

1) COLORADO

1
THE STATE AGRICULTURAL COLLEGE.

2)
THE AGRICULTURAL EXPERIMENT STATION.

3) _____ 4)
BULLETIN NO. 52.



I. Pasturing Sheep on Alfalfa.

II. Raising Early Lambs.

Approved by the Station Council,

ALSTON ELLIS, President.

FORT COLLINS, COLORADO.

APRIL, 1899.

Bulletins will be sent to all residents of Colorado, interested in any branch of Agriculture, free of charge. Non-residents, upon application, can secure copies not needed for distribution within the State. The editors of newspapers to whom the Station publications are sent are respectfully requested to make mention of the same in their columns. Address all communications to the

DIRECTOR OF THE EXPERIMENT STATION,

Fort Collins, Colorado.

THE AGRICULTURAL EXPERIMENT STATION,

FORT COLLINS, COLORADO.

THE STATE BOARD OF AGRICULTURE.

	TERM EXPIRES
HON. JAMES L. CHATFIELD, Gypsum,	1901
HON. A. LINDSLEY KELLOGG, Rocky Ford,	1901
HON. B. F. ROCKAFELLOW, Canon City,	1903
MRS. ELIZA F. ROUTT, Denver,	1903
HON. JOHN J. RYAN, Fort Collins,	1905
HON. P. F. SHARP, Pueblo,	1905
HON. HARLAN THOMAS, Denver,	1907
HON. P. A. AMISS, Pruden,	1907
GOVERNOR CHARLES S. THOMAS, } <i>ex-officio.</i>	
PRESIDENT ALSTON ELLIS, }	

EXECUTIVE COMMITTEE IN CHARGE.

A. L. KELLOGG, CHAIRMAN.	ALSTON ELLIS,	JOHN J. RYAN,
P. F. SHARP,	B. F. ROCKAFELLOW.	

STATION COUNCIL.

ALSTON ELLIS, A. M., PH. D., LL. D.,	PRESIDENT AND DIRECTOR
L. G. CARPENTER, M. S.,	METEOROLOGIST AND IRRIGATION ENGINEER
C. S. CRANDALL, M. S.,	HORTICULTURIST AND BOTANIST
C. P. GILLETTE, M. S.,	ENTOMOLOGIST
WELLS W. COOKE, B. S., A. M.,	AGRICULTURIST
WILLIAM P. HEADDEN, A. M., PH. D.,	CHEMIST
J. E. DuBOIS,	SECRETARY
FRANK H. THOMPSON, B. S.,	STENOGRAPHER.

ASSISTANTS.

ROBERT E. TRIMBLE, B. S.,	METEOROLOGIST AND IRRIGATION ENGINEER
FRANK L. WATROUS,	AGRICULTURIST
LOUIS A. TEST, B. M. E., A. C.,	CHEMIST
ELMER D. BALL, B. S.,	ENTOMOLOGIST

SUB-STATIONS.

HARVEY H. GRIFFIN, B. S.,	SUPERINTENDENT
Arkansas Valley Station, Rocky Ford, Colorado.	
J. E. PAYNE, M. S.,	SUPERINTENDENT
Rain-Belt Station, Cheyenne Wells, Colorado.	

I. PASTURING SHEEP ON ALFALFA.

BY W. W. COOKE.

The high price of sheep and lambs during the years since 1896 has turned the attention of sheep feeders to the question of raising the lambs they feed, in place of depending on the ranges of the south and west. The summer feed for the sheep, where there is no range, is the most difficult problem attending the raising of sheep on the ranches. It has been generally recognized that if it was as safe to pasture sheep on alfalfa as it is to let horses run on the same feed, there would be but little difficulty in raising lambs on any of the farms of the irrigated districts of Colorado. Many have tried pasturing sheep and lambs on alfalfa, but so many sheep have been lost by bloat that most herders have dropped the practice and others have been deterred from attempting it.

The high price of sheep has again awakened interest in the subject and led to the following experiments and investigation:

In the early fall of 1897 we bought eleven ewes for the purpose of making a double test, *i. e.*, the raising of early lambs and the pasturing of these lambs and the ewes on alfalfa during the summer of 1898. The ewes were mixed Shropshire and Merino, weighing about ninety pounds apiece. They were old ewes that had still fairly good teeth, but were so old that it was expected that the 1898 lamb would be the last one raised. They reached the college farm October 29, 1897, and were bred as soon as possible to the fine registered Shropshire ram Bennett's Prince, No. 87674, that stands at the head of the college flock. The eleven ewes dropped eleven lambs, most of them within a week after March 4, 1898. Through the winter the ewes were fed alfalfa hay. They received a small amount of ensilage during part of the winter, but in figuring on the finan-

cial side of the transaction this has been counted at its equivalent feeding value in alfalfa. As soon as the lambs were dropped, some grain was added to the feed and both ewes and lambs were turned on to alfalfa April 20. At this time the young alfalfa was barely showing green and the feeding of alfalfa hay and grain was continued until the green alfalfa was about four inches high. At first they were given the run of a field containing about three-fourths of an acre of fairly good alfalfa and half an acre of poor alfalfa, which was considered equal to an acre of medium alfalfa. The season proved very dry and as the field could not be irrigated the alfalfa did not make enough growth to supply them all the food they needed. About the middle of June they were given access to a second field of two acres of alfalfa. Even with the aid of several pigs they could not keep up with both fields, and one cutting of the alfalfa was made for hay. It was estimated that the total green alfalfa eaten by the sheep and lambs was about equivalent to an acre and a half of good alfalfa that would cut from three to four tons of alfalfa hay to the acre during the whole season. The sheep were shut up at night in a small corral to keep them away from dogs and coyotes. During all the summer they were fed half a pound of bran per day per head, of both sheep and lambs. On June 12 one of the ewes died of bloat and on June 20 one of the lambs followed its example, leaving us ten ewes and ten lambs.

The ewes were sheared April 29, yielding 54 pounds of wool from the ten ewes, showing that they were rather light fleeced sheep.

The experiment closed September 6, at which time the ewes weighed an average of 103 pounds and the lambs an average of 94 pounds. We sold the ewes for \$3.50 per head. If we could have had the lambs in Chicago at that time they would have sold for \$6.00 per head, but we had too few to make a shipment and so they are counted at their value in the Colorado market, *i. e.*, \$4.00 per head. Thus the whole experiment was closed up in a few days over ten months.

SUMMARY.—Expenses.

To 11 ewes @ \$2.50	\$27.50
Service of ram	2.50
Alfalfa hay, 5 pounds per day per head for 180 days, 5 tons @ \$4.00 per ton.	20.00
1600 pounds of grain @ \$11.00 per ton...	8.80
Total expenses.....	\$58.80

Receipts.

