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LABOR REQUIREMENTS FOR FEEDING CATTLE AS AFFECTED BY
NUMBER OF CATTLE FED

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LABOR REQUIREMENTS FOR FEEDING CATTLE AS AFFECTED BY
NUMBER OF CATTLE FED

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INTRODUCTION

A study of the labor used in beef cattle feeding operations was conducted during the 1956-57 feeding season. Fifty-nine members of the Southeast and Southwest Minnesota Farm Management Services, with a total of 70 lots of beef cattle, participated in this project. Each farmer submitted monthly reports on the time spent on each task in his feeding operation.

The purpose of this study is to show (1) the amount of labor used on each of the major tasks in cattle feeding for various equipment and work procedures, and (2) the relationship of time spent to number of cattle per lot. This information should help farmers and others interested in beef cattle feeding, in farm planning, and in the estimation of probable time which might be saved by the addition of labor-saving equipment.

The 70 lots of cattle represent three different feeding programs: long-fed calves, long-fed yearlings and short-fed yearlings and two-year-olds. Cattle on feed 240 days or less are classed as short-fed and those fed for longer periods as long-fed. All lots with an average purchase weight of 500 pounds or less per head are classed as calves. It was found in this study that there was no significant difference among cattle feeding programs in the amount of labor used per week for each task except that calves required more time for care and treatment of sick animals. The number of lots, number of cattle per lot, and length of feeding period is shown in Table 1.

1. The authors wish to acknowledge the support received for this study under the North Central Regional Project No. 28.

Table 1. Numbers of Cattle, Days on Feed, and Feeding Programs in Labor Study

Feeding program	:: Number : :: of : :: lots :	Number of cattle per lot			: Average : days : on feed
		: Average :	: High :	: Low :	
Long-fed calves	33	61	151*	20	321
Long-fed yearlings	11	74	133	35	295
Short-fed yearlings and two-year olds	26	49	119	9	181

* The labor from one lot of 237 head is included in some of the data in this report.

The labor used on feeder cattle has been divided into the various jobs. Average labor requirements per week are shown for all jobs performed in a similar manner and using comparable equipment. These chores are divided into two general categories. Jobs done routinely once a week or more are termed "routine" chores, and jobs done less than once a week are termed "non-routine" chores. Routine chores are feeding hay, silage and grain, observation of cattle and checking of water. Bedding and grinding feed are also routine chores for most lots. Non-routine jobs include manure hauling, care of sick animals, equipment and fence repair, buying and selling and other miscellaneous tasks.

The labor used per week for each job is correlated with the number of animals in the lot to determine the relationship between time spent and number of head. If there is a significant correlation, the average labor requirements are presented in tables and graphs showing the relationship between hours spent per week and number of animals in the lot. Since most jobs were reported for lot sizes ranging from 15 to 120 head, the average labor requirements given in the tables and graphs are most reliable for lot sizes within this range.

In the tables labor is divided into (1) the fixed time per lot, which does not vary with the number of animals, and (2) the additional time per head, which is the labor determined by the number of animals in the lot. Those tasks which are not related to the number of animals in the lot are presented simply in terms of the average time used per lot. The tables also give the number of lots on

which a job was done and the coefficient of determination, r^2 , which can be read as the percentage of the variation in labor used, which is explained by the number of head in the lot. The value of r^2 is significant at the 5 percent level unless otherwise indicated.

All jobs are reported in terms of hours and tenths of an hour per week. Spaces are provided in this report for recording the labor figures for the individual lots included in the study.

ROUTINE CHORES

Care of Cattle on Corn Stalk Pastures: Twenty-five lots of cattle were covered by labor records during the period the cattle were in the corn fields after corn picking. Very little routine time is spent with the cattle during this period unless they are driven to and from the fields every day. There is some time spent in observing and occasionally driving the cattle into the yard. The average time spent on these tasks is reported in Table 2. There is little relation between the time used and the number of animals in the lot, so the average time per week presented would apply to most lot sizes.

Hay is sometimes also fed during this period. The time required for feeding it would be about the same as during the period when cattle are on limited feed of grain.

Table 2. Labor Used in Observation and Care of Cattle While on Corn Stalk Pasture

Type of work	:: Number of :: lots*	: Avg. no. : cattle	: Avg. hours : per week	: Average weeks : on corn stalks
Driving cattle to and from corn stalks every day	9	69	4.00	6.5
Your lot	—	—	—	—
Observing cattle and bringing in occasionally	12	67	1.14	7.0
Your lot	—	—	—	—

* Four lots reported no time spent on either of these tasks.

