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B619: An Economic Study of Sheep Production in Maine

Dean F. Tuthill

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SHEEP PRODUCTION
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Maine Agricultural Experiment Station
Bulletin 619 University of Maine, Orono Jan., 1964

ACKNOWLEDGMENTS

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SUMMARY

This study of sheep production in Maine was done in the summer of 1962 on the prior year's sheep operation. Records of 60 producers were included in the study, approximately a 30 percent sample of producers with 20 or more mature ewes per flock. Considerably more than half of all sheep producers in Maine had less than 20 ewes per flock. These were not included in the sample.

Nearly half of the producers in the study were full-time farmers, the rest were part-time or retired farmers or non-farmers. For those farming, dairy and poultry were the most prevalent farm enterprises. Most producers followed recommended feeding practices by providing grain for ewes before and after lambing and for lambs while nursing and before marketing. Little extra or special feeding was done during breeding season. Good programs for parasite control were followed with phenothiazine treatments and greensalt, and most producers docked and castrated lambs. Generally, good care was provided during lambing. All producers in the study provided housing, either barns or sheds, for their sheep except island sheep producers who were not included in the main part of the study.

The average flock for the 60 producers consisted of 53 ewes, 10 yearling ewes, one yearling ram, and two rams. Seventy lambs were produced from the average flock representing a 133 percent lamb crop. Slightly more than 60 lambs reached market age and about 48 of these were marketed. Lambs were most commonly born in March and April and sold in September and October. A few ewes were bred for and lambs sold on the Easter market. The most common market for lambs was the livestock dealer and slaughterer while lamb pools ranked second.

All expenses for the average producer totaled $2,194. Feed cost was 48.6 percent of the total cost. The cost of hay accounted for slightly more than half of the feed cost; pasture and grain in nearly equal proportions accounted for the rest. About one-half ton of hay and one hundredweight of grain were fed per ewe during the year. Direct care of the flock in feeding, lambing and general care required 508 hours for the average producer which, when charged at $1.15 per hour, equaled 27.1 percent of the total cost. Most labor was provided by the operator, and was not a cash cost. The balance of the costs (24.3 percent) consisted of building expenses, purchase of and investment in sheep, equip-

ment costs, hired shearing, medication for parasite control and some other minor expenses. Costs also included depreciation and interest on all investment in facilities used directly for sheep.

Gross receipts from the average flock totaled $1,348. Sale of lambs accounted for 45.7 percent, and sales of all animals, including cull and breeding rams and ewes, provided 54.4 percent of gross receipts. The marketing of wool, 9.4 pounds average per ewe, accounted for 20.0 percent of gross receipts. The wool incentive payment, provided by the National Wool Program and applied for by producers on the basis of their wool sales, added 8.9 percent for a total wool return of 28.9 percent of gross receipts. Miscellaneous cash receipts provided an additional 2.6 percent. Non-cash income from credit for manure applied to cropland or pasture not used for sheep and increase in flock inventory accounted for 7.9 and 6.2 percent, respectively, of gross receipts.

The cash and non-cash receipts from the average sheep enterprise did not cover total cash and non-cash expenses, resulting in a net loss of $848. With the operators labor deducted as a cash cost, assuming that all labor except hired shearing was done by the operator, the average producer received a negative labor income of $252.

The loss of $848 in net income or $252 in labor income was not a normal or long run situation, however. Lamb prices in 1961 were the lowest for any of the prior ten years and were 82 percent of the 1952-61 ten-year average lamb price. An adjustment of receipts from the sale of sheep to the ten-year average price increased gross receipts from $1,348 to $1,509 and reduced the loss in net return to $666. The return to operators labor was –$72. This negative wage rate might be sufficient for continued sheep production, when other advantages of sheep are considered. Sheep may complement other farm enterprises or a non-farm job in the use of labor, land and equipment resources that are not being used for other productive purposes. Apparent enjoyment and satisfaction to retired farmers and non-farmers gained from sheep ownership may be non-economic advantages.

Although the average sheep producer operated at a loss considering all costs, even with prices adjusted to the ten-year average, not all producers had low returns. A group of twenty producers in the high income range had feed costs 23 percent lower than for the average of all producers. These flocks were fed approximately one-third ton of hay and 72 pounds of grain per ewe per year. More and better pasture was provided flocks in

this high income group. Labor costs were 26 percent lower with 380 hours of direct labor for flocks of the same size. Building costs were lower for the high income group. Cost reductions were made possible by more efficient housing, care and feeding of sheep. Total costs were $1,765 per high income producer compared with $2,194 for all producers.

Average receipts for the high income producers were $1,664 compared with $1,348 for all producers. This income difference was due to a larger lamb crop, a higher value per lamb sold and to a larger wool yield. The high income producers marketed a larger proportion of their lambs on the Easter market and through lamb pools than did all producers.

The average high income producers had a $101 negative net income in 1961. With the cost of labor deducted, he had a labor income of $336, or $.88 per hour return for labor. With lamb prices adjusted to the 1952-61 ten-year average, he would have a $101 net income, a $538 labor income or a labor return of $1.42 per hour. Under these average conditions, better sheep producers could make a reasonable labor return by controlling expenses and increasing receipts through more efficient production and marketing of the lamb crop.

AN ECONOMIC STUDY OF SHEEP PRODUCTION IN MAINE

Dean F. Tuthill[1]

INTRODUCTION

Historically sheep production was an important industry in Maine. Clarence Day in his history, "Farming in Maine" states, "Sheep husbandry, from the earliest times until the close of the nineteenth century, was one of the most important branches of Maine agriculture."[2] The Census of 1860 reported 452,472 sheep in Maine, nearly equal in number to all other farm animals including horses, oxen, cattle and hogs. The doubling of wool prices during the Civil War resulted in Maine sheep numbers increasing to more than 1 million. By 1880, the number was again down to around a half-million, and shortly thereafter a long, steady decline began. The low point was reached early in the 1950's when sheep numbered about 19,000 in 1951 and 1952. The numbers and value of sheep in Maine doubled during the decade of the 1950's to around 40,000 head in 1959. A twenty percent increase occurred from 1954 to 1959 according to the Census of Agriculture.

Sheep are not now an important industry in Maine. Not only have they declined in numbers during the last century, but other enterprises, mainly dairy, poultry and potatoes, have surged ahead in importance. Cash receipts for all farm commodities in 1961 were $180,169,000, of which sheep, lambs and wool contributed $301,000 or 0.2 percent of the total.

In spite of the relatively minor position of the sheep industry, the increasing numbers of and interest in sheep during recent years made this economic study of Maine sheep appropriate at this time. The study was conducted in the summer of 1962 and included 1961 operations. Special emphasis was given to management practices during the breeding, lambing and marketing periods. All costs of production, including feed, labor, housing and equipment used directly for sheep, and returns from sale of animals and wool, were obtained. The profitability of keeping sheep in Maine was a major objective of the study.

Each county Agricultural Stabilization and Conservation Office

[1] Dean F. Tuthill, Associate Professor, Department of Agricultural Business and Economics, University of Maine, Orono, Maine.

[2] Day, Clarence Albert, *Farming in Maine, 1860-1940*, University of Maine Press, Orono, Maine, 1963, p. 2.

provided a list of sheep producers in its county from the incentive payment records. Of approximately 200 flocks with 20 or more mature ewes, sixty, or roughly a 30 percent random sample, were selected for study. Many small producers, more than half of those in Maine, were therefore, not represented in this study.

The information from the A.S.C. offices, including number of applicants, wool sales and receipts, net wool payment and net unshorn wool payment by counties is included in appendix A.

A rule-of-thumb for determining the number of mature ewes was to divide the pounds of wool sold by ten. Producers with less than 200 pounds of wool sold were eliminated as too small, and many producers selling 200 or slightly more pounds of wool were found on a visit to have fewer than 20 ewes. The A.S.C. records showed the average state wool sales to be 203 pounds per producer; thus the average size flock in the state was 20 or less ewes.

SHEEP PRODUCERS AND THEIR OPERATIONS

Characteristics of Sheep Producers

Of the 60 producers studied, 23 had kept sheep less than 10 years, 19 from 10 to 19 years and the other 18 from 20 to over 70 years. The fairly large number of producers just starting to keep sheep during the last 10 years coincides with the increasing numbers of sheep in Maine during this period of time.

The average age of the operators was just under 50 years, while the largest number (17) were in their 40's, 12 were older than 60.

Over half of the producers interviewed, or 33 of the 60, had been increasing the size of their flocks in the past few years. Nineteen had kept their flocks about constant.

Nearly half of the sheep producers made all of their living from farming, and all but two had farm income in addition to returns from the sheep enterprise (table 1).

Table 1. Share of Living from Farming Exclusive of Sheep
Maine Sheep Producers — 1961

Percent	Number of producers
100	27
75	6
50	4
25	3
Small percent	18
Zero	2
All	60

The 33 producers who had off-farm jobs spent various amounts of time at these jobs. Twelve considered it a full-time job, 14 around half-time and 7 said it took only a minor part of their time. The off-farm jobs varied from professional to laborer (table 2).

Table 2. Off-farm Jobs

Job	Number of producers
Professional	9
Craftsman & machine operators	5
Laborer	14
Service	4
Fishing	1
All	33

Farm Enterprises

Sheep were the major farm enterprise on 20 of the 60 farms studied. Fifteen of these 20 producers had off-farm jobs as their major source of income and the other five were retired farmers. Other major farm enterprises of sheep producers in order of importance were poultry, dairy and potatoes with a few other combinations (table 3).

