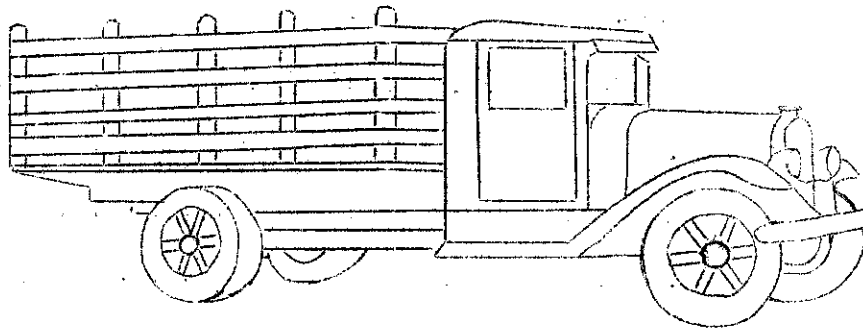


G. B. East

NEW YORK STATE COLLEGE OF AGRICULTURE

***COST OF OPERATING
FARM AND MILK TRUCKS***



Prepared by

Department of Agricultural Economics and Farm Management

A. E. 64-Re.

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CONTENTS

	<u>Page</u>
<u>Truck Costs</u>	1
<u>Farm Trucks</u>	2
Annual cost of operating a truck	2
Fixed and Variable costs	4
Variations in cost due to:	
1. Mileage	5
2. Ton-Miles of hauling.	6
3. Size of truck	7
4. Value and age of trucks	9
<u>Milk Trucks</u>	
Trucks hauling from farms to country plants. . .	11
Trucks hauling from country plants to the city .	13
<u>Summary</u>	
Farm trucks.	15
Milk trucks.	16

THE TRUCK CODE

How does the NRA Truck Code affect the farmer who owns a truck? The answer is that it doesn't affect him at all unless he is doing custom hauling or hauling for hire. Without signing the NRA code he may haul his own products, or he may haul those of his neighbor on an exchange of work basis, as long as he receives no direct pay in the form of actual cash.

The farm truck owner who is doing custom hauling or hauling for hire must comply with the regulations of the truck code in the same way as any other trucker. He must file an application for registration of his truck with the code authorities by April 29, 1934, and he must file with this authority by May 14, 1934, the schedule of the minimum rates which he will charge for hauling. These minimum rates must not be less than the total cost of doing this hauling, including depreciation, interest, insurance, license, and other more or less fixed costs of operating the truck, as well as gasoline, oil and grease, repairs, and driver's wages. Upon acceptance of his rates by the NRA authorities he will be sent an insignia to indicate that he is complying with the trucking code. This insignia must be displayed on his truck.

The truck owner should send to the State Truck Association at 1440 Broadway, New York City, or 184 State Street, Albany, for a copy of the trucking code. This will give all the details of the operations of the code and also the requirements for compliance with the code.

Cost of Operating Farm Trucks*

The figures used in this brief report are average figures for a number of trucks. The cost of operating an individual truck depends on many factors, such as the value of the truck, the capacity, the size of load, the number of miles it is driven in a season, and the type and conditions of roads. However, it is hoped that these figures may serve as a basis for determining the cost of operating an individual truck. A truck operator may be able to substitute for the figures given in the following tables some of his own figures and obtain reasonably accurate costs. If no definite record is available, the costs of license and insurance are usually known; one can estimate the number of miles which the truck is driven during a year and this figure may be used as a check on the purchases of gas and oil. The NRA code for automobile and truck dealers gives figures for depreciation on trucks of a given age, make, and capacity which may be useful in arriving at the cost of depreciation and interest on the investment.

Annual Cost of Operating a Truck:

The average cost of operating 72 farm trucks in Chenango County from May 1, 1930 to May 1, 1931, was \$193.13. This cost does not include the charge for the driver running the truck, for building space to house the truck, or for farm labor repairing the truck. These trucks averaged about 1 ton in capacity and were used largely to haul milk and miscellaneous farm products and supplies. The average annual mileage was about

* This report is based upon Cornell Experiment Station Bulletin #427 by V. B. Hart; #507 by C. W. Gilbert; #539 by S. W. Warren; and a study now being made by Mr. T. P. Lee; records on cost account farms in New York State. Cost of gasoline, oil, and repairs as well as the initial cost of trucks has varied widely during the period of these studies.

