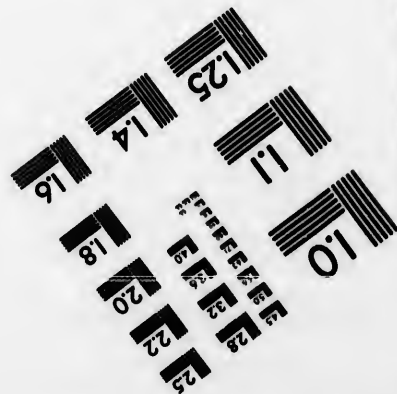
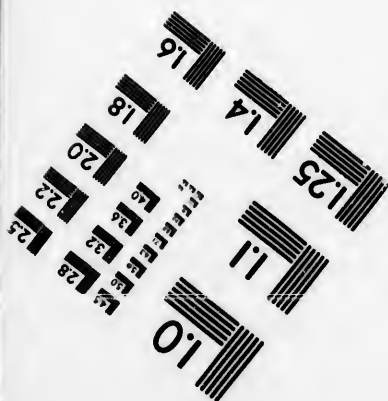
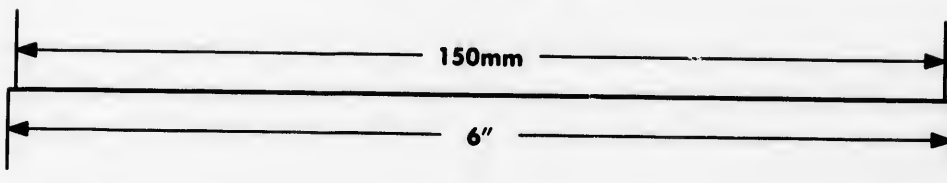
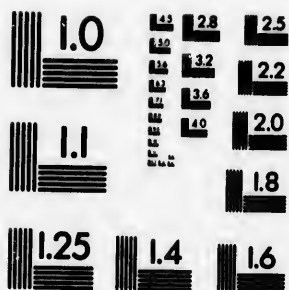
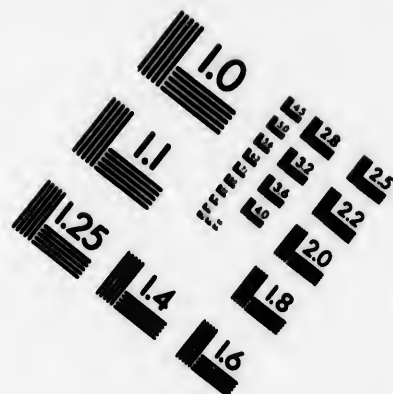
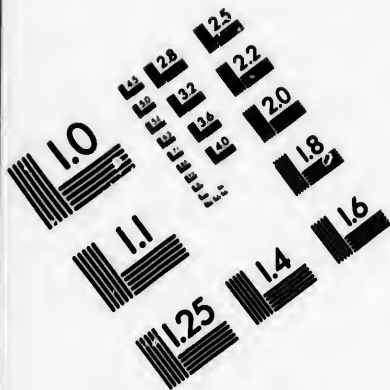


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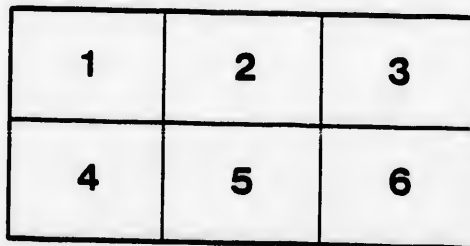
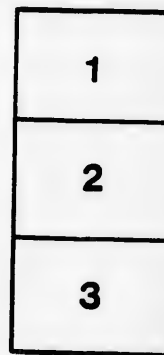
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BULLETIN LX XIII.  
FEEDING SHORN AND UNSHORN LAMBS IN WINTER  
AND  
FEEDING LAMBS ON DIFFERENT RATIONS.

BY THOMAS SHAW, PROFESSOR OF AGRICULTURE, AND  
C. A. ZAVITZ, B.S.S., EXPERIMENTALIST.

PUBLISHED BY THE DEPARTMENT OF AGRICULTURE  
November 21, 1892.