54 pounds wool, less cost of shearing. . . .	\$ 7.00
10 ewes @ \$3.50.	35.00
10 lambs @ \$4.00.	40.00
	<hr/>
Total receipts.	\$82.00
	58.80
	<hr/>
Net return	\$23.20

The above amount, \$23.20, represents the return for the labor of caring for the sheep and for the acre and a half of alfalfa pasture. If the estimate is made that it costs thirty cents per head to look after sheep through the winter, which is a close approximation where many sheep are kept, there remain \$20.00 as the return for the alfalfa from one and a half acres of ground. This is more than four dollars a ton for alfalfa in the field, with the sheep doing all the haying, or more than five dollars a ton for the hay in the stack. These results also include the estimating the hay eaten during the winter at four dollars per ton.

It should be remembered that these are the financial results, notwithstanding a nine per cent. loss from bloat on both the ewes and the lambs. While it may be that less than nine per cent. loss cannot be safely estimated on the ewes, it is seldom that a lamb bloats on alfalfa pasture and it would be safe to expect no loss from this source.

It is a fair question whether we received an extra growth and corresponding return for the grain fed during the summer. This cannot be told, as we had no check lot not receiving grain. Other sheepmen in Colorado who pasture sheep on alfalfa are not in the habit of feeding grain after the alfalfa gets in good growth. But on the other hand they do not get so large a growth on their lambs as we did. The grain fed through the summer amounted to 700 pounds, or \$3.85 and it is probable, though not certain, that the lambs grew the 10 pounds each of live weight necessary to pay for the grain.

The only other person in the vicinity of Fort Collins who pastured sheep on alfalfa during the season of 1898 is C. W. Trimble. He pastured 40 ewes and 40 lambs on two acres of good alfalfa. They remained on the alfalfa day and night, rain and shine, all the season, except three times of four or five days each when the land was irrigated, then they were taken off and fed alfalfa hay. They had forty pounds of corn chop per day, *i. e.*, one pound a day for a ewe

and her lamb. None were lost by bloat of either ewes or lambs. After the third crop of alfalfa was cut the ewes and lambs were turned on the stubble to eat the fourth crop. The lambs were taken up in the latter part of September to feed for market. They weighed then about 65 pounds per head. The ewes remained in the fields until late. The same ewes are being kept for a repetition of the test in 1899.

PASTURING ALFALFA IN THE ARKANSAS VALLEY.

More attempts have been made in the Arkansas valley to pasture sheep on alfalfa than in any other part of Colorado. Some years when the feed on the range has been poor quite a large number of sheep have been pastured part of the season on alfalfa, but during the summer of 1898, the range grass was very abundant and nearly everybody turned the sheep and lambs on the range. The center of the sheep industry in the Arkansas valley is the counties of Otero, Bent and Prowers. Statements were obtained from those who had had the most experience in pasturing sheep on alfalfa and they are given herewith as showing what diverse results have been obtained and how various the opinions now held by those most familiar with the subject.

W. E. DOYLE, Pueblo.

We tried raising lambs on alfalfa pasture during the spring of 1898 and got along very well for the first two or three weeks while the pasture was short. But just as soon as the alfalfa got to growing faster than the sheep could eat it down close, they began to bloat, and before I gave it up I had lost about sixty head of fine Shropshire ewes and several lambs. I tried every precaution I knew of, such as not turning out until late in the morning, having them well filled with hay and grain, but it seemed to make no difference. Some days there would be no losses; then would come a day when a dozen would die after they had been grazing four or five hours.

My opinion is that if one had a dog and coyote proof fence around the pasture and kept the sheep on night and day and kept the alfalfa picked down close until they got accustomed to it, the loss would not be so large.

However, from what I have been able to learn from

those who have had more experience than myself, they suffer from 15 to 25 per cent. loss, which at the present high price of ewes is rather expensive.

WM. and H. G. GREENE, Olney.

Our late lambs began to come about the tenth of April, and both in 1897 and in 1898 we lambled them on alfalfa. We put the ewes on the alfalfa before it started and kept them there until we were through lambing. We yarded them at night. Until the alfalfa got well grown we fed them hay. When feed began to get plenty, they would bloat more or less, but we never lost a sheep.

The first season after the lambs were a few days old we tried returning the ewes to the alfalfa. But we could not make it work. The ewes would bloat and die, if they were only on for a short time, even fifteen to twenty minutes. Last year we did not try to return the ewes to the alfalfa after they came in, but took them to the prairie which was good feed. By running the dropping band on alfalfa, the ewes have plenty of milk and are in good condition. We expect to run the dropping band in 1899 the same way. We have fine lambs and expect to get nearly one hundred per cent. increase. We have tried other ways of running sheep on alfalfa but cannot make a success of it.

D. C. ROBERTS, Ordway.

My experience in pasturing alfalfa with sheep is on rather a small scale. Among my sheep that I was fattening during the spring of 1898, were eight ewes that dropped lambs in April—fifteen lambs from the eight ewes—while on dry feed in the corral. When I sold my sheep in May, these ewes and lambs were turned loose in the alfalfa fields, twenty-three head in all. They roamed over the farm at their own will, seldom coming near the barn. In September I put them in the corral again and found there were twenty-three head still. On September 10, several of the larger lambs weighed 80 to 90 pounds. They were on the green alfalfa through wet and dry and apparently never bloated.

S. McCARTA, Manzanola.

In October 1896, I bought my first bunch of sheep. I

got them home about two o'clock in the afternoon, turned them into an alfalfa field, went on to the house and paid no attention to them except to look from the house and see if they were still in the field. About sundown I turned them into the corral. I thought they looked full, but never thought of bloat, as the party from whom I bought them assured me there was no danger in pasturing on alfalfa. The next morning I turned them into the same field, and continued this practice as long as there was anything in the field to eat, in fact nearly all winter. The alfalfa was nearly a foot high when I turned them in and they were very hungry, for I had driven them thirty miles during the day and a half, and they had had little to eat or drink. This was my first experience in pasturing sheep on alfalfa and I never lost a single one. By the fall of 1897 I had received the advice from all the know-alls in the sheep business. I was warned never to let the sheep on to the alfalfa unless they were well filled up with feed and water, also especially never to turn sheep on alfalfa early in the morning.

I adhered to both of these rules until I lost about forty-five ewes. The last loss was sixteen in less time than it takes to write it. They came off of a hill pasture where they had been all day. This was at four o'clock in the afternoon. Before half-past four they were tumbling in every direction.

The next morning early I opened the gate from the corral and let them into the alfalfa field. Then I told my man not to go near them and I went away for the day, and at night they were all right with not a single loss. After that I continued to shut them up late at night and turn them out early and lost no more from that bunch.

A few weeks later I bought another bunch of 600 ewes. I filled them up well on hay and corn for about a week. Then about the middle of one afternoon I turned them into the alfalfa. In half an hour I had lost nine head. The next morning I turned them out at daylight and lost no more. In all these cases there was plenty of water in all the fields.

