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## **An economic appraisal of sheep production in the Northeast prairie of Mississippi**

D. W. Parvin

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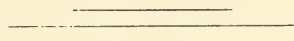
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**An Economic Appraisal of**

# **SHEEP PRODUCTION**

**In The Northeast Prairie of Mississippi**



MISSISSIPPI STATE COLLEGE  
AGRICULTURAL EXPERIMENT STATION

CLAY LYLE, Director

STATE COLLEGE

MISSISSIPPI

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This is one of a series of studies dealing with the economics of livestock production on Mississippi farms. Other studies include hogs, poultry, milk production, and beef production.

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Mr. D. R. Bryan and Mr. W. E. Hall, graduate students in the Department of Agricultural Economics, collected most of the farm data.

# An Economic Appraisal of Sheep Production in the Northeast Prairie of Mississippi

By D. W. PARVIN

**The Problem.** Although the sheep enterprise is of minor importance as a source of income on Mississippi farms, it has been increasing in importance in the past decade.<sup>1</sup> A decline in the farm labor supply, relatively low labor requirements for sheep production and relatively high prices for lambs and wool are the major factors contributing to the increased number of sheep on Mississippi farms. The low investment requirements for a one-ram unit as compared to a one-bull unit for beef production was probably a contributing factor on some farms.<sup>2</sup>

It is expected that the demand for meat will continue at a high level and that there will continue to be a shortage of farm labor. Therefore, further increases in sheep numbers on Mississippi farms may be expected. Farmers contemplating adding a sheep enterprise to their present system of farming or expanding their present sheep enterprise need certain basic information on which to base their decisions. This study was designed to provide basic information relating to sheep production on Mississippi farms, particularly the following:

1. The resources used in sheep production and the investment required.
2. The management practices used.
3. The costs and returns involved.
4. Weaknesses in present management practices and ways by which sheep production can be made more profitable.

**Method of study.** Data for the study were obtained by personal interview with 25 producers in the Prairie section

of Clay, Lowndes, and Noxubee Counties. A list of sheep producers was secured from the Agricultural Extension Service and supplemented by agricultural workers in each county. Insofar as possible,<sup>3</sup> all sheep producers were interviewed who owned an average of 10 or more ewes or who sold 10 or more lambs during the year studied. Detailed information with regard to all phases of the sheep enterprise was obtained. Methods used in calculating investment costs and returns are given in Appendix I.

## System of Farming

**Land use.** The farms studied were much larger than the average operating unit in the Northeast Prairie, 880 acres compared to less than 160 acres.<sup>4</sup> (Appendix Table 1). On the farms studied, about seven-eighths of the land was open and about one-eighth wooded. Approximately four out of each 10 acres of open land were devoted to crops and six acres to permanent pasture. Most of the wooded areas were pastured—83 percent.

**Cropping pattern.** Hay, cotton, temporary winter pasture, and corn were the principal crops (Appendix Table 2). Hay crops occupied almost twice as much land as any other crop. Hay crops were grown on 37 percent of the cropland, cotton on 20 percent, temporary winter pasture on 19 percent and corn on 15 percent. One out of each eight acres of cropland was idle. Sixteen percent of the land was double-cropped, usually with temporary winter pasture and a summer hay crop.

<sup>1</sup> The number of stock sheep on Mississippi farms increased from 64,000 on January 1, 1941 to 106,000 on January 1, 1951. (Agricultural Statistics, USDA, 1942 and 1951).

<sup>2</sup> As shown in Mississippi Experiment Station Bulletin Number 497, the investment in animals, land and buildings for a one-bull unit of 30 cows was approximately \$12,000 in 1950. As shown later in this study, the investment in animals, land and buildings for a one-ram unit of 30 ewes was approximately \$2,000 in 1950—one-sixth as much.

<sup>3</sup> If a schedule was not obtained in three visits to a farm, that producer was dropped from the study.

<sup>4</sup> Estimations based on census of 1950.



**Livestock system.** Eighteen of the 25 operators had been in commercial sheep production 10 years or less. In terms of the overall livestock production program, the sheep enterprise was relatively small. In addition to the sheep enterprise, there was at least one other livestock enterprise of commercial importance on all farms studied; of the 25 farms, 17 had a beef enterprise of commercial importance, 15 had a dairy enterprise of commercial importance and 11 had a hog enterprise of commercial importance (Appendix Table 9).

There was an average of 52.6 ewes per farm (Appendix Table 10). In addition, an average of 44 beef animals and 25 hogs were sold per farm; also, 24 cows were milked per farm.

**Farm labor supply.** There was an average of 3.4 members of the operator's family on the farm during the year studied (Appendix Table 3). The family labor force was almost equally divided between males and females and about two-thirds were between the ages of 18 and 69. Most of the operators were between 30 and 70 years of age. Only four operators were either below 30 years of age or above 70 years of age (Appendix Table 4).

In addition to the family labor force, most farms had croppers or wage hands, or both. Approximately four-fifths of the cotton and three-fifths of the corn was worked by croppers. The remaining acreage of cotton, corn, and all other crops was handled by the operator's family and wage hands. An average of 579 days of wage work was hired per farm, 72 percent by the day and 28 percent by the month.

**Farm equipment.** Four-fifths of the farms had both tractors and workstock (Appendix Table 6). Mowers, rakes, discs, and breaking plows were found on almost all farms. Hay balers and lime spreaders were found on about two-thirds of the farms; grain drills and cultipackers on about one-half of the farms; and combines and silage cutters on about one-third of the farms.

**Farm buildings.** The general barn was used in connection with the sheep enterprise on 13 of the 25 farms studied (Appendix Table 7). A general sheep barn was used on nine farms. Also, in connection with the sheep enterprise, hay barns were used on four farms, cribs on three farms, dog-proof carrols on two farms, and a silo on one farm.

### Management Practices

**Pastures.** The greater part of grazing furnished sheep was in the form of improved permanent pasture.<sup>5</sup> Each ewe was provided with an average of .71 acres of improved permanent pasture, .11 acres of unimproved permanent pasture, .03 acres of woodland pasture, .09 acres of temporary winter pasture and .02 acres of temporary summer pasture (Appendix Table 16).

