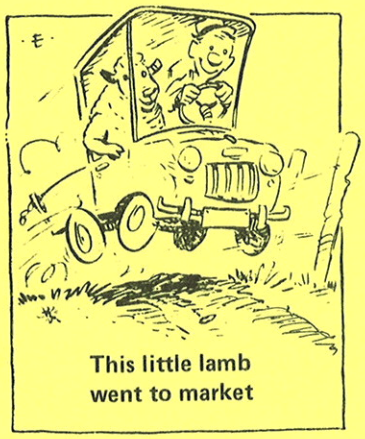
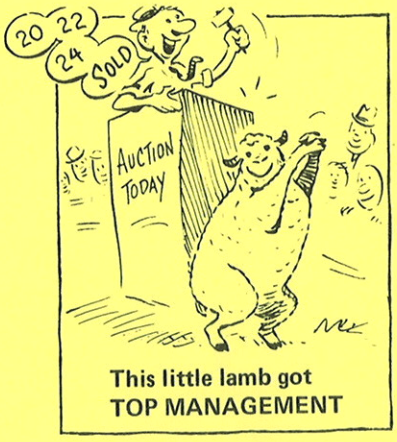
18th Annual
WESTERN DAKOTA
SHEEP DAY

WEDNESDAY, FEBRUARY 9, 1977, HETTINGER ARMORY



This little lamb
went to market

This little lamb
stayed at home



This little lamb got
TOP MANAGEMENT

This little lamb
got none

TIMOTHY C. FALLER, SUPT.

HETTINGER BRANCH EXPERIMENT STATION
NORTH DAKOTA STATE UNIVERSITY

18th ANNUAL
WESTERN DAKOTA
SHEEP DAY

WEDNESDAY, FEBRUARY 21, 2018 | DICKINSON, ND

DICKINSON RESEARCH EXTENSION CENTER

SHEEP DAY DIGEST

by

Timothy C. Faller, Supt.
Hettinger Experiment Station

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2. SELECTION
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10. FLOCK OUTLINE
    A calendar type outline for producer use in flock management. Sect. IV pp, 32-35

SECTION I

Reports of

Research in Progress

at the

Hettinger Experiment Station

Presented by
Timothy C. Faller
Superintendent

at the

18th Annual Sheep Day

Hettinger Experiment Station
Hettinger, North Dakota

February 9, 1977

PRODUCTIVITY OF SELECTED SHEEP BREEDS AND CROSSES UNDER NORTH DAKOTA CONDITIONS
(1976 Report)

The most important factor to a profitable sheep enterprise is the number of lambs marketed per ewe exposed. Many factors influence the percent lamb crop marketed. Of these, selection of parental stock having the genetic capability of conceiving and bearing large numbers of offspring is of primary importance.

An experiment was initiated in 1965 to determine the potential of crossbred offspring of two breeds not commonly raised in North Dakota or other parts of the United States, the North Country Cheviot and the Border Leicester. These breeds are white faced, medium to large in size, clean faced and clean legged. They do not carry a reputation for being outstanding wool producers but are used extensively in the British Isles to sire crossbred commercial ewes. Rams of these two breeds were mated to Columbia and Rambouillet ewes and these crossbred offspring are being compared with each other and with straightbred Columbia and Rambouillet ewes and also with Columbia x Rambouillet crossbreds.

Experimental Procedure

The Hettinger Branch Experiment Station contracted with a commercial Columbia sheep producer and with a commercial Rambouillet producer to produce the experimental females for this experiment. Each producer randomly allotted his ewes into four groups of about 40 each. Each group was then mated to either a Columbia, Rambouillet, North Country Cheviot or Border Leicester ram considered to be of typical commercial quality. The initial matings were made in the fall of 1965 and the first delivery of eight breeds or breed combinations was made to the experiment station in the fall of 1966. All lambs were handled as a single unit during the winter and summer period that followed. Additional like matings were made in the fall of 1966.

These ewe lambs were delivered the fall of 1967 as the final ewes for evaluation.

The initial matings of the experimental ewes were made in the fall of 1967 to Hampshire and Suffolk rams. Ewe groups were randomly assigned to Hampshire and Suffolk ram groups and to February and April lambing groups.

In the fall of 1971 an additional 16 ewe lambs of each cross were contracted for, excluding the reciprical crosses, and adding Finnish Landrace crosses. These ewes were added to check information already collected in the crossbreeding project, and to compare Finn crossbred ewes to the various crosses worked with. The new ewe lambs were to begin lambing the spring of 1973. 24 each of Border Leicester-Rambouillet and Finn-Rambouillet crosses were added to begin lambing in 1974 and 13 additional Border Leicester-Rambouillet crosses were added to begin lambing in 1975.

The following is a summary of the production of the ewes added since 1973.

TABLE I

EFFECT OF BREED OF SIRE ON EWE'S WOOL PRODUCTION

Breed of Sire	Grease Fleece Wt.	STaple Length (MM)
Rambouillet	10.4	78.00
Columbia	9.9	89,7
Border Leicester	10.7	116.9
North Country Cheviot	8.3	91.2
Finnish Landrace	8.8	97.6

TABLE II

EFFECT OF BREED OF SIRE ON EWE'S BODY SIZE

Breed of Sire	Pre-Breeding Wt.	Pre-Lambing Wt.
Rambouillet	144.0	170.3
Columbia	139.3	166.3
Border Leicester	141.7	173.0
North Country Cheviot	142.5	162.3
Finnish Landrace	121.2	150.2

TABLE III
EFFECT OF BREED OF SIRE ON LAMBING PERFORMANCE

Breed of Sire	Lambs Born	Lambs Weaned	Loss Percentage
Rambouillet	136.9	114.6	16.0
Columbia	142.8	118.8	16.8
Border Leicester	141.9	122.0	14.0
N.C. Cheviot	121.5	101.3	16.5
Finnish Landrace	191.6	155.6	18.8

1 - Includes only those lambs raised on dam.

TABLE IV
EFFECT OF BREED OF DAM ON EWES WOOL PRODUCTION

Breed of Dam	Grease Fleece Wt.	Staple Length (MM)
Rambouillet	10.1	94.3
Columbia	9.0	101.7

TABLE V
EFFECT OF BREED OF DAM ON EWES BODY SIZE

Breed of Dam	Pre-Breeding Wt.	Pre-Lambing Wt.
Rambouillet	140.8	169.6
Columbia	134.7	158.4

TABLE VI
EFFECT OF BREED OF DAM ON LAMBING PERFORMANCE

Breed of Dam	Lambs Born	Lambs Weaned	Loss Percentage
Rambouillet	154.9	130.5	15.8
Columbia	129.7	106.9	17.6

TABLE VII
CROSSBRED EWE PRODUCTION (1973-76)

Cross	Grease Fleece Wt. Lbs.	Staple Length (MM)	Pre-Breeding (lbs)	Lamb wt. Lbs	Lambs Born/ 100 ewes	Lambs Weaned/ 100 ewes
Ramb. x Ramb.	10.53	77.31	142.4	168.7	136.7	112.2
B.L. x Ramb.	11.26	112.25	145.5	179.8	149.7	133.1
N.C.C. x Ramb.	8.76	86.58	146.5	167.7	130.5	111.0
Finn x Ramb.	9.01	95.17	122.9	154.2	200.0	159.6
Col. x Col.	9.54	92.44	132.4	160.6	134.7	112.0
B.l. X Col.	9.40	126.57	134.3	159.1	127.5	98.6
NCC. x Ramb.	7.69	96.86	137.5	155.0	110.5	89.6
Finn x Col.	7.73	107.17	114.8	134.7	160.00	140.0

TABLE VIII
LAMB PERFORMANCE

Cross	Birth Wt. Lbs.	Wean Wt. Lbs.	Wean Age Days	Mkt. Wt. Lbs.	Market Age Days
Ramb. x Ramb	11.09	48.66	68.25	100.28	173.25
B. L. x Ramb	10.56	49.62	75.55	102.21	177.33
N.C. x Ramb	11.01	48.06	68.45	100.62	174.17
Finn x Ramb	8.13	42.71	71.76	97.77	197.33
Col. x Col.	10.84	51.57	70.99	100.42	165.82
B. L. x Col.	9.56	46.47	69.75	99.20	177.93
N.C.C.x Ramb	10.19	44.11	66.68	101.80	181.76
Finn x Col.	7.99	37.46	65.22	99.26	189.36

Results

It would appear at this time that reproductive performance of all ewes purchased after 1973 was lower than the original ewes purchased in 1966 and 67; however, the same trends are evident. The use of Border Leicester rams to produce white faced crossbred ewes made significant improvements in productivity when used on Rambouillet ewes and decreased productivity when mated to Columbia ewes and the F, were retained for replacement. The use of Finnish Landrace rams to produce crossbred ewes appears to be a profitable practice primarily if your goal is to increase lamb production. In all cases F, finn cross ewes were more prolific than their dams. Lambs sired by blackfaced rams from F, Finn-cross ewes required 10 to 14 additional days to reach acceptable market weight. The use of Border Leicester rams did slightly increase the grease fleece wts of resulting F, crossbred ewes, and crossbred ewes resulting from North Country Cheviot and Finnish Landrace crosses reduced wool production.

*This report is offered as a progress report and final analysis will not be completed until collection of data from 1977 lambing.

