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TRANSPORTATION OF LIVESTOCK BY MOTOR TRUCK TO THE KANSAS CITY MARKET

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TRANSPORTATION OF LIVESTOCK BY MOTOR TRUCK TO THE KANSAS CITY MARKET[1]

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INTRODUCTION

The motor truck is by far the most important means of transporting livestock from farms to slaughtering plants. Most livestock leaves the farm in trucks and a large proportion of it moves from local markets to central markets by the same method. In 1942, 64 percent of the cattle and calves, 69 percent of the hogs, and 34 percent of the sheep received at 68 public markets in the United States were received by truck. At most markets in the Corn Belt states, the proportion is higher than the national average because of the shorter average distances from which livestock is received.

At the Kansas City market, however, the proportion of cattle, calves, and sheep received by truck is below the 68-market average. Less than one-half of the cattle and calves and less than one-third of the sheep are received by truck. On the other hand, nearly all the hog receipts are by truck. Because of the relative importance of the livestock truck as a means of transportation, programs for the control and conservation of trucks are of concern to farmers in states where meat animals contribute such a large part of the farm income as in Kansas and Missouri.

The scarcity of rubber, new trucks, repair parts, truck drivers, and motor mechanics during the war period made necessary the conservation of motor transportation as soon as the United States entered World War II. To facilitate such conservation, the Office of Defense Transportation was established. The programs developed by the ODT included voluntary actions as well as regulatory controls. In many instances, information was not available to serve as a guide to those developing the programs, and these programs could not wait until it was assembled. Studies such as this one have been helpful, therefore, in providing information which may be used as a basis for judging the effectiveness and appropriateness of the various actions and controls which have been put into effect as well as serving as a guide in future action.

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1. Contribution No. 126 from the Department of Agricultural Economics. This study was conducted coöperatively by the agricultural experiment stations of Missouri and Kansas. Persons in need of detailed information concerning the method of conducting the study as well as type of schedule used may obtain such information by writing to either of the experiment stations.

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Reasons for Study

This report covers information revealed by two surveys of the trucks and truckers at the Kansas City market. Since little information on motor transportation was available at that time, the primary purpose of the first survey in May, 1942, was to ascertain certain facts about livestock trucks and trucking conditions, among which were the age and condition of trucks, the condition of tires, and relation of market and return loads to capacities of trucks. A secondary purpose was to obtain information which would indicate how the trucking of livestock could be done more efficiently so as to save trucks, tires, and man power. It was believed that such information might also indicate which of the many control measures proposed for livestock trucking would be practicable and effective.

The principal purpose of the second survey in December, 1943, was to determine the changes in conditions of trucks and in the relation of loads to capacities during the nearly 20 months since May, 1942. A second objective was to obtain information which would make it possible to establish standards of physical capacity for trucks, which would have value for measuring the relation of loads to truck capacity beyond the wartime regulatory period. A third purpose was to obtain from truckers their opinions concerning the most important difficulties encountered and the solutions to current problems.

Methods and Procedures in Study

The first survey covered the period from Sunday evening, May 3, to Wednesday morning, May 6, 1942, and the second was for the period from Sunday evening, December 19, to Wednesday, December 22, 1943. In each case, the data were obtained by personal interviews of the truckers unloading at the Kansas City stockyards and were recorded on formal schedules. The schedules used in the first survey were modified for use in the 1943 survey to omit certain data obtained in the 1942 survey and to include other matters thought more important at the time of the second survey. The interviews were usually made at the docks while the truckers were waiting to unload their livestock or waiting for the checkers to sign the livestock receipt form used at the market.

During the first survey, 518 usable records were obtained. Of these, 249 were of Kansas shipments and 269 were for Missouri consignments. In December, 1943, of 455 records taken, 202 were from Kansas and 253 from Missouri truckers. Hence, the two studies involved 973 truckloads of livestock.

According to records available, about 2,500 full or partial truckloads were received at the market during the period of the first survey and 2,373 truckloads during the December 19-22, 1943, period. Thus, the interviewers obtained information on about 21 percent of the loads in the 1942 period and on 19.2 percent in the 1943 period. This is a sample of sufficient size to be representative.

Because several trucks were represented two or more times in the records, the number of trucks covered was smaller than the number of truckloads. Information was obtained for 455 trucks in May, 1942, and for 384 in December, 1943.

Although the interviewers were unable to obtain records from all truckers during the rush periods of the day, they made no intentional selection of trucks and truckers. Thus, the records probably are highly representative of the trucks and truckers which frequent the Kansas City livestock market.

LIVESTOCK TRUCK FACILITIES

In view of the importance of trucks in transportation of livestock, specific information concerning type of truck, body type, and ownership is useful to those responsible for increasing the efficiency of truck transportation. Data on types used, total mileages, ages, and condition of existing trucks indicate the present situation of livestock trucks and may be used as a guide in the manufacture and allocation of trucks.

Types of Trucks Used for Livestock

Trucks used in transporting livestock to the Kansas City stockyards were classified into three types — pickups, standards, and semitrailers. Pickup trucks are relatively unimportant as a means of getting livestock to the Kansas City market. Only 38 of the 384 trucks included in the study in December, 1943, were of this type, The proportion was even less in May, 1942, when a similar survey was made of 455 trucks. A greater proportion of Missouri trucks were pickups. For the most part, pickup trucks are owned by farmers who transport their own livestock to market. They are mostly one-half ton or three-quarter ton sizes and are general-purpose vehicles. When used for transporting livestock, a stake frame is attached to the truck body or, in some cases, crates for livestock are placed in the body. Few operators of pickup trucks carried permits to haul for hire.

Standard trucks are relatively important in the movement of livestock to the Kansas City market. About 70 percent of the trucks surveyed in December, 1943, and 76 percent in May, 1942, were of this type. A slightly greater proportion of the Missouri trucks were of this type. Most of these trucks had stake bodies and a 1½-ton rated capacity. Many of the larger trucks which transport sheep and hogs had full, half, or quarter decks.

Semitrailers are used extensively, particularly in Kansas where hauls are considerably longer than in Missouri. In Kansas about one truck in every three was of this type in December, 1943, compared with one out of 15 in Missouri (Table 30, Appendix). These trucks have a full trailer body which is supported for the most part on wheels in the rear, with the front resting on the chassis of the truck, usually called the tractor. Semitrailers are relatively large, commonly ranging from 1½ to 5 tons in rated capacity.

TABLE 1. *Number and percent of livestock trucks at the Kansas City market during certain periods in May, 1942, and December, 1943, classified according to type of truck and type of operator.*

TYPE OF OPERATOR AND TYPE OF TRUCK.	1942.		1943.	
	Number.	Percent.	Number.	Percent.
For-hire truckers:				
Class A:				
Standard	116	67.8	96	62.3
Semitrailer	54	31.6	57	37.0
Pickup	1	0.6	1	0.7
Totals	171	100.0	154	100.0
Class B:				
Standard	143	85.1	110	81.5
Semitrailer	18	10.7	20	14.8
Pickup	7	4.2	5	3.7
Totals	168	100.0	135	100.0
Class C:				
Standard	46	78.0	27	71.1
Semitrailer	4	6.8	1	2.6
Pickup	9	15.2	10	26.3
Totals	59	100.0	38	100.0
Total for hire:				
Standard	305	76.6	233	71.3
Semitrailer	76	19.1	78	23.9
Pickup	17	4.3	16	4.8
Totals	398	100.0	327	100.0
Self-haulers:				
Standard	42	73.7	34	59.6
Semitrailer			1	1.8
Pickup	15	26.3	22	38.6
Totals	57	100.0	57	100.0
Total:				
Standard	347	76.3	267	69.5
Semitrailer	76	16.7	79	20.6
Pickup	32	7.0	38	9.9
Grand totals	*455*	*100.0*	*384*	*100.0*

Classification of Livestock Trucks by Type of Operator

There are many types of truck operators. Some truckers have permits which allow them to operate between states. In Kansas many truckers carry state permits only. Some farmers transport only their own livestock; others also haul for hire occasionally.

In this study, livestock truckers were classified as follows: (1) Class A includes for-hire truckers operating with Interstate Commerce Commission permits which allowed transportation of products in interstate commerce. These truckers also have Public Service Commission authority in Missouri, and Kansas Corporation Commission authority in Kansas. (2) Class B includes for-hire truckers operating under state authority in Kansas and those truckers who haul for hire but operate in such a way that permits are not required in Missouri (3) Class C includes farmers who occasionally haul for hire and may or may not operate with permits. (4) Self-haulers

include farmers and others who haul their own livestock but do not haul livestock for hire. Truckers in Missouri may transport livestock anywhere within the state without a permit if it is moved directly from farm to market or from market to farm. In Kansas, contract carriers, common carriers, and private carriers (outside a 25-mile radius of place of business) must have a permit or certificate to haul livestock; however, permits are not required by a farmer or producer of farm products as long as he transports livestock which he has produced and transports such livestock to market in his own motor vehicle or in a neighbor's vehicle which he has borrowed for that purpose. Borrowing of vehicles for transportation of livestock must be on a basis of barter or exchange of services or employment.

Approximately 40 percent of the 839 trucks surveyed in 1942 and 1943 operated with permits which allowed interstate travel. More than two-thirds of the relatively large semitrailer trucks and about one-third of the standard trucks carried such permits. Only two of the 70 pickup trucks carried a permit for interstate travel (Table 1.) A much greater propartion of Kansas truckers than those from Missouri operated with permits. One reason for this is that Kansas truckers must go into Missouri to unload their livestock and in many cases to obtain return loads. Longer marketing distances in Kansas encourage the use of the larger trucks and it is for these that permits most frequently are used.

A relatively small number of farmers haul their livestock to the Kansas City market in their own trucks. Of the 839 trucks surveyed, about 14 percent were operated by farmers hauling their own livestock. Almost an equal number of farmers hauled livestock for hire, although in these cases it was not uncommon for the farmers to haul some of their own stock and to fill out the load with a neighbor's livestock. The practice of farmers hauling for hire apparently is more common among Missouri farmers (Table 1.)

Type of Bed on Livestock Trucks

The most, common type of truck bed used in transporting livestock to the Kansas City market is the stake type. Seven hundred fifty-eight, approximately 90 percent of the 839 trucks surveyed during 1942 and 1943, were of this type. Only 1.8 percent of the total number of trucks had box-type beds. For the most part, pickup trucks have neither stake- nor body-type beds. They have low beds into which stakes or crates may be fitted or placed.

More than 98 percent of the truckers that operated under interstate commerce permits had trucks with the stake-body type. Approximately 94 percent of all trucks operating for hire had this type body. As might be expected, farmers and dealers hauling their own stock use the box-type and pickup-type beds to a greater extent than do those truckers hauling for hire. Most of the pickups are general-purpose vehicles that may be used for transporting livestock to market only occasionally. Farmers who hauled for hire, which

included some who hauled their own and neighbors' stock, used trucks with stake bodies in nearly 74 percent of the eases (Table 2.)

Practically all standard and semitrailer trucks transporting livestock to the Kansas City market had the stake-type body. Less than 3 percent had box- or other type bodies. Only about 10 percent of the pickups had stake or box bodies (Table 2.)

TABLE 2. *Percentage of livestock trucks having different kinds of beds classified according to type of truck and type of operator at the Kansas City market, December, 1943.*

CLASSIFICATION.	Type of bed.				
	Stake.	Box.	Pickup.	Not given.	Total.
	(Percent of trucks)				
Type of truck:					
Standard	98.1	1.5	.....	0.4	100.0
Semitrailer	97.4	2.6	.....	.....	100.0
Pickup	7.9	2.6	89.5	.....	100.0
All trucks	89.1	1.8	8.8	0.3	100.0
Type of operator:					
For hire:					
Class A	98.1	1.3	.....	0.6	100.0
Class B	94.8	1.5	3.7	.....	100.0
Class C	73.7	2.6	23.7	.....	100.0
Total for hire	93.9	1.5	4.3	0.3	100.0
Self-haulers	62.1	3.4	34.5	.....	100.0
All operators	*89.1*	*1.8*	*8.8*	*0.3*	*100.0*

Age and Condition of Livestock Trucks

The average age of the 384 livestock trucks surveyed on the Kansas City market in December, 1943, was 3.2 years. More than three-fourths of the trucks were 1939 models or later, and 1941 models constituted about 33 percent of the total number. Most of the older trucks were standard or farm pickup trucks, of which two were 1928 and 1930 models. The average age of all pickup trucks was 4.1 years compared with 3.2 years for standards and 2.6 years for semitrailers. The average age of trucks operated by farmers and others hauling their own livestock was 5.2 years. This compares with 2.5 years for trucks operated for hire with permits (Class A truckers). Missouri trucks averaged approximately one-half year older than Kansas trucks. Missouri pickups averaged almost one year older than Kansas pickups but standards and semitrailers were only three to four months older (Table 3.)

In May, 1942, and again in December, 1943, livestock truckers were asked to rate the condition of their trucks on the basis of excellent, good, fair, and poor. Replies were made by 440 truckers in May, 1942, and 372 truckers in December, 1943. In 1943 only about 12 percent considered their trucks were in excellent condition while in 1942 more than 25 percent reported their trucks to be in excellent condition. According to the operators about one-half of the trucks were

TABLE 3. *Average age of trucks according to type of truck and type of operator at the Kansas City market, December, 1943.*

TYPE OF TRUCK AND TYPE OF OPERATOR.	Age of trucks in years.		
	Kansas.	Missouri.	Both states.
All pickups	3.4	4.3	4.1
Standards:			
Class A	2.6	2.4	2.5
Class B	2.3	3.0	2.9
Class C	3.7	4.6	4.3
All for hire	2.9	3.2	3.1
Self-haulers	5.0	5.4	5.2
All standards	3.1	3.4	3.2
Semitrailer trucks:			
Class A	2.4	3.7	2.5
Class B	2.6	2.3	2.5
Class C	.....	2.0	2.0
All semitrailers	2.5	2.9	2.6
All trucks	*2.9*	*3.5*	*3.2*

in good condition in December, 1943, about 5 percent less than the number in this category a year earlier. Approximately 30 percent of the operators in 1943 reported their trucks in fair condition and only 5 percent listed their trucks as being in poor condition, but in May, 1942, only four of 440 trucks were reported in poor condition compared with 21 of 372 in December, 1943.

TABLE 4. *Condition of trucks classified according to type of truck and type of operator at the Kansas City market, December, 1943.*

CLASSIFICATION.	Condition of trucks.					
	Excellent.	Good.	Fair.	Poor.	Not given.	Total.
	(Percent of trucks)					
Type of truck:						
Standard	10.8	47.2	33.1	5.2	3.7	100.0
Semitrailer	16.7	55.1	18.0	6.4	3.8	100.0
Pickup	7.9	55.3	31.6	5.2	.....	100.0
All trucks	11.7	49.6	29.9	5.4	3.4	100.0
Type of operator:						
For hire:						
Class A	14.9	51.3	24.7	5.8	3.3	100.0
Class B	8.9	48.9	31.8	5.2	5.2	100.0
Class C	5.3	50.0	39.5	5.2	.....	100.0
Total for hire	11.3	50.1	29.4	5.5	3.7	100.0
Self-haulers	13.8	46.5	32.8	5.2	1.7	100.0
All operators	*11.7*	*49.6*	*29.9*	*5.4*	*3.4*	*100.0*

The reported condition of standards and pickups was not so good as the condition of semitrailers and trucks operated with permits. This might be expected, considering the fact that pickups and standards averaged at least one year older than semitrailers and trucks operated with permits.

Mileages on Livestock Trucks

Approximately 50 percent of the 384 livestock trucks surveyed in December, 1943, showed total mileages in excess of 100,000. The average mileage on trucks was 108,000. In May, 1942, when a similar survey was made of 455 livestock trucks only 25 percent had mileages in excess of 100,000, and the average mileage was only 63,000. This indicates that in another year three-fourths or more of the livestock trucks would have total mileages in excess of 100,000 and the average per truck would be more than 150,000 unless some replacements were made. Nearly 10 percent of all trucks in late 1943 had total mileages of 250,000 or more, of which a few registered more than 400,000.

