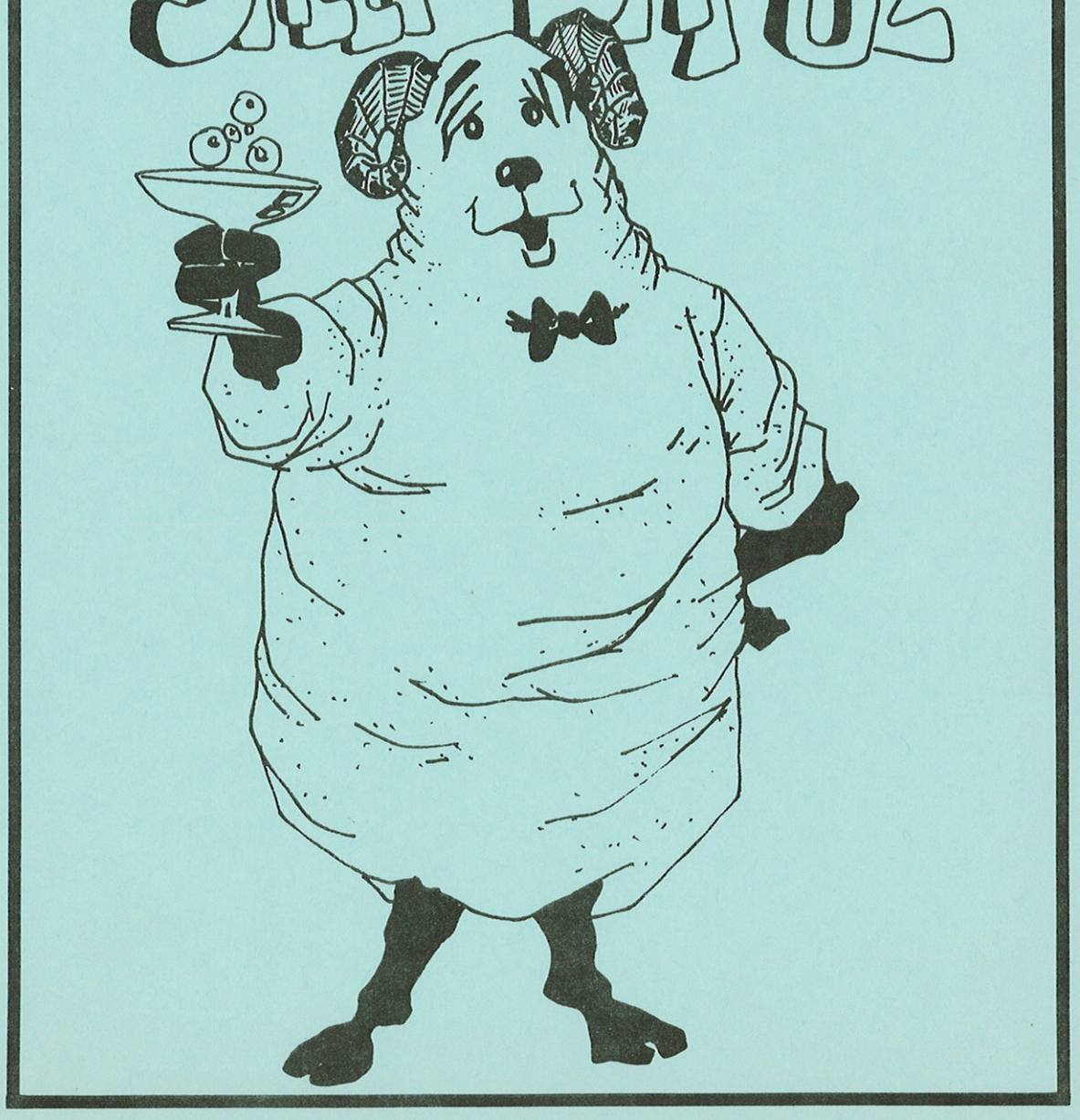
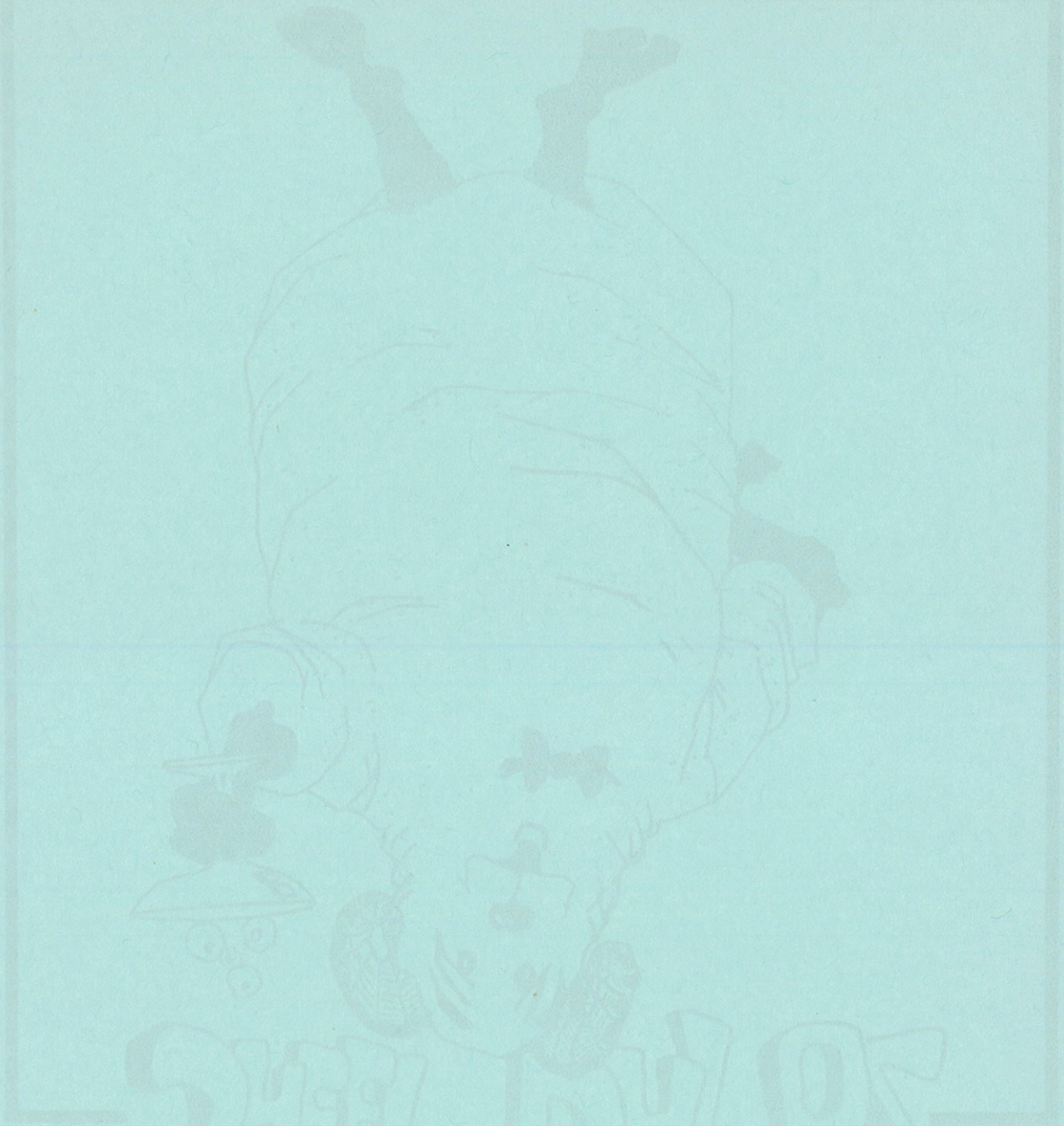
23RD ANNUAL WESTERN DAKOTA SHEEP DAY 82



WEDNESDAY, FEB. 10, 1982 · HETTINGER ARMORY

TIMOTHY C. FALLER, SUPT.