Table 3. Major Farm Enterprises

Enterprise	Number of producers
Sheep	20
Poultry	13
Dairy	11
Potatoes	5
Sheep & poultry	3
Dairy & poultry	2
Blueberries	2
Beef	1
Woods	1
Other	2
All	60

The numbers of livestock and acres of crops for those who had farm enterprises in addition to sheep is given in table 4. Number of sheep per producer was 66, fifty-three of these were ewes. In each case, producers were included who raised other livestock or crops except for those with two or less family cows or just a few chickens for the family. These other enterprises were small on the average although there were a few large dairy, poultry and potato operators.

Table 4. Producers of Livestock and Crops and the Average Size

	Number of producers	Average number or acres
Sheep	60	66
Dairy cows & bulls	21	22
Young stock	27	20
Beef cattle	8	17
Poultry, layers	23	5,289
Broilers	5	12,130
Horses	13	2
Hogs	8	10
Turkeys	1	2,500
Pasture	60	44
Hay	54	63
Oats	11	22
Rape	10	10
Potatoes	6	89

MANAGEMENT AND MARKETING PRACTICES

Breeding Practices

Feeding Ewes Before Breeding. — In answer to the question of whether the producer fed ewes a special ration before breeding, 32 answered no, 18 yes and 10 did not answer. Sixteen of those feeding a special ration gave their ewes some grain predominantly a mixture of oats and protein supplement. The other two producers, and some of those feeding grain, supplemented pasture with turnips, dry beans or potatoes. Fifteen producers who did not feed a special ration made sure their ewes were on good clover or aftermath pasture and two producers put their ewes on rape before breeding. The rest had the ewes on regular pasture or supplemented it with some hay.

Handling Rams. — More than half of the producers (35) started their breeding season by placing rams with the ewes in October or November (table 5). Another 18 producers started breeding ewes in

Table 5. Start of the Breeding Season

Month	Number of producers
July	3
August	5
September	9
October	16
November	19
December	4
Remains all year	1
Other	3
All	60

August, September or December. Rams remained with the ewes for a period of one to three months. A few left them in up to six or more months and one kept his ram with the ewes throughout the year.

Of the 60 producers, 28 changed the ram or rams every two years. Two changed every year, two every 3 years, three every 4 years and twenty-five had no regular pattern or did not answer.

The main reason for changing rams was to prevent inbreeding the ram with his own off-spring, which would require a change every two years (table 6). Others changed rams for cross-breeding purposes to balance wool and meat production, and they generally had regular patterns for the change. The Hampshire was mentioned most often in crosses to obtain good lambs, and Corriedale, Cheviot and Columbia were used to improve wool production.

Table 6. Reasons for Changing Rams

Reasons	Number of producers
Change within breed to keep from inbreeding	22
Crossbred to balance meat and wool production, regular cross	14
Change to improve breed or just for sake of change, no regular cross	10
Other or no answer	14
All	60

Breeds of Sheep. — At least eleven breeds were mentioned by producers with no one outstandingly popular breed, although Hampshires were kept by more producers than any other breed and were present in most crosses of breeds. Twenty-three producers kept pure-

Table 7. Purebred and Grade Breeds of Ewes and Rams

	Number of producers			
	Ewes		Rams	
Breed	Purebred	Grade	Purebred	Grade
Hampshire	3	5	6	2
Corriedale	2	3	4	1
Cheviot	2	0	5	0
Columbia	1	2	4	0
Oxford	1	1	4	1
Suffolks	2	2	5	1
Romney	2	3	3	2
Montadale	1	0	1	2
Dorsets	0	0	2	1
Shropshire	2	0	2	0
Southdown	1	0	1	0
More than 1 breed	6	23	19	4
Total	23	39	56	14

bred ewes; this included six producers with two or more breeds. Some of these also had grade ewes and some either grades or crossbreeds in combination with purebreds. Thirty-nine producers had grade ewes, and 23 of the 39 had a combination of two or more breeds. Fifty-six producers had purebred rams, nineteen of which had more than one breed. Fourteen producers had grade rams, and some had both purebred and grade rams.

Many of the grades were mixtures or crosses with predominant features of one breed. However, some producers crossed purebred rams and ewes, or purebred rams and grade ewes in a definite breeding program to balance wool and meat production. The Hampshire was the most commonly used, and was crossed with Columbia, Suffolk, Romney, Cheviot, Shropshire and Oxford breeds. Other crosses mentioned by not more than one producer in each case were Corriedale-Romney, Corriedale - Shropshire, Corriedale - Oxford and Romney - Shropshire.

Lambing Practices

Grain Feeding Before Lambing. — Most of the producers, 50 out of 60, fed grain before lambing. Twenty-six of the 50 who used grain fed a pound a day, 13 a half a pound or less a day and 11 fed one and one-half pounds or more of grain per day. A mixture of home-grown grain, usually oats, and a protein supplement was fed by the largest number of producers, although many fed a regular dairy or fitting ration, and a few fed horse feed.

Four weeks of grain feeding before lambing was most common and was practiced by 15 producers. Seven producers fed grain for three weeks before lambing, 8 for six weeks, and the remaining 20 who fed grain did so irregularly.

Checking Ewes. — The lambing period required close supervision and accounted for a large proportion of the annual labor time. In answer to the question of how often the ewes were checked during lambing, replies varied from one to three times a day and not at night to every hour during day and night. The largest number of producers (12) who had a fairly regular schedule said they checked one to three times during the day and once or twice at night.

Lambing Practices Check List. — Information on other practices during and after lambing was obtained and is summarized in table 8. Checking the ewe's udder was almost universally done and most producers provided individual lambing pens with water. More than half did not use heat lamps, treat navel cords or tag lambs. On farms where

ewes lambed in late spring or summer, producers did not feel heat lamps were needed, and those who did not tag lambs usually used other means for identification.

Table 8. Lambing Practices

Question	Replies Yes	No
Individual lambing pens	48	12
Heat lamps for lambs	23	37
Reduce grain for ewes the day of lambing	38	22
Water ewes in individual lambing pens	48	12
Check ewe's udder	59	1
Treat navel cord	23	37
Tag lambs	24	36

Birth-weight of Lambs. — The average birth-weight of lambs was about nine pounds. Thirty-one producers stated birth-weights to be from eight to ten pounds. One producer had an average birth-weight of seven pounds and two said the birth-weight was over ten pounds. Twenty-six producers did not weigh or estimate weight of lambs.

Lambing Percentage. —For all producers, 97 percent of the ewes bred lambed. A few ewes died during the gestation period, and others were culled as non-breeders. The lamb crop related to ewes lambing

Good care of ewe and lamb at lambing time was time consuming but paid off in terms of low mortality and large returns from meat per ewe.

was 133 percent, or the average size flock of 53 ewes produced 70 lambs.

Lambing Season. — Sixty-eight percent of the lambs were born in March and April, and another 19 percent in January and February. Early lambing may be attributed to those farmers who planned to sell lambs on the Easter market. Only 12 percent were born in May and June, and an insignificant number in the summer and fall.

Table 9. Seasonal Distribution of Lambing

Month	Percent of annual lamb crop
December	1
January	10
February	9
March	33
April	35
May	9
June	3
Summer (July, August)	*
Fall (Sept., Oct., Nov.)	-
Total percent	100

* .1 percent

Feeding Lambs. — Most nursing lambs were fed some grain. Twenty producers creep fed grain for lambs. Eleven fed lambs and ewes together and eight said lambs were fed some grain while on pasture. Twenty-one producers fed no grain or did not answer. The grain mixture fed to lambs was usually the same as fed to ewes—a home mixture or dairy grain.

Other Management Practices

Parasite Control. — Nearly half of the producers treated sheep and lambs for control of parasites twice a year (table 10). Eight treated once a year, in spring or fall, and 17, three or more times a year.

Table 10. Treatment for Parasite Control

Time of treatment	Number of producers
Once a year, spring	5
Once a year, fall	3
Twice a year, spring & fall	28
Three times a year	5
More than three times a year	12
Used greensalt	4
None	1
No answer	2
All	60

More than half, or 35 of the producers used phenothiazine in the tablet or liquid form (about half each) for control of parasites. Another 11 used phenothiazine with lead arsenate for at least one of the yearly treatments. One producer mixed phenothiazine powder with feed, and the rest who treated used a copper compound, some trade-name brand or did not know what they used.

As stated in table 10, four producers used only greensalt, or phenothiazine salt, for parasite control. The majority, however, combined greensalt with periodic phenothiazine treatments. Thirty-eight producers made greensalt available throughout the year, seven part of the time, nine used none and six did not answer. The majority of producers felt that greensalt combined with one or more treatments per year with phenothiazine were necessary for parasite control.

Dipping of Sheep. — Thirty-nine of the 60 producers did not dip sheep for control of fleas and ticks, 19 dipped regularly and two dipped irregularly. At least 11 of these who did not dip, dusted their sheep with a flea and tick powder. Several stated that they had dip tanks but no longer used them since dusting gave sufficient control. The majority who dipped or dusted did so in the spring after shearing. A few treated at the end of the pasture season, and others did so when it was convenient or when it seemed to be needed, especially for spot dusting.

Docking of Lambs. — Fifty-nine out of the 60 producers docked their lambs. Two-thirds (41) of those who docked did so at 3 to 4 days of age to within a week after birth and 15 at two to three weeks of age.

Castration of Lambs. — Forty-six of the producers castrated the lambs, 14 did not. Of the 46 who did castrate, about half (21) did so at 2 to 3 weeks of age, eleven castrated within a week (usually combining this with docking) and six at about 10 days. Seven castrated after three weeks of age varying from a month to three months after birth.