Total mileage on the different types of trucks varied considerably. Farm pickup types had much less mileage than standards and semitrailers in spite of the fact that they averaged one to two years older. Nearly 85 percent of all pickups had mileages of less than 100,000 compared with about 50 percent of standards and less than 30 percent of all semitrailers. None of the Kansas pickups had mileages greater than 150,000 but more than 40 percent of the semitrailers had mileages greater than this. The average mileage on all pickup trucks in December, 1943, was 54,000 compared with 103,000 on standards and 156,000 on semitrailers. (Table 5.)

Trucks operated for hire, of which about 50 percent had permits for interstate travel, showed much higher total mileages than trucks owned by farmers and others not hauling for hire even though farmers' trucks generally were older models. About 55 percent of the trucks for hire had mileages in excess of 100,000 compared with less than 30 percent of the trucks owned by farmers hauling their own livestock.

TABLE 5. *Average total mileages on livestock trucks classified according to type of truck and type of operator at the Kansas City market.*

CLASSIFICATION.	May, 1942, survey.		Dec., 1943, survey.		Both states.	
	Kansas.	Missouri.	Kansas.	Missouri.	1942.	1943.
	(Thousands of miles per truck)					
All pickup trucks	44	34	49	55	36	54
Standard trucks:						
Class A	61	63	138	86	62	117
Class B	59	57	92	103	57	101
Class C	67	55	83	110	58	99
All for hire	61	58	122	99	59	103
Self-haulers	62	36	65	70	50	68
All standards	61	55	114	96	58	103
Semitrailer trucks:						
Class A	114	56	143	201	111	149
Class B	76	83	195	160	79	185
Class C	50	45	200*	22*	48	111
All semitrailers	105	70	155	166	99	156
All trucks	*73*	*54*	*126*	*94*	*63*	*108*

* Less than five trucks in sample.

At the time of each survey, each trucker was asked to estimate the mileage his truck had been driven during the past year. These estimates averaged 39,000 miles in December, 1943, compared with 34,000 in May, 1942. Annual mileages varied with the type of truck. On the average, pickup trucks had been driven about 15,000 miles in the year preceding the December, 1943, survey; standards, 36,000 miles, and semitrailers, 66,000 miles. Semitrailer trucks had been driven 14,000 miles more in the 12 months preceding the later survey than they had in the year preceding the 1942 survey. For standards the increase was only 4,000 miles and for pickups there was a decrease of 2,000 miles between the periods.

Kansas semitrailers were driven more miles per year than those from Missouri, but the situation was the opposite for pickup trucks. Annual mileages on standard trucks were about the same in each state.

Farmers hauling their own livestock to market drove their trucks the least number of miles per year, and the trucks of Class C operators showed the next lowest, annual mileages. For all trucks, the highest average yearly mileage was attained by Class A operators, but this was a result of the greater use of semitrailers. When mileages on similar types of trucks are compared, the differences in annual mileages between Class A and B operators do not appear significant.

TABLE 6. *Average mileage which livestock trucks at the Kansas City market had been driven during preceding year, by type of truck and operator and by states, May, 1942, and December, 1943.*

TYPE OF TRUCK AND TYPE OF OPERATOR.	1942 survey.		1943 survey.		Both states.	
	Kansas.	Missouri.	Kansas.	Missouri.	1942.	1943.
	(Thousands of miles)					
Pickup trucks:						
For hire	6*	19	.....	20	17	20
Self-haulers	16*	15	12*	10	16	10
All operators	14	17	12*	16	17	15
Standard trucks:						
Class A	36	40	45	38	37	42
Class B	32	35	46	42	35	43
Class C	35	26	25	22	28	23
All for hire	35	34	42	39	34	40
Self-haulers	19	13	8	15	13	13
All operators	33	34	37	36	32	36
Semitrailer trucks:						
Class A	55	65*	67	66	55	67
Class B	51	30	67	63	48	66
All operators†	53	48	67	61	52	66
All trucks:						
Class A	43	41	54	40	43	49
Class B	37	35	55	42	36	44
Class C	29	25	25	22	26	23
All for hire	40	34	52	38	37	44
Self-haulers	18	14	10	13	16	12
All operators	*38*	*31*	*46*	*34*	*34*	*39*

* Less than five trucks.
† Includes some not itemized above.

Number of Trips to Market During a Week in December, 1943

About 22 percent of the 384 truckers interviewed in December, 1943, indicated that they either had not been on the market the previous week or had brought only one load. A little more than one-fifth of all truckers had made two or three trips and about one-fourth had made four or five trips during the previous week, Many truckers operating from nearby producing areas were on the market each day and, in a few instances, had made as many as two or three trips daily. Since most of the standard and semitrailer trucks were operated for hire, it is logical that they would be at the market a greater number of times each week than pickups which were owned largely by farmers hauling their own livestock. This is indicated by the data in Table 7, which show that one-half of the pickups made only one trip the previous week or made no trips at all compared with 20 and 14 percent, respectively, for standard and semitrailers.

About one-third of the truckers operating with permits made four or five trips during the week previous to the time of this study. Slightly more than two-thirds made from two to seven trips weekly. This may be compared with farmers and dealers hauling their own livestock, of which only about one-fifth made two to seven trips during the previous week and more than one-half made only one trip or none at all. Farmers hauling for hire tended to make more trips per week than farmers hauling their own livestock but they made fewer trips than others who hauled for hire (Table 7.)

TABLE 7. *Trips made the preceding week to the Kansas City market according to type of truck and type of operator, December, 1943.*

CLASSIFICATION.	Trips made the previous week.						
	0 to 1.	2 to 3.	4 to 5.	6 to 7.	8 to 9.	10 and more.	Not given.
	(Percent of trucks)						
Type of truck:							
Standard	20.8	20.8	28.2	11.2	4.8	3.1	11.1
Semitrailers	14.1	25.6	25.6	10.3	3.8	3.9	16.7
Pickup	50.0	10.5	7.9	5.3	.....	2.6	23.7
All trucks	22.4	20.8	25.7	10.3	4.1	3.2	13.5
Type of operator:							
For hire:							
Class A	9.7	23.3	31.2	13.6	3.2	5.4	13.6
Class B	21.5	24.4	23.8	11.9	7.4	2.8	8.2
Class C	26.3	13.2	36.9	5.2	2.6	.....	15.8
All for hire	16.6	22.6	28.8	11.9	4.9	3.6	11.6
Self-haulers	55.1	10.4	8.7	1.7	.....	.....	24.1
All operators	*22.4*	*20.8*	*25.7*	*10.3*	*4.1*	*3.2*	*13.5*

Insurance Carried on Livestock Trucks, 1942

About two-thirds of the 455 truckers interviewed in May, 1942, carried public liability and property damage insurance on their trucks and also livestock insurance. Only about one-third carried cargo insurance—mainly to cover return loads. Approximately 6 percent of all truckers carried no insurance of any kind (Table 8).

All Class A truckers are required to carry public liability and property damage insurance. However, only about nine out of ten of these truckers reported that they carried this type of insurance. According to reports made, approximately one-half of Class B and C truckers and self-haulers carry public liability and property damage insurance.

Insurance on livestock was carried by nearly 72 percent of Class A, 87 percent of Class B, and 51 percent of Class C truckers. Only 14 percent of the farmers hauling their own livestock carried livestock insurance.

Cargo insurance was carried by two-thirds of Class A haulers but by a smaller proportion of other type truckers. Only 3.5 percent of farmers hauling their own livestock to market carried cargo insurance. This is not surprising since most farmers, and for that matter other truckers operating the smaller trucks, do not bother with return cargoes.

Most truckers hauling for hire carried some type of insurance. All Class A haulers had some type of insurance. However, about 15 percent of farmers hauling for hire or for themselves were without insurance (Table 8).

TABLE 8. *Insurance carried on livestock trucks classified according to type of operator at the Kansas City market, May, 1942.*

KIND OF INSURANCE.	Type of operator.					
	Class A.	Class B.	Class C.	All for hire.	Self-haulers.	All operators.
	(Percent of trucks)					
Public liability and property damage	91.8*	55.4	55.9	71.1	49.1	68.4
Livestock	71.9	86.9	50.8	75.1	14.0	67.5
Cargo	66.6	21.4	15.2	40.0	3.5	35.4
No insurance	.....	6.5	13.6	4.5	15.8	5.9

* All Class A truckers are required to carry public liability and property damage insurance. The data given by truckers indicate an error in reporting.

DEFINITIONS OF CAPACITY

In studying the efficiency of trucking, it is desirable to relate the load hauled to the capacity of the truck and thereby determine the extent to which trucks are being loaded to their capacities. For this purpose, the writers not only have used the standards of capacity established by the Office of Defense Transportation but also have set up a new standard of physical capacity based on data from the 1943 survey. Definitions of these capacities are presented in this section.

Gross and Net Capacities

As a means of relating loads to capacities of trucks, the Office of Defense Transportation in early 1942 outlined a basis for determining the normal gross capacity of a truck. The capacity is the sum of the load-carrying abilities of the tires mounted on the running

wheels of a motor truck, as set forth in detailed tables published by this agency.[3] For example, a 7.00-20, 8-ply tire has a load-carrying ability of 1,950 pounds and a 7.50-20, 10-ply tire, 2,700 pounds. Thus, a truck with two front tires of the former size and four rear tires of the latter size has a *normal gross capacity* of 14,700 pounds. This capacity, of course, includes the weight of the empty truck.

Also, for purposes of administration, the ODT permits a maximum gross load of 20 percent in excess of the normal gross load. Thus, the *maximum gross capacity* of the truck described above would be 17,640 pounds.

Usually, truckers consider their loads in terms of net or "pay" loads rather than gross loads. The net load would be the gross load less the weight of the empty truck. Thus, if the weight of the above truck was 6,500 pounds, its *normal net capacity* would be 8,200 pounds and its *maximum net capacity* would be 11,140 pounds.

Physical Capacity

Ideally, the measure of capacity of a livestock truck should be that number or weight of livestock which can be hauled safely within the area of the truck floor and deck. Such a figure, which would vary with the species and weight of livestock, may be regarded as the physical capacity of the truck.

To obtain information about physical capacities of trucks, each trucker interviewed at the Kansas City market during the period, December 19-22, 1943, was asked to state the number of animals of specified weights which he considered a safe load for the floor area and usual deck area of his truck. Inside dimensions of the trucks were used in calculating the area of floors and decks.

The weight of livestock considered a safe load for trucks varied widely for the various species and weights of animals. On the floor area of standard trucks, for example, the load factor for light lambs was only 27 pounds per square foot compared with more than 90 pounds per square foot for heavy cattle (Table 9). Weights per square foot generally increased as the average weight of animals increased.

The average load factor declined as the size of truck increased. Thus, estimated safe loads,on semitrailers were slightly smaller in relation to the area of the truck than were those for standard trucks. Similarly for pickup trucks, estimated loads per square foot were greater than for standard or semitrailer trucks in the case of calves, sheep, and lightweight hogs. For heavy hogs and cattle, however, the load factor for pickup trucks was smaller than for the other types.

In general, truckers' estimates showed lighter loading of deck space than of truck floors, but the difference was greater for hogs than for sheep. The estimates are similar to those obtained by Wiley in an Indiana study.[4]

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3. General Order ODT 8, revised (7 F. R. 5445) or General Order ODT 17 (7 F. R. 5678).

4. Wiley, James R. Head of Livestock in Relation to Floor Area of Truck. Indiana Agr. Expt. Sta. Manuscript. October, 1943.

Using load factors determined mainly from truckers' estimates, tables of physical capacities were established for each species and weight of livestock and for each common size of pickup, standard, and semitrailer truck. The load factors used and the physical capacities for three sizes of trucks appear in Table 10. The method of determining physical capacities and complete tables of physical capacities are presented in the Appendix.

TABLE 9. *Pounds of livestock per square foot considered a safe load for types of trucks, based on estimates of truckers, Kansas City market, December 19-22, 1943.*

SPECIES OF LIVESTOCK AND WEIGHT PER HEAD.	Pickup trucks.	Standard trucks.		Semitrailers.	
		Floor.	Deck.	Floor.	Deck.
	(Pounds per square foot of area)				
Cattle and calves, lbs.:					
150	.....	44.4*	.....	45.1*	.....
300	82.8*	59.5	.....	56.3	.....
450	106.7*	71.5	.....	77.2	.....
700	79.9	82.0	.....	80.7	.....
1,000	80.4	87.8	.....	90.7	.....
1,300	76.1	92.8	.....	97.5	.....
Hogs, lbs.:					
150	72.3	61.4	57.2	59.2	35.7*
200	73.8	63.6	56.9	60.6	51.2
250	75.1	67.3	57.2	67.1	53.7
350	80.6	81.1	63.1	75.0	55.6
Sheep and lambs, lbs.:					
60	30.8*	27.1	26.3	25.2	25.0
90	43.8*	35.4	35.2	33.4	32.9
120	42.9*	41.4	40.9	37.6*	37.6*

* Based on less than five estimates.

TABLE 10. *Standard weight factors (pounds per square foot) used in determining physical capacities and physical capacities for three types of trucks, by species and weight of livestock.*

SPECIES OF LIVESTOCK AND WEIGHT PER HEAD.	Load factors.		Physical capacity of trucks.		
	Pickup trucks.	Standard trucks and semi-trailers.	Pickups, 4 x 6 ft.*	Standards, 8 x 14 ft.*	Semi-trailers, 8 x 24 ft.*
	(Pounds per square ft.)		(Pounds per load)		
Cattle and calves, lbs.:					
Less than 250	45	60†	865	6,075	10,575
250– 350	60	60	1,155	6,075	10,575
350– 550	70	70	1,345	7,085	12,335
550– 850	80	80	1,540	8,100	14,100
850–1,150	80	90	1,540	9,110	15,860
1,150 or more	70	90	1,345	9,110	15,860
Hogs, all weights	*60*	*80†*	*1,155*	*8,100*	*14,100*
Sheep, all weights	*30*	*60†*	*575*	*6,075*	*10,575*

* Outside dimensions; capacity determined by inside dimensions, which are six inches less.
† Includes allowance for use of decks.

DISTRIBUTION OF TRUCKS BY CAPACITIES

Trucks hauling to the Kansas City livestock market vary widely in capacity. Distribution of such trucks by various measures of capacity is presented in detail in this section.

Normal Gross Capacity

At the Kansas City market the most common size of trucks, measured by normal gross capacity, was less than 3 tons for pickups, 6 to 7 tons for standards, and 12 to 14 tons for semitrailers. Standard trucks were the most numerous. Relatively more of the trucks were of the larger capacities in December, 1943, than in May, 1942. One-half of the standard trucks in 1943 were of 7-ton or greater gross capacity compared with one-fourth in 1942. In 1943, more than 20 percent of the semitrailers had a gross capacity in excess of 16 tons compared with less than 5 percent in 1942.

Normal Net Capacity

The distribution of trucks according to normal net capacity was similar to that for normal gross capacity. The most common net capacity for standard trucks was 3 to 4 tons and for semitrailers, 7 to 8 tons. Most pickup trucks had a net capacity of less than one ton. The average net capacity of trucks surveyed in December, 1943, was greater than in May, 1942. The average net capacity of standard trucks was 700 pounds greater and that of semitrailers more than one ton larger, but the average net capacity of pickup trucks was 100 pounds less.

On the basis of all trucks operated, the average net capacity was largest for trucks operated by Class A operators and smallest for those operated by self-haulers. In 1943, trucks used by self-haulers had an average net capacity of only 5,216 pounds compared with 10,342 pounds for those of Class A haulers (Table 31, Appendix). Class B and C truckers operate the largest standard trucks whereas Class A truckers have more and larger semitrailers. The use of many small pickup trucks by self-haulers accounts for the relatively small average capacity of their trucks.

Kansas trucks had a greater average net capacity than Missouri trucks in each year. In May, 1942, the difference was more than 1,500 pounds and in December, 1943, nearly 3,200 pounds. Missouri truckers used larger standard trucks but Kansas truckers used more and, in 1943, larger semitrailers. This raised the average capacity of their trucks.