In the spring of 1898 I had about 900 ewes to lamb. Five hundred of them were in one bunch in a corral at one corner of a fifty acre alfalfa field. Early in the morning we opened the corral gate and filled the racks with hay so that the sheep could roam over the field or stay and eat hay if they preferred. This was begun before the alfalfa started. It was kept up until the middle of May by which time the alfalfa was a foot high. Then as we needed the alfalfa for

hay we turned the sheep on the range. In all this time we lost only one sheep and it is not sure that this one died of bloat. We were very careful not to drive or bother this bunch of sheep. When they had all gathered in the corral at night the gate was closed and opened again very early in the morning.

The other 400 ewes had no alfalfa field so convenient to their night corral and they had to be both driven and herded. We had almost daily losses with this bunch until finally we made some new fencing that allowed them to roam without herding and after that our losses ceased.

In the light of these three season's experience, it seems to me that if a person wants to make a success of pasturing alfalfa and is so situated that he must corral the sheep at night, then this corral should be in the field where there will be no need ever to drive the sheep or worry them.

In the fall of 1898 I took sheep off the cars and turned them at once into an alfalfa field that had been cut but once during the season and where the alfalfa was so high the sheep could hardly be seen. Yet there were no losses.

In regard to the profit of thus pasturing alfalfa; I have made a little money at it and I believe there is money in it for anyone who has sufficient land and capital so that he can arrange matters properly.

W. B. BALDWIN, Fowler.

We have had considerable experience in pasturing sheep on alfalfa. At first we lost quite a number, but finally found that the loss would be largely reduced if we left the sheep on the alfalfa day and night and kept the alfalfa large. We also found it best to have the sheep's stomach empty, when put on alfalfa and then not take them out even if they do bloat. Our theory is that if the stomach is empty there will be room for a large amount of gas if they do bloat, and as soon as they begin bloating they will stop eating and but few will die. This theory is altogether different from the general opinion, but it is all right. Sheep must not change pasture. They must stay on the same pasture all summer if you wish to have success. Good alfalfa will keep about eight ewes and their lambs per acre. It should be irrigated often so as to keep the alfalfa from getting dry. If the alfalfa should get dry and you have to change the sheep to another field, you may expect losses.

Shropshires are the hardiest sheep I have had on pasture or on range.

Lambs do not bloat on alfalfa pasture until they are old enough to wean.

Alfalfa is certainly the best thing to lamb on for spring lambs. We are now (January 1899) having our first experience in lambing ewes in the winter. We have 1100 ewes and so far have saved about ninety-five per cent. of the lambs.

W. H. NEY, Fowler.

The best way to guard against bloat in pasturing sheep on alfalfa is to feed the sheep well on any dry feed just before turning them on the alfalfa and turn them in while full and leave them there night and day. By this method the losses will be light and success assured. Alfalfa pasture has great fattening qualities and early lambs having the run of alfalfa fields during the summer months will make much heavier gains than lambs running on the open range and depending on native grass. We could show lambs the fall of 1898 that were fit for any market and had tasted no grain since the last April. Sheep that run on alfalfa need little or no grain to fit them for market and this makes quite a saving.

The Arkansas valley is well adapted to sheep farming. Hay is cheap for winter feeding and the necessary grain can be raised here as cheaply as anywhere. For either breeding or fattening sheep I know of no place to equal the Arkansas Valley.

J. W. BROWN, Rocky Ford.

This is our first year of pasturing sheep on alfalfa. We pastured 500 ewes and their lambs on alfalfa for two months and then turned them on the range. We did not lose any by bloat. We did not move the sheep off the alfalfa when we irrigated. We have a large breed of sheep, the French Merinos, the ewes weighing from 140 to 200 pounds. We lamb early, feed for awhile in the corrals and this year we pastured on alfalfa for two months. This gives both the ewes and the lambs a good start and they do well on the range. We expect our lambs to weigh 90 pounds the first of October. Alfalfa is all right for sheep.

T. N. ORCUTT, Rocky Ford.

I have never pastured on alfalfa, but make it into hay

and feed the year around. I now have only pure bred Cotswold sheep at the home farm. I have two pastures, one of rye and one of blue grass; while one is growing they eat the other.

Alfalfa is not used for pasture for sheep in this section at all. Where it has been tried the losses were heavy. I understand that some feeders think they can afford to lose 5 to 10 per cent. This may do for toothless ewes, but my registered sheep are too valuable to take the risk. One of my neighbors put 1,500 sheep on alfalfa and I understand lost as high as sixteen in one day. Another tried it this spring, but the losses were so heavy he abandoned it. Near Las Animas they succeeded better, but here the alfalfa grows too rank.

A. FORDER, Rocky Ford.

I pastured one year 1200 ewes and their lambs on alfalfa for thirty days without any losses, then changed pastures and lost 75 ewes in about ten days, then changed to the range and will not try alfalfa pasture again. We did not irrigate the land while the sheep were there.

I have pastured old ewes and lambs on alfalfa after it stopped growing in the fall and did not lose any by bloat. We fed corn at the same time and the sheep did well.

J. P. STEVENSON, Rocky Ford.

I have tried for several years to run sheep on alfalfa; the result has been disastrous every time. Some four or five years ago I bought a bunch of New Mexican lambs, put them at first on very short alfalfa and kept them there for several days, then put them on better alfalfa. They commenced to bloat and before I took them out I lost 65 head. I had at the time a bunch of 300 native ewes. I put them on the same ground and gave them the same treatment and never lost one. The next spring these ewes were turned on the alfalfa as soon as it appeared green, but as soon as it got some growth they commenced to die and I had to remove them to native grass. I lost from one to four every day. Last fall I again bought 300 well bred Shropshire ewes. I put them on good alfalfa the first day I got them home and kept them there until night. I did not lose one. Next morning put them on again after dew was dry and kept them on all day; lost one. The third day I waited

until grass was dry and then put them on again. By noon I had lost nine head.

This spring I have kept the ewes up, fed them hay and let the lambs run through the fence and graze the alfalfa. They have done fairly well, but I believe if they and the ewes had other green grass and plenty of it as they do on alfalfa, that they would do better than on alfalfa. I have noticed one thing, that these lambs will leave the green alfalfa for dry hay and for a patch of wild grass. Still I have good lambs; some few January and February lambs weighed the middle of June 80 to 90 pounds.

All my sheep were turned on the range in June and I will bring them back the middle of August. Lambs dropped in April and fed as above ought to weigh 70 pounds the first of September.

My experience with pasturing sheep on alfalfa for six years has cost me several hundred dollars on account of bloat and that, too, with only a small bunch, of 300 to 500 ewes.

I do not think I shall ever graze sheep on it again. The sooner the farmer who wants to graze his breeding stock on green feed gets something in place of alfalfa the better off he will be. People who have been buying old ewes at 75 cents to \$1.00 per head and putting them on alfalfa have not lost much money if they lose ten per cent. of their ewes. But where the ewes are worth four to six dollars per head the case is quite different.