3900 miles. Depreciation was the largest item of expense making up more than one-fourth of the total cost. Gasoline, repairs, license, insurance, interest, and tires were the other important items of expense, listed in the order of their importance.

In 1930-31, the costs of operating trucks was much less than the costs on trucks of like capacity in 1920-21 and in 1926-27, table 1. The value of trucks was much lower in the latter period and therefore the cost of depreciation and interest was lower. Tires were cheaper and better. More farmers are carrying insurance on their trucks than formerly and the cost of license is a more important item. For trucks of about one ton capacity, the total cost of operating declined from 9.9 cents a mile in 1920-21 to 5.0 per mile in 1930-31. These trucks were driven about 3900 miles per year.

TABLE 1. COST OF OPERATING TRUCKS ON NEW YORK FARMS
1920-1927 and 1930

Year of record	1920-21*			1926-27**			1930-31***		
Number of trucks	70			31			72		
Average value of trucks	\$654			\$536			\$208		
Average mileage	3863			3937			3877		
COST	Average annual cost			Per cent of total annual cost					
	20-21	26-27	30-31	20-21	26-27	30-31			
Depreciation	\$105.77	\$131.07	\$54.00	28.0	37.4	28.0			
Interest	39.25	32.14	12.42	10.4	9.2	6.4			
Insurance	.81	12.77	16.58	.2	3.6	8.6			
License	12.29	23.19	18.19	3.3	6.6	9.4			
Tires	54.47	36.96	12.88	14.4	10.5	6.7			
Repairs	37.54	29.75	18.56	9.9	8.5	9.6			
Gasoline	105.29	69.87	51.11	27.9	19.9	26.5			
Oil	22.43	14.19	8.30	5.9	4.1	4.3			
Other costs	0	.61	1.09	0	.2	.5			
TOTAL****	\$377.85	\$350.55	\$193.13	100.0	100.0	100.0			
Average cost per mi.	9.9	8.9	5.0 (cents)						

* V. B. Hart, "Farm Motor Trucks in N. Y., Cornell Bul. 427, p. 19-(1924)

** C. W. Gilbert "Motor Trucks on N. Y. Farms, Cornell Bul. 507, p. 16, (1930).

*** T. P. Lee - Unpublished data

**** Total cost exclusive of driver, use of buildings, and farm labor repairing trucks.

A study of the cost of operating 72 trucks in Chenango County in 1931 shows the relative importance of various items of cost on trucks driven relatively little and those driven more than 4000 miles annually. Because the value of the trucks driven over 4000 miles was nearly 3 times the value of those driven less than 2500 miles the cost of depreciation was higher proportionately for the trucks driven the greater distance. Nevertheless, the cost of depreciation was less per mile for trucks driven 4000 miles during the year than for those driven only 2000 miles.

TABLE 5. RELATION OF SEASON'S MILEAGE TO COST OF OPERATING TRUCKS
72 Chenango County Farms, 1930-31

Item of cost	Season's mileage		
	Less than 2500	2500-2999	4000 and over
	Per cent of total expense		
Depreciation	22.1	35.1	28.2
Interest**	5.9	7.6	5.9
Insurance	10.3	8.6	7.5
License	14.9	9.6	6.3
Tires	7.8	5.0	7.0
Repairs	11.9	10.3	7.7
Gasoline	22.1	19.7	32.3
Oil	4.5	3.5	4.6
Other costs	.5	.6	.5
Total Costs*	100.0	100.0	100.0
Total costs	\$113.33	\$185.08	\$329.43
Average season mileage	1716	2968	8120
Cost per mile	\$.066	\$.062	\$.041
No. of farms	30	22	20
Value of trucks, May 1, 1930	\$118	\$254	\$320

*Total cost, exclusive of use of buildings, farm labor for repairs, and cost of driver.

