WINTER RATIONS FOR PREGNANT EWES

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Over 90 per cent of the feed consumed by the ewe flock comes from pastures, hays, silages and fodders. Pregnant or lactating ewes do not do well on mature, weathered, coarse, native hays. Unfortunately it is not always possible for the sheepman to obtain excellent quality roughage for his flock, so the less desirable roughages must be fed. These poor quality roughages are often low in such necessary nutrients as protein, vitamins and minerals.

In 1953 experiments were initiated at the North Dakota Agricultural Experiment Station to study the problem of how best to use roughages and other feeds for wintering pregnant ewes. Previously this station (Klosterman, 1950, 1951-A, 1951-B, 1953) made extensive studies of the role of protein in this problem.

The source of the protein did not seem to be important for pregnant ewes. The protein from linseed meal was equal to that from dried skim milk and the protein from alfalfa hay was as good as soybean oil meal or linseed meal. These studies further showed that the protein requirements as listed in the National Research Council (1949) could be reduced. Similar results were obtained by Montana workers (Van Horn 1950, 1951), by Canadian workers (Slen et al 1952 a, 1952 b, 1952 c) and South Dakota workers (Jordon 1950, Wilson 1948). These studies further indicated, however, that additional research was necessary.

Thomson and Thomson (1949) did not get good lamb production when the pregnant ewes were restricted both in energy and protein. Wilson (1948) reported that adding corn or oats to a prairie hay ration did not make it comparable to alfalfa hay for pregnant ewes, nor was the addition of excessive amounts of protein profitable. Jordon (1950) reported that a ration of one-third alfalfa and two-thirds brome hay gave good results when fed to pregnant ewes.

Experiment I

Ninety-six grade Columbia ewes were pasture bred to Suffolk rams prior to separation into two groups of 48 ewes each. Lot I received native wild hay and Lot II received alfalfa hay. Both lots received steamed bone meal and trace mineral salt free-choice. At about six weeks prior to lambing, corn was added to Lot I to bolster the energy intake. Lot II continued on the alfalfa hay. After lambing all ewes, regardless of previous treatment, received a

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ration of alfalfa hay, grain and minerals. The results are presented in Table I.

TABLE I.—**Lamb production of pregnant ewes fed wild hay or alfalfa hay.**

Treatment Lots	Wild hay plus corn[1] I	Alfalfa hay II
Ewes on experiment	48	48
Average weight gained during pregnancy. (lb)	2.5	21.7
Ewes lambing	40	44
Lambs dropped	57	72
Average birth weight of lambs (lb)	9.1	10.3
Live lambs at 2 weeks of age	47	66
Percent lamb crop per ewe bred	119	150.0
Percent lamb crop per ewe lambed	143	164
Percent livability at 2 weeks of age	82	92

[1]Corn added last 6 weeks of pregnancy.

It is obvious that the ewes receiving the wild hay did not produce as well as those on alfalfa. It became necessary to add corn to the wild hay ration to increase the energy intake. Even though offered enough of the wild hay, the ewes would not consume enough to meet their energy needs. This ration was obviously low in protein but also unpalatable which further reduced the hay intake. The ewes receiving the wild hay gained an average of only 2.5 pounds per ewe during pregnancy whereas the ewes receiving alfalfa alone gained an average of 21.7 pounds per ewe.

Experiment II

The ewes on the wild hay ration received 4.1 pounds of hay per day for two months. Then the allowance was increased to 4.5 pounds per day. This level was fed until six weeks prior to lambing, when the allowance was increased to 4.8 pounds. In addition these ewes received one pound of corn per head the last four to six weeks prior to lambing. The wild hay contained 6.4 per cent protein. Therefore these rations provided enough energy but were slightly low in protein. In the early part of the gestation period, the ewes appeared to like the hay and consumed normal amounts. But as the period advanced the ewes did not consume as much as was desired and necessary to provide normal gains for pregnant ewes of these weights.

The ewes fed alfalfa consumed the hay readily throughout the period. The alfalfa hay was of good quality and high in protein (16.6 per cent protein). The alfalfa was increased, as with the wild hay group from 4.0 pounds then 4.5 pounds and finally 4.8 pounds per ewe per day. No corn was fed to this group prior to lambing. This allowance of alfalfa hay was enough to meet requirements for energy and protein; in fact the hay supplied almost twice the protein requirement. Steamed bone meal and trace mineral salt were provided, free-choice, at all times to both groups. Water was always available. The results are reported in Table II.

