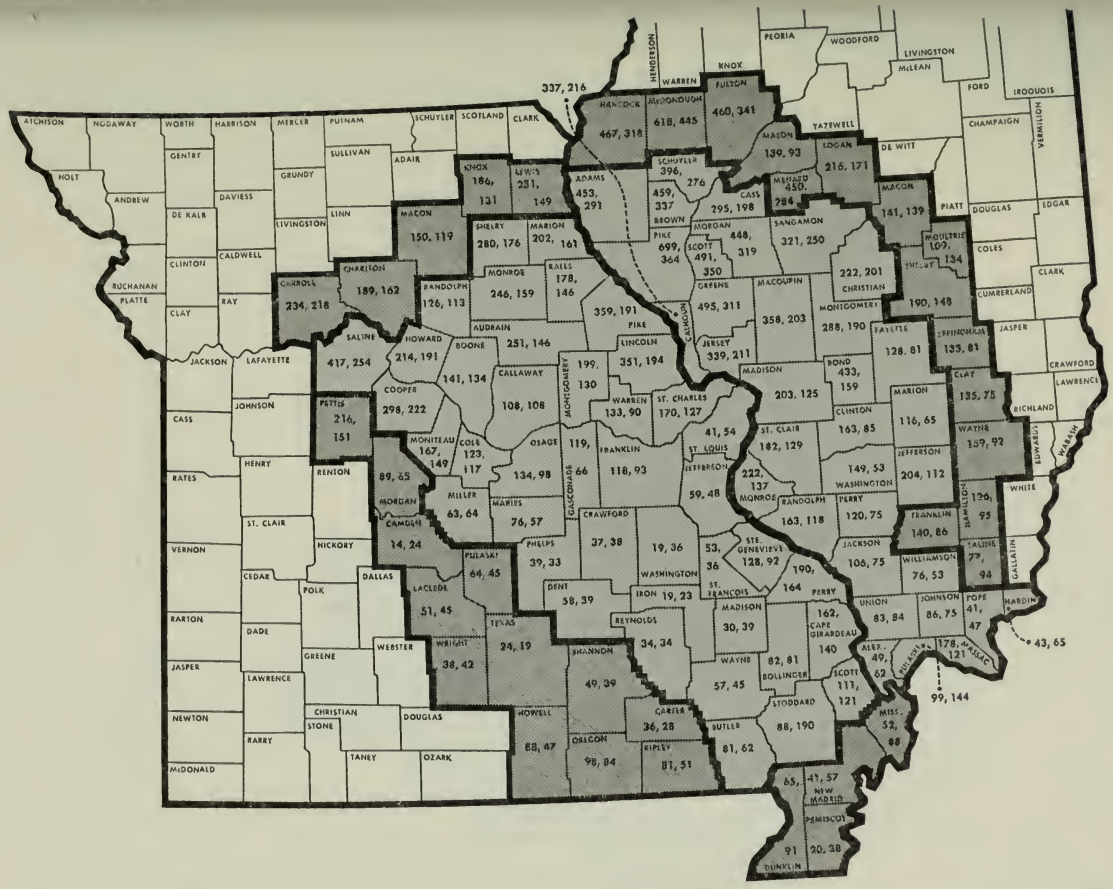
The major livestock market for the trade territory has been the National Stock Yards Company, located east of the Mississippi river adjacent to East St. Louis. This market is commonly referred to as the St. Louis terminal livestock market.

Salable receipts at the St. Louis terminals have not kept pace with increases in the total number of livestock produced and marketed in the trade territory (Table 11). From 1939 to 1959 total marketings of cattle and calves increased 29 percent, while salable receipts at terminals decreased 8 percent. Hog marketings increased 87 percent, salable receipts only 50 percent. Sheep and lamb marketings decreased 42 percent and salable receipts 58 percent.

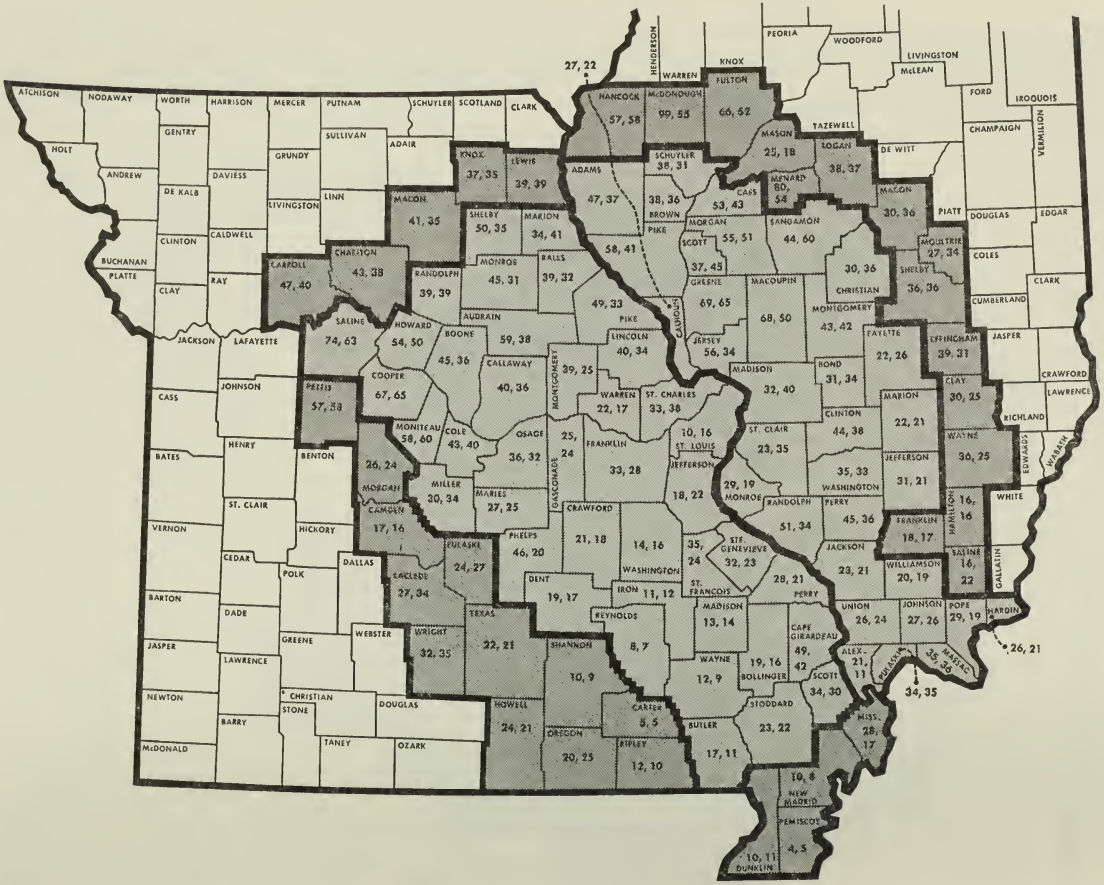
Before World War II, the volume of livestock in much of the trade territory was so sparse there was little incentive for private operations to develop local livestock marketing points. This situation has gradually changed, however. The packing industry has initiated direct (farm to packer) marketing throughout much of the area. Many small and a few large auctions and local country markets have developed to intercept the flow of livestock that formerly moved to the terminal market (Fig. 5).