**Interest at 6% of average value.

2. Ton-miles of Hauling. Not all of the driving of any truck is done with the truck loaded. The miles which the truck is driven empty on return trips are part of the total cost of hauling. The more a truck is driven loaded and the less empty the less will be the cost of hauling per

ton-mile. The number of ton miles hauled per truck measure a combination of two things, first the total mileage driven and second the average load. The greater the number of ton miles hauled in general the less the cost per ton-mile. The variation in size of truck was from .9 of a ton to 1.1 tons.

TABLE 6. RELATION OF TON-MILES OF HAULING TO COST PER TON-MILE, EXCLUSIVE OF DRIVER, 97 TRUCKS, 1926-27

Ton-miles of hauling	No. of trucks	Average per truck				
		Total operating cost	Total miles driven	Cost per mile	Total ton-miles	Cost per ton-mile
Less than 500	28	\$156	1,273	\$0.123	321	\$0.431
500 to 1,000	30	256	1,641	0.156	722	0.341
1,000 to 2,000	21	310	2,538	0.122	1,372	0.225
2,000 to 4,000	10	436	4,734	0.092	2,651	0.155
Over 4,000	8	452	6,068	0.074	5,939	0.076
Total	97	--	--	--	--	--
Average	--	\$274	2,413	\$0.113	1,378	\$0.192

3. Size of Truck. In general, the larger the truck the greater is the total cost of operating the truck per mile of driving. The larger trucks have a higher average value and hence the cost of depreciation and interest is greater. Gasoline, oil, license, repairs, and insurance also cost more for the larger trucks. Hence, the cost per mile of driving increases as the size of the truck increases. However, when the cost per ton-mile is considered, the larger trucks do the hauling more cheaply than the smaller trucks. The cost of operating a truck does not increase with the size of the truck as rapidly as the number of tons hauled. In other words, the heavier loads hauled by the larger trucks more than offset the added cost of operation and the result is a decrease in the cost per ton-mile.

TABLE 7. AVERAGE ANNUAL COSTS OF TRUCK OPERATIONS
97 New York Farms, 1926-27

	Size of trucks			Total and average
	1/2 ton	1 ton	1 1/2 ton	
No. of trucks	10	64	7	97
Average value	\$156.20	\$382.25	\$849.64	\$431.37
Costs:				
Depreciation	30.50	90.03	227.86	101.72
Interest	9.37	23.15	50.97	26.02
Insurance	5.10	5.92	26.68	9.65
License	13.10	23.95	34.29	23.67
Cash repairs	50.67	47.91	43.78	52.35
Farm labor, repairing	1.37	1.78	8.46	2.08
Gasoline	32.68	34.90	54.16	40.18
Motor oil	7.68	8.94	12.25	8.94
Grease	.57	.98	.89	1.04
Use of buildings	3.54	8.77	7.37	7.95
Other costs	.15	.13	.07	.22
Total cost, without driver	\$154.73	\$246.46	\$466.78	\$273.82
Cost of driver	80.99	146.08	152.13	135.19
TOTAL COST OF TRUCK AND DRIVER	\$235.72	\$392.54	\$618.91	\$409.01
Average total miles	2,358	2,269	2,370	2,413
Average ton miles of hauling	436.6	1,349.6	2,213.6	1,377.9
Cost per mile:				
Truck	\$0.066	\$0.109	\$0.197	\$0.113
Driver	0.034	0.064	0.064	0.056
TOTAL	0.100	0.173	0.261	0.169
Cost per ton-mile:				
Truck	0.264	0.179	0.207	0.192
Driver	0.159	0.107	0.068	0.096
TOTAL	0.424	0.286	0.275	0.288

With a decline in the general price level the cost of operating trucks was less than formerly, but the relationship between costs and the size of truck has not changed. The records for the cost of operating farm trucks on 32 farms keeping cost accounts with the College of Agriculture in 1932 show the value for the ton and ton and a half to be less than formerly. Other costs were less and the cost per mile was considerably less than five years earlier, tables 7 and 8.