HETTINGER BRANCH EXPERIMENT STATION
NORTH DAKOTA STATE UNIVERSITY



P R O G R A M

10:15 a.m.	Coffee KING PINNER WOOL PACKER Don Hafner No. Central Wool Marketing Corp. Belle Fourche, South Dakota
11:00 a.m.	HETTINGER & FARGO STATION REPORTS Timothy C. Faller, Superintendent Professor Merle Light Dr. I. A. Schipper Dr. Duane Erickson
12 Noon	LUNCH: Roast American Lamb Dinner
1:15 p.m.	WELCOME Dr. H. R. Lund, Director Agriculture Experiment Station North Dakota State University
1:30 p.m.	PREDATOR CONTROL BY MANAGEMENT Bill Pfieffer Bureau of Sport Fisheries & Wildlife Bismarck, North Dakota
1:45 p.m.	ANGORA GOATS UNDER NORTH DAKOTA CONDITIONS? Dwight Halloway Sheep and Goat Producer Pipestone, Minnesota
2:15 p.m.	THE STORY OF A SUCCESSFUL SHEEP CONFINEMENT OPERATION Marlin Norby, Sheep Producer Fairview, Montana
2:45 p.m.	INTENSIFIED SHEEP PRODUCTION IN CANADA Gary Ransom, Rancher Ransom Enterprises Boisevain, Manitoba, Canada
3:15 p.m.	CLOSING REMARKS Richard Pfliger, President North Dakota Lamb and Wool Producers Bismarck, North Dakota
3:30 p.m.	Drawing and Coffee

* There will be a "Ladies Program" beginning at 1:30 p.m. at the Hettinger Armory

SHEEP DAY DIGEST

by

Timothy C. Faller, Supt.
Hettinger Experiment Station

1. CONFINEMENT SHEEP PRODUCTION
   Initial information affecting sheep production in total confinement Sec. I pp. 1 - 4

2. PROTEIN LEVELS
   A comprehensive series of trials involving various protein levels, sources, and their effect on gain and efficiency. Sec. I pp. 5 - 15

3. SELECTION
   A review of results of selecting replacement ewes for single heritability traits. Sec. I pp. 16 - 18

4. ACCELERATED LAMBING PROGRAMS
   A final summary of previous years reports on attempting to increase lambing frequency of the ewe. Sec. 1 pp. 19-20

5. PROGRESSIVE PNEUMONIA
   A study of the development of resistance to progressive pneumonia. Sec. II pp. 21 - 24

6. FLOCK OUTLINE
   A calendar type outline for producer use in flock management. Sec. III pp. 25 - 28

7. COLLAPSIBLE FEED BUNK
   A blue print and bill of materials for construction of the collapsible feed bunk. Sec. III

8. THE NORTH DAKOTA SHEEP PRODUCTION TESTING PROGRAM
   Complete details on use of the newly prepared testing program. Sec. III

SECTION I

Reports of

Research in Progress

at the

Hettinger Experiment Station

Presented by

Timothy C. Faller
Superintendent

Dr. Paul Berg
Animal Science Department
North Dakota State University

Dr. Duane Erickson
Animal Science Department
North Dakota State University

Professor Merle Light
Animal Science Department
North Dakota State University

Dr. James Tilton
Animal Science Department
North Dakota State University

at the

23rd Annual Sheep Day

Hettinger Experiment Station
Hettinger, North Dakota

February 10, 1982

WARM BARN CONFINEMENT SHEEP PRODUCTION
Project ND 3729

Merle R. Light, Timothy C. Faller, and Duane O. Erickson

Summary

This project was initiated with yearling ewes 7-6-81 and preliminary data are being collected according to the project outline. We have no results other than preliminary data.

Procedures

The objectives of this experiment are:

1. To determine costs involved in warm barn confined sheep production.
2. To determine effects of total confinement on ewe productivity and longevity.
3. To determine the level of wheat straw that can be added to self-fed alfalfa rations during maintenance periods.

To accomplish objective 1, warm barn housing will be compared to traditional shed lambing. Data will be collected and compared for (1) feed and bedding requirements, (2) daily labor expended, (3) water requirements, (4) energy requirements for ventilation, lighting, and supplemental heat, and (5) housing and equipment costs.

To accomplish objective 2, the effects of warm barn confinement on longevity, health, and lamb production and breed cross suitability will be determined. Two hundred and sixteen crossbred ewes of the following genetic makeup will be utilized: (1) 72 ¼ Finn x ¼ Border Leicester, ½ Rambouillet (2) 72 ½ Suffolk x ½ Rambouillet, and (3) 72 ½ Finn x ½ Rambouillet. Ewes will be assigned to traditional or confined management groups according to body weight and genetic cross. Confinement groups will be made up of 18 ewes replicated for each crossbred genetic group and placed in 12' x 24' pens where they will remain for their lifetime. The traditional management group will be fed and managed in breed groups except during the lambing and grazing period. Ewes and lambs will be housed in small cold barn-type housing.

All ewes will be mated to closely related Suffolk ram lambs and will commence lambing February 1. Lambs will be weaned at 56 days (average) and finished to a market weight of 50 kg.

The following practices will apply to all ewe groups:

1. Common rations for flushing and breeding
2. Common rations during gestation
3. Common rations during lactation
4. All lambs will be creep fed a common ration
5. A mineral mixture that is fortified with vitamins A, D, and E will be provided

6. All ewes will be vaccinated against vibriosis.

Data to be collected on each ewe are:

1. Pre-breeding weight and condition scores
2. Weaning weight and condition scores
3. Lamb birth date, and birth, weaning and market weight, and sex
4. Group feed consumption
5. Death causes
6. Lambing ease
7. Removal causes
8. Fleece weights

Lambs in each management group will be fed to market weight in groups according to their genetic makeup. All lambs will be fed a common finishing ration, and group feed efficiencies will be calculated.

To accomplish objective 3, ground wheat straw will be mixed with ground alfalfa hay to determine the levels of straw that are best suited to biweekly feeding during maintenance periods. The experimental procedure will be as follows:

1. Rations will contain 0, 20, 40, or 60 percent straw and fed twice weekly according to appetite during the periods from postweaning to flushing and mating, and from mating until 6 weeks prior to lambing.

2. Common rations will be fed to all groups during these periods:
   a. Three weeks prior to breeding
   b. During first 3 weeks of breeding
   c. Six weeks prior to parturition
   d. Lactation (8 weeks)

3. Records to be maintained are:
   a. Ewe weights
      1. Prior to flushing
      2. End of breeding season
      3. Six weeks prior to parturition
   b. Body condition scores at each weigh period
   c. Lambing records
      1. Number born
      2. Weight and sex of lambs
      3. Number of lambs weaned
      4. Weight of lambs weaned
   d. Wool production
   e. Death loss and causes

4. Experimental design
   a. Each lot will consist of 18 grade Rambouillet ewes with each lot replicated in triplicate.

Results and Discussion

Preliminary information on certain warm barn confinement costs have been collected from 11-19-80 to 12-6-81. This period included one lambing season with an average of 374.5 ewes for the 330 day period. Labor or other costs are not included for finishing lambs during the period from weaning to market. The data collection (preliminary) show the following expenditures.

Labor:	Hours	Hr/Ewe
Barn Cleaning	95.6	.25
Feeding	143.0	.38
Bedding	74.80	.19
Vaccinating and Castration	19.10	.05
Lambing	221.8	.59
Shearing	69.4	.18
Total	623.7	1.64

The total labor expenditures amounted to an average of 1.64 hours per ewe for this past year. Labor expenditures were greatest for lambing and almost equalled the labor expenditures for feeding and barn cleaning.

The costs for bedding sheep in this type of confinement would approximate $775.00 per year if straw costs were .35 per bale and if labor is calculated to cost $3.50 per hour.

Ewes consumed 1.1 gallons of water per day during the 330 period. Water consumption during the lactation period was roughly double that during the period from weaning to parturition.

A mineral mixture was offered free choice to all sheep and consumption was found to average .8 oz. per day. The mineral mixture was formulated by mixing 1/3 white iodized salt and 1/3 trace mineralized salt and 1/3 dicalcium phosphate. Almost identical consumption levels have been recorded at the North Dakota State University, Fargo, main station.

Electrical energy consumption in the confinement unit has amounted to 33.7 KWH per ewe. Electricity provides heat for office space, lighting and to provide ventilation. No supplemental heat is required for the insulated confinement unit except that provided by body heat from ewes (Twice yearly shearing required).

Data are being collected concerning objectives 2 and 3. All ewes necessary are on test and meaningful data should be available during 1982. Two hundred four whitefaced yearling ewes have been assigned to the study concerning straw and alfalfa ratios. The whitefaced ewes averaged approximately one hundred forty five pounds on July 7 and were in excellent condition when placed on trial. All lots (100% alfalfa, 80% alfalfa, 60% alfalfa and 40% alfalfa) lost weight in amounts varying from a negative 4.1 to a negative 9.2 pounds per ewe. Weight losses did not differ significantly between groups and was not associated with the proportion of alfalfa in diets offered. Some difficulties are being encountered in regulating the amounts of roughage delivered with the mechanical feeder to the various lots.