Of the 25 farms, 22 had made some improvement on open permanent pasture. A complete job of improvement (land preparation, fertilization, and seeding) had been done on 34 percent of the improved permanent pasture (Appendix Table 13). Forty-four percent of the total acreage of improved permanent pasture had been improved by either land preparation, fertilization or seeding or by a combination of two of these practices; 22 percent had been improved by mowing only.

As far as land preparation for improved permanent pasture was concerned, only 41 percent was disced, 3 percent broken with a breaking plow, 32 percent harrowed and 11 percent cultipacked (Appendix Table 11). Almost all producers mowed at least a part of the improved permanent pasture, 86 percent was mowed an average of 1.5 times per acre.

Fertilizers (not including lime) had been applied to 69 percent of the total acreage of improved permanent pasture. Lime had been applied to 14 percent of the acreage. Superphosphate and basic slag were the fertilizers most commonly used. Superphosphate had been applied to 52 percent of the total acreage of improved permanent pasture

<sup>5</sup> Open permanent pasture where the land had been broken, seeded, or fertilized or any combination of these practices. Open permanent pasture that had been mowed every year for the four years immediately preceding the year studied was also classified as being improved.

and basic slag to 25 percent. See Appendix Table 11 for rates per acre where applied.

Forty-five percent of the improved permanent pasture had been seeded to one or more grasses and legumes. Lespedeza, wild winter peas, White Dutch clover, fescue, and crimson clover were the pasture plants most commonly seeded. Other pasture plants seeded included Dallis grass, Lapacea clover, sericea lespedeza, Ladino clover, black medic, red clover, and Persian clover.<sup>6</sup>

Temporary winter pasture was provided for the sheep enterprise on 13 of the 25 farms studied and averaged about .15 acres per ewe on these farms. Several combinations of winter growing crops were used. However, oats alone or in combination with legumes, and wild winter peas alone were the predominant types of temporary winter pasture. Only 5.3 percent of the total acreage of temporary winter pasture was planted to other crops or combination of crops.<sup>7</sup>

Since wild winter peas do not require annual planting, all land used for this temporary winter pasture was not broken during the year studied. About three-fourths of the total acreage was broken, one-half harrowed and one-fourth cultipacked (Appendix Table 12).

Nitrogen and phosphate were the only fertilizers used on temporary winter pasture. Nitrogen was applied to 51 percent of the acreage at the rate of 44 pounds of nitrogen per acre and phosphate to 15 percent of the acreage at the rate of 76 pounds of  $P_2O_5$  per acre.

Temporary summer pasture was provided for the sheep enterprise on three of the 25 farms studied and averaged .13 acres per ewe on these farms. Johnson grass, sericea lespedeza, and Sudan were the crops used for temporary summer pasture.

The usual practice was to give sheep access to permanent pasture the year around. On the average, grazing on temporary winter pasture was begun the middle of December and continued

until the end of March. During this period, animals were allowed to graze temporary winter pasture about three-fourths of the days. On days when grazing was done, the usual grazing period was 24 hours; however, some producers grazed temporary winter pasture a few hours and then removed the flock. Grazing practices varied widely on the three farms having temporary summer pasture.

In addition to the grazing secured, 12 of the 22 producers having improved permanent pastures and eight of the 13 producers having temporary winter pasture harvested hay or seed from these pastures. Hay harvested from improved permanent pasture averaged .24 tons per acre for the total acreage of improved permanent pasture. A small amount of seed (less than four pounds) was also harvested per acre. An average of 9 bushels of oats, 46 pounds of wild winter peas, and 2 pounds of crimson clover seed were harvested per acre from the total acreage of temporary winter pasture. In all, 9 tons of hay, 43 bushels of oats, 302 pounds of wild winter peas, and 49 pounds of other seeds were harvested per farm from the 37.5 acres of improved permanent pasture and 4.8 acres of temporary winter pasture used by the sheep enterprise.

Water for the sheep was supplied by ponds, wells, and creeks (Appendix Table 18). Ponds were used on 80 percent of the farms, wells on 32 percent and creeks on 16 percent. Seven of the 25 flocks had two sources of water.

**Feeding practices.** Of the 25 flocks, 11 were fed roughage and concentrates, 4 were fed roughages alone, 4 were fed concentrates alone, and 6 were not fed. On the farms where the sheep were fed, feeding was begun on the average about December 20 and continued to about March 20.

Very little feed was given sheep during the year studied. For all flocks, feed per ewe averaged 42 pounds of roughage and 14 pounds of concentrates (Appendix Table 19). Corn and cotton-

<sup>6</sup> See Appendix Table 11 for acres applied to and rates per acre where applied.

<sup>7</sup> In addition to oats and wild winter peas, crimson clover, rye grass, and red clover were the only crops seeded.



seed meal were the principal concentrates fed; most of roughage fed was hay.

**Breeding practices.** Practically all farms had purebred rams and grade ewes. However, about one-half of the producers had at least one registered ram and about one-fourth had some registered ewes. Most of the ewes (80 percent) were classified as Hampshire, Western, Native, or Southdown.<sup>8</sup> Hampshire and Southdown rams were predominant (Appendix Table 20). There was one ram for each 20 ewes.

Eighty-four percent of the lambs were born in the four-month period—December through March—with 56 percent of the births being concentrated in January and February (Appendix Table 21). The lamb crop amounted to 99 percent of the average number of ewes.

**Buying and selling sheep.** In terms of liveweight, 96.5 percent of the sheep produced were sold. Lambs accounted for 95 percent of sales (Appendix Table 22). Lambs were sold at an average weight of 74 pounds. Almost nine-tenths of the lambs were sold in June, the balance being sold in March, May, and July. All ewes sold were sold in May and June and rams in May, June, and July. Almost all wool marketed was sold in May and June.

For the year studied, ewes purchased amounted to 14 percent and rams purchased to 16 percent of the number on hand at the beginning of the year. Ninety percent of the ewes were purchased from May through August, 60 percent being concentrated in May and June. Eighty percent of the rams were purchased in May and June; the balance in February and August. Only one lamb was purchased on all farms studied.