TABLE 8. COSTS OF OPERATING TRUCKS ON 32 FARMS IN 1932*

Size or capacity	1/2 ton	1 ton	1 1/2 ton
Number of trucks	8	11	13
Average value	\$194	\$321	\$403
Average depreciation	\$54	\$104	\$109
Total cost per truck for year	\$232	\$283	\$322
Average miles of use during year	4,862	3,943	4,407
Average miles per gallon of gasoline	10	9	8
Average cost per mile for:			
Depreciation	\$.011	\$.026	\$.025
Fuel and oil	.016	.017	.020
Cash repairs	.007	.011	.011
Total	\$.048	\$.072	\$.073

*By J. F. Harriott

4. Value and Age of Trucks. The amount of depreciation per year is much greater on a new truck than on an old one. The cost for interest and depreciation on old, cheap trucks is very small. The cost per mile for depreciation and interest increase as the value of the truck increases, table 9.

TABLE 9. RELATION OF VALUE OF TRUCKS TO COST OF OPERATION
127 Farm Trucks, Livingston County, 1928

Value of truck April 1, 1929	No. of farms	Average value of truck Apr. 1, '29	Season's mileage	Cost per mile for			
				Depre- ciation	Interest	Other costs	All costs
Less than \$95	30	\$ 38	2,733	\$.006	\$.001	\$.033	\$.040
\$ 95 - \$194	46	118	1,978	.017	.004	.051	.072
\$195 or more	51	396	3,235	.036	.008	.045	.089

An analysis of the relation of the value of trucks to the cost of depreciation on Chenango County farms also shows that depreciation increases with the value of the truck, table 10. The trucks of highest value were driven a greater distance and the total operating cost per mile of this group was no more than the group which had an average value of about \$292 less. The cost per mile for depreciation and interest was only 0.6 cents for the least expensive trucks as compared with 2.2 cents for the most expensive trucks. However, the cost of gasoline and oil, and other costs was only 3.1 cents a mile for the better trucks as compared with 3.5 cents a mile for the cheaper trucks.

TABLE 10. RELATION OF VALUE OF TRUCK TO COST OF OPERATION
72 Farm Trucks, Chenango County, 1930-31

Value of truck	No. of farms	Average value of trucks	Season's mileage	Cost per mile for		
				Depreciation and interest	Other costs	All costs
Less than \$100	33	\$ 49	2,436	\$.006	\$.035	\$.040
\$100 - \$299	19	181	3,547	.022	.033	.055
\$300 and over	20	473	6,570	.022	.031	.054
All farms	72	\$202	3,877			\$.050

The cost of depreciation decreases with the age of a truck while the cost of repairs increases. However, the cost of depreciation on a new truck is so much greater than on an old truck that the combined cost of depreciation and repairs decreases with the age of the truck, (table 11).

TABLE 11. RELATION OF AGE OF TRUCK TO DEPRECIATION AND REPAIRS
FOR YEAR 1926-27 ON 66 TRUCKS PURCHASED NEW

Age of truck at beginning of year (months)	No. of trucks	Average age (months)	Average size (tons)	Sum of depreciation and repairs	% of cost new represented by depreciation and repairs
New	7	0.0	1.07	\$321.52	34.4
1 to 12	32	5.4	0.99	182.24	23.7
13 to 36	8	21.8	0.97	216.09	23.6
37 to 60	12	50.2	1.02	130.20	13.1
Over 60	7	78.9	0.96	102.69	11.8
Total	66	--	--	--	--
Average	--	22.8	1.00	\$183.23	21.4

Cost of Operating Trucks Used Principally
For Hauling of Milk

Trucks Used from Farm to Country Plants.* The investigation of hauling costs was begun in 1924 and most of the data are for the twelve months ending April, 1924. Some additional data were obtained in 1925 and 1926. Costs were obtained on 59 trucks used for commercial hauling of milk. The cost of the driver is not included.

In compiling detailed costs for truck operation the 59 trucks were classified into three groups according to size. There were more one-ton trucks than any other size, trucks of two tons and two and one-half ton capacity ranked second and third respectively. Some of the small sized trucks were loaded considerably beyond their rated capacity, particularly during the months of greatest production of milk. The average cost for each group is given in table 12.

* Leland Spencer, An Economic Study of the Collection of Milk at Country Plants in New York, Cornell Bulletin No. 486.

