

Quality Lean Growth Modeling Project

DAVID J. MEISINGER*

Introduction

The Quality Lean Growth Modeling Project of the National Pork Producers Council (NPPC) was originally designed to provide new data for development of new pig growth curves to heavier weights. Another interest was to develop meat quality parameters as part of the growth curves.

The second of three replications of the study was just completed with data collection for the third rep scheduled for the fall of 1997. Approximately, 1650 pigs and carcasses in total will be evaluated in the study with about 550 per replication. Genetic type is a variable in the study with inclusion of lines with high lean growth, low lean growth, high appetite, low appetite, good meat quality, and poorer meat quality. Crossbred pigs representing Berkshire, Duroc, Danbred, Newsham Hybrid, Hampshire, and DeKalb genetics are being evaluated. All program pigs are being tested for the Halothane genotype.

The slaughter weights for the trial are 250 lb, 290 lb, and 330 lb. The weights are assigned to pigs at the beginning of the trial and sex is balanced across the three slaughter weights. The design is also overlaid with four treatments consisting of four different diets made up of four different protein levels.

After the SEW nursery period, the pigs are moved to a building equipped with electronic feeding and pig weighing equipment (FIRE system) until desired weight is achieved. The FIRE system records each pig's weight and feed intake daily.

All pigs are ultrasonically evaluated periodically during the trial. This results in about eight measurements on the heaviest off-test weight pigs. Analysis of ultrasound data will produce rates of backfat and loin muscle deposition in market hogs. Scan measurements for intramuscular loin fat or at other locations of interest may also be recorded.

Fat-Free Lean Index Revision

The different genotypes, varying slaughter weights, and large numbers in this trial offer a unique opportunity to update the NPPC Fat-Free Lean Index (FFLI). This system was originally developed with the intent to standardize the approach to grading carcasses so that pork producers would have a valid comparison of their market hogs from one packer to the next.

To accomplish this revision, all carcasses are being evaluated on-line using a ruler, an optical probe (Fat-o-Meater), and ultrasound. In addition, it is hoped that the Autofom comes on-line before the conclusion of the project. About 800 carcass sides are being removed at slaughter at Hormel Foods in Austin, MN and transported to Geneva Meats in Geneva, MN where carcass separation into primals, subprimals, and soft tissue is occurring. Following that separation, the ten location samples from each carcass will be analyzed to provide a chemical lean figure for calculation of the new regression equations.

Loin Quality

At slaughter, a five rib section is taken from one side of the carcass, one section of three ribs for meat and eating quality traits evaluation and the other section of two ribs frozen for consumer preference studies. The three rib section is analyzed for pH and color and scores are applied for color, marbling, and texture. The samples are sent to Iowa State University for instrumental and taste panel analysis.

Ham Quality

All the hams from this project as well as about another 600 from the National Barrow Show pigs are being sent to Texas A & M University Meats Lab for further analysis of ham quality. The fresh hams are weighed and analyzed for lean content with TOBEC upon arrival. The hams are then boned into the component parts and the subprimals weighed. The inside, outside, and knuckle muscles are then pumped, weighed for yield measurement, cured, weighed for cooking yield measurement, and sliced to determine slicing yields. Taste panel analysis is conducted on every ham.

*David J. Meisinger, Asst VP, Pork Quality, National Pork Producers Council, P.O. Box 10383, Des Moines, IA 50306.

Reciprocal Meat Conference Proceedings, Volume 50, 1997.

Belly Quality

All bellies from the study are being stockpiled and frozen for subsequent shipment to the University of Nebraska for belly and bacon quality studies. The bellies will be categorized by weight and lean content into treatment categories. The bellies will be analyzed for color, lean to fat ratio, thickness, and weight. Following this analysis of the raw bellies, they will be pumped, smoked, blocked, and prepared for slicing on a high speed line. Appropriate yields and slicability measures will be collected. Bacon will be cooked to simulate commercial pre-cooking using different techniques. In addition, shattering and other defects will be investigated.

Chef Preference Studies

A sample of loins from this project were sent to the California Culinary Academy for the purpose of ascertaining whether foodservice chefs could detect differences in quality, and if so, what parameters were most important to their needs. Analysis of this data will take place in the near future so that decisions can be made on furtherance of this work.

Consumer Preference Studies

Loin samples from known carcasses with known differences in quality are being used in consumer preference studies conducted in major markets around the U.S. The param-

eters to be considered are pH, intramuscular fat, Instron tenderness, and price. The samples are cooked in this blind taste test with a chicken sample included for comparison. A sample of fresh ham muscle taken from the inside ham muscle will also be included.

Quality Instrument Testing

Another component of this study involves utilization of new technologies for evaluation of pork quality on-line. A new tetra polar electrode developed with producer check-off support, is being tested for its ability to predict water holding capacity differences. Analysis of fresh cuts using color vision technology is also progressing. Temperature of the carcass post slaughter is also being investigated for its involvement in quality development. Fiber optic probes will also be used in the final phase of the study. In addition, work of the Autofom, which measures composition will indicate whether quality can also be measured.

Conclusion

This project offers a great deal of opportunity for the pork industry. There are many new and exciting approaches being tested in this project. The outcomes will have impacts on the entire pork chain for many years to come. Information gleaned for this major study will help to make pork the meat of choice.