Hams

• An American Icon
• 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
  – 20% Protein
  – No weight gain
• 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

- Finchville Farms
- UK Meats Lab
- Meacham’s Country Hams
- Fathers Country Hams
- Penn’s Country Hams
- Scott’s Hams
- Clifty Farms, Scottsville Plant
- Broadbents B & B Foods
- Miller’s Country Hams
- Colonel Newsome
- Harper’s Country Hams
- Broadbents B & B Foods
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
• 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
Culatello Ham
Spain

• Jamon Iberico Ham
  – Most expensive ham
  – 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 it's 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**
  - $Aw = 0.88$
  - Range $0.74 - 0.93$
  - **Salt content** = $6.5\%$
  - Range $4 - 9.7\%$
  - $ph = 6.1$