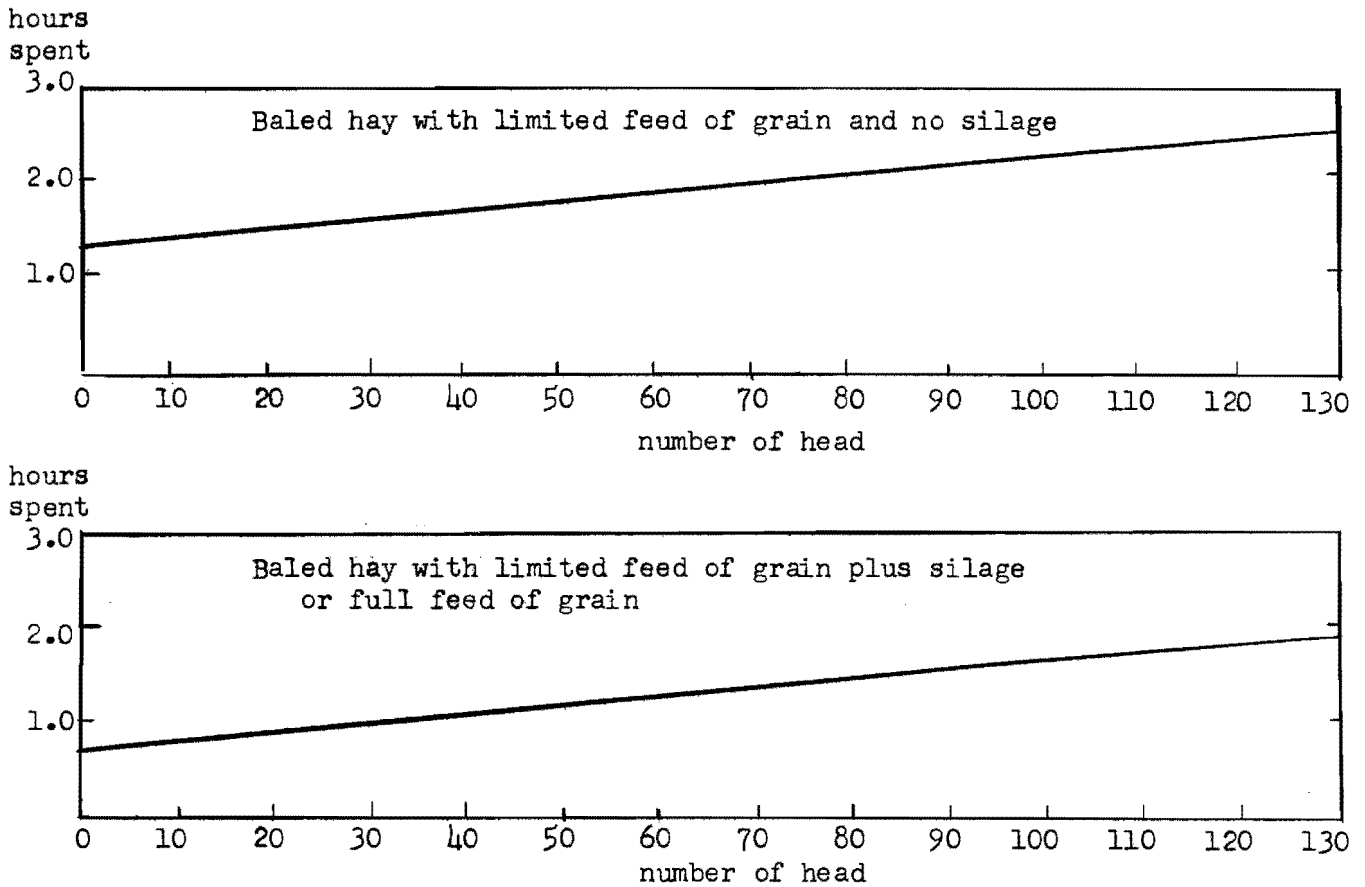


Figure 1. Number of Head and Hours Spent per Week Feeding Hay

Care of Cattle on Pasture: Generally hay is not fed when feeder cattle are on pasture. Time spent in feeding grain on pasture is given in Table 4. There is also some routine time spent in driving cattle to and from pasture and for moving fences for those using daily rotational grazing. Twelve of the seventy lots in this study were pastured. Five of these reported routinely driving the cattle to and from pasture for either all or part of the time they were on pasture, two reported time spent in fence moving for daily rotational grazing, and five reported no routine time spent in connection with pasturing. Table 4 presents the average numbers, weeks on pasture and hours spent on these jobs for the lots reporting.

Table 4. Weeks on Pasture and Hours Spent per Week on Routine Jobs Connected with Pasture Feeding

Job	:: Number :: of :: lots	: Average : number : of head	: Avg. no. : of weeks : on pasture	: Avg. no. : of weeks : job rept'd	: Avg. no. hrs. : spent/week : reported
Daily rotational grazing	2	45	12	12	1.98
Your lot	—	—	—	—	—
Driving to and from pasture, conventional grazing	5	53	11	8	2.08
Your lot	—	—	—	—	—

Grain Feeding: The feeding of grain has been divided into three periods, (1) when a limited amount of grain is fed, (2) when grain was fed on pasture, and (3) when the cattle are on full feed of grain. The first period is sub-divided into once a day and twice a day feeding.

The data in Table 5 and Figure 2 represents the time spent for lots in which the grain was either stored in a feed wagon or in a bin situated near the feed bunks. The grain was then carried to the cattle either in a basket or with a shovel.

Table 5. Hours Spent per Week Feeding Grain Using Hand Methods

Method	:: Number :: of :: lots	: Fixed : time : per lot	: Additional : time : per head	: r ²
Limited feed of grain				
(1) Fed once a day	11	.63	.0117	.40
(2) Fed twice a day	33	1.20	.0117	.16
Grain fed on pasture				
Fed twice a day	7	1.27	.0247	.62
Full feed of grain				
Fed twice a day	41	.50	.0471	.57
Your lot		Limited feed	Full feed	Feed on pasture
		Once daily	Twice daily	Twice daily
Average number in lot	_____	_____	_____	_____
Hours spent per week	_____	_____	_____	_____
Average time for lots of the same size	_____	_____	_____	_____

