Adding Value to Lamb by Evaluating and Reducing the Incidence of Lung Lesions

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Introduction:

Interest in assessing the significance of lung lesions in ruminants at slaughter has only recently emerged. Early reports examined the prevalence and effects of lung lesions on cattle performance (Wittum et al., 1995, Bryant et al., 1996). These reports concluded that lung lesions in cattle could be reliably diagnosed by observation at slaughter, and are associated with decreased performance and product quality (Gardner et al., 1999). Only very recently has the biological effect of lung lesions been assessed in fed lambs. These studies indicate that, depending on severity, lung lesions can decrease animal performance. The presence of lung lesions negatively impacts the growth performance of lambs. Lambs with severe lung lesions had reduced daily gain during the last month of the finishing period, a 5-10% decrease (Goodwin et al., 2001). Affected lambs usually have no history of respiratory disease prior to slaughter, therefore lung lesions represent subclinical (silent) respiratory disease.

Lung lesions have been shown to negatively impact growth performance of lambs and eliminate a lamb carcass from the highly valuable Kosher lamb market. Of lambs presented for Kosher slaughter, 20-30% are rejected due to lung lesions. Carcasses qualifying for kosher have $5-10 per head in added value, therefore rejection of 20-30% of lambs represents a significant loss to the sheep industry. The cause, timing, and predisposing conditions for development of the lung lesions are unknown, thus limiting the development of intervention plans to prevent lung lesion formation. At present, lung lesions can only be diagnosed at slaughter.

Lung lesions are a common condition in lambs, which lower growth performance and potentially decreasing carcass value, thus reducing profits for sheep producers. It is important that work be done to describe and attempt to limit lung lesions in lambs. We have planned a series of studies to determine the microbes associated with lung lesions and the time frame of lesions formation. The risk factors for lung lesion formation and management systems to reduce the incidence of lung lesions will also be investigated. This work features a lifetime approach, starting observations and measurements early in life and concluding at slaughter. We plan to find cost effective strategies to implement on commercial farms/ranches that would limit the effects of lung lesions in lambs. The initial studies described here assess the incidence and effect of lung lesions in lambs produced at the SDSU Sheep Unit.

Research Procedures:

Assessment of lung lesions in lambs.

In 2002, we monitored all the crossbred wethers born at the SDSU Sheep Unit. Lambs were either ½ Hampshire ½ Finn-Dorset-Targhee (Hampshire sired) or 3/8 Dorper 1/16 East Fresian 1/16 Corriedale ½ Finn-Dorset-Targhee (Dorper sired) and were born in a 28 day lambing period (February 14 - March 14, 2002). Lambs were weaned at 77 ± 1.4 days of age and fed common commercial lamb rations on an ad lib basis as a group. Hampshire-sired lambs were slaughtered at a target weight of 120 lb and Dorper-sired lambs were slaughtered at a target weight of 110 lb. Lambs were slaughtered in two groups (lot 1: July 18, 2002, n = 42, lot 2: August 22, 2002, n = 47). Live weights were collected on lambs the day prior to slaughter and designated as finished weight. Following slaughter, lungs were examined and scored for presence of lung lesions. Lambs were determined to have lung lesions if reactive lymph nodes and absesses were present in the lung, if over majority of the right cranial lobe was consolidated, or if pleural adhesions were present. Data were then analyzed for effect of the presence of lung lesions on average daily gain, finished weight, age at slaughter, and carcass traits (hot carcass weight, back fat thickness, body wall thickness, ribeye area, and yield grade).