The importance of other terminal markets has also declined. Table 12 shows the changes in salable receipts of cattle and hogs at the Peoria, Chicago, and St. Louis terminal markets for the period 1946-1963. It also shows the changes in total marketings of cattle and hogs for the United States, the east north-central states plus Iowa and Missouri, Illinois, and Missouri.

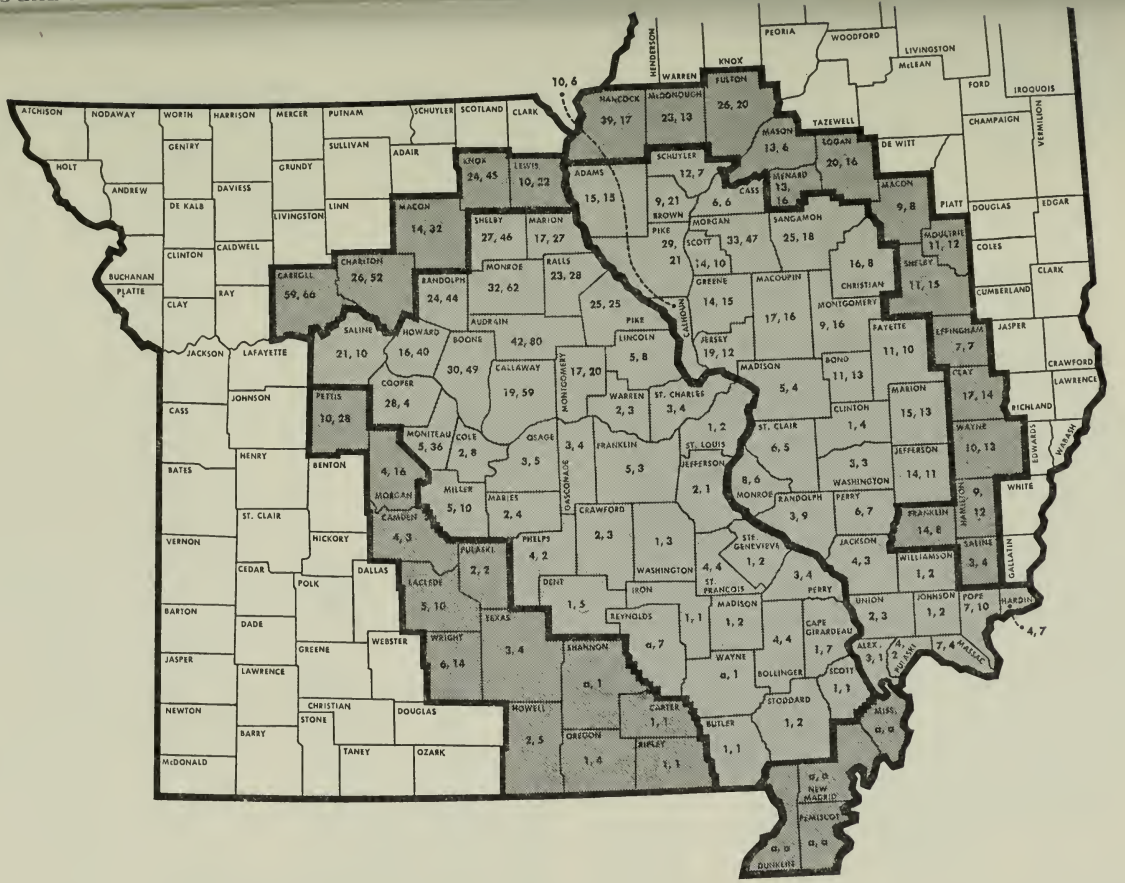
From 1946 to the mid-1950's annual salable receipts of cattle and hogs at terminal markets tended to vary with total marketings of live-



Hogs marketed per 1,000 acres in counties of the St. Louis trade territory. The first number is for 1959, the second for 1949. The 1959 averages for Illinois and Missouri were 264 and 130, respectively. The 1949 averages were 177 for Illinois and 112 for Missouri. (Fig. 2)