HES 6260

Title: Relative Responses of Selection Pressures Applied to Ewes

Objectives: To determine the rate of change in production of wool and the production of lamb @120 days when these factors are selected as single traits and pressure is applied to the ewe flock only.

Procedure: The Hettinger Station purebred flock of 90 Columbia ewes were allotted on the basis of weight and age into three groups of 30 ewes each. Three registered Columbia rams are to be used each year. Each ram to be exposed to ten ewes from each lot in order to distribute the influence of sires equally across groups.

Culling ewes will be conducted each fall on the following basis:

1. Age
2. Mechanical (Ill health, spoiled udder, etc.)
3. Flock A - low lamb production
   Flock B - low fleece production
   Flock C - general type (visual selection)

Each year, replacements will be selected on the following basis and held to approximately 25% (8 ewes) per group.

Flock A - 1. Yearling ewes born as twins with preference to those from ewes with the greatest corrected lamb production at 120 days.
2. Replacement yearling ewes must be physically sound.

Flock B - 1. Yearling ewes with heaviest fleeces at first shearing.
2. Replacement yearling ewes must be physically sound.

Flock C - 1. Ewe lambs showing most desirable Columbia breed type as suggested by the Columbia Sheep Breeders Association of America.

Analysis: The following data will be collected. Body weight of ewes prior to breeding and lambing, fleece weight and grade, date and cause of elimination of ewes from flock, lamb birth date, birth weight, type of birth, sex, weaning weight and cause of death.

The Lamb Index Calculator suggested by the American Hampshire Sheep Association will be used to correct weaning weights of lambs for birth type and rearing, sex and age of ewe to a common basis at 120 days. If this method of correcting production to a common denominator indicates significant change due to selection, a more sophisticated analysis will be conducted with the use of a suitable computer progress.

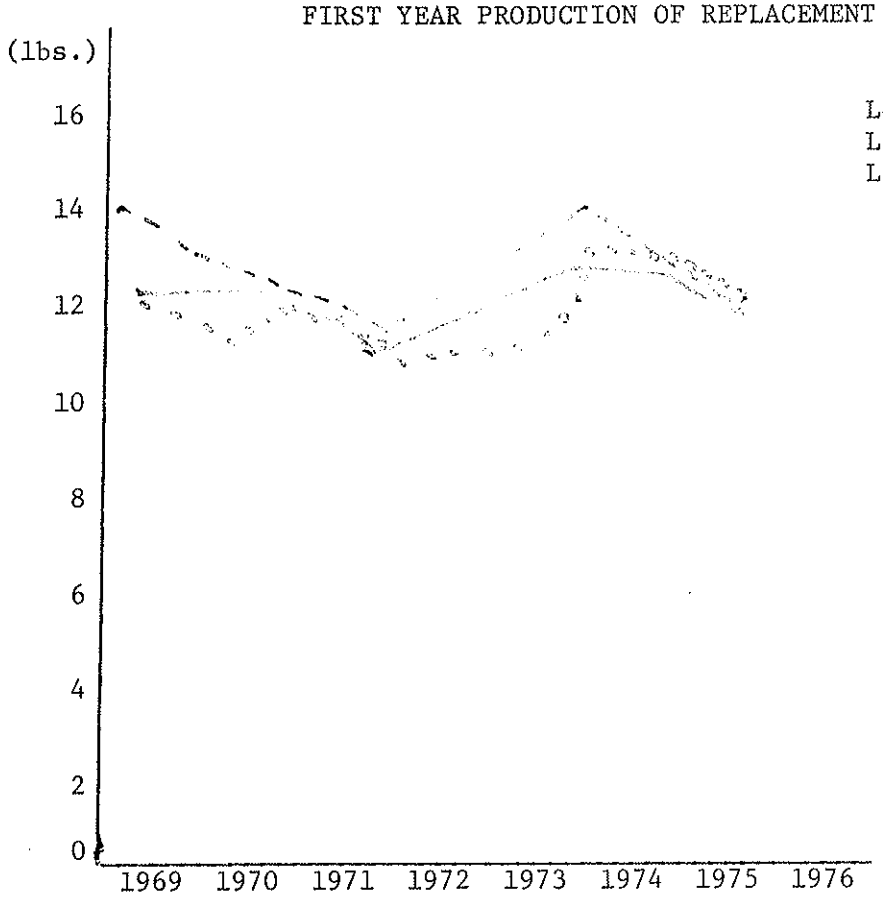
Changes in both wool production and lamb production at 120 days as averages by years will be observed for each treatment. Patterned changes, if any, will be noted. If changes seem possible as a result of selection pressures, the data will be analyzed to determine significance of changes in average production as measured.

In the fall of 1976, culling of mature ewes and selection of eight replacement ewes for each lot was accomplished according to the design of this study.

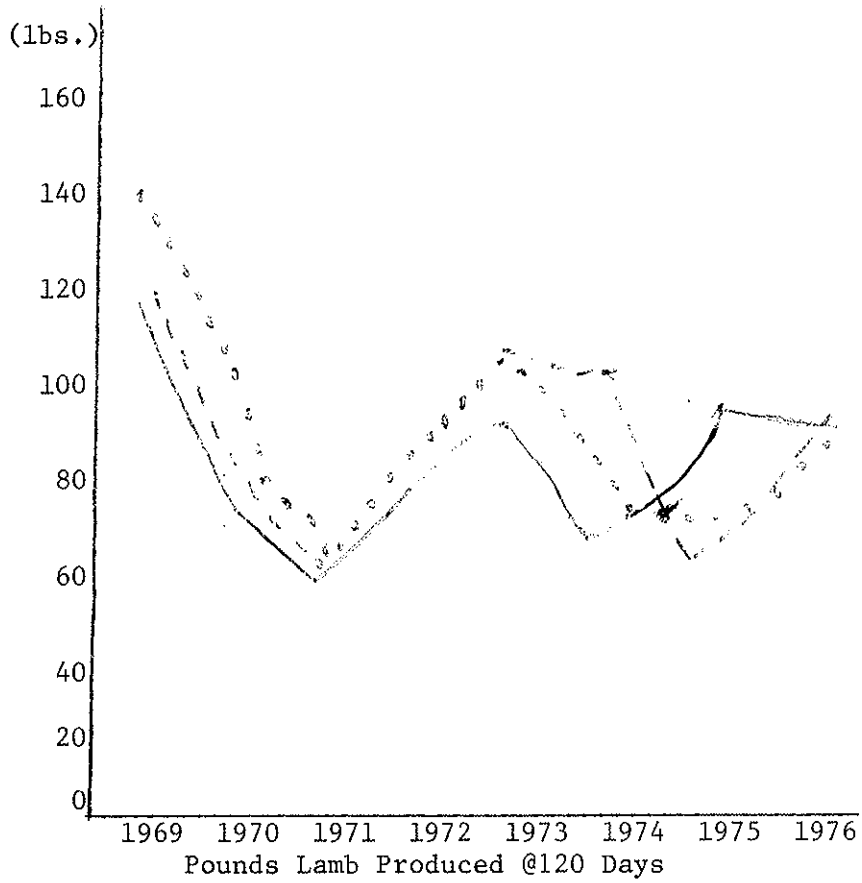
TABLE I - PRODUCTION OF YEARLING EWE REPLACEMENTS

	6 YR. Average 1969 - 1974	1975	1976
Percent Lambs Dropped			
Lot 1	120.28	100.00	100.0
Lot 2	137.92	100.00	112.5
Lot 3	129.17	100.00	125.0
Percent Lambs Weaned			
Lot 1	94.03	100.00	100.0
Lot 2	121.25	100.00	100.0
Lot 3	120.83	87.50	112.5
Pounds of Lamb @120 Days			
Lot 1	80.80	93.70	98.7
Lot 2	100.27	91.90	96.1
Lot 3	97.30	82.10	100.8
Grease Fleece Wt.			
Lot 1	12.47	12.3	12.0
Lot 2	12.25	13.6	12.0
Lot 3	12.93	13.3	12.0