TABLE II—**Results—Experiment II—Ewe and Lamb Performance.**

Lot Rations	I Wild hay[1]	II Alfalfa hay
Ewes on experiment	50	50
Average initial weight ewes (lb.)	129.8	132.5
Average weight gained during pregnancy (lb.)	13.1	30.2
Ewes died prior to lambing	3	0
Ewes aborted	1	0
Ewes lambing	43	48
Lambs dropped, total	80	90
Stillborn	9	5
Alive	71	85
Average birth weight (lb.)	9.6	11.1
Percent lamb crop per ewe bred	142	170
—at 120 days	112	146
Percent lamb crop per ewe lambed	165	177
—at 120 days	130	152
Lambs weaned at 120 days	56	73
Average weaning weight (lb.)	73.1	77.4
Percent livability to weaning	79	86
Total pounds of lamb per ewe lambed	95.2	117.7
Total pounds of per ewe bred	81.9	113.0

[1]Corn—1 lb. per head daily added about 6 weeks before lambing.

Results presented in Table II are similar to those found in Experiment I. This study was more detailed and includes the performance of the lambs until weaned at 120 days of age. The ewes were all fed alike after lambing on alfalfa hay, grain and minerals. Therefore, the differences in lamb production can be largely attributed to the gestation rations and their "carry-over" effects. The ewes on the wild hay ration did quite well. A lambing percentage of 112 per cent weaned is at least average for range conditions. However, production of this group does not compare with that of the ewes fed alfalfa.

A rather complete report is given in Table II to call attention to the different means of evaluating lamb production. The lambing percentages are quite different when calculated on the bases of ewes bred vs ewes lambing and even different when expressed on the basis of lambs weaned. A rather good measure is pounds of lamb produced at weaning per ewe bred. However if the sale of the barren ewe covers the cost of feeding the ewe for the previous year, no particular fault can be found with the measure pounds of lamb produced at weaning per ewe lambing.

Experiment III

For this experiment 112 grade Columbia ewes were pasture bred to Suffolk rams. On November second the ewes were removed from pasture, allotted at random into four lots on the basis of weight and age and placed on their respective rations. Lot I was fed a rather poor quality native wild hay, ad libitum. Lot II was fed the same hay 4.2 pounds per head per day and 0.1 pound of soybean oil meal. These amounts should meet the recommended allowances for T. D. N. (total digestible nutrients) and about two-thirds of the

protein allowances. Lot III was fed the wild hay, 4.2 pounds per head per day and 0.3 pound alfalfa hay. These allowances would be directly comparable to Lot II in T. D. N. and protein. Lot IV received alfalfa hay, 4 pounds per day.

After 90 days on the experimental rations, it became apparent that the ewes in the first three lots, and particularly those in Lot I, did not consume enough of the wild hay to meet their energy requirements and were losing weight. Beet pulp was then added, 1 pound per ewe per day, to these three lots and was continued in the ration until lambing. All ewes in all lots were handled alike after lambing. Grain and alfalfa hay furnished a balanced ration for lactation. Therefore most of the differences in lamb weights, lambing percentage, etc. can be attributed to the gestation rations.

Table III summarizes the results from this experiment. The results differ slightly from those reported in Table II because the lambs were weaned at 90 days rather than at 120 days as for Experiment II. This accounts for the lower weaning weights reported for the lambs discussed in this table. The differences in weaning weights and average daily gains of lambs in this experiment do show small advantages for the alfalfa ration and the wild hay rations supplemented with soybean oil meal or alfalfa. This indicates that for the lambs that survived until weaning much can be done with adequate lactation and creep rations. However, comparing lambing percentages, or pounds of lamb produced per ewe, one notes the superiority of the alfalfa rations for gestation. Supplementing the wild hay rations helped considerably but not enough to equal the alfalfa ration.