Cattle and calves marketed per 1,000 acres in counties of the St. Louis trade territory. The first number is for 1959, the second for 1949. The 1959 averages for Illinois and Missouri were 40 and 39, respectively. The 1949 averages were 36 for Illinois and 35 for Missouri. (Fig. 3)



Sheep and lambs marketed per 1,000 acres in counties of the St. Louis trade territory. The first number is for 1959, the second for 1949. The letter a represents less than one. The 1959 averages for Illinois and Missouri were 13 and 15, respectively. The 1949 averages were 12 for Illinois and 23 for Missouri. (Fig. 4)

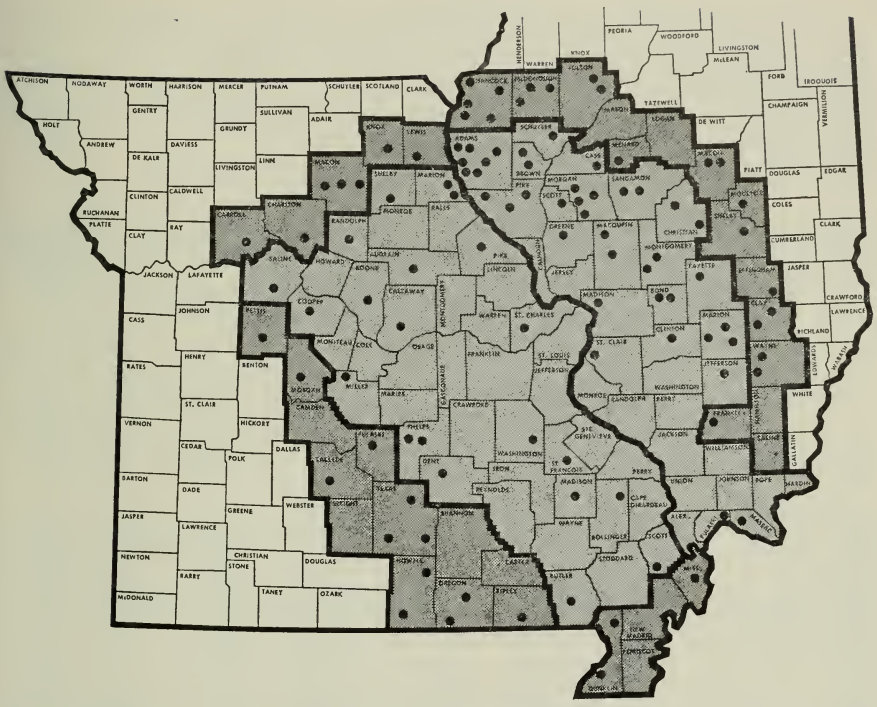
Table 11. — Salable Receipts at St. Louis Terminals,[a] Marketings From the St. Louis Trade Territory, and Marketings From Illinois and Missouri

	1939	1949	1959	1962
Cattle and calves				
Salable receipts	985,477	1,126,665	903,794	822,251
Marketings				
Trade territory	1,105,383	1,259,804	1,423,576	not avail.
Illinois and Missouri	2,712,934	3,368,977	3,923,000	3,934,000
Hogs				
Salable receipts	2,338,471	2,779,705	3,496,915	2,773,423
Marketings				
Trade territory	3,917,505	5,265,018	7,308,358	not avail.
Illinois and Missouri	9,178,401	12,834,291	17,004,836	17,233,000
Sheep and lambs				
Salable receipts	636,392	420,682	265,441	249,440
Marketings				
Trade territory	748,520	579,180	437,434	not avail.
Illinois and Missouri	2,040,541	1,635,281	1,421,841	1,148,000
	Indexes (1939 = 100)			
Cattle and calves				
Salable receipts	100	114	92	83
Marketings				
Trade territory	100	114	129	...
Illinois and Missouri	100	124	145	145
Hogs				
Salable receipts	100	119	150	119
Marketings				
Trade territory	100	134	187	...
Illinois and Missouri	100	140	185	188
Sheep and lambs				
Salable receipts	100	76	42	39
Marketings				
Trade territory	100	77	58	...
Illinois and Missouri	100	80	70	56

[a] Includes Mississippi Valley Stockyards and National Stock Yards.

stock in the United States, the east north-central states plus Iowa and Missouri, Illinois, and Missouri. Since 1956-57 salable receipts of cattle have steadily declined at the terminals, while total U.S. marketings have increased. Hog receipts, after reaching a peak in the mid-1950's, decreased on all terminal markets despite the increase in total marketings of hogs in the United States, Missouri, and Illinois.

The declining use of all terminals reflects the significant changes in the way livestock moves from producer to meat packer or processor. Farmers and packers have never used the terminals exclusively. More livestock today is marketed directly from farms to processors or through auctions and local markets. In 1962 the USDA Agricultural



Country livestock market outlets in the St. Louis trade territory, 1963. (Fig. 5)

Marketing Service reported these packers' livestock purchases through different market outlets:[1]

	Percent of total purchases by packers			
Type of outlet	*Cattle*	*Calves*	*Hogs*	*Sheep*
Direct, country dealers, etc.	38.6	31.0	59.6	49.4
Terminal markets	42.6	23.3	29.3	35.4
Auction markets	18.8	45.7	11.1	15.2

The extent of this change over time (1923, 1947, and 1962) is shown in the following table as the percent of total purchases of livestock by all U.S. packers from terminals.[2]

	Percent of total purchases by packers		
Type of livestock	*1923*	*1947*	*1962*
Cattle	90	76	43
Calves	86	61	23
Sheep and lambs	86	61	35
Hogs	76	37	29

[1] *Packers and Stockyards Resumé,* 1(7), Agr. Mktg. Serv., USDA, Dec. 1, 1963. The data include all packing firms purchasing more than 1,000 head of cattle or 2,000 head of small stock during the reporting period.