The production of sheep for a particular year includes lambs raised and sold, lambs raised and kept for replacement, weight put on animals on hand at the beginning of the year under consideration. Therefore, sales, changes in inventory, purchases and the amount slaughtered for home use must be taken into consideration in determining the

liveweight of sheep produced. During the year studied, the production of sheep averaged 2,940 pounds per flock or 56 pounds per ewe (Appendix Table 23). In addition, the production of wool amounted to 268 pounds per flock or 5.1 pounds per ewe.

**Health practices.** The sheep were treated for internal parasites with phenothazine on 24 of the 25 farms studied. In about one-third of the cases, the treatment was salt to which phenothazine had been added. Sheep were sprayed or dipped to control insects on four of the 25 farms.

Death losses for ewes average about 10 percent of the number on hand at the beginning of the year. Approximately one lamb out of each six born died or was killed during the year.

Dogs killed 61 percent of the ewes lost and 35 percent of the lambs lost. Other animals killed another 29 percent of the lambs (Appendix Table 24). Ten percent of the lambs and 2 percent of the ewes froze or starved. Death from old age was responsible for 14 percent of the ewes lost. The cause of death was unknown for 21 percent of the lambs and 12 percent of the ewes. Known cases of death due to parasites and diseases accounted for less than one percent of the lambs lost and for only 5 percent of the ewes lost. Perhaps parasites and diseases were responsible for some deaths the cause of which was listed as unknown.

**Labor utilization.** Labor used for the sheep enterprise average 138 hours per flock or 2.6 hours per ewe (Appendix Table 5). In general, there was a close correlation between the size of the flock and the number of hours of labor utilized per ewe. Thirteen flocks averaging 24 ewes required 5.3 hours of labor per ewe compared to 2.1 hours of labor per ewe for 12 flocks averaging 91 ewes.

### Investment, Costs, and Returns

**Investment.** Investment in the sheep enterprise included that in the breeding flock, pasture land (including fences), and buildings. These three items averaged \$3,444 per flock or \$65 per ewe (Table 1).

<sup>8</sup>The balance were Corriedale, Rambouillet, Shropshire, crosses and mixtures.

**Table 1. Investment in the sheep enterprise per flock and per ewe, 25 farm flocks, Northeast Prairie, July 1949 - June 1950.**

Item	Per flock	Per ewe	Percent of total
	Dollars	Dollars	
<b>Breeding flock:</b>			
Ewes .....	1,012	19.24	29.4
Rams .....	126	2.39	3.7
Total .....	1,138	21.63	33.1
<b>Pasture land:</b>			
Improved permanent .....	1,891	35.95	54.9
Unimproved permanent .....	137	2.60	4.0
Woodland .....	11	.21	.3
Temporary winter .....	124	2.36	3.6
Temporary summer .....	35	.67	1.0
Total .....	2,198	41.79	63.8
<b>Buildings:</b>			
General barn .....	56	1.06	1.6
General sheep barn .....	44	.84	1.3
Other buildings .....	8	.15	.2
Total .....	108	2.05	3.1
<b>Total investment</b> .....	<b>3,444</b>	<b>65.47</b>	<b>100.0</b>

**Table 2. Total cost per flock and per ewe, 25 farm flocks, Northeast Prairie, July 1949 - June 1950.**

Item	Per flock	Per ewe	Percent of total
	Dollars	Dollars	
Pasture <sup>1</sup> .....	241.81	4.60	58.7
Feed <sup>2</sup> .....	38.96	.74	9.5
Labor <sup>3</sup> .....	55.24	1.05	13.4
Buildings <sup>4</sup> .....	16.49	.31	4.0
Marketing <sup>5</sup> .....	10.68	.20	2.6
Miscellaneous <sup>6</sup> .....	48.44	.92	11.8
<b>Total</b> .....	<b>411.62</b>	<b>7.82</b>	<b>100.00</b>

<sup>1</sup> See Appendix Tables 14, 15, and 16 for detailed cost by types of pasture.

<sup>2</sup> See Appendix Table 19 for quantities and cost of various types of feed.

<sup>3</sup> Calculated by multiplying the hours of labor required per flock and per ewe as shown in Appendix Table 5 by the prevailing wage of 40 cents per hour.

<sup>4</sup> See Appendix Table 8 for details.

<sup>5</sup> See Appendix Table 25 for details.

<sup>6</sup> See Appendix Table 26 for details.

The investment in the breeding flock amounted to \$1,138 per flock or 33 percent of the total investment in the sheep enterprise. Investment in the breeding stock averaged \$21.63 per ewe of which \$19.24 was the value of the ewe; the remaining \$2.39 was the ewe's share of the investment in rams.

Almost two-thirds of the total investment in the sheep enterprise was in pasture land. This amounted to \$2,198 per flock and \$42 per ewe. Improved permanent pasture accounted for almost seven-eighths of this investment.

Buildings used by the sheep enterprise accounted for only 3 percent of the total investment in the enterprise. The investment in building averaged \$108 per farm and \$2 per ewe. The portion of the general barn used by the sheep enterprise and the general sheep barn accounted for 92.5 percent of the investment in buildings.

**Costs.** Total cost of the sheep enterprise as calculated in this study includes charges for pastures, feed, build-

ings, labor, marketing, and miscellaneous items. A charge for interest on investment was not included as a part of the cost of pastures and buildings. Total cost averaged \$412 per flock or \$7.82 per ewe (Table 2).

The annual cost of pastures accounted for almost three-fifths of the total cost of the sheep enterprise. Annual pasture cost averaged \$242 per flock or \$4.60 per ewe. The annual cost of improved permanent pasture accounted for 66 percent of total pasture cost; temporary winter pasture accounted for another 27 percent.

The cost of purchased feed plus the market value of home-grown feed fed to the sheep enterprise amounted to \$39 per flock or \$0.74 per ewe. This was 9.5 percent of the total cost of the enterprise. The total cost of feed was divided almost equally between concentrates and roughages.

At least a part of the labor used in taking care of the sheep on some farms was hired; therefore, all labor used was

included as an item of cost. In those cases where the operator and his family took care of the sheep or plan to take care of sheep, a more accurate picture of the costs involved may be obtained by deducting the labor cost from total cost. Labor cost per flock amounted to \$55 or 13.4 percent of the total cost of the enterprise. Labor cost per ewe averaged \$1.05.