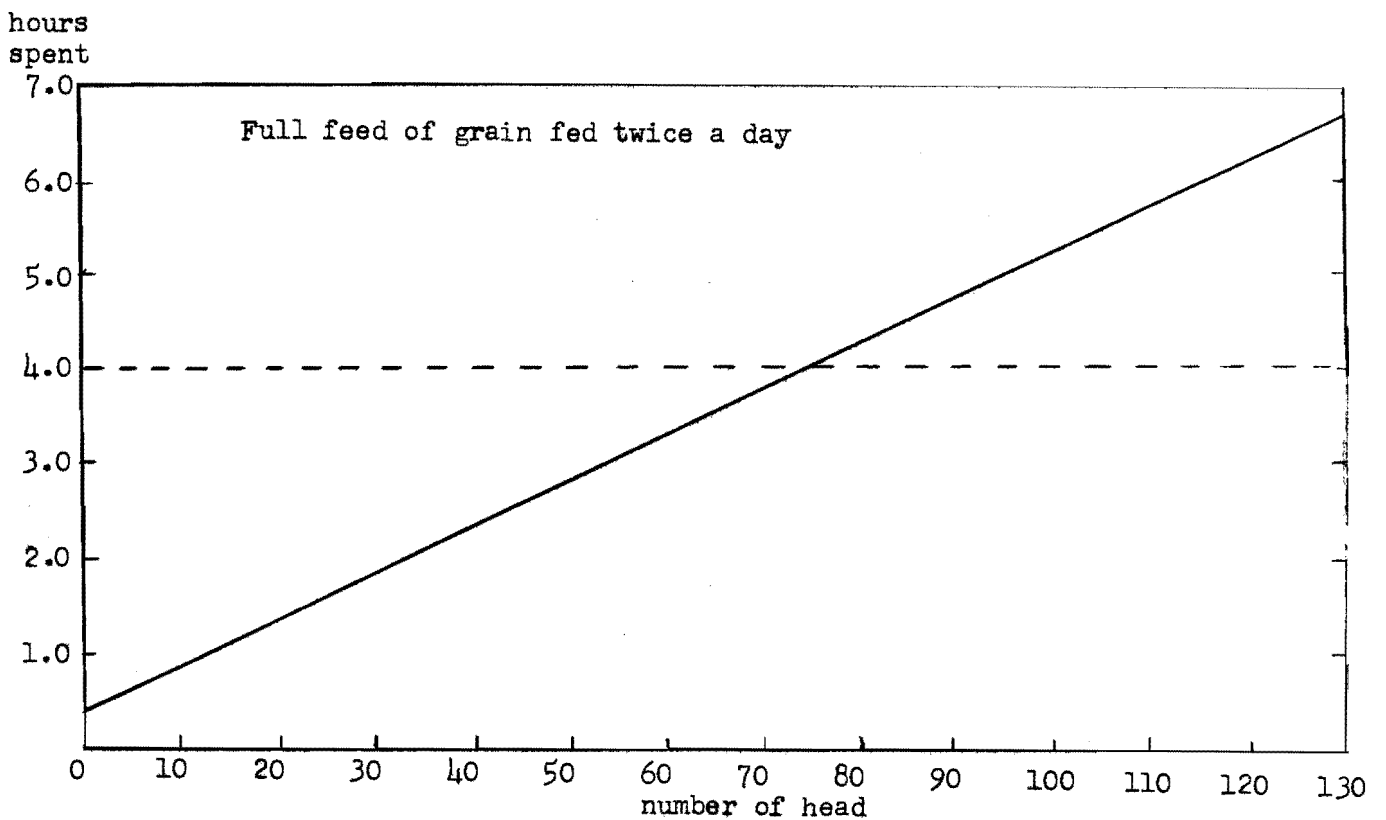
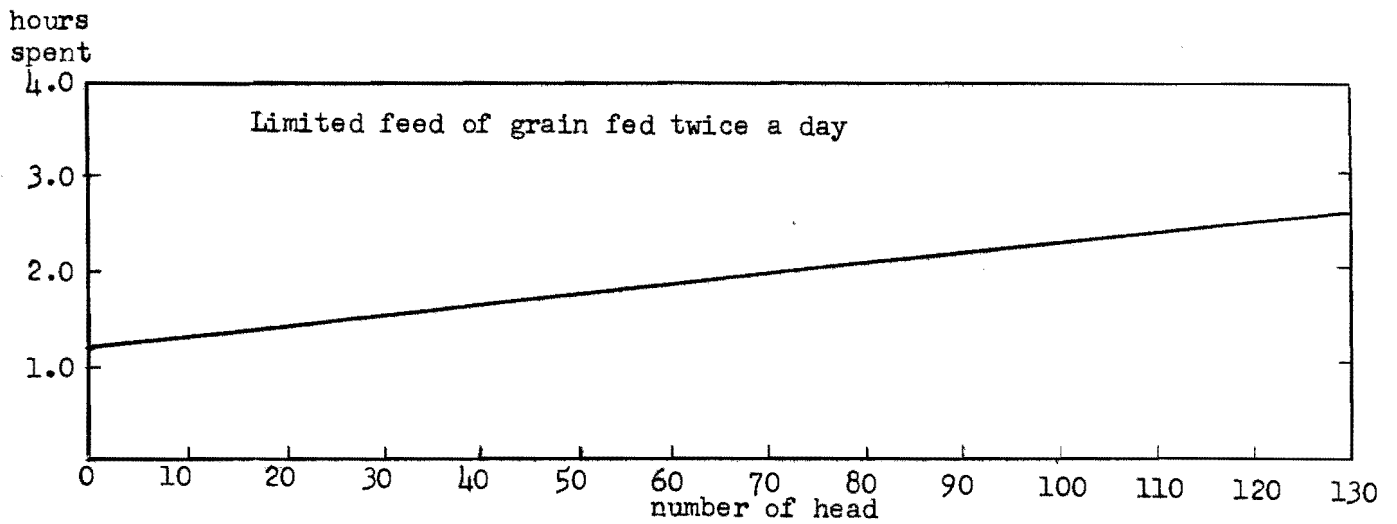
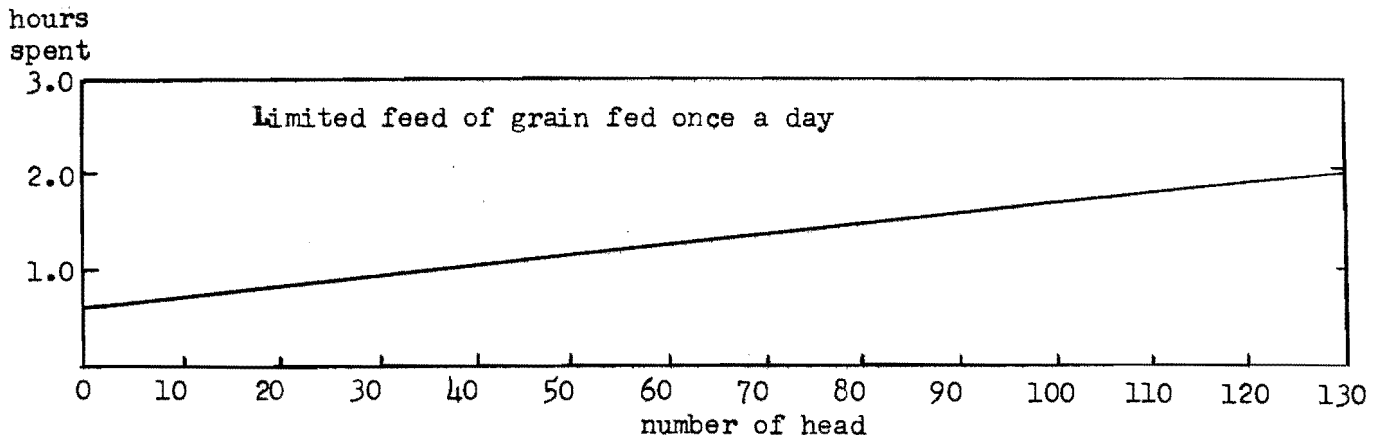


Figure 2. Number of Head and Hours Spent per Week Feeding Grain by Hand Methods (continued on page 8)

hours
spent

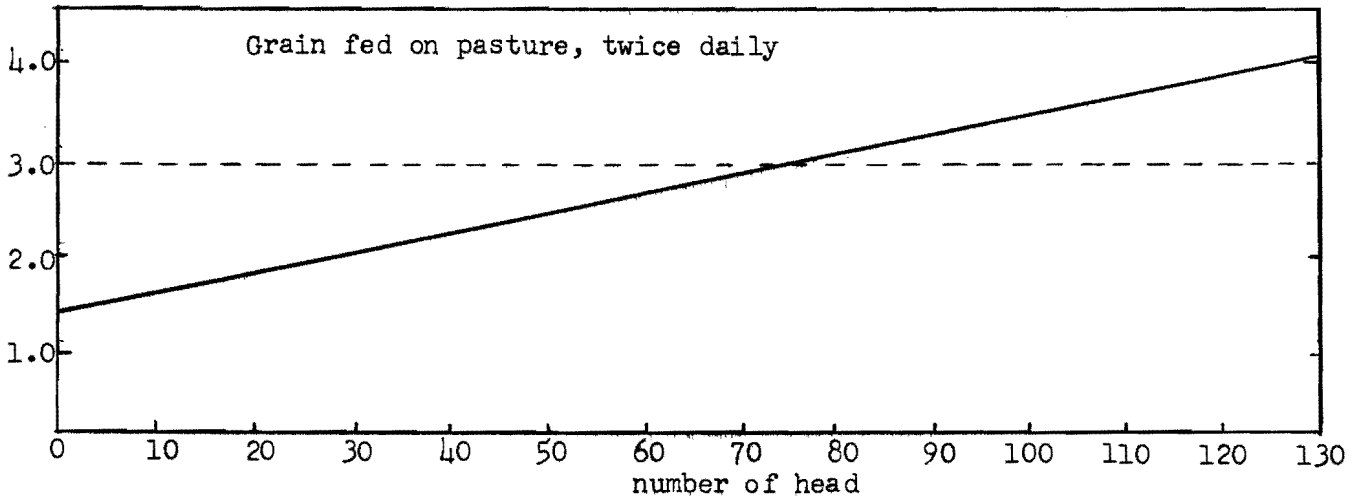


Figure 2. Number of Head and Hours Spent per Week Feeding Grain by Hand Methods

Silage Feeding: Most of the cattle in this study were fed silage using hand methods. Table 6 and Figure 3 give the labor used per week for silage feeding from an upright silo when silage is thrown down by hand and fed twice a day with either basket or shovel.