[2] *Financial Facts About the Meat Packing Industry,* American Meat Institute, Dept. of Mktg., 1962.

As a part of this trend in market flow, Armour's closed its total operations in St. Louis and Hunter's stopped slaughtering beef. Most other St. Louis packers indicated that if they were to rebuild facilities they would move to a more direct procurement system and relocate nearer the supply of surplus livestock.

Table 12. — Trends in Salable Receipts of Cattle and Hogs on the Peoria, Chicago, and St. Louis Terminal Markets and Total Marketings of Cattle and Hogs for the United States, the East North-Central States Plus Iowa and Missouri, Missouri, and Illinois, 1946-1963

	Salable receipts (1,000 head)			Total marketings (1,000 head)			
	Peoria	Chicago	St. Louis	U.S.	ENC,[a] Ia., Mo.	Mo.	Ill.
				Cattle			
1946	131	1,854	737	26,188	7,442	1,547	1,343
1947	140	1,994	1,002	26,995	8,142	1,556	1,567
1948	119	1,635	793	23,370	6,412	1,116	1,335
1949	122	1,798	734	23,281	6,763	1,053	1,442
1950	119	1,741	698	23,484	6,902	1,008	1,521
1951	110	1,591	622	22,638	6,454	922	1,387
1952	115	1,818	741	23,821	6,707	903	1,498
1953	134	2,265	978	28,242	8,567	1,276	1,860
1954	138	2,246	971	30,563	8,957	1,268	1,957
1955	145	2,260	901	33,530	13,074	1,362	2,078
1956	156	2,320	1,025	32,508	10,203	1,483	2,314
1957	147	2,366	980	32,915	10,401	1,483	2,314
1958	132	2,287	779	29,874	9,279	1,127	2,134
1959	113	2,207	740	32,130	9,602	1,308	2,096
1960	107	2,095	806	34,429	9,927	1,304	2,199
1961	96	1,917	744	35,177	9,695	1,250	2,080
1962	108	1,659	708	36,339	10,026	1,384	2,092
1963	106	1,605	651	37,787	8,897	1,342	2,133
				Hogs			
1946	744	1,817	1,299	64,409	39,913	4,344	7,613
1947	740	1,949	2,140	63,499	39,623	4,447	7,489
1948	790	2,389	2,368	61,790	36,946	4,213	7,177
1949	848	2,485	2,520	69,249	42,870	5,053	7,869
1950	971	2,579	2,770	71,969	45,999	5,622	8,221
1951	1,083	2,701	3,073	79,316	49,776	6,028	9,287
1952	1,161	2,883	2,823	81,506	50,480	5,491	9,622
1953	1,004	2,261	2,224	70,513	46,998	5,176	9,182
1954	956	2,197	2,208	69,360	45,752	5,036	8,722
1955	1,109	2,741	2,532	75,381	48,025	4,869	9,299
1956	1,162	2,416	3,242	78,407	50,129	5,881	10,143
1957	1,044	2,029	3,139	74,618	47,980	5,605	9,948
1958	1,034	2,074	2,727	73,835	47,279	5,387	10,027
1959	1,106	2,235	3,238	84,379	53,201	5,747	11,236
1960	929	1,780	3,059	80,087	51,016	5,689	10,651
1961	857	1,687	2,606	80,065	50,809	5,771	10,864
1962	893	1,722	2,574	81,660	51,658	5,765	11,468
1963	929	1,719	2,410	86,197	48,801	6,187	12,215

[a] East north-central states = Ohio, Indiana, Illinois, Michigan, and Wisconsin.

Table 13. — Origin of Salable Livestock Received on the National Stock Yards Market, 1961, 1962, and 1963

Origin	Cattle		Calves		Hogs		Sheep and lambs	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
				1961				
Illinois....	360,614	48.5	28,613	33.7	1,533,455	58.9	119,426	47.3
Missouri..	351,811	47.3	45,228	53.3	1,024,999	39.3	104,391	41.4
Outside source..	31,295	4.2	11,075	13.0	47,456	1.8	28,410	11.3
Total..	743,720	100.0	84,916	100.0	2,605,910	100.0	252,227	100.0
				1962				
Illinois....	349,319	49.3	25,001	33.3	1,552,353	60.3	111,595	46.5
Missouri..	337,015	47.6	43,094	57.5	984,373	38.2	109,110	45.5
Outside source..	21,617	3.1	6,926	9.2	37,352	1.5	19,282	8.0
Total..	707,951	100.0	75,021	100.0	2,574,078	100.0	239,987	100.0
				1963				
Illinois....	335,208	51.5	20,400	34.6	1,507,820	62.6	93,957	51.9
Missouri..	296,791	45.6	32,933	55.8	858,207	35.6	70,914	39.2
Outside source..	18,708	2.9	5,636	9.6	43,682	1.8	16,225	8.9
Total..	650,707	100.0	58,969	100.0	2,409,709	100.0	181,096	100.0

Origin and Disposition of the Livestock Supply for the National Stock Yards Company

The National Stock Yards Company depends heavily on the St. Louis trade territory for its basic supply of livestock (Table 13). In 1961, 1962, and 1963 over 95 percent of the salable cattle and hogs and more than 87 percent of the sheep and calves sold at the National Stock Yards Company originated in Illinois and Missouri, mainly in the area designated as the St. Louis trade territory. Illinois supplied more cattle, hogs, and sheep than Missouri, but Missouri provided about half again as many calves as did Illinois.