But although pasturing alfalfa has not been a success yet the sheep business, as a whole, has been profitable. This Arkansas Valley is a wonderful place for sheep. Our 1898 account stands as follows :

We had 35 lambs dropped in February and about 250 dropped in April and May. They went to the range June 10 and came back early in August. We commenced feeding bran and oats August 15 and got them on to full feed about the last of September, by which time they were eating one and three-fourths pounds of shelled corn per head per day. The latter part of October we sold 50 picked ram lambs at \$10 per head. Fifteen of these came in February and the rest in April. Their average age was about seven months and they weighed 99 pounds per head. During November we sold 20 more ram lambs for \$10 each. In December sold 40 ram lambs for \$5 each. This left us 18 cull ram lambs. These 18 with 118 ewe lambs we took to Kansas City the last of December and after an extra hard trip they weighed 81½ pounds and sold for \$5.40 per hun-

dred pounds or \$4.40 per head. We had, therefore, total receipts of almost exactly \$1500.00 from 246 lambs. We consider this a good showing.

JOSEPH CARL, La Junta.

We are pasturing 425 ewes and lambs on alfalfa the season of 1898. They have the run of twenty acres of alfalfa and up to June 8th, we have lost only one sheep by bloat. This is our first trial of pasturing sheep on alfalfa and so far we are well pleased with it and shall go into it on a larger scale next year.

S. H. POLLOCK, La Junta.

I undertook to pasture about 300 ewes and 225 lambs on alfalfa pasture, by feeding them well on corn and hay before turning them on the alfalfa and then leaving them there day and night. I left them three days and lost three ewes. I then gave it up and put them on the range.

GEO. W. PARKER, La Junta.

I have pastured sheep on alfalfa for three or four years and have lost on the average possibly two per cent by bloat. A good acre of alfalfa will support ten ewes and their lambs all summer. We turned the sheep off the land when we irrigated it. A cross bred Shropshire and Merino lamb pastured on alfalfa ought to weigh 75 to 80 pounds, the first of October. From my experience, more especially with old ewes, I think well of lambing on alfalfa when the grass is short on the range and would especially recommend keeping the breeding ewes on the farm and feeding them nice green alfalfa hay before lambing instead of wintering them on the range.

R. A. McKIBBON, Lamar.

We run a few ewes, about fifty, on a small patch of eight acres of alfalfa. We have the lot divided and put the sheep in one while we irrigate the other. This is the second year we have tried it. We have lost two old ewes by bloat. We expect our spring lambs to weigh 75 pounds by the first of October. The season of 1898, we also lost a lamb by bloating.

G. W. MAY, Lamar.

During 1897 we pastured 1,000 ewes on 80 acres of alfalfa. This was our first year's experience and we lost nine per cent with bloat. We left the sheep on the land when we irrigated it. We began pasturing in April and by the middle of July the 80 acres proved not enough and we got 15 acres more. Even the 95 acres did not keep them and about the first of August we turned them onto the range. In 1898 we started with 160 acres, but by the middle of August the alfalfa was all gone and we had to turn them onto the range.

My belief is that not over 100 head of ewes should be pastured in one bunch on alfalfa and that at the rate of five ewes and their lambs to the acre. For larger bunches, if the alfalfa pasture was free of cost, it would be dear to use it on account of the great loss by bloat.

GEO. W. WILSON, Lamar.

We had several thousand ewes on alfalfa for forty days during the spring of 1898. Part of the time we kept them on day and night; part of the time they were corralled at night and turned out after the dew had dried off in the morning. Both plans were failures so far as preventing bloat was concerning and after losing about five per cent by bloat in the forty days, we gave it up and sent them to the range. I have satisfied myself that pasturing on alfalfa in the Arkansas valley is not practicable at least with large bunches much as I should like to have had it otherwise. At the same time I consider it the best district in any country for raising and feeding lambs.

JOHN McNAUGHT, Las Animas.

Have pastured sheep on alfalfa for six years. Fifty acres of good alfalfa will support about 500 ewes and their lambs the whole season. In different years we have lost from eight to ten per cent by bloat. We do not move the sheep off the alfalfa when we irrigate it. We undertake to give plenty of pasture at the start and then not move them. Our May lambs we expect to weigh about 60 pounds the first of October. We fatten our own lambs.

[NOTE—The present writer visited Mr. McNaught, July 14th, 1898 and saw his 500 ewes and their lambs on alfalfa. These were all old ewes, nearly toothless, which is

the reason for keeping them at home instead of sending them out on the range. The number lost to date by bloat was fifteen or three per cent. They had some forty acres of alfalfa to run on and were not keeping it at all close. Quite a share of those lost had been when some overflow water ran into one corner of the field. Mr. McNaught says that if the whole field had been irrigated, there would have been less danger of bloating than with merely a single spot. Mr. McNaught's doctrine in regard to pasturing sheep on alfalfa is never to let them get hungry. The best way is to have the fence coyote tight, but if this cannot be done, then corral them at night as he is doing this summer and let them out early in the morning.]

PURVIS BROS., Las Animas.

During the summers of 1897 and 1898 the grass was so good on the range that, as a general thing, it paid to run sheep on the range. Indeed, under these conditions of an abundance of fine grass, the lambs are almost as good as those pastured on alfalfa and the expense is less.

We had only about a hundred sheep on alfalfa during the summer of 1898. They did quite well. We had them, their lambs and ten horses on a twenty acre pasture and we could almost have cut it for hay. When the lambs were weaned the ewes were nearly fat enough for market.

The cause of the greatest loss from bloat is probably the necessity of corralling at night on account of coyotes. Where this plan is practiced the sheep should not be put into the corral until almost dark and turned out in the morning before daylight. The sheep generally bloat in the evening and this is due most likely to the practice of leaving them in the corral too late in the morning. Some actually put them in the corral at 4 o'clock in the afternoon, thinking to avoid the loss, as it is after this time that they generally bloat, and then leave them shut up until after the dew is off in the morning. This makes about sixteen hours in the corral and only eight hours on feed, consequently the sheep do not do well.

This year, 1898, was the fourth season for us of pasturing alfalfa with sheep. On the average we have lost about five per cent. with bloat. We have the field divided into two parts and pasture one while we irrigate the other. These were old ewes and were pastured all summer. We expect alfalfa fed lambs to weigh about 75 pounds the first of October.

[When on a visit to the Arkansas Valley in July the

present writer learned that Purvis Brothers have their fences coyote tight and do not have to bother about corralling the sheep at night. To still further lessen the danger from coyotes, they had taken to hunting them with greyhounds and had killed seventeen so far during the season.

To surround a whole farm with coyote tight fence would be rather expensive, but it would not cost much to fence five acres and drive the sheep in there at night, thus diminishing the danger from bloat.]

CHRISTIAN MARLMAN, Las Animas.

Pastured 470 ewes and their lambs on alfalfa during May and June 1898. They ran on about fifty acres of alfalfa. They were turned onto the range June 11 and remained there until the latter part of September. Lost in all about three per cent. by bloat. They ate all the first cutting, so that it cost us one-third of our hay crop. These lambs were dropped in March and weighed between 50 and 60 pounds when brought back from the range. We are well satisfied with the result and shall try it again next season.

JOHN E. DONLON, Las Animas.