Housing and Feeding. — All producers provided shelters for their sheep, at least in winter. Twenty-three provided a shed or pole-type barn which was open on one side. Twenty-two used barns which were enclosed on four sides, but usually these had wide doors which could be opened on one side. The other fifteen used combinations of barns and sheds or barns and basements.

Fifty-four producers fed hay in racks installed along the side of the barn or moveable or stationary center racks. The other six producers fed the hay loose in the shelters or outside.

Two-thirds of the producers fed first cutting hay and the majority

Creep feeding of lambs gives them a faster start which results in better finish and a higher grade at market.

tried to cut the hay for sheep early or in June. Most of the rest fed a combination of first and second or third cutting of hay. The hay was mainly mixed grasses or clover and mixed grasses. Only five fed clover or alfalfa hay.

Marketing Practices for Lambs and Wool

Feeding Lambs for Market. — Grain feeding of lambs before marketing was not widely practiced (table 11). Twenty-four of the 60 producers said they did not grain feed lambs before marketing. Other information indicates that about half of the 18 who did not answer did

Table 11. Daily Grain Feeding of Lambs Before Marketing

Grain feeding	Number of producers
½ pound	5
1 pound	10
1½ pound	3
None (pasture fed)	24
No answer	18
All	60

not grain feed, but had good pasture before marketing. Eighteen respondents did answer *yes*, with one pound a day being the most common amount fed. The period of feeding varied from about three weeks up to two months. Five producers fed lambs from nursing to the time of marketing.

Marketing Time and Weight for Lambs

Sixty-nine percent of the lamb crop was marketed in September, October and November (table 12). This corresponds very closely with the 68 percent of the lamb crop born in March and April, indicating a 6 to 7 month marketing age. October was the largest month with more than one-third of the lamb crop marketed in this month. The smallest number were marketed in summer, and about equal proportions (11 percent) in spring and winter. Nine producers with lambs born in January and February accounted for the spring sales. Five of these producers did sell for the Easter market.

Table 12. Time of Marketing the Lamb Crop

Month	Percent of lamb crop
Spring (Mar., Apr., May)	11
Summer (June, July, Aug.)	8
September	21
October	36
November	12
Winter (Dec., Jan., Feb.)	12
Total percent	100

When asked at what age they preferred to market lambs, most producers replied at about 6 months although this varied from 3 to 8 months.

Table 13. Preferred Weight for Market Lambs

Weight (pounds)	Number of producers
40- 45	10
60- 70	1
71- 80	10
81- 90	17
91-100	11
101-110	3
Over 110	3
Other	5
All	60

The weight at which most producers preferred to sell lambs averaged approximately 85 pounds (table 13). Ten producers preferred to sell lambs in the 40 to 45 pound weight category. Some of these lower weight lambs were for the Easter market.

Markets for Lambs.—Eighteen producers sold lambs directly to dealers or slaughterers, while 14 producers sold through lamb pools (table 14). Seven producers had lambs slaughtered for them on a custom basis and then sold dressed lamb at retail. Four sold dressed lambs at wholesale, three producers sold lambs at an auction, and the rest sold to a combination of these or other markets.

Table 14. Markets for Lambs

Market	Number of producers
Dealer - slaughterer	18
Lamb pool	14
Slaughtered, sold dressed weight - retail	7
Slaughtered, sold dressed weight to local butcher	4
Auction	3
Other	14
All	60

Co-op. wool pool handled by sheep breeders brings higher returns to grower and higher quality to the market.

Marketing of Wool. — Nearly half of the producers marketed wool through a wool pool while most of the rest sold directly to a woolen mill (table 15). Slaughterers and dealers acted as middlemen in marketing some of the wool. More than half of the producers marketed wool in June, at the time of or soon after shearing. Most of the rest marketed wool in the spring or early summer with few storing it for extended periods of time.

Table 15. Markets for Wool

Market	Number of producers
Wool Pool	28
Woolen mill (company)	20
Slaughterers or dealers	10
Other	2
Total	60

Island Sheep

Five sheep producers were interviewed who kept sheep on islands off the coast of Maine. These sheep enterprises were so different in practices, costs and returns from the normal land-based operations, that they were not included in this study. Cost information was generally incomplete, or posed difficult allocation problems. Observations about and descriptions of these island operations are included in appendix B.

INVESTMENT IN SHEEP PRODUCTION

Investment in Land, Buildings, Equipment and Livestock

As stated before, only 20 of the 60 producers kept sheep as their major farm enterprise. Most of the rest of the sheep producers were farmers with other major enterprises of poultry, dairy or potatoes. A few were producers with off-farm jobs who had another farm enterprise more important than sheep. Thus, there was considerable investment in land, buildings, equipment and livestock other than for the sheep enterprise. The major part of the total farm investment was in land and buildings which represented more than half of the total farm investment of $34,241 (table 16).

The average investment in the sheep enterprise was $2,790 about equally divided between land and buildings and the value of sheep. A small investment of $108 was made on the average in equipment needed to support the sheep enterprise. Shears were the largest equipment expense, and other equipment included implements for castrating, docking and medication.

Creep feeding of lambs gives them a faster start which results in better finish and a higher grade at market.

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INVESTMENT IN SHEEP PRODUCTION

Investment in Land, Buildings, Equipment and Livestock

As stated before, only 20 of the 60 producers kept sheep as their major farm enterprise. Most of the rest of the sheep producers were farmers with other major enterprises of poultry, dairy or potatoes. A few were producers with off-farm jobs who had another farm enterprise more important than sheep. Thus, there was considerable investment in land, buildings, equipment and livestock other than for the sheep enterprise. The major part of the total farm investment was in land and buildings which represented more than half of the total farm investment of $34,241 (table 16).

The average investment in the sheep enterprise was $2,790 about equally divided between land and buildings and the value of sheep. A small investment of $108 was made on the average in equipment needed to support the sheep enterprise. Shears were the largest equipment expense, and other equipment included implements for castrating, docking and medication.

Table 16. Average Investment in Farm and Sheep Enterprises

Item	Maine Sheep Producers — 1961 Average farm investment[a]	Sheep share of investment
Land and buildings	$18,614	$ 1,373[b]
Truck and tractors	3,104	——
Farm machinery & equipment	2,848	——
Equipment for sheep:		
Manure loader	145	29
Feed and water equipment	116	11
Shears	37	36
Scales	8	4
Other small equipment	28	28
Total land & equipment	$24,900	$ 1,481
Sheep inventory	$ 1,309	$ 1,309
Other livestock inventory:		
Dairy cows and bulls	2,350	——
Young stock	1,197	——
Layers	3,116	——
Broilers	506	——
Beef cattle	459	——
Other	404	——
Total livestock	$ 9,341	$ 1,309
Total farm investment	$34,241	$ 2,790

[a]Total farm investment was obtained from 56 of 60 producers.
[b]Includes the sheep share of buildings only.

The farm investment in livestock in addition to sheep was mainly in dairy cattle and poultry. Other livestock included horses, hogs and turkeys.

Sheep Inventory in Numbers and Values

The average flock of sheep for the 60 cooperators in this study was 66 head as an average of beginning and ending year inventory (table 17). There was a slight increase during the year in number and value of sheep. The average flock of 66 head was made up of about 53 ewes, 10 yearling ewes, 2 rams and 1 yearling ram. A fractional part of the flock was made up of market lambs held over from the prior year's crop although most lambs, not kept as replacements, were marketed within the year in which they were born.

The flock was valued at $1,309 as the average of the beginning and ending year inventory. The producers estimated the value of ewes in their flock as $967 or an average of $18.38 per head. Yearling ewes were valued at $20.30 per head and breeding rams at $52.63 per ram for the nearly two rams per flock. Lambs, both market and other, sold at an average price per head of $12.87. The ewes were the only

Table 17. Sheep Flock Inventory

Sheep	Beg. Jan. 1		Born	Purchased		Marketed & eaten		Died	End. Dec. 31		Average beg. & end. inventory	
	No.	Value	No.	No.	Value	No.	Value	No.	No.	Value	No.	Value
Ewes breeding	52.6	$ 976	—	3.3[a]	$57[a]	2.5	$ 54[a]	3.5	52.6	$ 957	52.6	$ 967
Ewes cull	—	—	—	—	—	5.3	47	—	—	—	—	—
Yearling ewes breeding	8.2	168	—	—	—	.1	—	—[b]	11.2	227	9.7	197
Rams breeding	1.8	89	—	.4[a]	26[a]	.3	16[a]	.1	1.9	110	1.9	100
Rams cull	—	—	—	—	—	—	—[b]	—	—	—	—	—
Yearling rams breeding	.5	17	—	—	—	.3	—	0	1.3	36	.9	27
Market lambs	.1	—	69.8	.2	1	47.8	588	9.2	.5	8	.3	3
Other lambs breeding, 4-H, etc.	.7	17	—	.2	11	.4	28	.1	.6	13	.6	15
Total	63.8	$1,267	69.8	4.1[a]	$95[a]	56.7	$733[a]	12.9	68.1	$1,351	66.0	$1,309

[a]Includes yearlings.
[b]Less than .1 in number and one dollar in value.

class of animals, other than market lambs, with significant sales for cull and breeding purposes. The cull price was $8.81 per head, and the breeding price $20.81 per head. The average producer purchased three ewes per year and one ram every other year. A few producers rented rather than owned rams.

The lamb crop of 69.8 lambs born from 52.6 breeding ewes was an average 133 percent lamb crop. The main death loss was in the lambs, and at 9.3 per flock this was a loss of 13 percent of the lambs born. With this loss deducted from the lamb crop, 60.5 lambs reached market age, either to be sold or added to the flock. Thus the lamb crop which reached market age was 115 percent.