Until 1956 the volume of salable cattle and calves at the National Stock Yards was usually above one million head (Table 14). In the late 1940s and early 1950s major packers near the stockyards bought about half the cattle sold. By 1963 the flow of cattle decreased by almost half and major packers bought less than 30 percent of the cattle sold. Other local packers and truckers absorbed the major volume of salable cattle.

Since 1956 there has been a 24-percent decrease in the flow of salable hogs from the National Stock Yards (Table 14). Major packers were the most important outlet for hogs but their dominance diminished appreciably after 1956. Disposition of hogs outside the trade territory has developed as the most important kind of outlet for the National

Table 14. — Disposition of Salable Livestock From National Stock Yards, 1946-1963

Year	Major packers	Other local packers and truckers	Outside area	Stockers and feeders	Total number
	(percent)				(1,000 head)
	Cattle and calves				
1946	33	12	35	20	1,122
1947	57	11	8	24	1,413
1948	54	22	16	8	1,152
1949	52	23	16	9	1,042
1950	54	23	13	10	977
1951	45	24	19	12	869
1952	46	22	17	15	1,007
1953	50	24	18	8	1,300
1954	49	26	15	10	1,248
1955	44	19	25	12	1,117
1956	46	32	11	11	1,268
1957	41	30	6	23	980
1958	33	45	6	16	911
1959	22	39	22	17	859
1960	17	35	33	15	926
1961	22	34	28	16	829
1962	22	35	26	17	783
1963	27	42	31	..	649
	Hogs				
1946	32	23	42	3	1,298
1947	49	20	29	2	2,140
1948	44	21	34	1	2,368
1949	46	22	31	1	2,520
1950	48	22	30	1	2,770
1951	40	26	33	1	3,073
1952	46	23	29	2	2,833
1953	45	22	30	..	2,224
1954	51	26	23	..	2,208
1955	50	11	39	..	2,532
1956	62	16	32	..	3,242
1957	48	15	33	4	3,139
1958	42	13	45	..	2,727
1959	41	20	39	..	3,238
1960	32	19	49	..	3,059
1961	34	20	46	..	2,606
1962	36	19	45	..	2,574
1963	36	13	51	..	2,409
	Sheep and lambs				
1946	73	13	12	2	531
1947	83	8	2	7	468
1948	86	6	4	4	483
1949	78	10	6	6	387
1950	72	13	8	7	377
1951	67	5	20	8	244
1952	72	8	9	11	335
1953	78	8	6	8	352
1954	75	9	10	6	313
1955	75	6	13	6	306
1956	72	12	6	10	312
1957	74	7	8	11	287
1958	45	24	7	24	241
1959	76	8	5	11	253
1960	67	8	15	10	238
1961	46	38	6	8	252
1962	48	40	6	6	240
1963	50	43	7	..	181

Table 15. — Origin and Disposition of Livestock and Meat Processed by St. Louis Area Packers, 1963[a]

	Cattle	Calves	Hogs	Sheep and lambs
		(percent)		
Origin of livestock				
Local trade territory	14.5	16.8	50.7	29.1
St. Louis terminals	69.9	42.7	34.6	46.1
Total trade territory	84.4	59.5	85.3	75.2
From outside the territory	15.6	40.5	14.7	24.8
Total slaughtered	100.0	100.0	100.0	100.0
Disposition of meat				
St. Louis territory	24.9	27.2	22.9	19.9
Outside the trade territory	75.1	72.8	77.1	80.1
Total	100.0	100.0	100.0	100.0

[a] From surveys of St. Louis area packers.

Stock Yards. Most outside shipments of live hogs go to the southern or eastern United States.

There were only 34 percent as many sheep and lambs available on the National Stock Yards in 1963 as in 1946. In 1963 major packers absorbed only half the available volume. Other local packers were about as important as major packers as outlets for sheep.

Origin and Disposition of Packers Slaughter Livestock and Meats

According to a 1963 survey, packers in the St. Louis area patronized the St. Louis terminals for about 70 percent of their total slaughter cattle, 43 percent of their calves, 35 percent of their hogs, and 46 percent of their sheep and lambs (Table 15). Shipments from outside the trade territory represented about 16 percent of the slaughter cattle, 41 percent of the calves, 15 percent of the hogs, and 25 percent of the sheep and lambs. The rest of the slaughter stock originated from other local sources in the trade territory.

In total, the St. Louis trade territory supplied about 84 percent of the cattle slaughtered locally, 60 percent of the calves, 85 percent of the hogs, and 75 percent of the sheep and lambs. The packers in the St. Louis area sold 75 percent of their beef outside the trade territory, 73 percent of their veal, 77 percent of their pork, and 80 percent of their lamb and mutton.

Origin of Beef and Pork for Retail

Major chain stores and meat wholesalers in the territory were interviewed to determine the origin of beef and pork sold through their retail outlets in 1963. Most fresh pork products were supplied to the chains by local packers. Some processed sausage products, bacon, and canned hams originated beyond the trade territory.

