

## 2018 Reciprocal Meat Conference – Undergraduate Research Competition

## Meat and Muscle Biology™



## Predictions of Lean Meat Yield in Lambs Using Dexa and Chemical Analyses Proximate

S. M. M. Justice\*, J. Britt, M. Miller Jr, M. Greene, C. Davis, B. Koch, S. Duckett, and E. Jesch

Animal Veterinary Sciences, Clemson University, SC, 29634, USA

\*Corresponding author. Email: smjusti@g.clemson.edu (S. M. M. Justice)

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### Objectives

The objective of this study was to compare the use of dual-energy X-ray absorptiometry (DEXA) and chemical analyses for the prediction of carcass lean yield. This was done to decrease the total amount of time utilized in analyzing carcass composition. The scanning of carcasses on a DEXA takes approximately 2 min per carcass compared to chemical analyses that can take days of work in the lab.

### Materials and Methods

Suffolk wethers ( $n = 44$ ) were put on a high-energy diet and then finished to 59 kg or d 185 post weaning. At this point the wethers were slaughtered. Hot carcass weight was obtained and the hot carcass was scanned using DEXA to measure carcass fat and lean composition. At 24h postmortem, the carcasses were scanned again using the DEXA. Carcass data were collected and the right side of the carcass was fabricated manually to obtain total lean and fat mass, and then ground. Samples of the ground lamb were taken and a total lipid analysis was performed.

### Results

A linear regression model was used then to compare carcass fat composition estimated from the total lipid analysis versus total carcass fat estimated by the

DEXA. Each method was compared on a percent total lipid basis and a total lipid mass basis. Values received from both hot and cold scans of the carcasses were used. Regression analyses found that DEXA scans on the cold carcass for total fat mass had the best agreement with the total lipid mass estimated from total lipid analyses ( $r^2 = 0.75$ ). When compared on a percentage basis, the percent fat estimated from DEXA compared to percentage of total lipid from chemical analyses had lower agreement ( $r^2 = 0.49$ ). The DEXA scans from the hot carcasses did not yield results with as high of agreement with chemical analyses for total lipid mass basis ( $r^2 = 0.47$ ) or a total percent fat basis ( $r^2 = 0.13$ .) Stepwise regression was used to develop prediction equations for carcass fat mass or lean meat yield estimated from DEXA scans or chemical analyses using hot carcass weight, carcass traits or muscle weights. For DEXA fat mass, an equation including the variables for hot carcass weight (HCWg) and ribeye area (REAcM) were deemed most significant ( $r^2 = 0.7673$ ,  $r^2 = 0.7915$ ). The equation for DEXA percent fat mass used the same variables, HCWg and REAcM but with less agreement than DEXA fat mass ( $r^2 = 0.2310$ ,  $r^2 = 0.3079$ ).

### Conclusion

The data collected from the DEXA scans on the cold carcasses for total fat mass can be utilized in predicting total carcass composition. These findings can help in time management and overall human resources when conducting a large-scale animal carcass study.