The annual cost of buildings for the year studied averaged \$16.49 per flock or \$0.31 per ewe. This was 4 percent of the total cost of the enterprise.

The cost of marketing sheep, lambs, and wool, including such items as commission fees, hauling, etc., amounted to \$10.68 per flock or 2.4 percent of the total cost of the enterprise. The cost of marketing per ewe was \$0.20.

Miscellaneous cost items such as shearing, taxes, veterinary fees and medicine, salt, feed grinding, etc., amounted to \$48 per flock or \$0.92 per ewe. Miscellaneous items accounted for about 12 percent of the total cost of the enterprise.

**Returns.** Total returns averaged \$1,046 per flock or \$19.89 per ewe. The value of animals produced accounted for 74 percent of total returns, the value of wool produced for 11 percent and pasture credits for 15 percent (Table 3).

The difference between total returns and total costs as calculated in this study represents the return to the operator for capital invested in the enterprise and for management of the enterprise. Returns to investment averaged \$635 per flock or \$12.07 per ewe. The percentage return on capital invested in the sheep enterprise averaged 18.43.

### Summary and Conclusions

This study of the sheep enterprise on 25 farms in the Northeast Prairie was made for the purpose of providing pres-

ent and prospective sheep producers with basic information relative to (1) the resources used in sheep production and the average investment required, (2) the usual management practices, (3) the average costs and returns, and (4) ways by which sheep production can be made more profitable.

The farms studied were much larger than the average operating unit in the Northeast Prairie. Most of the land was open and about six out of each ten acres were used for pasture and grazing crops. Hay, cotton, temporary winter pasture, and corn were the principal crops grown. In terms of the overall livestock production program, the sheep enterprise, which averaged 53 ewes per flock, was relatively small.

In addition to the family labor force of 3.4 persons, most farms had croppers or wage hands or both. Four-fifths of the farms studied used both tractors and workstock as sources of power. A general barn or a general sheep barn were the buildings most commonly used for the sheep enterprise.

The greater part of the grazing furnished sheep was in the form of improved permanent pasture. Each ewe was provided with an average of .71 acres of improved permanent pasture, .11 acres of unimproved permanent pasture, .03 acres of woodland pasture, .09 acres of temporary winter pasture, and .02 acres of temporary summer pasture.

A complete job of improvement (land preparation, fertilization, and seeding) had been done on 34 percent of the improved permanent pasture. Taking into consideration the total acreage of improved permanent pasture, about 43 percent was broken, 69 percent fertilized, 14 percent limed, and 45 percent seeded. Lespedeza, wild winter peas, White Dutch clover, fer-

Table 3. Returns and returns to investment per flock and per ewe, 25 farm flocks, Northeast Prairie, July 1949 - June 1950.

Item	Per flock	Per ewe	Percent of total
	Dollars	Dollars	
Value of animals produced .....	776.44	14.76	74.21
Value of wool produced .....	115.72	2.20	11.06
Pasture credits .....	154.10	2.93	14.73
<b>Total returns .....</b>	<b>1,046.26</b>	<b>19.89</b>	<b>100.00</b>
Less total cost .....	411.62	7.82	
Returns to investment .....	634.64	12.07	
Percent returned to investment .....			18.43



cue, and crimson clover were the pasture plants most commonly seeded.

Temporary winter pasture was provided for the sheep enterprise on 13 of the 25 farms studied and averaged about .15 acres per ewe on these farms. Oats alone, oats in combination with legumes, and wild winter peas were the predominant types of temporary winter pasture. Temporary summer pasture was provided for sheep on three of the 25 farms and averaged .13 acres per ewe on these farms; Johnson grass, sericea lespedeza, and Sudan were the crops used.

The usual practice was to give sheep access to permanent pasture the year around. On the average, grazing on temporary winter pasture was begun the middle of December and continued until the end of March. During this period, sheep were placed on temporary winter pasture an average of three days out of four; the usual grazing period was 24 hours per day.

In addition to the grazing secured, 12 of the 22 producers having improved permanent pasture and eight of the 13 producers having temporary winter pasture harvested hay or seed or both from these pastures. Nine tons of hay, 43 bushels of oats, 302 pounds of wild winter peas, and 49 pounds of other seed were harvested per farm from the 37.5 acres of improved permanent pasture and 4.8 acres of temporary winter pasture used by the sheep.

The sheep were not fed concentrates or roughage on six of the 25 farms studied. On the farms where the sheep were fed, feeding was begun on the average about December 20 and continued to about March 20. For all flocks studied, feed per ewe averaged 42 pounds of roughage and 14 pounds of concentrates.

Purebred rams and grade ewes were the usual breeding stock. However, in a few cases, the ram and a part or all of the ewes were registered. There was one ram for each 20 ewes. Eighty-four percent of the lambs were born from December through March, with 56 percent of the births concentrated in January and February. The lamb crop

amounted to 99 percent of the average number of ewes.

During the year studied, the production of sheep averaged 2,940 pounds per flock and 56 pounds per ewe. In addition, 268 pounds of wool were produced per flock which amounted to 5.1 pounds per ewe.

Practically all lambs were sold in June. All ewes and most of the wool was marketed in May and June. Lambs were sold at an average weight of 74 pounds. Ninety percent of the ewes purchased and 80 percent of the rams purchased were purchased in May and June. Only one lamb was purchased on all farms studied.

Sheep were treated for internal parasites on 24 of the 25 farms, and sprayed or dipped for insect control on four. Death losses for ewes averaged about 10 percent and about one lamb out of each six born was lost during the year. Sixty-one percent of the ewes lost were killed by dogs and 64 percent of the lambs lost were killed by dogs and other animals. Known cases of death due to parasites and diseases accounted for less than 1 percent of lamb losses and for only 5 percent of the ewes lost.

Labor used for the sheep enterprise averaged 138 hours per flock or 2.6 hours per ewe.

Investment in the sheep enterprise averaged \$3,444 per flock or \$65 per ewe. Thirty-three percent of the total investment was in breeding stock, 64 percent in pasture land, and 3 percent in buildings.