In 1896 we pastured 1200 ewes with their lambs on 160 acres of alfalfa and lost about eight per cent. by bloat. That year we fed no grain. In 1897 we fed 1,000 ewes and their lambs on the same field. This second year we fed corn chop to the sheep and lost only 2 per cent. by bloat. Both these years we had aged ewes and kept them on the field all the time, even when we irrigated it. We would not risk young ewes on alfalfa. In 1898 we have had such excellent feed on the prairie that we kept our sheep on the range most of the season.

A. M. LAMBRIGHT, Las Animas.

During 1897 we pastured 750 ewes and their lambs on 100 acres of alfalfa and lost about three per cent by bloat. We kept them on the land the entire season, not changing when the land was irrigated.

In the spring of 1898 we started 1,000 ewes on 160 acres of alfalfa, but the feed on the range was so good that we turned them onto the range the latter part of May. If we

had kept them on the farm all the season, I think 130 acres would have been sufficient to feed them.

There have not been very many raising lambs here and what has been done has been done for only a couple of years. We have run simply old ewes on alfalfa so that the test so far as bloat is concerned is hardly a fair one for sheep raising in general. I am sure that old ewes do not bloat so much as young ones. Most of us have not invested in enough for fences to cut our pastures up properly. I think that if we had our pastures fenced so that there would be no danger from coyotes and would leave the sheep on the land all the time, there would be comparatively little danger from bloat if the owner would go around through them a couple of times a day and make them get up and eat a little. Some lost considerable here this year and have been scared out to the range. We have only lost three out of 1,000. Of this 1,000, not over one-third could be classed as old ewes. I have very little doubt but that there is a difference in size in an alfalfa fed lamb and one raised on the range of at least twenty-five pounds. The chances are that we could afford to raise nearer pure bred Shropshire or Hampshire Downs on ranches than we could afford to do on the range (for it is generally supposed here that none but Merinos or Mexican Improved with Merinos will herd on the range), and if this is done we can make a difference of at least fifty pounds.

SCOTT BROTHERS, Las Animas.

In 1898 our sheep are all on the range, the grass is so good.

A good stand of alfalfa will carry ten ewes and their lambs per acre the first year; the next year fewer and the next year still fewer.

Pasturing alfalfa by sheep is hard on the stand, as they bite out the crowns of the plant. We pastured sheep on alfalfa for one whole season and during the fall for three years. When pasturing the whole season we lost about five per cent. by bloat. We are very careful to leave them on the alfalfa all the time after they are once placed there, never changing them when the field is irrigated. Grade Shropshire lambs to which we had fed corn while on alfalfa weighed 75 pounds the first of October. Our grade Mexican lambs weighed 70 pounds. If we had not fed corn they would probably have weighed 5 to 10 pounds less. We fatten our own lambs.

JACOB WEIL, Las Animas.

During 1898 we did not pasture sheep on alfalfa, but have done so on two previous years. We were in the habit of taking them off the field when it was irrigated. Our lambs weighed about 65 pounds the first of October and we fattened them on the farm.

F. T. WIBBER, Fredonia.

We have pastured sheep on alfalfa for five years. The first year we lost ten per cent. Now we do not expect to lose any. We do not move the sheep when we irrigate. In 1898 we pastured 500 ewes and their lambs on 160 acres of alfalfa from early in the season until the first of July. They were then turned on the range and stayed there until fall. We expect lambs so treated to weigh 70 pounds the first of October. We fatten our own lambs.

A. F. KLINKERMAN, Fredonia.

We have pastured sheep on alfalfa part or all of three seasons. One season we lost as high as ten per cent. by bloat, but this was due largely to inexperience. During 1898 we let the ewes run on alfalfa during the six weeks of the lambing season and as soon as that was over we sent them to the range. We lost about one per cent. during the six weeks. We had about 500 ewes and their lambs on 50 acres of alfalfa. We have always left the sheep on the land when irrigating it. We expect May lambs to weigh 60 pounds the first of October if pastured on alfalfa. In 1898 we turned the ewes and lambs on the range the first of June. It probably took two-thirds of the first cutting of alfalfa to lamb the sheep on it, but we consider ourselves well paid in saving of lambs and the start it gave them and the old ewes before turning them on the range. We are satisfied that we saved at least fifteen per cent. more lambs than could be done on the range and also saved in the expenses of herders during lambing.

L. M. CAMPBELL, Fredonia.

We feed on alfalfa exclusively, no grain except to lambs born in the winter.

First make a fence with posts 10 feet apart, nine barbed

wires, stretched tight, $4\frac{1}{2}$ feet high. This will turn a wolf or a dog and is the principal essential of running sheep on alfalfa pasture, since they must have free access to the feed day and night. Shade, salt and water are very essential. Have the sheep entirely free from hunger or thirst before turning them on the alfalfa.

In December, 1895, I bought off the range 100 ewes, each with a lamb by its side. They did well until the alfalfa started in the spring. Then we attempted to herd them on the alfalfa in the day time and corral them at night. Our loss by bloat in ten days was 12 ewes and 15 lambs. We put them on native grass for a few days until we could build such a fence as I have described. We enclosed 10 acres of alfalfa and 5 acres of timber. This was in April, 1896. I drove them over a wheat field to the alfalfa pasture to be sure they were full. I have not lost a sheep or lamb since then by bloat and I have no fear of ever losing one.

I have yet five head—four ewes and one buck—of the first 100 bought and they have never been out of that enclosure. The ewes are nine years old, the buck a few years older, and their teeth are as good as the average six-year-old on the range. We never take the buck away from the ewes.

Two of the four ewes had twins last November and the same ewes had twins again this year (1898) in May. The four November lambs weighed in the middle of June 70 pounds each, while the May lambs weighed at the same time twenty pounds each.

We wintered 85 ewes in that pasture during 1897-98 and raised in the spring of 1898 135 lambs, forty of which—the wether lambs—we sold in Kansas City in April, where they averaged 60 pounds and brought $6\frac{1}{2}$ cents per pound, or \$3.95 cents per head. The ewes sheared about $7\frac{1}{2}$ pounds of wool apiece.

I think my pasture would support quite a number more sheep than we have on it, or about ten ewes and their lambs per acre. We irrigate with the sheep in the pasture and can see no bad effects. I do not advocate close pasturing. We have never fattened any lambs, selling them when they are three months old.

Sheep do their principal feeding at night. It would not be profitable to corral sheep at night when in alfalfa pasture, even if it were not for bloating. They will do much better when they can have access to feed both day and night.

Alfalfa pasture does not seem to be favorable to scab.

We bought our sheep from a herd that was infested and expected to dip, but so far have had no occasion.

I am a strong believer in pasturing as a method of handling our alfalfa. Conducted on the principles here described there is nothing in my judgment more profitable than handling sheep and I hope to see the day when every farm in Colorado will be supporting a flock of sheep.