Physical Capacity

As stated, the physical capacity of trucks as set forth in this study varies by species and weights of livestock and by inside area of truck bed. Since the inside width of the truck bed on standard and semitrailer trucks usually is 7½ feet, the inside area varies directly with length of the bed and any distribution of these trucks by physical

capacity will be, in reality, a distribution of trucks by length and area of bed.

Five different schedules of physical capacities of trucks were set up to make proper allowances for different species and weights of livestock (Tables 27 and 28, Appendix). Of these, the physical capacities of trucks were least for sheep and lambs and were greatest for 850- to 1,150-pound cattle.

The most common standard trucks, based on physical capacity for sheep and lambs, were those capable of hauling an estimated load of 6,000 to 7,000 pounds (Table 32, Appendix). Semitrailers with physical capacities of 5 to 6 tons of sheep were most numerous. Few pickup trucks surveyed were large enough to haul more than 1,500 pounds of sheep. About two-thirds of all trucks surveyed had a physical capacity of 5,000 to 7,000 pounds of sheep and lambs.

For cattle weighing between 850 and 1,150 pounds, standard trucks with a physical capacity of 4 to 5 tons were most common. This group comprised nearly two-thirds of the standard trucks and nearly one-half of all trucks (Table 33, Appendix). Few pickup trucks had a physical capacity beyond 2 tons of cattle. Of the semitrailer trucks covered in the 1943 survey, more than one-third could haul more than 9 tons of medium to heavy weight cattle but those with a physical capacity of 8 to 9 tons were most numerous. The most common physical capacity for semitrailers at the time of the 1942 survey was 7 to 8 tons of heavy cattle.

Outside Dimensions of Truck Bed

A trucker ordinarily states his truck's dimensions in terms of outside measurements although inside dimensions determine the physical capacity of the truck. Most beds on standard and semitrailer trucks have an outside width of nearly 8 feet but the lengths vary greatly. Of the standard trucks included in these surveys, the most common outside length of bed was 14 feet (Table 11.) About 40 percent of standard trucks and 30 percent of all trucks were in this group. Beds on semitrailers also were nearly 8 feet wide and ranged from 19 to 36 feet in outside length, but those 25 to 26 feet long were most numerous. Beds on pickup trucks varied from 4 by 5 feet, outside dimensions, to 8 by 8 feet, but the 4 by 6, 4 by 7, and 6 by 8 sizes were most common.

In each survey, the average length of bed on Kansas trucks was greater than that for Missouri trucks. The difference for standard trucks was 7 to 8 inches and semitrailers 1 to 2 feet. The average length of standard trucks varied from about 12 feet for self-haulers to more than 14 feet for Class A truckers.

TABLE 11. *Distribution of livestock trucks at the Kansas City market according to area or length of bed, May, 1942, and December, 1943.*

FLOOR AREA OR LENGTH OF BED.	Number of trucks.		Percent of subgroup.		Percent of grand total.	
	1942.	1943.	1942.	1943.	1942.	1943.
Pickup trucks: (Inside area of bed, square feet)						
Less than 22.5	4	6	17.4	16.7	0.9	1.6
22.5–29.9	6	12	26.1	33.3	1.4	3.2
30.0–37.4	2	6	8.7	16.7	0.5	1.6
37.5–44.9	4	8	17.4	22.2	0.9	2.1
45.0 or more	7	4	30.4	11.1	1.6	1.0
Totals	23	36	100.0	100.0	5.3	9.5
Standard trucks: (Outside length of bed, feet)						
12 or less	101	48	30.4	18.3	23.7	12.8
13	66	50	19.9	19.0	15.5	13.3
14	124	112	37.3	42.6	29.0	29.8
15–16	24	39	7.2	14.8	5.6	10.4
17 or more	17	14	5.2	5.3	3.9	3.7
Totals	332	263	100.0	100.0	77.7	70.0
Semitrailer trucks: (Outside length of bed, feet)						
20 or less	9	5	12.5	6.5	2.2	1.3
21–22	10	11	13.9	14.3	2.3	2.9
23–24	19	9	26.4	11.7	4.5	2.4
25–26	20	20	27.7	26.0	4.8	5.3
27–28	10	19	13.9	24.6	2.3	5.1
29–30	4	8	5.6	10.4	0.9	2.1
31 or more	.....	5	.....	6.5	.....	1.4
Totals	72	77	100.0	100.0	17.0	20.5
Grand totals	*427*	*376*	.....	.....	*100.0*	*100.0*

Extent of Usual Deck

At the time of the 1943 survey, truckers were asked to report the usual length of deck used for hogs, sheep, and calves. Few truckers had ever used a deck for calves, but most reported length of deck for hogs and sheep. These measurements were then related to the length of bed and tabulated as fractions of the bed length.

Full decks for sheep were used by nearly 40 percent of all standard truck operators and by more than 50 percent of those using semitrailers (Table 34, Appendix). About one-fourth of each usually did not use decks for sheep.

Half decks were most common for hogs. They were used on one-third of the standard trucks and one-fourth of the semitrailers. Full decks on semitrailers and three-quarter decks on standards were also used extensively for hogs.

Truckers using long truck beds also use relatively long decks. Of the standard trucks with 16-foot or longer beds, nearly two-thirds had full decks for sheep and more than one-half had three-quarter or full decks for hogs. Similar decks for sheep and hogs were used on much smaller proportions of the trucks with beds 12 feet or less in length.

The use of extensive decks is more common in Missouri than in Kansas. More than 60 percent of the Missouri truckers at the Kansas City market used three-quarter or full decks for sheep compared with 43 percent of the Kansas truckers. Three-quarter or full decks were used for hogs by nearly 50 percent of the Missouri truckers and by only 18 percent of the Kansas truckers.

Weight of Empty Trucks

The weight of empty trucks is an important factor in determining the net capacity of trucks based on the load-carrying ability of tires. Weights of trucks varied considerably at the Kansas City market. Standard trucks usually weighed between 3 and 4 tons. The average weight was 6,382 pounds in the 1942 survey and 6,604 pounds in the December, 1943, survey (Table 12). Empty semitrailers, including tractors, averaged about 12,650 pounds and most weighed from 6 to 8 tons. Pickup trucks averaged about 3,900 pounds.

The empty weight of a small truck is equal to a large part of its gross capacity. For pickup trucks, empty weights averaged nearly two-thirds of gross capacity; for standards, nearly one-half, and for semitrailers, about 45 percent (Table 12).

TABLE 12. *Weight of empty livestock trucks and relation of that weight to normal gross capacity of livestock trucks, Kansas City market, May, 1942, and December, 1943.*

TYPE OF TRUCK.	Weight of empty trucks, pounds.			Weight as percent of gross capacity.		
	1942.	1943.	Both.	1942.	1943.	Both.
Pickup	3,819	3,963	3,901	62.4	64.6	63.6
Standard	6,382	6,604	6,486	49.4	47.5	48.6
Semitrailer	12,568	12,708	12,649	47.2	44.2	45.4
All trucks	*7,130*	*7,673*	*7,396*	*49.2*	*46.9*	*48.0*

Relation of Net Capacity to Physical Capacity

The adequacy of normal net capacity as a measure of efficiency in the use of trucks for livestock hauling is indicated by the relation of that capacity to physical capacity. For the purpose of showing this relationship, the net capacities of trucks were expressed as percentages of the physical capacities of trucks for sheep, the class of livestock for which physical loads are lightest, and for heavy cattle, the class of livestock for which physical capacity of trucks is greatest.

For hauling sheep, the net capacity of trucks is usually in excess of physical capacity. This was true of 78 percent of all trucks surveyed in May, 1942, and 92 percent in December, 1943 (Table 35, Appendix). Thus, most trucks could not safely haul a net capacity load of sheep. However, net capacity for most trucks was less than physical capacity for heavy cattle. In the May, 1942, survey, 91

percent of all trucks had net capacities which were less than their physical capacities for 850- to 1,150-pound cattle. In December, 1943, the proportion was 80 percent. In other words, most trucks at the Kansas City market had tires too small to permit the hauling of a physical capacity load of heavy cattle. The net capacity of semitrailer trucks averaged a greater percentage of physical capacities for sheep or cattle than did the capacity of other types of trucks. This means that the size of tires on semitrailers was more nearly in line with their physical capacities for hauling cattle than was true of standard or pickup trucks.

MARKET TRIPS OF LIVESTOCK TRUCKS

Loads hauled on market trips of livestock trucks covered by the surveys totaled nearly 1,600 tons of livestock in 1942 and more than 1,800 tons in 1943 (Table 13.) More than one-half of the tonnage was cattle and about 40 percent was hogs. Calves and sheep made up the relatively small remainder of the total tonnage. The importance of the two major species varied between the states. Two-thirds to three-fourths of the Kansas tonnage was cattle compared with less than two-fifths of the Missouri tonnage. Hogs composed more than one-half of the weight of Missouri loads and only one-fourth of Kansas loads.

TABLE 13. *Number of head, average weight, and total weight of livestock on livestock trucks at the Kansas City market, by states and species, May, 1942, and December, 1943.*

SPECIES AND ITEM.	1942.		1943.		Both states.	
	Kansas.	Missouri.	Kansas.	Missouri.	1942.	1943.
Weights of loads hauled, tons:						
Cattle	568.5	297.7	750.8	299.3	866.2	1,050.1
Hogs	239.1	414.1	254.1	468.0	653.2	722.1
Calves	18.3	35.5	15.1	18.8	53.8	33.9
Sheep	9.1	9.2	7.9	11.1	18.3	19.0
Totals	835.0	756.5	1,027.9	797.2	1,591.5	1,825.1
Weight of each species as percent of total:						
Cattle	68.1	39.4	73.0	37.5	54.4	57.5
Hogs	28.6	54.7	24.7	58.7	41.0	39.6
Calves	2.2	4.7	1.5	2.4	3.4	1.9
Sheep	1.1	1.2	0.8	1.4	1.2	1.0
Totals	100.0	100.0	100.0	100.0	100.0	100.0
Number of head of livestock hauled:						
Cattle	1,410	736	1,597	692	2,146	2,289
Hogs	1,998	3,479	2,216	3,936	5,477	6,152
Calves	157	312	102	133	469	235
Sheep	191	183	194	253	374	447
Average weight per head of livestock, pounds:						
Cattle	806	809	940	865	807	918
Hogs	239	238	229	238	239	235
Calves	233	227	297	282	229	289
Sheep	95	101	81	88	98	85

Average Weights of Animals

The average weights of livestock in the loads varied between the two surveys and between states. Kansas hogs were 10 pounds lighter in 1943 than in 1942 and 9 pounds lighter than Missouri hogs in 1943 (Table 13). The average weight of all cattle was more than 100 pounds greater in December, 1943, than in May, 1942. In 1942, Kansas and Missouri cattle were about the same weight but at the time of the 1943 survey Kansas cattle were considerably heavier. Calves also averaged heavier in 1943 than in 1942 but Kansas calves were only slightly heavier than those from Missouri at the time of each survey. The average weight of sheep and lambs was 13 pounds less in December, 1943, than in May, 1942. Missouri sheep and lambs averaged slightly heavier than did those of Kansas shipments.

Number of Consignments

On the average, more than two consignments of livestock were required to make a truckload in the Kansas City market area (2.4 consignments in May, 1942, and 2.2 in December, 1943). The fewest consignments per load were hauled in pickup trucks and in loads delivered by farmers hauling their own livestock. These involved little more than single consignments. Loads on standard trucks operated for hire averaged more than two and one-half consignments. Although they haul large loads, semitrailers are used to haul relatively large consignments, as indicated by the fact that the average number of consignments in loads was 2.2 in the 1943 survey and 1.7 in the 1942 survey. There seemed to be little difference between classes of truckers in the number of consignments per load on standard trucks.

About 55 percent of the truckloads covered by the two surveys were single consignments, and 14 percent were two-shipper loads (Table 37, Appendix). Twelve percent of the loads were assembled from five or more consignors. There was no significant difference between states in the distribution of loads by number of shippers.

The fact that nearly one-half of the truckloads required the assembly of livestock from two or more farms, increased the travel required to move a given volume of livestock to market over that needed if shipments had been larger. It also increased the possibilities of duplication of travel by truckers in a community.

Number of Consignees

The number of commission firms or other consignees to which each load was consigned was obtained in the 1942 survey. At that time, the number of consignees averaged 1.6 per load compared with an average of 2.4 consignments, which indicates that occasionally two consignments in the same truckload went to one consignee. The general tendency, however, was for each consignor to ship to a different consignee, as the truckers hauling the load involving the highest average number of shippers also delivered to the largest average number of receivers. Although farmers hauling their own livestock

were hauling single consignments in most instances, they often shipped to more than one commission firm. This indicates the tendency for farmers to split a single consignment into several parts such as the consignment of hogs to one firm and cattle to another.

About 60 percent of the loads in the 1942 survey were consigned to a single firm and nearly 20 percent to two firms (Table 38, Appendix). Less than 2 percent went to as many as five consignees.

Mileage for Assembling Load

For the 1942 survey truckers were asked to estimate their mileage from starting point to the last stop in assembling their loads and, for the 1943 survey, to estimate the mileage traveled for assembly in excess of the direct trip to market. This would make assembly mileage reported for 1943 greater than that reported for 1942 even under the same assembly conditions.

According to the information received from truckers, about 10 miles of travel was required, on the average, to assemble a load of livestock for a standard truck and about 15 to 20 miles for a semitrailer load (Table 14). These estimates probably are less than actual travel because assembly mileage in Boone county, Missouri, when routes traveled were plotted and measured on a map, averaged about 25 miles for standard truckloads and 45 miles for semitrailer loads.[5]

When roads permit, truckers commonly assemble their loads of more than one consignment by driving from farm to farm until the load is completed. Frequently, however, it is necessary for the trucker to haul two or more partial loads to a loading point and then load these onto the truck going to market. In December, 1943, 275 assembly trips were required to assemble 201 loads of livestock for standard trucks and 86 trips for 53 loads on semitrailers. Thus, most loads involved only one assembly trip. Since most loads were single consignments, this was to be expected.

TABLE 14. *Average mileage required to assemble loads as estimated by for-hire truckers at the Kansas City market, by state of origin and type of truck, May, 1942, and December, 1943.**

TYPE OF TRUCK.	1942.		1943.		Both states.	
	Kansas.	Missouri.	Kansas.	Missouri.	1942.	1943.
	(Assembly mileage per load of livestock)					
Pickup	.....	3.0	.....	9.9	3.0	9.9
Standard	9.7	9.7	11.5	10.7	9.8	10.9
Semitrailer	16.1	12.9	21.5	14.8	15.5	20.3
All trucks	11.4	9.6	14.9	10.9	10.5	12.5

* Data not strictly comparable between years. See text.

5. Haag, Herman M., Transportation of Livestock in the Boone County Area with Estimates of Possible Savings (Mimeographed). Missouri Agr. Expt. Sta., April, 1943.

Average Distance to Market

The average trip to market for livestock trucks, exclusive of mileage for assembly, was slightly less than 85 miles. In May, 1942, this average distance was 84.6miles and in December, 1943, 83.2 miles. If these distances are weighted by the amounts of livestock hauled each distance, the weighted average distance is about 100 miles in each year.

Average distances traveled to market varied by type of truck and operator. As indicated, small trucks are used for the shorter distances. Thus, the average trip in 1943 for pickup trucks was 38 miles; for standard trucks, 71 miles; and for semitrailers, 142 miles (Table 15). Semitrailer trips averaged 35 miles shorter in 1943 than in 1942, but the differences between years were not significant for other types of trucks. In general, the Class B truckers made the longest average trips with standard and semitrailer trucks if each is considered separately. On the basis of all trucks used, the trips made by Class A truckers were longest and those made by self-haulers were shortest.

