Poultry - Aging and Electrical Stimulation Effects on Tenderness

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Electrical Stimulation in the Poultry Industry

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ES Fundamentals

- The Mechanics
  - Electric Current is passed through the carcass
  - AC Current
  - DC Current
  - Continuous current application
  - Cyclic current application
  - The Electrical Stimulation (ES) initiates the chemical reaction of muscle contraction
    - Current flow starts at the breast and terminates at the hock

- Accelerated Rigor
  - The series of muscle contractions and relaxations reduce the available amount of chemical energy in the muscle
  - The delay phase of rigor is reduced or eliminated
    - Does this depend on when the bird last ate?
      - 4 hr. eating cycles
      - Feed withdrawal

Developing a Management Strategy

- Where are you now?
  - What are the descriptive statistics of your incoming birds?
  - How much variation is there between farms and flocks?
- Where do you want to go?
  - Who are your customers?
  - What are their expectations?

Change Management

- Have a Change Management Plan in place before a crisis
- Overacting can be just as bad as not reacting
- Remember: You have a chiller full of product that’s heading your way. It’s too late to make a change in your ES system!
Change Management

• Determine who has the authority to make a change
  • Quality
  • Operations
  • Engineering

• Understand why and when you need to make a change

ES Change Management Strategy

• Process Change Management
  • Define the WHY (Data Driven Decision) that initiates the need for change
    • Feathering
    • Too Tough
    • Too Tender
  • Define the WHAT that will be changed
    • Voltage
    • Cycle Times

ES Management Strategy

• Use data to manage the system.
  • Develop a consistent sampling process
  • Develop a consistent sample preparation procedure
  • Develop the statistical metrics for your products
    • Is it the Average?
    • Standard Deviation
    • Both?

Change Management

• Develop a reasonable and statistically valid sampling plan
• Never make Drastic changes in the system
• Clearly understand the risk of an incorrect change
• Consider Farm / Flock variation when making the choice to make a change
  • All farms / flocks are not created equal

ES Change Management Strategy

• Process Change Management
  • Define the HOW that system changes will be made
    • How long will the settings be changed?
    • What’s the Sample plan?
  • Determine the success criteria
    • Average = ?
    • Variation = ?
    • Max = ?
    • Min = ?
    • Yield = ?

ES Management Strategy

• Sample Management
  • Sample Volume & Frequency
    • What sample size can you process?
    • What sample frequency is needed?
    • When do you need to sample data?
**ES Management Strategy**

- Operational Management
  - Understand how the process can fail
  - Is the system turned on?
  - Has someone changed the established set points?
  - Did Sanitation do their part?
  - Did Quality do their part?
  - Did Maintenance do their part?
  - Did Production do their part?

- Environment
  - There are some things out of your control
    - Temperature difference between the house and environment during transport clearly has an impact on tenderness.
    - ES system adjustments during cold weather may be required.

**Summary**

- Management Education is Key
  - Who’s in charge?
  - Understand your products
    - What are you making?
  - Know your customers needs
    - What do they need?
  - Understand how the system can fail
  - Have a clearly defined action plan before a crisis occurs

**Questions**

- Its been a stimulating experience!
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