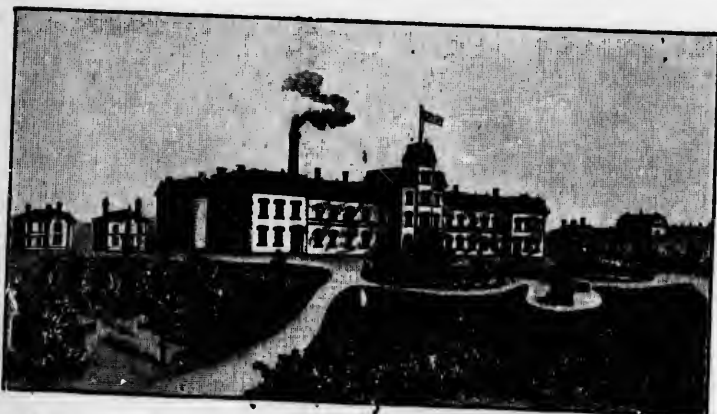
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# BULLETIN LXXXIII.

## PART I.

### FEEDING SHORN AND UNSHORN LAMBS IN WINTER.

This experiment began on December 3rd, 1891, and closed on April 12th following, thus covering a period of 131 days. It is the second of a series of experiments having the same objects in view. The results of the first experiment are given in Bulletin LXVIII, issued in 1891.

The objects of the experiment include the following, viz.: 1. To ascertain whether shorn or unshorn lambs will give the best returns for the food consumed in winter. 2. To ascertain the relative gains that will result from liberal feeding at such a time. 3. To ascertain the cost of feeding lambs for fattening purposes in the winter season on the ration used in this experiment. 4. To ascertain the adaptability of the work to the conditions of Ontario.

*The Animals Selected.* Twenty lambs were chosen from those obtained in Eastern Ontario, and which reached the farm August 29th, 1891. These lambs are more fully described in Bulletin LXXVII issued earlier in the year. As will be apparent from the weights, these lambs were above the average of the lot from Eastern Ontario, although they were not above the average of the grade lambs of the whole country speaking in a general way. They were of mixed breeding, the blood of the long wools probably being in the ascendant.

*Conditions Governing the Experiment.* On November 30th, the lambs were divided into two groups of ten each. The fleeces were then removed from those of one group. On December 3rd they were all weighed separately and the experiment commenced. The pens in which they were fed and the yards attached were the same as those used in the corresponding experiment of the previous year, and which are described in Bulletin LXVIII, page 4. The lambs in both groups were given the same kinds and the same quantities of food, except in the item of hay, of which they were given all they would take. They were weighed every month.

*Food and Feeding.* The food fed to the lambs throughout the experiment consisted of hay, grain, bran and roots. The hay was principally clover, and it was fed uncut. The grain and bran ration

was made up of 3 parts oats, 2 parts peas, and 1 part wheat bran by weight. The oats and peas were fed whole. The roots consisted of turnips and mangels fed at different seasons, and they were sliced before being fed. The whole was given in two feeds per day, morning and evening. They had access to water and salt at will.

*Estimated Value of the Food.* The hay, grain and roots were estimated at the current market values in Guelph, less the cost of marketing from an Ontario farm under average conditions. (See Bulletin LXVIII, p. 5.) The home value put upon the hay therefore was \$9 per ton, the oats 26 cts. per bush., the peas 50 cts. per bush., the roots sliced 6 cts. per bush, and the bran was put at \$14 per ton. It will also be observed as stated in previous bulletins that in all probability a profit has already been made on the marketable food used, providing it has been grown upon the farm, as in this experiment the food was charged at the full market values less the cost of marketing. This profit will be represented by the difference between the cost of growing the food and the value put upon it.

*Food Eaten.* The total amount of food eaten by the lambs of each group was the same, except in the case of hay. In each they consumed 1,665 lb. grain and bran, and 6,550 lb. roots. The unshorn lambs consumed 1,832 lb. hay and the shorn lambs 1,885 lb. The amount of food eaten therefore per day by the average lamb was :

Oats.....	.635 lb.	} 1.271 lb. grain and bran.
Peas.....	.424 lb.	
Bran.....	.212 lb.	
Roots.....	5.000 lb.	
Hay.....	1.418 lb.	
Total.....	7.689 lb.	

The ration was uniform and constant throughout with the exception of the grain portion of it, which was increased at the end of 60 days. All the hay was given to the lambs that they would eat.