CONFINEMENT MANAGEMENT UPDATE

- Feeding 3 times per week - working excellently.

- 404 shorn ewes will heat facility under all conditions even extended period of sub-zero weather (January, 1982).

- Gravity water system works well, except for sedimentation buildups in the lines.

- Total Confinement requires 1 complete hoof trimming per year on average ewes (probably twice on Columbia type ewes).

- Cleanliness of wool is equal or superior to traditional production system (highly dependent on management).
  * we had a six months clip that was raised totally in confinement that yielded 58.7% clean wool, and the vegetable content was 1.3% (possibly could go over 60% clean with a 12 month clip).

- Total Confinement requires some type of warning system to protect against failure of ventilation system. (a standby generator is also probably a necessity).

THE PERFORMANCE OF FEEDLOT LAMBS AS AFFECTED BY PROTEIN LEVEL, PROTEIN SOURCE AND GRAINS

L. Insley, D.O. Erickson, M. Light, T. Faller, and W. Limesand

Summary

Four experiments were conducted to determine the affect of protein level, protein source and grain on the performance of feedlot lambs. Purebred lambs were fed 13%, 15%, and 17% protein rations (70% TDN) from weights of 65 pounds to finish at 105 pounds. There were no differences in gain across the three protein levels and feed efficiencies were similar at 4.11, 4.01, and 4.15, respectively. Crossbred lambs fed 11%, 14%, and 17% protein rations (70% TDN) were fed from 49 pounds to finish at 105 pounds. Lambs gained faster ($P<.001$) on both the 14% and 17% rations over the 11% ration. Gains for the 14% and 17% rations were not different. Feed efficiencies were similar 4.56, 4.13, and 4.16 for 11%, 14%, and 17%, respectively. Purebred lambs were fed sunflower meal, soybean meal or a combination of 50% sunflower meal and 50% soybean meal as the supplemental protein source and fed from 71 pounds to finish at 105 pounds. Lambs gained faster ($P<.005$) with the soybean meal and the soybean meal/sunflower meal combination rations than with the sunflower meal ration. Gains were similar for the soybean meal and the soybean meal/sunflower meal combination. Feed efficiences were not different at 4.91, 4.34, and 4.10 for sunflower meal, soybean meal and the soybean meal/sunflower meal combination. Males gained significantly faster than females ($P<.01$) on all rations mentioned to this point except the sunflower meal ration.

Crossbred lambs were fed rations containing 70% TDN with 13% or 16% protein, sunflower meal or soybean meal along with corn or 50% corn/50% barley from 57 pounds to finish at 105 pounds. Lambs gained faster ($P<.05$) on the 13% protein, soybean meal, corn ration than those on the 13% sunflower meal-corn/barley ration, the 16% soybean meal-corn ration, and the 16% sunflower meal-corn/barley ration. Lambs on the 16% sunflower meal-corn/barley ration gained slower ($P<.05$) than those on the 16% sunflower meal corn-ration, the 16% soybean meal-corn/barley ration, the 13% sunflower meal-corn ration and the 13% soybean meal-corn/barley ration. Feed efficiences were similar among rations.

Introduction

Information is needed concerning the levels of protein and the grains needed for superior feedlot performance by lambs with exceptional gaining ability. Research is also needed to determine the effectiveness of sunflower meal as a protein supplement for such lambs. Three trials designed to aid in these determinations were conducted at Fargo and one at Hettinger. These trials will be discussed under separate headings.

Trial I: Fargo - Protein Levels - Purebred Lambs

Experimental Procedure

One hundred sixty-two purebred lambs (54 Suffolk, 42 Columbia, 36 Hampshire and 30 Rambouillet) averaging 65 pounds were uniformly allotted to six pens by breed, sex and initial weight. Three pelleted rations containing calculated protein levels of 13%, 15%, and 17% were fed to 2 pens each. The major ration ingredients were corn, alfalfa and sunflower meal with total ration ingredients listed in Table 1. All rations contained 70% calculated TDN and were fed for 42 days.

Results and Discussion

The average daily gains by protein level and sex are given in Table 2. The males gained faster than the females ($P<.001$) over all three protein levels. Gains were similar for the 13%, 15%, and 17% protein levels with similar feed efficiences of 4.11, 4.01, and 4.15, respectively. These data indicate that purebred lambs capable of gaining close to 1 pound per day can do so on a properly balanced 13% protein ration with no great advantage to the higher protein rations. Initial weights were higher (65 pounds) compared to the early weaned lambs finished to market weight reported last year. Research conducted the previous year and reported last year at the "Sheep Research Day" indicated protein of 15 to 16% supported optimal gains and efficiencies. More research is currently in progress and is planned to explain these differences.

TABLE 1. Ration Composition with Calculated Protein and TDN Used for Finishing Purebred Lambs at Fargo (Sheep Barn) 1981

Feedstuff	Ration 1	Ration 2	Ration 3
Corn (shelled)	66.0	61.0	56.0
Alfalfa (pellets)	19.0	14.5	10.0
Sunflower Meal (34%)	12.0	21.5	31.0
Calculated TDN	70.0	70.0	70.0
Calculated Protein	13.0	15.0	17.0

Common to all rations (%): ammonium chloride .5, TM salt .5, limestone .3, vitamin AD & E premix .05, and terramycin.

TABLE 2. Average Daily Gains of Male and Female Purebred Lambs Fed Three Protein Levels at Fargo (Sheep Barn) 1981, with Overall Efficiencies.

% Protein	GAIN (pounds per day) Males (24)[1]	Females (30)	Average (54)	Efficiency
13	1.04	.88	.96[a]	4.11[a]
15	1.06	.89	.97[a]	4.01[a]
17	1.01	.89	.95[a]	4.15[a]

[1]( ) refers to number of animals in a group
Means with different superscript letters within a column are different @ P<.01
Males outgained females on all rations @ P<.01

Trial II: Fargo - Protein Levels - Crossbred Lambs

Experimental Procedure

One hundred thirty-two crossbred lambs (72 males and 60 females) averaging 49 pounds were allottted by sex and weight to 6 pens of 22 animals each. The rations contained calculated protein levels of 11%, 14%, and 17% and were fed in pelleted form to two pens each. Major ration ingredients were corn, alfalfa and sunflower meal with total ration ingredients listed in Table 3. All rations contained 70% calculated TDN, and were fed for 56 days.

Results and Discussion

The average daily gains by protein level and sex are given in Table 4. The male lambs outgained the female lambs ($P<.01$) on all three protein levels. The lambs gained faster ($P<.01$) on both the 14% and 17% protein rations than on the 11% ration. No advantage was seen for the 17% over the 14% protein ration. Feed efficiencies for the 11%, 14%, and 17% protein rations were similar at 4.56, 4.13, and 4.16, respectively. Such data indicates that crossbred lambs capable of gaining close to 1 pound per day require ration protein levels of close to 14%. No advantage in gain was indicated from rations of 17% protein. These data support the research reported last year.

TABLE 3. Ration Composition with Calculated Protein and TDN Used for Finishing Crossbred Lambs at Fargo (Sheep Barn) 1981

	Ration		
Feedstuff	1	2	3
Corn (shelled)	65.5	63.5	56.0
Alfalfa (pellets)	32.0	16.5	10.5
Sunflower Meal (34%)	-	17.0	31.0
Calculated TDN	70.0	70.0	70.0
Calculated Protein	11.0	14.0	17.0

Common to all rations (%): ammonium chloride .5, TM salt .5, limestone .3, vitamin AD & E premix .05, and terramycin.

TABLE 4. Average Daily Gains of Male and Female Crossbred Lambs Fed Three Protein Levels at Fargo (Sheep Barn) 1981, with Overall Efficiences.

% Protein	GAIN (pounds per day)			
	Males (24)[1]	Females (20)	Average (44)	Efficiency
11	.96	.87	.91[a]	4.56[a]
14	1.02	.93	.97[b]	4.13[a]
17	1.01	.91	.96[b]	4.16[a]

[1]( ) refers to number of animals in a group
Means with different superscript letters within a column are different @ P<.01
Males outgained females on all rations @ P<.01

Trial III: Fargo - Protein Supplements - Purebred Lambs

Experimental Procedure

Seventy-eight purebred lambs (48 Columbia and 30 Suffolk) averaging 71.5 pounds were allotted by breed, sex, and initial weight to six pens. Three pelleted rations containing 16% calculated protein and 70% calculated TDN with sunflower meal, soybean meal or a 50/50 mixture of the two meals representing the supplemental protein source were fed to two pens each. Major ration ingredients other than the protein supplements were corn and alfalfa. Total ration ingredients are listed in Table 5. Rations were fed for 42 days.