The range in size of the 60 flocks was from 16 to 151 ewes. Three records of flocks of less than 20 ewes were included in the study. These flocks had a beginning inventory of more than 20 ewes, but due to culling during the year, averaged less than 20 for the year. The distribution of the flocks by size shows that flocks with 20 to 39 ewes were most common. Less than half of the producers (29) had 40 or more ewes in their flocks.

Table 18. Range in Number of Ewes per Flock

Number of ewes	Number of producers
10- 19	3
20- 29	11
30- 39	17
40- 49	6
50- 59	5
60- 69	3
70- 79	1
80- 89	3
90- 99	4
100-109	2
110-119	2
120-129	1
130-139	1
140-149	—
150-159	1
All	60

SHEEP PRODUCTION EXPENSES

A main objective of this study was to determine the economic feasibility of sheep production in Maine. All costs were summarized as an average per farm for the 60 producers and as an average per ewe for the 52.6 ewes in the average flock (table 19). Physical quantities

were also determined where appropriate. The relative importance of the cost items is shown in the percentage column. The per ewe data will be useful to producers in comparing costs and returns of their flocks with average costs and returns. The cost per ewe includes the ewe's share of the cost of rams, wethers, yearling ewes and the market lambs in the average flock.

Feed Costs

The cost of all feed per ewe at $20.26, making up 48.6 percent of total cost, was the largest cost item. Of this the cost of hay at $10.96

Table 19. Average Costs for Sheep Production

Item	Average per producer (60 producers) Quantity	Cost	Average per ewe (52.6 ewes) Quantity	Cost	Percent of total cost
Feed:					
Hay, home-grown (tons)	23.7	$ 518	.45	$ 9.85	23.6
Hay, purchased (tons)	3.2	58	.06	1.10	2.6
Pasture permanent, rotational and aftermath (acres)	52.6	224	1.00	4.25	10.2
Pasture (annual) (acres)	.6	19	.01	.36	.9
Mixed ration or protein supplement (cwt.)	41.5	206	.79	3.92	9.4
Oats, home-grown (bu.)	34.5	18	.66	.35	.8
Oats, purchased (bu.)	6.7	8	.13	.15	.4
Other grain (purchased)	1.6	8	.03	.14	.4
Other (potatoes, beans, (home-grown)		7		.14	.3
Total		$1.066		$20.26	48.6
Labor (hours)	508	$ 594	9.66	$11.29	27.1
Building expense		138		2.62	6.3
Sheep purchased		95		1.80	4.3
Interest on investment in sheep		65		1.23	3.0
Truck, tractor, auto expense		58		1.11	2.6
Hired shearing		24		.46	1.1
Equipment expense		23		.44	1.0
Parasite control		23		.44	1.0
Salt and minerals		18		.33	.8
Veterinary and medicine (other than parasite)		16		.30	.7
Taxes on sheep		12		.23	.5
Trucking hire and freight		12		.23	.5
Commissions and/or market costs		10		.19	.5
Telephone and electricity		7		.14	.4
Rental - animals (rams)		6		.12	.3
Show costs		6		.11	.3
Supplies for sheep (spray, disinfectants, etc.)		4		.08	.2
Livestock insurance		3		.06	.2
Registration fees		3		.05	.2
Advertising		2		.04	.1
Association dues		1		.02	.0
Other		8		.16	.3
Grand Total		$2,194		$41.71	100.0

per ewe was the largest and included about ½ ton of both home-grown and purchased hay. The price of home-grown hay was the producer's estimate of the market price of the hay he fed his sheep in 1961. The average price estimated by producers was $22.00 per ton. Purchased hay was charged at the purchase price, and at $18 per ton was lower than the value of home-produced hay.

Pasture cost, making up 10.2 percent of all costs, was difficult to calculate and to allocate to sheep. Costs of labor, material, truck, tractor and machinery use for fencing and pasture maintenance were obtained from 43 of the 60 producers[3]. The fencing and maintenance costs were $2.75 per ewe, and the land charge $1.50 per ewe. The land charge was calculated as 10 percent of the value of land at $30 per acre for improved, and $10 per acre for unimproved and aftermath pasture. Aftermath made up nearly one-half, or 25 acres, of the pasture. For aftermath pasture most of the land, fertilizer, reseeding and maintenance charge was allocated to the crop. Improved pasture accounted for 17 acres and unimproved pasture 11 acres of the 53 acres of pasture. The cost of pasture was $4.25 per ewe. This pasture cost was used for all producers by multiplying $4.25 times the number of mature ewes in each flock. This procedure, although acceptable in providing an average for all producers, does not allow for differences in costs among producers.

The $4.25 as a standard for pasture costs compared very closely to other studies of sheep production costs. In a New York study in 1956, pasture costs for an average flock of 55 ewes was $4.39 per ewe.[4] The New York study also showed the use of 0.9 acres of pasture per ewe, slightly under the one acre per ewe in this study.

The cost of providing annual pasture for sheep was not included in the preceding pasture costs. This cost was obtained from cost account data and was $32 per acre. For the average producer with .6 of an acre of annual pasture the cost was $19 or $.36 per ewe. Most of the annual pasture, or about .4 acre per producer, was rape and the balance oats. Eight producers grew an average of three acres of rape for sheep, and four other producers grow an average of slightly under three acres of oats.

The cost of all grain was 11.3 percent of the total cost, and about

[3] This phase of the study was done by a mail questionnaire.

[4] Earle, Wendell and Rogalla, John, *Costs and Returns from the Sheep Enterprise, 60 Central New York Farms, 1956*, New York State College of Agriculture, Cornell University, A.E. 1066, July, 1957, p. 4.

equal to pasture cost. Purchased ration or protein supplement to be mixed with home-grown feed was the largest grain item at $3.92 per ewe. Some home-grown and purchased oats, beans and potatoes were fed. Slightly more than a hundredweight of grain equivalent was fed per ewe.

Labor

The labor cost of $11.29 per ewe was 27.1 percent of total cost. This cost was based on the producers' estimate of the actual time spent during the year in direct care of sheep. Approximately 90 percent of this labor was performed by the operator and his family. Most of this labor was provided by the operator himself. Shearing, if hired on a custom basis, was listed as a separate expense. Except for the small share of labor hired by the average producer, labor was not a cash expense, but whether hired or not, it was an important input. All labor was figured at $1.15 per hour, the wage rate most commonly paid for hired labor. The hours of all labor for the year was 508 hours per farm and about 10 hours per ewe.

The labor input was the total of hours spent on the different jobs in sheep production during the winter and pasture season as shown in table 20.

Table 20. Labor Input for Major Jobs in Sheep Production

Job	Winter season	Pasture season	Total for year	Percent of total
	Average of 59 producers			
	hours	hours	hours	
General care, feeding, bedding	246	73	319	63
Lambing	124	2	126	25
Manure removal	2	21	23	5
Shearing	3	10	13	2
Marketing	2	11	13	2
Dipping	–	3	3	1
Other	1	10	11	2
Total	378	130	508	100
Percent labor in each season	74	26	100	

General care took the most time, or 63 percent of the total, which came largely during the winter housing period. Lambing care, at 25 percent of the total time, took place almost entirely in the winter season, since most lambs were born in the barn. Lambs born in the pasture season, received little care. Winter work accounted for 74 percent of all labor time.

Other Expenses

All costs other than feed and labor made up 24.3 percent of the total costs, and although each one in itself was minor, these costs amounted to $10.16 per ewe (table 19).

The building expense of $138 per farm and $2.62 per ewe was 10 percent of the average investment of approximately $1,380 in buildings used directly to house sheep. The 10 percent charge conservatively covers annual costs of depreciation, interest and repairs. This charge for housing compared closely with other studies of sheep production costs. The annual cost of buildings in the New York study for an average size flock of 55 ewes was $148 per farm or $2.70 per ewe.[5]

The $95 cost of purchasing sheep was largely for breeding ewes and rams. The $65 interest on investment was a 5 percent charge on the average investment of about $1300 in sheep. This interest charge was not a cash cost but a charge for money invested in sheep which could have been invested elsewhere at a comparable rate of return.

Tractors, trucks and auto expense of $58 was the cost for hours or miles of direct use for sheep in manure removal with a tractor loader, hauling of bedding, feed, sheep and wool to or from market and travel to sheep if they were kept away from the home place. The hours or miles of use were multiplied by 85 cents per hour for tractor use, 17.2 cents per mile for truck use and 8.5 cents per mile for pick-up or auto use.[6] This probably underestimated the actual costs, as many odd trips to obtain medication, supplies and for general inspection of the flock were not included and should be at least partially charged to sheep.

The equipment expense of $23 was charged in a similar manner. Twenty percent of the investment in equipment used directly for sheep, or the sheep share of general equipment, was assumed to cover the annual cost of depreciation, interest, repairs and upkeep.

Hired shearing represented a custom cost commonly at 75 cents per head equivalent to $24 for the average producer. Parasite control of $23 was the cost of phenothiazine or other medication for parasites. The salt and mineral cost of $18 was largely for greensalt used by most producers for additional parasite control. Veterinary cost of $16 was not a major item as many producers simply allowed a sick sheep to die rather than treat it. Some veterinary services were used during lambing.

Taxes on sheep were $12 per flock. Maine tax laws exempt sheep

[5] Ibid, pp. 10-11.