The total income from these 87 ewes for the year from November 1897 to 1898 is as follows:

40 wether lambs sold in April @ \$3.95..	\$158.00
640 pounds wool from ewes @ 10c.....	64.00
175 pounds wool from lambs @ 14c.....	24.50
35 ewe lambs saved for breeding @ \$3.50.	122.50
52 lambs for market, 75 lbs. each, November 1, @ \$3.00.....	156.00
	\$525.00

Year's income per ewe \$6.04.

IS PASTURING ALFALFA PROFITABLE.

It will be noticed from the foregoing letters that the pasturing of alfalfa by sheep is used for several purposes; sometimes for only a few weeks in the spring while the ewes are lambing; sometimes for very early lambs to fit them for the summer market; more commonly for old ewes that would not thrive on the range and by some as a regular way of keeping sheep.

It will also be noticed that there are certain things about which all are agreed. By inference we may judge that all agree, that for keeping wethers or ewes without lambs, alfalfa pasture cannot compete with the open range. This is undoubtedly true so that the only profitable use for alfalfa pasture is as feed for ewes with lambs.

It is also evident at the outset that alfalfa pasture is not cheap feed, not nearly so cheap as the range. If then it is to be used in competition with the range it must be because more growth is obtained on the lambs when on alfalfa than when roaming the range.

The question of raising early lambs on alfalfa and other feeds will be discussed in the latter part of this bulletin.

Here we are to consider the pasturing of lambs during the whole summer that are to be fattened on the same farm during the fall and winter for the eastern markets.

The practical question is, can this be done with as much profit as to range the lambs through the summer and then bring them to the farm for winter feeding. To the feeder of the Arkansas Valley at the present time, this is the simple proposition. But the time will come when the problem will present itself in another form. In the feeding districts of Northern Colorado that time has already come and the problem as it will appear in the future is this: There is or will be on the farm a certain amount of alfalfa. By which method can I realize the more profit, by making hay of it and feeding it to lambs in the winter or by using part of it as pasture for ewes and lambs during the summer and the rest to support the ewes during the winter?

The average of the statements from the various individuals seems to be about ten ewes and their lambs to one acre of good alfalfa pasture, running on the land from the middle of April until the first of October. This would require very good alfalfa and it is probable that eight ewes to the acre would be nearer average conditions. The ewes would feed on the stubble fields practically without cost during October and November, leaving four and a half months that they would have to be hay fed.

A full grown ewe will eat five pounds of hay per day or two and three-fourth tons of hay to run the eight ewes through the winter. If we estimate an acre to produce four tons of alfalfa, then it would require three-fourths of an acre to supply hay for the winter and one acre to pasture them during the summer.

What return could be expected as the income from this acre and three-fourths of alfalfa? For the last four years lambs have averaged being worth four cents a pound live weight on the farm the first of October. It is fair to presume that a person who was planning for pasturing alfalfa would have the lambs dropped in March and they ought then to weigh 70 pounds the first of October and be worth \$2.80 each. The ewes would need to be fed grain for sixty days, one pound per day, costing in all forty cents for each ewe. The ewes should shear seven pounds of wool each, worth at least ten cents per pound.

The whole account would stand thus:

Income.	
8 lambs @ \$2.80.....	\$22.40
56 pounds wool @ 10c.....	5.60
Total	<u>\$28.00</u>
Expenses.	
480 pounds grain.....	<u>\$ 3.20</u>
Difference	\$24.80

This difference of \$24.80 represents the return from the land that will produce seven tons of alfalfa or about \$3.50 per ton for cutting and feeding about half the alfalfa and letting the sheep harvest the other half.

Out of this return would need to be deducted the interest on the investment and any losses by bloat that may occur.

Whether or not any greater return for the alfalfa can be obtained in any other way, each farmer will need to answer for himself. It is believed that the items of income as given above are conservative estimates and that profits much larger than this would often be obtained.

IS PASTURING ALFALFA SAFE.

The answer must be given in the negative. But in view of the statements given by some of those who have had the most experience, the danger from bloat can be largely overcome and the loss reduced to at least not more than five per cent.

On the basis of the estimates already given, a five per cent loss by bloat would reduce the returns for the alfalfa fifteen cents per ton. If there is any profit in pasturing alfalfa, a five per cent. loss on the ewes would not reduce the profit to any serious extent.

There seem to be certain precautions that need to be observed in pasturing alfalfa to prevent bloat and they can be summarized as follows:

1. Have the sheep in small bunches, or if in a large bunch divide into several lots in separate fields.

2. Have a large enough field to supply them with an abundance of food with little effort.

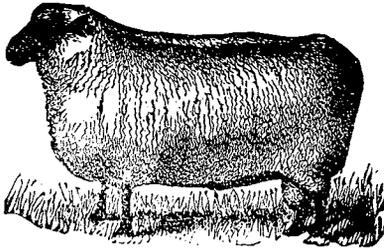
3. Leave them in the field day and night and do not remove them when the field is irrigated.

4. Have water and salt before them all the time and if there are no trees in the field provide some sort of shelter against the sun.

5. Be sure they are filled up with some other food and not thirsty when first turned on the alfalfa.

6. Do not attempt to pasture on alfalfa anything but old ewes and their lambs.

It is probable that by following out the above directions the losses by bloat with old ewes can be reduced to less than five per cent.



II. RAISING EARLY LAMBS.

BY W. W. COOKE.

For many years there have been a few early lambs raised in Colorado. The large markets for early lambs—Chicago, New York and Boston—are so distant that Colorado can hardly hope to compete with the eastern states in supplying lambs in the spring to these cities. Kansas City and Omaha are near enough to be reached, but they are never able to handle very many lambs at one time and their total demand for early lambs is not large. The local market in Colorado is still more limited. It is evident, then, that not many people in Colorado can profitably engage in the raising of early lambs. But there is always a demand for some of these lambs and some one has to supply that demand. At the present time the attention of Colorado feeders is turned more particularly to the feeding of lambs raised in the south and west, because for them the market is almost unlimited and they can be handled by the thousands. The object of the present inquiry was to learn whether the small farmer can raise early lambs and realize as much for his labor and feed as his neighbor with the larger farm does with the older lambs.

During the summer of 1895 fifty ewes were purchased for the test. Half were grades of the Shropshire crossed onto the Merino, and the other half were Horned Dorset and Merino. They were a fine lot of ewes, all of them three years old, having dropped their second lamb the spring of 1895. They cost three dollars per head. Fifteen of the Shropshire ewes were served by registered Shropshire bucks, the other ten by registered Dorset bucks. Fifteen of the Dorset ewes were served by the Dorset bucks the other ten by Shropshire bucks. The lambs were dropped during January and February of 1896.

The fifteen Shropshire ewes that were served by Shropshire bucks dropped 14 lambs, of which 11 were buck lambs and 3 ewe lambs. The ten Shropshire ewes served by Dorset bucks dropped 13 lambs, 5 bucks and 8 ewes. The fifteen Dorset ewes served by Dorset bucks dropped 20 lambs, 16

bucks and 4 ewes. The ten Dorset ewes served by Shropshire bucks dropped 9 lambs, 5 bucks and 4 ewes.