Total cost of the sheep enterprise, not including a charge for interest on investment, amounted to \$412 per flock or \$7.82 per ewe. Pastures were the major cost item accounting for about three-fifths of all cost; feed, labor, building, marketing charges, and miscellaneous items accounted for the balance.

Total returns averaged \$1,046 per flock or \$19.89 per ewe. Returns to investment amounted to \$635 per flock and \$12.07 per ewe. The percentage return on capital invested in the sheep enterprise averaged 18.4.

Most phases of the sheep enterprise appear to have been managed with a reasonable degree of efficiency as evidenced by the favorable return on capital invested. Pastures, the major cost item, were fairly well stocked, and in most cases where surplus grazing existed, hay or seed were harvested which served to help keep the net cost of grazing low. When the value of hay and seed saved from pastures (\$2.93 per ewe) is deducted from total pasture cost (\$4.60 per ewe), and the remaining \$1.67 is the net cost of pastures per ewe. The acres of pasture used per ewe could have been reduced by heavier stocking; however, this would have reduced or eliminated pasture credits and increased the problem of feeding during the months when grazing normally is limited. The cost of feed, labor, buildings, marketing and miscellaneous items was relatively low per ewe. The

lamb crop of 99 percent was satisfactory.

High death losses appear to have been the major weakness in the management of the sheep enterprise. Most of these deaths could have been prevented by protecting the sheep from dogs and other killers, especially at night, by giving the animals better care during the winter and lambing season, and by culling out old ewes. The cause of death should be determined in all cases in order to try to prevent similar losses. Perhaps the average weight of lambs sold could be increased by having more of them dropped early in the lambing season and by the selection of better ewes. Also, more attention to the feeding program in the month prior to lambing should result in stronger lambs and ewes and heavier lambs at market time.



## APPENDIX I

### Methods Used In Calculating Investment, Costs, and Returns

#### A. Investment

1. **Breeding stock:** The average number of each class of sheep was calculated from the number on hand at the beginning and at the end of the year. Investment in the breeding stock was determined from the average number of each class of animals and producer estimates of the value of each class at the end of the year. An allowance was made on each farm for changes in weight of each class of animal.

2. **Land:** Acreage of pasture land used by sheep was calculated by prorating the total acreage, on the basis of grazing secured, between sheep and other livestock. Investment in pasture land was based on the number of acres used by sheep and producer estimates of value per acre which included the value of fences. Only one-half of the value of land double-cropped was included in the investment. Woodland pasture was valued for grazing purposes only.

3. **Buildings:** It was assumed that the average investment in buildings would approximate one-half of the replacement cost. Investment in buildings was based on this assumption and on producer estimates of replacement cost. Investment in buildings used jointly with other livestock was prorated on the basis of the proportion used for the sheep enterprise.

#### B. Costs

1. **Feed:** Feed costs were based on producer estimates of quantities fed and the average price of each kind of feed. The price used for home-grown feeds was the price paid farmers during the harvest season.

2. **Pasture:** Pasture cost was based on the acreage used by the sheep enterprise and the annual cost per acre of each type of pasture. In calculating pasture costs, labor was calculated at the prevailing wage rate of 40 cents per hour; machinery cost was based on farm management cost studies; fencing

cost was based on producer estimates as to the materials, labor, and equipment used and prevailing prices; and seed and fertilizer costs were calculated by using average prices for the year studied and producer information as to quantities used.

In calculating the total cost of improved permanent pasture, the total cost of improvements made was calculated on the basis of July 1949-June 1950 prices regardless of the year in which the improvement was made. Because of wide differences in P.M.A. payments rates in different years and in the different counties, no deduction from total pasture cost for these payments was made.

Upon the recommendations of agronomists the annual charges for seed, fertilizer, and land preparation for improved permanent pasture were calculated as follows: (1) seed, one-tenth of the total cost; (2) land preparation except applying fertilizer, one-tenth of the total cost; and (3) cost of fertilizer and the cost of applying fertilizer was calculated as follows: the total cost of nitrogen was charged to the year applied; 40 percent of the total cost of phosphate, potash and basic slag were charged to the year applied, 40 percent to the following year and 20 percent to the third year; and 20 percent of the total cost of lime was charged to each of the first four years after its application, 10 percent to the fifth year and 10 percent to the sixth year. In addition, the annual cost of improved permanent pasture included mowing and fencing.

3. **Building:** Building cost included depreciation and repairs. The annual charge for depreciation was calculated by the straight-line method; charges for repairs were based on farm management cost studies and were calculated at 3 percent of replacement cost.

4. **Labor:** Labor cost was based on producer estimates of time spent on the sheep enterprise and the prevailing wage rate (40 cents per hour).

5. **Marketing:** Marketing cost was based on producer information as to commission fees and other marketing costs.

6. **Miscellaneous:** Miscellaneous cost was based on producer information as to these costs or as to the quantities of miscellaneous items used and the average price of these items.

### C. Receipts

1. **Sheep Production:** Receipts from the production of sheep were calculated by adding the value of animals sold, animals killed for food, and inventory changes and subtracting the value of animals purchased. In calculating the

value of inventory changes, increases or decreases in inventory were valued at prices per pound prevailing at the end of the year.

2. **Wool Production:** Receipts from the production of wool were calculated by adding the value of wool sold to the value of the change in the inventory of wool.

3. **Pasture Credits:** Pasture credits were based on producer estimates as to the quantity of hay and seeds harvested from pasture land charged to the sheep enterprise and prevailing prices for these items. The average price received for these items was discounted by an amount equal to the cost of harvesting.

## APPENDIX II

### Statistical Tables

**Appendix Table 1. Land use, 25 farms having sheep enterprise, Northeast Prairie, July 1949 - June 1950.**

Item	Acres per farm	Percent of total
Acres owned .....	772	87.7
Acres rented in .....	136	15.5
Acres rented out .....	28	3.2
Acres operated .....	880	100.0
Cropland .....	295	33.5
Improved permanent pasture .....	326	37.1
Unimproved permanent pasture .....	132	15.0
Woodland pasture .....	89	10.0
Woodland .....	18	2.0
Farmstead and other .....	20	2.3

**Appendix Table 2. Cropland utilization, 25 farms having sheep enterprise, Northeast Prairie, July 1949 - June 1950.**

Item	Acres per farm	Percent of total
Cotton <sup>1</sup> .....	58	19.7
Corn <sup>2</sup> .....	45	15.2
Hay .....	109	36.9
Temporary winter pasture .....	56	19.0
Other crops .....	36	12.2
Idle cropland .....	38	12.9
Land double-cropped .....	47	15.9
Total cropland .....	295	100.0

<sup>1</sup> Croppers worked 45 acres or 78 percent of the 58 acres of cotton.