Table 16. — Number of Steers and Heifers Sold Out of First Hands for Slaughter at Five Terminal Markets

		Prime	Choice	Good	Standard, Commercial, and Utility	All grades
			St. Louis National Stock Yards			
Steers	1959	62	43,453	148,035	62,586	254,136
	1960	170	44,081	185,698	62,187	292,136
	1961	260	65,134	189,165	56,011	310,570
	1962	44	66,694	179,030	36,849	282,617
Heifers	1959	6	13,427	43,298	26,764	83,495
	1960	..	18,709	53,286	26,295	98,290
	1961	32	21,993	53,411	18,746	94,182
	1962	..	19,208	50,450	13,941	83,599
			Chicago			
Steers	1959	118,809	943,315	398,822	69,604	1,531,816
	1960	147,339	935,354	365,128	54,679	1,502,500
	1961	179,474	881,107	308,945	61,785	1,431,311
	1962	100,980	762,373	278,558	45,760	1,187,671
Heifers	1959	13,855	200,680	128,263	27,846	370,644
	1960	18,049	196,717	119,311	25,883	359,960
	1961	11,590	178,698	89,058	23,782	303,128
	1962	8,355	154,979	93,171	25,160	281,665
			Kansas City			
Steers	1959	713	106,017	146,778	33,569	287,077
	1960	503	134,860	150,688	42,006	328,057
	1961	2,491	122,729	177,851	38,399	341,470
	1962	1,536	97,040	147,953	25,364	271,893
Heifers	1959	71	45,248	44,998	15,113	105,430
	1960	262	50,206	52,726	15,733	118,927
	1961	1,352	56,551	56,377	12,187	126,467
	1962	513	37,409	46,961	9,606	94,489
			Omaha			
Steers	1959	6,379	406,356	434,652	48,424	895,811
	1960	8,426	411,840	435,320	57,957	913,543
	1961	10,315	468,213	382,950	59,690	921,168
	1962	9,262	437,100	438,892	47,678	932,932
Heifers	1959	3,397	213,599	198,584	19,325	434,905
	1960	6,241	205,617	230,457	22,717	464,632
	1961	8,568	248,586	223,564	25,846	506,564
	1962	6,661	229,219	238,519	20,068	494,467
			Denver			
Steers	1959	..	93,537	72,678	3,208	169,423
	1960	33	100,003	46,286	4,463	150,785
	1961	377	124,190	34,165	3,932	162,664
	1962	641	87,314	34,627	2,339	124,918
Heifers	1959	..	81,639	74,093	2,711	158,443
	1960	..	69,987	53,524	1,536	125,047
	1961	69	98,191	34,281	1,184	133,725
	1962	146	61,567	31,213	1,736	94,662

It was estimated that the chain stores sold over 200 million pounds of beef in the trade territory. They imported 36 percent of their total beef supply from outside the territory.[1] Choice carcass beef was the most important kind imported. One firm imported more than 50 per-

[1] Some of the beef for processing was imported from outside the United States.

cent of its beef requirements, another brought in about 40 percent, and still another about 30 percent. Practically every major chain used some imported beef.

Meat wholesalers obtained their beef mostly from local sources. Ingredients for processed meat and hamburger originated from trimmings, from locally produced low-quality cattle, and from imported beef.

The St. Louis terminal market attracts neither the kind nor the volume of beef needed to meet the demands of the trade territory (Table 16). If the total number of prime and choice beef steers and heifers on the terminal market in 1959-62 were consumed in the area, less than 15 percent of the total beef requirements for consumers in the territory would be met. If all of the slaughter grades of beef on the terminals were consumed in the territory, only half the beef requirements would be met.[1] The meat trade has no alternative but to import beef.

Even though there is a surplus of beef in the territory, there is still a gap between the total supply of choice beef and the demand for choice beef (see "Meat Balance," page 6). To meet the demand for quality beef, chain stores must procure their supplies from packers located west and north of the St. Louis trade territory (that is, from the Denver, Kansas City, Omaha, and Chicago areas).

SUMMARY AND CONCLUSIONS

The study indicates the following:

1. There is a surplus above local consumption requirements of all classes of red meat in the St. Louis trade territory.

2. There is a large surplus of livestock feeds.

3. An important portion of the beef sold at retail and many of the live cattle and hogs bought by packers originate outside the territory.

4. More than two-thirds of the meat processed by packers in the St. Louis area is exported, yet chain stores import 36 percent of their beef requirements.

5. Terminal livestock markets in the territory do not provide the volume or the kind of beef needed to satisfy local consumer demands.

6. In recent years, livestock handled through the terminals has declined relatively and absolutely.

7. The surplus feed, livestock, and meat supplies must compete with outside sources on local, national, and world markets.

In the St. Louis trade territory advances in the production of feed have allowed the production of almost three times as much meat as con-

[1] In 1959 trade territory requirements for beef and veal were 323 million pounds.

sumers need. There is adequate feed for further expanding livestock and meat production if marketing institutions can create a demand for the meat products.

The livestock feed balance and exports from the area have developed because producers and the feed trade have found it to their advantage to sell cash grain and transport surpluses from the area. The livestock and feed industry is confronted with a basic problem: should it export meat products or should it export feed grains that could be used to produce more meat of higher quality?

Expanding the livestock and meat industry can only be anticipated as marketing agencies in the territory do a better job than is being done by their competitors outside the territory. Until existing institutions can be competitive, it is economically efficient for chain stores to import meat if they can obtain better meat at the same prices or as good a meat at lower prices. Also, there is no good reason to believe that local producers will feed their grain through livestock if they think they can make more by selling it for cash (even though the surplus feeds move outside the territory).

Expanding the livestock and meat industry in the territory may require lower costs and perhaps lower unit margins for the livestock and feed industry. The territory must produce and market larger amounts of higher quality beef at lower prices if it is to become an important supplier of beef even in its own area. This adjustment in the industry would, of course, have to fit in with the national system of meat distribution.

