Lean Lamb Divergent Selection Project Update

Objective 2: To evaluate genetic and environmental strategies to improve efficiency of lean tissue accretion in lamb.

The preliminary reports concerning the divergent selection project which have been presented in the past two years (Berg and Faller, 1998 and 1999) have pointed out the difficulty encountered by attempting to lower the generation interval by using ram lambs as service sires. This past year was the first lamb crop in which analyzable numbers were born to selected sires.

Finished lambs which have been slaughtered within the protocol of the lean lamb project (HES 1790) have largely been marketed through an arrangement with retail grocers in the Fargo-Moorhead area. As such the demand is limited and lambs are often held on feed longer than would be the case if strict production principles were followed. While this practice has allowed the comparison of lambs over a very wide range of carcass weights and there-by aided in the overall evaluation of Bioelectrical Impedance as a selection tool, a refinement of technique was required to help determine if selection for lean tissue accretion under a more practical setting. Beginning in 1998, rams from the divergent selection portion of the lean lamb project were selected and mated to a flock of western white-face ewes. Four rams from each of the High Lean (HL) and High Fat (HF) line were chosen as service sires. The first lambs from these matings were slaughtered during 1999. Standard carcass data was recorded and converted to pounds of closely trimmed retail product and fat according to the method described by Maddux (1997). The data was regressed to a standard carcass weight of 60 pounds for comparison of the sire groups. Sire groups averages are presented in table 1. At this early stage of the project, differences between sire and progeny are small. Differences in sire group means are apparent, but the ram whose offspring has the most lean and least fat was identified as a "low lean" sire, while the ram with the least lean and most fat was identified as a "high lean" sire. Numbers of offspring within each sire group are low so no conclusions may yet be drawn. The questions suggested by these very preliminary numbers are:

Is the bioelectrical impedance selection formula developed by Maddux (1997) the problem? (With respect to accuracy)

Is the difficulty with the theory that lean tissue accretion is strictly a quantitative genetic trait and there-by subject to selection pressure?

Only time and more observations will provide answers for these questions.

Summary of Sire Groups

Sire	Status	N	Adj.# lean	Adj. % lean	Adj. # fat
C3507	Low Lean	3	36.8	62.3	14.0
C2303	Low Lean	7	37.0	62.6	13.8
C3572	Low Lean	12	36.7	62.1	14.1
N2833	Low Lean	10	35.7	60.5	15.1
Average	Low Lean	32	36.51	61.68	14.34
B6510	High Lean	11	35.7	60.8	14.9
B9104	High Lean	9	35.7	60.4	15.2
C3508	High Lean	11	36.6	61.5	14.5
C3569	High Lean	6	36.3	61.4	14.6
Average	High Lean	37	36.13	61.03	14.78
Overall	Average	69	36.25	61.34	14.57