To make the comparison a little easier to see, the above figures have been reduced to the basis of 100 ewes and give the following results:

	Lambe.	Sets of Twins.
100 Shropshire ewes served by Shropshire bucks dropped.....	94	7
100 Shropshire ewes served by Dorset bucks dropped.....	130	40
100 Dorset ewes served by Dorset bucks dropped	134	33
100 Dorset ewes served by Shropshire bucks dropped	90	0

Figured from the side of the ewe, 200 Shropshire ewes, half served by Shropshire bucks and half by Dorset bucks produced 224 lambs with 47 sets of twins. 200 Dorset ewes, with the same service produced 224 lambs with 33 sets of twins. Figuring from the side of the buck, 200 ewes, half Shropshire and half Dorset and all served by Shropshire bucks, produced 184 lambs with 7 sets of twins. 200 ewes, the same but served by Dorset bucks produced 264 lambs with 73 sets of twins.

It is evident from these last sets of comparisons that the prepotency toward the production of twins lay with the bucks and not with the ewes. It is generally conceded that the Dorset is one of the most prolific sheep and the bucks ought to have had this quality more pronounced for they were pure bred while the ewes were grades.

So far everything seemed to favor the Dorsets as the more profitable sheep. But these lambs were dropped in the middle of winter and the twins did not seem to have the vigor to stand cold weather so well as those that had been born singly. Moreover the ewes seemed to be able to give an abundance of milk for one lamb but not enough for two.

The ewes were given grain, and a lamb creep was provided where cracked grain was kept all the time. The lambs learned to eat grain before they were a month old and after that, ate nearly as much as the ewes. Yet in spite of this the twin lambs did not do so well as the others and those that we lost were almost entirely from the twins.

We began selling March 10 and sent off the last May 21. The price was 15 cents per pound dressed weight.

The four sets of lambs of different parentage gave the following results:

Record for the Spring of 1896.

Dam.....	Sire.....	No. of Lambs.	Average Date of Birth.	Average Date of Sale.	Age in Days at Time of Sale.	Live Weight. Pounds.	Dressed Weight. Pounds.	Selling Price Per Head.
Shropshire	Shropshire	13	Feb. 1	April 20	79	47	22	\$3.30
"	Dorset.....	10	" 3	" 25	82	48	22	3.30
Dorset.....	Dorset.....	15	" 9	" 16	67	47	22	3.30
"	Shropshire	9	Jan. 22	" 3	72	51	23	3.45
Total and Average...		47	Feb. 1	April 16	74	48	22	\$3.30

The reason that the dressed weights are so nearly equal, is that we sold from week to week, selecting the lambs as soon as they were large enough to dress over twenty pounds. We finally sold 47 lambs from the 50 ewes, of which 25 came from the twenty-five ewes that were served by Dorset bucks, while 22 were from the twenty-five ewes served by Shropshire bucks.

In the matter of rapidity of growth the ewe seemed to be the controlling factor, rather than the buck as might naturally have been expected. The lambs from Dorset ewes dressed 22 pounds by the time they were 69 days old, averaging 49 pounds live weight, while the lambs from Shropshire ewes required eleven days longer to reach the same weight.

Taking the whole experiment through, the Dorset ewes served by Dorset bucks gave the best results, giving us fifteen lambs from fifteen ewes that sold for \$3.30 per head at 67 days old.

The average for all classes is January 30 for date of birth and April 16 for the date of sale when they were 77 days old, weighed 48 pounds alive, 22 pounds dressed and sold for \$3.30 at the farm.

As fast as the lambs were sold the ewes were taken off from grain and when the last lambs were gone, the ewes were sheared and turned out to pasture on native grass until the next winter.

The same method of procedure was adopted in 1897, except that as the lambs were dropped a little earlier, they were allowed to grow a little larger before they were sold.

This season all the ewes were served by Shropshire bucks and though the lambs sold are one more than 1896, the difference in favor of the Dorsets is larger than in 1896.

There are 21 lambs credited to the Shropshires. One more lamb was dropped but so late in the season that it could not be sold with the others in the spring and was carried over until the next season. It is counted in the summary as worth \$2.00, though of course we actually received more than that for it at the time of sale.

The record for the spring of 1897 is as follows.

Record for the Spring of 1897.

DAM.	No. of Lambs Sold	Average Date of Birth.	Average Date of Sale.	Age at Date of Sale, Days.	Live Weight, Lbs.	Dressed Weight, Lbs.	Selling Price.
Shropshire	21	Jan. 15	March 27	71	54	27	\$4.05
Dorset	27	Jan. 12	April 2	80	56	26	3.90
Total and Average.....	48	Jan. 13	March 30	76	55	26.5	\$3.97

Again for the third year the same experiment was repeated. The ewes were all served by Shropshire bucks, but were getting so old that several did not lamb the spring of 1898.

Instead of selling the lambs for slaughter they were all sold April 13 at \$3.50 per head for breeding purposes. This was about the price they would have brought if they had been fed a little more grain and sold for meat.

The following is the record for the spring of 1898:

Record for the Spring of 1898.

DAM.	No. of Lambs Sold	Average Date of Birth.	Date of Sale.	Age at Date of Sale, Days.	Live Weight.	Selling Price
Shropshire	17	Jan. 1	April 13	102	61	\$3.60
Dorset	23	Dec. 25	April 13	109	59	3.40
Total and Average ..	40	Dec. 28	April 13	106	60	\$3.50

This closed the experiment. The total records for the three years will be considered first with reference to the two breeds, the Shropshire and the Horned Dorset. Then it will be treated as a whole with reference to the financial side of the question.

Shropshires.

Year.	No. of Lambs Sold.	Age in Days at Date of Sale.	Live Weight.	Dressed Weight.	Selling Price Per Head.	Total Selling Price.
1896	23	80	47	22	\$3.30	\$75.90
1897	21	71	54	27	4.05	87.05
1898	17	102	61		3.60	61.20
Total.....	61	84	54	26	\$3.64	\$224.15

Horned Dorsets.

Year.	No. of Lambs Sold.	Age in Days at Date of Sale.	Live Weight.	Dressed Weight.	Selling Price Per Head.	Total Selling Price.
1896	24	69	49	22	\$3.30	\$ 80.55
1897	27	80	56	26	3.90	105.30
1898	23	109	59	..	3.40	78.20
Total.....	74	86	55	25	\$3.57	\$264.05

The financial results are in favor of the Horned Dorsets. The first year they grew the faster, but in both the other years the Shropshires made the most weight and sold for the most per head. But the Dorsets produced so many more lambs as to more than overbalance their slower growth. On the whole the Dorsets brought in \$40 more than the

Shropshires or about one-sixth of the total income. This difference is due entirely to the larger number of lambs reared by the Dorsets. Their record is practically one hundred per cent. since 74 lambs were sold from 25 ewes in three years.

ARE EARLY LAMBS PROFITABLE.