• In the corresponding experiment of the previous year the average daily consumption of food was 8.81 lb., and with the 100 lambs fed for the British market in the winter of 1891-92, it was but 4.87 lb. The marked difference in the amounts eaten is caused in part by a difference in the size of the lambs, and in part by aiming to finish them quickly in the one case and more leisurely in the other. It will be interesting to compare the results when we get sufficient data from which to draw conclusions safely.

*Weights.* The unshorn lambs averaged 104.25 lb. at the commencement of the experiment, and 141.6 lb. at its close. The shorn

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lamb weighed 101.15 lb. and 132.3 lb. respectively at the corresponding dates. The increase in weight was therefore a little more than 6 lb. in the aggregate in favor of the unshorn lambs. Had they been shorn earlier in the season the results might have been different. In the corresponding experiment which is to follow, the lambs will be shorn at a period considerably earlier.

The average daily gain of each lamb was .262 lb. or a little more than  $\frac{1}{4}$  lb. per day. While these lambs consumed daily 2.82 lb. more of a ration very similar in kind to that fed to the lambs in preparation for the British market, they gained but little more per day. This would seem to intimate that we can easily go too fast in fattening lambs, but there are various considerations to be taken into the reckoning before we draw any hard and fast conclusions.

Table I gives a summary and an analysis of weights.

	Unshorn.	Shorn.
Weight at commencement.....	1042.500 lb.	1011.500 lb.
Weight at close.....	1416.000 "	1323.000 "
Increase per group.....	373.500 "	311.500 "
Average daily increase per group.....	2.851 "	2.378 "
Average individual increase.....	37.350 "	31.150 "
Average individual daily increase.....	.285 "	.238 "

VALUES. Table II gives the financial results of the experiment.

	Unshorn lambs.	Shorn lambs.
Cost of animals at commencement of the test....	\$ 0.	\$ 0.
" shearing.....	52 10	50 55
" food.....	27 73	27 97
" attendance.....	1 36	1 36
Total cost.....	81 19	80 38
Value of animals at close of test.....	99 12	92 61
" wool.....	5 85	5 85
" manure.....	16 53	16 53
Total value.....	115 65	114 99
Total gain.....	34 46	34 61
Gain per cent. on the whole transaction.	42 44	43 06

The lambs were valued at 5 cts. per pound live weight at the commencement of the experiment. We received an offer of  $4\frac{1}{2}$  cts. per pound for all the lambs at that time, but they were put at the price named as they were somewhat superior in quality to the average of the lambs then on hand. The cost of shearing was put at 5 cts. per head. The attendance was reckoned on the basis that one man would care for 800 lambs when the food is all prepared. (See Bulletin LXXVII). At the close of the test the lambs were sold to Mr. L. O. Barber, live stock dealer, Guelph, for 7 cts per pound live weight. They were sent to the Halifax market. The wool from the 10 shorn lambs weighed 45 lb. and was sold at 13 cts. per pound.

The quantity of the manure was estimated from that made by the lambs sent to Britain, and the major portion of which had been weighed. (See Bulletin LXXVIII, p. 14). The estimate was further based on the respective quantities of food consumed daily by the two lots respectively, that is to say, the lambs sent to England and all lambs in this experiment. This gives the output of the manure from the 20 lambs as 12.025 tons, or 9.17 lb. per lamb per day.

Professor A. E. Shuttleworth, the chemist of the station, made a careful analysis of the manure, and handed to us the following report as to the analysis and the commercial value of the ingredients which are chiefly useful in the same: Organic nitrogen, 9.8 lb. per ton, worth 17 cents per pound; total phosphoric acid, 12.6 lb. per ton, worth 3 cents per pound; muriate of potash, 15.0 lb. per ton, worth  $4\frac{1}{2}$  cents per pound.

The commercial value of the manure therefore is \$2.75 per ton, which would give the value of the amount made per day per lamb as  $1\frac{1}{2}$  cents. A due allowance for bedding however would somewhat lessen the value of the manure. As we have given an approximate estimate of the amount of the manure made, the reader can put that value upon it which may seem best to him.

It will also be observed that there was a net cash gain of \$38.73 on the 20 lambs fed, or a gain of \$1.94 per head, without including cost of attendance or value of manure.