TABLE 12. COSTS OF OPERATING TRUCKS FOR COMMERCIAL HAULING OF MILK
(Cost of driver not included)

	Rated capacity of trucks			All trucks	
	1 ton	1-1/4, 1-1/2 and 2 tons	2-1/4 to 3-1/4 tons	Amount	Per cent of total
Number of trucks	24	22	13	59	--
Average number of years used	2.0	2.2	2.4	2.2	--
Average value	\$581.42	\$1,457.59	\$1,715.92	\$1,158.10	--
Interest	\$ 27.71	\$ 68.82	\$ 97.31	\$ 58.37	5.6
Depreciation	\$192.75	\$ 437.72	\$ 558.15	\$ 364.61	35.1
Repairs:					
Cash	\$128.46	\$ 308.73	\$ 313.92	\$ 236.54	22.7
Labor:					
Hours	140.3	155.4	195.8	158.1	--
Amount	\$ 57.92	\$ 66.14	\$ 85.46	\$ 67.05	6.5
Total cost	\$186.38	\$ 374.87	\$ 399.38	\$ 303.59	29.2
Fire and Liability Insurance	\$ 5.50	\$ 16.68	\$ 25.69	\$ 14.12	1.4
Truck and driver's license	\$ 27.13	\$ 36.91	\$ 46.31	\$ 35.00	3.4
Gasoline:					
Gallons	616	1,436	1,129	1,035	--
Cost	\$119.78	\$ 274.70	\$ 225.78	\$ 200.96	19.3
Oil and grease	\$ 34.42	\$ 48.95	\$ 44.62	\$ 42.08	4.0
Housing	\$ 21.38	\$ 22.68	\$ 19.08	\$ 21.36	2.0
Total cost	\$615.05	\$1,281.33	\$1,416.32	\$1,040.09	100.0
Deduction or other uses:					
Per cent	11.2	14.6	14.9	13.9	--
Amount	\$ 68.94	\$186.88	\$211.01	\$144.28	--
Net cost to milk	\$546.11	\$1,094.45	\$1,205.31	\$895.81	--
Cost per trip	\$ 1.84	\$2.64	\$3.00	\$2.46	--
Average haul (miles)	5.46	8.27	7.00	6.85	--
Average number of trips per year	297.3	414.6	401.2	363.9	--
Number of miles for milk hauling	4,413	8,677	6,500	6,463	--
Cost per mile	\$0.1238	\$0.1261	\$0.1854	\$0.1306	--

The average cost of operating 24 one-ton trucks for the year not including the cost of the driver was \$615.05.

On the average, 11.2 per cent of the total truck costs were deducted for other uses of the trucks, leaving an average amount of \$546.11

charged to milk hauling. The average number of miles traveled in hauling milk was 4,413 and the average cost per mile was 12.38 cents.

The annual cost of operating the medium sized trucks was more than double the cost for one-ton trucks.

The average cost for trucks of more than two tons capacity was only \$135 more than the cost for the medium sized trucks, but the large trucks covered 25 per cent less mileage.

On the average, depreciation constituted 34 per cent, repairs including labor 29 per cent, and gasoline 19 per cent of the total truck costs.

Trucks Used from Country Plant to City. During the summer of 1933 a study of milk transportation from country plants to the city was made by H. R. Varney of the New York College of Agriculture. Records were obtained on trucks hauling milk to the Metropolitan Area. Figures were obtained on 61 trucks that were used part or all of the year, July, 1932 to June 30, 1933. These trucks traveled a total of about one and two-thirds million miles and hauled 117 million pounds of milk during this period. The average load was nearly 16,000 pounds or almost 1750 gallons. The average run was a little over 100 miles or 213 miles for the round trip. The cost per mile was 16.5 cents. This includes depreciation, interest and driver's wages. This is equivalent to 23.5 cents per hundred pounds of milk hauled. The LCL rate for the same distance at that time was 42 cents. Under the present schedule which took effect July 1, 1933 it would be 36 cents. This effected a savings delivered at the dealer's plant of about 28.5 cents a hundred over the old rate or 22.5 cents over the present rate, as it costs approximately 10 cents to deliver the milk from the railroad platform to the dealer's plant.