FIRST YEAR PRODUCTION OF REPLACEMENT EWES



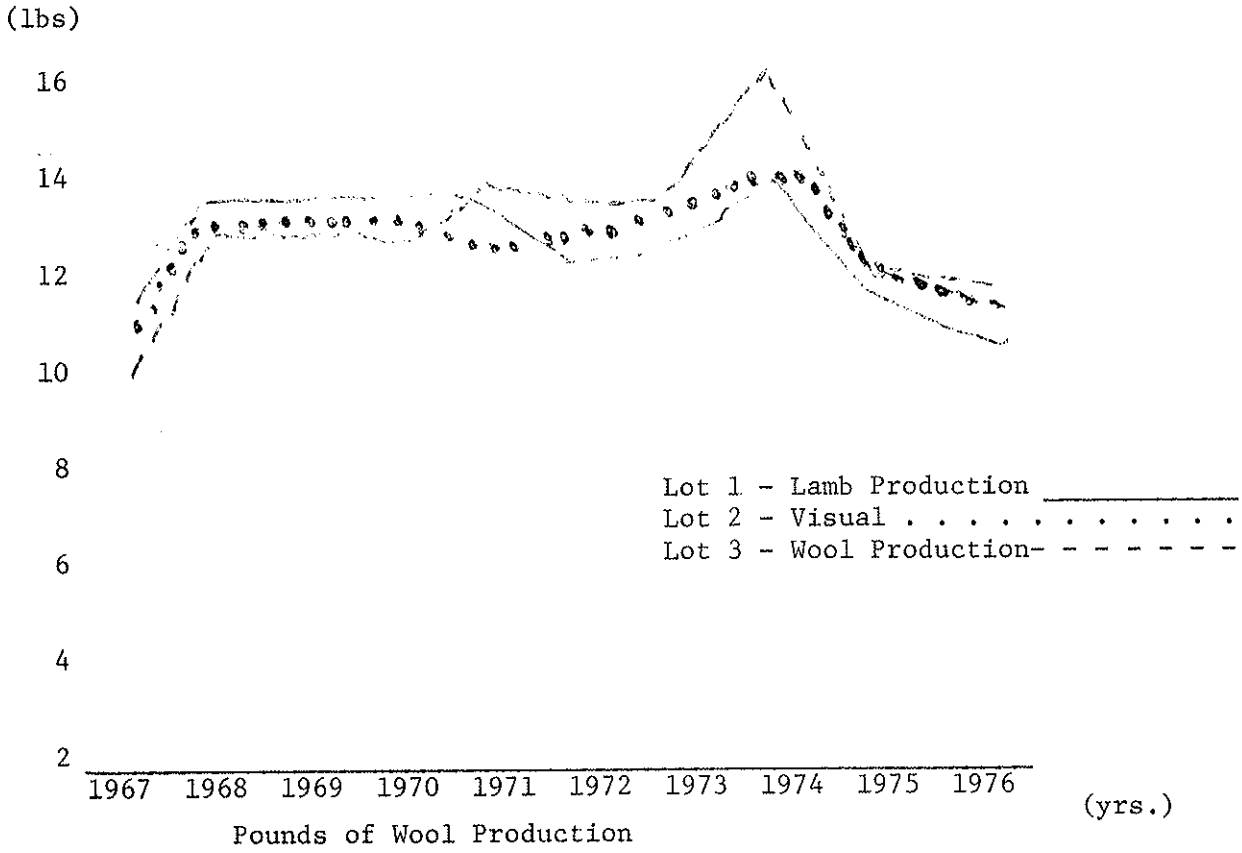
Pounds Wool Production

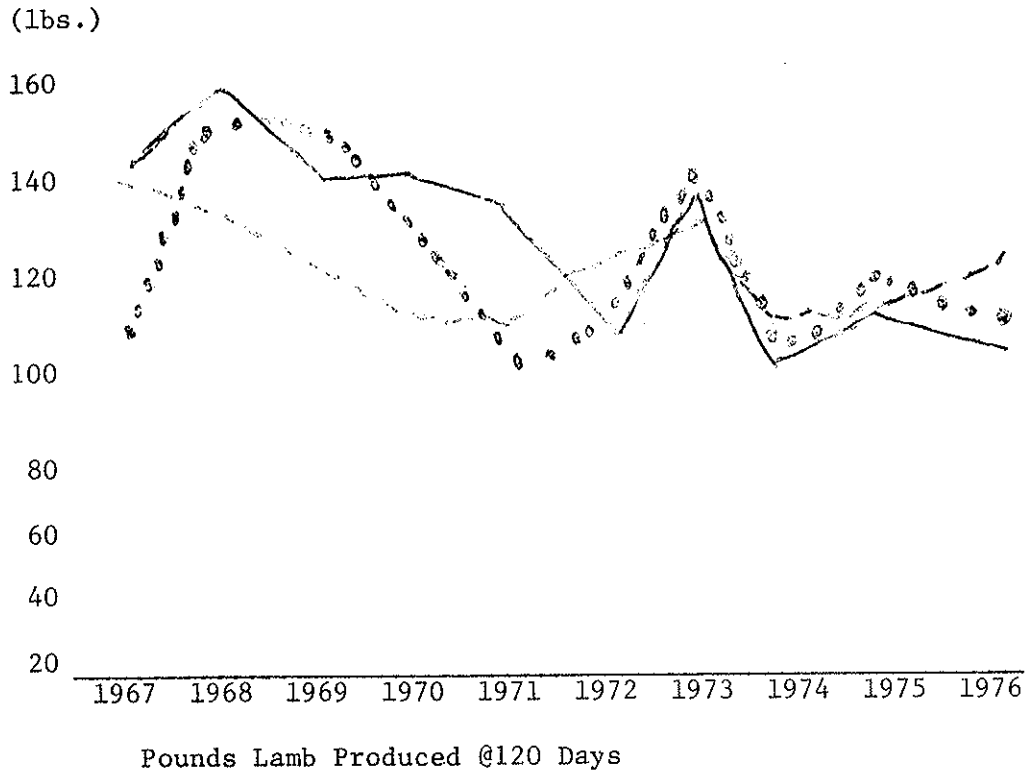


Pounds Lamb Produced @120 Days

	Sire No. 1	Sire No. 2	Sire No. 3
Sire Records - 1967	Marshall	NDSU #1	Archibald
Ewes Exposed	29	30	30
% Lambs Dropped	151.7	166.7	166.7
% Lambs Weaned	134.5	143.3	140.0
Sire Records - 1968	Marshall	NDSU #1	E. Ehlers
Ewes Exposed	30	30	30
% Lambs Dropped	163.3	150.0	140.0
% Lambs Weaned	150.0	143.0	136.7
Sire Records - 1969	J. Ehlers	NDSU #2	E. Ehlers
Ewes Exposed	30	30	30
% Lambs Dropped	143.3	150.0	150.0
% Lambs Weaned	130.0	143.0	140.0
Sire Records - 1970	Osborne	NDSU #2	E. Ehlers
Ewes Exposed	30	30	30
% Lambs Dropped	163.3	76.7	166.7
% Lambs Weaned	140.0	66.7	153.3
Sire Records - 1971	Osborne	Shown #1	Shown #2
Ewes Exposed	30	30	30
% Lambs Dropped	160.0	153.3	173.3
% Lambs Weaned	140.0	123.3	150.0
Sire Records - 1972	Hall	Shown #1	Shown #2
Ewes Exposed	30	30	30
% Lambs Dropped	162.1	190.0	166.7
% Lambs Weaned	144.8	140.0	130.0
Sire Records - 1973	Hall	Shown #3	H E S #1
Ewes Exposed	30	30	30
% Lambs Dropped	166.7	163.3	182.8
% Lambs Weaned	140.0	156.7	165.5
Sire Records - 1974	H E S #2	Shown #3	H E S #1
Ewes Exposed	30	30	30
% Lambs Dropped	140.0	150.0	120.0
% Lambs Weaned	116.7	130.0	96.7
Sire Records - 1975	H E S #2	Burchill #1	Larsen
Ewes Exposed	30	30	30
% Lambs Dropped	140.0	140.0	140.0
% Lambs Weaned	116.7	130.0	116.7
Sire Records - 1976	Caras	Burchill #1	Larsen
Ewes Exposed	30	30	30
% Lambs Dropped	160.0	103.3	116.7
% Lambs Weaned	133.3	96.7	110.0

TOTAL EWE FLOCK PRODUCTION





SUMMARY OF "MEANS OF DATA"

	Lot 1 Lamb. Prod.		Lot 2 Visual		Lot 3 Fleece Prod'n	
	1969-75 Ave. Prod.	1976 Ave. Prod.	1969-75 Ave. Prod.	1976 Ave. Prod.	1969-75 Ave. Prod'n	1976 Ave. Prod'n
Ewes Exposed	30	30	30	30	30	30
Age @ Breeding	2.71	2.60	2.73	2.47	2.65	2.60
Initial Wt. (lbs.)	156.5	149.3	158.4	158.1	155.4	152.3
Gain During Breeding (lbs.)	1.3	-1.6	2.1	.30	1.7	-.1
Gain Breeding to Lambing(lbs.)	22.1	19.6	20.6	19.8	20.0	16.8
Ewes Lambing	28.2	29	27.5	30	27.3	30
% Lambs Dropped/ewe exposed	158.7	126.7	153.1	130.0	150.5	150.0
% Lambs Weaned/ewe exposed	134.2	110.0	128.5	116.7	128.7	136.7
Corrected Pounds of Lamb Per Ewe at 120 days	111.9	103.9	107.7	111.2	107.0	122.8
Grease Fleece Wt.	12.6	10.6	12.5	11.0	12.8	11.1
Lamb Birth Wt.	10.9	11.8	10.8	11.9	10.7	10.9
Uncorrected Weaning Wt.	67.1	44.4	66.7	46.8	67.4	44.6
Corrected Weaning Wt.	84.3	94.5	83.6	95.3	82.9	89.9
Age in days at weaning	104.2	57.6	103.7	58.9	105.4	63.2
Birth Type of Dams at Letting						
% Singles	5.1	0.0	23.3	13.0	26.9	16.7
% Twins	83.1	80.0	74.9	86.7	69.9	76.7
% Triplets	11.6	20.0	1.7	0	3.2	6.7

SUMMARY

The selection project is a long duration project to evaluate the productive improvements that can be made through selection of dams based on single traits.

Severe yearly variations due to: climate, feed, management, etc., may indicate that no improvement is being accomplished, however, it will take 3-4 complete flock turnovers to accomplish significant improvement to establish heritability estimates.

