

## **Feedlot Performance of Terminal and Maternal Cross Lambs**

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One of the objectives of the Ontario Lamb Improvement Breeding Strategy (OLIBS) was to develop superior maternal-type ewes to serve as a genetic base for flock expansion in the province. It was acknowledged that these maternal genetics were unlikely to match terminal-type lambs for feedlot performance and carcass quality, thus comparisons of maternal and terminal cross lambs were made at the New Liskeard Agricultural Research Station (NLARS). This update summarizes the feedlot data from these trials.

### **Methods:**

Three separate feeding trials were conducted. In each, three genotypes were evaluated. The dam side in all cases was a Rideau Arcott x Dorsett ewe (hereafter referred to as an OLIBS cross), while the sire was one of: Charolais (COx), Suffolk (SUx), or OLIBS. The COx and SUx lambs were produced via artificial insemination using either frozen or fresh semen, while the OLIBS lambs were produced using natural service.

Lambs were born during October, 1999 (trial 1), August 2000 (trial 2) and September 2000 (trial 3) at NLARS. The lambs were offered a barley-based creep at about 14 days of age. Lambs were weaned at 50 to 60 days of age and were given a 2 week warm-up period on the test ration prior to the start of the feeding period.

For all trials, the ration consisted of a free choice grain mixture as well as approximately 160 grams/head/day of alfalfa pellets which were hand fed. The grain mix formula was 820 kg of whole barley mixed with 120 kg of a custom lamb grower supplement. The resulting mixture was 14.7% crude protein and 72.5% TDN. The supplement was fortified with minerals and vitamins and was medicated with lasalocid sodium at a rate of 126 mg/kg as an aid in the prevention of coccidiosis. Clean water was also available at all times. All feed was weighed into the feeders and any wasted or refused feed was weighed back.

Lambs were weighed at the start of each trial: December 22/99 (Trial 1), October 06/00 (Trial 2) and November 16/00 (Trial 3) and every 14 days thereafter. Weighing conditions were the same for all groups and over all weighing periods. Lambs were shipped to the University of Guelph Meat Laboratory when they reached a live weight of 45 kg or higher. Lambs were shipped every 2 weeks. At the Meat lab, further data such as carcass weight, GR measurement, fat scores, and rib eye area were measured. This paper deals only with the feeding data.

In trial 1, three pens of each genotype (SUx, COx, and OLIBS) were used. The assignment of genotype to pens was done randomly. In trials 2 and 3, only a small number of COx lambs were available, and no OLIBS lambs were available. Thus, only one pen of COx lambs was used in trials 2 and 3. Three pens of SUx lambs were used in trial 2 and two pens in trial 3.

Results of Trial 1 were analysed using analysis of variance. Where the analysis indicated that

significant differences existed, the least significant difference method was used to compare means. Trials 2 and 3 could not be statistically analyzed due to a lack of replication on the COx pens.

**Results:**

Trial 1:

Starting weights were significantly higher for the SUx lambs as compared to the OLIBS lambs (Table 1). Lambs were somewhat lighter than anticipated at the start of the trial but were in good health.

During the first 56 days of the feeding period, the SUx lambs gained significantly faster than the COx and OLIBS lambs (Table 1). Absolute gains for the SUx lambs were 365 grams/head/day (0.8 lb/hd/d) which is acceptable but not outstanding for this feeding program and type of lambs. Average daily gain calculated until each lamb reached its target weight was again highest for the SUx lambs, averaging 372 grams/head/day. In both cases, the average daily gain was not significantly different between the CO cross lambs and the OLIBS lambs.

The SUx lambs reached their target weight in an average of 73 days (range 58 to 98 days) as compared to 80 days (range 70 to 98 days) for COx lambs and 83 days (range 70 - 98) for OLIBS lambs. However, there was not a statistically significant difference between the 3 genotypes for days to finish.

Feed to gain ratio is defined as the kilograms of grain mixture required to produce a kilogram of lamb bodyweight gain. In this trial, feed:gain ratios were quite similar across genotypes, averaging 3.4:1 for the SUx lambs and 3.6:1 for the COx lambs. Feed:gain ratios were slightly higher when calculated over the entire feeding period. There were no significant differences in feed:gain ratio in either case.