Since the livestock supply area of the Kansas City market extends farther westward than eastward, the average trip of Kansas trucks was longer than that for Missouri trucks. The difference in May, 1942, was nearly 50 miles and in December, 1943, nearly 40 miles. Despite this difference, the average trip of standard trucks

TABLE 15. *Average mileage traveled to market after assembly of livestock, by state of origin and by type of truck and operator, Kansas City market, May, 1942, and December, 1943.*

TYPE OF TRUCK AND OPERATOR.	1942.		1943.		Both states.	
	Kansas.	Missouri.	Kansas.	Missouri.	1942.	1943.
	(Miles per trip)					
Pickup trucks:						
For hire	15.0*	43.5	.....	30.2	41.6	30.2
Self-haulers	32.0*	25.2	29.2*	48.1	27.0	44.4
All operators	27.7*	36.9	29.2*	39.5	35.5	38.2
Standard trucks:						
Class A	81.4	53.9	75.0	59.7	72.8	68.7
Class B	83.6	72.0	98.4	77.9	74.7	80.7
Class C	107.1	56.6	74.0	56.3	63.7	62.4
All for hire	83.2	65.5	78.9	70.3	72.6	73.4
Self-haulers	84.5	40.4	60.3	42.4	60.6	50.2
All operators	83.4	63.2	76.5	67.6	71.4	70.9
Semitrailer trucks:						
Class A	186.9	108.3*	149.3	82.5	181.9	143.3
Class B	244.6	94.3	158.4	107.9	174.5	143.0
All operators	194.6	98.3	151.3	92.9	177.1	142.2
All trucks:						
Class A	116.8	57.7	108.8	62.1	102.2	94.7
Class B	111.6	71.6	127.5	77.1	81.8	88.0
Class C	109.7	56.6	74.0	48.7	65.5	55.2
All for hire	115.2	65.9	110.4	68.9	88.3	88.0
Self-haulers	76.6	36.0	58.0	45.0	52.9	49.8
All operators	*111.5*	*62.6*	*105.1*	*65.4*	*84.6*	*83.2*

* Less than five trips.

in Kansas was only 20 miles greater in 1942 and 9 miles greater in 1943 than that of Missouri trucks. Kansas truckers used semitrailers for the long trips, a fact which made their average trips nearly 100 miles longer than Missouri semitrailer trips in 1942 and nearly 60 miles more in 1943.

TABLE 16. *Average weight of market load on livestock trucks at the Kansas City market, by state of origin and by type of truck and operator, May, 1942, and December, 1943.*

TYPE OF TRUCK AND OPERATOR.	1942.		1943.		Both states.	
	Kansas.	Missouri.	Kansas.	Missouri.	1942.	1943.
	(Pounds)					
Pickup trucks:						
For hire	200*	1,990	.....	1,784	1,871	1,784
Self-haulers	1,383*	1,291	1,231*	1,636	1,316	1,555
All operators	1,088*	1,736	1,231*	1,708	1,636	1,653
Standard trucks:						
Class A	5,741	5,088	6,720	6,556	5,539	6,652
Class B	6,099	6,048	6,640	6,991	6,060	6,943
Class C	6,150	5,260	7,776	6,049	5,384	6,644
All for hire	5,864	5,710	6,812	6,763	5,772	6,781
Self-haulers	4,629	4,371	4,541	4,507	4,489	4,522
All operators	5,722	5,587	6,516	6,546	5,642	6,535
Semitrailer trucks:						
Class A	13,258	7,800*	16,251	16,658	12,910	16,287
Class B	15,965	12,050	15,722	13,472	14,138	15,038
All operators	13,668	11,304	16,016	14,775	13,238	15,827
All trucks:						
Class A	8,266	5,183	11,059	7,601	7,504	10,014
Class B	7,815	6,151	11,044	7,096	6,574	7,947
Class C	7,122	5,226	7,776	5,004	5,542	5,715
All for hire	8,099	5,778	10,871	6,944	6,833	8,754
Self-haulers	4,142	3,491	3,972	3,194	3,762	3,477
All operators	*7,715*	*5,522*	*10,170*	*6,408*	*6,511*	*8,093*

* Less than five loads.

Weights of Loads Hauled.

At the time of the 1943 survey, the average estimated market load on trucks surveyed was 8,093 pounds (Table 16). Loads on pickup trucks averaged 1,653 pounds; on standards, 6,535 pounds; and on semitrailers, 15,827 pounds. These averages for standard and semitrailer trucks were substantially larger than a year earlier.

The heaviest average loads for all trucks were hauled by the Class A operators, but Class B operators hauled the heaviest standard truckloads and the heaviest semitrailer loads in May, 1942. The fact that Class A operators use more semitrailers than Class B truckers increased the average load of the former. Farmers hauling their own livestock hauled the lightest loads.

Loads on Kansas trucks averaged heavier than those from Missouri, but this was due largely to the greater use of semitrailers in Kansas than in Missouri. Results from each survey showed that standard trucks from Missouri were loaded nearly as heavily as those from Kansas.

Relation of Loads to Capacity

Relative to the capacities of trucks, market loads varied greatly. The greatest variation in the proportion of loads to capacities was in the comparisons of loads to normal net capacities and physical capacities, but the percentages which loads were of gross capacities also showed wide variation.

Gross market loads on livestock trucks, which include the weights of empty trucks, were commonly between 75 and 120 percent of normal gross capacity. Approximately 45 percent of the gross loads studied were from 75 to 100 percent of gross capacity and, in addition, one-third were in the 100- to 120-percent group. About 12 percent of the loads were more than 25 percent below gross capacity in 1942 and 18 percent in 1943, and about 7 percent in each year were more than 20 percent above.

Since the weight of empty trucks is included in gross loads, the relationship of net loads to net capacity shows much greater spread than that of gross loads to gross capacity. For example, 11.3 percent of the market loads in 1943 and 18.9 percent in 1942 were less than one-half of normal net capacity (Table 39, Appendix). A larger percentage of the Missouri trucks than of Kansas trucks were loaded this lightly.

In December, 1943, loads hauled by the truckers interviewed averaged 93.2 percent of net capacity, compared with 88.3 percent in May, 1942, despite the fact that net capacity of the trucks in 1943 was greater than in 1942 (Table 40, Appendix). Each type of truck and each class of hauler, except self-haulers, showed an increase in loading relative to capacity in 1943 over 1942. In each period, Kansas trucks were loaded more nearly to net capacity than were Missouri trucks. Relative to net capacity, loads brought to market by self-haulers were lightest. Differences in loading among other types of truckers were not great, but Class C operators, farmers hauling for hire, tended to haul lighter loads than other for-hire truckers.

The standards for physical capacities of trucks described earlier are the estimated weights of livestock which may be hauled safely within the area of the truck floor and deck and, therefore, are optimum or practicable loads. Although the largest proportion of loads was less than this physical capacity, 27.6 percent of the loads in December, 1943, and 13.9 percent in May, 1942, were greater than the optimum load (Table 17). Interviewers saw many instances of physical overloading during the 1943 survey period. However, many trucks were loaded considerably below their physical capacity. About 30 percent of the trucks in December, 1943, and nearly one-half in May, 1942, had loads of less than 75 percent of optimum physical capacity. A larger percentage of the Missouri trucks than of those from Kansas were either overloaded or lightly loaded relative to physical capacity.

In 1943, loads on trucks surveyed averaged 88.4 percent of physical

TABLE 17. *Percentage distribution of market loads on livestock trucks at the Kansas City market according to relation of load to physical capacity of truck, by states, May, 1942, and December, 1493.*

LOAD AS PERCENT OF PHYSICAL CAPACITY.	1942.		1943.		Both states.	
	Kansas.	Missouri.	Kansas.	Missouri.	1942.	1943.
	(Percent of total)					
Less than 25	6.2	10.8	2.1	2.9	8.7	2.5
25– 49.9	12.9	11.7	6.2	11.6	12.2	9.2
50– 74.9	27.6	28.5	16.0	20.3	28.1	18.4
75– 99.9	41.8	32.9	52.6	34.0	37.1	42.3
100–124.9	7.5	11.3	18.0	24.5	9.5	21.6
125–149.9	3.1	4.0	3.6	4.2	3.6	3.9
150 or more	0.9	0.8	1.5	2.5	0.8	2.1
Totals	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

capacity compared with 77.8 percent in 1942 (Table 18). Nearly all classes of truck operators showed increases in loading of all types of trucks relative to physical capacity in 1943 compared with 1942.

On the average, the larger trucks were more nearly loaded to capacity than the smaller ones. Loads on pickups in 1943 averaged 78 percent of capacity; on standards, 83 percent; and on semi-trailers, 99 percent (Table 18). In 1942 the same relationship existed but the percentages were smaller. Loads on all Missouri

TABLE 18. *Relation of market loads to the physical capacity of livestock trucks at the Kansas City market, by state of origin and by type of truck and operator, May, 1942, and December, 1943.*

TYPE OF TRUCK AND OPERATOR.	1942.		1943.		Both states.	
	Kansas.	Missouri.	Kansas.	Missouri.	1942.	1943.
	(Load as percent of physical capacity)					
Pickup trucks:						
For hire	23.1	62.0	.....	75.9	61.3	75.9
Self-haulers	78.9	43.9	72.9	81.9	50.3	80.3
All operators	71.0	55.8	72.9	78.8	57.0	78.2
Standard trucks:						
Class A	72.0	65.2	83.0	78.9	70.0	81.3
Class B	75.4	79.6	84.1	88.8	78.6	88.2
Class C	76.5	73.0	88.3	80.6	73.5	83.5
For hire	73.2	75.5	83.8	85.0	74.5	84.5
Self-haulers	67.3	64.4	65.6	65.2	65.8	65.4
All operators	72.6	74.6	81.7	83.3	73.8	82.7
Semitrailer trucks:						
Class A	91.3	53.7	97.8	113.1	88.9	99.0
Class B	101.7	90.2	99.2	89.9	96.8	96.5
All operators	93.2	82.1	97.9	100.3	91.3	98.2
All trucks:						
Class A	81.3	63.1	92.4	84.7	77.5	90.5
Class B	83.0	80.1	94.0	88.4	81.0	90.0
Class C	84.2	75.6	88.3	82.8	77.3	84.6
All for hire	81.8	75.8	92.5	86.7	79.0	89.9
Self-haulers	67.8	61.4	66.4	68.5	64.2	67.6
All operators	*80.9*	*74.5*	*91.1*	*85.1*	*77.8*	*88.4*

trucks averaged a smaller percentage of capacity than those on Kansas trucks because of the greater use in Kansas of semitrailers which were loaded more nearly to capacity. For each type of truck in 1943 and for standard trucks in 1942, loads from Missouri averaged heavier relative to capacity than Kansas loads. Relative to physical capacity, self-haulers also hauled lighter loads than other operators. Class A and B operators loaded their trucks more nearly to capacity but Class C haulers hauled only slightly smaller loads.

Other Factors Affecting Size of Load on Livestock Trucks

Type of truck, distance to market, type of operator, and species of livestock hauled affect the proportion of market loads to the capacities of trucks. The relationship between type of truck and relative loads was discussed in the preceding section.

The number of loads of livestock on standard and semitrailer trucks was sufficient to permit analysis of these loads according to distance hauled to market. In general, trucks hauling for long distances were loaded more nearly to physical capacity. This was to be expected because the saving in mileage by combining two or more shipments rather than hauling each individually is much greater for consignments distant from market than for those nearby. In 1943, those standard trucks within an area only 25 miles from market were loaded to only one-half of physical capacity whereas loads on standard trucks from distances of 150 miles or more averaged greater than physical capacity (Table 19). In 1942, the same general trend prevailed but the difference between relative loads on trucks from short and long distances was not so great. There were no consistent differences in relative loading between Missouri and Kansas trucks when comparisons were made between trips of similar distances.

As the distance from market increased, the percentages of loads on standard trucks in relation to net capacities also increased. For most mileage groups in excess of 100 miles, the average load ex-

TABLE 19. *Relation of market loads to physical capacities of standard for-hire livestock trucks at the Kansas City market, by state of origin and distance from market, May, 1942, and December, 1943.*

DISTANCE FROM MARKET, MILES.	1942.		1943.		Both states.	
	Kansas.	Missouri.	Kansas.	Missouri.	1942.	1943.
	(Market load as percent of physical capacity)					
Less than 25	47.6*	46.3	45.6	56.8	46.5	52.4
25– 49.9	67.6	68.0	77.5	70.0	67.8	72.7
50– 74.9	73.5	80.6	87.8	86.5	78.1	86.9
75– 99.9	72.2	81.4	78.2	96.2	77.5	91.2
100–124.9	87.4	81.1	112.0	91.2	83.3	99.5
125–149.9	76.2	83.8	95.6	97.7	80.3	97.0
150 or more	81.8	61.0*	107.1	113.0	80.1	108.9
All	*73.7*	*75.5*	*87.6*	*85.0*	*74.8*	*86.9*

* Less than five loads.

ceeded average net capacity in both years. Average loads from less than 25 miles distant were usually less than two-thirds of net capacity.

The tendency to load trucks more nearly to physical capacity as the distance to market increased also was evident in the case of semitrailers, but was not so pronounced as that shown for standard trucks (Table 41, Appendix). Truckers with semitrailers usually also have standard trucks which may be used to haul shipments too small for a capacity semitrailer load.

Loads hauled by farmers were smaller relative to the physical capacities of trucks used than those delivered by other types of operators. Part of this is due to the fact that farmers or self-haulers haul relatively short distances, from which all types of truckers haul relatively light loads, but within the same mileage zones self-haulers use less of the physical capacity of trucks than other haulers. In general, Class B truckers loaded their trucks more nearly to physical capacity than other for-hire operators within each mileage zone.

The percentage which the load was of physical and normal net, capacities varied according to the species of livestock hauled. In both years, mixed loads of cattle and hogs showed the largest average percentage of physical capacity while loads of calves used the smallest proportion of space available (Table 42, Appendix). Loads of cattle and hogs and mixed loads involving cattle, calves, and hogs were loaded to nearly 80 percent of physical capacity in 1942 and, with the exception of loads of hogs, more than 80 percent in December, 1943. Relative to net capacity, straight loads of cattle were heaviest.

Relation of Type of Truck to Distance from Market

As the distance that livestock is hauled increases truckers shift from the smaller to larger types of trucks. In the 25-mile zone, nearly 10 percent of the tonnage was hauled to market on pickup trucks, and the remainder by standard trucks. (Table 43, Appendix). In the most distant areas, 250 miles or more, standard trucks hauled only 6 percent of the livestock tonnage and semitrailers hauled the remainder. Pickup trucks were not used extensively beyond the 50-mile zone. Semitrailers became important after the distance had increased to 75 miles.

Relation of Trips per Week to Distance from Market

In December, 1943, truckers were asked to report the number of trips made to the Kansas City market during the previous week. According to these reports, operators of pickup trucks averaged 1.7 trips; of standard trucks, 3.8 trips; and of semitrailers, 4.0 trips (Table 44, Appendix). These averages indicate that it would be possible to move even larger volumes of livestock to the Kansas City market with existing trucks than were moved in December, 1943, by increasing the number of trips per week for trucks now being used less than four times per week for livestock hauling. Of course, many trucks are used for purposes other than livestock hauling.

As the distance from market increased, the average number of

trips per week declined. Semitrailers within the 50- to 100-mile zone made 6.7 trips to market during the previous week while those at least 250 miles from market made only two trips. The number of trips made by standard and pickup trucks showed similar declines as distances increased.

Miles per 1,000 Pounds of Load

In some instances it may be desirable to have a measure of efficiency which shows the relative travel required to deliver certain products within a certain area to market. One such measure, miles per 1,000 pounds of load, may be used to compare mileage requirements between two periods of time within the same market supply area or to compare performances of truckers hauling from the same supply zone to market.

In December, 1943, 10.3 miles of travel per half-ton of livestock were required to deliver semitrailer loads to market (Table 20). This was 30 percent less than the 14.6 miles per 1,000 pounds traveled in 1942. This improvement resulted from more complete loading of the physical capacities of such trucks and from a decline in the average length of haul. The latter may have resulted from the use of other nearer markets by producers distant from Kansas City.