At this time one complete turnover has been made and the three groups are just past the mid-point of the second turnover. It may be necessary to make more rapid replacement to speed up turnover rate.

PROJECT: HES 6261

TITLE: Ralgro Implants for Pasture Lambs

PERSONNEL: T. C. Faller, M. R. Light, W. E. Dinnuson

OBJECTIVES: To evaluate the use of Ralgro (zeranol) implants for increasing the growth rate of mixed lambs grazing alfalfa Pasture.

PROCEDURE:

Ninety-one ewe lambs and ninety-seven wether lambs of mixed breeding were wormed and randomly allotted to four lots. The lambs in one lot of each group were implanted in the ear with a 12 mg. pellet of Ralgro (zeranol). All lambs were grazed on alfalfa stumpage for 55 days, from July 24 to September 17. The results of gains is given in the following table.

	No.	Weight (lbs.) Initial	Final	Average Daily Gain (Lbs.)	% Increase
Ewes, ccontrol	46	72.7	95.7	0.419	
Ralgro	45	75.9	99.3	0.426	+ 2
Wethers, control	48	75.6	98.8	0.403	
Ralgrow	47	80.0	106.5	0.480	+19.1

One lamb was lost from bloat in the ewe control and wether treated lots. It is interesting to note that the ewe lambs in the control lot outgained the wether lambs in the control lot whereas, the treated wether lambs outgained the treated ewe lambs by about 12.5%.

Looking at the results another way, by using covariance analysis to adjust initial weights, it can be predicted that for all lambs, both ewes and wethers, implanting with Ralgro and pasturing on alfalfa stumpage will result in an increased gain of about 2.5 pounds per lamb.

Work planned for the coming year:

A similar trial will be conducted in 1977, and possibly will be expanded to include young growing lambs that are nursing.

PROJECT: HES 6261

TITLE: Monensin for Finishing Lambs (Hettinger)

PERSONNEL: T. C. Faller, W. E. Dinnuson

OBJECTIVES:

1. To evaluate Monensin as a coccidiostat for lambs.
2. To determine the most efficient dosage level.
3. To measure any other effects of Monensin on lambs.

PROCEDURE:

Two hundred and forty range lambs will be purchased and randomly allotted by sex and weight groups into eight lots of thirty lambs each.

Prior to initiating the experiment fecal samples will be taken as prescribed by Eli Lilly and Co., and sent to the Greenfield Laboratories for analysis. If this preliminary sample show that the lambs have coccidiosis, the project will be aborted rather than attempt to replace them with "clean" lambs and other treatments will be used. If lambs are clean, then samples will be taken each 28 day period. If clinical coccidiosis is observed during the experiment, fecal samples will be collected from affected individuals.

Initial and final weights will be taken after an overnight shrink and for each 28 day period during experiment. To permit evaluation of effect of Monensin on feed intake, an extra weight will be taken 2 weeks (14 days) after initiation of experiment. Feed intake will be recorded for the first 14 days, 28 days and each 28 day period thereafter.

Monensin will be used at 4 levels, 0, 5, 20 and 30 grams per ton of total ration. Each level will be fed to two lots (simple replicates). The Monensin will be thoroughly mixed with wheat bran to form a pre-mix (in 30 pounds of wheat bran per 1000 pounds of grain) to permit more uniform mixing. When thoroughly mixed in the grain (crushed corn) the grain will be mixed with

chopped roughage in proper ratios in a mixing wagon and put in self-feeders in the respective lots.

Samples of grain mix and also of total ration should be taken for five days, mixed and pooled for analysis. A sample of this pooled mixture will be submitted for analysis. Sampling will be done in this manner for each ration and each time a new grain mix is made. These samples will be sent to Eli Lilly for determination of uniformity and level of Monensin in each mix. Samples of feedstuffs - roughage and grain - shall be sent to North Dakota State University, Animal Science, for standard feedstuffs analysis.

The rations fed will be 2/3 cracked wheat, 1/2 crushed oats and chopped alfalfa. A suitable mineral mixture will be fed ad libitum. The roughage to concentrate ratio shall be 60% roughage, 40% grain for first 28 days, a 50:50 ratio for next 28 days and a 40:60 for the third 28 days or as long as lambs are on trial.

Lambs will be marketed at weights of 100-120 pounds. If lambs average less the 65 pounds initially they may all be implanted with Ralgro. If heavier, than Ralgro will not be used to permit at least a 56 day finishing period, preferably 84 days. All Monensin will be removed at least 48 hours before slaughter.

At conclusion of experiment lambs will be taken to slaughter and routine carcass measurements taken (dressing percentage, grade and finish) as well as any other measures deemed appropriate.

Elanco data sheets will be used to record weights and feed intake.

The experimental results will be provided to Eli Lilly's representative, period by period and the summary of results published in Hettinger Sheep Day reports.

Hettinger Branch wishes to acknowledge a grant of $2500. by Eli Lilly Co. for support of this project.

"SUMMARY OF RUMENSIN FEEDING PROJECT"

	Pen 1 5 grm level	Pen 2 Cont. 0 grm level	Pen 3 30 grm level	Pen 4 20 grm level	Pen 5 5 grm level	Pen 6 Cont. 0 grm level	Pen 7 30 grm level	Pen 8 20 grm level
Initial Information								
Ave. Initial Wt. (lbs)	77.63	73.96	75.53	74.47	74.30	73.96	73.83	73.43
Ave. Initial wt. shorn (lbs.)	73.70	69.56	70.83	69.94	70.17	69.83	69.60	69.30
Ave. Wool Wt.	3.93	4.40	4.70	4.53	4.13	4.13	4.23	4.13
Ave. Final Wt.(30 hd.)	102.83	102.20	100.80	99.70	103.90	99.70	98.90	95.33
Ave. Wt. of Carcass Data Lambs (15 hd.)	102.2	99.86	98.33	101.53	102.30	101.33	100.4	97.86
Gain Information								
Ave. Wt. Gain Period 1 (14 day)	(-.866)	4.43	(-.067)	(-1.33)	(-.967)	(-2.90)	4.30	(-2.03)
Ave. Da. Gain Period 1 (14 day)	(-.062)	.316	(-.005)	(-.095)	(-.069)	(- .20)	.288	(-.145)
Ave. Wt. Gain Period 2 (14 day)	9.46	8.30	10.70	10.30	10.86	8.6	6.63	6.70
Ave. Da. Gain Period 2 (14 day)	.676	.593	.764	.736	.776	.614	.474	.479
Ave. Wt. Gain Period 3 (28 day)	15.13	13.67	12.30	11.43	15.10	16.10	12.80	14.73
Ave. Da. Gain Period 3 (28 day)	.540	.488	.439	.408	.539	.575	.457	.521
Ave. Wt. Gain Period 4 (13 day)	5.40	4.20	7.07	9.36	8.7	8.1	6.13	6.63
Ave. Da. Gain Period 4 (13 day)	.415	.323	.544	.721	.669	.623	.471	.510
Ave. Gain Full Period (lbs.)	29.13	32.64	29.97	29.76	33.73	29.87	29.30	26.03
Ave. Da. Gain Full Period (lbs.)	.422	.473	.434	.431	.488	.433	.425	.377

Summary of Rumensin Feeding Project (cont.)

	Pen 1 5 grm level	Pen 2 Cont. 0 grm level	Pen 3 30 grm level	Pen 4 20 grm level	Pen 5 5 gram level	Pen 6 Cont. 0 grm level	Pen 7 30 grm level	Pen 8 20 grm. level
Carcass Information								
*Ave. Shrunk Wt. at Sioux Falls	98.80	96.46	94.93	98.13	98.9	97.93	97.0	94.46
*Ave. Shrink	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40
Hot Carcass Wt. (lbs.)	52.06	51.53	49.20	52.07	52.33	50.43	51.67	48.80
Dressing Percent (%)	52.69	53.42	51.82	53.06	52.91	51.49	53.26	51.76
Loin Eye Area (sq.in.)	2.297	2.225	2.316	2.360	2.371	2.204	2.335	2.308
Est. Kidney Fat (lbs.)	2.96	2.68	2.98	3.03	2.43	2.98	2.81	2.82
Fat Thickness	.165	.160	.156	.188	.175	.170	.173	.185
Firmness Grade(2-25)	16.5	16.0	15.7	16.2	16.7	15.6	15.5	15.7
USDA Grade	11.93	11.80	11.13	12.20	11.40	11.35	11.13	11.13
Feed Consumption								
Oats	1283.0	1328.0	1548.00	1077.0	1375.00	1382.0	1255.0	1097.00
Wheat	2587.0	2682.0	3122.00	2163.0	2775.00	2792.0	2537.0	2213.00
Alfalfa	4720.0	5110.0	5560.00	4340.0	5250.00	5225.00	4940.00	4010.00
Total Feed	8590.0	9120.0	10230.00	7580.0	9400.00	9400.00	8732.00	7320.00
Feed 1# Gain	9.82	9.31	11.38	8.49	9.29	10.92	9.93	9.36

LAMB FEEDING INCOME AND EXPENSE
(Per Lamb Basis)