Results and Discussion

The average daily gains by supplement and sex are given in Table 6. The males outgained the females ($P<.05$) on the soybean meal and the soybean meal/sunflower meal combination rations but not on the sunflower meal ration. Lambs on the soybean meal and the soybean meal/sunflower meal combination rations outgained ($P<.01$) those on the sunflower meal ration. Feed efficiencies were variable but not significnatly different for the sunflower meal, soybean meal and soybean meal/sunflower meal combination rations at 4.91, 4.34, and 4.10 pounds of ration per pound of gain, respectively. These data indicate that sunflower meal alone as the supplemental protein source does not provide the same level of performance as soybean meal alone or a 50/50 combination of soybean meal/sunflower meal. Economic considerations as to cost and availabilty of sunflower meal should determine its inclusion or level of inclusion in feedlot lamb rations.

TABLE 5. Ration Composition with Calculated Protein and TDN Used for Finishing Purebred Lambs at Fargo (Research Center) 1981

	Ration		
Feedstuff	1	2	3
Corn (shelled)	58.5	57.0	57.5
Alfalfa (pellets)	12.5	23.5	19.0
Sunflower Meal (34%)	26.5	-	-
Soybean Oil Meal	-	16.5	-
50% Soybean/50% Sunflower	-	-	20.5
Calculated TDN	70.0	70.0	70.0
Calculated Protein	16.0	16.0	16.0

Common to all rations (%): ammonium chloride .5, TM salt .5, limestone .3, vitamin AD & E premix .05, and terramycin.

TABLE 6. Average Daily Gains of Male and Female Purebred Lambs Fed Three Supplemental Protein Sources at Fargo (Research Center) 1981, with Overall Efficiences.

Protein Source	GAIN (pounds per day) Males (14)[1]	Females (12)	Average (26)	Efficiency
Sunflower Meal	.88	.77	.83[a]	4.91[a]
Soybean Meal	1.10	.95	1.02[b]	4.34[a]
Combination Meal[2]	1.08	.84	.96[b]	4.10[a]

[1]( ) refers to number of animals in a group

[2]Combination of 50% sunflower meal and 50% soybean meal

Means with different superscript letters within a column are different @ P<.01

Males outgained females on all rations @ P<.05, differences not significant on the sunflower meal ration

Trial IV: Hettinger - Protein Supplement - Grain - Protein Level

Experimental Procedure

Three hundred-twenty crossbred lambs (approximately 50% males and 50% females) averaging 57 pounds initial weight were allotted to 8 rations. Two protein levels (13% or 16% crude protein), two protein supplements (soybean meal or sunflower meal) two grains (corn or 50% corn/50% barley) were utilized. Alfalfa was the other major feed ingredient utilized. Total ration ingredients are listed in Table 7. The rations were fed in ground form for 56 days.

Results and Discussion

The average daily gains by protein level, supplement, grain and sex are presented in Table 8. Lambs gained faster on the 13% soybean meal-corn ration ($P<.05$) than on the 13% sunflower meal-corn/barley ration, the 16% soybean meal-corn ration, and the 16% sunflower meal-corn/barley ration. Lambs on the 16% sunflower meal-corn/barley ration gained slower ($P<.05$) than those on the 16% sunflower meal-corn ration, the 16% soybean meal-corn/barley ration, the 13% soybean meal-corn/barley ration, and the 13% sunflower meal-corn ration. Feed efficiences for the eight rations are listed in the right hand column of Table 8. The males outgained the females ($P<.01$) overall and for each ration. Lambs on the corn rations outgained ($P<.05$) those on the corn/barley rations. Lambs on the soybean meal rations outgained ($P<.05$) lambs on the sunflower meal rations. Lambs on the 13% protein rations outgained ($P<.05$) those on the 16% protein rations. Efficiencies and rates of gain for these comparisons are listed in Table 9. Efficiencies were similar among rations.

TABLE 7. Ration Composition With Calculated Protein and TDN Used for Finishing Crossbred Lambs at Hettinger, 1981.

	Ration							
Feedstuff	1	2	3	4	5	6	7	8
Corn (shelled)	64.1	36.7	64.0	37.5	57.2	33.3	58.5	32.7
Barley	-	36.7	-	37.5	-	33.3	-	32.7
Alfalfa	25.9	21.5	21.1	18.0	23.6	17.8	12.5	14.2
Sunflower Meal	-	-	12.3	4.4	-	-	26.4	17.8
Soybean Meal	7.4	2.6	-	-	16.6	13.0	-	-
Calculated TDN	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
Calculated Protein	13.0	13.0	13.0	13.0	16.0	16.0	16.0	16.0

Common to all rations (%): ammonium chloride .5, TM salt .5, limestone .3, vitamin AD & E premix .05, and terramycin.

TABLE 8. Average Daily Gains of Male and Female Crossbred Lambs Fed 2 Grains, 2 Supplemental Protein Sources and 2 Levels of Protein at Hettinger 1981, with Overall Efficiencies

			GAIN (pounds per day)			
% Protein	Protein Source	Grain	Males	Females	Average	Efficiency
13	SBM[3]	C[4]	.89±.02[1](21)[2]	.69±.03(18)	.79[a] (39)	4.65[a]
13	SBM	C/B[5]	.85±.02(19)	.67±.02(19)	.76[ab](38)	4.61[a]
13	SFM[6]	C	.89±.02(22)	.65±.03(18)	.77[ab](40)	5.04[a]
13	SFM	C/B	.77±.02(22)	.68±.03(17)	.73[bc](39)	5.30[a]
16	SBM	C	.80±.02(21)	.68±.03(18)	.74[bc](39)	4.26[a]
16	SBM	C/B	.89±.02(20)	.63±.02(19)	.76[ab](39)	4.68[a]
16	SFM	C	.84±.02(19)	.65±.02(18)	.75[ab](37)	4.78[a]
16	SFM	C/B	.75±.02(19)	.64±.02(20)	.69[cd](39)	4.31[a]

[1]Standard deviation of the mean
[2]( ) refers to number of animals in a group
[3]Soybean meal
[4]Corn
[5]50% corn and 50% barley
[6]Sunflower meal
Means with different superscript letters wtihin a column are different at P<.05
Males outgain females on all rations @ P<.01

TABLE 9. Average Daily Gains Comparing Grain, Protein Source and Protein Level for Hettinger Crossbred Lambs, 1981

	GAIN (pounds per day)	Efficiency
Grain		
Corn (shelled)	.762*	4.67
Corn/Barley	.735	4.70
Protein Source		
Soybean Meal	.763*	4.55
Sunflower Meal	.735	4.83
Protein Level		
13%	.763*	4.50
16%	.735	4.88
Sex		
Males	.835*	-
Females	.662	-

*Significantly lower at P<.05
**Significantly lower at P<.001

THE RELATIVE RESPONSE TO SINGLE TRAIT SELECTION PRESSURE APPLIED TO COLUMBIA EWES
Project 6260

P.T. Berg, M.R. Light, W.D. Slanger, T.C. Faller, and C.L. Johnson

Summary

Lamb survival in this experimental flock in 1981 was not good. Percent lamb crop weaned was 123.3, 89.7 and 106.0% for the lamb production, visual selection, and wool production groups respectively. Average wool production was 10.3, 10.7, and 11.6 pounds per ewe for the three groups, respectively, which is somewhat less than the 1980 averages. Average adjusted 120 day weaning weights were 79, 74, 82 pounds per lamb for the three respective groups which was up slightly from the 1980 average for the lamb and wool production groups but down slightly for the visual selection group.

Introduction

Data on single trait selection applied only to ewes has been gathered for 13 lambing seasons. A summary of the first 11 years of the experiment was presented in the 21st Annual Western Sheep Day Report (1980). The project was redirected based on the results of that summary. Minor changes in selection criteria were made. Specifically, ewes were no longer culled automatically on age; but would be kept if in the opinion of the experiment station personnel were physically sound at six years of age and still in the upper 75% of production. Ewes lower in production were to be culled. Ewe lambs were to be selected for replacement based on their adjusted weaning weight rather than selecting replacements based on total yearly productivity of the dam from the lamb production group. These changes were made because it was felt that the major emphasis for culling a ewe was age, and since all ewes eventually became old (6 years was maximum age and an automatic cull factor) the only selection pressure was directed toward ewe lambs. Once the ewe lamb was selected as a replacement she stayed in the flock, until she died, became unsound, or reached six years of age. This essentially allowed for no "mistakes" in selection of ewe lambs, and actually decreased selection intensity as it didn't allow for culling of ewes who proved low in production. The second change in selection procedure called for selection of the heaviest ewe lamb regardless of birth type. Previous criteria called for selection of a pair of twin ewe lambs with a combined adjusted weight of, for example, 100 pounds in preference to a single lamb with a weight of 70 pounds. This type of selection definitely favored multiple births but over the course of the 11 years, no increase in lambing percent could be demonstrated and no increase relative to the first year yearling or mature weight has been documented. By making the changes in selection procedures, we hope to determine if lambing percent changes and/or weaning weight will respond more favorably to selection pressure.