The mileage used to haul 1,000 pounds of livestock to the Kansas City market in standard trucks declined from 14.4 to 12.5 miles during the period between the surveys, mainly because of loading the trucks more fully. There was a marked decline in the efficiency of use of pickup trucks, due mainly to increased mileage for assembly.

It should be noted that the larger trucks traveled fewer miles per 1,000 pounds in hauling livestock from long distances than the smaller trucks traveled for the shorter distances. Thus, small trucks used beyond the limit of their most effective distance zones were extremely inefficient in the use of man power and equipment.

TABLE 20. *Miles traveled per 1,000 pounds of load hauled to market, by type of truck, both states, May, 1942, and December, 1943.*

	1942.			1943.		
	Pickup trucks.	Standard trucks.	Semi-trailers.	Pickup trucks.	Standard trucks.	Semi-trailers.
Average load, pounds....	1,636	5,642	13,238	1,653	6,535	15,827
Distance traveled per trip, miles:						
Assembly.....	3.0	9.8	15.5	9.9	10.9	20.3
To market.....	35.5	71.4	177.1	38.2	70.9	142.2
Totals.....	38.5	81.2	192.6	48.1	81.8	162.5
Travel per 1,000 pounds, miles:						
Assembly.....	1.8	1.7	1.2	6.0	1.7	1.3
To market.....	21.7	12.7	13.4	23.1	10.8	9.0
Totals.....	*23.5*	*14.4*	*14.6*	*29.1*	*12.5*	*10.3*

RETURN TRIPS OF LIVESTOCK TRUCKS

In general, livestock hauling is a specialized service involving the assembly of livestock from farms into truckloads and the delivery of these loads to the markets preferred by livestock producers. The specialized livestock trucker usually expects to return from market with an empty truck to avoid delay in the assembly of the next load. It is only under abnormal conditions, such as those created by wartime transportation shortages, that the livestock hauler gives much consideration to loads on return trips if they require considerable additional time, travel, or expense for handling.

On the other hand, a number of the truckers engaged mainly in the hauling of return loads of dry freight such as feed, hardware, and building materials from cities where livestock markets are located, also haul loads of livestock to market. For these operators, livestock trucking service is sideline business. This is particularly true of Class A truckers in Missouri because they are the only group authorized to haul nonfarm commodities for hire.

If livestock trucks are to be used efficiently under wartime conditions, as many as possible should be loaded on return trips from market. In considering the extent to which truckers haul return loads, it must be remembered that there are numerous hindrances to the hauling of return loads, among which are legal restrictions as to types of commodities which truckers without special franchises may haul, the differences between quantities of livestock originating at and quantities of freight destined to various points, and the delays at market usually necessary if return loads are to be hauled.

TABLE 21. *Tons of freight hauled on latest return trip of livestock trucks at the Kansas City market, by states and type of operator, May, 1942, and December, 1943.*

SURVEY AND TYPE OF TRUCKER.	Tons hauled.			Percent of total.		
	Kansas.	Missouri.	Both states.	Kansas.	Missouri.	Both states.
May, 1942:						
Class A	359	143	502	70.7	38.2	56.9
Class B	114	170	284	22.4	45.3	32.1
Class C	25	44	69	4.9	11.7	7.8
All for hire	498	357	855	98.0	95.2	96.8
Self-haulers	10	18	28	2.0	4.8	3.2
All operators	*508*	*375*	*883*	*100.0*	*100.0*	*100.0*
December, 1943:						
Class A	457	139	596	78.4	33.9	60.0
Class B	98	221	319	16.8	53.9	32.1
Class C	12	28	40	2.1	6.8	4.1
All for hire	567	388	955	97.3	94.6	96.2
Self-haulers	16	22	38	2.7	5.4	3.8
All operators	*583*	*410*	*993*	*100.0*	*100.0*	*100.0*

Volume of Return Freight Hauled

Return loads hauled by the truckers on their latest trip to market totaled 880 tons in 1942 and 990 tons in 1943 (Table 21). Of this tonnage, Class A truckers hauled about 60 percent in each survey and Class B operators about 30 percent. In Kansas, Class A haulers accounted for 70 to 80 percent of the tonnage and Class B about 20 percent. Missouri Class B truckers hauled about one-half of the return freight reported by Missouri livestock truckers and Class A operators hauled about one-third.

Kinds of Commodities Hauled

Feed and livestock made up the largest proportion of return loads on livestock trucks. More than one-half of the loads were of these commodities. Other important items hauled were coal, sand, gravel, lime, fertilizer, and groceries.

Where Load Was Booked

More than 85 percent of the return loads hauled at the time of the 1942 survey and nearly 100 percent in 1943 were arranged for by the trucker before he left on the market trip. Since most livestock truckers knew about their return loads before they started to market, clearing or information offices at markets were of little value.

Delivery of Return Loads

Information on the number of places involved in the delivery of return loads and the extra mileage required for delivery was obtained in the 1942 survey. At that time, return loads required an average of 1.7 stops and about 3.2 extra miles for delivery. Class A truckers hauled loads involving the most consignees but traveled the fewest miles to deliver their return loads. Class B operators had few return loads with more than one consignee but traveled the most miles to deliver them. The latter truckers hauled mainly feed and livestock on return trips. This accounts for the greater distances for delivery because such loads are commonly delivered direct to farmers within the territory rather than to merchants.

Proportion of Trips with Return Loads

According to their statements, more livestock truckers were hauling loads on a large percentage of return trips in December, 1943, than in May, 1942. Nearly one-third of the truckers in 1943 were hauling return loads on every trip compared with 18 percent in 1942 (Table 45, Appendix). About one-fourth of the truckers hauled return loads on less than one-fourth of the trips in each year.

More Kansas truckers hauled return loads on 75 percent or more of their trips than did Missouri truckers. More than one-half of the Kansas truckers in 1943 and nearly 40 percent in 1942 attained this percentage compared with 34 percent and 32 percent for Missouri truckers.

In each year, truckers reported their loads on the last previous trip to market. These reports of actual loads compare favorably

with the truckers' estimates. About 52 percent of the truckers had hauled return loads on the same trucks on the last previous trip to market in December, 1943, compared with 46 percent in May, 1942, (Table 46, Appendix).

In each year, a smaller percentage of Missouri than Kansas trucks hauled return loads, but the difference between the states in 1943 was less than in 1942. In general, Class A truckers in both states made a larger proportion of return trips with loads than did other classes of operators. The averages indicate that more semitrailers than standard trucks returned with loads but this is due to the fact that the semitrailer average is made up largely of Kansas trucks. For the same state, year, and type of operator, a higher proportion of loads on return trips usually was hauled on standard trucks than on semitrailers.

Relation of Return Load to Net Capacity

The weight of return loads hauled on the latest previous trip to market in December, 1943, amounted to 50 percent of the net capacity of trucks covered by the survey. In May, 1942, returning trucks were loaded to 42 percent of capacity (Table 22). Trucks operated in Kansas were loaded more nearly to total capacity on return trips than those from Missouri. Also, Class A operators hauled more return freight relative to the capacities of their trucks than did other types of operators. Self-haulers hauled relatively little cargo on return trips.

TABLE 22. *Relation of return loads to the net capacities of livestock trucks at the Kansas City market, by state and type of truck and operator, May, 1942, and December, 1943.*

TYPE OF TRUCK AND OPERATOR.	1942.		1943.		Both states.	
	Kansas.	Missouri.	Kansas.	Missouri.	1942.	1943.
	(Return load as percent of net capacity)					
Pickup trucks:						
For hire	*.....	45.7	.....	97.4	45.7	97.4
Self-haulers	0.0	37.6	0.0	34.4	23.5	26.5
All operators	*0.0*	*43.5*	*0.0*	*53.6*	*37.4*	*44.4*
Standard trucks:						
Class A	58.7	87.0	69.2	59.4	70.1	65.2
Class B	58.9	30.2	71.3	38.3	35.3	42.4
Class C	48.0	30.5	29.7	28.8	33.2	29.2
All for hire	57.9	40.8	64.6	43.2	46.0	51.0
Self-haulers	11.9	24.6	16.7	20.1	18.9	18.8
All operators	*51.8*	*38.5*	*59.4*	*40.9*	*43.5*	*47.6*
Semitrailer trucks:						
Class A	47.2	95.9*	55.4	54.8	49.8	55.4
Class B	35.8	32.7	43.0	70.2	18.5	51.9
All operators†	*44.1*	*39.1*	*53.3*	*59.9*	*39.0*	*54.3*
All trucks:						
Class A	52.2	88.1	60.3	58.7	61.1	59.9
Class B	51.1	31.1	51.2	44.0	33.1	46.1
Class C	37.1	27.1	29.7	27.3	29.1	28.2
All for hire	51.0	40.7	57.0	46.3	44.1	52.4
Self-haulers	11.0	25.9	27.2	23.5	19.4	24.9
All operators	*47.9*	*39.6*	*55.3*	*43.3*	*42.2*	*50.2*

* Less than five loads.
† Includes some truckers not shown separately above.

Average Relation of Market and Return Loads to Net Capacity

Under conditions requiring maximum utilization of transportation facilities it is desirable to know the average relationship to capacity of loads coming to and going from market, because certain truckers haul relatively large loads on return trips. When both parts of the round trip are considered, the average load was 71.7 percent of average net capacity of trucks in December, 1943, and 65.2 percent in May, 1942 (Table 23). Kansas truckers hauled larger average loads for both parts of the round trip than did Missouri truckers. Also, Class A operators had a substantially better loading record in both years than Class B operators, but the latter showed greater improvement in the intersurvey period. Self-haulers hauled the lightest loads relative to capacity.

TABLE 23. *Relation of average market and return loads on capacities of livestock at the Kansas City market, by states and by type of truck and operator, May, 1942, and December, 1943.*

	1942.		1943.		Both states.	
	Kansas.	Missouri.	Kansas.	Missouri.	1942.	1943.
	(Average percentage market and return loads were of net capacities)					
Type of truck, all operators:						
Pickup	13.5	65.5	33.3*	65.2	54.3	60.1
Standard	71.8	61.2	77.0	64.4	64.9	69.0
Semitrailer	70.9	49.5	76.2	77.0	66.7	76.4
All trucks	70.8	60.2	76.4	66.1	65.2	71.7
Type of operator, all operators:						
Class A	73.2	78.4	79.3	75.4	75.3	78.4
Class B	76.9	58.1	76.2	67.4	62.8	69.8
Class C	63.6	54.9	63.8	59.1	56.6	60.7
All for hire	73.5	61.3	78.0	68.7	67.0	73.9
Self-haulers	38.6	47.6	49.4	43.5	43.6	45.8
All operators	*70.8*	*60.2*	*76.4*	*66.1*	*65.2*	*71.7*

* Less than five trips.

To give a better picture of the utilization of livestock trucks, each trip to market was classified into one of four groups based on the relation of the load to the net capacity of the truck on each part of the round trip. On this basis, less than one-fourth of all trips in December, 1943, were made with loads of less than 75 percent of capacity on both parts of the trip and about one-fourth with loads of 75 percent or more of capacity on both parts (Table 47, Appendix). The capacities of trucks were being utilized more fully in 1943 than in 1942. Kansas trucks had a better record than those from Missouri. In general, Class A truckers made fewer trips with relatively light loads, and more trips with relatively large loads, in both directions, than did other types of truck operators. Self-haulers utilized the capacities of their trucks to the least extent on round trips.

DIFFICULTIES IN TRUCKING LIVESTOCK DURING WARTIME

Shortly after the Pearl Harbor attack the production of trucks and automobiles for civilian use was discontinued. In early 1942 part of the stocks of trucks were sold to the army. This situation resulted in a serious shortage in livestock-trucking facilities. It was impossible to get new trucks and the difficulties in obtaining new tires, gasoline, and repairs increased. The drafting of truck drivers and mechanics as well as their shift into war jobs resulted in another problem in the trucking of livestock.

In addition to these serious wartime difficulties in livestock trucking were the usual problems involved in assembly of livestock from farms, unloading at the market, poor roads in some localities, death of livestock, rate undercutting, and other difficulties which assumed added importance during a war emergency.

Since about one-half of the cattle and most of the hogs are delivered to the Kansas City market by truck, the importance of maintaining livestock trucking on an efficient basis was apparent. Practically all local and short-distance hauling of livestock is by truck and hauling over longer distances was increasing in importance prior to the war. There undoubtedly was some shifting to rail transportation in the emergency but this had its limitations, one of which was the fact that railroads were hauling a near-capacity tonnage of freight.

Number of Days Behind with Livestock Trucking Orders

With fewer livestock trucks available and with record numbers of livestock to be marketed, many livestock truckers in December, 1943, had orders booked ahead for several days to as long as three months. This was interpreted to mean that livestock which was ready for market had to be held back on some farms. Undoubtedly, this represented some financial loss to farmers and probably some uneconomical utilization of feeds.

Information was obtained from 384 truckers concerning the extent to which they were behind on their trucking orders. About one-fourth said that they did not know and about one-fifth said that they were not behind with orders. Approximately four out of every 10 reported that they were one day to one week behind. Fifteen truckers indicated that they had orders booked ahead from 19 to 90 days. Class A and B truckers were much farther behind with their orders than were Class C truckers and self-haulers. About one-half of the nonfarmer, for-hire truckers (Class A and B) were one day to one week behind with orders and 15 to 16 percent were two weeks to one month behind. Only a small proportion of farmers and others hauling their own livestock were behind more than one or two days in moving their livestock to market as it was ready. Of the 38 farmers who filled out their loads with neighbors' livestock or hauled entirely for hire (Class C truckers), none had orders booked ahead for more than one week (Table 24).

TABLE 24. *Days behind with livestock trucking orders, classified according to type of operator at the Kansas City market, December, 1943.*

DAYS BOOKED AHEAD.	Type of operator.					
	For-hire truckers.				Self-haulers.	All operators.
	Class A.	Class B.	Class C.	All.		
	(Percent of trucks)					
Not given	22.7	20.8	15.8	21.1	56.9	26.5
0	13.6	14.8	50.0	18.3	31.0	20.2
1	8.5	4.4	7.8	6.7	5.2	6.5
2	8.4	8.9	7.8	8.6	5.2	8.1
3	5.2	8.1	7.8	6.7	.....	5.7
4	5.2	5.9	3.0	5.2	.....	4.4
5	4.5	3.0	.....	3.4	.....	2.9
6	0.7	.....	.....	0.3	.....	0.3
7	16.2	17.8	7.8	16.0	1.7	13.8
8	.....	0.7	.....	0.3	.....	0.3
9	0.7	.....	.....	0.3	.....	0.3
10	4.5	1.5	.....	2.8	.....	2.3
11	.....	.....	.....	.....	.....	.....
12	.....	.....	.....	.....	.....	.....
13	.....	.....	.....	.....	.....	.....
14	6.5	6.7	.....	5.8	.....	4.9
15	.....	.....	.....	.....	.....	.....
16	.....	.....	.....	.....	.....	.....
17	.....	.....	.....	.....	.....	.....
18	.....	.....	.....	.....	.....	.....
19	1.3	.....	.....	0.6	.....	0.5
20 to 30	.....	3.0	.....	1.2	.....	1.0
More than 30	2.0	4.4	.....	2.7	.....	2.3
Totals	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

Livestock Trucking Problems Relating to Old Trucks, Tires, Repairs, and Gasoline

Livestock trucking problems increased and intensified after this country entered the war. The 384 truckers interviewed in December, 1943, were asked to list their most serious difficulties in transporting livestock to market. Apparently the most important problem and one that almost 40 percent of the truckers listed as particularly serious, was difficulty in obtaining repairs and spare parts. The critical repair parts varied from fan belts to rear axles. The next most serious problem was need for tires, mentioned by 56 truckers. Twenty-three truckers said that adequate gasoline supplies were hard to get, and 23 said that the fact that trucks were wearing out was as important a problem as any other. Farmers and others hauling their own livestock to market apparently had somewhat less difficulty getting sufficient gasoline than did truckers hauling for hire (Table 25).