	Pen 1 5 grm level	Pen 2 Cont. 0 grm level	Pen 3 30 grm level	Pen 4 20 grm level	Pen 5 5 grm level	Pen 6 Cont. 0 grm. level	Pen 7 30 grm level	Pen 8 20 grm level
Feed Costs								
Oats @4.5¢/lb.	1.92	1.99	2.32	1.62	2.06	2.08	1.88	1.65
Wheat 4.0¢/lb.	3.45	3.58	4.16	2.88	3.70	3.72	3.38	2.95
Alfalfa 2.5¢/lb.	3.93	4.26	4.63	3.62	4.38	4.40	4.12	3.34
Total Feed Cost	9.30	9.83	11.11	8.12	10.14	10.20	9.38	7.94
Feed Cost/lb. Gain Marketed	.361	.336	.418	.308	.334	.385	.374	.285
Wool Income								
Wool wt.	3.93	4.40	4.70	4.53	4.13	4.13	4.23	4.13
Wool Inc. @.83/lb.	3.26	3.65	3.90	3.76	3.43	3.43	3.51	3.43
Shearing Expense	.81	.81	.81	.81	.81	.81	.81	.81
Net Wool Income	2.45	2.84	3.09	2.95	2.62	2.62	2.70	2.62
Drug & Death Costs								
Drugs (Incl. vacc. & Drench)	.50	.50	.50	.50	.50	.50	.50	.50
Death Loss	.00	.00	.00	.00	.00	.00	.00	.00
Total Income								
Lamb sales	48.72	48.31	47.73	47.19	49.25	47.19	46.80	45.06
Wool sales	3.26	3.65	3.90	3.76	3.42	3.43	3.51	3.43
Total	51.98	51.96	51.63	50.95	52.67	50.62	50.31	48.49
Expenses								
Purchase Price	35.70	34.02	34.74	34.25	34.17	34.02	33.96	33.78
Feed Costs	9.30	9.83	11.11	8.12	10.14	10.20	9.38	7.94
Shearing Expense	.81	.81	.81	.81	.81	.81	.81	.81
Drug Costs	.50	.50	.50	.50	.50	.50	.50	.50
Death Loss	.00	.00	.00	.00	.00	.00	.00	.00
Trucking to Sioux Falls	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	47.31	46.16	48.16	44.68	46.62	46.53	45.65	44.03
Return to Labor and Management	4.67	5.80	3.47	6.27	6.05	4.09	4.66	5.46

SECTION II

Reports of

Sheep Research in Progress

At the

Main Station, Fargo, N. D.

Presented by
Merle R. Light

at the

18th Annual Sheep Day

Hettinger Experiment Station
Hettinger, North Dakota

February 9, 1977

PROJECT: H-7-056

TITLE: Border Leicester and Finn Crossbred Ewe Evaluation Under Two Environments

PERSONNEL: M. R. Light, D. O. Erickson, J. E. Tilton, M. J. Marchello T. C. Faller

SPECIFIC PROBLEM AREA: 310

OBJECTIVES:

To evaluate crossbred ewe productivity under western North Dakota conditions and under conditions in eastern North Dakota

PROCEDURE:

Fifty-six Border Leicester and fifty-six Finn sired ewe lambs were purchased in July of 1973.,All ewe lambs originated from the same South Dakota flock. One half of each cross was randomly assigned to the Hettinger Experiment Station at Hettinger and to the Main Station at Fargo. Ewe lambs assigned to Hettinger were grown on grass pastures following purchase. Ewe lambs assigned to Fargo were grown through their yearling year on alfalfa hay and two pounds of oats daily from July 1 through February.

ABSTRACT OF PAST YEARS EXPERIMENTATION: (MAIN STATION)

All experimental ewes were handled as one unit and were pastured on brome and June grass pastures during the summer months. "Flushing" was accomplished by turning the ewes into a breeding pasture containing fall regrowth of brome and June grass. Suffolk and Hampshire rams were mated to the ewes commencing September 1.

Lambs were weaned from their days at approximately 45 days of age and were then finished to market weights in dry lot. Feed records show that lambs from Border Leicester ewes consumed an average of 361 pounds of total feed from birth to market while lambs from Finn crossbred ewes consumed and averaged 325 pounds.

Death losses in crossbred lambs were greater than normal in 1976 mainly because of a outbreak of Colibacillosis causing diarreha, dehydration and enterotoxemia in lambs 6-12 hours of age.

ABSTRACT OF PAST YEARS EXPERIMENTATION: (HETTINGER)

All experimental ewes were handled as one unit and were flushed on alfalfa-brome grass pastures. Suffolk and Hampshire rams were mated to the ewes beginning October 1.

Lambs and ewes were grazed on tame grass pastures until weaning at approximately 90 days of age. Post weaning lambs were grazed on tame grass pastures until 200 days of age when they were implanted with (zeranol) and pastured on alfalfa stumpage. All lambs were sent to market at approximately 250 days of age and a weight of 99.1 pounds. Lambs from Border Leicester cross ewes averaged 105.2 pounds and those from Finn cross ewes averaged 94.5

TABLE I
EWE PERFORMANCE
Main Station

	Border Leicester Cross	Finn
No. ewes mated	25	25
No. Ewes Lambed	24	25
No. Lambs Born	48	57
No. Lambs Weaned	36	46
% Lambs Born	192.0	228.0
% Lambs Weaned	144.0	184.0
% Death Loss	25.0	19.3
Av. Birth Wt.	10.2	8.6
Av. 28 Day Wt.	29.7	26.9
Av. 90 Day Wt.	73.8	61.9
Av. Mkt. Wt.	96.0	90.3
Av. Wool Wt.	11.1	8.7

TABLE II
EWE PERFORMANCE
Hettinger Station

	Border Leicester Cross	Finn
No. Ewes Mated	23	24
No. Ewes Lambed	19	24
No. Lambs Born	37	52
No. Lambs Weaned*	33	43
% Lambs Born	160.8	216.7
% Lambs Weaned*	143.5	179.2
% Death Loss	10.8	17.3
Ave. Birth Wt.	11.2	8.4
Ave. 28 Day Wt.		
Ave. 90 Day Wt.	58.0	54.1
Ave. Market Wt.	105.2	94.5
Average Wool Wt.	10.4	8.2

* Represents only those lambs raised on dam.

PROGRESSIVE PNUEMONIA

Chronic progressive pnuemonia, a contagious virus disease of adult sheep was first reported by H. Marsh of Montana in 1923. "Lungers disease" has been identified since that time in almost every major sheep producing country. Geographically, chronic progressive pnuemonia has been reported in South Africa, Iceland, Britain, France, Germany, India and in America. This disease is characterized as a slowly developing but continuous pnuemonia with physical weakness, labored and rapid breathing accompanied by emaciation. Some authors state that 100% of affected sheep die. Reduced productivity is noted in affected flocks.

Progressive pnuemonia, in the United States, has been thought of mainly as a disease of range ewes in which 1 to 2 percent of ewes in affected flocks contract the disease. In Iceland it has been estimated that as many as 20 to 30 percent of ewes in infected flocks contract the disease.

The extent to which chronic progressive pnuemonia affects ewe flocks in North Dakota has not been documented. Private communication from purebred breeders in particular indicate that losses due to "lungers disease" are increasing. It is known that chronic progressive pnuemonia has existed in flocks at the main station in Fargo for at least twenty years.

Experimental

This study was initiated to determine (1) the genetic basis of resistance to progressive pnuemonia or the existence of resistance to infection and (2) epidemology and prophylactic aspects of progressive pnuemonia.

Lambs were selected in 1974 and 1975 in an attempt to establish flocks of Border Leicester, Suffolk, Columbia and Hampshire sheep that were free of the virus causing progressive pnuemonia. Lambs were from flocks in which progressive pnuemonia was known to exist. Methods used to create these flocks were to (1) Remove lambs from ewes immediately following parturition. Licking of lambs by

ewes or suckling by lambs was not permitted. (2) Lambs were raised on lamb milk replacer and natural grains and roughages. (3) Lambs were raised in buildings that had been free of sheep for 5 to 6 months and were thoroughly cleaned, limed and disinfected.

Results and Discussion

Losses of new born lambs was greater than desired initially. Subsequent use of cows milk colostrum plus the use of injectable vitamins A, D and E and selenium along with the use of anti-toxin injections to prevent enterotoxemia was effective in preventing losses of new born orphan lambs.

The general health of ewes in experimental flocks has been excellent. There have been no observation of respiratory disease, coughing, crusted eyes or nasal exudate in the isolation flock.

Blood was drawn from all ewes in the isolation flocks and parental flocks during September of 1975. Analyses of blood sera samples were made at the USDA National Disease Laboratory at Ames, Iowa to determine the extent of infection. The technique employed was an agar gel immunodiffision test to determine the presence or absence of antibodies agains progressive pnuemonia virus. Sera analyses of ewes from all flocks have not been completed. The results of partial analyses are presented in Table I.

TABLE I. RESULTS OF IMMUNODIFFUSION TEST

	Parental Flocks		Isolation Flocks			
Breed	Columbia	Rambouillet	Hampshire	Suffolk	Border Leicester	Columbia
No. Ewes	26	38	15	17	14	19
No. Positive	12	24	0	0	0	0
% Positive	46.2	63.2	0.0	0.0	0.0	0.0

The results indicate that sheep in isolation flocks have not contracted progressive pnuemonia to date. In contrast, rather large percentage of ewes in parental flocks have contracted progressive pnuemonia. In parental flocks 20 percent of ewes 1 to 2 years of age reacted positively and 50 percent of ewes 2 to 3

years of age reacted positively. These results indicate that it may be possible to establish sheep flocks that are free from virus pnuemonia. Further research is indicated to determine if breed or individual differences exist in resistance to progressive pnuemonia. Methods to control or eliminate progressive pnuemonia in infected flocks need to be established.