<sup>2</sup> Croppers worked 28 acres or 62 percent of the 45 acres of corn.

**Appendix Table 3. Age and sex distribution of the family labor force, 25 farms having sheep enterprise, Northeast Prairie, July 1949 - June 1950.**

Age group	Males	Number per farm	
		Females	Total males and females
Under 9 .....	.12	.16	.28
9 - 12 .....	.16	.08	.24
13 - 17 .....	.28	.32	.60
18 - 59 .....	1.04	.92	1.96
60 - 69 .....	.12	.12	.24
70 and above .....	—	.08	.08
Total .....	1.72	1.68	3.40

<sup>1</sup> In addition to the family labor force, 579 days of labor were hired per farm of which 28 percent was hired by the month.

**Appendix Table 4. Age of operator, 25 farms having sheep enterprise, Northeast Prairie, July 1949 - June 1950.**

Age of operator	Number of farms	Percent of farms
Under 20 .....	1	4
20 - 29 .....	1	4
30 - 39 .....	3	12
40 - 49 .....	6	24
50 - 59 .....	9	36
60 - 69 .....	3	12
70 and above .....	2	8
Total .....	25	100

**Appendix Table 5. Hours of labor used for the sheep enterprise, per flock and per ewe, by months, 25 farm flocks, Northeast Prairie, July 1949 - June 1950.**

Month	Total per flock	Total per ewe
January .....	21.6	.41
February .....	17.6	.33
March .....	13.6	.26
April .....	12.6	.24
May .....	19.1	.36
June .....	7.8	.15
July .....	6.4	.12
August .....	6.4	.12
September .....	6.2	.12
October .....	6.5	.12
November .....	7.3	.14
December .....	13.0	.25
Total .....	138.1	2.62

<sup>1</sup> For 12 farms averaging 91 ewes, the hours of labor required per flock and per ewe were 183 and 2.07, respectively; for 13 farms averaging 24 ewes, the hours of labor required per flock and per ewe were 127 and 5.29, respectively.

Appendix Table 6. Number and percent of farms having specified types of power and equipment, 25 farms having sheep enterprise, Northeast Prairie, July 1949 - June 1950.

Item	Number of farms having	Percent of farms having
Workstock	23	92
Tractor	21	84
Disc	23	92
Breaking plow	22	88
Grain drill	12	48
Lime spreader	16	64
Cultipacker	13	52
Mower	24	96
Rake	24	96
Baler	16	64
Combine	8	32
Silage cutter	8	32

Appendix Table 7. Type of buildings used for the sheep enterprise, percent of farms using each type building, replacement cost and replacement cost to the sheep enterprise, 25 farms having sheep enterprise, Northeast Prairie, July 1949 - June 1950.

Item	Percent of farms using	Replacement cost per flock	
		Dollars	Dollars
General barn	56	1,432	111
General sheep barn <sup>1</sup>	36	87	87
Hay barn	16	256	9
Crib	12	15	2
Dog-proof corral	8	4	4
Silo	4	40	2
Total	100	1,834	215

<sup>1</sup> Closed, 8; open, 1.

Appendix Table 8. Building cost per flock and per ewe, 25 farm flocks, Northeast Prairie, July 1949 - June 1950.

Item	Dollars	
	Per flock	Per ewe
Depreciation	10.04	.19
Repairs	6.45	.12
Total	16.49	.31

Appendix Table 9. Number and percent of farms having other livestock enterprise<sup>1</sup> of commercial importance, 25 farms having sheep enterprise, Northeast Prairie, July 1949-June 1950.

Item	Number of farms having	Percent of farms having
Beef cattle <sup>2</sup>	17	68
Dairy cattle <sup>3</sup>	15	60
Hogs <sup>2</sup>	11	44

<sup>1</sup> Only one farm had as many as 300 laying hens. Two farms sold 500 or more turkeys.<sup>2</sup> Selling 10 or more animals; 44 beef animals and 25 hogs were sold per farm studied.<sup>3</sup> Milking 10 or more cows; 24 cows were milked per farm studied.

Appendix Table 10. Sheep number, 25 farm flocks, Northeast Prairie, July 1949 - June 1950.

Item	On hand July 1, 1949	Born	Purchased	Number per flock			On hand June 30, 1950	Average of inventories
				Home use	Sold	Died		
Ewes	50.5	—	7.2	—	.7	5.0	54.7	52.6
Lambs	6.8	52.0	* 1	.8	36.4	8.3	9.6	8.2
Rams	2.5	—	.4	—	.1	.4	2.7	2.6
Wethers	.4	—	—	.4	.5	—	.2	.3
Total	60.2	52.0	7.6	1.2	37.7	13.7	67.2	63.7

<sup>1</sup> Less than .05. Only one lamb purchased on all farms.

Appendix Table 11. Land preparation, fertilization and seeding practices, all improved permanent pastures, 25 farms having sheep enterprises, Northeast Prairie, July 1949 - June 1950.

Item	Percentage of total acreage covered	Times over or rate when performed <sup>1</sup>
Land preparation:		
Discing .....	41	1.7
Breaking .....	3	1.0
Harrowing .....	32	1.4
Cultipacking .....	11	1.4
Fertilizing .....	69	1.3
Limeing .....	14	1.0
Seeding .....	45	1.1
Mowing .....	86	1.5
Fertilization:		
Lime .....	14	1920
Basic slag .....	25	502
Nitrogen (N) .....	1	46
Phosphate (P <sub>2</sub> O <sub>5</sub> ) .....	52	74
Potash (K <sub>2</sub> O) .....	1	124
Mixed fertilizers <sup>2</sup> .....	4	115
Seeding:		
Lespedeza .....	19	22.6
Wild winter peas .....	17	44.3
White Dutch clover .....	4	9.4
Fescue .....	2	11.3
Crimson clover .....	2	6.3
Dallis grass .....	1	7.7
Lapacea clover .....	1	13.9
Sericea lespedeza .....	1	30.1
Ladino clover .....	* 3	4.5
Black medic .....	* 3	6.7
Red clover .....	* 3	18.8
Persian clover .....	* 3	1.0

<sup>1</sup> Times once over for land preparation where performed and pounds of fertilizer and seed per acre where applied.