Labor problems increased in importance as the draft reached deeper into manpower resources. A scarcity of mechanics was reported soon after the war started, partly because of the draft, but at first probably due to a greater extent to mechanics transferring to more remunerative jobs in war industries. Most draft boards have not deferred truck drivers for occupational reasons. Labor

TABLE 25. *Difficulties listed by livestock truckers in the transportation of livestock to the Kansas City market classified according to type of operator, December, 1943.*

DIFFICULTIES.	Type of operator.					
	For-hire truckers.				Self-haulers.	All operators.
	Class A.	Class B.	Class C.	All.		
	(Number of truckers)*					
No difficulties	11	15	3	29	17	46
Tires	17	21	9	47	9	56
Repairs	63	62	13	138	13	151
Gasoline	6	13	3	22	1	23
Mechanics	3	9	1	13	1	14
Labor shortage	41	23	3	67	3	70
Old trucks	7	11	4	22	1	23
Loading at farms	9	7	.....	16	.....	16
Unloading at market	14	7	3	24	.....	24
Rate undercutting	1	1	2	4	.....	4
Poor roads	3	6	1	10	.....	10
Death of stock	.....	1	.....	1	.....	1
No reply	16	11	5	32	18	50
Totals	191	187	47	425	63	488

* A total of 384 truckers were interviewed, but some operators listed more than one difficulty or problem.

problems were second only to lack of repairs as difficulties in livestock trucking. Seventy operators, or about 20 percent of those interviewed, said that lack of labor was a major problem. Farmers hauling for hire or for themselves apparently had less difficulty in obtaining labor than did truckers hauling for hire. Here again, however, it must be remembered that farmers do not use their trucks so much as operators hauling for hire.

Problems resulting from loading and unloading facilities, poor roads, death losses, and rate cutting are important at all times. Some of these problems are a result of farmers' marketing methods and some are a result of inefficient, practices and inadequate facilities of truckers. There was considerable inefficiency in the assembly of livestock. For the most part, livestock was assembled from farms in small lots. It was quite common for a trucker to make from two to five stops in assembling his load. The farmer often did not have adequate loading facilities and much time was consumed in loading a few animals. The farmer frequently did not have his stock ready when the trucker called. There was considerable duplication of effort in assembling livestock on farms. One farmer preferred a certain trucker and others preferred someone else. Several farmers may have decided to sell at the same time; consequently, several trucks were in the community at that time. This often resulted in route duplication, cross hauling, and underloading.

In unloading at the terminal market some time was lost on days when marketings were heavy, as they were at the time of the second survey. Trucks had to wait several hours for their turn to

unload. When a load was made up of several consignors, it was necessary to make delivery to different consignees. This took time but involved little additional transportation.

The problems relating to the assembly and the unloading of livestock apparently were not considered so important as others by the 384 truckers interviewed in December, 1943. Only 16 truckers mentioned loading at farms as a serious problem, and only 24 indicated difficulty in unloading at the market. Wartime problems of obtaining gas, tires, labor, and repairs evidently overshadowed other difficulties.

Poor roads, death of livestock, and rate undercutting are important problems in normal times but during the war emergency were considered relatively unimportant by the truckers. Only 15 truckers mentioned these problems specifically as of importance at the time of the survey (Table 25). Rate undercutting, for example, probably was a less severe problem in wartime than in peacetime, since competition was not so keen in most communities.

SUGGESTIONS BY LIVESTOCK TRUCKERS FOR SOLVING DIFFICULTIES

Assembly of Loads

The 384 truck operators interviewed in 1943 were asked to give their suggestions for improving livestock trucking conditions. A surprisingly large number, 213, had no definite ideas or apparently had given this matter no thought. Forty-two said flatly that there was nothing that could be done, at least for the present, to improve conditions. Of several worthwhile suggestions made, one was that farmers should bring their livestock to a centrally located farm for loading into large trucks. Twenty-one Class A and B truckers thought this would promote more efficient trucking, particularly for the larger trucks. Class C and self-haulers, being farmers, were not so much in favor of this idea.

Four of the Class A and B truckers thought that farmers should bring their livestock to a central loading place in town. They considered it inefficient for the large standard and semitrailer trucks to make farm pickups, which were especially difficult when roads were poor or the weather was bad.

It was not uncommon for a farmer to arrange for the hauling of his livestock on a certain day and then not have it ready for loading when the trucker arrived. In some cases the animals were not separately corralled or penned and arrangements had not been made for getting livestock into the trucks. Twenty truckers said that a farmer having his livestock ready to load when the truck arrived would save much time. This is important when it is realized that about one-half of the trucks made two or more stops in getting a load and that 12 percent of the loads were made up or five or more consignors' livestock.

Many farmers do not have loading chutes. It often is the trucker's responsibility to devise some way to load the livestock. This may be done by backing up to an embankment or by digging a ditch for the rear wheels of the truck. In any event, such arrangements are time-consuming and inconvenient. Nonfarmer truckers in particular voiced the opinion that every farmer who expects to have his livestock trucked to market either should have a chute of his own, or should borrow one and have it ready when the truck comes to pick up his livestock.

TABLE 26. *Suggestions made by livestock truckers at the Kansas City market for solving livestock trucking problems, classified according to type of operator, December, 1943.**

SOLUTION.	Type of operator.					
	For-hire truckers.				Self-haulers.	All operators.
	Class A.	Class B.	Class C.	All.		
	(Number of truckers)*					
No report	81	70	25	176	37	213
No solution	15	16	3	34	8	42
Assembly of load:						
Bunching of livestock	8	13	1	22	.....	22
Central loading places	2	2	.....	4	.....	4
Having livestock ready	10	8	2	20	.....	20
Building loading chutes	4	6	1	11	.....	11
Truck maintenance:						
Careful driving	10	11	1	22	6	28
Care of equipment	10	2	2	14	4	18
More repairs	1	2	1	4	.....	4
Drivers and mechanics	2	.....	.....	2	.....	2
Avoidance of overload'g	3	1	1	5	1	6
Other:						
Having return loads	.....	2	1	3	.....	3
Better roads	6	6	.....	12	.....	12

* A total of 384 truckers were interviewed but some operators listed more than one solution to their problems.

Maintenance and Operation of Trucks

Careful driving was indicated by a number of truckers as the best solution to some of their difficulties. Careless driving is hard on the truck, tires, and livestock. Sudden starts and stops are especially hard on tires and often result in crippling and bruising the animals. Farmer and nonfarmer haulers were about equally of the opinion that careful driving would help prevent costly breakdowns. Excessive speed is hard on tires and is also hard on the trucks where roads are rough, as they frequently are in rural areas.

Regular and proper care of equipment to avoid breakdowns and delays was suggested by 18 truckers. Proper lubrication and correct tire inflation prevent excessive wear and breakdowns. A periodical checkup often reveals defects which, if not cared for in time, would cause expensive repairs and loss of time.

Several of the truckers reported that the unavailability of repair parts and a shortage of drivers and mechanics caused them considerable difficulty. Many drivers and mechanics had been drafted or had gone into war work. Repair parts often were not available locally but had to be obtained from some other place after considerable delay.

Other Suggestions

Although the hauling of return loads provides a greater utilization of trucking facilities, only three truckers stated that return loads were a means of solving trucking problems. Truckers favor return loads as an additional source of income but they sometimes have difficulty in obtaining information about such loads. Also, many shipments are not suitable for transportation in livestock trucks.

Twelve truckers stated that better roads would make possible more economical transportation of livestock and conservation of trucks. All who made this suggestion were nonfarmer, for-hire haulers who spend much of their time on the road.

RECOMMENDATIONS FOR INCREASING LIVESTOCK TRUCKING EFFICIENCY

Recommendations for improving the efficiency with which livestock trucks are used usually apply only to methods of conserving present trucking facilities and manpower, but suggestions concerning arrangements for making these methods effective are also appropriate. The methods of conservation may be classified into four groups: (1) Using the truck most appropriate for the task; (2) improving the efficiency of the livestock trucking service; (3) using greater care in maintaining and operating trucks; and (4) making greater use of farm trucks and railroads to supplement present livestock trucks and drivers.

Methods of Conserving Livestock Trucks and Manpower

It has been noted that there seemed to be certain distance zones within which each type and size of truck was being used most effectively. Standard trucks were loaded relatively light when used for distances of less than 25 miles from market and frequently for distances of 25 to 50 miles (Table 46, Appendix). For distances of less than 75 miles and usually for those up to 100 miles, semitrailers were not loaded so near to capacity as desirable. Thus, in general, the pickup truck is appropriate for distances up to 25 miles, standard trucks for distances up to 100 miles, and semitrailers for distances of 75 miles or more. As the distance from market increases, truckers are justified in using the extra mileage for assembling larger loads because of the saving in truck miles and man power in delivering the larger loads to market compared with that required for smaller loads.

Inefficiency in the use of livestock trucks results mainly from excessive travel in the assembly of small shipments and the making

of trips to market with less than capacity loads. There are several practices which a livestock trucker may adopt to reduce these two sources of waste. He can save mileage in assembling loads by requiring livestock to be listed several days in advance so that several small shipments in a community may be picked up on one trip. He can exchange listings with other truckers when this will save mileage. He can arrange to haul breeding and feeder animals from farm to farm and to deliver feed or other items from town to farm in connection with trips for the assembling of livestock for market. In some cases where the area served by a trucker is large and where side roads will not permit,the hauling of large loads on heavy trucks, he can save mileage by using small trucks to haul shipments from farms to loading stations on improved roads in distant communities for loading onto larger trucks instead of assembling all livestock at his headquarters for reloading. In some instances, a trucker may save mileage by arranging his loads in the country so that each load will be delivered to the fewest possible number of consignees.

The livestock producer also can do many things to assist truckers in improving livestock trucking efficiency. In the first place, he can list his livestock well in advance of the date when he expects to ship and allow the trucker some leeway as to the day on which it will be hauled. He can list his livestock with only one trucker at any one time instead of several. He can group his sales so as to reduce the number of small shipments from his farm. He can build a loading chute and have his livestock penned for loading when the trucker arrives. He can cooperate with his neighbors to reduce the number of markets and consignees to which livestock is sent. He can drive his livestock to a nearby farm or loading point on an improved road for loading when the road to his farm is in bad condition. He can refrain from asking the trucker to perform special personal services which require the trucker to drive extra miles or to be delayed at the market.

In addition to these practices, truckers, farmers, and dealers can avoid practices which cause livestock to move in a direction opposite to that of the eventual route to market.

To conserve transportation facilities, livestock truckers also should haul return loads whenever possible if they do not require too much delay or excessive mileage. Where state and federal laws and regulations permit, thoroughly cleaned and disinfected livestock trucks may be used to haul fertilizer, seed, feed, lumber, farm machinery, and other commodities, as well as feeder livestock, from city markets to local towns or farms. Arrangements for return loads usually can be made at home more satisfactorily than at market. Livestock truckers without authority to haul certain types of freight on return loads should attempt to make arrangements locally with common carriers having that authority.

Truckers should use extreme care in the upkeep and use of trucks, When truckers have a large backlog of unfilled orders, the tendency is to postpone mechanical checkups and repairs as long as possible.

If livestock trucks are to last, they must be checked regularly and repaired as promptly as possible. Tires should be checked daily and repaired as soon as damage is discovered. Furthermore, trucks should be operated so as to reduce wear on them and on the tires. Care in starting and stopping, avoiding bad roads, and keeping the load within the capacity of the truck and tires are practices which will make the trucks last longer.

Another way of extending the life of livestock trucks is to use other trucks, particularly those owned by farmers, for livestock hauling during rush seasons. The use of farm trucks not only shifts part of the burden to trucks which normally are used relatively few miles per year, but also gives commercial livestock haulers opportunities to withdraw their trucks more promptly for repairs.

Consideration also should be given to diverting a larger proportion of the long-distance movement of livestock from trucks to railroad cars. This is practicable only if the railroad service to the desired market is reasonably prompt and convenient.

Arrangements for Making Conservation Methods Effective

Farmers, truckers, and other interested groups may set up an organization to facilitate the adoption of conservation practices. In general, they may establish any one of three different types of arrangements; namely, voluntary committees, livestock industry transportation committees, or formal organizations.

Various groups, particularly local farm organizations, took an active part in setting up livestock transportation committees in certain Corn Belt states during early 1942 when the gravity of the tire situation became apparent. These committees usually worked closely with the Agricultural Extension Services and developed suggested rules or practices for truckers and producers to follow in the shipment of livestock. Programs in many counties closely resembled those later developed by livestock industry transportation committees set up under ODT procedures. In some instances, truckers set up informal clearing offices to assist in saving travel required to assemble livestock.

The Office of Defense Transportation outlined a procedure for establishment of area and county livestock industry transportation committees to develop plans for the conservation of livestock trucking facilities. Either the area or the county committee could develop the formal plans. If the plans were developed by county committees, the area committee served as a coordinating group. The territory served by an area committee usually was the ODT district. In Missouri, where most counties had county livestock industry transportation committees, the county livestock transportation conservation plans usually embodied a set of rules covering most of the items mentioned under "improving the efficiency of livestock trucking service." These rules were widely publicized and an appeal was made to farmers and truckers for voluntary compliance. It was proposed, however, that the ODT revise downward the gasoline allot-

ment of any trucker failing to coöperate with the programs in his territory.

Livestock producers may set up special associations or expand the operations of existing coöperative associations to provide listing services for facilitating the handling of livestock shipments. If and when the need arises, such an association might become the agency responsible for handling rail shipments. Livestock producers may have to establish livestock trucking associations as a means of assuring continued livestock transportation service in some communities where important livestock truckers have discontinued operations.

Under certain conditions livestock truckers may find it desirable to set up a formal organization to provide for the listing of livestock shipments and other mutual services. Such an association could adopt a schedule of rates for assembly which would discourage requests for special trips to individual farms for picking up or delivering one or a few animals. This could be accomplished by setting rates on the basis of the length of the assembly trip rather than on the weight of livestock hauled. The charge for hauling to market could still be on the basis of so much per head or 100 pounds hauled.

SUMMARY

This study covers two surveys of trucks at the Kansas City stockyards. The first, in May, 1942, included 518 truckloads of livestock, and the second, in December, 1943, covered 455 truckloads. Information was obtained from about 20 percent of the truckers unloading at the market during these periods.

The standard truck with a stake bed was the most important type used in transporting livestock to the Kansas City market. Probably three-fourths of all livestock trucks at this market during 1942 and 1943 were standards. Farmers and others hauling their own livestock used pickup-type trucks to a much greater extent than those who hauled for hire. About one truck in five was of the semitrailer type. Semitrailers were used to a much greater extent in Kansas than in Missouri because marketing distances are greater in Kansas. Farmers hire most of their livestock trucked to market. About three-fourths of the trucks surveyed were nonfarmer owned and operated. About one-half of the for-hire trucks carried permits for interstate travel.

The average age of 384 livestock trucks in December, 1943, was 3.2 years and about one-third were 1941 models. The average age of trucks operated by farmers hauling their own livestock was about twice that of trucks operated for hire by nonfarmers. About nine out of every 10 livestock trucks were reported in fair to excellent condition by their operators even though all were 1941 models and older. However, only one-half as many reported their trucks in excellent condition in 1943 as in1942. Trucks owned by farmers hauling their own livestock were not in so good condition as others.

About one-half of the 384 trucks surveyed in late 1943 had total mileages in excess of 100,000. In May, 1942, only one-fourth of the trucks had been driven 100,000 miles. The average mileage driven per truck in Kansas in 1943 was estimated as 45,000 which was greater than in Missouri where the market area was smaller. Farmers used their trucks much less than did those truckers who hauled for hire.

About one-fifth of the truckers made two or three trips to market the week preceding the period of the 1943 survey. One-fourth made four or five trips. Most truckers who haul livestock as a business were at the market daily and where distances were short they sometimes had made two or three trips daily.

