
**Bas taurus and Bos indicus sired F1 steers (n = 2888) produced by 22 breeds of sire mated to Angus and Hereford cows in cycles I, II, III, and IV of the Germplasm Evaluation project at MERC were evaluated. Shear force and tenderness rating were not different (P > .05) for meat from Bas taurus cattle with Slight through Moderate marbling. Meat with Slight and Small marbling in Bos indicus cattle was not different (P > .05) in shear force or tenderness rating. Variation in meat tenderness tended to increase as marbling degree decreased in meat from Bas taurus cattle from cycles I, II, III, and IV, although this tendency was not apparent in meat from Bas indicus cattle, nor in meat from cycle IV. The percentage of meat with unacceptable tenderness follows this same pattern. Meat with Modest and Moderate marbling from Bas taurus cattle was more juicy (P < .05) than meat with traces or Slight marbling. Juiciness was not affected (P > .05) by marbling score in either Bos taurus or Bos indicus cattle. Meat from Bas indicus cattle was less tender than meat from Bas taurus cattle, regardless of marbling degree. A strong inverse relationship between marbling degree and percentage yield of retail product at 0-cm fat trim was detected. Regression of shear force and sensory traits on marbling resulted in coefficients of determination of 1 to 55. Generally, chemical fat, calories, and percentage calories from fat increased (P < .05) as marbling score increased from both cooked and uncooked longitudinal slices. These data show that the merit of using marbling degree as a predictor of meat palatability relative to the disadvantages should be reevaluated.**

Key Words: Marbling, Tenderness, Retail Yield

---

The use of electromagnetic scanning to determine the yield of retail product and boxed beef from beef carcasses and carcass primalts. D.L. Schaefer, G.H. Rouse, D.E. Wilson, and D.G. Olson, Iowa State University, Ames, IA.

The research objectives of this study were to evaluate the usefulness of electromagnetic scanning (EMS) for determining retail product and boxed beef yield from chilled beef carcasses and carcass primalts. EMS technology is based on the absorption of energy by lean tissue within an electromagnetic field. Beef carcasses from three commercial beef producers were scanned and fabricated in accordance with a fixed retail product and total product. All boxed beef was fabricated according to current industry specifications and trimmed to 64 cm. Retail product consisted of boxed product plus the weight of lean trimmings arithmetically adjusted to 80% lean. The carcass weights ranged from 352 kg to 43 kg with a mean and standard error of 352 ± 6 kg. USDA等级 grades ranged from 2.3 to 51. Boxed product weight as a percent of cold side weight ranged from 32.9% to 42.2% and retail product as a percent of cold side weight ranged from 65.6% to 70.9%. The highest R² values resulted from stepwise regression of hot carcass weight, streamlined carcass weight, and marbling grade.**

**Key Words: Beef, Electromagnetic Scanning, Carcass Composition**

---


Twenty-one hot and twenty-two cold (24 h chill) lamb carcasses, avg. wt. 26.8 ± 9.2 kg and 26.4 ± 8.9 kg, respectively were measured for body electrical conductivity (TOBEC, model MO-35, Moline, IL). The MO-35 generates a synthetic electromagnetic field which is sensitive to perturbations by the conductive muscle. Since lean tissue is approximately 30 times more electrically conductive than fat tissue, the amount of EM energy lost to the (lean) carcass is highly correlated to lean tissue. Twenty-four hundred and fifty points of measurement were recorded for each carcass passed through the EM tunnel. Absorption of energy rises over time as more lean tissue enters the EM field. The location where the entire carcass is in the EM field is the point of peak absorption. A plot of the absorption units over time should reveal the location of the major primal cuts. This study utilized the difference in curve height between two points (D), the phase measurement (PEAK) and lamb carcass measurements (hot or chilled carcass wt. HCWT or CWT and length of outstanding points LENG) to predict total percent of lean meat (TOLN), percent lean leg (LEGL) and all other dissected lean tissue (LETL). A consistent geometry of the subject is vital to accurate scans. Two geometric orientations were used for each subject. For statistical analysis, the least squares method was used. The results of this preliminary study indicate that EM scanning has remarkable potential as a means of predicting total lean and lean components of primal cuts in lamb carcasses.**

**Key Words: Lamb, Electromagnetic scanning, carcass**

---


Seventy-six pigs were fed from 44 to 127 kg to determine the interrelationships among genotype, sex, and dietary lysine on subprimal cut distribution. The experiment was designed in a 2 x 2 x 2 factorial arrangement and analyzed as a randomized complete block. Pigs were derived from genotypes highly and consistently characterized by low (high) leg and medium lean gain; HLG and MLG, respectively. Within genotype, pigs were split by sex (barrows or gilts) and fed either a .90 or .70% lysine corn-soybean meal diet. With the percent of lysine increased 104 kg, the diets were decreased from .90 to .70 to .55% dietary lysine, respectively. Pigs were slaughtered when the weight of the 2 pigs per pen averaged 127 kg. At 24 h postmortem, carcass data were collected and left sides were fabricated into closely trimmed, bone-in and boneless (BNLBS), subprimal cuts according to Institutional Meat Purchase Specifications. Carcasses from HLG pigs had (P < .05) heavier hot carcass weights, larger longissimus area (LMA) and higher dressing percentages than MLG pigs. High lean gain carcasses had (P < .05) a higher percentage of their chilled side in trimmed shoulder (406 Boston butt+405 picnic shoulder), BNSL shoulder (406A BNSL Boston butt+405A BNSL picnic shoulder), 410 loin, and BNSL loin (413 BNSL loin+415 tenderloin) than MLG carcasses. Also, HLG carcasses tended to have a higher percentage of 402C BNSL ham (P = .06), and a lower percentage of 416 spareribs (P = .09) than MLG carcasses. Carcasses from HLG pigs had (P < .05) less rib fat and larger LMA resulting in a higher percent lean than barrow carcasses. Gilt carcasses had (P < .05) a higher percentage of 410 loin, BNSL loin, 402 ham, and 402C BNSL ham; and tended to have a higher percentage of BNSL shoulder (P = .08) than barrow carcasses. In a sex x lysine interaction (P < .05), gilts fed high lysine diets had (P < .05) a higher percentage of trimmed shoulder than barrows fed high lysine but the highest lysine had minimal influences (P > .05) on other subprimal cut yields. These data suggest that the highest percentages of BNSL subprimals for pigs fed to 127 kg can be realized by feeding HLG gilts.

**Genotype Sex Dietary lysine**

<table>
<thead>
<tr>
<th>Trait</th>
<th>HLG</th>
<th>MLG</th>
<th>Barrow</th>
<th>Gilt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lean%</td>
<td>46.5</td>
<td>45.4</td>
<td>44.3</td>
<td>47.6</td>
</tr>
<tr>
<td>BNSL, %</td>
<td>16.5</td>
<td>16.5</td>
<td>15.9</td>
<td>14.9</td>
</tr>
<tr>
<td>BNSL loin, %</td>
<td>13.8</td>
<td>12.5</td>
<td>12.9</td>
<td>13.5</td>
</tr>
<tr>
<td>BNSL shoulder, %</td>
<td>14.4</td>
<td>14.4</td>
<td>14.9</td>
<td>14.0</td>
</tr>
</tbody>
</table>

*Genotype effect (P < .05) Sex effect (P < .05)

**Key Words: Finishing Pigs, Meat Yield, Genotype**

---

52