It is a difficult matter to estimate the cost of running sheep in such small numbers as we had in this experiment. But we will give the income side and the winter expenses and each one can estimate for himself what the cost would be, in his own case, of carrying the ewes through the summer.

Year.	No. of Lambs Sold.	Age in Days at Date of Sale.	Live Weight.	Dressed Weight.	Selling Price per Head.	Total Selling Price.
1896	47	74	48	22	83.30	\$156.45
1897	48	76	55	26.5	3.97	192.35
1898	40	106	60	..	3.50	140.00
Total.....	135	488.80
Average.....	45	85	54	25	83.62	\$162.93

The above figures show a yearly income from fifty ewes of \$162.93 for the lambs. To this should be added the re-return for the wool. This has amounted to about 70 cents per year per head, or \$35.00 for the 50 ewes. This gives a total yearly income of \$197.93, or \$3.96 per ewe. The ewes were sold at the end of the experiment for a little more than they cost, so there was no loss in that respect.

Here are some items that can be estimated in the expense of these ewes as follows:

The ewes were kept in the corrals and fed hay after about the first of November. As soon as the lamb was dropped grain was given to the ewe and continued until the lamb was sold. When on hay alone, the ewes ate about five

pounds of hay per head per day and decreased to about four pounds when a pound of grain was added. The lambs ate a pound of hay and a pound of grain after they were 30 days old until they were sold. This makes 85 pounds of grain for each ewe and 25 pounds of grain for each lamb, or 110 pounds of grain for the ewe and lamb, costing us on an average 64 cents.

Each ewe ate 715 pounds of hay and the lamb 25 pounds or 740 pounds of hay, which at \$3.00 per ton comes to \$1.11 or a total cost for winter feed of \$1.75. Subtracting this from the income of \$3.96 leaves \$2.21 as the return for the summer feed of the ewes and the labor of caring for the sheep and lambs through the winter.

These returns compare very favorably with any that can be obtained from running sheep on the range. They represent a clear profit of at least forty per cent. on the investment. Indeed so profitable is the business that if one was sure of a market at the above prices there would be thousands and tens of thousands of early lambs raised each year in Colorado. But, as stated at the beginning of this article, the local market that pays these prices is quite limited and will buy only the very best of stock. There is money in the business for a few breeders near each of the larger cities, but if many went into the business they would break the market and themselves.

RAISING EARLY LAMBS IN THE ARKANSAS VALLEY.

The Arkansas Valley in Colorado is naturally tributary to Kansas City. There are more early lambs raised in the Arkansas Valley than in all the rest of the state together and most of these lambs are marketed in Kansas City, though a few are sent west to Pueblo and Colorado Springs.

The following quotations will give an idea of how the business is carried on and what returns are expected. It can be said as a preface to what follows that the early lamb business in the Arkansas Valley is founded almost entirely on the aged ewe. The old ewes that are too weak or have too poor teeth to stand another year on the range, are brought to the farm in the fall, bred to drop their lambs early, are fed heavily during the winter and spring so that by early summer they are in excellent condition for mutton and bring considerably more than could have been gotten for them fresh from the range the preceding fall. Thus there are two sources of income, the return from the lamb and the increased value of the ewe.

WM. AND H. G. GREENE, Olney.

We raised some early lambs in 1898 that were dropped from the latter part of January to the early part of March. Our experience is that owing to the extra care and feed necessary, these early lambs are not so profitable as the later lambs.

W. A. COLT, Manzanola.

We have been quite successful both in raising early lambs and feeding sheep on alfalfa. We breed the ewes to lamb in February and usually feed the ewe well and get her at least half fattened by lambing time. After lambing we feed the ewe all the grain she can eat and provide corn chop for the lambs. We usually have a "lamb creep" into an adjoining lot where the lamb can find corn chop and bran at any time.

As soon as the alfalfa starts we turn both ewe and lamb out during the day and provide grain and hay in the lots at night. The main point is not to compel the ewe to live entirely on the green alfalfa. There is some loss from bloat with the best of management, usually two to three per cent.

We often market the ewe and lamb in the same car, usually when the lamb is about three months old. Some, however, market the lamb and keep the ewe a few weeks and then send her in. All this class of sheep business is done with the old ewes. The ewe and lamb sometimes bring as low as five dollars, while some of our best farmers have received as high as seven dollars.

W. H. NEY, Fowler.

During the months of January and February, 1898, we lambed 350 Shropshire ewes. These were all young ewes and of course harder to handle during lambing than older ewes. We saved over 100 per cent. of large strong lambs. The work was easier than it would have been to lamb in summer time on open range or pasture; the cost no more; a larger per cent. of lambs saved; better lambs and no loss in the ewes. The result has been entirely satisfactory to us and I can see no reason why anyone, properly prepared for it, cannot do equally well.

We have comfortable sheep barns with ample room for all breeding stock. We feed liberally on alfalfa with mixed grain ration of wheat and oats in sufficient quantities to keep the ewes in good condition. The lambs get grain with their mothers and appreciate it.

We have raised California Merinos and Shropshires.

The California Merinos require more care and warmer quarters than the Shropshires. The Shropshires can stand any amount of dry cold and their lambs are soon up and strong. The Merino lambs must have close attention and warm quarters, but the same attention would be necessary during the spring months and then other farm work would be crowding and prevent the expenditure of the necessary time to make a successful lambing.

When spring comes winter lambs are ready to go to the range or pasture with their mothers and will hold their own anywhere.

E. M. SMITH, on the farm of **A. M. LAMBRIGHT**, Las Animas.

My early lambs in 1897 sold as follows: Lambs dropped in January sold in April at Kansas City for 7c per pound, live weight, and weighed 48½ pounds or \$3.40 per head. None of these lambs had any green alfalfa, but the ewes were turned onto the alfalfa after the lambs were sold. These ewes were sold in Kansas City in June, weighing 81 pounds, at \$3.85 or \$3.02 per head.

My March lambs sold in Kansas City in June for \$4.25 per hundred pounds and weighed 61 pounds or \$2.60 per head. These lambs were dropped in the corral and were fed alfalfa hay, corn chop and bran until March 26, when they and the ewes were turned onto alfalfa pasture and remained there until they were sold in June. We had 600 ewes and 590 lambs on 95 acres of alfalfa and with the addition of one-fourth pound of corn chop per day for a ewe and her lamb, they kept in fine shape. We commenced selling in June and sold until fall. The ewes were sold as soon as fat, some ewes going with each bunch of lambs. The April lambs in August weighed 71 pounds. In 1898 the feed on the range was so good that we pastured but little on alfalfa.

JOHN McNAUGHT, Las Animas.

In 1898 I lambed 200 ewes in January and sold the lambs in Kansas City in March for 8c per pound. They weighed 53 pounds or \$4.24 per head. Two weeks later I sold the ewes for \$4.75 per hundred pounds and as they weighed 96 pounds each they brought \$4.56 per head. Neither these ewes nor lambs had any green alfalfa.

In April and May I lambed 500 ewes on alfalfa pasture. They remained there until May 26 when they were turned on the range.