SECTION III

GUEST SPEAKER REPORTS

Presented by

DR. CHARLES PARKER

Ohio Ag. Research &
Development Center
Wooster, Ohio

At the 18th Annual Sheep Day

Hettinger Experiment Station
Hettinger, N. D.

February 9, 1977

* All reports in this section reprinted from 1976
Ohio Sheep Day Report

GENETIC CONTROL OF REPRODUCTIVE PERFORMANCE: ROLE OF FINNSHEEP

C.F. Parker, C.B. Boyles, and R.A. Krause
Department of Animal Science

The proper breed type for optimal performance in a given sheep operation should be determined by the degree of intensification desired and influenced by the nutrient resources, physical facilities, markets, and managerial abilities. The Finnsheep breed provides an opportunity to establish a genetic framework to break the common lamb crop percentage barrier and to establish lamb meat production as an important alternative enterprise for utilizing resources responsiblity.

The major economic output for commercial ewe flocks in Ohio is the quantity of lamb marketed annually. The most important biological factors affecting yearly lamb production include: sexual maturity, percent conception, lambing rate, and lamb livability. These lamb meat production components can be accumulated overall for the ewe flock and expressed as lamb crop percentage or the annual number of lambs produced per ewe. The average annual lamb crop percentage of approximately 100 has remained rather constant for Ohio flocks during the past 20 years. Nutrition is recognized as an important limiting factor on reproduction. However, few ewe flocks average more than a 50 to 60 percent twinning rate and therefore have an inherently unacceptable barrier for high lamb crop percentages even under the most ideal flock conditions.

Research at this station has been designed to study methods for improving lamb crop percentage. Finnsheep and Border Leicester rams were introduced in 1971 to determine their potential value for improving the reproductive performance through the production of crossbred ewes for lamb meat production.

Straightbred Finn and F_1 Finn x Suffolk rams were initially purchased to cross with Dorset, Rambouillet, and Targhee ewes to produce replacement crossbred ewes with 50 percent and 25 percent Finn breeding. Subsequently, F_1 Finn x Dorset and Finn x Rambouillet rams were used to sire crossbred replacement ewes. Border Leicester rams were used to produce F_1 Border Leicester x Rambouillet and Border Leicester x Targhee ewes.

All ewe lambs were developed for first mating at 7 to 9 months of age during mid-October to late November. Ewe lambs were managed separately prior to and during breeding, gestation, and lactation. It was considered important to maintain the ewe lambs at an optimal level of development but to avoid excessive weight gains or condition during late pregnancy. Suffolk rams were used for all mating groups regardless of ewe age. Breed group samples of ram lamb offspring are being finished to market condition and slaughtered to study growth rate, weight at market condition, and carcass characteristics.

A total of 460 crossbred ewe lambs have been exposed for breeding since 1972. The 4-year summary on their reproductive performance is presented in Table I. There is a highly significant influence of the Finnsheep breeding on conception and lambing rates. For the F_1 ewe lambs, 87.9 percent of those mated lambed and more than 50 percent of those lambing had twin births at approximately 12 to 14 months of age. A small number of F_1 Finn cross ewes had triplets at their first lambing.

Early sexual maturity with high conception rate is important if the breeding of ewe lambs is to be successful. The value of multiple births at first lambing may be dependent upon the type of flock management available. Yearling ewes can rear twin lambs if properly managed. However, since only half of the F_1 ewes lambing in this study dropped twins, proper nutrition during gestation according to need becomes more difficult. Those ewe lambs with a single pregnancy would tend to be over-fed while those with multiple pregnancy could be undernourished at the same level of nutrition. The ¼ Finn ewes can be more easily managed according to their nutrient requirements because of their having a higher percentage of single births at first lambing. The conception rate and lambing rate of the Border Leicester yearling ewes were less than the Finn cross ewes and higher than the level expected for straightbred Rambouillet and Targhee. Lambing difficulties were minimal but proper nutrition was considered important. The crossbred Finn ewes have smaller lambs at birth with excellent livability.

TABLE I. Reproductive Performance of Yearling Ewes.

Breed Cross	Number	Percent Lambing	Lambing Rate	Lambing Percentage
½ Finn	190	87.9	154.5	135.8
¼ Finn	204	77.9	115.1	89.7
½ Border Leicester	66	72.3	110.4	80.3

TABLE 2 Lambing Rate of Two and Three-Year-Old Ewes.

Breed Cross	Age	Number	Lambing Rate
½ Finn	2 yr.	17	194.1
	3 yr.	42	228.6
¼ Finn	2 yr.	37	186.5
	3 yr.	25	204.0
½ Border Leicester	2 yr.	8	137.5
	3 yr.	20	160.0

The lambing rates of 2 and 3 year-old ewes are presented in Table 2. The Finn cross ewes show high rates of lambing at both ages. The ½ Finn ewes excell the ¼ Finn ewes for lambing rate, but the latter provide a genetic potential for two lambs born per ewe lambing.

Specific Finn cross ewes are currently being studied under three systems of management. These systems include: complete year-round in-barn confinement on expanded metal floors, partial confinement prior to and during lambing and early lactation, and limited housing with maximum forage utilization and low labor and capital inputs. An accelerated lambing schedule of three lambings per 2 years is being evaluated with a portion of the ewes in confinement. To date, the ¼Finn ¼ Suffolk ½ white face cross ewes show outstanding potential and general adapatability for a once-a-year lamb production systems. Their relatively high

conception rate as lambs, gradual increase in lambing rate with age, and large body size balance a number of traits of importance in lamb meat production. The ½ Finn ½ Dorset ewes have the highest lambing rates at all ages starting with 166.7 percent at one year of age and increasing to 233.3 percent at age three. These ewes may be highly adapted to intensive lamb production systems.

FEEDING AND BREEDING EWES IN CONFINEMENT HOUSING

C. F. Parker
Department of Animal Science

The TDN requirements of gestating ewes reared in confinement housing can be substantially reduced from the recommended NRC levels. This suggests that a lower quality feed can be substituted into the diets of ewes in confinement with the potential of a lowered annual ewe feed cost. Location and date of breeding can be important factors affecting the reproductive performance of ewes. The performance of ewes mated during the optimum breeding period of early to mid-October is not highly influenced by the effects of location of mating, age of ewe, or breed type. However, age of ewe and breed type can affect reproductive performance during early and late fall breeding periods and should be given consideration in planning the management of the breeding flock for optimal lamb production.

The versatility of sheep for adaptation to a wide range of environmental circumstances is a unique advantage. The increased genetic variability and potential for lamb meat production with an abundant source of high fiber refuse feed sources from increased grain production creates an opportunity for greater intensification of sheep raising in the Midwest. Where land prices are relatively high and generally adapted to grain production, confinement of the ewe flock to eliminate fencing costs, predation losses, and internal parasites becomes a possible alternative system to more fully utilize available resources. An increased research effort is being conducted to evaluate confinement sheep production.

The Ohio Agricultural Research and Development Center constructed a housing facility during summer 1973. The confinement building has expanded metal floors, electrically-powered manure removal, and a bunk line feeding arrangement to self-feed or limit-feed diets on a time interval basis. A bottom unloading poured concrete silo was built to maximize utilization of silage. Some groups of ewes are being maintained continuously in confinement. Other groups are grazed and enter the facility during late gestation to be housed for approximately 3 months or until their lambs are weaned at 45 to 60 days of age. To date, three lambing seasons have been completed in the facility.

A change to confinement housing establishes a different environment from conventional sheep management systems and, therefore, generates many questions and unrecognized opportunities for more profitability from sheep. A number of recognized animal-environment relationships need to be studied before confinement housing can be properly evaluated. The question of space requirement becomes critical because of the capital investment per producing unit. Feed requirements are expected to change for sheep reared in confinement. The effect of breeding in confinement on reproductive performance needs further clarification. The behavior patterns of confined sheep and their influence on performance are questions related to the confinement housing of sheep.

Since a high portion of the annual ewe cost is for feed, the nutrient requirements of ewes in confinement were of immediate concern. Three groups of mixed breed type ewes were used in a study of enery requirements of ewes in confinement. The three treatment flocks consisted of 44 crossbred and 3 and 4 year old ewes, 48 2 year-olds, and 112 crossbred yearling ewes bred as lambs. The test was conducted during gestation (90 days for the 2 year old ewes, 103 days for the

yearling ewes, and 132 days for the older ewes). Diets consisted of a high percentage of corn silage (35 percent dry matter) supplemented with 17% crude protein alfalfa pellets.

