Department of Agriculture, Trade and Consumer Protection

Division of Agricultural Development

Agricultural Development & Diversification Program (ADD)

Grant Project Final Report

Contract Number: 17069

Grant Project Title: Improvement of Quality and Pricing of Wisconsin Lambs

Amount of Funding Awarded: $13,040

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Wisconsin Department of Agriculture, Trade and Consumer Protection
Agriculture **D**evelopment and **D**iversification **P**rogram
2002 GRANT PROJECT FINAL REPORT

Date: August 26th, 2003 WDATCP Contract No.: **17069**

Project Title: **Improvement of Quality and Pricing of Wisconsin Lambs**

Contractor Name: **UW-Madison, Animal Sciences**

Project Leader: **David Thomas**

Final Report: July 1, 2002 through June 30, 2003

This report is submitted in fulfillment of Appendix A of the contract. The reports should: summarize project activities and key results for the reporting period, and describe project activities and results expected during the next phase of the project. **(Attach additional pages of information, if needed.)**

For the initial year of this longer-term project, effort has been focused on entering Equity scale ticket data, providing educational talks to producer groups and youth livestock exhibitors, measuring lambs via ultrasound to monitor weight and compositional growth, and scanning lambs going through direct marketing channels and at various other events in order to gather data to determine the correlation between carcass traits measured by ultrasound on the live animal and measured on the carcass. A final report on the project's first year is provided below. The project will run for at least one additional year through September 2004.

Cody Hiemke was recruited to supervise the project for his M.S. thesis research. Cody came to UW-Madison with a background in sheep production from his home farm near Oconomowoc, WI, a B.S. degree in Animal Sciences from UW-Madison, and 3 years of experience marketing livestock, especially sheep, with Equity Cooperative Livestock Sales Association.

An ultrasound machine and transducer were purchased for this project from other funding sources. An ultrasound training school was held on the UW-Madison campus on January 8 – 9, 2003. Primary goal of the school was to train the UW-Madison sheep faculty and staff in the ultrasounding of sheep so they could proceed with collection of ultrasound data from the 2003 lamb crop. The training school was taught by J.R. Tait, a Ph.D. student and instructor from the livestock ultrasound certification program at Iowa State University. Six UW-Madison Animal Sciences faculty and staff members, a Wisconsin sheep producer, and a Minnesota veterinary technician with ultrasound experience participated in the school. The basics of the ultrasound technology was taught, participants practiced by taking ultrasound scans of fat thickness and loin eye areas on nine live lambs. Live animal scans were compared with measurements taken on the carcasses of the sacrificed animals. Correlations between ultrasound scans and carcass measurements varied among participants from .26 to .91 for fat thickness (average correlation = .70) and from .01 to .66 for loin eye area (average correlation = .50). Correlations between ultrasound and carcass measurements by trained technicians reported in the scientific literature are approximately .60, and some of the participants achieved this level of accuracy in this first training session.

Copies of scale tickets for every lamb purchased through Equity Livestock Sales in the past three years continue to be entered into spreadsheets. Currently scale tickets have been entered from Johnson Creek, Arlington, Reedsville, Bonduel, Barron, Altoona, Richland Center, and

Monroe markets. There are 4574 scale tickets entered into the spreadsheet at the current time. Still to be collected are the Stratford, Sparta, and Beetown markets. Tickets from the Ripon market, up until its closing early last year, are at the main office in Baraboo but have yet to be copied. The intent is to have all tickets in hand and entered by the end of the 2003.

Since January 2003, Cody Hiemke, M.S. graduate student on this project, has given several educational talks for producer and youth livestock groups throughout Wisconsin. In January, Cody gave a lamb marketing talk which included information on the use of ultrasound to improve carcass merit in flocks to the Southeast Wisconsin Sheep Breeders. In early March, a talk focusing on the use of ultrasound was given to the Northeast Wisconsin Sheep Producers at their spring Shepherds' Clinic. Through an invitation from county agents, talks were given to Calumet and Crawford County youth showing the function, application, and relevance of ultrasound to both the livestock industries and their fair projects. On June 28th, Cody provided an update of the project, a background in ultrasound, and ultrasound demonstrations at the Wisconsin Sheep Breeders' Sheep Production Field Day in Oregon, Wisconsin. Cody ultrasounded lambs at the Iowa County Fair on August 28 in an educational session for youth lamb exhibitors. Scheduled for September 7th is a joint talk with Todd Taylor, UW-Madison Arlington Shepherd, discussing the use of ultrasound in pregnancy detection and evaluation of carcass merit. This talk will be given at the Wisconsin Sheep Breeders Cooperative's 2nd Annual Sheep and Wool Festival at Jefferson, WI.