[6] Kearl, C. D., *Overhead Costs from Farm Cost Accounts,* Cornell University, Ithaca, New York, A. E. Res. 80, December, 1961, pp. 17 and 19.

to 35 in number from taxation. The rate varied with townships, but a common charge was 50 per head for those subject to the tax. Trucking hire and freight of $12 generally was a cost for marketing lambs when the producers hired this done. Commissions of $10 were an additional cost of marketing taken by marketing agencies or the lamb and wool pools. The $7 cost of telephone and electricity were the direct calls related to lamb marketing largely and the cost of operating heat lamps, lights and water pumps for sheep.

Two producers rented rams during the breeding season. One of these rented three rams and accounted for most of the cost of $6 per producer. He paid rent on the basis of 50 cents per live lamb born.

Six producers had show costs which were more than covered, on the average, by show premiums. Sheep supplies, averaging $4 per producer, covered the minor costs of disinfectant, dust and dip powders and other small items purchased by producers.

The remaining costs of insurance, registration fees, advertising and association dues totaling $9 were minor expenses for the average producer because very few of the 60 producers had expenses in these areas. Other miscellaneous expenses of $8 were largely made up of slaughter costs for the producers who hired lambs slaughtered on a custom basis and then wholesaled or retailed the carcasses. The most common charge for slaughter was $1.00 per head plus the pelt, and the highest charge was $2.50. Nine producers out of the 60 reported a cost for slaughter. Bedding cost, included in "Other" was very slight as few producers purchased bedding. Most bedding was provided from uneaten hay.

SHEEP PRODUCTION RECEIPTS

Receipts for the average sheep producer, presented in table 21, will be discussed in the following sections.

Receipts from Sheep Sales

Over half or 54.4 percent of the gross receipts for the average sheep enterprise came from sale of animals, and 43.6 percent of all receipts were from sale of market lambs. Forty-eight market lambs were sold from the average flock of 53 ewes at an average return of $12.30 per lamb. On the average only a fraction of the lambs were sold for breeding purposes, to 4-H members or for pets.

An average of about five ewes, or 10 percent of the ewes were culled for a return of $8.81 per head. Two to three head of breeding ewes per flock were sold at a price of $20.81 per head. Sale of cull and breeding ewes accounted for 7.5 percent of all receipts.

Table 21. Average Receipts from Sheep Production

Item	Average per producer (60 producers) Quantity	Value	Average per ewe (52.6 ewes) Quantity	Value	Percent of total receipts percent
Sheep sales (No. head):					
Market lambs	47.8	$ 588	.91	$11.17	43.6
Other lambs	.4	28	.01	.53	2.1
Breeding ewes	2.6	54	.05	1.03	4.0
Cull ewes	5.3	47	.10	.89	3.5
Breeding rams	.6	16	.01	.30	1.2
Cull rams	—*	—*	—	.01	—*
Total	56.7	$ 733	1.08	$13.93	54.4
Wool (lbs.)	494.9	$ 269	9.4	$ 5.11	20.0
Wool incentive payment		119		2.27	8.9
Show premiums		18		.35	1.3
Other receipts		18		.34	1.3
Total wool and other		$ 424		$ 8.07	31.5
Total cash receipts		$1,157		$22.00	85.9
Manure credit		$ 107		$ 2.03	7.9
Net inventory increase		84		1.59	6.2
Gross receipts		$1,348		$25.62	100.0

*Less than .05 in number or 50 cents in value.

The sale of wool accounted for 20.0 percent of total receipts but with the incentive payment on wool, this was increased to 28.9 percent.[7] The average quantity of wool sold by producers in the study was 494.9 pounds (9.4 pounds per ewe) for a return of $268.81, or 54 cents per pound. The quantity of wool sold, wool receipts and incentive payments were obtained from the farmers and checked against the A.S.C. record for accuracy. The producers included in this study received a better price, at 54 cents per pound, than the state average price of 42.9 cents per pound in 1961. This state average price was the basis for the incentive payment which was set to bring the average price level to 62 cents per pound as provided by the National Wool Program. With the incentive payment of $119 for both shorn and unshorn wool added, the

[7] The incentive payment for 1961 was $44.50 per $100 of receipts from wool sales less a promotional deduction of 1 cent per pound of wool sold. On this basis the average wool producer received $120.00 (2.69x$44.50) minus $5.00 (494.93 lbs. x $.01), or $115 net incentive payment. Unshorn wool payment would make the difference between $115 and $119, or $4.00 per producer. The unshorn wool payment was calculated on the basis of $.71 ($.76 less $.05 promotional deduction) times the hundredweight of live lambs sold. Twenty-two producers applied for the unshorn wool payment while others did not apply who could have received a payment. The unshorn wool payment was not as universally applied for as the shorn wool payment because of lack of records on lamb sales, the return did not seem worth while (less than $3.00 was not paid) and lack of information on the payment.

producers in the study (with larger operations on the average than all producers in Maine) received 78 cents per pound for wool.

Show premiums on the average were a minor part of the receipts since only six producers did any showing. The $18 return per producer more than covered average showing costs as listed by the producer. However, it is likely that not all time, travel, feed and other costs were included. Most producers expressed the opinion that the publicity and sales promotion benefits were worth the effort.

Other receipts accounting for about 1 percent of the total, were largely reimbursements from the state on sheep and lambs killed by dogs or bears. Eight producers reported such losses amounting to $10 to $15 for lambs, and $15 to $20 for sheep.

Cash receipts totaled $22.00 per ewe and were 85.9 percent of all receipts. In addition to cash receipts, manure, which in only a very few cases was sold for a cash return, was credited at $2.03 per ewe as a return to the sheep enterprise. Only the value of sheep manure put on cropland including hay land, corn or cash crops, or on pasture used for other livestock, was credited to sheep. Manure put on sheep pasture was not credited as a receipt to sheep or charged as a pasture expense. Producers were not asked to estimate the amount of manure produced; this was based on a standard of 2,300 pounds of manure per ewe at a value of $2.60 per ton, or a credit of $3.00 per ewe for the share not put on sheep pasture. Thirteen of the sheep producers put all of their manure on sheep pasture, 35 only on cropland and the rest divided it about equally between sheep pasture and cropland.

The inventory increase of $1.59 per ewe, amounting to 6.2 percent of total receipts was the increase during the year in the flock value of the average producer. This change in inventory value was not due to change in the price of animals. The price was held constant from the beginning to end of year inventory unless a producer felt the quality or real value of his flock had improved or deteriorated during the year. The number of ewes remained constant during the year, although the value per ewe did decline. The main cause of the overall increase in inventory during the year was the larger numbers of yearling ewes kept in the flock at the end of the year (table 17). There was also an increase in the number and value of rams.

NET INCOME AND LABOR INCOME FROM SHEEP PRODUCTION

Gross receipts from the sheep enterprise for the average of 60 producers was $1,348 per producer or $25.62 per ewe. This included cash returns from sale of animals, wool and other sales and non-cash returns

for manure and an increase in inventory. The total expenses were $2,194 per producer or $41.71 per ewe. These expenses included cash costs and non-cash items, such as labor, depreciation and interest on investment. The net loss for the average operation was $846 per producer and $16.09 per ewe.

Table 22. Average Net Income and Labor Income for Sheep Production

Item	Average per producer (60 producers)	Average per ewe (52.6 ewes)
Gross receipts	$ 1,348	$ 25.62
Total expenses	2,194	41.71
Net income	—$ 846	—$ 16.09
Less labor cost	$ 594	$ 11.29
Labor income	—$ 252	—$ 4.80

Labor income was obtained by deducting the value of operators' labor from net income. It was reasonable to assume all labor except hired shearing was provided by the operator since this was the case for most operations. Labor income, based on this assumption, was a minus $252 per producer and minus $4.80 per ewe. On a strict accounting basis where all costs were considered, the average producer received a negative return for the time he devoted to the sheep enterprise. These figures lead to several questions: were costs too high?; were receipts too low?; and, are sheep economically feasible in Maine? These points will be examined briefly.

Were Costs too High?

It is difficult to determine what costs should be. The costs from this study were similar to those of other studies with comparable conditions. This does not mean, however, that costs cannot be lowered. The costs presented were averages for all producers in the study and hide the efficiencies of some producers. Average costs do not give a true picture of what is being done or can be done to reduce costs. The last section is devoted to analyzing the one-third of the producers with the highest net income compared to the average of all producers. In this manner, factors associated with low costs and high returns may be identified.

Were Receipts too Low?

Whether receipts are low or high depends not only on the individual producer's ability to produce and market lambs and wool, but also on the overall supply and demand situation which determines the prices

received. Lamb prices influence the value of cull or breeding stock.

During the last ten years, the price ranged from a high of $24.30 per hundredweight in 1952 (U. S. average price received by farmers) to a low of $15.80 per hundredweight in 1961 (table 23). The price during the year of the study was the lowest received in this 10-year period of time, and was 82 percent of the average price for the 10-year period. The estimated U. S. price in 1962 was $17.71 and for the first six months of 1963 was $18.50. The main reason for price recovery was the decrease, country-wide, in the production and marketing of lambs.

The price for lambs received by Maine farmers compared to U. S. farmers over the 10-year period from 1952 to 1961 was the same or higher for 8 out of 10 years, or as an average for the 10-year period, the Maine price was $19.76 compared to the U. S. price of $19.29. However, in 1962, the estimated Maine price was $17.07 per hundredweight compared to the U. S. price of $17.71 and in the first six months of 1963, the estimated Maine price was $18.30 compared to the U. S. price of $18.50. Whether this indicates a reversal of the Maine versus U. S. price cannot be determined on the basis of a year and a half, but it does seem to indicate some weakness in the recent Maine market compared to the U. S.