Figure 2 depicts the amount of TDN fed and the expected amount required for the actual average weight gain realized for each of the three test groups. The predicted TDN values were calculated from National Research Council (NRC) formulas that estimate the maintenance and gain requirements for sheep. The formulas are most applicable for sheep through the first 15 weeks of pregnancy and less useful for the TDN requirements during late gestation. Therefore, the predicted levels of TDN for the actual gains are higher than would be expected for ewes in mid to late gestation. Note the ewe group with an average mid-test weight of 154 lb. was fed 1.87 lb. per head of TDN daily. The average daily gain of 0.28 lb. during the 132 days for this group was twice the level of gain expected from the actual TDN fed during gestation. A similar difference was observed for the 2-year-old Rambouillet ewes. These ewes had an average daily gain for 90 days of 0.39 lb per day. The actual TDN consumption was 1.85 lb with a gain response for an expected intake of 2.57 lb of TDN according to the NRC standards for non-pregnant ewes. The gain realized by this group is the same recommended by NRC during the last 6 weeks of gestation from feeding 2.42 lb. of TDN daily. This gain response represents an estimated level of TDN required that was 30 precent greater than the actual amount fed. The results from these two groups of ewes indicate that a considerable reduction in feed can be realized for older ewes housed in confinement during gestation. This finding in feed savings suggests the possibility that lower quality feed sources can be used in a greater portion of the diet of ewes reared in confinement. An average daily gain of 0.25 lb. for 112 ewe lambs from 1.90 lb. of daily TDN was the same level of performance expected from the NRC standards. These lambs were on test for 103 days with an average weight of 108 lb. It appears the NRC levels for pregnant ewes of this size are adequate for the development of ewe lambs during late pregnancy.

During the past two fall breeding seasons, a large number of ewes varying in age and breed type have been included in a study of the effects of location at breeding and date of breeding on lambing rate. Mating on pasture vs barn

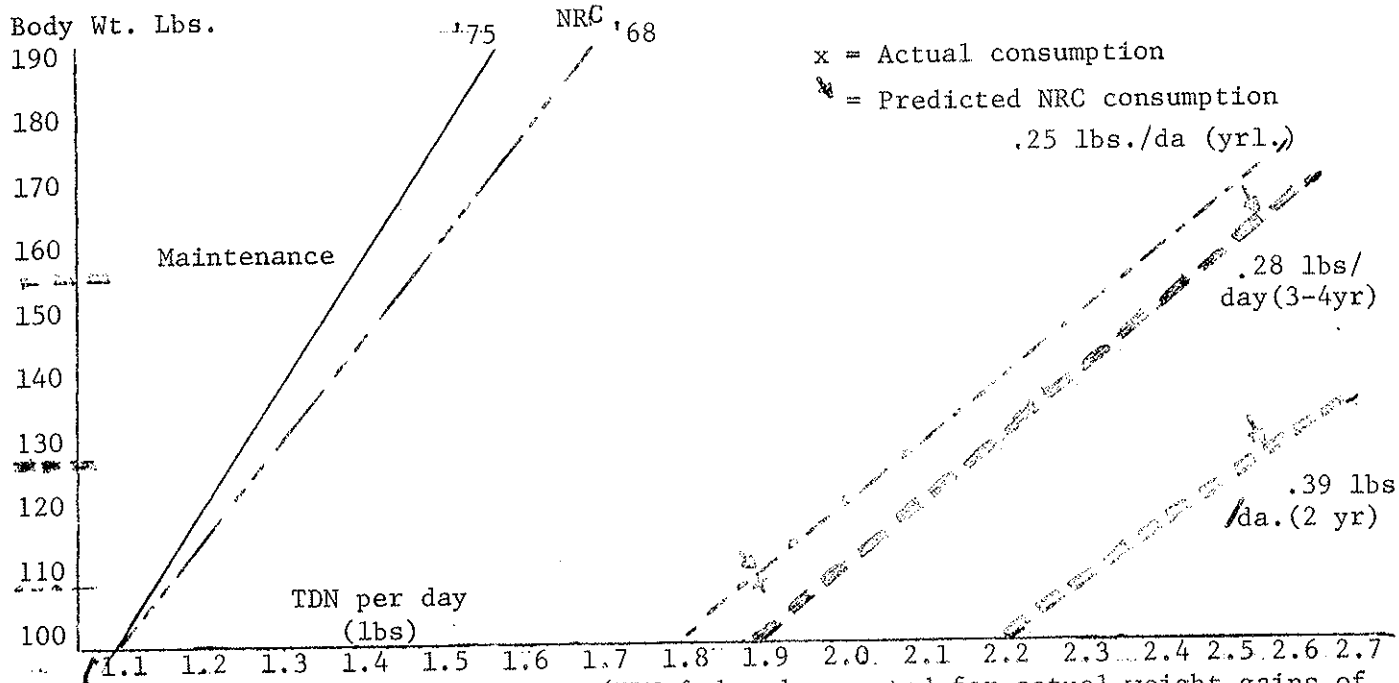


Fig. 2 - Total digestible nutrients (TDN fed and expected for actual weight gains of ewes in complete confinement.

confinement had no important effect on the lambing rate of 2 and 3-year old ewes conceived during mid-October to mid-November. However, there were important differences due to location of breeding and age of ewe for 185 Targhee, Columbia, and F_1 Columbia x Targhee ewes mated for March and early April lambing. The percentage of ewes lambing was not markedly affected, but the lambing rate was slightly higher--159.0 vs 154.0% for the 85 mature ewes and 174.1 vs 139.0% for the 2 year old ewes when mated on pasture vs. in the barn, respectively. Ewes mated in confinement were housed on expanded metal floors and allowed approximately 8 to 10 square feet per ewe. These results show that an important relationship exists between the location of mating, age of ewe, and lambing rate. The lambing rate of younger ewes appears to be more highly affected by breeding location when mated before the optimum breeding period of early to mid-October.

There appears to be a breed effect on lambing rate for early fall-mated ewes compared to late fall-mated ewes. Balanced breed groups of ewes mated on pasture in September were compared to those mated on pasture during November and December. Overall, the September-mated ewes had a higher lambing rate (171.0%) than the November-December mated ewes (162.7%). However, differences in breed type were more important between breeding dates. Ewes with 50% or more Rambouillet breeding had higher lambing rates when mated early, while the F_1 Border Leicester x Targhee and straightbred Dorset ewes had higher lambing rates from the late mating period. These results show that the effects of location at breeding and date of breeding can interact with age of ewe and breed type to have an important influence on lamb production. High lambing rates can be expected when proper consideration is given to the management of the breeding flock. In fall 1975, 74 two and three-year-old ewes were mated on expanded metal floor in the new confinement housing facility with excellent conception and lambing rates from a late October early November breeding period. For a mating period of 34 days, 94.5% of the ewes lambed with an average lambing rate of 188% during a 26-day lambing interval.

WOOL EATING AMONG EWES IN COMPLETE CONFINEMENT

K. E. McClure and C. F. Parker
Department of Animal Science

We have had 3 years of experience with a total confinement research facility for sheep at OARDC. This barn has an expanded metal floor with metal gates and partitions. One of the more frustrating management problems encountered to date has been excessive wool eating among ewes on limited rations during period of maintenance and early gestation. A prelimary study indicates that the problem is reduced by increasing the fiber in diets of confined ewes.

Wool eating has been a problem with ewes in confinement during all winter seasons, but it became most pronounced during winter 1975-76. The wool eating was so extensive that four animals died from apparent exposure to cold due to an almost complete loss of wool. One group of wool-less ewes was moved to conventional housing to avoid further death losses.

During the past two seasons, some groups of ewes in this facility were fed at 60% of NRC TDN requirement levels. At this level, all ewes were maintained in a near ideal body condition during each productive phase (maintenance, gestation, and lactation). To feed ewes to appetite with corn silage (the basal ration ingredient both years) in such a facility, would not only be an inefficient use of feed, but could also result in lambing problems (ewe and lamb mortality, etc.) from ewes being too fat and lambs becoming excessively large at lambing.

Counterpart ewes on winter pasture and in conventional housing did not exhibit the wool eating tendency. These ewes were fed at 100% of NCR requirements levels, or were on pasture. Ewes moved from winter pasture to the confinement facility and placed on the corn silage feeding regime began eating wool within 4 days.

When the wool eating problem became more acute during the past winter, additional fiber in the form of straw and peanut hulls was included in the diets of all ewes in confinement. Concurrently, a preliminary experiment was conducted with a group of Rambouillet ewes to study the inclusion of fiber (dry matter).

Twenty-one 3 year old Rambouillet ewes were allotted equally to three TDN/DM treatment levels. It was determined that by feeding these ewes the corn silage available at a level of 60% of TDN requirements, the dry matter level fed was only 54% of that suggested in the NRC table. Treatments were set up to feed additional fiber to adjust the dry matter intake to the TDN intake as indicated in Table 1 (phase 1). Ewes were fed at a maintenance level but at an exaggerated weight (154 lb.) since they were in thin condition. They were fed for 5 weeks at these levels.

The groups of ewes were then switched to alternate TDN/DM treatments to determine if the wool eating condition would change, Table 1 (phase 2). The phase 2 diet was a late gestation level recommended for 132 lb. ewes. In both phase 1 and phase 2, the ewes were fed 60% of TDN levels recommended by NRC with the dry matter levels varied as indicated in Table 1.

The inclusion of wheat straw and/or peanut hulls in the diets of all ewes in the confinement barn tended to stop the wool eating. The observations in Table 1 (phase1) would indicate that additional fiber added to increase the dry matter level to equal the TDN level (60%) had a marked influence on wool eating.