**Table 1. Feedlot performance of Suffolk (SU), Charolais (CO) and OLIBS lambs in trial 1.**

<b>Cross</b>	<b>Start Weight</b>	<b>ADG day 0-56</b>	<b>ADG to finish</b>	<b>Days to Finish</b>	<b>Feed:Gain day 0-56</b>	<b>Feed:Gain to finish</b>
<b>SU (32)</b>	19.9a	365a	372a	73	3.4	3.5
<b>CO (27)</b>	18.4ab	327 b	344 b	80	3.7	3.7
<b>OL (26)</b>	16.8 b	335 b	340 b	83	3.5	3.8
<b>LSD</b>	2.3	28.8	24.4	ns	ns	ns
<b>Mean</b>	18.3	342	352	79	3.5	3.7
<b>CV</b>	5.6	3.7	3.1	5.4	5.9	8.9

### Trial 2:

Trial 2 consisted of 1 pen of 7 COx lambs, and 3 pens with a total of 51 SUx lambs. The SUx lambs were sorted into pens by starting weight (Table 2). Over the first 42 days, the average daily gain ranged from 349 to 373 g/hd/d. The feed:gain ratio over the same period varied widely, ranging from 2.8:1 for the lightest group of SUx lambs to 4.9 for the COx lambs. Over the entire feeding period until the lambs reached the target weight, the average daily gain ranged from 330 to 348 g/hd/d. For the entire feeding period, the feed:gain ratio ranged from 4.2:1 to 4.9:1 for the SUx lambs, and was 6.0 for the single pen of COx lambs. While the difference in feed:gain ratio between SUx lambs and COx lambs is relatively wide, statistical analysis cannot be applied since there was no replication of the COx pen.

**Table 2. Performance of Charolais-cross (COx) and Suffolk-cross (SUx) in Trial 2.**

<b>Cross</b>	<b># lambs</b>	<b>Start Weight</b>	<b>ADG day 0-41</b>	<b>Feed:Gain day 0-41</b>	<b>ADG to finish</b>	<b>Feed:Gain to finish</b>
<b>CO</b>	7	25.8	349	4.9	341	6.0
<b>SU (1)</b>	18	24.8	363	3.9	348	4.9
<b>SU (2)</b>	17	20.2	373	3.8	342	4.8
<b>SU (3)</b>	16	14.6	359	2.8	330	4.2
<b>Average</b>			361	3.9	340	5.0

**Table 3. Performance of Charolais-cross (COx) and Suffolk-cross (SUx) lambs in Trial 3.**

<b>Cross</b>	<b># lambs</b>	<b>Start Weight</b>	<b>ADG day 0-28</b>	<b>Feed:Gain day 0-28</b>	<b>ADG to finish</b>	<b>Feed:Gain to finish</b>
<b>CO</b>	8	29.2	250	5.7	264	6.0
<b>SU (1)</b>	11	25.9	282	4.8	313	4.7
<b>SU (2)</b>	12	30.5	340	4.3	332	4.6
<b>Average</b>			291	4.9	303	5.1

### Trial 3.

In trial 3 a single pen of 8 COx lambs and 2 pens of SUx lambs with a total of 23 lambs were used. Starting weights were higher than for the previous two trials. Average daily gain for the first 28 day period was widely variable, ranging from 238 to 340 grams/hd/d. The feed:gain ratio for the same period was 4.3 to 4.8 for the SUx and 5.7 for the COx. Over the total feeding period (up to day 69), average daily gains were 264 g/hd/d for the COx lambs and from 313 to 332 for the SUx lambs. Feed:gain ratio for the total period averaged 6.0 for the COx lambs and

4.7 for the SUx lambs. As with trial 2, lack of replication in the COx pens did not allow statistical analysis to be done.

### Cost of Gain

In the spring of 2001, the supplement pellet cost approximately \$400/mt (fob mill) and local barley was about \$120/mt. At a mixing rate of 18% supplement and 82% barley, the mixture cost per tonne was \$170.40. This equates to a cost of 7.7 cents per pound.

Using the performance data from Table 1 above, the calculated cost for grain supplement per pound of liveweight gain ranged from 26.3 cents to 28.1 cents (Table 4). Feed cost per day was between 20 and 21 cents and total grain cost to reach the target weight ranged from a low of \$15.33 for the SUx to a high of \$16.60 for the OLIBS cross. Note that these costs do not include the alfalfa pellets, which cost about 3.5 cents per head per day. On most farms this would be replaced with alfalfa hay at a much lower cost.

**Table 4. Cost of gain for lambs on Trial 1.**

<b>Cross</b>	<b>Feed Cost/Pound Gain (dollars)</b>	<b>Feed Cost/Day (dollars)</b>	<b>Total Feed Cost (dollars)</b>
<b>COx</b>	0.281	0.202	16.16
<b>SUx</b>	0.263	0.210	15.33
<b>OLIBS</b>	0.270	0.200	16.60

### **Summary:**

Overall average daily gains on these trials were somewhat below expectations but still reasonable. Cold weather in trials 2 and 3 may have affected daily gains and feed efficiency as compared to Trial 1. Temperatures inside the feeder barn are only slightly above ambient. Feed to gain ratios in Trial 1 were very good as compared to industry standards. This series of trials indicates that while daily gains did vary between genotypes, differences in feed efficiency were less clear. Trials 2 and 3 suggested that the SUx lambs had superior feed efficiency, but this cannot be stated with certainty due to the lack of replication discussed earlier. The cost figures presented above can serve to provide guidelines for feedlot lamb cost of production. Carcass quality data will be presented in a following article.