Table 23. U. S. Average Price for Lambs per Hundredweight Received by Farmers from 1952 to 1963 and the Yearly Price as a Percent of the 10-year Average (1952-61)

Year	*Maine* average price per hundredweight received by farmers	U. S. average price per hundredweight received by farmers	Percent of average (U. S.)
1952	$24.30	$24.30	126
53	20.10	19.30	100
54	18.80	19.10	99
55	18.80	18.40	95
56	19.70	18.50	96
57	19.90	19.90	103
58	20.70	21.00	109
59	20.00	18.70	97
1960	18.70	17.90	93
61	16.60	15.80	82
10-year avg. (1952-61)	19.76	19.29	100
1962*	17.07	17.71	
1963*	18.30	18.50	

*Estimate.

A more nearly normal long-run situation for sheep production in Maine could be simulated if Maine receipts for sale of all animals were adjusted to the 10-year average by dividing 1961 sheep sales by 82 percent. This assumes that cull and breeding prices change in the same re-

Table 24. Net Income and Labor Income with 1961 Receipts Adjusted to a 1952-61 Average Price Received by Farmers for Lambs

Item	Actual receipts 1961	Receipts adjusted to 1952-61 average lamb prices
Sheep sales	$ 733	$ 894
Wool and other	424	424
Manure credit	107	107
Inventory income	84	84
Gross receipts	$ 1,348	$ 1,509
Less total expenses	$ 2,194	$ 2,194
Net income	—$ 846	—$ 685
Less labor cost	$ 594	$ 594
Labor income	—$ 252	—$ 91

lationship as lamb prices. Net income would be a minus $685 and labor income a minus $91 with this adjustment made, or larger by $161 (table 24). This is a considerable improvement from the 1961 situation.

Are Sheep Economically Feasible in Maine?

Whether sheep are economically feasible depends in part on how they fit in with the overall business, farm or non-farm. Sheep were the major farm enterprise only for producers with off-farm jobs or older, retired farmers. In most cases they were a minor enterprise on farms with other crops or livestock, and were minor for most farmers with off-farm jobs. In many cases, resources of buildings, facilities, forage and labor were available which, if not used, would provide no return. A low return might be satisfactory to the producer especially if the side-line enterprise fits well with another livestock or crop enterprise or off-farm job. The sheep enterprise would also provide interest, diversion and some cash return for a producer and his family tied to a routine, 40 hour-a-week off-farm job, or keep a retired person more active and content. One retired businessman, not included in this study, had held a responsible position out-of-state. When a heart attack forced his retirement, his doctor advised him to raise sheep. With income not a problem, he felt occupied, useful and enjoyed good health.

Most producers said that sheep as a side line enterprise fit in well with their other enterprises or non-farm jobs. Seven producers in each category said specifically that sheep fit in well with poultry and with cattle. Only one producer said sheep conflicted in use of pasture and three said they took too much time from other jobs.

The major conflict of sheep with other enterprises was during lambing. Sixteen out of the 60 producers said that lambing did take time away from other jobs. Eight others mentioned conflict of lambing with specific jobs such as haying and planting, maple sugaring and snow-plowing.

Only five of the 60 producers said the major reason they kept sheep was for extra income. Other reasons for keeping sheep were for enjoyment, to utilize pasture land, for fire protection, to control brush, family tradition and for home-produced meat. These reasons are not all economic, but there are some economic implications in all of them, even if the sheep are kept primarily for enjoyment. One overwhelming conclusion drawn from personal interviews with producers was that people who keep sheep *like* them. Some name the sheep individually, have certain pets that come when called by name, and are concerned for the sheeps' safety and well-being. They fulfill a human need, or serve possibly as a substitute for human affection. This relationship is not peculiar to modern times but is inferred in many parables of the Bible.

With these thoughts in mind, it would be difficult to say that sheep are not economically feasible in Maine. Sheep will probably not, however, become a major commercial enterprise on more than a very few farms in the state, at least in the near future.

TWENTY HIGH INCOME PRODUCERS COMPARED TO ALL PRODUCERS

The 60 producers in the study were sorted into three equal groups according to income. The average labor income was $343 for the high income producers, -$81 for the medium and -$962 for the low.

A comparison of the three groups showed that the medium income group had the smaller size unit, 42 ewes, and lower expenses and receipts than the average of either of the other two groups. The low income group had, on the average, the largest flock of sheep, 64 ewes. They lost the most money because of high expenses while total receipts were only slightly larger than the average of all producers. The high income group had approximately the same size flock as the average of all producrs, 53 ewes. It should not be concluded, however, that larger size is necessarily correlated with lower net returns. It does appear that the low income producers kept larger flocks without controlling their expenses or improving their outlets for the market animals. This does not mean that a good individual manager could not profitably increase his operation, but it is a caution signal that larger flocks need closer control of expenses if profits are to be realized, particularly on a low price market such as existed in 1961.

Further analysis of the medium and low income groups adds little information of value to sheep producers for improving their flock management. The most valuable analysis appears to be a comparison of the high income group with the average of all producers. High income producers were included in the average costs, values and numbers for all 60 producers. Thus the differences were somewhat less pronounced than would have occurred if the higher income producers had been excluded.

High quality pasture was an economic substitute for grain feeding with excellent gains in weight recorded.

Managers and Management of High Income Farms

The average age and number of years in sheep production were higher for the high income producers than for all producers. Over half of the 20 producers in the high income groups had kept sheep for 20 or more years, and all of the older producers who had kept sheep 50 or more years were in the high income group. Twelve of the high income producers earned all their income from farming, with three more essentially full-time farmers. In the high income group, seven farmers had dairy as the major farm enterprise and seven had poultry. In con-

trast, dairy and poultry, were a major enterprise on only 10 farms out of the other 40 studied. Three producers kept sheep as the major enterprise, and none of the producers in this group grew potatoes as a major crop. These factors indicate that sheep fit in well with dairy cows and poultry, not as well with potatoes, and that full-time farmers generally had more profitable sheep enterprises than did part-time farmers.

Very little difference in breeds and breeding could be found between the high income producers and the average of all producers. One exception was that a larger proportion (one-third) of the high income producers than all producers did crossbreed in a regular pattern to balance wool and meat production. A smaller proportion of the high income producers fed a special ration to ewes before breeding, and those that did, fed less grain per day. However, 16 of the 20 did feed grain before lambing, but all but one fed a pound or less per day per ewe, which was a smaller quantity than for all producers.

One significant difference was that 33 percent of the high producers' lamb crop was born in December, January and February compared to 20 percent of all producers (table 25). Only 10 percent of the lambs of all producers were born in January compared to 20 percent for the high income producers.

Table 25. Seasonal Lambing Distribution
Twenty High Income Producers and All Producers in Maine — 1961

Month	Percent of lamb crop sold	
	High income producers	All producers
December	2	1
January	20	10
February	11	9
Winter	(33)	(20)
March	15	35
April	44	9
May	8	3
Rest of year	—	*
Total	100	100

* .1 percent.

The marketing pattern followed the lambing pattern in that 25.0 percent of the lambs marketed by the high income producers were sold in the months of March, April and May. Most of these lambs were sold on the Easter market. This compared to 11.1 percent of the lamb crop for all producers being sold in the spring period.

A slightly greater proportion of the high income producers treated for parasites twice or more often each year; only two treated once a

year, and one did not treat except with greensalt. More of the high income producers used lead arsenate with phenothiazine at least for one treatment a year. Seventeen of the 20 high income producers castrated lambs compared to 46 of the 60 producers, and they castrated generally at an earlier age. In housing, one-half of the 20 high income producers used a shed or three-sided pole barn for housing compared to about one-third of all producers. The significance of this will be seen in a consideration of housing investment and cost.

One-half of the twenty high income producers fed lambs during the nursing period compared to nearly two-thirds of all producers. However, the producers in the high income group who sold lambs on the Easter market did feed these lambs in creep feeders. About one-third of each group fed grain to lambs before marketing but the most common rate for the high income producers was one-half a pound a day rather than the most common one pound feeding of all producers. The lower grain feeding among the high income producers in a year when lamb prices were lower was a rational management decision which followed the economic principles of diminishing returns and feed substitution. The high income producers fed more second-cutting hay, even though they fed less total hay. The saving in quantity fed of both grain and hay was replaced by more and better quality pasture for sheep. The total acreage of all pasture used by the high income producers was 59.4 acres for the flock or 1.12 acres per ewe compared to 1.00 acre per ewe as an average for all producers. A larger proportion of this pasture used by high income producers was improved, rotational pasture and aftermath and less unimproved. A small amount of rape and oats (.2 acres per producer) was used as pasture by the high income producers.

A larger proportion of high income producers marketed lambs and wool through pools. On the other hand, the livestock dealer was used as an outlet much less frequently by the high income producers than by all producers.

Costs for High Income Producers Compared to All Producers

Average costs of the 20 high income producers were compared to the average costs of all producers on a per producer and per ewe basis (table 26). Producer cost comparisons between the two groups are meaningful because the average size of flocks are almost identical, 52.6 ewes for all producers and 53.0 ewes for the high income producers. The 20 high income producers were able to hold costs down to $1,765 per producer and $33.31 per ewe by improvements in management practices in contrast to $2,194 per producer and $41.71 per ewe for all producers.