TABLE I EFFECT OF ADDED FIBER (DM) AND SODIUM BICARBONATE ON WOOL EATING

Animal Group[b]	Phase 1 Maintenance (154 lb. ewe) 1	2	3	Phase 2 Late Gestation (132 lb. ewe) 1	2	3
Ave. wt. (lb)						
Initial	118	117	118			
5 weeks	116	121	124			
Ave. wt. (lb)						
Initial				116	121	124
3 weeks				128	133	125
(Ration components as fed, lb.)[a]						
Corn Silage[c]	3.5	3.0	1.4	3.7	5.4	5.4
Straw	---	0.4	1.3	1.1	---	---
Soybean Meal	---	---	0.25	0.25	0.15	0.15
Sodium Bicarbonate	---	---	---	---	0.1	---
Levels of Feed as % of NRC						
TDN	60	60	63	60	60	60
DM	54	60	71	60	51	51
Wool Eating[d]						
Observed	Yes	No	No	No	Yes	Yes

a Crude protein levels in all ration combinations were 100% of NRC levels.

b The animal groups remained the same for Phase 1 and Phase 2 (7 ewes per animal group).

c Corn silage was treated with 1.0% urea, 0.5% limestone, 4.0 lb. dicalcium phosphate and 1.0 lb. Dynamate per ton at ensiling time. Corn silage dry matter 39.5%, Phase 1, and 36.2% Phase 2.

d In the Rambouillet ewes, wool was eaten in a manner which resulted in a pattern effect. Wool was removed from the top of the neck down over the withers and over the rump. Wool was not eaten from the middle of the back.

The wool eating condition was reversed by switching the TDN/DM levels (Table 1 phase 2). The evidence of wool eating was indicated by white edges along the periphery of the patterns where wool had been previously removed. Where wool had been eaten from these edges, the area was white similar to mechanically shorn sheep. There were no white edges when no wool was eaten.

Rumen pH was measured with a stomach tube on three ewes of each group on 2 different days during each phase. There was a tendency for pH to be higher when additional roughage was included. In phase 2, pH was highest where sodium bicarbonate was fed. However, wool eating still occurred. Rumen pH did not appear to be a primary factor for the wool chewing condition. Therefore, supplemental sodium bacarbonate did not appear to be important to the solution of the problem.

Before the ewes were shorn, a subjective estimate was made of the amount of fleece remaining on the animal. Of the 21 ewes on the study, four had undamaged fleeces (averaging 10.4 lb./fleece). The remainder had fleeces estimated as low as 40% of the original. Using estimated percentage of fleece, the actual grease fleece weights were adjusted to 100%. The adjusted fleece weights averaged 10.1 lb. of wool per ewe. The actual shorn fleece weights resulted in 7.7 lb of wool per ewe. Thus, 2.4 lb. of marketable wool per ewe (23.9%) were lost due to wool eating in this group of animals. This would be in excess of the amount of wool value required to pay for shearing. This was a modest estimate of the wool eating problem since more wool was eaten from some groups of ewes in confinement than those in this preliminary study.

The quantity of fiber is apprently an important factor in the diet of ewes in confinement. The inclusion of straw and/or peanut hulls tended to decrease the incidence of wool eating among all ewes in confinement during the past winter.

It appears from the results of this preliminary study that actual fiber intake was more important than elevated rumen pH in controlling wool chewing. We are planing to continue to study the influence of fiber levels on wool eating in confinement. Other factors, such as animal behavior, are possibly associated with this problem.

MANAGEMENT SECTION

Taken From

Previous Sheep Day Reports

HETTINGER BRANCH EXPERIMENT STATION

FLOCK CALENDAR - OUTLINE

PRIOR TO BREEDING

1. Bag and mouth ewes and cull those that don't meet requirements.

2. Replace culled ewes with top-end yearlings saved for replacement.

3. Drench ewes (Phenothiazine).

4. Evaluate Sires:

   a. Be sure they are vigorous, healthy and in good breeding conditions (possibly production tested).

   b. Allow 3 rams to 100 ewes under range conditions and 2 when pen breeding, as in small lots or pastures.

5. Crutch ewes.

6. Flush ewes (if in thin condition)

   a. 1# grain 2 weeks to 5 weeks (usually 17 days).

   b. Moving ewes to a better quality pasture prior to breeding will serve as an effective flush.

      *if ewes are overconditioned the effect of flushing will be lessened.

BREEDING

1. Test rams with marking harness or water color paint on brisket to see if they are getting the job done (change colors at the end of first 17 days).

2. Leave rams in NO LONGER than 57 days (38-40 days more desirable).

3. Remove rams (don't winter rams with ewes).

PRIOR TO LAMBING (First 15 weeks)
Early Pregnancy

1. Watch general health of ewes, if possible sort off thin ewes and give extra feed so they can catch up.

2. Feed the poor quality roughage you have on hand during this period saving the better for lambing.

LAST SIX WEEKS BEFORE LAMBING

1. Drench Ewes (Thiabendazole).
2. Six - four weeks before feed 1/4 - 1/3# oats per ewe per day.
3. Shear ewes, trim hoves and vaccinate ewes for example: Entrotoxemia, Vibriosis, Soremouth.
4. Four weeks before lambing increase grain to 1/2 - 3/4# per head per day. (Usually done immediately after shearing).
5. Check facilities and equipment to be sure everything is in order.
6. Two weeks before lambing increase grain to 1# per head per day.

LAMBING

1. Watch ewes closely as extra effort will be repaid with more lambs at weaning time.
2. Put ewe and lambs in lambing pen (jug) after lambing (not before).
3. Be available to provide assistance if ewe has troubles.
4. Disinfect lambs navel with iodine as soon after birth as possible.
5. Use heat lamps in cold weather.
6. Be sure both teats are functioning and lambs nurse as soon as possible.
7. Brand ewes and lambs with identical numbers on same sides.
8. Turn ewes and lambs out of pen as soon as all are doing well. (24 hrs. - 6 days).
9. Bunch up ewes and lambs in small groups 4-8 ewes and then combine groups until they are in a workable size unit.
10. Castrate and dock lambs 1-2 weeks after birth.

SUPPLIES THAT MAY BE NEEDED DURING SEASON

1. Good disinfectant.
2. Forceps or Balling gun
3. Syringe and needles
4. Hoof trimmer
5. Sulfa urea Boluses for ewes that were assisted in lambing.

6. Iodine for disinfecting navels.

7. Soap and mineral oil.

8. Tri-sulfa pills for treatment of early pneumonia symptons.

9. Mastitis ointment.

10. Branding paint and irons.

11. Heat lamps for severe weather.

12. Docking and castrating tools.

13. Surgical scissors.

14. Needle and thread in case a suture is needed.

15. Crate for mothering-up lambs and adopting.

END OF LAMBING TO WEANING

1. Feeding practices will vary depending on the time that lambs were born.

   A. Dec. 15 - March 1 - Lambs are usually creep fed and not allowed to go on pasture before market.

   B. Lambs born after March 1 are usually not creep fed and allowed to go on pasture during summer.

2. Drench ewes before turning them on pasture. (Phenathiazine.)

   * try and drench according to a program that works for you, (don't wait until signs of worminess appear, it is too late then).

3. Rotate pastures if possible, this also is helpful in internal parasite control.

WEANING TO PRE-BREEDING

1. Time of rest for ewes

2. Time for shepherd to adjust ewes conditions so they can be effectively flushed, for next breeding season.

ORPHAN LAMBS - MANAGEMENT IDEAS

1. Buy a good milk replacer, Should be 30% fat. Good replacers available from:
   A. K & K Mfg., Rogers, Minn.
   B. Land O'Lakes
   It will cost approximately 30¢ per pound and each lamb will require from 12 to 15 pounds.

2. Use fgood equipment. NDSU has had good success with the LAMB bar, K & K Mfg. sells a self priming nipple and tube assemble that we have found to be excellent for starting orphans.

3. Start on nurser quickly. Young lambs start easier. Check ewes udder right after she lambs and make decision. Lambs from ewes that are questionable in any manner should be put on artificial milk. Lambs will take to nurser best at young age.

4. Self feed cold milk replacer after lambs are started. Milk replacers should be mixed with warm water for best results and then cooled down. Lambs fed cold milk grow well with less problems from scours and other digestive disturbance. Cold milk keeps better too.

5. Vaccinate lambs to protect against overeating. For immediate protection use antitoxin. For long term protection use bacteria. (cl. per fringens type D).

6. Vaccinate to protect against "white muscle" disease. Use 1 Se or Bo Se.

7. Best results have been obtained when lambs are fed in groups of 3 or 4. This would be advisable when lambs are just being started. After lambs are successfully trained, they can be handled in groups of 25.

8. Orphan lamb pens should be heated. A plastic tent can easily be devised and heated. Extra heat will save extra lambs.

9. Provide colostrum milk for all orphans. Colostrum should be provided as quickly as possible. Colostrum milk is rich in fats, vitamins and antibody globulins to protect against disease organisms. Cow colostrum milk can be substituted for ewe colostrum milk.

10. Provide supplemented feed at 7 days. Use high energy, highly palatable feed. Where few lambs are being fed it may be advisable to purchase a good commercial lamb creep feed.

11. Provide clean fresh water.

12. Wean lambs abruptly at 21-30 days of age. When to wean depends upon whether lambs are eating creep feed. Newly weaned lambs will go backwards for several days. Don't worry - lambs will make compensating gains later on.