<sup>2</sup> Includes 0-14-7, 0-14-2, and 6-8-4.

<sup>3</sup> Less than .5 percent.

Appendix Table 12. Annual land preparation, fertilization and seeding practices, temporary winter pasture, 25 farms having sheep enterprise, Northeast Prairie, July 1949 - June 1950.

Item	Percentage of total acreage covered	Times over or rate when performed
Land preparation:		
Discing .....	71	1.82
Breaking .....	17	1.00
Harrowing .....	49	1.16
Cultipacking .....	26	1.00
Fertilizing .....	62	1.06
Seeding .....	73	1.20
Fertilization:		
Nitrogen (N) .....	51	44
Phosphate (P <sub>2</sub> O <sub>5</sub> ) .....	15	76
Seeding:		
Oats .....	62	111
Wild winter peas .....	51	41
Crimson clover .....	15	9
Rye grass .....	2	15
Red clover .....	2	12

Appendix Table 13. Percentage of improved permanent pasture improved by specified method, and percentage of temporary grazing crops that were specified crops, 25 farms having sheep enterprise, Northeast Prairie, July 1949 - June 1950.

Item	Percentage of total acreage
Permanent pasture improved by:	
Fertilization, seeding and land preparation .....	34.1
Either fertilization, seeding or land preparation or a combination of two of these methods .....	44.1
Mowing .....	21.8
Total .....	100.0
Temporary winter pasture seeded to:	
Oats .....	32.8
Oats and some legume .....	27.1
Wild winter peas .....	34.8
Other .....	5.3
Total .....	100.0
Temporary summer pasture:	
Sudan .....	57.7
Johnson grass .....	26.9
Lespedeza sericea .....	15.4
Total .....	100.0



Appendix Table 14. Cost of establishment and annual cost per acre for all improved permanent pasture, 25 farms having sheep enterprise, Northeast Prairie, July 1949 - June 1950.

Item	Cost of establishment		Annual cost
	Dollars		Dollars
Land preparation .....	2.36		.40
Fertilizer .....	4.14		1.24
Seed .....	2.80		.28
Bushing .....	.03		.01
Fencing .....	—		.74
Mowing .....	—		1.59
<b>Total</b> .....	<b>9.33</b>		<b>4.26</b> <sup>1</sup>

<sup>1</sup> When interest is charged at 5 percent on the investment in land and fences, the annual cost per acre is \$6.78.

Appendix Table 15. Annual pasture cost per acre, unimproved permanent, woodland, temporary winter and temporary summer, 25 farms having sheep enterprise, Northeast Prairie, July 1949 - June 1950.

Item	Unimproved permanent	Woodland	Temporary	
			winter	summer
			Dollars	
Land preparation .....	—	—	3.49	3.54
Fertilizer .....	—	—	3.75	4.04
Seed .....	—	—	5.82	3.62
Fencing .....	.56	.67	.50	.73
Mowing .....	—	—	—	.69
<b>Total</b> <sup>1</sup> .....	<b>.56</b>	<b>.67</b>	<b>13.56</b>	<b>12.62</b>

<sup>1</sup> When interest is charged at 5 percent on the investment in land and fences, the annual cost per acre is as follows: \$6.78, \$1.78, \$0.96, \$14.85, and \$14.35 for improved permanent, unimproved permanent, woodland, temporary winter, and temporary summer pasture, respectively.

Appendix Table 16. Acres of pasture per flock and per ewe and annual pasture cost per flock and per ewe, 25 farm flocks, Northeast Prairie, July 1949 - June 1950.

Type of pasture	Per flock		Per ewe	
	Acres	Cost	Acres	Cost
		Dollars		Dollars
Improved permanent .....	37.5	159.75	.71	3.04
Unimproved permanent .....	5.6	3.14	.11	.06
Woodland .....	1.8	1.21	.03	.02
Temporary winter .....	4.8	65.09	.09	1.24
Temporary summer .....	1.0	12.62	.02	.24
<b>Total</b> .....	<b>50.7</b>	<b>241.81</b>	<b>.96</b>	<b>4.60</b>

Appendix Table 17. Pasture credits per flock and per acre, 25 farm flocks, Northeast Prairie, July 1949 - June 1950.

Item	Unit	Quantity		Value	
		Per flock	Per acre	Per flock	Per acre
				Dollars	
Improved permanent pasture:					
Hay .....	ton	9.00	.24	85.88	2.29
Wild winter peas .....	lb.	83.62	2.23	5.85	.16
Korean lespedeza .....	lb.	22.88	.61	2.06	.05
Sericea lespedeza .....	lb.	6.75	.18	1.89	.05
Lapacea clover .....	lb.	4.12	.11	2.47	.06
Dallis grass .....	lb.	3.38	.09	1.69	.05
Fescue .....	lb.	1.12	.03	.69	.02
<b>Total</b> .....				<b>100.53</b>	<b>2.68</b>
Temporary winter pasture:					
Oats .....	bu.	42.86	8.93	30.86	6.43
Wild winter peas .....	lb.	218.83	45.59	15.32	3.19
Crimson clover .....	lb.	10.27	2.14	7.39	1.54
<b>Total</b> .....				<b>53.57</b>	<b>11.16</b>
<b>Total all pasture credits</b> .....				<b>154.10</b>	

**Appendix Table 18. Source of water, 25 farm flocks, Northeast Prairie, July 1949 - June 1950.**

Source of water	Number of flocks	Percent of farms
Pond .....	13	52
Pond and well .....	4	16
Pond and creek .....	3	12
Well .....	4	16
Creek .....	1	4
<b>Total</b> .....	<b>25</b>	<b>100</b>