Only about two-thirds of the truckers carried public liability and property damage insurance. More operators hauling for hire carried this type of insurance and insurance on livestock than did farmers trucking their own livestock. Few farmers carried insurance on livestock or cargo. About 6 percent of the truckers carried no insurance at all.

In this study, three measures of capacity were used. Normal net capacity and normal gross capacity were based on the load-carrying ability of tires as outlined by the Office of Defense Transportation.

Practical physical capacity was based on truckers' estimates of the number of head of livestock that could safely be loaded in trucks of various sizes.

The most common normal gross capacity of the pickup trucks surveyed was less than 3 tons; of standards, 6 to 7 tons; and of semitrailers, 12 to 14 tons. Most pickup trucks had a normal net capacity of less than 1 ton; standard trucks, 3 to 4 tons; and semitrailers, 7 to 8 tons. Class A truckers had the largest trucks. Kansas trucks had greater average capacities than did Missouri trucks.

Physical capacity in pounds was greatest for heavy cattle and smallest for sheep and lambs. The most common physical capacity for sheep was 3 to 3½ tons for standard trucks and 5 to 6 tons for semitrailers. Of heavy cattle, standard trucks most frequently could haul 4 to 5 tons and semitrailers, 7 to 9 tons. Physical capacity and net capacity were not closely correlated.

The most common length of bed on standard trucks was 14 feet and on semitrailers, 25 to 26 feet. Full decks were common for sheep and half-decks for hogs.

The weight of empty pickup trucks averaged two-thirds of gross capacity; of standards, nearly one-half; and of semitrailers, about 45 percent.

The surveys covered 1,600 tons of livestock in 1942 and 1,800 tons in 1943. Cattle made up more than one-half of the tonnage and about two-fifths were hogs.

On the average, more than two consignments were required to make a truckload. The average number of consignees in 1942 was 1.6 per load. According to truckers' estimates, 10 miles of travel were required to assemble a standard truck load and 15 to 20 miles for a semitrailer load. The unweighted average distance to market was 85 miles; the weighted distance was about 100 miles.

In December, 1943, loads hauled averaged 93 percent of net capacity and 88 percent of physical capacity. In May, 1942, the percentages were 88 and 78, respectively. Self-haulers hauled the smallest loads relative to capacity and Class A and B operators hauled the largest loads. The percentage of load in relation to capacity increased as the size of truck increased.

The type of truck changed as the distance from market increased. In the less-than-25-mile zone, pickup trucks hauled nearly 10 percent of the shipments while in the 200-to-250-mile zone, semitrailers hauled more than 90 percent of the truck receipts at the Kansas City market.

In 1943, 10 miles were required to deliver 1,000 pounds of livestock in semitrailers, 12½ miles in standard trucks, and 29 miles in pickups although the average mileage per trip for semitrailers was twice that for standards and nearly four times that for pickups.

Truckers surveyed at the Kansas City market hauled 880 tons of freight on latest previous return trips in 1942 and 990 tons in 1943. Class A operators hauled the largest precentage of this tonnage. Commodities commonly hauled included feed, livestock, coal, sand,

gravel, lime, and fertilizer. These loads usually were booked before corning to market.

About 52 percent of the truckers interviewed had hauled return loads on the last previous trip to market in 1942 compared with 46 percent in 1943. A greater percentage of return loads was hauled by Kansas trucks than by Missouri trucks. Class A truckers hauled return loads on a greater percentage of latest trips than did other classes of truckers.

Return loads averaged 42 percent of net capacity in 1942 and 50 percent in 1943. On both parts of the round trips loads averaged 72 percent of net capacity in December, 1943, and 65 percent in 1942.

Many livestock truckers were behind on orders in December, 1943, as a result of record numbers of livestock to be marketed, fewer livestock trucks, and problems in the efficient operation of trucks. The most serious difficulty reported by livestock truckers was that of obtaining repairs and spare parts. About four out of every 10 truckers were having difficulty in getting repair parts in late 1943. Labor difficulties, particularly a shortage of drivers and mechanics, and lack of tires probably were other difficult problems confronting these truckers. Other difficulties were inadequate gasoline supplies, worn-out trucks, loading and unloading at the farm and market, poor roads, and death of livestock. Lack of planning or coördinated direction in the assembly of livestock resulted in many instances in route duplication, cross hauling, and underloading.

Most livestock truckers were of the opinion that careful driving and proper care of equipment were more important in solving livestock trucking problems than greater availability of repairs and mechanics.

Many truckers indicated that if farmers would bring their livestock to a central loading place, either at a farm or in town, some of the problems of assembling loads would be solved. Considerable criticism was directed at farmers for not having livestock ready for loading when the truck arrived and for not making the necessary arrangements for loading facilities. The truckers suggested that every farmer who markets livestock should have or borrow a loading chute. Better roads were suggested as another means of solving trucking problems.

APPENDIX

Determination of Physical Capacities

The physical capacities presented in Tables 27 and 28 were obtained by multiplying the floor area of the truck by a standard load factor. The average load factors in Table 9 were used as the basis for the standard load factors presented in Table 10. In most instances, the standard factors were slightly lower than the truckers' estimates. In the case of hogs, sheep, and veal calves, the load factor includes an allowance for use of decks. It was assumed that the deck for hogs and calves would be one-third of the floor length and that a full deck would be used for sheep and lambs. Load factors are expressed as pounds per square foot.

The floor area used was that of the inside of the truck floor. Inside measurements were assumed to be six inches less than outside measurements. Thus, a truck floor with outside dimensions of 8 by 14 feet would have 101.25 (7½ X 13½) square feet of inside floor area. Its physical capacity for hogs, then, would be 8,100 pounds (101.25 sq. ft. X 80 lbs. per sq. ft.). Therefore, 7,200 pounds of hogs would be 88.9 percent of physical capacity.

The presence of mixed loads made it necessary to determine the average capacity of a truck for trips involving several species and weights of animals. In the case of mixed loads, the weighted average physical capacity was obtained by weighting the physical capacity for each species and weight of livestock by the weight of such livestock in the load. For example, a mixed load on a 14-foot truck included 3,000 pounds of hogs, 600 pounds of sheep, 400 pounds of calves, and 2,000 pounds of cattle. The average weight of the calves was 200 pounds and of the cattle, 1,000 pounds. The average physical capacity of the truck for this load was determined by the method shown in Table 29. The weighted average physical capacity was 8,099 pounds (48,595,000 ÷ 6,000). Thus, the mixed load of 6,000 pounds was 74.1 percent of physical capacity.

The additional tables in the appendix present other data obtained in the study.

TABLE 27. *Estimated practicable physical net capacities of pickup truck beds of various dimensions.*

OUTSIDE DIMENSIONS.	Area in square feet.*	Hogs, all weights.	Sheep, all weights.	Cattle and calves, pounds.					
				Less than 250.	250–350.	350–550.	550–850.	850–1,150.	1,150 or more.
4 x 5	15.75	945	470	705		1,100	1,260		
4 x 6	19.25	1,155	575	865		1,345	1,540		
4 x 7	22.75	1,365	680	1,020		1,590	1,820		
4 x 8	26.25	1,575	785	1,180		1,835	2,100		
4 x 9	29.75	1,785	890	1,335		2,080	2,380		
5 x 6	27.75	1,485	740	1,110		1,730	1,980		
5 x 7	29.25	1,755	875	1,315		2,045	2,340	Same	Same
5 x 8	33.75	2,025	1,010	1,515	Same	2,360	2,700	as for	as for
5 x 9	38.25	2,295	1,145	1,720	as for	2,675	3,060	550 to	350 to
6 x 6	30.25	1,815	905	1,360	hogs	2,115	2,420	850 lb.	550 lb.
6 x 7	35.75	2,145	1,070	1,605		2,500	2,860	cattle	cattle
6 x 8	41.25	2,475	1,235	1,855		2,885	3,300		
6 x 9	46.75	2,805	1,400	2,100		3,270	3,740		
6 x 10	52.25	3,135	1,565	2,350		3,655	4,180		
7 x 7	42.25	2,535	1,265	1,900		2,955	3,380		
7 x 8	48.75	2,925	1,460	2,190		3,410	3,900		
7 x 9	55.25	3,315	1,655	2,485		3,865	4,420		

* Inside floor space, assuming that inside width and length of bed are each six inches less than outside dimensions.

TABLE 28. *Estimated practicable physical net capacities of standard and semi-trailer truck beds of various lengths.*

LENGTH OF BED, OUTSIDE.	Area in square feet.*	Hogs, all weights.	Sheep, all weights.	Cattle and calves, pounds.					
				Less than 250.	250–350.	350–550.	550–850.	850–1,150.	1,150 or more.
8.....	56.25	4,500	3,375			3,935		5,060	
9.....	63.75	5,100	3,825			4,460		5,735	
10.....	71.25	5,700	4,275			4,985		6,410	
11.....	78.75	6,300	4,725			5,510		7,085	
12.....	86.25	6,900	5,175			6,035		7,760	
13.....	93.75	7,500	5,625			6,560		8,435	
14.....	101.25	8,100	6,075			7,085		9,110	
15.....	108.75	8,700	6,525			7,610		9,785	
16.....	116.25	9,300	6,975			8,135		10,460	
17.....	123.75	9,900	7,425			8,660		11,135	
18.....	131.25	10,500	7,875			9,185		11,810	
19.....	138.75	11,100	8,325			9,710		12,485	
20.....	146.25	11,700	8,775			10,235		13,160	
21.....	153.75	12,300	9,225			10,760		13,835	
22.....	161.25	12,900	9,675			11,285		14,510	Same
23.....	168.75	13,500	10,125	Same	Same	11,810	Same	15,185	as for
24.....	176.25	14,100	10,575	as for	as for	12,335	as for	15,860	850 to
25.....	183.75	14,700	11,025	sheep	sheep	12,860	hogs	16,535	1,150 lb.
26.....	191.25	15,300	11,475			13,385		17,210	cattle
27.....	198.75	15,900	11,925			13,910		17,885	
28.....	206.25	16,500	12,375			14,435		18,560	
29.....	213.75	17,100	12,825			14,960		19,235	
30.....	221.25	17,700	13,275			15,485		19,910	
31.....	228.75	18,300	13,725			16,010		20,585	
32.....	236.25	18,900	14,175			16,535		21,260	
33.....	243.75	19,500	14,625			17,060		21,935	
34.....	251.25	20,100	15,075			17,585		22,610	
35.....	258.75	20,700	15,525			18,110		23,285	
36.....	266.25	21,300	15,975			18,635		23,960	
37.....	273.75	21,900	16,425			19,160		24,635	
38.....	281.25	22,500	16,875			19,685		25,310	
39.....	288.75	23,100	17,325			20,210		25,985	
40.....	296.25	23,700	17,775			20,735		26,660	

* Inside floor space, assuming that bed measures 7½ feet wide inside and that inside length is six inches less than outside length of bed.

TABLE 29. *Method of determining average physical capacity for mixed loads.*

SPECIES.	Average weight, pounds.	Total weight, pounds.	Physical capacity for truck.	Product of weight times capacity.
Hogs	.....	3,000	8,100	24,300,000
Sheep	.....	600	6,075	3,645,000
Calves	200	400	6,075	2,430,000
Cattle	1,000	2,000	9,110	18,220,000
All	.....	6,000	.....	48,595,000

TABLE 30. *Number of livestock trucks at the Kansas City market at certain periods in 1942 and 1943 classified according to type of truck and type of operator, Kansas and Missouri.*

TYPE OF OPERATOR AND TYPE OF TRUCK.	Kansas.		Missouri.	
	1942.	1943.	1942.	1943.
	(Number of trucks)			
For-hire truckers:				
Class A:				
Standard	82	58	34	38
Semitrailer	50	51	4	6
Pickup	.....	.....	1	1
Totals	132	109	39	45
Class B:				
Standard	32	16	111	94
Semitrailer	11	13	7	7
Pickup	.....	.....	7	5
Totals	43	29	125	106
Class C:				
Standard	11	10	35	17
Semitrailer	2	.....	2	1
Pickup	3	.....	6	10
Totals	16	10	43	28
All for hire:				
Standard	125	84	180	149
Semitrailer	63	64	13	14
Pickup	3	.....	14	16
Totals	191	148	207	179
Self-haulers:				
Standard	22	14	20	20
Semitrailer	.....	1	.....	.....
Pickup	7	7	8	15
Totals	29	22	28	35
All operators:				
Standard	147	98	200	169
Semitrailer	63	65	13	14
Pickup	10	7	22	31
Totals	*220*	*170*	*235*	*214*

TABLE 31. *Average normal net capacity of livestock trucks at the Kansas City market, by type of truck and operator and by states, May, 1942, and December, 1943.*

TYPE OF TRUCK AND OPERATOR.	1942.		1943.		Both states.	
	Kansas.	Missouri.	Kansas.	Missouri.	1942.	1943.
	(Pounds per truck)					
Pickup trucks:						
For hire	1,420*	1,985	.....	1,822	1,947	1,822
Self-haulers	4,903*	1,979	1,848*	2,598	2,776	2,448
All operators	4,032*	1,983	1,848*	2,222	2,298	2,179
Standard trucks:						
Class A	6,042	6,905	6,823	7,333	6,309	7,035
Class B	6,453	6,775	7,206	7,687	6,698	7,621
Class C	6,983	6,697	7,939	6,661	6,737	7,101
All for hire	6,205	6,786	7,000	7,474	6,554	7,303
Self-haulers	6,492	6,250	6,033	7,076	6,366	6,616
All operators	6,238	6,738	6,874	7,436	6,535	7,229
Semitrailer trucks:						
Class A	14,139	13,200	16,542	16,192	14,079	16,511
Class B	13,096	14,871	14,833	15,457	13,925	15,023
All operators†	13,975	14,267	16,146	15,689	14,028	16,077
All trucks:						
Class A	8,762	7,244	11,248	8,249	8,387	10,342
Class B	7,609	6,964	10,904	7,826	7,128	8,490
Class C	7,897	6,316	7,939	5,507	6,579	6,131
All for hire	8,435	6,887	10,997	7,620	7,591	9,176
Self-haulers	6,254	5,036	5,545	5,029	5,544	5,216
All operators	*8,228*	*6,681*	*10,443*	*7,245*	*7,376*	*8,680*

* Less than five trucks.
† Includes some trucks not itemized above.

