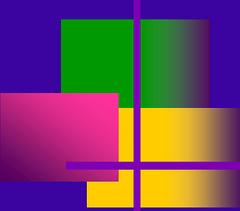


MEASURING AND PREDICTING CONSUMER ACCEPTANCE

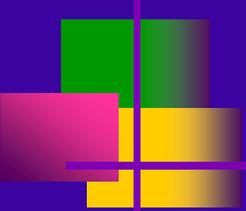
Edgar Chambers IV, Ph.D.
The Sensory Analysis Center
Kansas State University



Why Study Consumer Acceptance?

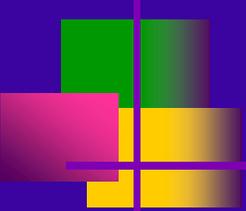
- Consumer acceptance ultimately is the most important piece of information related to all types of food production.





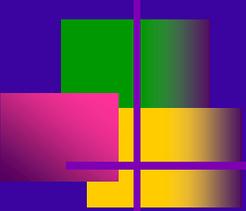
Meat Quality Evaluation

- Grading Characteristics
- Physical and Chemical Analysis
- Descriptive Sensory Analysis
- Consumer Evaluation



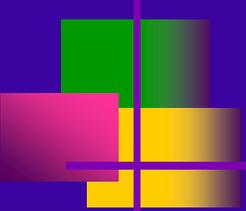
Understanding Consumer Perceived Meat Quality

- If we want to understand and predict consumer acceptance why not just measure consumer acceptance and forget predicting it from other tests?



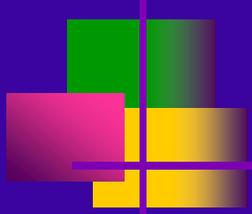
Why not?

- Because consumer tests are:
 - Expensive
 - Time consuming
 - Take a lot of sample
 - Destructive



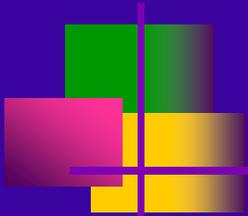
Common Expected Relationships

- Grading Characteristics:
 - Carcass Age - tenderness
 - Marbling – Flavor and Texture Characteristics
- Physical and Chemical Analysis (common examples) relationships:
 - Shear Value – tenderness/toughness
 - Color – “freshness”
 - Cooking Loss – juiciness
 - Proximate Analysis – juiciness, flavor
- Descriptive sensory analysis relationships
 - Texture and flavor characteristics



Aren't These Relationships Established?

- Yes, Maybe, and No

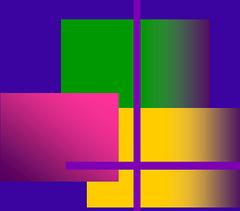


- If I order a U.S. “Prime” steak will the meat be more tender than if I order a U.S. “Select” steak?
- If I measure a Warner Bratzler Shear force of 3.5 kg on a piece of meat from Carcass A and 5 kg on a piece of meat (same muscle) from Carcass B, doesn't that mean that Carcass A is more tender than Carcass B?
- If a trained panel tells me that a slice of roast from Carcass R is slightly juicier than a slice of roast from Carcass T, will consumers be more likely to purchase meat from that carcass?

How can we establish better relationships?

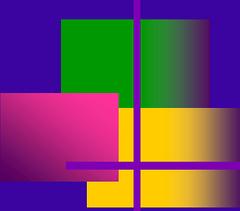
- Understand methods
 - What can a method test and what can't it test.
 - Machines don't yet measure like a human mouth or nose.
- Understand limitations
 - Variability – within and among carcasses, research techniques, and even consumers perceptions of quality.





Understand Methods

- Warner-Bratzler Shear
 - Measures cutting force
 - Does not measure chewing or crushing
- Tensile Stretch
 - Measures breaking strength
 - Does not measure cutting or chewing
- Fat Content
 - Measures amount of fat
 - Does not measure moisture, "moistness", or "juiciness"



Understand Methods

- Descriptive Sensory Analysis
- e.g., Juiciness
 - Measures perceived juiciness by “experts” at a given time, temperature, cooking method, etc. in a given muscle (very controlled situation)
 - Does not measure juiciness of situations not part of the experimental conditions

Understand Limitations

- Product
 - Intact meat is variable, within an animal and from animal to animal
 - Even structured meats are variable (end to end, inside to outside)
- Sampling. Just what it says – a “sample” – that we hope represents a larger group of products.
 - Limited number of observations
 - Variability in samples and the “population”
 - Range of attribute variability studied may be different