Table 6. Hours Used per Week Feeding Silage, Fed Twice Daily, Hand Methods

Method	:: Number :: of :: farms	: Fixed : time : per lot	: Additional : time : per head	: : : :	r ²
Upright silo, hand feeding Fed twice each day	18	1.66	.0432		.37
Your lot					
Average number of head in lot				_____	
Hours spent per week				_____	
Average time for lots of the same size				_____	

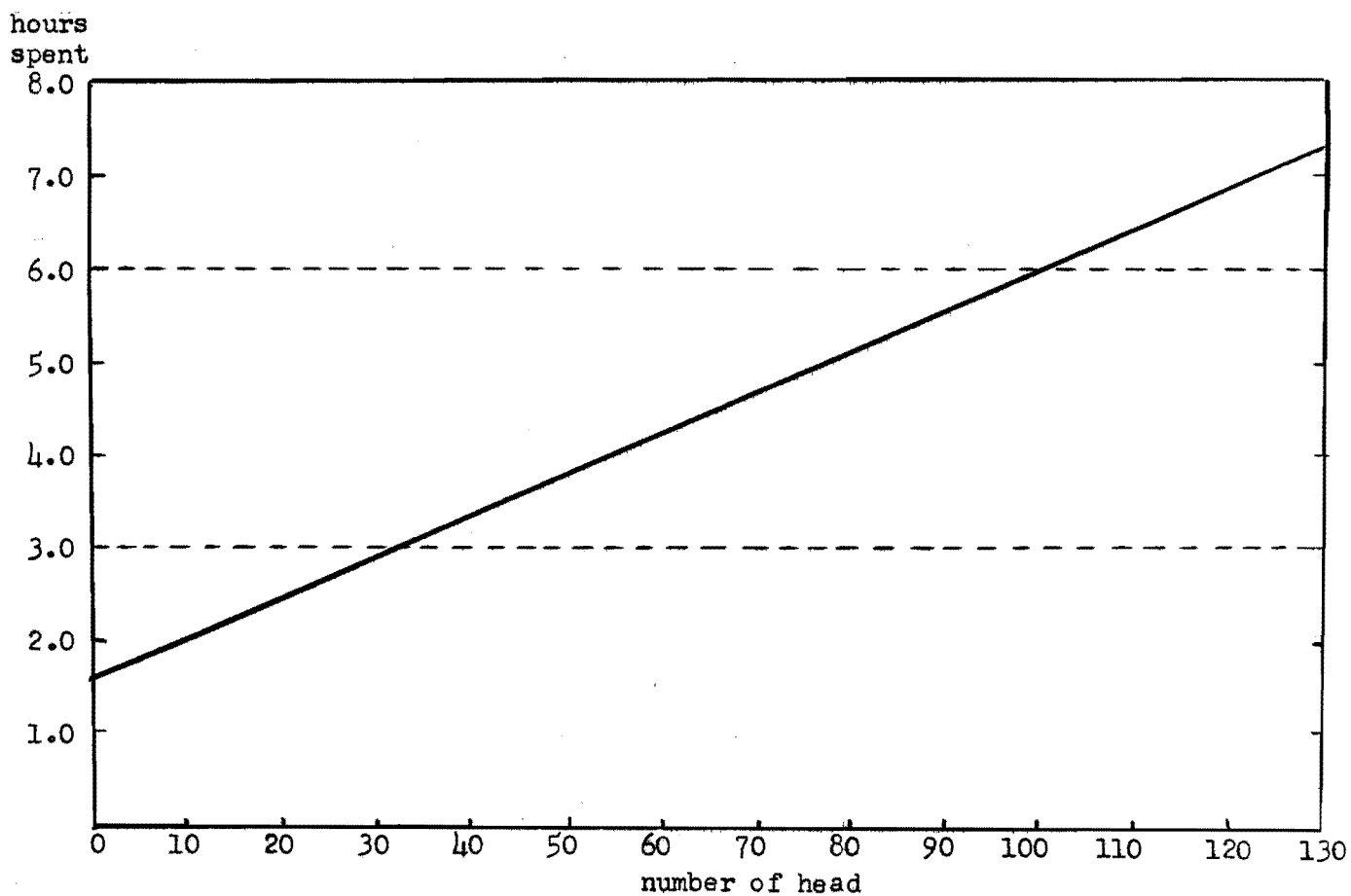


Figure 3. Number of Head and Hours Spent per Week Feeding Silage, Hand Method, Fed Twice Daily

Bedding the Cattle: Bedding was done for most lots only during the winter period. Under Minnesota conditions this period extends from the time the cattle are placed in the lot in the fall until the first part of May. The bedding used was straw and/or corn cobs.

Some farmers bedded routinely while others bedded only once a month or less. Those who bedded routinely are divided into three groups, (1) those who bed four or more times weekly, (2) those bedding two or three times weekly, and (3) those bedding once a week. Included in this labor is any non-routine bedding, such as hauling in a load of corn cobs. This was prorated on a per week basis for the season. Table 7 and Figure 4 give the labor used on bedding for those who bedded routinely.

Table 7. Hours Spent per Week Bedding Cattle Routinely

	:: :: Number :: reporting ::	: : Fixed : time : per lot :	: : Additional : time : per head :	: : : r ² :
Bedded 4 or more times per week	23	.10	.0250	.79
Bedded 2-3 times per week	24	.02	.0165	.43
Bedded once a week	11	.09	.0077	.61
Your lot	4+ times per week	2-3 times per week	Once per week	
Average number of head	_____	_____	_____	
Hours spent per week	_____	_____	_____	
Average time spent for lots of the same size	_____	_____	_____	

Those who bedded non-routinely generally hauled in corn cobs once a month or less often. This has been reported as average hours spent per week in the lot from December through April. The average number and time is presented in Table 8.