Table 26. Average Costs for Sheep Production
Twenty High Income Producers Compared to All Sheep Producers
Maine — 1961

Item	All producers			High income producers		
	Average per producer (60 prod.)	Average per ewe Quantity (52.6 ewes)	Cost	Average per producer (20 prod.)	Average per ewe Quantity (53.0 ewes)	Cost
Feed:						
Hay (tons)	$ 576	.51	$ 10.95	$ 445	.39	$ 8.39
Pasture (permanent and aftermath)	224	1.00	4.25	224	1.12	4.25
Pasture (annual)	19	.01	.36	7	—	.13
Mixed ration (cwt.)	206	.79	3.92	152	.65	2.87
Oats (bu.)	26	.79	.50	2	.21	.03
Other grain	15	—	.28	9	—	.17
Total	$ 1,066		$ 20.26	$ 839		$ 15.84
Labor (hours)	$ 594	9.66	$ 11.29	$ 437	7.17	$ 8.25
Building cost	138		2.62	95		1.79
Sheep purchases	95		1.80	101		1.90
Interest on sheep	65		1.23	70		1.32
Tractor, truck and auto	58		1.11	36		.68
Hired shearing	24		.46	29		.55
Equipment expense	23		.44	23		.44
Parasite control	23		.44	20		.38
Salt and minerals	18		.33	14		.26
Veterinary and medicine	16		.30	11		.20
Taxes on sheep	12		.23	12		.23
Trucking hire and freight	12		.23	14		.27
Commissions and/or market costs	10		.19	13		.25
Telephone and electricity	7		.14	6		.11
Rental - animals	6		.12	16		.30
Show costs	6		.11	10		.19
Supplies for sheep	4		.08	3		.06
Other	17		.33	16		.29
Total costs	$ 2,194		$ 41.71	$ 1,765		$ 33.31

Feed Costs. — The high income producers fed less grain to both ewes and lambs on the average than did all producers. This resulted in a saving of $74 in grain feeding. Approximately 72 pounds of grain was fed per ewe during the year by the high income producers compared with about 100 pounds for all producers. Hay was also fed more sparingly and carefully at a saving of $131 to the high income producer. Less, though still adequate, hay feeding by high income producers was likely the result of better quality forage with better utilization and less waste.

Pasture costs were the same for both groups of producers due to the method of calculation whereby a standard per ewe cost of pasture was charged to each producer. Less annual pasture was provided by the

high income producers at a small savings. The total savings by the high income producers for all feed, both home-grown and purchased, was $226 per producer and $4.41 per ewe. Since feed was nearly one-half of all costs, this savings was substantial.

Labor. — The saving in labor cost of $157 per producer by the high income producers compared to the average of all producers was second to feed costs in importance. This was due entirely to a saving in hours as the standard wage rate of $1.15 was used for all labor time. The total hours per producer were 380 for the high income producers compared to 508 for all producers. Table 27 shows the proportion of this 380 hours spent on each job by the high income producers, table 20 for all producers.

Table 27. Labor Input for Major Jobs in Sheep Production Twenty High Income Producers in Maine — 1961

Job	Pasture season	Over-winter season	Total for year	Percent of total
General care, feeding, bedding	53	144	197	52
Lambing	—*	122	122	32
Manure removal	14	2	16	4
Shearing	6	3	9	2
Marketing	13	2	15	4
Dipping	3	—*	3	1
Other	17	1	18	5
Total	106	274	380	100
Percent of total	28	72	100	

*Less than .5.

The major saving in labor by the high income producers was in general care and feeding with 197 hours for the average of the high income producer compared to 319 as an average for all producers. More efficient housing and feeding arrangements probably accounted for this saving in general care labor. The time spent during the lambing period was only slightly less for the high income producers or 122 compared to 126 hours for all producers. Differences in labor for other jobs were minor. The high income producers actually spent more time on marketing than all producers (15 compared to 13 hours) and on other labor (18 compared to 11 hours). While not highly significant, the increased time spent by the high income producers, mainly in the summer on marketing and other labor such as castrating, docking, medication and overseeing the flock, is indicative of better marketing and management practices.

Other Expenses. — There was a saving in building costs of $43 per producer for the high income producers compared to all producers

because of lower investment in buildings. A larger share of the high income producers had three-sided sheds or pole barns, and the sheep share of the investment in these buildings was $984 per producer compared to $1,373 per producer for all producers. High income producers put more money into purchase of sheep and had a slightly higher investment in sheep than all producers.

Less use was made of trucks, tractors and auto for sheep by the high income producers with an annual saving of $22. Hired shearing cost more by $5, showing that less shearing was done by the high income operator himself. Equipment expense and investment was the same for both groups of producers.

Parasite control, salt and minerals and veterinary and medicine costs for high income producers compared to all producers were less though apparently sufficient to produce a good lamb crop. Taxes were the same while trucking, freight and commission costs were somewhat greater for the high income producers. These latter costs indicate hired services rather than ownership of transportation facilities and accounts for some of the lower truck, tractor and auto expense of the high income producers. Rental costs for animals, mainly rams, were higher for the high cost producers compared to all producers. Telephone and electricity, supplies and other costs including livestock insurance, registration fees, advertising and association dues were all somewhat less expensive for the high income producer compared to all producers.

All costs were $1,765 for the high income producers, or a saving of $429 over the average of all producers. On the per ewe basis, all costs were $33.31, or a saving of $8.40 per ewe.

Receipts and Net Returns for High Income Producers Compared to All Producers

The high income producers, with negative net income of a minus $101, came nearer to covering all costs than did all producers who had an average net income of minus $846. Deducting the cost of labor resulted in a positive labor income of $336, or an average return of $.88 an hour for the high income producer's 380 hours of labor. This assumes that the operators performed all labor except custom shearing. In addition to lower expenses an increase in gross receipts accounted for the higher net income position of the high income producers.

Sheep Sales. — Sheep sales returned $187 more in receipts for the high income producers than for the average of all producers. Sale of market lambs accounted for most of this increase, or $126. The price received per head for lambs was $13.42, or more than a dollar per head higher than the $12.30 average for all producers. Also, more

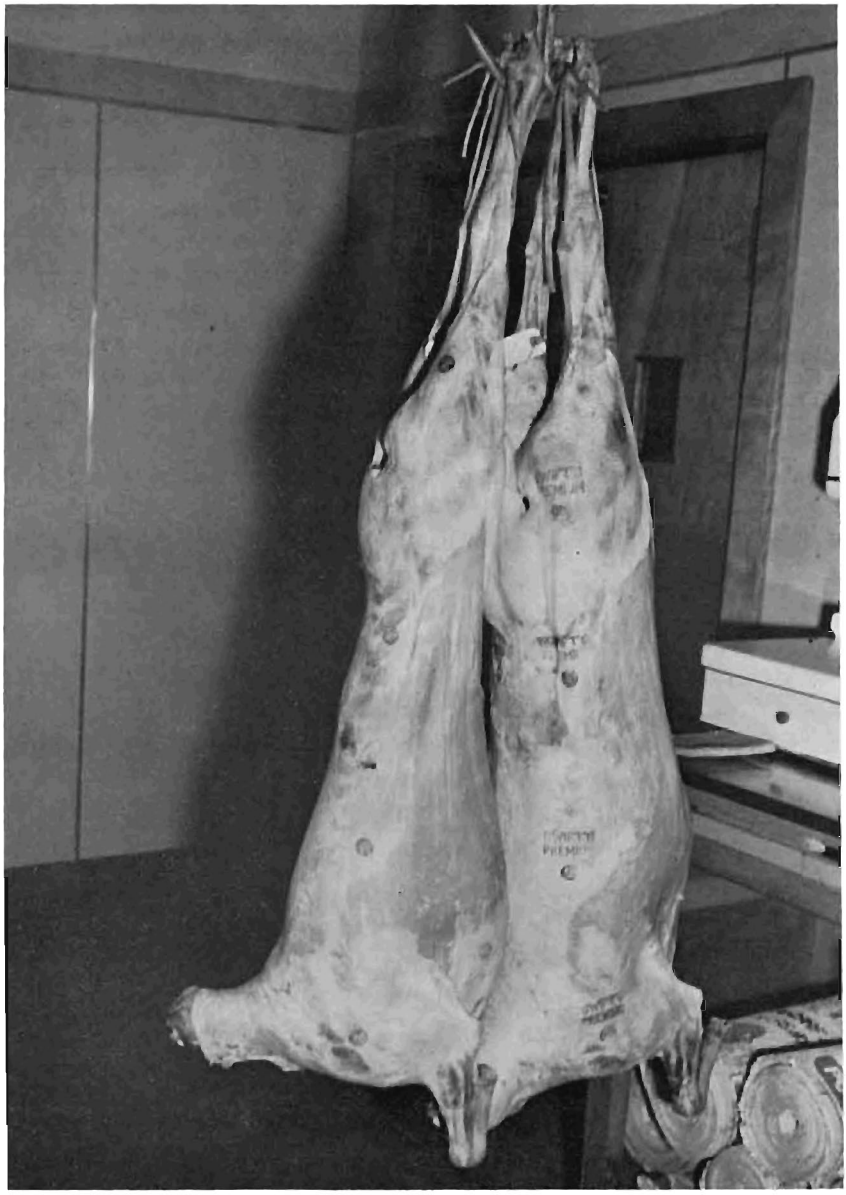
Table 28. Average Receipts and Net Returns for Sheep Production and Twenty High Income Producers Compared to All Sheep Producers
Maine — 1961

Item	All producers			High income producers		
	Average per producer Value (60 prod.)	Average per ewe Quantity	Value (52.6 ewes)	Average per producer Value (20 prod.)	Average per ewe Quantity	Value (53.0 ewes)
Sheep sales (No. head):						
Market lambs	$ 588	.91	$ 11.17	$ 714	1.00	$ 13.47
Other lambs	28	.01	.53	24	.01	.45
Breeding ewes	54	.05	1.03	102	.06	1.93
Cull ewes	47	.10	.89	61	.09	1.15
Breeding rams	16	.01	.30	18	.01	.34
Cull rams	—*	—*	.01	1	.00	.01
Total	$ 733	1.08	$ 13.93	$ 920	1.17	$ 17.35
Wool (lbs.)	$ 269	9.41	$ 5.11	$ 317	11.03	$ 5.98
Wool incentive payment	119		2.27	140		2.64
Show premiums	18		.35	35		.67
Other receipts	18		.34	27		.51
Total wool and other	$ 424		$ 8.07	$ 519		$ 9.80
Total cash receipts	$ 1,157		$ 22.00	$ 1,439		$ 27.15
Manure credit	$ 107		$ 2.03	$ 103		$ 1.95
Inventory increase	84		1.59	122		2.31
Gross receipts	$ 1,348		$ 25.62	$ 1,664		$ 31.41
Less total expenses	$ 2,194		$ 41.71	$ 1,765		$ 33.31
Net income	—$ 846		—$ 16.09	—$ 101		—$ 1.90
Less labor cost	$ 594		$ 11.29	$ 437		$ 8.25
Labor income	—$ 252		—$ 4.80	$ 336		$ 6.35

*Less than .05 in number or 50 cents in value.

lambs were sold by the high income producers; 53 lambs for an average of 1.00 per ewe compared to 48 lambs or an average of .91 per ewe for all producers.