Figures on the consumption of gasoline and oil were obtained on 25 trucks covering 1,378,000 miles (table 13). The gasoline and oil

consumption increased with the capacity of the truck, but not proportionally. The miles per gallon of gasoline decreased from 7.6 with the thousand-gallon trucks to 4.5 for the two thousand-gallon trucks. Oil consumption varied from 82.4 miles per quart for the thousand-gallon trucks to 55.9 miles for the two thousand-gallon trucks. With the two thousand-gallon trucks one driver's salary could also be saved as compared to the thousand gallon size.

TABLE 13. RELATION OF SIZE OF TRUCK TO AMOUNT OF GAS AND OIL USED
(1932-33)

Size (gallons)	Number of trucks	Total miles traveled	Miles per gallon of gas	Miles per quart of oil
1000	2	68,435	7.6	82.4
1600	18	1,039,294	5.0	77.9
1800	4	227,788	4.9	67.7
2000	1	42,483	4.5	55.9

Ninety-two long haul truck routes were sorted according to their distance from New York (table 14). The cost per hundred pounds of milk varied from 10.3 cents in the 41 to 50-mile zone to 53 cents in the 261 to 270-mile zone. These costs for truck transportation include wages of the driver, depreciation and interest on equipment as well as maintenance and repair work.

TABLE 14. COST OF TRANSPORTING MILK BY TRUCK
(92 Routes 1932-33)

Zone (miles)	No. routes	Cost per cwt.
21 - 30	1	\$.153
31 - 40	2	.127
41 - 50	3	.103
51 - 60	5	.142
61 - 70	11	.158
71 - 80	5	.134
81 - 90	6	.129
91 - 100	7	.222
101 - 110	9	.202
111 - 120	5	.192
121 - 130	6	.274
131 - 140	1	.270
141 - 150	1	.259
151 - 160	2	.239
161 - 170	5	.335
171 - 180	2	.485
181 - 190	4	.385
191 - 200	7	.379
201 - 210	2	.492
211 - 220	1	.424
221 - 230	2	.446
261 - 270	5	.530

SUMMARY

Farm Trucks.

The costs of operating a truck, especially depreciation and interest, have decreased considerably in the last 10 years. Many of the figures in the tables given in this discussion of truck costs may be high compared with present day truck costs. However, these tables may be of some value as a basis for figuring present costs on an individual truck by substituting known figures for a truck for those given in the tables. The present NRA code value and the amount of depreciation on your truck may be obtained from your truck dealer.

The average cost of operating a ton truck driven about 3900 miles in 1930-31 was about 5 cents per mile. Certain costs of operating a truck are more or less fixed regardless of the amount a truck is driven while

other costs are nearly proportional to the amount of driving. License, insurance, and to a certain extent, depreciation and interest are examples of the former, while gasoline and oil are examples of the latter. In general, the more a truck is used the less is the cost per mile and per ton-mile of hauling. The cost per ton-mile of hauling is lower with the larger trucks. In general, the total cost per mile of operating the older and less valuable trucks is somewhat less than the cost for operating new trucks. This is due to the higher costs for interest and depreciation on the new trucks.

Milk Trucks. On hauling from farm to country plant the average cost per mile of operating the medium sized trucks was only slightly greater than the cost for one-ton trucks. The average mileage traveled by the medium sized trucks was, however, nearly twice that for the one-ton trucks. The trucks of more than two-ton capacity with an average mileage of about 25 per cent less than the medium sized trucks had an average cost per mile of about 50 per cent greater. On the average, for all trucks, depreciation constituted 34 per cent, repairs including labor, 29 per cent, and gasoline 19 per cent of the total truck cost not including the wages of the driver.

On hauling from country plant to the city, the trucks were larger and made longer trips than the 'farm to country plant' trucks. The average load was nearly 16,000 pounds or almost 1750 gallons. The average round trip was 213 miles. The average cost per mile including depreciation, interest and driver's wages, was 16.5 cents. The miles per gallon of gas were 40 per cent less with the 2000-gallon trucks than with the 1000-gallon trucks. The oil consumption was about one-third greater for the 2000-gallon trucks than for those of 1000-gallon capacity.