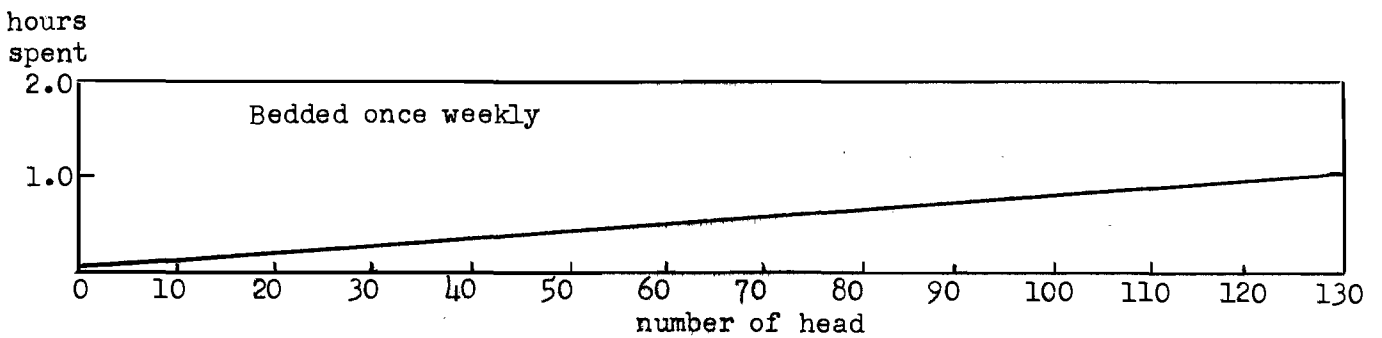
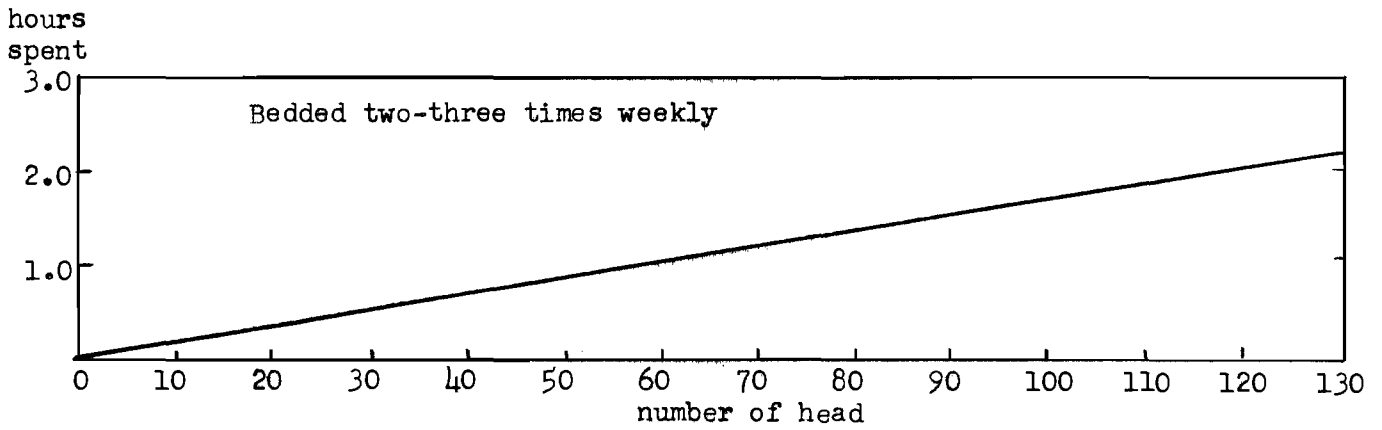
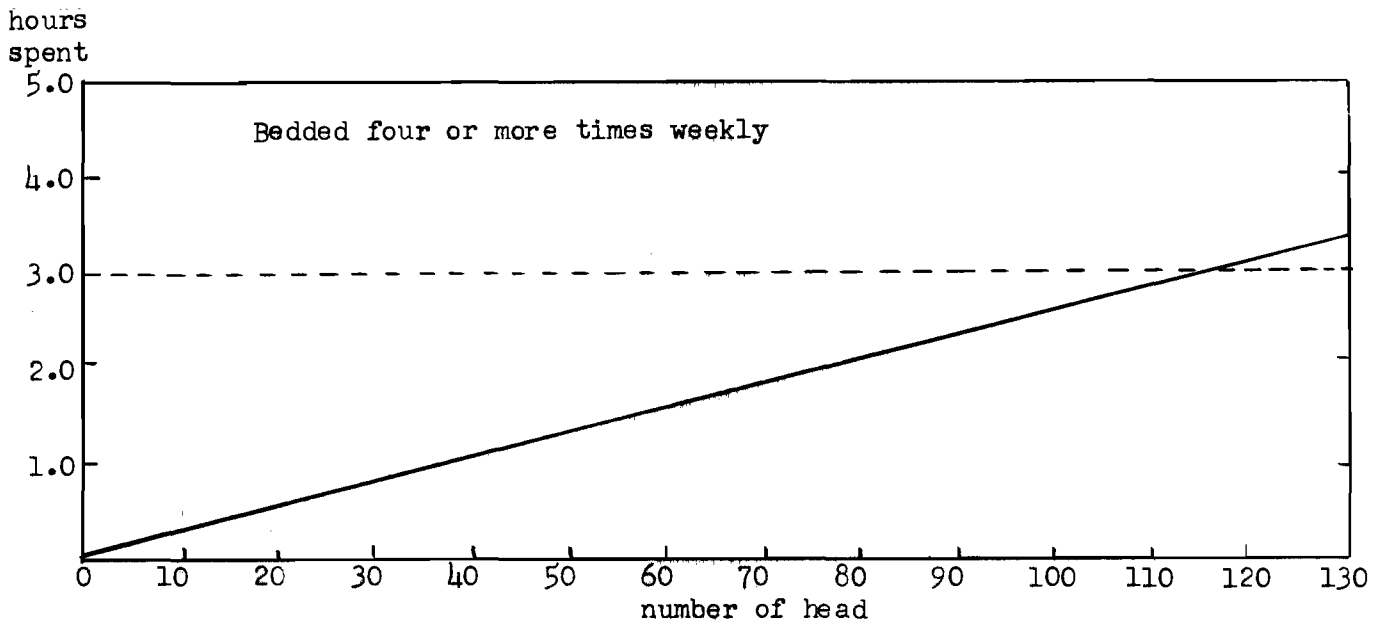


Figure 4. Number of Head and Hours Spent per Week Bedding Cattle

Table 8. Hours Used per Week Bedding When Done Non-routinely

Method	:: :: :: ::	Number of lots	: : : :	Average no. of head	: : : :	Average hours per lot
Bedded once a month or less often		12		62		.43
Your lot				—		—

Watering and Checking Cattle: Labor used on this job is divided into two periods: the winter feeding period, extending from the date cattle are taken off corn stalks or fall pasture through March, and the summer feeding period, extending from April through October. This activity was not reported by all the lots. Average number of head in the lot is not reported as the number of head does not affect the time spent. The average time spent per week is presented in Table 9.

Table 9. Average Hours Used per Week Watering and Checking Cattle

Period	:: :: :: ::	Percent of lots reporting this job	: : : :	Average hours per lot reporting
Winter feeding period		35		.72
Your lot				—
Summer feeding period		21		.54
Your lot				—

Feed Grinding: The procedures employed in grinding feed and the capacities of the mills varied widely. The average time per bushel or per 100 pounds ground for twenty lots is reported in Table 10. These lots used no special equipment other than a grinder. The feed was stored in a trailer or bin until fed. Some farmers in the study had either all or part of their feed custom ground, for which the time spent is considerably less.

Table 10. Average Hours Used Grinding Feed per One Hundred Pounds or per Bushel

	:: Number of :: lots	: Hours per : 100 lbs.	: Hours per : bushel*
Grinding feed	20	.044	.0246
Your lot		_____	_____

* Bushel of corn or corn equivalent.

NON-ROUTINE CHORES

Non-routine chores are divided into four categories: (1) manure hauling, (2) care of sick animals, (3) buying and selling, and (4) all other non-routine jobs. Although these jobs are not done every week, the time is reported in time spent per week. This was done by dividing the total time spent for the feeding period by the number of weeks on feed. The reason for reporting it in this way is to put all the data in a common form to make it easier to use and also to make it possible to estimate the total time required for any length of feeding period desired.

Manure disposal: Manure was cleaned from all outside lots with a tractor manure loader and manure spreader. On the basis of the number of times cleaned per year and the equipment used to clean the barn, the labor used is reported separately for three methods: (1) barn cleaned with a tractor manure loader, manure hauled once or twice a year (built up manure pack), (2) barn cleaned with a tractor manure loader, manure hauled every two months or more often, and (3) barn cleaned by hand, manure hauled either once or twice a year or at more frequent intervals.

In determining the number of weeks the cattle are in the lot for purposes of manure hauling, the time when the cattle are on corn stalks is counted only one-half time, since the cattle are in the lot only part of the time. Time on pasture is not counted.

The data on manure disposal is presented in Table 11 and Figure 5.