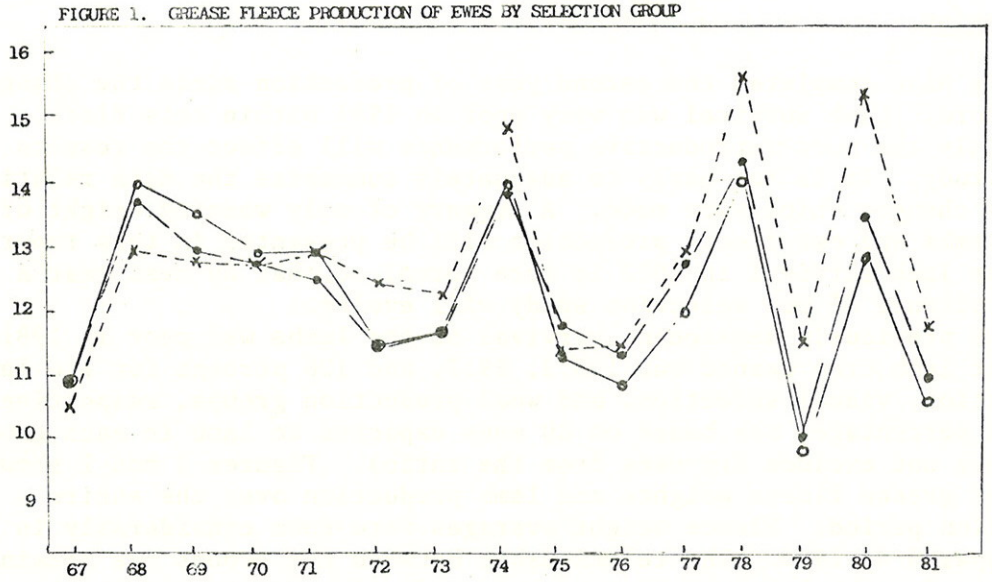
Discussion

We have completed the second year of production since the change in procedure. Lamb survival was very poor in 1981 within this flock. Certainly the poor reproductive performance will effect the results of this study. It is too early to adequately summarize the data relative to the changes which were made. A summary of only weaning weight of the 1981 lambs and ewe fleece production will be presented in this report. We hope lamb survival in 1982 is more normal so that by next year a clear picture of our selection study will evolve.

As previously mentioned, survival of the lambs was poor in 1981. Percent lamb crop weaned was 123.3, 89.7, and 106 percent for the lamb production, visual selection, and wool production groups, respectively (These percentages are based on 30 ewes expected to lamb in each group and does not exclude dry ewes from the ratio). Figures 1 and 2 show a plot of grease fleece weights and lamb production over the entire selection period. Fleece weight averages were down considerably in 1981 as compared to 1980. The relationship between the groups has remained the same for the last six years (wool production group superior to visual groups which in turn is superior to the lamb production group). This relationship between the groups may suggest that selection for wool is effective even though there may be a fluctuation in phenotypic (weight) values from year to year.

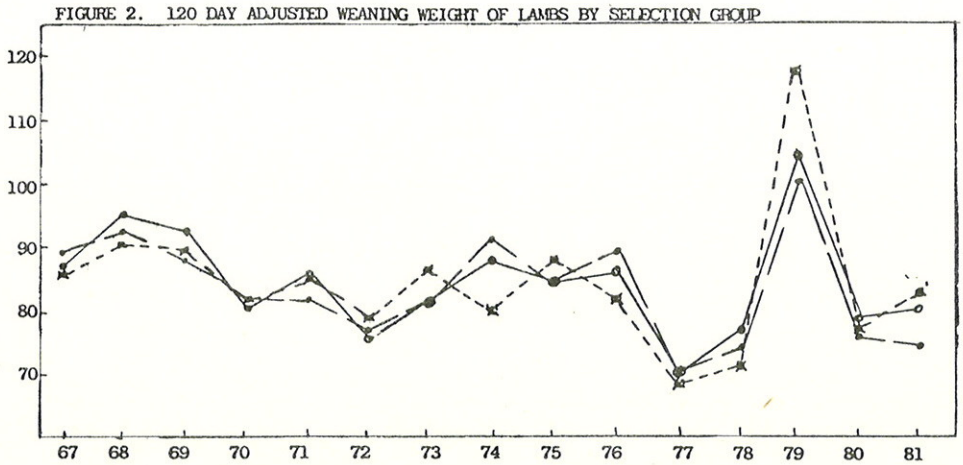
Although lamb numbers were down considerably from 1980, a slight increase in average adjusted weaning weight over the previous year (except for visual group) was demonstrated. While the increase was small, it was at least a reversal of the 1979-1980 trend.

FIGURE 1. GREASE FLEECE PRODUCTION OF EWES BY SELECTION GROUP



0 = Lamb Production Group
• = Visual Selection Group
X = Wool Production Group

FIGURE 2. 120 DAY ADJUSTED WEANING WEIGHT OF LAMBS BY SELECTION GROUP



0 = Lamb Production Group
• = Visual Selection Group
X = Wool Production Group

Accelerated Lambing Programs or Their Influence on Ewe Longevity (Project 1768)

J. E. Tilton, M. R. Light, T. Faller and W. Limesand

Numerous studies have been conducted with accelerated lambing as a goal with considerable variation in success noted. This range is associated with the stage of anestrous in the ewe and different hormonal regimes. Little information has been gathered to assess the effect of repeated hormonal administration on longevity of the ewe or her fertility at times other than periods of controlled mating activity.

Experimental Procedure

The experiment called for a continuation of the five year planned project. With this objective, 47 ewes at Fargo and 19 ewes at Hettinger were administered progestogens for 12 days prior to breeding. At Fargo black-faced rams were subjected to light treatment for 42 days. Treatment consisted of eight hours light and 16 hours of dark per day. At Hettinger half of the rams were treated by injecting 50 ug GNRH two times weekly for 5 weeks prior to breeding and the control rams received the same dosage of saline solution.

Results

At Hettinger 13 of 19 treated ewes were mated at the first breeding of which 5 remated at the following breeding period and 4 of the non-treated ewes mated in the first cycle. Ten (10) of the 17 ewes that mated in the first cycle were served by rams treated with GNRH and 7 were serviced by control rams. Two ewes actually conceived both of which came from the combination of treated ewes and treated rams. Both ewes had singles.

At Fargo, 47 ewes were treated with pessories for 13 and then 13 were removed, 2 days later an additional 13 were removed, 2 days later an additional 13 were removed, and then the last 8 were removed 2 days later. After removal the ewes were turned with the light treated rams 13 of the 47 ewes conceived and lambed and had 18 live lambs.

Summary

Two experiments were conducted with an ultimate goal of out-of-season lambing. Mating activity was stimulated in both experiments with subsequent ovulation indicated by increased progesterone levels detected in one experiment. Lambing results achieved very limited success. If out-of-season mating is to become a routine management procedure, new

methods or products will be needed, probably with more information needed on male fertility. To date all work has not produced any results that would indicate financial feasability to the producers.

Future Work Planned:

1. Discontinue present project.

2. Redesign project to utilize new breeds and crosses that may prove more financial feasability under producer conditions.

SECTION II

Reports of

Sheep Research in Progress

At the

Main Station, Fargo, N. D.

Presented by

Merle R. Light
Animal Science Department

Dr. I. A. Schipper
Veterinary Department

at the

23rd Annual Sheep Day

Hettinger Experiment Station
Hettinger, North Dakota

February 10, 1982

OVINE PROGRESSIVE PNUEMONIA
Project 1772

Summary

Flocks free of ovine progressive pnuemonia have been established through post parturant separation of lambs from ewes. These flocks of sheep have remained disease free for six years as determined by the agar-gel immunodiffusion test.

Ten flocks of sheep have been tested to determine the extent of infection. All flocks were found to be infected with levels varying from 1 to 74 percent.

Lambs have been infected by oral feeding of colostrum milk and PPV virus or by intratracheal injection of PPV virus.