A more efficient assembling, processing, and distribution system needs to be developed. Steps toward greater efficiency are already evident. Slaughter plants have been abandoned and major packers have withdrawn their support from the terminals. Major food chains have obtained the kind of beef they need for their trade from sources other than local packers. Most of the packers have arranged for the direct marketing of their basic supply of slaughter stock.

Basic changes in the livestock industry in the territory will probably be associated with the following:

1. The sale of meat at low-enough prices and in sufficiently uniform volume to compete with the sources that now dominate the local wholesale-retail trade in higher priced beef.

2. The development of larger and more efficient units of livestock feeding to utilize supplies of surplus feed.

3. The production of livestock with more desirable weights and higher grades.

4. The relocation or rebuilding of obsolete slaughtering facilities at locations of maximum advantage.

5. The development and expansion of better outlets for meat in the southeastern and southwestern United States.

There is a need to evaluate the locational advantages the St. Louis trade territory should enjoy if it uses feed surpluses to produce livestock and meat of a quality that can satisfy much of the local demand as well as expand markets, especially throughout the southeastern United States. Such analysis should be profitable for those concerned with the decline of terminal livestock receipts and slaughtering in this trade territory.

APPENDIX

Appendix Table 1. — Per Capita Consumption of Meat and Poultry in the United States

	Beef	Veal	Lamb and mutton	Pork, excluding lard	Lard	Total meats	Broilers	Farm chickens	Total chickens	Turkeys	Total poultry
						(pounds)					
1939	54.7	7.6	6.6	64.7	12.7	133.6	....	....	14.1	...	16.6
1940	54.9	7.4	6.6	73.5	14.4	142.4	2.0	12.1	14.1	2.9	17.0
1941	60.9	7.6	6.8	68.4	14.1	143.7	2.8	12.5	15.4	2.9	18.3
1942	61.2	8.2	7.2	63.7	13.2	140.3	3.2	14.5	17.7	3.0	20.7
1943	53.3	8.2	6.4	78.9	13.9	146.8	4.1	18.9	23.0	2.7	25.7
1944	55.6	12.4	6.7	79.5	14.0	154.2	3.9	16.5	20.4	2.7	23.1
1945	59.4	11.9	7.3	66.6	12.4	145.2	5.0	16.6	21.6	3.5	25.1
1946	61.6	10.0	6.7	75.9	11.9	154.2	4.1	15.3	19.4	3.7	23.1
1947	69.6	10.8	5.3	69.6	13.2	155.3	4.3	13.8	18.1	3.6	21.7
1948	63.1	9.5	5.1	67.8	13.4	145.5	5.5	12.8	18.3	3.1	21.4
1949	63.9	8.9	4.1	67.7	11.8	144.6	7.1	12.5	19.6	3.3	22.9
1950	63.4	8.0	4.0	69.2	13.8	144.6	8.7	11.9	20.6	4.1	24.7
1951	56.1	6.6	3.4	71.9	13.7	138.0	10.4	11.3	21.7	4.4	26.1
1952	62.2	7.2	4.2	72.4	13.4	146.0	11.7	10.4	22.1	4.7	26.8
1953	77.6	9.5	4.7	63.5	12.7	155.3	12.3	9.6	21.9	4.8	26.7
1954	80.1	10.0	4.6	60.0	11.0	154.7	13.7	9.1	22.8	5.3	28.1
1955	82.0	9.4	4.6	66.8	12.1	162.8	13.8	7.5	21.3	5.0	26.3
1956	85.4	9.5	4.5	67.3	12.6	166.7	17.3	7.1	24.4	5.2	29.6
1957	84.6	8.8	4.2	61.1	9.5	158.7	19.1	6.4	25.5	5.9	31.4
1958	80.5	6.7	4.2	60.2	9.7	151.6	22.0	6.2	28.2	5.9	34.1
1959	81.4	5.7	4.8	67.6	8.8	159.5	22.8	6.1	28.9	6.3	35.2
1960	85.2	6.2	4.8	65.2	8.5	161.4	23.4	4.8	28.2	6.2	34.4
1961	88.0	5.7	5.1	62.2	7.7	161.0	25.9	4.9	30.8	7.4	37.7
1962	88.8	5.5	5.2	63.6	7.2	163.1	25.6	4.4	30.1	7.0	37.0
1963	94.2	4.9	4.9	65.3	6.4	169.3	27.0	3.8	30.8	6.7	37.5

Appendix Table 2. — Livestock Marketings in the St. Louis Trade Territory[a]

	1939	1949	1959	1959 as % of 1939	1959 as % of 1949
	(1,000 head)				
Cattle and calves					
St. Louis trade territory					
Primary area	741	840	959	129	114
Secondary area	364	419	464	128	111
Total St. Louis trade territory	1,105	1,260	1,424	129	113
Illinois trade territory					
Primary area	368	387	425	116	110
Secondary area	176	129	229	130	119
Total Illinois trade territory	544	580	654	120	113
Missouri trade territory					
Primary area	374	453	534	143	118
Secondary area	188	227	236	126	104
Total Missouri trade territory	561	680	770	137	113
Hogs					
St. Louis trade territory					
Primary area	2,558	3,556	5,079	198	143
Secondary area	1,359	1,709	2,229	164	130
Total St. Louis trade territory	3,918	5,265	7,308	187	130
Illinois trade territory					
Primary area	1,404	1,891	2,932	209	155
Secondary area	773	992	1,366	177	138
Total Illinois trade territory	2,176	2,884	4,298	198	145
Missouri trade territory					
Primary area	1,154	1,664	2,147	186	129
Secondary area	587	717	863	147	120
Total Missouri trade territory	1,741	2,381	3,010	173	126
Sheep and lambs					
St. Louis trade territory					
Primary area	498	377	277	56	73
Secondary area	250	201	161	64	80
Total St. Louis trade territory	749	579	437	58	76
Illinois trade territory					
Primary area	180	123	127	71	104
Secondary area	87	67	87	100	129
Total Illinois trade territory	268	190	215	80	113
Missouri trade territory					
Primary area	318	255	149	47	59
Secondary area	163	135	74	48	56
Total Missouri trade territory	481	389	223	47	58

[a] Adjusted to correspond to Crop Reporting Service estimates of marketing.