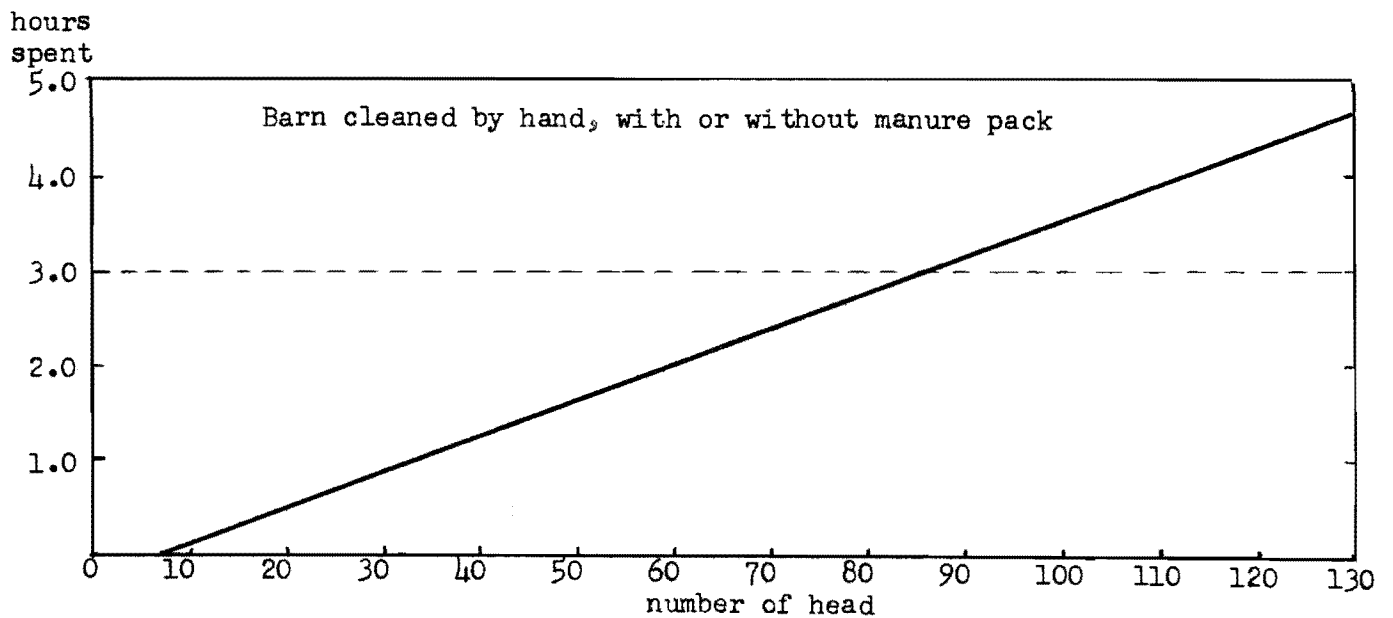
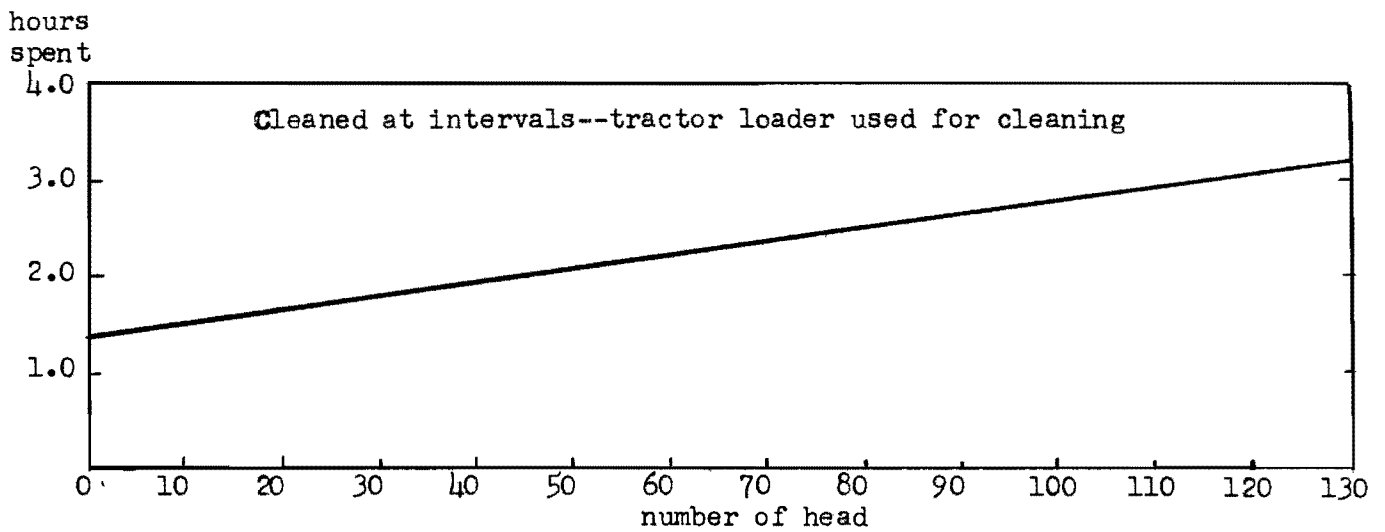
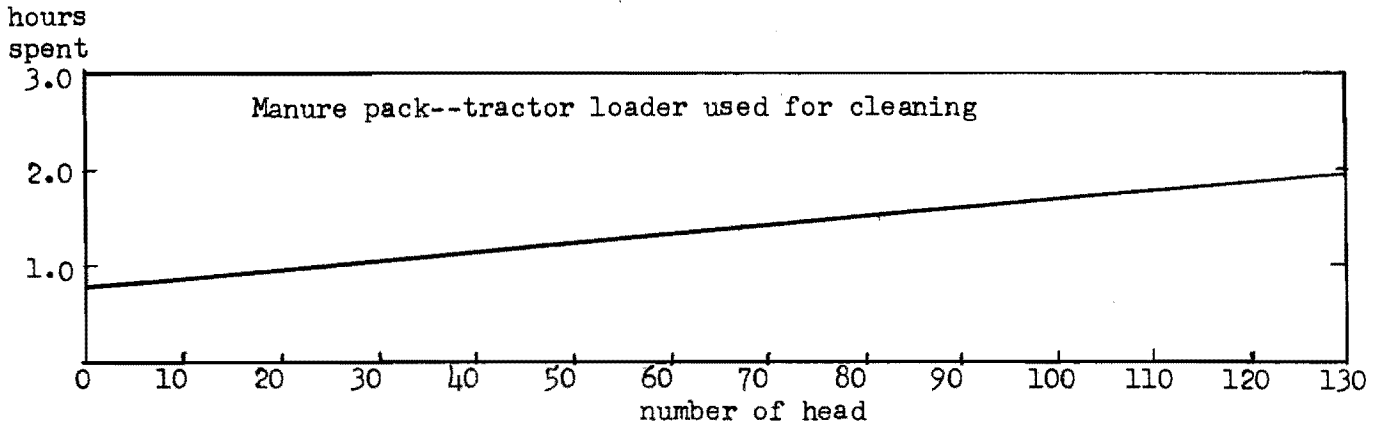


Figure 5. Number of Head and Average Hours Spent per Week Disposing of Manure

was made to look at cattle and other lots in which a commission company did all the buying and selling for the farmer.

Time spent buying and selling for your lot _____

Miscellaneous Labor: Included in this category is the rest of the time spent in non-routine tasks. The major items are repair of equipment, fence repair, moving bunks, and hauling hay, straw and commercial feeds. There is no significant difference in time spent among feeding systems. The time spent on these jobs is presented in Table 13 and Figure 6.