Understand Limitations

- Test Methods
 - Don't measure what a consumer senses
 - Have their own innate variability
 - Measure single dimensions – consumer measure integrated attributes and concepts
- Consumers
 - What is important to one consumer may be less important to others – predicting for one segment may not provide information for another



Understand Limitations

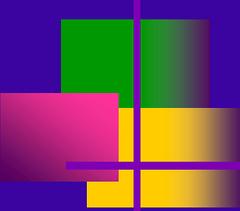
- Analysis

- Statistical Methods relate data, not perceptions
- Many statistical methods – which one gives the “best” or “right” answer

- Interpretation

- Have a tendency to give results rather than attempt to interpret what those results mean.
- Have a tendency to interpret based on what we think we already know rather than what we have learned



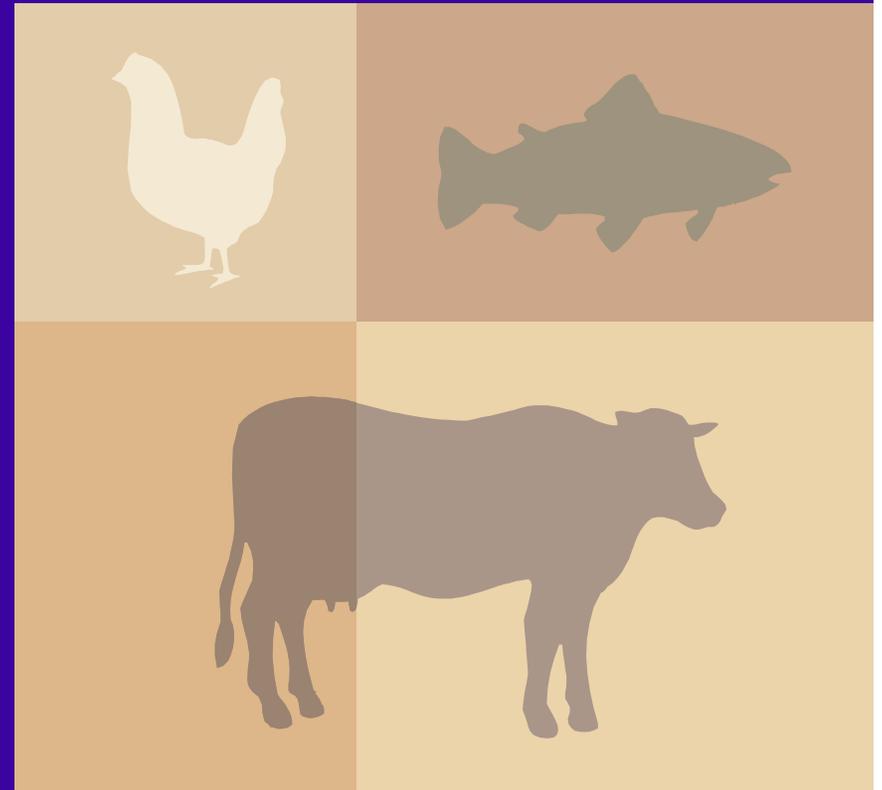


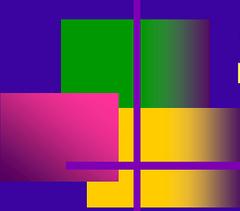
Design Study

- Make sure what you want to predict is actually predictable from what you will measure – probably have to measure multiple things if you want to “predict” consumer responses.

STUDY – Products and Sampling

Select products appropriately for the study. Getting a selection that is too broad or too narrow reduces the ability to properly interpret the data.

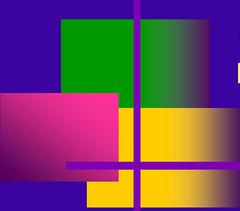




STUDY – Test methods

- Determine test methods that actually measure what you want to measure.
- Conduct tests consistently in the best way.
- Use appropriate equipment; Use appropriate descriptive panel

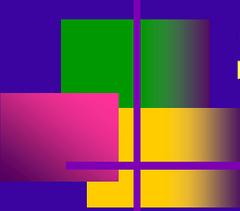




STUDY – Consumers

- Use appropriate consumers

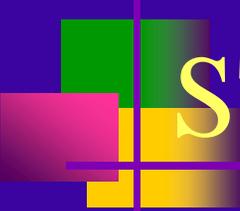




STUDY – Analysis and Interpretation

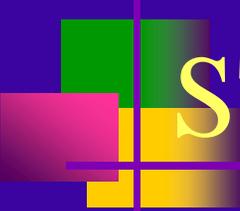
- Select appropriate analytical procedure
- Interpret data; don't just restate results.





