consumption. Canada has here an opportunity. It is believed that cheap meats are a thing of the past, as range conditions have almost disappeared, a higher quality meat is being sought, and in view of the comparatively high land values a higher standard of breeding and feeding is imperative for further development.

In regard to the hog situation, the Live Stock Commissioner estimates that the live hog industry sustained a loss of approximately $11,000,000, during the seven months ending July 31, that sum representing the difference in value between the visible hog marketings during that period and the same period of 1919. The loss in revenue was due the liquidation of breeding stock during 1919, the loss being estimated on the basis of prices in 1920. The Commissioner says: "We continue to steadily fall behind in the volume of our marketing, while at the same time the percentage liquidation of sows suitable for breeding is on the increase." From January 1 to September 1, 1920, there were marketed at the six principal markets in Canada, 456,629 hogs, and of this total 18,178, or 3.9 per cent., were sows. During the month of August, out of a total of 42,022 hogs marketed, 3,609, or 8.5 per cent., were sows. This shows that brood sows are being disposed of more rapidly than during any previous month of the year. This can scarcely be understood in view of the prospects for cheaper feed. The market itself gives promise of prices very favorable as regards their relation to the cost of production. The Live Stock Commissioner finds it impossible to explain the present liquidation of breeding sows, as during a normal period it is the hard and fast rule to go into hogs in a time of famine in supply. To-day, with the most marked shortage in a decade, and prospects of a comparatively high and steady market, apparently the opposite stand is being taken in regard to supplies. Apparently Canadians are faced with the problem of keeping supplies up to normal in the meat line, especially of hog products, at a time when extensive preparations should be made to greatly extend our normal output. It rests with the individual producer as to whether the market surplus of hogs in 1921 will be below requirements or adequate to meet the needs of the export market. The past two years have been rather difficult ones for the hog feeder, owing to the high price and difficulty in securing feed. There is reason to believe that we have passed the peak in feed prices, and that from now on there will be a more liberal supply of pig feeds.

Winter Rations for Breeding Ewes.

A considerable study has been made of rations for breeding ewes during the winter, in an effort to find out what effect they had on the production of lambs and wool. A. A. Dowell and G. L. Flack, of the Department of Animal Husbandry, Alberta, have been carrying on extensive work for the past year, using local roughages. Their conclusions after one year's work are given in the following paragraphs. Although the experiment was carried on in Alberta, varieties of fodder similar to that fed to Ontario flocks were used so that the results obtained should be of interest to Ontario flock owners. The amount of feed consumed is figured at a fair average price, and in this way the cost of wintering the ewes is arrived at. The following paragraphs are the results obtained during the winter of 1919-20.

The objects of the experiment were to determine the comparative value of the following roughages in wintering pregnant ewes:

Alfalfa hay, timothy hay, prairie hay, oat green feed hay, oat straw, prairie hay and oat green feed hay, alfalfa hay and oat straw, oat straw and turnips. To show the effect on the growth of fleece, size and strength of lambs and body development of bred ewes when forced to use snow in place of the usual practice of allowing access to water.

In this test common white faced range ewes, showing a predominance of Merino blood were used. They were three years old in the spring of 1919 and consequently four years old at the time of lambing in the spring of 1920. As they were handled exactly alike, under average farm conditions, during the winter of 1918-19 and the summer and fall of 1919, it will be evident that they were placed on test in a very uniform condition—being alike in age, breeding and having been handled under identical conditions of feed and management.

The fifty ewes in this test were purchased in March, 1919, so that lambing and shearing records for the year would be available for comparison with similar records the following spring after completing the 1919-20 winter experiments. By feeding a little whole oats they were "flushed" just before breeding in the fall of 1919 to insure their being in the proper condition at the time of service.

Then ten ewes were bred to an Oxford ram, ten to a Suffolk, ten to a Leicester and twenty to a Hampshire. All of these rams were pure-bred, of good type and in their mature form. The ewes were so placed in the different lots that in each group one would be bred to an Oxford, one to a Suffolk, one to a Leicester and two to a Hampshire. This was done for two reasons. In the first place, by using rams of four different well-known breeds on the five ewes in one lot, any good or bad results from the roughage fed to that lot could not be attributed to the use of a ram belonging to one special breed. Second, while carrying on this experiment to determine the value of different feeds for wintering pregnant ewes, it was felt that breeding work in "Grading-up" the grade flocks could be carried on as well by placing the ewes in the different lots as mentioned. It should be stated that each ewe was placed in its respective lot on the date bred so that the feeding test started at the very beginning of the pregnancy period.