Table 13. Hours Used per Week on Non-Routine Miscellaneous Labor

	:: Number :	Fixed :	Additional :	
	:: of :	time :	time per :	
	:: farms :	per lot :	head :	r ²
	:: :	:	:	:
Non-routine miscellaneous labor	65	.14	.0080	.29
Your lot				
Average number of head in lot		_____		
Hours spent per week		_____		
Average time for lots of the same size		_____		

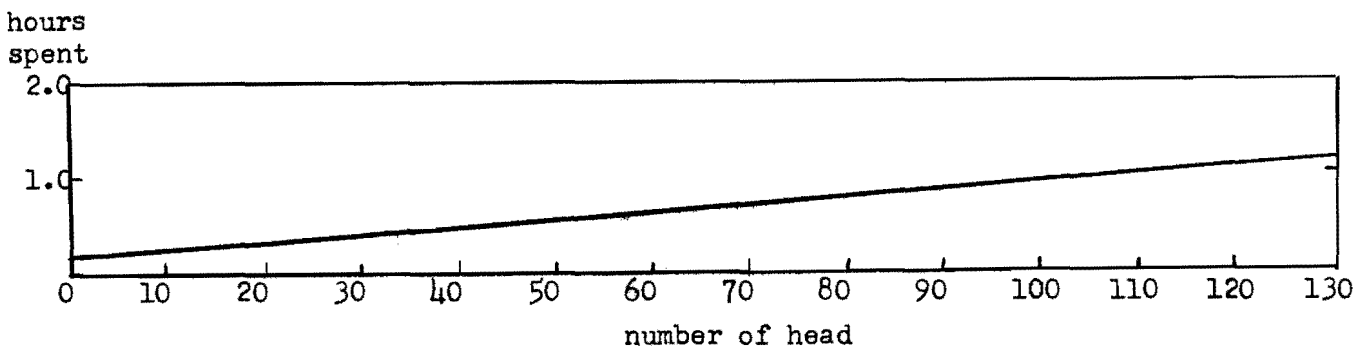


Figure 6. Number of Head and Average Hours Spent per Week on Non-routine Miscellaneous Labor

DETERMINING TOTAL LABOR REQUIRED FOR A FEEDING SEASON

To determine the total labor needed for a particular lot of cattle, multiply the time used per week by the number of weeks each job is done for the lot of cattle. Adding all the jobs together will give the total fixed time and total additional time per head for the feeding season. Multiply the additional time per head by the number of head and add the result to the fixed time per lot to get the total labor required for the given number of animals for the feeding period.

As an example, in Table 14 is given the labor needed for a typical lot of log-fed calves. These calves are in the lot forty-nine weeks. They are run on corn stalks with hay for six weeks, followed by a limited feed of grain and silage for the next twenty-five weeks. They are then put on full feed of grain for the last eighteen weeks. Total labor for the forty-nine weeks amounts to 195.86 hours of fixed time, plus 5.0288 hours additional time for each animal in the lot.

A lot of sixty head would use 195.86 hours + 301.73 hours (5.0288×60) or a total of 497.59 hours of labor for the feeding season.

In Table 15 is given another example for a lot of short-fed yearlings on a typical liberal grain program without silage. These cattle are on corn stalk pasture for three weeks and then put on full feed of grain and hay for the next thirty weeks. Total labor for the thirty-three weeks amounts to 106.74 hours of fixed time, plus 4.0662 hours additional time per head in the lot.

A worksheet is provided upon which the individual cattle feeder can determine the amount of labor required by jobs for his particular lot of cattle. To make this determination easier the average labor requirements for each job, using the methods described in the report, are summarized in Table 16. The individual farmer should make his own best estimate of the time used per week for methods of feeding and handling not included in this report.

Table 14. Labor Used for Long-Fed Calves on a Typical Liberal Forage Program Using Conventional Hand Feeding Methods

Job	Equipment or procedure	Labor per week			Total	
		Fixed time: per lot	Additional: time : per head	Number: of : weeks	Fixed time: per lot	Additional time per head
Care on corn stalk pasture		1.14		6	6.84	
Hay feeding	Baled with silage or full feed of grain	.77	.0087	49	37.73	.4263
Grain feeding	Limited amount, fed once a day	.63	.0117	25	15.75	.2925
Grain feeding	Full feed, fed twice each day	.50	.0471	18	9.00	.8478
Silage feeding	Fed twice each day, hand methods	1.66	.0432	25	41.50	1.0800
Bedding	Bedded 2 or 3 times each week	.02	.0165	26	.52	.4290
Watering and observation	November-March	.72		22	15.84	
Grinding feed (50 bu. per head)			(.0246 hrs./bu.)			1.2300
Manure disposal	Manure pack, tractor loader used	.89	.0072	46	40.94	.3312
Care of sick animals		.12		49	5.88	
Buying and selling	(15 hours per lot)				15.00	
Miscellaneous labor		.14	.0080	49	6.86	.3920
Total					195.86	5.0288

Number of head in lot 60
 Total time = 195.86 + (5.0288 x 60) = 497.59 hours of labor

Table 15. Labor Used for Short-fed Yearling Steers on a Typical Liberal Grain Program, No Silage, Using Conventional Hand Feeding Methods

Job	Equipment or procedure	Labor per week			Total	
		Fixed time: per lot	Additional: time per head	Number: of weeks	Fixed time: per lot	Additional: time per head
Care on corn stalk pasture		1.14		3	3.42	
Hay feeding	Baled with full feed of grain	.77	.0087	30	23.10	.2610
Grain feeding	Full feed, fed twice a day	.50	.0471	30	15.00	1.4130
Bedding	Bedded 2-3 times each week	.02	.0165	26	.52	.4290
Watering and obser- vation	November-March	.72		22	15.84	
Grinding feed (60 bu. per head)			(.0246 hrs./bu.)			1.4760
Manure disposal	Manure pack, tractor loader	.89	.0072	31	27.59	.2232
Care and treatment of sick animals		.05		33	1.65	
Buying and selling	(average 15 hours per lot)				15.00	
Miscellaneous labor		.14	.0080	33	4.62	.2640
Total					106.74	4.0662

Number of head in lot 60
 Total time = 106.74 + (4.0662 x 60) = 350.71 hours of labor

Table 16. Hours of Labor Used per Week, by Job, for Cattle Feeding

Job	Labor per Week	
	Fixed time per lot	Additional time per head
<u>Care on Corn Stalk Pasture</u>		
Driving to and from corn stalks every day	4.00	-
Observing and bringing in occasionally	1.14	-
<u>Hay Feeding</u>		
Baled hay with limited grain and no silage	1.34	.0087
Baled hay with silage or full feed of grain	.77	.0087
<u>Pasturing Cattle</u>		
Daily rotational grazing	1.98	-
Driving to and from pasture, conventional grazing	2.08	-
<u>Grain Feeding</u>		
Limited feed of grain, fed once daily	.63	.0117
Limited feed of grain, fed twice daily	1.20	.0117
Grain fed on pasture, fed twice daily	1.27	.0247
Full feed of grain, fed twice daily	.50	.0471
<u>Silage Feeding</u>		
Fed twice a day from upright silo	1.66	.0432
<u>Bedding Cattle</u>		
Bedded 4 or more times per week	.10	.0250
Bedded 2-3 times per week	.02	.0165
Bedded once a week	.09	.0077
Bedded once or less a month	.43	-
<u>Watering and Observing Cattle</u>		
Winter feeding period	.72	-
Summer feeding period	.54	-
<u>Feed Grinding</u>		
Hours used per bushel fed	(.0246 per bu.)	
<u>Manure Disposal</u>		
Tractor loader, removed once or twice yearly	.89	.0072
Tractor loader, removed every 2 months or oftener	1.44	.0135
Barn cleaned by hand	-.29	.0368
<u>Care and Treatment of Sick Animals</u>		
Calves	.12	-
Yearlings and two-year-olds	.05	-
<u>Buying and Selling</u>		
Average of 15 hours per year but there is much variation		
<u>Miscellaneous Labor</u>		
Repairs, hauling supplies, etc.	.14	.0080