**Appendix Table 19. Quantities of feed used per flock and per ewe, 25 farm flocks, Northeast Prairie, July 1949 - June 1950.**

Item	Per farm		Per ewe	
	Amount	Value	Amount	Value
	Pounds	Dollars	Pounds	Dollars
<b>Concentrates:</b>				
Cottonseed meal .....	201	6.76	3.82	.13
Corn .....	338	6.92	6.43	.13
Oats .....	77	2.12	1.46	.04
Dairy feed .....	92	3.64	1.75	.07
Soybeans .....	4	.12	.08	*2
Wheat bran .....	21	.72	.40	.01
<b>Total</b> .....	<b>733</b>	<b>20.28</b>	<b>13.94</b>	<b>.38</b>
<b>Roughage:</b>				
Hay <sup>3</sup> .....	1,921	16.44	36.52	.32
Silage .....	840	2.24	15.97	.04
<b>Total</b> <sup>4</sup> .....	<b>2,201</b>	<b>18.68</b>	<b>41.84</b>	<b>.36</b>
<b>Total</b> .....		<b>38.96</b>		<b>.74</b>

<sup>1</sup> The average feeding period was from December 21 through March 18.

<sup>2</sup> Less than \$0.005.

<sup>3</sup> Includes 97 pounds of crushed corn cobs and shucks.

<sup>4</sup> Silage converted to hay equivalent.

**Appendix Table 20. Breed of sheep, 25 farm flocks, Northeast Prairie, July 1949 - June 1950.**

Breed	Ewes <sup>1</sup>	Rams <sup>2</sup>	Percent of total	
			Ewes	Rams
Hampshire .....	28.1	55.4		
Native .....	18.3	—		
Western <sup>3</sup> .....	16.6	—		
Southdown .....	15.7	23.1		
Corriedale .....	4.2	—		
Rambouillet .....	3.8	—		
Shropshire .....	—	3.1		
Crosses .....	7.3	9.2		
Mixed flocks .....	6.0	9.2		
<b>Total</b> .....	<b>100.0</b>	<b>100.0</b>		

<sup>1</sup> Four farms had purebred ewes and two farms had a part of their ewes registered.

<sup>2</sup> Twenty-three farms had at least one purebred ram and 13 had at least one registered ram.

<sup>3</sup> Includes Texas ewes.

**Appendix Table 21. Percentage of lambs born by months and sold by months and percentage of animals purchased by months, 25 farm flocks, Northeast Prairie, July 1949 - June 1950.**

Month	Lambs born	Lambs sold <sup>1</sup>	Ewes purchased <sup>2</sup>	Rams purchased	Percentage each month			
					Lambs born	Lambs sold	Ewes purchased	Rams purchased
January .....	30.2	—	—	—				
February .....	26.4	—	10.6	10.0				
March .....	13.5	5.5	—	—				
April .....	4.5	—	—	—				
May .....	1.6	4.3	33.5	20.0				
June .....	.7	88.9	27.9	60.0				
July .....	.6	1.3	9.0	—				
August .....	.6	—	19.0	10.0				
September .....	.6	—	—	—				
October .....	.5	—	—	—				
November .....	6.7	—	—	—				
December .....	14.1	—	—	—				
<b>Total</b> .....	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>				

<sup>1</sup> All ewes were sold in May and June and rams in May, June, and July; almost all wool marketed was sold in May and June.

<sup>2</sup> Only one lamb was purchased on all farms.

Appendix Table 22. Number, liveweight, and value of animals sold per farm, 25 farm flocks, Northeast Prairie, July 1949 - June 1950.

Item	Number sold	Liveweight sold	Value of animals sold
		Pounds	Dollars
Ewes	.7	68	11.80
Lambs	36.4	2,702	704.40
Rams	.1	16	3.04
Wethers	.5	52	15.16
Total	37.7	2,838	734.40

Appendix Table 23. Liveweight and value of sheep produced per flock and per ewe, 25 farm flocks, Northeast Prairie, July 1949 - June 1950.

Item	Liveweight	Value
	Pounds	Dollars
Sales	2,838	734.40
Plus or minus change in inventory	+ 726	+ 140.08
Plus amount used in the home	+ 103	+ 25.68
Minus purchases	- 727	- 123.72
Net production per farm <sup>1</sup>	2,940	776.44
Net production per ewe <sup>1</sup>	56	14.76

<sup>1</sup> In addition, 268 pounds of wool valued at \$115.72 was produced per farm; this was 5.1 pounds valued at \$2.20 per ewe.

Appendix Table 24. Cause of death of ewes and lambs, 25 farm flocks, Northeast Prairie, July 1949 - June 1950.

Cause	Percent of animals dying	
	Ewes	Lambs
Killed by dogs	60.8	34.5
Killed by hogs, cows, and horses	—	9.4
Killed by buzzards	—	19.6
Frozen or starved	2.4	9.9
Old age	14.4	—
Diseases and parasites	4.8	.5
Unknown	12.0	21.2
Other	5.6 <sup>1</sup>	4.9 <sup>2</sup>
Total	100.0	100.0

<sup>1</sup> Includes bloat, heat, constipation, lambing, and strangled.

<sup>2</sup> Includes lambing, castration, drowned, and killed by automobile.

Appendix Table 25. Marketing cost per flock and per ewe, 25 farm flocks, Northeast Prairie, July 1949 - June 1950.

Item	Per flock	Per ewe
	Dollars	
Commission fees	3.80	.07
Hauling	5.40	.10
Other marketing charges	1.48	.03
Total	10.68	.20

Appendix Table 26. Miscellaneous cost per flock and per ewe, 25 farm flocks, Northeast Prairie, July 1949 - June 1950.

Item	Per flock	Per ewe
	Dollars	
Shearing	14.60	.28
Taxes	12.44	.24
Veterinary fees and medicine	9.08	.17
Salt (common and medical)	5.28	.10
Feed grinding	1.52	.03
Automobile	1.48	.03
Insurance on buildings	1.36	.03
Electricity and telephone	1.24	.02
Spray material and disinfectants	.80	.01
Minerals	.64	.01
Total	48.44	.92