Profitability of postweaning lamb feeding in North Dakota

Isaac D. Brunkow[1], Jon T. Biermacher[2], Steven E. Anderson[1] and Travis W. Hoffman[1]

This study evaluated animal performance and analyzed the profitability of feeding lambs postweaning at North Dakota State University. Over the three-year average, it was more profitable to sell feeder lambs than finished lambs with the given scenario in 2020-2022. The net return for our lamb feeding study was a loss of $18.91/head compared to marketing as feeder lambs.

Summary

Sheep producers face many issues, with a prevalent problem being how to maintain profitability. Many different strategies have arisen to address this issue. One such strategy is to retain lambs at weaning, as opposed to selling them as feeder lambs. The postweaning feeding of lambs and economics will change based on a variety of inputs, including feeder lamb value, feed cost and market lamb price. Our analysis did not support the strategy to feed lambs profitably under our NDSU scenario.

Introduction

As with any livestock species, profitability can make or break an operation. This is especially true with sheep producers, as profit margins are often very thin, if they exist at all. Many marketing strategies exist in livestock production outside of the standard production practice of selling lambs at, or shortly following, weaning. Individuals may retain lambs at weaning and feed to a finished market weight. Thus, it is possible to sell them via an auction barn or direct-market them to processors or consumers. This analysis explored the profitability of selling the retained lambs through a local auction barn.

Procedures

An exploratory exercise was conducted utilizing previously collected data to determine the economic feasibility of retaining lambs to a postweaning finished weight before marketing via a sale barn auction. The objectives of this study were to determine the economic feasibility of retaining feeder lambs at weaning, feeding to a finished weight and selling at local sale barns as a profitable marketing strategy. Data from three years (2020-2022) of spring-born Hampshire lambs (n = 125) was obtained from the North Dakota State University Sheep Unit in Fargo, North Dakota.

These lambs were retained, and postweaning and growth data were collected. Performance measurements included birth weight (BW) and date, weaning weight (WW) and date, average daily gain (ADG) from birth to weaning, age at weaning, finishing weight (FW) and date, total gain (TG) from weaning to finishing, ADG over the feeding period, days on feed (DOF), ADG from birth to finishing and TG from birth to finishing (Table 1). Growth data was then paired with the cost of inputs, opportunity cost of retaining the feeder lamb and price of finished lamb to determine net return to land management and farm overhead (Table 2). Sensitivity analysis was also conducted to determine the required percent change of production factors (feeder/fed lamb price and ration cost) necessary to reach operation profitability.

Results and Discussion

The lamb crops for all three years (2020, 2021 and 2022) were 49 head, 37 head and 39 head, respectively. The average WW over the three years were 79.7, 70.0 and 67.5 lb, respectively, with the WW decreasing progressively due to a decrease in weaning age [75.3 days (2020), 65.9 days (2021) and 62.2 days (2022)]. Average DOF during the finishing period was 70, 79 and 80 days for 2020, 2021 and 2022, respectively. Days on feed typically have a great impact on finishing weight. Feeder lamb ADG over the finishing period for 2020, 2021 and 2022 was 0.43, 0.59 and 0.87 lb/head, respectively, and TG was 29.92, 46.70 and 70.03 lb/head, respectively. The short feeding period for the year 2020 may also be why the initial group had the poorest growth performance over the feeding period (0.66 lb/head) and average total gain (94.99 lb/head). The 2020 group (n = 49) also had the highest average weaning weight, due to also

[1]Department of Animal Sciences, North Dakota State University, Fargo, ND
[2]Department of Agribusiness and Applied Economics, North Dakota State University, Fargo, ND

Table 1. Descriptive statistics for measures of animal performance for feeder lambs

Variable	N	Mean	Std Dev	Min.	Max.
Birth weight (lb/head)	125	13.87	2.23	9.20	20.00
Weaning weight (lb/head)	125	73.03	12.43	40.00	99.00
Average daily gain from birth to weaning (lb/head)	125	0.87	0.14	0.50	1.15
Age at weaning (days)	125	68.39	8.92	50.00	86.00
Finishing weight (lb/head)	125	120.43	22.17	74.00	198.00
Gain from weaning to finishing (lb/head)	125	59.16	11.32	29.00	83.20
Average daily gain over feeding period (lb/head)	125	0.61	0.23	0.17	1.24
Total gain over feeding period (lb/head)	125	47.40	20.44	12.00	110.00
Days on feed	125	75.93	8.09	50.00	96.00
Average daily gain from birth to finishing (lb/head)	125	0.74	0.14	0.41	1.11
Total gain (lb/head)	125	106.56	21.73	61.00	180.60

Table 2. Measures of animal performance and expected costs, revenue, and Net return to land management and farm overhead ($/head) to land, management and farm overhead for feeding lambs

