


Pork Quality and Your Profitability

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Starting Points

- Swine production is a business enterprise
- It must be profitable over the long run
- It should be enjoyable over the long run
- The quality of our product will have a major effect on our business and our future
 - On consumer acceptance and repeat business
 - On the price received for our product




Trends in Marketing

- Over the past 10 years, the major emphasis has been on lean percent of the carcass
 - Now the ultra-lean carcasses are being discounted due to loss of value in the belly
- Optimal weight ranges, large lot sizes, regularly scheduled shipments are stressed
- Must be free of residue
- Pricing on meat quality is just starting





Reasons for These Trends

- These factors influence the profitability of the packer and retailer
- Consumers pressure the retailer who pressure the packer who pressure the producer who pressure the seedstock supplier
- Result is a combination of meat quality and lean value pricing





Which Traits Should Producers Focus On?

- Carcass - Easy to change
 - Extreme lean will reduce growth and reproduction
- Growth - Easy to change
 - Fast growth will increase fat
- Reproduction - Harder to change
 - Best reproduction will increase growth and reduce carcass merit
- Quality - ????? Value?????



Commercial Producer Strategy

- Carcass merit must be adequate to ensure a market for your hogs
- Balance reproduction, growth, and carcass merit to maximize profitability on your farm
- How much emphasis should be put on quality?


Muscle Quality Traits

- Must be measurable
- Must be under genetic control
- Must not be genetically related to other traits in a devastating manner
- Must have an economic impact on the commercial producer



Improving Meat Quality

- Genetics set the foundation and the limit for meat quality improvement
 - Genetics account for 10 to 50% of the variation in meat quality traits
- Quality means different things to different members of the “value chain”
 - Consumer/retail/processing/production chain




Meat Quality

- Ultimately, meat quality is defined as a wholesome product that tastes good, has good value and generates repeat sales





Pork Quality is Influenced by:


- Genetics
 - Stress gene, Napole gene
- Preslaughter pig management
- Slaughter techniques
- Meat handling
- Cooking methods
- Unknown?




Traditional View of Food System




- Agricultural Inputs
- Agricultural Production
- Commodity Handlers
- Food Processors
- Wholesalers
- Retailers
- Consumers



Current View of Food System



- Consumers
- Retailers
- Wholesalers
- Food Processors
- Commodity Handlers
- Agricultural Production
- Agricultural Inputs



What do Consumers Want?

- Muscle Quality
- Eating Satisfaction
- Visual Appeal
- Increased Shelf-life
- Nutritional Value
- Food Safety
- Foreign Objects
- Animal Welfare
- Other????



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Use **LARD**
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 National Live Stock and Meat Board

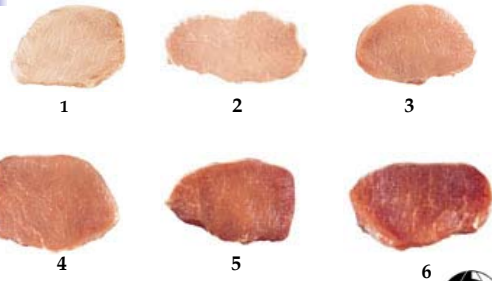


“Quality” Indicators

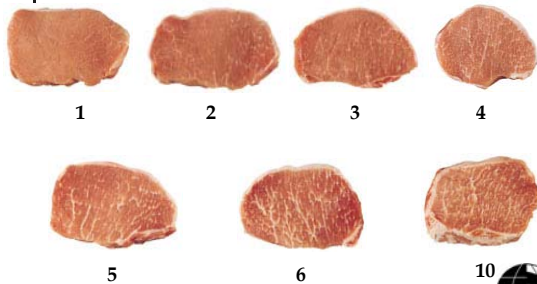
- Color
- Marbling
- Firmness
- Water holding capacity
- pH
- Tenderness
- Taste



Color Scores



Marbling Scores



Trait Characteristics

Trait	Measurability	Heritability
Color	Yes (not at line speed)	0.15-0.50
pH	Yes (maybe at line speed)	0.50
Marbling	Not at line speed	0.50
Others	Not at line speed	0.15-0.65



Pork Quality and Profitability

- Q1: Do you know what quality of the pork you produce?
- Q2: Does the quality of the pork you currently produce influence your profit?
 - Profit = Return - cost of production



What Affects Pork Quality

- 50 % producer causes and responsibility
 - Genetics
 - Nutrition
 - Handling on the farm and in transport
- 50 % packer causes and responsibility
 - Stunning, sticking, bleeding, and pre-evis
 - Evisceration
 - Chilling
 - Fabrication



How Does a Pork Producer Find Out the Quality of their Pork?

- Look at the genetics used
 - Choice of breeds or lines
 - Choice of sires within breeds or lines
 - Major genes in your genetics (HAL, RN)
- Do a cut test with an unbiased technician at your packer



Genetic Variability in Meat Quality

- Differences between breeds or genetic lines
 - Can be used in making purchase decisions
- Variation within breeds or genetic lines
 - Should be used in making purchase decisions
- Major gene effects
 - Halothane gene, Napole gene, etc.