Introduction

Ovine progressive pneumonia (OPP) is a chronic debilitating disease of adult sheep that causes serious economic losses in affected flocks. The causative agent of OPP is progressive pneumonia virus (PPV), an enveloped, spherical, single-strand RNA virus (Kennedy et al., 1968) classified in the family Retroviridae (Fenner, 1977).

The clinical symptoms of OPP include slow progressive loss of weight accompanied by physical weakness, the absence of fever, increasingly severe respiratory distress with a chronic cough and labored breathing and finally, death (Sigurdsson et al., 1952; Ressang et al., 1968). Differential diagnosis requires consideration of pulmonary tumors, lung worm infestation, pulmonary abscesses and Mycoplasma spp. pneumonia. Diagnosis of OPP is based on a number of diagnostic criteria including clinical signs, histopathological lesions, isolation of PPV, and presence of precipitating antibodies against PPV (Cutlip et al., 1976). The agar-gel immunodiffusion has proved to be an uncomplicated and inexpensive technique for the detection of precipitating antibodies in sheep sera (Cutlip et al., 1977; Molitor, 1978).

The presence of precipitating antibodies in an animal indicates exposure to PPV but does not necessarily indicate prior, current or impending diseases. Many sheep apparently carry the virus and antibody for life without developing lesions (Cutlip et al., 1976).

Marsh (1923) first described OPP in Montana range sheep and found that one to two percent of sheep in affected flocks contracted the disease. Since that time, affected individuals have been reported throughout world sheep producing areas including South Africa, Britain, France, Germany, India and America (Palsson, 1976). Cutlip et al. (1977) surveyed cull slaughter ewes from Western and Midwestern United States and reported up to 68% of old ewes were infected with OPP. Gates et al. (1978), after serologically surveying Idaho range sheep, reported an incidence ranging from 58% in all ages to 90% in cull ewes. Epidemiological studies in Iceland with Maedi, the Icelandic equivalent of OPP, indicated certain strains within Icelandic breeds were more resistant than others to the disease (Palsson, 1976). Specifically, crosses between Icelandic sheep and Border Leicester rams appeared to be

particularly resistant. The use of selected breeds in Iceland along with elimination of affected sheep helped eradicate Maedi from most of Iceland (Palsson, 1976).

Experimental Procedure

The objectives of this experiment are:

1) to determine methods of transmission of ovine progressive pnuemonia and 2) to propagate and maintain and OPP-free flock.

To acomplish objective 1 and 2, the following procedures have been initiated:

I. Vertical transmission

1. Milk; colostrum will be collected from infected ewes and the following aliquots will be cultured for PPV in an established ovine tracheal cell line or ultracentrifuged and observed under the electron microscope.

   a. Unaltered
   b. Sonicated to break leukocytes
   c. Diluted with warm buffered saline and centrifuged to obtain leukocytes
   d. Ultracentrifugation and electron microscopy

2. Placenta; cotyledons will be subjected to one or more of the following:

   a. Maceration
   b. Enzyme treatment
   c. Freeze-thaw cycle

3. Buffy coats will be treated as follows:

   a. Leukocytes, subjected to sonication, enzyme treatment and/or freeze-thaw will be inoculated on to ovine tracheal cells and observed for presence of virus.

4. Direct

   Lambs removed from PPV-free ewes prior to nursing will be fed colostrum from PPV-infected ewes by stomach tube.

5. Indirect

   Isolated negative sheep will be watered from water that positive ewes have partially consumed to determine whether OPP may be transferred by this method.

II. The establishment of OPP-free flocks:

a. Infected adult sheep will be identified by serologic methods and removed from the flock when facilities become available.

b. Lambs removed immediately postpartum and formula fed will be housed in a separate facility located approximately one mile from the other sheep.

Results and Discussion

Flocks of Columbia, Suffolk, Hampshire, and Border Leicester sheep were established by separation of lambs from dams immediately following birth. All lambs were isolated and reared artifically. These flocks have remained free of ovine progressive pneumonia as determined by the agar-gel immunodiffusion test (AGID) since 1974. It appears that OPP-free flocks could be established by this method. Attempts are being made to create OPP-free flocks by removal of positive reacting ewes as determined by the AGID method or by physically separating into positive and negative flocks. To date, one flock was negative after three testing periods. Lamb weights at market time in a negative flock at one cooperator's farm were reported (unsubstantiated) to average 20 pounds greater than lamb weights in his positive flock. We are hoping to pursue this farther in later tests. Lambs have been infected by feeding colostrum milk plus OPP virus. We have not established, however, that the virus is present in colostrum from positive ewes.

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SECTION III

MANAGEMENT SECTION

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23rd Annual Sheep Day

Hettinger Experiment Station
Hettinger, North Dakota

February 10, 1982

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 hoofs, and vaccinate ewes for example: Enterotoxemia, Vibriosis, Soremouth.
4. Four weeks before lambing increase grain by 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 symptoms.

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 replacer available from:
   A. K & K Mfg., Rogers, Minnesota
   B. Land O'Lakes
   C. G T A
   It will cost approximately 50¢ per pound and each lamb will require from 15 to 20 pounds.

2. Use good equipment. NDSU has had good success with the LAMB bar, K & K Mfg., sells a self priming nipple and tube assembly 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. There is a Formaldahyde solution commercially available that Retards Bacterial Growth in milk (1 cc/gallon milk).

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

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

8. 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.

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

10. 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. It can be kept frozen in 1-4 oz. Containers.

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

12. Provide clean, fresh water.

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

16' COLLAPSIBLE FENCELINE FEED BUNKS (FOR SHEEP)

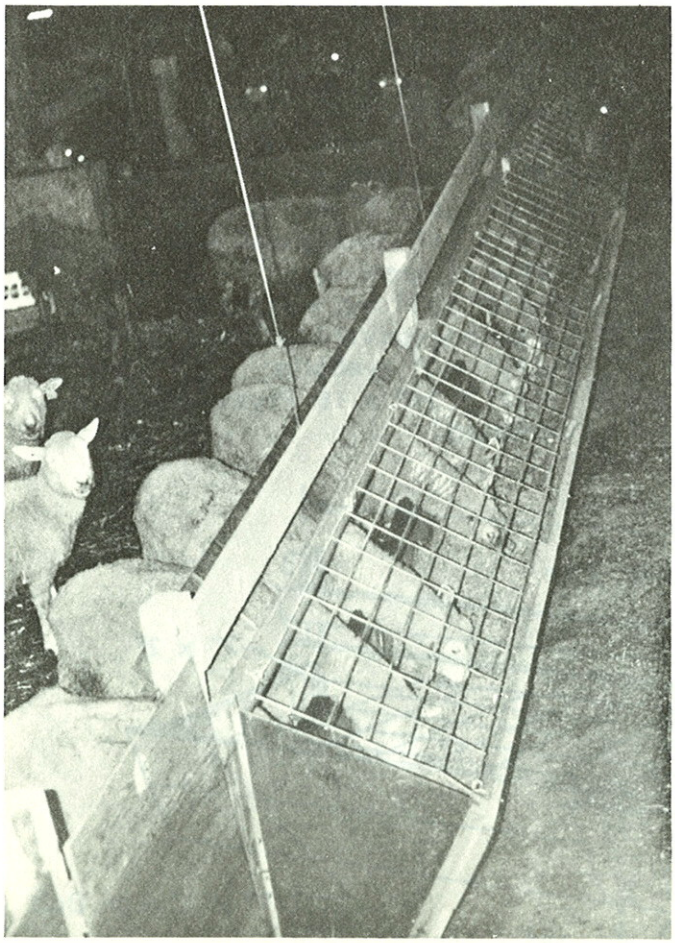
Timothy C. Faller and Dexter Johnson

Inexpensive, versatile, fenceline feedbunks are usable in many present day sheep operations. Many ranchers are utilizing finely ground roughage rations to mechanically handle feed to the eweflock. Realizing the need for a new, low-cost type of feedbunk construction for sheep producers the Hettinger Experiment Station produced the collapsible feeder for use in many operations.