Variable	N	Mean	Std Dev	Minimum	Maximum
Feeder lamb cost	125	150.59	11.29	139.21	164.36
Feeder lamb interest	125	2.65	0.21	1.62	3.11
Feed and hay cost	125	45.06	14.83	29.59	65.01
Labor cost	125	13.64	2.74	9.52	18.29
Vet/healthcare	125	1.00	0.00	1.00	1.00
Fuel/equipment maintenance cost	125	1.00	0.00	1.00	1.00
Marketing cost	125	2.00	0.00	2.00	2.00
Total variable cost	125	217.16	7.37	212.07	231.50
Total fixed cost	125	3.50	0.00	3.50	3.50
Total cost	125	220.66	7.37	215.57	235.00
Gross revenue	125	201.75	37.13	123.96	331.69
Net return to land management and farm overhead	125	-18.91	33.22	-91.61	96.69

having the highest average age at weaning (79.71 days). The 2021 lamb group was the smallest in size (n = 37) with an average total ADG (0.71 lb/hd) observed group over a 79-day period for all lambs — an average total gain of 103.05 lb/hd. The final reported year of 2022 had an increase in retained lambs from the previous year (n = 39) and the lowest average weaning weight of 67.51 lb/head. Reported values for average DOF, average finishing weight, average total ADG and average total gain were all the highest from the data analyzed. The increase in DOF paired with increasingly improved ADG resulted in an increase in finishing weight and total gain in feeder lambs from 2020 to 2022.

Preweaning data is very consistent over the collected years. Birth weight averages stay similar over the three years: 14.6 lb for 2020, 13.7 lb for 2021 and 13.1 lb for 2022, with an average standard deviation of 2.2 lb for the total three-year period. Additionally, ADG from birth to weaning is relatively consistent across the three years, with the largest variation occurring from 2021 to 2022 — ADG increasing from 0.85 lb in 2021 to 0.88 lb in 2022. This may offer an explanation for the variances in weaning weight, with weaning weights consistently decreasing over the three years. Average daily gain over this period was similar, but age at weaning was different than the 2020 season — the year with highest weaning weight (79.71 lb/hd) and an average age at weaning of 75 days — compared to the 2022 season — the year with the lowest average weaning weight (67.51 lb/hd) and an average age of 62 days of age.

Performance measures following weaning, however, have more variability. For instance, while ADG for the preweaning period saw little variance from year to

year, postweaning ADG increased from 0.43 in 2020 to 0.86 lb in 2022. Finishing weight also saw an increase of 27.91 lb from 2020 (109.63 lb/hd) to 2022 (137.54 lb/hd). These increases through progressive years can be attributed to not only an increasing ADG but also an increase in DOF; 2020 (70 days), 2021 (79 days) and 2022 (80 days). Total ADG from birth to weaning also increased progressively through the three years, with a measurement of 0.66 lb/head for the 2020 lamb crop and a 0.87 lb/head for the 2022 lamb crop.

Calculated financial data, such as average cost of production, gross revenue and net return to land, management and farm overhead, averaged for all three years, is displayed in Table 2. Overall total cost of production was tabulated for each year as follows: $215.57/head (2020), $216.16/head (2021) and $231.32/head (2022). The highest calculated costs were the opportunity cost of retaining a feeder lamb and the ration cost to feed the lamb to finishing weight. Cost of feeder lambs began to decrease over the observed time period, with the highest value being $164.36/head in 2020 and the lowest being $139.21/head in 2022. Ration cost increased from $29.59/head (2020) to $65.01/head (2022), primarily due to days on feed. The calculated average total cost per head was valued at $220.66/head.

Gross revenue increased from 2020 to 2022, with gross revenue being $183.66/hd for 2020, $195.50/hd for 2021 and $230.40/hd for 2022. These increases are partially due to an increase in finishing weight from 2020 to 2022. The overall average gross revenue for all three years was calculated as $201.75/hd. The calculated gross revenue shows profit potential if production costs are kept low.

With both total production cost increasing and gross revenue increasing from 2020 to 2022, there was a reduction in the perceived deficit to net return to land management and farm overhead from -$31.92/hd to -$0.91/hd. The nearest to profitability was 2022, with an average loss of less than a dollar per head. The average net return to land management and farm overhead over the three-year period was tabulated as -$18.91/hd, meaning that the proposed system was not successful in making producers profitable.

Result of a sensitivity analysis was conducted to show the effects of changes to fed lamb prices, feeder lamb prices and ration cost on net return to land management and farm overhead. The sensitivity analysis determined that the price of fed lambs had the greatest influence on profitability in this system, with an increase of 10% in the price of fed lambs from the base, resulting in the system becoming profitable. A decrease in fed lamb price of 10% also drastically increases losses in comparison to the base. A 15% decrease in the base price of feeder lamb prices was required to increase the net return to $4.07/hd. The cost of feed was the least sensitive. A substantial 50% decrease in pelleted ration cost, with all other inputs the same, resulted in the net return to profit of $3.18/hd.

The results indicate that with current input prices, it was not profitable to feed lambs postweaning in North Dakota in the years 2020, 2021 and 2022. More work is needed to evaluate and determine improved efficiency of growth and animal performance and/or production cost savings for profitability of finishing lambs in North Dakota farm flock operations. In addition, more production systems should explore the potential of direct marketing of lambs, either with marketing contracts to processors or directly to consumers.