Hams

• An American Icon
• We’ve all had ham in one way or another
• Tradition
  – Christmas Ham
  – Easter Ham
• “City” Ham
• Country Ham or Dry-cured Ham
City Ham

- Wet cured ham
- Pumped with a “brine”
  - Water, salt, sweetener, phosphate, nitrite, sodium erythorbate, spices and seasonings
Ways of brining a ham

- Needle injectors
- Stitch pumps
- Artery injection
- Cover brine
- Goal to distribute brine evenly throughout the ham
- Avoid “Tiger Stripes”; uncured spots
Tumbling Hams

- Tumble or Massaging
- Diffuse brine throughout the ham
- Increase binding
  - Develops protein exudate to aid binding
- Increase tenderization
Types of Hams

• Get what you pay for!!!
• Ham with Natural Juices
  – 18.5% Protein
  – Very little water added
  – No more than an 8% gain in weight from green weight
• Ham with Water Added
  – 17% Protein
  – 10% added ingredients
  – No more than an 8% gain
• Ham and Water Product
  – 17% Protein
  – Water labeled as % added
Other Types of Ham

- Canned Hams
- Boiled Ham
  - Boiled in water
- Spiral Sliced Ham
- Semi-boneless Ham
  - Usually contains femur bone
- Bone-in Ham
- Shank and butt halves
- Boneless Ham
- Pit Ham
Country Ham

- Dry cured ham
- Salt, Sweetener, Spices, Nitrate (can make without)
- Box cured = 1”/week
- Bag cured = 2 d/ lb
- 90 – 100 days to several months
The Ham Belt

• Regions of the world were dry cured, country-type hams are produced
• Not all dry cured hams are called country hams
• These countries have climates that are optimal for the production of dry cured meats
• Mild winters and springs, hot humid summers
Kentucky Country Ham Producers

- Harper's Country Hams
- Meacham's Country Hams
- Fathers Country Hams
- Scott's Hams
- Penn's Country Hams
- Finchville Farms
- UK Meat's Lab
- Clifty Farms, Scottsville Plant
- Broadbents B & B Foods
- Miller's Country Hams
National Numbers

- Over 35 Country Ham Curers nationally
- Cure 5 – 10% of the ham supply
- Top Ham Producers
  1. Smithfield Hams, North Carolina
  2. Burgers’ Ozark Country Cured Hams, INC, Missouri
  3. Clifty Farms, Tennessee and Kentucky
Germany

- Westphalian Ham and Black Forest Ham
  - Westphalian ham are from pigs fed acorns from the Westphalian Forest
    - Smoked over Beech wood and Juniper Branches
    - Combination of dry and immersion curing
    - Aged for a month
  - Black Forest are dipped in beef blood to produce the characteristic black surface
Italy

- **Prosciutto (aka Parma Hams)**
- **Two Main Types:**
  - Prosciutto de Parma
  - Prosciutto de San Danielle
- Yorkshire pigs fed grain, parsnips and whey from parmesan cheese
- Aitch bone removed
- Flattened to ~2”
- Aged for a year or more
- **Culatello Ham**
  - Expensive and difficult to find in US
  - Butt portion cured with salt, pepper, garlic, and dry wine
Spain

- **Jamon Iberico Ham**
  - Most expensive ham
  - Not imported into US, but have been cleared for import in 2008
  - Black pigs are fed acorns
  - 24+ months old

- **Jamon Serrano (mountain ham)**
  - 18+ months old
  - White pigs fed acorns
  - Can be purchased in the US
China

• **Jinhua Ham**
  - Named for the city its made in
  - Making hams for over 900 years
  - Aged over 9 months
  - Sun Dried

• **Yunnan Ham**
  - Far western corner of China
  - Very rare
France

- Bayonne Ham
- Wine cured
- Slightly smoked and air-dried
- Covered with pork fat and flour (Pannage)
- 9 to 10 months old
England

• York Ham
• True York Hams are cured within 2 miles of York England
• Smoked over oak chips
• Large White Pigs
How do I make a Country Ham?

- Performed during the Winter months (December and January)
- Coolers
- Salt and sugar will penetrate the ham
- Other seasoning (black & red pepper) typically do not penetrate the ham
Curing

- Important to get enough cure in the hock and around the aitch bone
- Bone sour is one of the most common problems
- Allow enough time for the cure to penetrate the ham
- Most moisture loss
- After curing hams are sometimes washed, before salt equalization
Salt Equalization

- Usually 10 - 20° F warmer than curing temperature
- Spring time temperatures
- 2 to 3 weeks
- Allow the salt to equilibrate throughout the ham
Smoking Hams

- Smoking occurs after salt equalization
- Cold Smoke
  - 12 hours to 7 days
- Cannot let the temperature get above 90° F
  - Kill the enzymes responsible for flavor and aroma
Aging

- aka “Summer Sweat”
- Develop flavor and aroma
- Proteolysis and lipolysis of the protein and fat contribute to the flavor and aroma
- 50 to 60% Relative Humidity
The Law

• To be labeled a Country Ham

• Must have lost 18% of its green weight

• Contain at least 4% salt
Problems that occur

- **Mold Growth**
  - Common
  - *Penicillium*

- **Insect damage**
  - Larder Beetles, Red-legged Ham Beetles, Cheese Skippers, Ham Mites

- Avoid PSE and DFD hams

- White specks – tyrosine
Question

• Why is a country ham shelf stable?
Hurdle Technology

• A way of using several, effective preservation technologies to create safe, well preserved foods
• Add Salt
  – Effective bacteriostat and aids in water removal
• pH
  – Cannot get it low enough to create shelf stability
• Not vacuum packaged
• Water Activity (Aw)
  – Need to reduce the Aw enough to create shelf stability
  – Below 0.90
Industry Averages

• Average
  – $A_w = 0.88$
    • Range 0.74 – 0.93
  – Salt content = 6.5%
    • Range 4 – 9.7%
  – $pH = 6.1$