Accuracy of ultrasound measurements has been obtained on over 60 lambs throughout the course of the last three months by an arrangement with Steve Pinnow, a direct marketer of lamb, and the Elkhorn Locker. Over 120 lambs have been scanned in this time period at Pinnow's. We don't receive measurements on approximately a quarter of the lambs scanned because their carcasses leave the locker whole. A different technique was used in ultrasounding the lambs at Pinnow's from what was taught at the training session. The primary reason for the change in protocol was the need for exactly similar locations of measurement between the carcass and ultrasound. In the training seminar, general protocol was to measure lambs between the 12th and 13th ribs. Elkhorn Locker breaks carcasses after the 13th rib, so the decision was made to take a last rib measurement for ultrasound as well. Cody's correlations between ultrasound scans and carcass measurements for the 60 lambs were as follows: .375 for back fat thickness, .630 for loin depth, and .712 for loin eye area. Bias for the measurements were +.014 cm, -.286 cm, and +1.44 cm^2, respectively. The advantage to taking a last rib ultrasound measurement is there is no rib to compress the loin, which can cause an underestimated reading. The disadvantage to the thirteenth rib measurement is the landmark used to determine the outer loin edge. The joining intercostal muscles present between the ribs is absent at this location causing a lack of definition to the lateral side of the image. The current change in protocol is to take both 12th and 13th rib measurements and observe any change in error in the loin measurements. Nearly 40 of the 60 lambs evaluated were bought by Steve through Equity Cooperative Livestock Sales Association and represent lambs produced in southern Wisconsin.

An opportunity to scan 100 lambs at the National Lamb Show (NLS) in Cedar Rapids, Iowa was taken June 7th. The NLS is a show that encourages emphasis on production merit; lambs are ranked by a combination of average daily gain, carcass merit, and appearance. Three ultrasound technicians (including Cody) took ultrasound measurements on the 100 lambs in an effort to compare accuracies of the three technicians. Upon initial measurement of the ultrasound images, Cody's correlations between ultrasound and carcass measurements were .652 and .532 for 12th rib back fat and rib eye area, respectively; bias was -.008 and -.249, respectively. By adjusting

the measuring protocol and re-measuring the same images, correlations were improved to .728 for back fat and .645 for rib eye area. We are very pleased with these correlations. The limited amount of research work previously reported for ultrasound carcass measurements in lambs have shown a correlation between the ultrasound and actual carcass measurements of approximately 0.60. Statistics for comparison of the ultrasound technicians have not been received from Iowa State University.

Cody has aided UW Extension and The Wisconsin Sheep Breeders Cooperative in obtaining ultrasound measurements on two of the four groups of rams to go through the Wisconsin Ram Test Station. Sixty rams were measured for carcass merit via ultrasound over the course of this year's test. By the Production Tested Ram Sale date of September 6th, Cody will have compiled comparisons of the ultrasound and weight measurements for the ram test rams to be sold.

In two commercial sheep flocks, we are determining the value of purchasing rams with desirable ultrasound measurements. The two flocks used rams last fall that had come from the test station with ultrasound rib eye and back fat measurements. We have ultrasounded lambs in both flocks – twice in one flock and once in the other flock. At least one more set of ultrasound measurements will be taken on lambs in each flock. There are over 300 lambs in this data set. The data will allow us to calculate the heritability of ultrasound rib eye and back fat measurements and to demonstrate the amount of progress that can be obtained in these traits when selecting rams for desirable ultrasound measurements.

The summer of 2003 has offered many chances to ultrasound lambs. At the research station in Arlington, lambs have been weighed and evaluated for carcass merit via ultrasound monthly since May. To date, over 400 lambs have been evaluated over the course of the last four months. This data set will allow us to compare weight and carcass compositional growth on a variety of sheep breeds. Many of the lambs will have three or four ultrasound scans taken at approximately monthly intervals. Cody made a trip to a commercial lamb producer, Dale Dobberpuhl, in July. By the end of the summer this producer will have four scans on his current years lamb crop, adding to the data set another sixty head and a different breed of sheep. The comparison of measurements from Cody and the other technician who took measurements at Dobberpuhl's will provide similar data to that collected in Arlington.

During the one year of this ADD project, we have made considerable progress. We have obtained an ultrasound machine (through another funding source) and become trained in the collection of ultrasound measurements of carcass traits in live lambs, have demonstrated the ultrasound technology to several youth and producers in organized educational meetings, and have research projects in progress on commercial farms and at the University of Wisconsin-Madison to assess the value of ultrasound measurements in the improvement of carcass traits in lambs. This project is continuing with other funding. Next year, results of our on-farm and UW-Madison research will be made known to the Wisconsin sheep industry and recommendations will be made as to how ultrasound technology can best be used to improve the quality of Wisconsin market lambs.