Genetic System Design

- Terminal cross mating system is most profitable
- Genetic decisions that must be made
 - Breed combination of maternal sow line
 - Breed of terminal sire line
 - Specific animals within sire and dam line for use
 - Status of major meat quality genes (Halothane, RN)
- Balance production traits with meat quality traits



Differences Between Breeds or Genetic Lines

- Based on producer checkoff-funded NPPC research
 - NBS Sire Progeny Tests
 - Terminal Line Evaluation
 - Quality Lean Growth Modeling
 - Maternal Line Evaluation



Breed or Line Differences: NGEP Sire Line Results

Sire Line	pH	Color	Drip %	IMF
Berk	5.91	3.1	2.43	2.41
Danbred	5.75	3.0	3.34	2.33
Duroc	5.85	3.0	2.75	3.03
Newsham	5.82	2.7	2.99	2.25
Hamp	5.70	2.8	3.56	2.57
York	5.84	2.9	2.85	2.30



Breed or Line Differences: Lean Growth Modeling Project

Breed of Pig	Color Score	pH
Berk cross	3.20	5.78
Danbred	2.93	5.51
DeKalb	3.00	5.65
Duroc cross	3.10	5.65
Newsham	2.95	5.58
Hamp cross	2.78	5.42



Breed or Line Differences: Maternal Line Evaluation

Breed	pH	Color	IMF%
Amer. Diamond	5.63	3.15	2.00
Danbred	5.63	3.17	1.93
DeKalb DK44	5.63	3.05	2.09
DeKalb MXP	5.66	3.12	1.94
NSR	5.63	3.14	2.08
Newsham	5.62	3.21	1.90



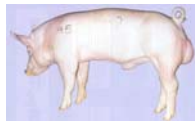
Breed or Line Differences: Summary

- Berkshire and Duroc - best pH, color, marbling
- DeKalb - very good pH, good color
- Yorkshire - average on most, low marbling
- Landrace - below average on most traits
- Danbred and Newsham - below average on pH, color, marbling
- Hampshire - poorest on pH, color, drip and cook loss



Animal Differences Within A Breed

Name	Breed	EPD for IMF
Great Dane	Duroc	0.25
Changer	Duroc	-0.16
Cambridge	York	0.11
Interstate	York	-0.02



Major Gene Effects

- Halothane gene
 - Gene found primarily in Pietrain breed crosses, with low frequency in most breeds
- Napole gene
 - Gene found primarily in Hampshire breed crosses



Sponsored by the National Pork Producers Council and the American Meat Science Association



Economic Value of HAL Gene

Trait	Normal	Carrier	Diff.	\$\$/pig
LMA	5.94	6.23	0.29	\$ 1.65
Drip %	2.61	3.09	0.48	\$ -0.31
pH	5.85	5.84	-	
IMF %	2.60	2.28	-0.32	\$ -3.17
Instron	5.66	6.61	0.50	\$ -2.08
Total				\$ -3.91



Napole Gene Effects

Trait	RN	rn	Significance
Yield	91.65	95.28	**
WHC/protein	1.95	2.10	*
48 hr drip	7.50	4.97	***
Cook loss	24.09	20.56	***
Loin purge	4.47	3.55	*
Ham purge	6.29	4.99	*



Summary of Major Gene Effects

- Presence of the stress gene will increase loin muscle area; but, it will increase drip losses, decrease marbling and makes the meat tougher resulting in lower value/pig.
- Presence of the Napole gene will increase drip loss, increase cooking loss, increase purge; but, will increase juiciness resulting in lower value of pig.



Correlation Between Meat Quality and Production Traits

- Increase IMF
 - more BF, less LMA
 - no effect on pH and color
- Better pH
 - no effect on growth and BF
 - usually darker color
- Darker color
 - independent of production traits



Genetic Improvement of Breeds or Lines in Meat Quality Traits

- The seedstock organization must first measure the meat quality traits that are important in the marketplace.
- These traits must then be included in the selection program with adequate emphasis to result in genetic improvement.



Cut Test to Assess Meat Quality

- Work with an unbiased program to measure meat quality
 - Such as Iowa Premium Pork Co-op and ISU
- Measure a group of 15-20 pigs from multiple litters from your farm
- Be a part of a test that includes several farms testing at the same time
- Repeat the test on a regular basis



Does Your Meat Quality Influence Your Profit?

- First, look at your market
 - If you market in a value added system (Niman Ranch, Berkshire Gold, etc.), it is a primary factor
 - If you are producing “commodity pork” then the packer exerts an indirect effect
 - Pigs that provide “inferior quality” pork will not be purchased



Summary

- The quality of our product will have major effects on the price producers receive and on repeat purchase decisions by consumers
- Genetics set the foundation and the limit for meat quality
- Traits must be both measurable and heritable to make genetic improvement



Summary

- Differences between the breeds (lines) are large for the meat quality traits, as well as production traits
- Improvement of pH and color appear to offer the most promise for added value without decreased performance
- Major genes identified (Stress gene, Napole gene) result in inferior meat quality and reduced value



Summary

- The meat quality traits of pH, marbling and color have an adequate heritability for genetic improvement to be possible.
- These traits must be measured and included in the seedstock supplier’s selection program in order to make progress.
- High meat quality is essential for our future.