TABLE 32. *Distribution of livestock trucks at the Kansas City market according to physical capacity for sheep, May, 1942, and December, 1943.*

PHYSICAL CAPACITY FOR SHEEP, POUNDS.	Number of trucks.		Percent of subtotal.		Percent of grand total.	
	1942.	1943.	1942.	1943.	1942.	1943.
Pickup trucks:						
Less than 500	.....	1	.....	2.8	.....	0.3
500–1,000	10	20	43.5	55.5	2.3	5.3
1,000–1,500	13	13	56.5	36.1	3.1	3.5
1,500 or more	.....	2	.....	5.6	.....	0.5
Totals	23	36	100.0	100.0	5.4	9.6
Standard trucks:						
Less than 4,000	15	5	4.5	1.9	3.5	1.3
4,000–5,000	10	3	3.0	1.2	2.3	0.8
5,000–6,000	142	90	42.8	34.2	33.2	23.9
6,000–7,000	148	151	44.6	57.4	34.7	40.2
7,000 or more	17	14	5.1	5.3	4.0	3.7
Totals	332	263	100.0	100.0	77.7	69.9
Semitrailer trucks:						
Less than 10,000	19	16	26.4	20.8	4.5	4.3
10,000–12,000	43	34	59.7	44.1	10.1	9.0
12,000–14,000	10	22	13.9	28.6	2.3	5.9
14,000 or more	.....	5	.....	6.5	.....	1.3
Totals	*72*	*77*	*100.0*	*100.0*	*16.9*	*20.5*
Grand totals	**427**	**376**	.....	.....	**100.0**	**100.0**

TABLE 33. *Distribution of livestock trucks at the Kansas City market according to physical capacity for 850 to 1,150 pound cattle, May, 1942, and December, 1943.*

PHYSICAL CAPACITY FOR CATTLE, POUNDS.	Number of trucks.		Percent of subtotal.		Percent of grand total.	
	1942.	1943.	1942.	1943.	1942.	1943.
Pickup trucks:						
Less than 2,000	8	12	34.8	33.3	1.9	3.2
2,000–3,000	4	12	17.4	33.3	0.9	3.2
3,000–4,000	11	10	47.8	27.8	2.6	2.7
4,000 or more	.....	2	.....	5.6	.....	0.5
Totals	23	36	100.0	100.0	5.4	9.6
Standard trucks:						
Less than 6,000	15	5	4.5	1.9	3.5	1.3
6,000– 8,000	86	43	25.9	16.4	20.1	11.4
8,000–10,000	196	171	59.0	65.0	45.9	45.5
10,000 or more	35	44	10.6	16.7	8.2	11.7
Totals	332	263	100.0	100.0	77.7	69.9
Semitrailer trucks:						
Less than 14,000	10	5	13.9	6.5	2.3	1.3
14,000–16,000	28	20	38.9	26.0	6.6	5.3
16,000–18,000	24	25	33.3	32.5	5.7	6.7
18,000–20,000	10	22	13.9	28.5	2.3	5.9
20,000 or more	.....	5	.....	6.5	.....	1.3
Totals	*72*	*77*	*100.0*	*100.0*	*16.9*	*20.5*
Grand totals	**427**	**376**	.....	.....	**100.0**	**100.0**

TABLE 34. *Percentage of livestock trucks at the Kansas City market, with various extents of usual decks for hogs and sheep on standard and semitrailer trucks, December, 1943.*

EXTENT OF USUAL DECK REPORTED.	Deck for hogs.		Deck for sheep.	
	Standard.	Semitrailer.	Standard.	Semitrailer.
	(Percent of total)			
None	19.6	25.8	27.6	25.9
One-fourth	8.8	7.6	4.9	.....
One-half	35.8	25.7	13.5	11.1
Three-fourths	25.5	18.2	14.6	9.3
Full	10.3	22.7	39.4	53.7
Totals	*100.0*	*100.0*	*100.0*	*100.0*

TABLE 35. *Distribution of livestock trucks at the Kansas City market according to the percentage which net capacity is of physical capacity for sheep, by types of truck, May, 1942, and December, 1943.*

NET CAPACITY AS PERCENT OF PHYSICAL CAPACITY FOR SHEEP.	1942.				1943.			
	Pickup trucks.	Standard trucks.	Semi-trailers.	All trucks.	Pickup trucks.	Standard trucks.	Semi-trailers.	All trucks.
	(Percentages of total number of trucks)							
Less than 80	27.3	4.2	1.7	5.1	2.9	3.9	.....	3.0
80–100	13.6	19.6	5.1	17.1	8.9	5.0	1.3	4.6
100–120	.....	38.3	20.3	33.4	2.9	29.6	13.0	23.6
120–140	4.6	23.1	47.5	25.8	2.9	37.0	36.4	33.7
140 or more	54.5	14.8	25.4	18.6	82.4	24.5	49.3	35.1
All	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

TABLE 36. *Distribution of livestock trucks at the Kansas City market according to the percentage which net capacity is of physical capacity for 850 to 1,150 pound cattle, by types of truck, May, 1942, and December, 1943.*

NET CAPACITY AS PERCENT OF PHYSICAL CAPACITY FOR CATTLE.	1942.				1943.			
	Pickup trucks.	Standard trucks.	Semi-trailers.	All trucks.	Pickup trucks.	Standard trucks.	Semi-trailers.	All trucks.
	(Percentages of total number of trucks)							
Less than 60	54.6	12.6	5.1	13.8	29.4	4.7	1.3	6.2
60– 80	13.6	49.8	23.7	43.9	20.6	33.8	13.0	28.3
80–100	13.6	30.9	52.5	33.1	11.8	46.7	54.5	45.1
100–120	9.1	5.5	17.0	7.4	14.7	12.8	24.7	15.5
120–140	.....	0.6	1.7	0.8	17.6	1.6	6.5	4.1
140 or more	9.1	0.6	.....	1.0	5.9	0.4	.....	0.8
All	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

TABLE 37. *Distribution of market loads on livestock trucks according to number of consignments in each load, by state of origin, Kansas City market, May, 1942, and December, 1943.*

NUMBER OF CONSIGNMENTS.	1942.		1943.		Both states.	
	Kansas.	Missouri.	Kansas.	Missouri.	1942.	1943.
	(Percent of total)					
1	56.7	54.3	53.9	54.9	55.4	54.5
2	13.4	14.1	15.8	12.6	13.8	14.0
3	8.6	9.3	11.1	13.0	9.0	12.2
4	9.0	10.0	5.3	9.1	9.6	7.5
5	5.4	3.7	4.8	3.6	4.5	4.1
6	2.3	3.0	3.2	2.8	2.7	2.9
7	1.8	3.3	1.1	2.0	2.6	1.6
8	1.4	0.4	2.1	1.2	0.8	1.6
9	0.5	.....	1.1	0.4	0.2	0.7
10 or more	0.9	1.9	1.6	0.4	1.4	0.9
All	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

TABLE 38. *Distribution of loads on livestock trucks according to the number of consignees per load, by state of origin, Kansas City market, May, 1942.*

NUMBER OF CONSIGNEES.	Number of loads.			Percent of total.		
	Kansas.	Missouri.	Total.	Kansas.	Missouri.	All.
1	77	123	200	53.8	64.4	59.8
2	31	36	67	21.7	18.8	20.1
3	23	22	45	16.1	11.5	13.5
4	9	7	16	6.3	3.7	4.8
5	3	3	6	2.1	1.6	1.8
Totals	*143*	*191*	*334*	*100.0*	*100.0*	*100.0*

TABLE 39. *Distribution of market loads on livestock trucks at the Kansas City market according to relation of load to normal net capacity, by state of origin, May, 1942, and December, 1943.*

LOAD AS PERCENT OF CAPACITY.	1942.		1943.		Both states.	
	Kansas.	Missouri.	Kansas.	Missouri.	1942.	1943.
	(Percent of total)					
0– 24.9	4.9	8.2	2.1	3.2	6.8	2.7
25– 49.9	10.9	13.0	4.8	11.4	12.1	8.6
50– 74.9	11.9	16.0	17.5	21.7	14.2	19.9
75– 99.9	32.2	24.9	30.2	26.9	28.0	28.3
100–119.9	19.3	20.4	24.3	17.8	20.0	20.6
120 or more	20.8	17.5	21.1	19.0	18.9	19.9
Totals	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

TABLE 40. *Relation of market loads to the net capacity of livestock trucks at the Kansas City market, by state of origin and by type of truck and operator, May, 1942, and December, 1943.*

TYPE OF TRUCK AND OPERATOR.	1942.		1943.		Both states.	
	Kansas.	Missouri.	Kansas.	Missouri.	1942.	1943.
	(Load as percent of capacity)					
Pickup trucks:						
For hire	14.1	100.3	.....	97.9	96.1	97.9
Self-haulers	28.2	65.2	66.6	63.0	47.4	63.5
All operators	27.0	87.6	66.6	76.8	71.2	75.9
Standard trucks:						
Class A	95.0	73.7	98.5	89.4	87.8	94.6
Class B	94.5	89.3	92.1	90.9	90.5	91.1
Class C	88.1	78.5	97.9	90.8	80.0	93.6
All for hire	94.5	84.1	97.3	90.5	88.1	92.8
Self-haulers	71.3	69.8	75.3	63.7	70.5	68.3
All operators	91.7	82.9	94.7	88.0	86.3	90.4
Semitrailer trucks:						
Class A	93.8	59.1	98.2	102.9	91.7	98.6
Class B	121.9	81.0	106.0	87.2	101.5	100.1
All operators	97.8	79.2	99.2	94.2	94.4	98.5
All trucks:						
Class A	94.3	71.5	98.3	92.1	89.5	96.8
Class B	102.7	88.3	101.3	90.7	92.2	93.6
Class C	90.2	82.7	98.0	90.9	84.2	93.2
All for hire	96.0	83.9	98.9	91.1	90.0	95.4
Self-haulers	66.2	69.3	71.6	63.5	67.9	66.7
All operators	*93.8*	*82.7*	*97.4*	*88.4*	*88.3*	*93.2*

TABLE 41. *Relation of market load to physical capacity of semitrailer livestock trucks at the Kansas City market, by state of origin and by distance from market, May, 1942, and December, 1943.*

DISTANCE FROM MARKET, MILES.	1942.		1943.		Both states.	
	Kansas.	Missouri.	Kansas.	Missouri.	1942.	1943.
	(Market load as percent of physical capacity)					
Less than 100	90.3	78.8	92.7	91.9	85.8	92.4
100–149.9	83.8	83.8	98.1	92.3	83.8	97.9
150–199.9	93.4	91.5	100.9	105.9	93.2	101.5
200–249.9	93.5	.....	100.7	85.1	93.5	99.9
250 or more	102.4	.....	97.1	.....	102.4	97.1
All	*93.4*	*82.1*	*98.1*	*94.6*	*91.4*	*97.6*

TABLE 42. *Relation of market loads to capacities of livestock trucks at the Kansas City market, by species of livestock and type of truck, both states, May, 1942, and December, 1943.*

TYPE OF TRUCK AND SPECIES INCLUDED IN LOAD.	Loads as percent of capacity, 1942.		Loads as percent of capacity, 1943.	
	Physical.	Normal net.	Physical.	Normal net.
STANDARD TRUCKS:				
Straight loads:				
Cattle	78.7	104.1	87.5	101.3
Calves	35.4	33.0	*	*
Hogs	77.5	91.9	76.3	81.9
Mixed loads:				
Cattle and calves	53.5	62.3	57.8	63.5
Cattle and hogs	79.9	90.9	88.6	94.3
Calves and hogs	61.8	73.1	83.8	88.3
Cattle, calves and hogs	79.3	97.3	83.4	91.5
SEMITRAILER TRUCKS:				
Straight loads:				
Cattle	100.5	131.5	98.5	105.0
Hogs	69.0	77.5	106.5	94.1
Mixed loads:				
Cattle and hogs	87.1	99.5	93.3	89.2

* Less than five loads.

TABLE 43. *Tonnage of livestock hauled to the Kansas City market by each type of truck from various distances to market, both states and periods.*

DISTANCE TO MARKET, MILES.	Tons hauled to market by—				Percent of total.		
	Pickup trucks.	Standard trucks.	Semi-trailers.	All trucks.	Pickup trucks.	Standard trucks.	Semi-trailers.
Less than 25	12.1	113.5	.....	125.6	9.6	90.4	.....
25– 50	21.7	397.8	23.6	443.1	4.9	89.8	5.3
50– 75	12.4	591.5	78.6	682.5	1.8	86.7	11.5
75–100	3.4	343.2	153.2	499.8	0.7	68.7	30.6
100–150	1.0	461.6	233.9	696.5	0.1	66.3	33.6
150–200	.....	105.0	245.0	350.0	.....	30.0	70.0
200–250	.....	24.5	264.8	289.3	.....	8.5	91.5
250 or more	.....	9.0	138.4	147.4	.....	6.1	93.9
All	*50.6*	*2,046.1*	*1,137.5*	*3,234.2*	*1.6*	*63.2*	*35.2*

TABLE 44. *Number of trips made by livestock truckers to the Kansas City market during the previous week, by type of truck and distance from market, December, 1943.*

DISTANCE FROM MARKET, MILES.	Number of truckers reporting.			Number of trips per truck.		
	Pickup trucks.	Standard trucks.	Semi-trailers.	Pickup trucks.	Standard trucks.	Semi-trailers.
Less than 50	21	74	.....	2.0	4.4	.....
50– 99.9	8	95	18	1.0	4.1	6.7
100–149.9	1	61	16	0.0*	2.9	4.2
150–199.9	.....	12	16	.....	2.6	2.7
200–249.9	.....	2	14	.....	3.0*	2.5
250 or more	.....	.....	4	.....	.....	2.0
All	*30*	*244*	*68*	*1.7*	*3.8*	*4.0*

* Less than three estimates.

TABLE 45. *Distribution of return trips of livestock trucks at the Kansas City market according to percentage of trips with return loads, by state of destination, May, 1942, and December, 1943.*

PERCENT OF TRIPS WITH RETURN LOADS.	1942.		1943.		Both states.	
	Kansas.	Missouri.	Kansas.	Missouri.	1942.	1943.
	(Percent of total)					
0–24.9	15.6	36.7	21.1	32.4	25.4	26.6
25–49.9	10.5	9.1	10.9	12.7	9.8	11.8
50–74.9	35.3	21.8	16.3	20.4	29.1	18.3
75–99.9	24.8	10.1	19.0	4.9	18.0	12.1
100.0	13.8	22.3	32.7	29.6	17.7	31.2
All	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

TABLE 46. *Proportion of loads on latest return trips of livestock trucks at the Kansas City market, by state of destination and type of truck and operator, May, 1942, and December, 1943.*

TYPE OF TRUCK AND OPERATOR.	1942.		1943.		Both states.	
	Kansas.	Missouri.	Kansas.	Missouri.	1942.	1943.
	(Return loads as percent of return trips)					
Pickup trucks:						
For hire	.....	33	.....	62	33	62
Self-haulers	0	29	17	36	22	30
All operators	0	32	17	48	29	33
Standard trucks:						
Class A	63	81	66	67	70	66
Class B	57	31	80	43	36	48
Class C	71	34	33	40	40	38
All for hire	62	41	65	49	48	55
Self-haulers	29	28	21	24	28	23
All operators	58	40	59	47	46	52
Semitrailer trucks:						
Class A	53	100*	56	24*	56	58
Class B	43	43	40	71	43	50
All operators	51	55	54	67	52	55
All trucks:						
Class A	59	82	62	68	66	63
Class B	54	33	60	45	37	48
Class C	67	30	33	43	36	40
All for hire	59	41	60	51	48	55
Self-haulers	25	28	24	29	27	27
All operators	*55*	*40*	*56*	*48*	*46*	*52*

* Less than 5 trips.

TABLE 47. *Proportion of trips to market with various relationships of loads to net capacity on the market and return parts of the trips, by states and types of truckers, May, 1942, and December, 1943.*

STATE, PERIOD AND CLASS OF TRUCKER.	Loads as percent of net capacity on each part of trip.				
	Less than 75 on both parts of trip.	Less than 75 on one, 75-100 on other part.	Less than 75 on one, 100 on other part.	75 or more on both parts of trip.	All trips.
	(Number in each group as percent of total)				
Kansas, 1942:					
Class A	27.9	18.0	32.0	22.1	100.0
Class B	30.4	21.7	28.3	19.6	100.0
Class C	40.0	30.0	20.0	10.0	100.0
All for-hire	29.2	19.7	30.3	20.8	100.0
Self-haulers	55.0	10.0	35.0	.....	100.0
All operators	31.8	18.7	30.8	18.7	100.0
Missouri, 1942:					
Class A	7.7	12.8	53.8	25.7	100.0
Class B	18.5	23.4	42.8	15.3	100.0
Class C	37.0	19.6	28.2	15.2	100.0
All for hire	20.6	20.6	41.6	17.2	100.0
Self-haulers	52.0	20.0	16.0	12.0	100.0
All operators	23.9	20.5	38.9	16.7	100.0
Kansas, 1943:					
Class A	16.0	21.3	28.7	34.0	100.0
Class B	33.3	.....	38.1	28.6	100.0
Class C	22.2	22.2	44.5	11.1	100.0
All for hire	19.4	17.7	31.4	31.5	100.0
Self-haulers	33.3	13.3	53.4	.....	100.0
All operators	20.9	17.3	33.8	28.0	100.0
Missouri, 1943:					
Class A	14.3	26.2	19.0	40.5	100.0
Class B	16.5	27.5	34.0	22.0	100.0
Class C	31.8	22.7	27.3	18.2	100.0
All for hire	18.0	26.5	29.0	26.5	100.0
Self-haulers	56.7	13.3	26.7	3.3	100.0
All operators	*24.3*	*24.3*	*28.7*	*22.7*	*100.0*