Results and Discussion:

Although only 8% of lambs required individual treatment for respiratory disease, slaughter lot 1 (July 18) had a 54.8% incidence of lung lesions, and slaughter lot 2 (August 22) had a 34% incidence of lung lesions. Post weaning to finish growth performance was 0.08 pounds per day lower for those lambs diagnosed with lesions (Figure 1). Although, Dorper sired lambs tended to have a greater incidence of lung lesions (55.6 % Dorper sired vs 35.8% Hampshire sired, P = 0.0659), lung lesions resulted in reduce average daily gain regardless of the breed composition of the lambs. On a live basis the lambs with lesions were 5 lb lighter at slaughter. Goodwin and coworkers also demonstrated that lambs with lung lesions had reduced average daily gain during the last month of the finishing period (2001). Additionally, lung lesions have been demonstrated to reduce average daily gain in cattle (Wittum et al., 1996, Gardner et al., 1999).

Research with finished cattle shows that presence of lung lesions negatively affected the quality grade of the carcass (Gardner et al., 1999). In the current study, the major impact on traits of economic importance is found in reduced growth performance. Lung lesions did not have a significant impact on any of the carcass traits examined. However, it is important to note that lung lesions can have an impact on the potential value of the carcass. Lung lesions prevent the lamb carcass from qualifying for the value-added Kosher processing.

Future studies are planned to examine the age when lung lesions development occurs. Establishing the chronological age in which the lung lesions develop, will assist us design studies to evaluate management strategies to reduce the incidence of lung lesions in lambs.

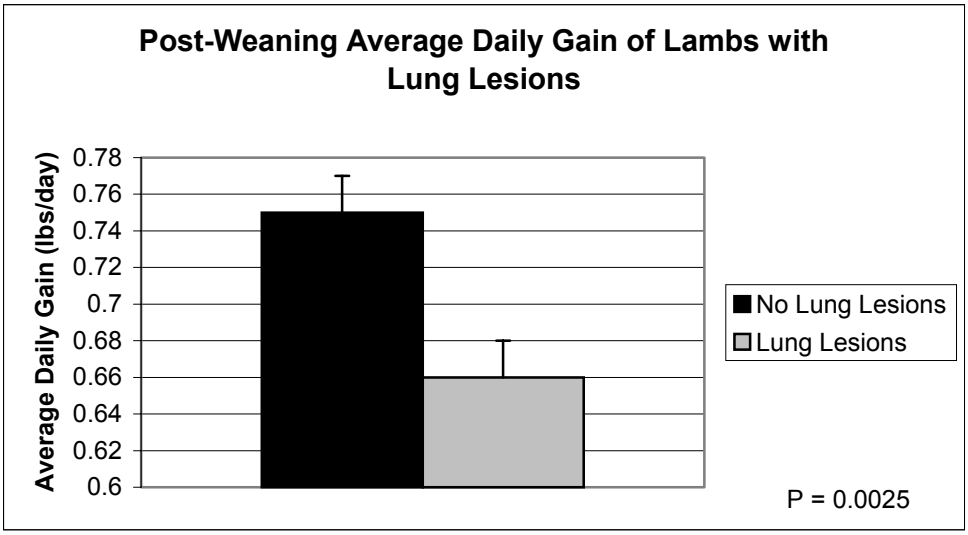

Figure 1. Lambs with lung lesions at slaughter had significantly lower post-weaning average daily gain than lamb without lung lesions.

Table 1. Effect of Lung Lesions on Carcass Traits (mean ± std err)			
	No lung lesions	Lung lesions	P-value
Number of animals	50	39	-------
Age at slaughter (days)	163.1 ± 2.4	157.3 ± 2.5	0.0790
Finished weight	125.5 ± 1.76	120.5 ± 1.54	0.3207
Hot carcass weight (lbs)	63.5 ± 0.84	61.9 ± 0.86	0.8264
Back fat (inches)	0.20 ± 0.01	0.18 ± 0.01	0.0617
Body wall thickness (inches)	1.06 ± 0.14	0.90 ± 0.03	0.4446
Ribeye area (square inches)	2.54 ± 0.04	2.48 ± 0.04	0.6695
Actual USDA Yield grade	2.29 ± 0.08	2.43 ± 0.08	0.2049

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