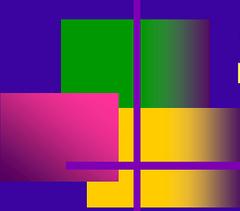
STUDY – Statistical Procedures

- Univariate
 - Histograms
 - Scatter Plots, Correlation
 - Analysis of Variance
- Uni or Multivariate
 - Regression



STUDY – Statistical Procedures

- Multivariate (Usually provide multi-attribute relationships and allow mapping)
 - Principal Components Analysis
 - Cluster Analysis
 - Partial Least Squares



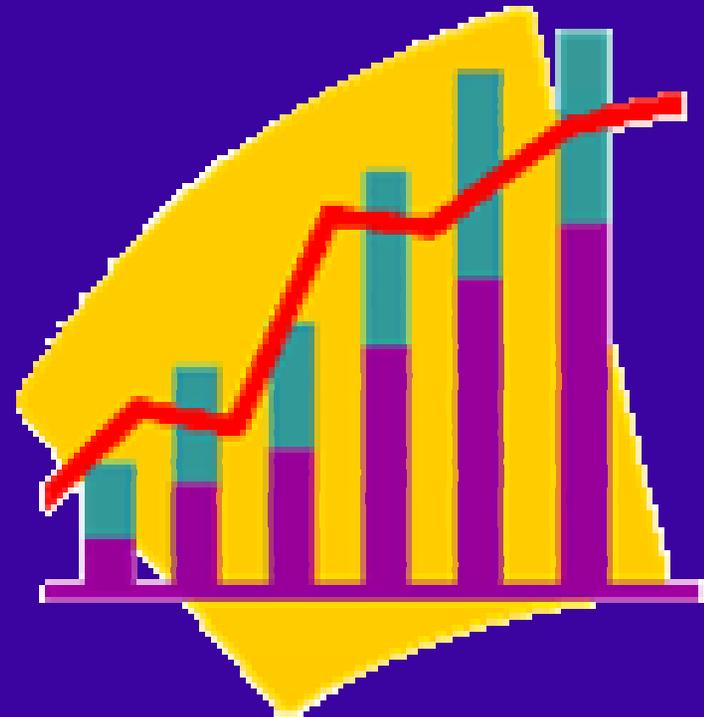
STUDY – Interpretation

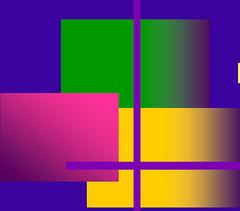
- Understand Results, but go beyond stating results – give implications, recommendations, suggestions



STUDY – Interpretation Example

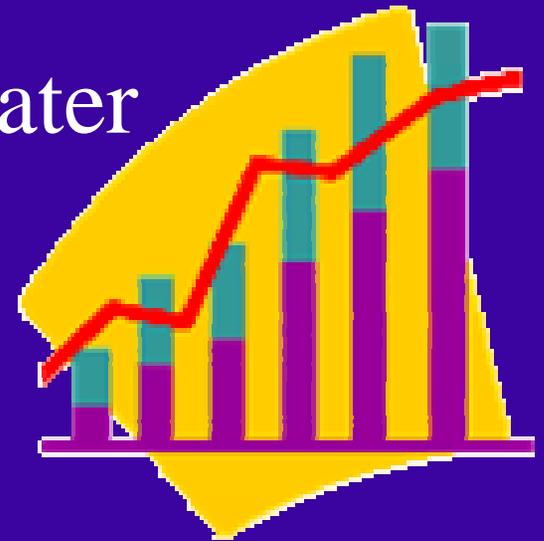
- Results: The correlation between total water and fat content and juiciness was 0.76.





STUDY – Interpretation Example

- Interpretation: Total fat and water were correlated with juiciness ($R^2=0.76$) suggesting that these may account for approximately half the variation seen by consumers in juiciness. Additional variables should be measured in future studies to determine if they add information on juiciness.



Reminder

- Prediction is not a matter of finding a significant correlation, regression, difference, relationship, etc. in one study.
- Prediction is the ability to forecast what usually will happen given some data.