Each individual fleece was carefully weighed at the time of shearing—the first week in June, 1919. After completing the winter tests the individual fleeces were again weighed the first week in June 1920. In this way the exact gain or loss in weight of each fleece could be determined and definitely charged to the feed allowed during pregnancy, as all were fed alike during the balance of the year.

Each ewe was weighed on the date bred and then every seven days throughout the winter. The last weight during pregnancy was recorded on the 145th day——the day before they were expected to lamb. They were again weighed eight hours after lambing. The difference between the weights at time of breeding and eight hours after lambing were used to determine the gain or loss per ewe on the different feeds. Each lamb was weighed as soon as dry so that the influence of the different roughages on the birth weight could be definitely recorded.

It is of interest to note that in the spring of 1919 only one of the fifty ewes failed to be in lamb, and that but one pair of twins was dropped. In the spring of 1920, three failed to be in lamb, while twenty-three ewes gave birth to twins. We cannot account for this remarkable increase in number of twin lambs for the ewes were three years old in the spring of 1919, and would be called mature at that time. Furthermore in the fall of 1918 they had been bred to good pure-bred Shropshire, Suffolk and Oxford rams, and had been well wintered on prairie hay and oat green feed hay—a combination that gave four pairs of twins from four ewes in the 1919-20 tests.

The ten different groups were provided with similar winter accomodations. Each lot was 30 feet wide and 300 feet long with the winter shelter placed at the rear and the feed racks at the front of the lot to force exercise.

Feeds were valued as follows: Alfalfa hay, $25 per ton; timothy hay, $20 per ton; oat green feed hay, $12 per ton; oat straw, $4 per ton; turnips, $6.00 per ton; whole oats, 75c. per bushel.

Results With Alfalfa Hay.

Leaving out of account the question of cost, the lot wintered on alfalfa hay would easily rank first. They were in excellent condition at time of lambing, with the after lambing weights showing a slight gain of .8 of a pound per ewe over weights at the time of breeding. Their lambs came 100 per cent. strong and were the heaviest in the test—averaging 9.94 lbs. at birth. These ewes made an average gain in weight of fleece over the 1919 clip of 2.94 pounds per head, which was 1.32 pounds above the next best shearing lot No. 7. During the 145-day period they consumed 605.88 pounds of hay per head at a cost of $7.57. With the alfalfa hay valued at $25 per ton or $5 above timothy and $9 above prairie hay, the cost of feed was greater than in any other lot.

Timothy Hay.

Results with timothy hay will be somewhat of a surprise to many sheep men for this roughage has generally been regarded to have a low feeding value, especially for breeding ewes. In this case the ewes came through to lambing a little thin in flesh, but quite thrifty—the after lambing weights showing an average loss of 12.6 pounds. They produced but one lamb per ewe, but they came 100 per cent. strong and weighed 8.78 pounds. This group made an average gain in fleece of 1.32 pounds which was surpassed only in lots 1, 7 and 8. Results with timothy were quite satisfactory though it should be remembered that the hay used was of very good quality and not over ripe or coarse.

Poor Showing on Oat Green Feed Hay.

Oat green feed hay, fed alone, proved the most unsatisfactory roughage of any on trial. The ewes wintered in fairly good condition showing an average loss of but 8.75 pounds, but the lamb crop was very disappointing. One ewe proved not to be in lamb one aborted on April 1st and another on April 3rd. The cause of the abortion was not known, so no conclusions can be drawn until after the test has been repeated another year. Another ewe carried her lamb the full gestation period, but at birth it was too weak and flabby to survive. The fifth ewe produced a large single lamb that was very drowsy for the first four days, but improved rapidly after that time. In all, four lambs were aborted, or died shortly after birth and but one was raised or 16⅔ per cent. The gain in fleece per ewe for this lot was only .55 pounds. The feed cost of $4.05 was comparatively low, but these results would seem to indicate that it should not be fed alone but in combination with some other roughage.

Bred Ewes Cannot be Maintained on Oat Straw Alone.