*Conclusions.* The following are the chief of the conclusions to be drawn from this experiment:

1. That good grade lambs, when being fattened in winter, may be made to increase .263 lb., or a little more than  $\frac{1}{4}$  lb. per day on a daily ration of 1.271 lb. grain and bran, 5 lb. roots and 1.418 lb. hay, or a total of 7.69 lb.
2. That when the prices of food are as charged in the experiment such lambs can be fattened at a cost for food per day of 2.12 cents.
3. That in this experiment the autumn shearing of the lambs was virtually of no practical material advantage.
4. That where there are facilities for the work, good grade lambs can be fattened in the winter at a substantial cash profit,

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## PART II.

## FEEDING LAMBS ON DIFFERENT RATIONS.

This experiment relates to feeding lambs on three different rations during the winter season. It may be fitly designated an experiment within an experiment, as the lambs used in conducting it were at the same time being fattened for the British market. (See Bulletin LXXVIII.) The 100 lambs used in the experiment were divided into four different groups, with 25 animals in each group. But for reasons to be given below the experiment was confined to three lots.

On December 31st, 1891, they were all weighed and the test commenced the following day. It closed April 30th, thus covering a period of 120 days. The leading object of this sub-experiment was to ascertain the respective values of the various rations used for fattening lambs.

*Conditions governing the Experiment.* The 100 lambs were so divided that those in each of the four groups were nearly equal in quality. They were then put in the four equal-sized compartments of the same closed shed, the internal divisions of which were made by feeding racks running across the building. The racks were so arranged that the lambs in each compartment could feed on the opposite sides thereof, thus affording them plenty of room for taking their food. The shed is 76 feet long and 28 feet broad outside measure; hence each compartment was virtually 19 feet by 28 feet, from which the room occupied by the feeding racks is to be deducted. The ceiling is 9 feet high, and the food was kept on the loft overhead. Each compartment has a low wide door which was kept open all the time, except in the stormiest weather. The yards in front of the compartments, one for each, extended out about 16 feet from the shed. All the food given them was accurately weighed, and it was given in two feeds daily. They were plentifully supplied with water and salt.

*Food and Feeding.* The lambs in No. 1 group received a ration consisting of grain, bran, roots, and hay. The grain ration consisted of oats, peas and bran fed in the proportions of 2.2 and 1 parts. The roots consisted of turnips and mangels sliced. The hay was principally clover, and it was fed whole. Those in No. 2 group received the same quantity of whole oats by weight as were given in grain and bran to the lambs in group 1, and roots and hay the same in character. The lambs in group 3 were fed mixed grains similar in quantity and quality to those in group 1. In addition they received virtually all the corn ensilage they would eat, and also hay. Those in group 4 were fed grain, bran and roots, the same as the lambs in group 1, and in addition all the pea straw they would take,

but as the pea straw proved of much poorer quality than was at first anticipated, the experiment with this lot was abandoned. The same quantity of roots was given to the lambs in groups 1 and 2, and the hay was given without limit in each instance; that is to say they were given all the hay they would eat clean. The experiment therefore was a test of the comparative value of a mixed grain ration in the one case, as against oats in making mutton, and of the value of ensilage as against roots for the same purpose in the other.

The table gives the comparative cost of the food consumed by the animals of each group, and also of the increase in live weight:

	Group I.	Group II.	Group III.
Total cost of food per group.....	\$66.50	\$65.94	\$60.17
Average cost of food per day per lamb .....	2.22 cts.	2.20 cts.	2.01 cts.
Total live weight increase per group.....	31.46 lb.	33.74 lb.	30.80 lb.
Average weight of increase per lamb per day .....	.262 lb.	.281 lb.	.257 lb.
Cost of food to produce one pound live weight increase .....	8.47 cts.	7.93 cts.	7.82 cts.

The good results relatively from feeding the grain ration of oats in the one case, and the ration of corn ensilage in the other, are clearly brought out in the experiment. This is so far satisfactory, as there is no grain so universally grown in Ontario, and corn ensilage can be grown by many who cannot grow roots.

#### *Conclusions.*

1. That in this experiment the rations with oats simply made mutton more quickly and more cheaply than the ration with oats, peas and bran.
2. That in this experiment while the ration with ensilage did not make mutton quite so quickly as the corresponding ration with roots, it made it more cheaply.
3. That in this experiment the ration given to the lambs in groups II and III, viz, the oat ration with adjuncts and the ensilage ration with adjuncts proved about equally valuable for fattening lambs, cost considered.
4. That in this experiment an average daily increase per lamb per group of .267 lb. was secured, at a cost for food of 2.14 cents per day; in other words every pound of mutton added to the live weight cost 8.07 cents, food only considered.