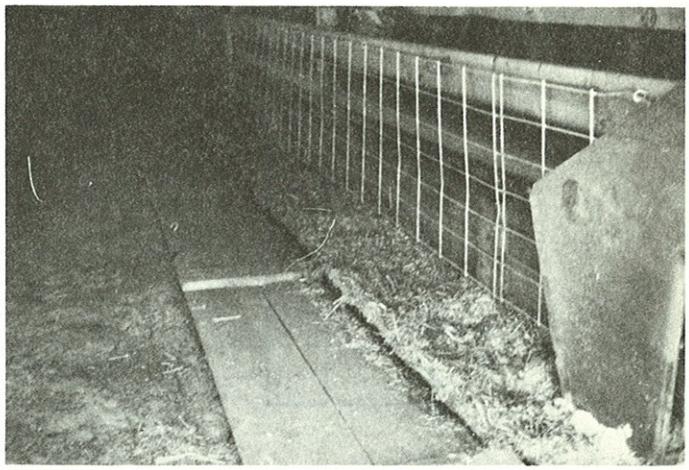
A 16' long feeder section was developed that uses the ground for a base and boards for sides. A wider top than bottom forms an angle which aids feed to slide to the bottom of the bunk. To keep lambs from crawling through, a grated cover was made by cutting a 52" x 16' "Stock Panel" in half (lengthwise forming 32' linear bunk cover). This grated cover attaches to a back fence section with a 9" wide neckspace opening and a 18" high front section to give the bunk shape. The back fence side is attached to wooden posts spaced 8' apart. There is no plywood floor in the bunks used at the Hettinger Station.

These bunks are easily collapsed to aid cleaning. This can be for cleaning snow out of the bunk when used outside in the winter or for pen access when used indoors. The grated cover serves as a constraint keeping baby lambs from escaping the pen via the feedbunk. The roughage should be cut no longer than 1½" to easily fall through the grated cover. When feeding only mature sheep an inexpensive option would be to use chains to give the bunk form. Another option would be the addition of a closure board to keep sheep out of the bunk and prevent wool contamination when unloading feed into the bunk from a wagon. The closure board would fit into the open neckspace and could be raised up after the feed is delivered into the bunk.

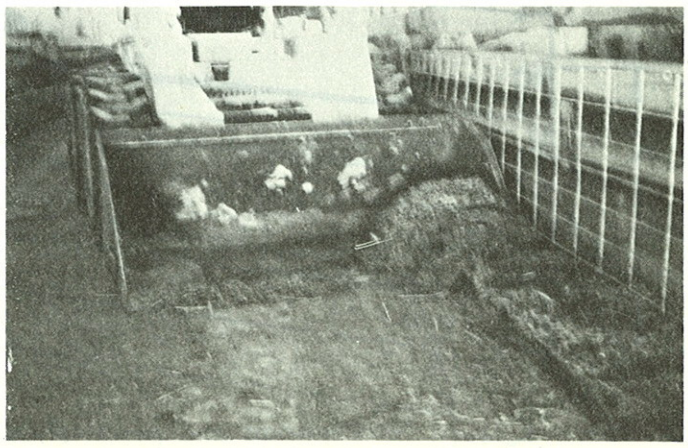
(Faller is Superintendent, Hettinger Experiment Station and Dexter Johnson is Extension Agricultural Engineer)



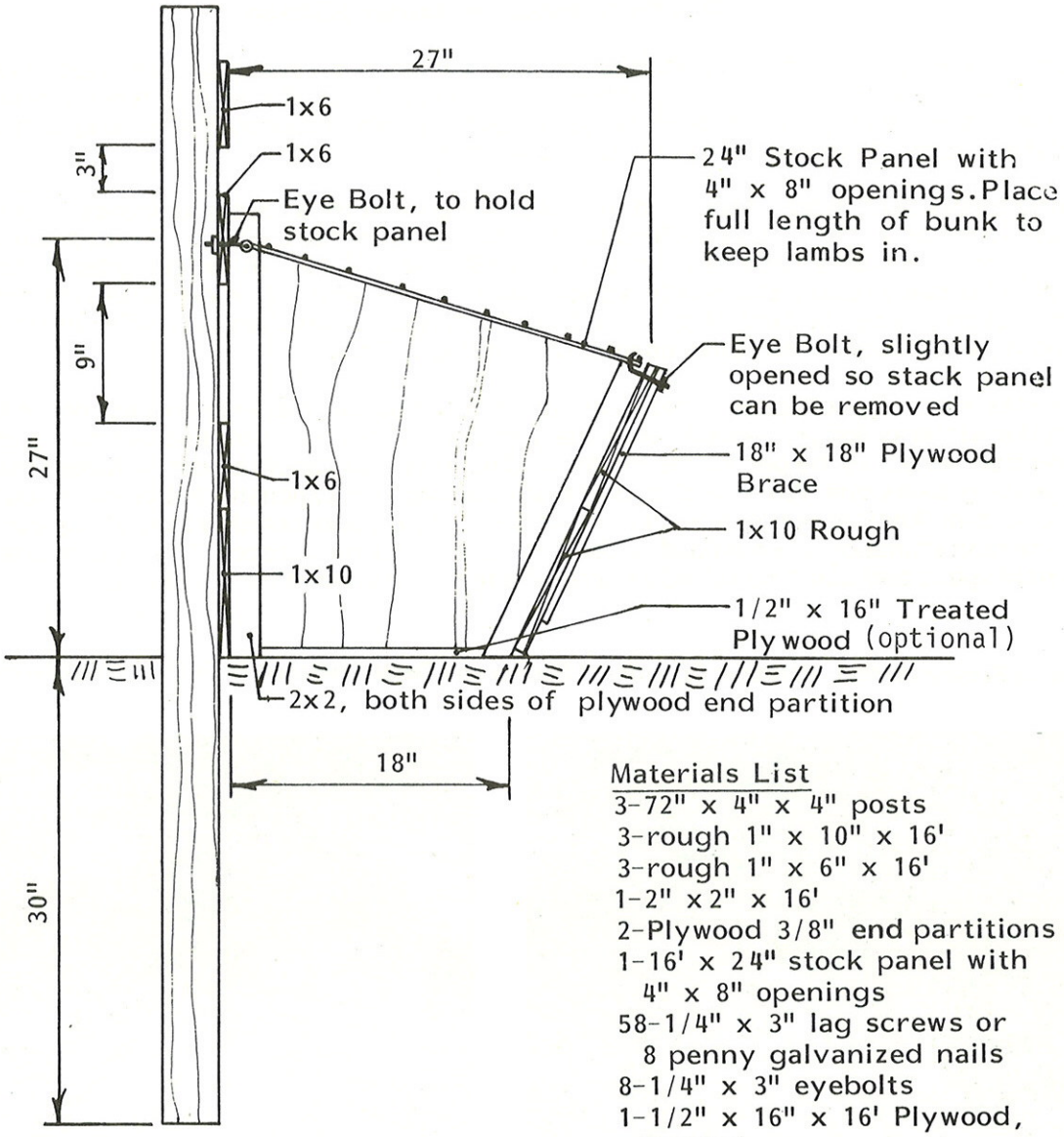
1. The "Stock Panel" grate in place holds the fenceline bunk together, keeps lambs from crawling out of pen and permits unloading feed directly into bunk.