TABLE III—**Results, gestation rations for ewes, Experiment III.**

Lots	I	II	III	IV
Ewes on experiment	28	28	28	28
Ewes died prior to lambing	6	1	0	0
Ewes aborted	2	0	0	1
Ewes not lambing	4	3	2	3
Ewes lambed	16	24	26	24
Lambs dropped	22	36	37	40
Alive	20	34	35	38
Alive at 90 days	15	29	31	35
Average birth weight (lb.)	9.1	8.9	9.2	10.6
Average weaning weight (90 days)	62	65.2	63.3	67.4
Percent lamb crop per ewe bred, birth	71.4	121.4	125	135.7
At 90 days	53.6	103.6	110.7	125
Percent lamb crop birth per ewe lambed	125	141.7	134.6	158.3
At 90 days	93.7	120.8	119.2	145.8
Average daily gain per lamb, (lb.)	0.59	0.63	0.60	0.63
Total lbs. of lamb per ewe lambed	62.6	78.7	78.5	98.2
Total lbs. of lamb per ewe bred	35.8	67.5	72.9	84.18

The ewes in Lot I fared badly. They lost weight and 6 out of 28 ewes died prior to lambing. Five of these deaths were diagnosed as pregnancy disease and one was due to pneumonia. Four of the ewes

either never conceived or reabsorbed their feti. Two of these ewes aborted. Therefore only 16 of the 28 ewes lambed. This group of ewes produced only 62.6 pounds of lamb at 90 days per ewe lambed. In Lot II the 0.1 pound of soybean oil meal helped the situation. Twenty-four out of the 28 ewes lambed. Of the four ewes which did not lamb, one died of pneumonia and three possibly did not conceive. This produced 78.7 pounds of lamb at 90 days per ewe lambed, definite improvement over Lot I. Lot III performed about the same at Lot II. Twenty-six ewes lambed and produced 78.5 pounds of lamb per ewe lambed. Presumably the third of a pound of alfalfa was every bit as good a supplement as the soybean oil meal. Lot IV ewes, receiving alfalfa hay, did by far the best. Even though one ewe in this lot aborted and three did not lamb, this group produced 98.2 pounds of lamb at 90 days per ewe lambed.

From this trial the evidence is strong that native wild hay is a poor ration for pregnant ewes. Supplementing native hay with 0.1 pound soybean oil meal or 0.3 pound alfalfa hay markedly improves the performance but is definitely not comparable to alfalfa hay as the roughage for pregnant ewes. Apparently lack of protein is only one of the faults of wild hay.

DISCUSSION

Results of these three trials confirm earlier findings that pregnant ewes do not do well on poor quality hay. These experiments indicate that the poor utilization of such hays is not due only to insufficient protein or minerals. Hays of poor quality do contain enough energy to meet the needs of the ewes if they would consume normal amounts of 3½ to 4½ pounds. It is noted in these experiments that during the latter half of the pregnancy period, when the nutrient requirements were increasing, the ewes actually consumed less of the wild hay than at the beginning of pregnancy. Supplementation with protein, grain, beet pulp or small amounts of alfalfa all helped to increase the usefulness of the wild hay. In no case did the production of the ewes fed poor hay, even with supplementation, equal that of the ewes receiving the alfalfa hay ration.

Application of these findings to the sheep industry suggests three ways of using wild hay to best advantage. Possibly the best way to use poor quality, mature wild or prairie hays for pregnant ewes would be in conjunction with alfalfa or other legume hay. Feed 1½ to 2 pounds of the poor hay (possibly the morning feeding) and 1½ to 2 pounds of the legume hay (the evening feeding.) Salt and a mineral mixture could be self-fed and an allowance of grain provided the last four to six weeks of gestation to insure adequate nutrition at this critical period.

Another possible way of using poor quality hay would be to feed it the first third to half of the gestation period, then gradually change to legume hay for the last part of the pregnancy period. Salt and mineral should be provided the entire period and if the

condition of the ewes warranted it, addition of half a pound to a pound of grain the last four to six weeks of pregnancy.

A third way of using poor quality hay for pregnant ewes would be to supplement with 0.1 to 0.15 pound of a 40 per cent supplement daily and for the latter half of the pregnancy period add one-fourth to one-half pounds of grain per ewe daily, increasing the grain to one pound per day four to six weeks prior to lambing. Salt and mineral should be provided at all times.

It is well to remember that cutting native hay at the shooting stage (when head is emerging) would preserve more nutrients, improve the palatability and provide better nutrition than would be contained in the same hay cut when it is mature and weathered.

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