Worksheet for Determining Labor Requirements for a Particular Feeding System

Job	Equipment or procedure	:Hours of labor per week:			: Labor for feeding period		
		: Fixed time :	: Additional :	: Number :	: Fixed time :	: Additional :	: Total time
		: per lot :	: per head :	: of weeks :	: per lot :	: per head :	: for head
Care on corn stalk pasture							
Hay feeding							
Hay feeding							
Grain feeding							
Grain feeding							
Silage feeding							
Silage feeding							
Bedding							
Watering & observation							
Grinding feed							
Manure disposal							
Care of sick animals							
Buying and selling							
Miscellaneous labor							
Total							

Fixed time + (variable time x number of head) = total hours of labor required

_____ + (_____ x _____) = _____

CONCLUSION

Average labor requirements are given for each major job in cattle feeding using conventional hand methods. The amount of labor required for each major job, using the methods described, has been divided into fixed time, which does not vary with the number of cattle, and additional time per head for each animal in the lot.

Because of the fixed time used in doing a task, larger numbers of cattle require less labor per head than do smaller numbers. Table 17 and Figure 7 illustrate this for the long-fed calf feeding system outlined in Table 14. It is seen from this graph that, using the conventional hand feeding methods, labor requirements per animal decrease rapidly as number of head increases up to about fifty head. For larger lots mechanized or self-feeding methods must be used to substantially reduce labor requirements per head.

Table 17. Labor Requirements for Long-fed Calves Using Conventional Hand Feeding Methods

	Number of head												
	10	20	30	40	50	60	70	80	90	100	110	120	130
Total fixed time	195	195	195	195	195	195	195	195	195	195	195	195	195
Total variable time	<u>50</u>	<u>100</u>	<u>150</u>	<u>200</u>	<u>250</u>	<u>300</u>	<u>350</u>	<u>400</u>	<u>450</u>	<u>500</u>	<u>550</u>	<u>600</u>	<u>650</u>
Total hours	245	295	345	395	445	495	545	595	645	695	745	795	845
HOURS PER HEAD	24.5	14.8	11.5	9.9	8.9	8.2	7.8	7.4	7.2	7.0	6.8	6.6	6.5

The labor data in this report may be used for the following purposes:

1. For use by an individual in comparing his labor requirements with the averages in this study.
2. For determining the amount of additional labor needed if the number of cattle fed is increased.

3. For determining the labor required for each of the major tasks and how these requirements change with the number of head.
4. For comparing labor requirements for various systems of cattle feeding.
5. For determining labor needed to care for feeder cattle during periods of peak labor loads.

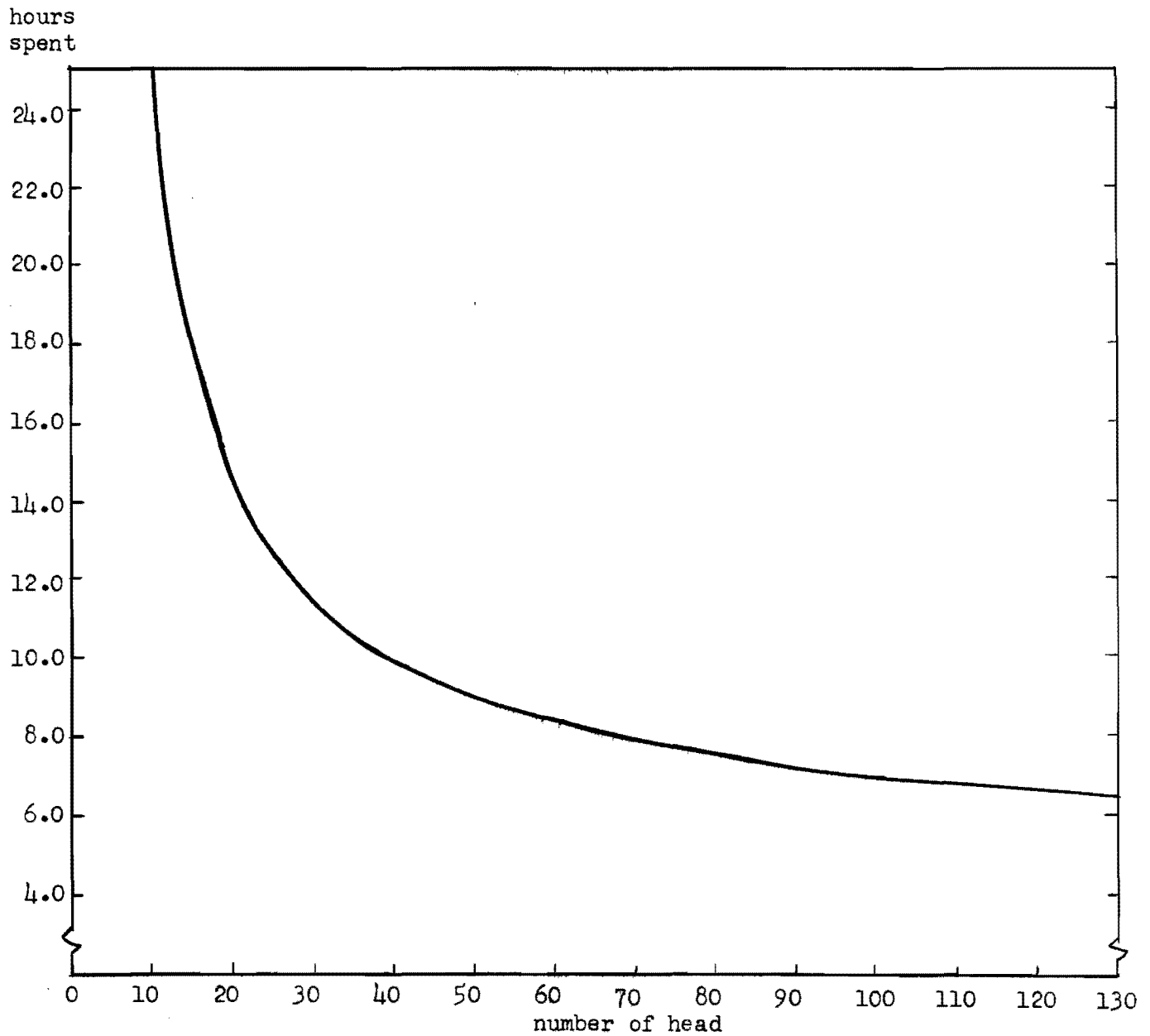


Figure 7. Relationship of Number of Head to Hours of Labor Used per Head for Long-fed Calves Using Conventional Hand Feeding Methods