An attempt was made to winter one lot on good quality mature oat straw containing considerable chaff. Two ewes failed to settle at the first service and together had lost 24 pounds by the time they were re-bred. This loss is not shown in the accompanying table, so that the original breeding weight of the group appears to be much less than in the other lots. At the time of the first service, (when they were actually put on this feed) they averaged 111 pounds. As soon as placed on the oat straw all ewes lost flesh rapidly. At the close of the fifth week they were so thin and weak that it was evident that they could not be maintained on this roughage, so whole oats were added. The quantity of grain was steadily increased until the ewes began to gain in weight. Towards the latter part of the period they were receiving a little over one pound of whole oats per head per day. At lambing time they were still rather thin. One ewe proved not to be in lamb, another produced twins that were too weak to survive, while the other three gave birth to good average single lambs. This lot showed the lowest average gain in weight of fleece with but .025 pounds per head to their credit. From the standpoint of condition of ewes, strength of lambs and growth of fleece, oat straw is not a satisfactory single roughage for bred ewes. If used it should be in combination with other more suitable roughages.

Prairie Hay and Oat Green Feed Hay.

Although prairie hay alone gave only fair results and oat green feed proved very unsatisfactory, this lot wintered on a mixture of equal quantities of the two roughages, ranked very high, especially when the cost of feed is considered. The average loss in weight was but 6.75 pounds, the ewes were in good condition, the four that proved to be pregnant each gave birth to twins averaging 7.96 pounds, and they came 100 per cent. strong. The average gain in weight of fleece was 1.30 pounds. These ewes were wintered at a cost of $4.28 per head. Keeping in mind the condition of the ewes, number and strength of lambs, gain in weight of fleece and cost of feed, the prairie hay and oat green feed hay combination indeed proved satisfactory, and furthermore these hays are available on most prairie farms.

Snow vs Water.

Lots 7 and 8 were fed exactly alike with the exception that the former was forced to use snow throughout the winter while the latter had access to water. Each received prairie hay and just enough whole oats (approximately .7 of a pound per head per day) to secure the gain in weight during pregnancy that was desired. As the table will show, after lambing weights gave a very slight loss in each case, with a little advantage for the lot receiving water. All ewes in each lot produced good lambs that came 100 per cent. strong. Those from the ewes on water weighed at birth 9.74 pounds and those from the snow lot 9.67. The ewes on snow made a gain in weight of fleece of 1.62 pounds and those in water 1.58 pounds. The feed cost was the same. All results were so nearly identical that it would appear that ewes may be wintered just as well on snow as by following the usual practice of providing water, though

How Fed	Lot 1 Alfalfa hay	Lot 2 Timothy hay	Lot 3 Prairie hay	Lot 4 Oat green feed hay	Lot 5 Oat straw and whole oats	Lot 6 Prairie hay and oat green F. hay	Lot 7 P. hay, whole oats and snow	Lot 8 P. hay, whole oats and water	Lot 9 Oat straw and turnips	Lot 10 Oat straw and alfalfa
Number of ewes	5 *	5	5	4	4	4	5	5	5	5
Av. weight when bred	116.40	116.20	116.00	125.00	***102.25	117.25	114.40	109.20	121.20	116.00
Av. wt. 8 hrs. after lambing	117.20	103.60	94.00	116.25	102.25	110.50	111.20	107.20	96.20	107.20
gain or loss per ewe	†0.80	−12.60	−22.00	−8.75	0.00	−6.75	−3.20	−2.00	−25.00	−8.80
Condition of ewes at time of lambing	excellent	fair	very thin	good	thin	good	very good	very good	very thin	good
Number of lambs	7	5	†10.00	‡6	5	8	6	7	*8	8
Per cent. strong lambs	100.00	100.00	80.00	16.66	60.00	100.00	100.00	100.00	87.50	100.00
**Av. birth wt. of lamb	9.94	8.78	7.01	9.00	8.80	7.96	9.67	9.74	7.84	8.50
Av. wt. of fleece 1919	7.20	6.88	7.80	8.40	7.10	6.85	6.80	6.72	6.68	8.00
Av. wt. of fleece 1920	10.14	8.20	8.70	8.95	7.125	8.15	8.42	8.30	7.12	9.06
Av. gain in wt. of fleece	2.94	1.32	.90	.55	.025	1.30	1.62	1.58	.44	1.06
Feed consumed per ewe during pregnancy—145 days:										
Roughage	605.88	599.28	580.12	674.97	593.80	612.04	482.91	479.34	581.67	612.51
Grain					146.02		103.21	103.75		
Turnips									632.95	
Feed cost per ewe	$7.57	$5.99	$4.64	$4.05	$4.41	$4.28	$6.14	$6.12	$3.06	$4.48

† One ewe aborted (2 lambs); ‡ two ewes aborted (4 lambs); * one ewe aborted (1 lamb); ** average weight does not include lambs aborted in lots 3, 4 and 9; *** two ewes failed to settle at first service and had lost 24 lbs. by the time they were re-bred. Consequently the actual loss is not shown in this table.