The sale of more lambs per ewe for the high income producers was due to the larger lamb crop. The percentage lamb crop born was 143 percent or 74 lambs from the 52 ewes in beginning inventory. The lamb crop brought to market age was 127 percent with a death loss of slightly over 8 lambs on the average or 11 percent of the lambs born. These figures compare to a lamb crop born of 133 percent, brought to market age of 115 percent and a death loss of 13 percent for the average of all producers.



The "Choice Grade" is the type of carcass a sheep breeder should be putting on the market

The sale of other breeding and cull animals made up the balance of the sales, and all of these returned more in value to the high income producer than to the average of all producers. The sale of breeding ewes by the high income producers showed a marked increase in return

over all producers, and was due to a price of $32 per head compared to $21 for the average of all producers. Even cull ewes brought $13 per head for the high income producers compared to about $9 for all producers.

These sales figures show that the high income producer had a larger lamb crop, a better grade and quality of animal and sold more on the Easter market which he marketed at higher prices. Higher receipts were due in part to a spring price in 1961 that was over a dollar higher per hundredweight than the fall price.

Wool and Other Cash Receipts. — Wool sales and other cash receipts also contributed to the increased receipts received by the high income producers compared to all producers. Since the wool price at $.54 per pound was the same, the difference was due to the 11 pounds of wool sold per ewe by the high income producer compared to 9.4 pounds for all producers. The incentive payment was larger by $21 due to the higher value of wool sold. Show premiums and other receipts were higher for the high income producers.

Table 29. Net Income and Labor Income with 1961 Receipts Adjusted to a 1952-61 Average Price Received for Lambs, High Income Producers in Maine — 1961

Item	Receipts adjusted to 1952-61 average lamb price
Sheep sales	$ 1,122
Wool and other	519
Manure credit	103
Inventory increase	122
Gross receipts	$ 1,866
Less total expenses	$ 1,765
Net Income	$ 101
Less labor cost	$ 437
Labor income	$ 538

Manure Credit and Inventory Increase. — Manure credit for the high income producers was lower than the average for all producers. The reason for this was that a larger share of the manure was put on sheep pasture at no credit, since the amount and value of manure produced per ewe was calculated in the same way for all producers. Inventory increase was larger by $38 for the high income producers, due to a slightly increased valuation.

Adjustment in Lamb Price to 10-year Average. — While the average high income producer did receive a fair return on his labor in the year 1961, in part by better prices for his animals sold, the supply-demand situation was the same for all producers. Presumably in a better

price year the high income producer could market his lambs and other animals at the same relative advantage over all producers. On this assumption, an adjustment in lamb and other sheep prices to the 1952-61 10-year average would increase gross receipts from $1,664 to $1,866 (table 29).

At this price level, the high income producers had a net return after deducting all costs, cash and non-cash, of $101, and a labor income of $538. With this labor income, the 380 hours of labor input would receive a return of $1.42 per hour. Thus, with average prices of the past decade, Maine sheep producers who controlled their costs and marketed to advantage, could have made a fair return to labor, or could have hired their labor and receive a profit in excess of all costs.

CONCLUSIONS

In 1961, sheep production by the average producer in this study resulted in a considerable economic loss when all expenses cash and non-cash were considered. When the lower lamb prices of 1961 were adjusted to a long-run, more nearly normal level, the loss was greatly reduced, but the average producer still did not cover all expenses, and received a negative return for his own labor, assuming he performed all labor himself.

While the average producer in the study appeared to be losing money even in the long-run, this does not mean that sheep do not have a place in Maine. Returns which are not entirely dollars and cents, but have economic implications, accrue to sheep producers. These include use of and some return on resources which would otherwise be idle, fire and brush control and enjoyment from caring for sheep.

Some producers were able, even in 1961, to earn a return for their labor. Twenty high income producers did receive, on the average, $336 per enterprise or $.88 per hour for their labor, assuming that they did all the work. These producers would receive $1.42 per hour for their labor at normal, long-run lamb prices. The improved performance was due to lower costs, particularly through more efficient feeding, housing and caring for sheep, and in higher returns from the sale of lambs and wool. The high income producers fed less grain and hay while providing more pasture and produced a larger percent lamb crop which sold at higher prices per head. The better returns were not due to a larger size flock than the average of all producers in the study, but the better producers did include more farmers, particularly dairymen and poultrymen, with sheep as a sideline enterprise. These higher income producers illustrated that through better management and marketing practices, sheep could, under average conditions, provide a fair return to the labor input.

APPENDIX

Table A. A Summary by Counties of Applicants, Wool Production and Receipts and Net Wool Incentive Payments for Shorn and Unshorn Wool from Agricultural Stabilization and Conservation County Office Listings — Maine, 1961

County	Number of applicants	Average wool sales (lbs.)	Average wool receipts	Average net wool payment	Net unshorn wool payment Number applicants	Net unshorn wool payment Average per applicant
Androscoggin	36	149	$ 62	$27	1	$ 8
Aroostook	97	357	182	77	0	—
Cumberland	68	144	73	31	7	17
Franklin	49	170	86	36	8	9
Hancock	62	137	73	31	6	13
Kennebec	78	179	93	40	18	17
Knox	62	190	104	44	13	8
Lincoln	30	224	118	50	7	16
Oxford	49	146	75	32	0	—
Penobscot	92	200	106	45	33	14
Piscataquis	20	349	186	80	8	18
Sagadahoc	16	160	82	35	1	60
Somerset	85	219	111	47	24	11
Waldo	69	236	122	52	17	15
Washington	68	170	90	38	6	17
York	35	164	90	39	4	17
State	916	203	$100	$45	153	$14

B. Coastal Island Sheep in Maine

While collecting the data on sheep production in Maine, some producers were contacted who kept part or all of their flocks on islands off the coast of Maine. Five producers thus contacted provided this information which is of a descriptive nature since costs and returns were not complete or could not be ascertained.

These producers, while fond of sheep, were proud of their animals ability to "rough it," or take the rugged climate with a minimum of attention and care. One producer said that he put out several breeds to see what sort of breed or hybrid would thrive on island conditions. They wanted the flock to increase to the feed capacity of the island. They claimed a more rugged animal developed under island conditions than on the mainland and that there were higher quantity and quality of wool yields.

The feed for the most part was natural grass or "salt grass" supplemented with seaweed washed ashore. The natural grass becomes matted and dried out in winter, making a feed similar to hay, though one person testified to the green grass that could be found year-round under the dried matting. Only one person fed some grain, and this was mostly to attract the sheep on visits to the island. Two producers fed

some supplementary hay during winter. One producer brought the yearling ewes back to the mainland for the winter to give them a better start for the first year.

In most cases, infrequent visits were made to the island. One producer made only two visits during the year, one in June to shear, check on the lambs and remove the ram, and one in December to take in the ram and remove the market lambs. In one case, the family took up summer residence on the island, and others made more frequent visits during the summer. Four of the island operators never checked their ewes during lambing, one checked every other day. During a visit in June, shearing was done, the lamb crop was checked, the ram removed and four of the five producers treated with phenothiazine. In all cases the ram or rams were taken to the island in December, or at Christmas time as was frequently stated, so that lambs would not be born until May or June. The lamb crop was usually less than 100 percent, with occasional large losses due to storms or cold, wet springs.

Only one island operator provided the shelter of an old building, but stated that the sheep usually stayed outdoors. The other operators mentioned that at one time they were required by law to provide shelters. This was soon changed because of the death losses suffered. The

The coast and off-shore islands of Maine have a climate well-suited to sheep production.

sheep would huddle in the shelter and either smother or eat other's wool rather than roam the island for forage.

The market lambs were sold in the fall or early winter, and taken off the island at an annual roundup. The same procedure was followed at the spring shearing. One husband and wife provided a big picnic dinner for all participants, and the spring shearing day was an annual town event. Due to such practices, the costs of labor and other operating costs were difficult to calculate.

Lobster boats were used for trips to the island, often observing or stopping while on the regular lobster runs, and for taking sheep on and off the island. Labor, other than the round-up, was slight in all cases except for the one producer who visited frequently during the lambing season, and other seasons as well.

Though no economic conclusion can be drawn from this part of the study, most flocks seemed to be a great source of satisfaction and interest to the owners, and all owners expected to continue or expand. Many interesting tales were told of the island ventures, from the occasional stranded sheep on off shore rocks, to the poachers sought and caught, and to the lamb who ate the cake and pie before the picnickers got to it.