Appendix Table 3. — Poultry in the St. Louis Trade Territory

	1939	1949	1959	1959 as % of 1939	1959 as % of 1949
St. Louis trade territory	(1,000 head)				
Primary					
Chickens, 4 months and over	12,814	10,923	7,982	62	73
Turkeys	507	494	976	193	198
Broilers and other chickens sold	7,685	9,122	12,841	167	141
Home consumption	4,735	3,021	1,940	41	64
Secondary					
Chickens, 4 months and over	5,800	5,261	3,026	52	58
Turkeys	215	259	849	395	328
Broilers and other chickens sold	3,779	3,770	6,778	179	180
Home consumption	2,230	1,251	705	32	56
Total					
Chickens, 4 months and over	18,614	16,184	11,008	59	68
Turkeys	722	754	1,825	253	242
Broilers and other chickens sold	11,463	12,892	19,621	171	152
Home consumption	6,965	4,272	2,704	39	63
Illinois					
Primary					
Chickens, 4 months and over	5,857	5,311	4,199	72	79
Turkeys	78	125	211	271	169
Broilers and other chickens sold	3,486	3,864	2,789	80	72
Home consumption	1,513	1,294	840	56	65
Secondary					
Chickens, 4 months and over	2,862	2,723	1,662	58	61
Turkeys	90	89	277	308	311
Broilers and other chickens sold	2,008	1,957	1,309	65	67
Home consumption	472	656	365	42	56
Total					
Chickens, 4 months and over	8,719	8,034	5,861	67	73
Turkeys	168	214	488	290	228
Broilers and other chickens sold	5,494	5,821	4,098	75	70
Home consumption	2,385	1,050	1,205	51	115
Missouri					
Primary					
Chickens, 4 months and over	6,957	5,612	3,783	54	67
Turkeys	429	370	764	178	109
Broilers and other chickens sold	4,198	5,258	10,054	239	191
Home consumption	3,221	1,727	1,100	34	64
Secondary					
Chickens, 4 months and over	2,938	2,539	1,364	46	54
Turkeys	126	170	572	454	336
Broilers and other chickens sold	1,771	1,813	5,469	309	302
Home consumption	1,359	595	400	29	67
Total					
Chickens, 4 months and over	9,895	8,150	5,147	52	63
Turkeys	555	539	1,336	241	248
Broilers and other chickens sold	5,969	7,071	15,523	260	220
Home consumption	4,580	2,322	1,500	33	65

Appendix Table 4. — Carcass Weights in Pounds per Head Used for Calculating Meat Supply[a]

	Illinois			Missouri		
	1939	1949	1959	1939	1949	1959
Cattle and calves	407	450	558	365	381	457
Hogs						
with lard	174	177	177	156	169	162
without lard	139	141	141	124	135	129
Sheep and lambs	41	43	47	38	43	48
Turkeys	11.4	14.6	14.6	11.7	13.8	14.3
Chickens	3.2	3.3	3.4	2.8	3.2	3.6
Broilers	2.0	2.1	2.3	2.0	2.2	2.3

[a] Based on average market weights (USDA) multiplied by estimated dressing pcts.

Appendix Table 5. — Coefficients Used to Compute Feed Requirements for Livestock Fed in the St. Louis Trade Territory, 1939, 1949, 1959[a]

	Corn	Oats	Protein	Corn and sorghum silages	Hay and pasture
Cattle and calves	*bu.*	*bu.*	*lb.*	*tons*	*tons hay equiv.*
Illinois primary					
1959	12.1	4.0	129	.665	1.8
1949	14.1	7.4	161	.385	3.0
1939	12.7	8.2	161	.369	3.3
Illinois secondary					
1959	13.1	2.7	114	.402	2.6
1949	15.4	6.6	151	.220	2.8
1939	12.1	7.4	148	.210	3.1
Missouri primary					
1959	10.6	2.5	100	.539	2.8
1949	13.5	5.6	138	.221	2.2
1939	11.9	5.3	126	.203	3.2
Missouri secondary					
1959	12.0	4.5	135	.548	2.9
1949	14.7	6.6	156	.180	3.1
1939	12.4	5.8	138	.183	3.2
Hogs, all areas					
1959	15.0	...	130	....	.1
1949	16.0	...	100	....	.1
1939	16.0	...	100	....	.1
Sheep and lambs, all areas, all years					
Sheep one year and older	2.0	...	...	.025	1.2
Lambs raised	2.0	...	10	.008	.3
Horses and mules, all areas, all years	12.0	12.0	...	....	5.1
Poultry, all areas					
Chickens, 4 months and older					
1959	1.47	...	21.0	....	...
1949	1.66	...	23.7	....	...
1939	1.66	...	23.7	....	...
Broilers and other chickens					
1959	.26	...	4.8	....	...
1949	.28	...	5.2	....	...
1939	.32	...	5.2	....	...
Turkeys					
1959	1.36	...	15.0	....	...
1949	1.54	...	17.0	....	...
1939	1.54	...	17.0	....	...

[a] Per head on hand: cattle and calves, sheep one year and older, horses and mules, chickens (4 months and older), turkey breeding hens. All others are per head sold or raised.

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