2. The front of the feedbunk drops down when the grate is lifted up. Note the grate lays against the back of the bunk.

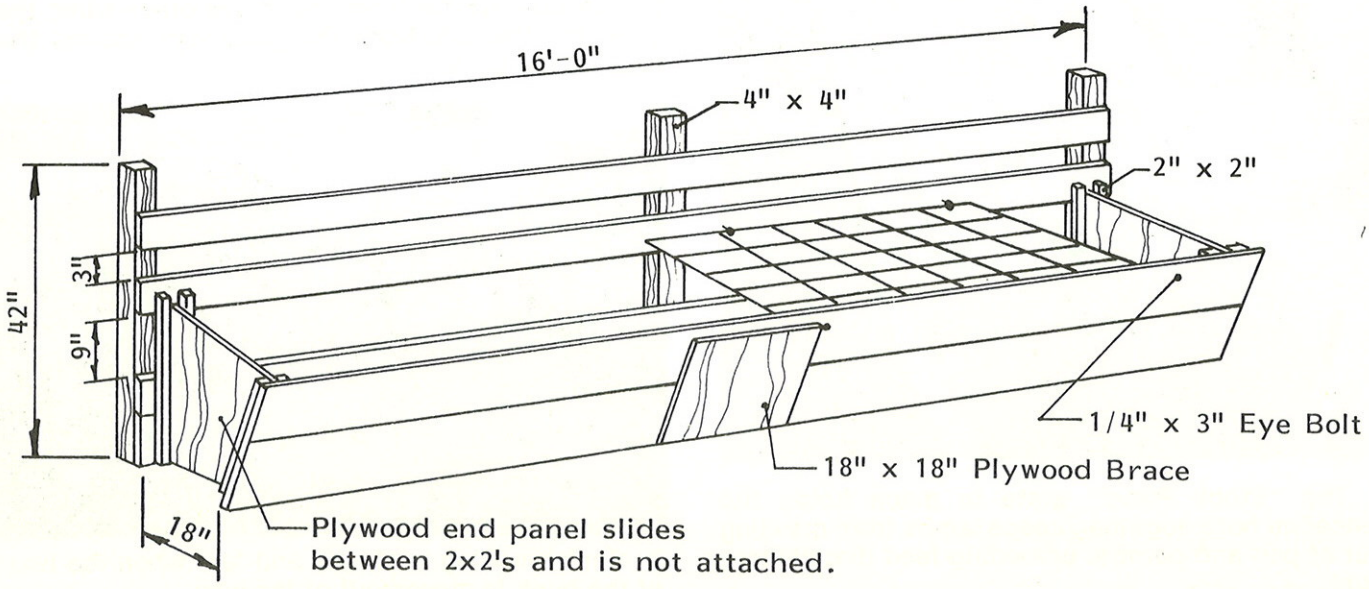


3. Bunk cleaning is simple and fast when the front of the bunk is moved out of the way.



Materials List

3-72" x 4" x 4" posts
3-rough 1" x 10" x 16'
3-rough 1" x 6" x 16'
1-2" x 2" x 16'
2-Plywood 3/8" end partitions
1-16' x 24" stock panel with 4" x 8" openings
58-1/4" x 3" lag screws or 8 penny galvanized nails
8-1/4" x 3" eyebolts
1-1/2" x 16" x 16' Plywood, treated



THE NORTH DAKOTA SHEEP PRODUCTION TESTING PROGRAM

ROGER G. HAUGEN
Extension Livestock Spcialist

The North Dakota Sheep Production Testing Program is designed to provide sheep producers information useful for making genetic selections and management decisions.

PURPOSE OF PRODUCTION TESTING

A production testing program **is not a contest.** Its sole purpose is to help both purebred and commercial sheep producers evaluate their individual flocks and locate the best producing ewes and rams to genetically improve their herds. Identification by purebred producers of rams that sire fast gaining lambs which finish as desirable market lambs should help satisfy the commercial producer's needs.

Purebred sheep producers cannot base their selection on production records alone but must also examine desirable, practical traits that are particular to the breed they are producing. Commercial sheep producers, on the other hand, should use production records very strongly for evaluating their ewes, selecting ewe lamb replacements and evaluating sires when possible.

BENEFITS OF THE PROGRAM

- **Provides the opportunity to more accurately select those ewes that will produce more pounds of lamb and wool.**
- **Provides a producer the opportunity to evaluate his lamb crop for profit and herd improvement.**
- **Provides information for culling ewes and selecting replacement ewe lambs.**
- **Provides individual sire summaries to enable a producer to evaluate the performance of individual sires.**
- **Provides an annual individual ewe production record which includes lifetime records plus a "Predicted Producing Value."**
- **Provides an annual lifetime flock summary with which a producer can evaluate his flock improvement over the years.**
- **Provides a yearly lambing worksheet for easy recordings of lambing information.**

INFORMATION PROVIDED TO PRODUCER BY PROGRAM

Many different values are generated by the production testing program. The following is an explanation on how some of the key values are obtained.

- **ADJ 90-day wt** — All lambs are adjusted to a 90-day weight basis. Adjustments are also made for sex, type of birth and rearing, and age of dam using adjustment factors from the Sheepman's Production Handbook (SID book). The **ADJ 90-day wt ratio** compares the growth rate of lambs on a within-flock basis with 100 being an average lamb.
- **Lamb Index** — The lamb index is a composite value using the lamb's ADJ 90-day wt and the fleece wt of its dam when available. Credit is also given in the index for multiple birth lambs. The Lamb Index formulas are:
  (Singles) ADJ 90-day wt + 0.6 × dam's fleece wt
  (Multiples) ADJ 90-day wt × 1.1 + 0.6 × dam's fleece wt
  The **Lamb Index Ratio** compares lambs on a within-flock basis with 100 being average.
- **Ewe Index** — The ewe index is a composite value using her lamb or lambs average ADJ 90-day wt and her fleece wt when available. Ewes having multiple birth are given additional credit. The Ewe Index formulas are:
  (Single Birth) AVG ADJ 90-day wt + 3 × her fleece wt
  (Multiple Births) AVG ADJ 90-day wt × 1.17 + 3 × her fleece wt.
  The **Ewe Index Ratio** compares ewes on a within flock basis with 100 being average.
- **EWE PPV (Predicted Producing Value)** — The Predicted Producing Value of a ewe is an estimated figure for the future level of her performance in comparison to other ewes in the flock. It is calculated from one or more ewe index ratio records on the same ewe and is based

COOPERATIVE EXTENSION SERVICE
North Dakota State University Fargo, North Dakota 58105

2WD = Born weak — died
2LD = Laid on
2ST = Starvation
2PN = Pneumonia
2WM = White muscle disease
2EN = Enterotoxemia (Over-eating)
2UC = Urinary calculi
2TE = Tetanus
2CO = Coccidiosis
2BL = Bloat
2PO = Poisoned
2AC = Accidental (hanging, drowning, etc.)
2PA = Parasites
2PR = Prolapse
2FR = Frozen
2VI = Vibriosis

3 = Defects
3IV = Inverted eyelids
3JA = Jaw (over-shot or under-shot)
3OT = One testicle
3BF = Black fibers
3HA = Hairy
3WR = Wrinkled Skin

A sample lambing worksheet is shown below. If there is not enough space in the remarks column, record the information as close to the space as possible and draw a line indicating where it goes.

FILLING OUT THE FARM WEIGH SHEET

The farm weigh sheet is the only other form that a producer needs to fill out. This should be filled out when the lambs are weighed at 80 to 100 days of age.

A producer should complete the top of the form with his name, address, county and phone number. A **flock number** will be assigned to him once he's on the program. **Season** of lambing should be filled in with a 1 for spring lambing or 2 for fall lambing. The last two digits of the present year should be filled in the **year** space.

A fee is accessed on each flock that uses the production program. It includes an annual fee plus a charge per ewe to cover the cost of card punching and computer time. A producer should record the number of ewes in his flock on the farm weigh sheet.

Regarding information on lambs weighed, a producer needs to record the date weighed (month/day/year), lamb identification and weight to the nearest pound.

FORMS AND ENROLLMENT

A producer can obtain initial lambing worksheets and farm weigh sheets from his county agent or by writing to the North Dakota Sheep Production Testing Program, Roger G. Haugen, Hultz Hall, NDSU, Fargo, ND 58105. (701) 237-7645. Once he is on the program, these forms will be sent directly to him each year. All completed forms should be sent directly to the address above.

COMMENT

Making permanent improvements or changes in a sheep flock in a positive way is a slow process. Improvements that are made and remain intact are accomplished through selection of genetically superior stock. Utilization of a production testing program can help a producer locate the superior producing animals in his flock and thus make a genetic improvement.

NORTH DAKOTA SHEEP PERFORMANCE PROGRAM

99999992 NDSU COLUMBIA FLOCK FARGO ND 58105 PAGE 1

1982 LAMBING WORKSHEET

EWE ID	EWE BREED	EWE AGE	EWE PRV	FLE-ECE WT	SIRE ID	SIRE BREED	LAMBING DATE	LAMBING NO. BRN	LAMB 1 ID	LAMB 1 SEX	LAMB 1 WT	LAMB 1 REMARKS	LAMB 2 ID	LAMB 2 SEX	LAMB 2 WT	LAMB 2 REMARKS	LAMB 3 ID	LAMB 3 SEX	LAMB 3 WT	LAMB 3 REMARKS
75152	COLM	7	95	11.5	81356	IIII	2/5/82	1	82101	R	11.0									
76410	COLM	6	94	13.0	81356	IIII	2/6/82	4	82110	E	7.0		82111	E	6.5	3IV	82112	R	6.0	FOSTERED 2/7, 75152 (1)
~~79732~~	~~COLM~~	~~3~~	~~93~~						EWE CULLED											
80600	ADLE-SUFF	2	102	9.0	81356	IIII	2/7/82	2	82114	R	10.5		82115	E	11.0	1LB				
80879	MCNT-CHEV	2	111	8.5	81356	IIII	2/8/82	3	82116	E	7.5		82117	R	7.0	BOTTLED 2/8	82118	R	9.0	
76410	IIII	6	94	13.0	81356	IIII	2/6/82	4	82113	E	5.5	DIED 2/6 2WD								
81340	1626	1	—	9.5	81356	IIII	2/10/82	1	82119	R	13.0									
81300	1911	1	—	9.0	81356	IIII	2/11/82	1	82120	E	6.0	DIED 2/11 2PN								

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