

# Time of Feeding Can Affect Your Bottom Line

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University of Missouri Extension and Truman State University recently collaborated on a lamb demonstration project to determine the effects of double-shearing, and time of feeding on growth of lambs. In this study 32 feeder lambs were assigned by sex and weight to either daytime (A.M.) or night time (P.M.) feeding groups. Additionally midway into the 100 day trial one-half of the lambs were sheared in each group. This was the second shearing for the latter as all lambs were sheared prior to the start of the experiment (double-shearing). The lambs in the trial were black face lambs, predominantly club-lamb phenotype, and genetically similar (all but six had the same sire). They were from one breeder.

Past research with beef cattle has shown that time of feeding can profoundly affect weight gain and feed efficiency (pounds of feed required per pound of gain). A study conducted at the University of Manitoba in Canada demonstrated that feeding cattle at night in winter can improve feed efficiency and average daily gain by as much as 25 percent. Other research has shown that heat stress (body heat gain greater than body heat loss) affects feed intake. Heat production increases during and after feeding. Not only does heat stress result in reduced growth rates, milk yields, and reproductive performance but it also increases maintenance energy requirements.

In a 2005 published report by Aharoni and Brosh, dairy cows that were fed at night had lower feed intake but similar milk yield to that of daytime fed cows. The energy expenditure of night time fed cows was also lower than that of daytime fed cows and their efficiency of energy utilization for milk production was improved.

In our lamb feeding study lambs were sheared and vaccinated against clostridium perfringens C

& D prior to the start of the trial. All male lambs in the trial had been previously castrated and well-healed. Lambs averaged 56.71 pounds at the start of the trial. They were assigned by sex and weight to either morning (A.M.) or evening (P.M.) feeding groups. They were penned in dry-lot conditions inside of a feeding barn facility at Truman State University. Midway through the trial the two feeding groups had their pens switched in an attempt to minimize any pen effects on weight gain and feed consumption. Also ½ of the lambs in each of the A.M. and P.M. groups were sheared for a second time (double shearing) midway through the feeding period. Both groups had access to plain salt and fresh water free choice. All lambs were fed a 12% protein pelleted commercial feed. The somewhat lower than ideal protein levels of the ration in this study likely accounted for the lower rates of gain than might usually be expected.

The group of lambs fed in the day time (A.M.) were allowed access to feed free choice from 8 A.M. to 8 P.M. daily. Night time fed lambs (P.M.) were allowed access to feed free choice from 8 P.M. to 8 A.M. daily. The feeding period of this trial was from June 18 to September 25, 2004. In both groups, the amount of feed provided in the feeders at the beginning of the feeding periods was weighed and recorded. Any balance remaining at the end of the 12-hour feeding periods was then removed, weighted, and subtracted from the original offerings to determine total daily feed consumed per pen or group.

## Results and Discussion

Time of feeding, that is A.M. or P.M., had a significant affect on lamb gain ( $P < .05$ ). Lambs in the P.M. fed group gained 7.7 pounds more than



those fed in the A.M. fed group (Table 1). Pen feed efficiency also favored the P.M. treatment. Feed efficiencies for the A.M. and P.M. fed groups were 8.76 versus 8.33 pounds of feed per pound of gain respectively. Increased weight gain in the P.M. group seems primarily due to increased feed consumption.

**Table 1. Effects of Feeding Time on Lamb Weight Gain (lbs.)**

| Feed        | Gain               | Std. Error |
|-------------|--------------------|------------|
| A.M. (n=15) | 43.30 <sup>a</sup> | 1.78       |
| P.M. (n=16) | 51.00 <sup>b</sup> | 1.68       |

a,b – values are significantly different at the P<.05 level

In this study sex of lambs, not surprisingly, also had a significant affect on lamb gain (P<.05). Ewe lambs and wether lambs gained an average of 43.93 and 50.38 pounds respectively (Table 2).

Double shearing had no effect (P>.05) on lamb weight gain.

**Table 2. Effects of Sex on Lamb Weight Gain (lbs)**

| Sex           | Gain               | Std. Error |
|---------------|--------------------|------------|
| Ewe (N=17)    | 43.93 <sup>a</sup> | 1.64       |
| Wether (N=14) | 50.38 <sup>b</sup> | 1.82       |

a,b – values are significantly different at the P<.05 level

## Management Considerations

In this study lambs fed during cooler, night time hours gained more weight than those fed during the day. As such, P.M. feeding could be a practical management tool for some producers to incorporate into their programs to help improve the bottom line. Some potential management strategies might include but may not be limited to:

- A) Using self-feeders
  - 1) Only allow lambs to eat at night by closing down feeders during the day. *This could be accomplished either automatically or manually.*
  - 2) Allow lambs into lot(s) that have self-feeders only at night. Then run the lambs into another lot without self-feeders during the day.
- B) Hand Feeding
  - 1) Hand feed lambs at night. In the morning, remove any excess feed that has not been eaten.
- C) Shade
  - 1) Feed animals in the shade to lessen heat stress during rumination.
- D) Mechanical
  - 1) Provide fans or other equipment to provide cooling when and if practical. •

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