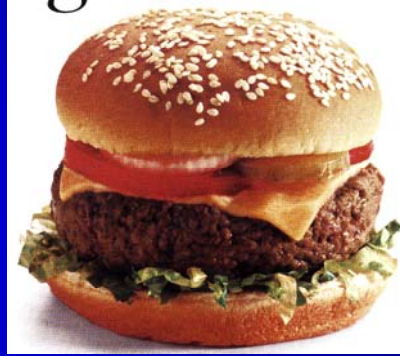


Fresh Meat Processing



Objective

To show how carcasses and wholesale meat cuts are processed to provide us with a wide variety of retail meat products

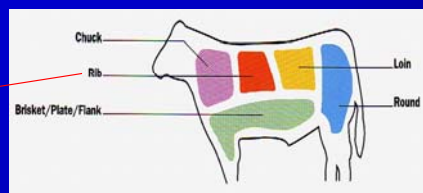


Problem: We have a cooler of beef, what do we do with it?



What is meat processing?

- Any mechanical, chemical or enzymatic treatment of meat that alters the form in which it originally occurs



What is “further processing”?

- An industry term used to describe the processes of comminuting (chop or grind) or enhancing through addition of low quality meats.
- Also referred to as Value Added



The function of further processing

- Preservation or shelf life extension
- Tenderization
 - Mechanical, enzymatic or chemical tenderization
- Increasing food safety and flavor
 - Usually through cooking of product prior to sales
- Manipulation and control of ingredients
- Portion control
- Increasing convenience to customer
 - Ready to eat meals



Carcasses Breaking

- Carcass breaking is first step in processing



Excel Fabrication line



More fabrication

- Fabrication of Ox tails



Size Reduction

- Size reduction is the most common form of meat processing






Tenderness and Thickness

- Thinner a piece of meat is sliced, the more tender it will be
- More finely a piece of meat is ground, the more tender it will be
 - However, thinner more ground meat will dry out more quickly



Tenderization Methods

- Mechanical
 - Cutting across the grain, chopping, grinding, beating with a mallet, needling, flaking
- Chemical or enzymatic
 - Papain
 - From the papaya 
 - Least effective on collagen
 - Bromelain
 - From pineapple 
 - Most effective on collagen
 - Ficin
 - From the fig 
 - Affects both muscle fibers and connective tissue



More Tenderization Methods

- Cooler Aging
- High temperature conditioning
 - Usually results in high bacterial counts
- Short term muscle shortening
 - Disrupts the z-line
 - Caution can cause cold shortening



Basic Meat Processing Equipment



Portion Control

- Example of steaks cut for hotel and tourism trade
 - Very trim and similar in size
 - Prevents cooking error
 - Customer always receives the same product



What is Shelf Life?

- The length of time before meat products become unpalatable, unsafe for human consumption or unattractive in the display case



Sell It or Smell It

- Treatment methods that extend shelf life
 - Chilling, Freezing and Freeze drying
 - Heat pasteurization
 - Heat sterilization
 - Curing and smoking
 - Dehydration
 - Irradiation



Shelf Life

- Contaminated hotdogs



Mechanical Refrigeration

- Refrigeration is main form of shelf life extension and preservation



Packaging meat in refrigerated room



Importance of Refrigeration

- Without refrigeration
 - Shelf life is only a few hours
- How do regions of the world where refrigeration is unavailable merchandize meat (Central Mexico)?



Composition Problems with Processing

- Compared to poultry, red meat is highly variable in composition
- Why does the variation exist?
- What do customers want from meat products
 - Consistency



Most Common Processed Meat

- Ground meat accounts for 60% of meat consumption
 - Hamburger is most common

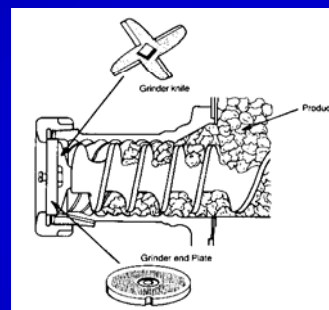


Most processing aids are targeted for ground meats

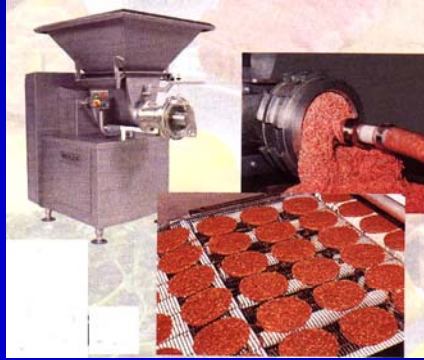


Meat Grinder

- Knife and auger rotate
- Grinder plate is stationary
- Many contain bone plate



Grinder with Bone Chip Collector



Making Commercial Patties

- Usually grind the meat twice
 - Coarse grind and determine fat content
 - Add **FAT** to reach desired content
 - Grind
 - Form patties or chubs

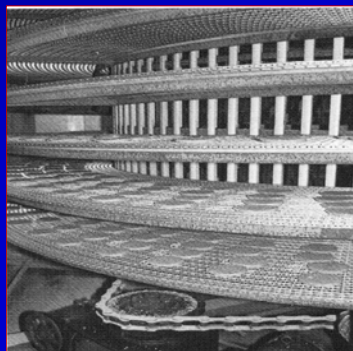


Patty Making Machine

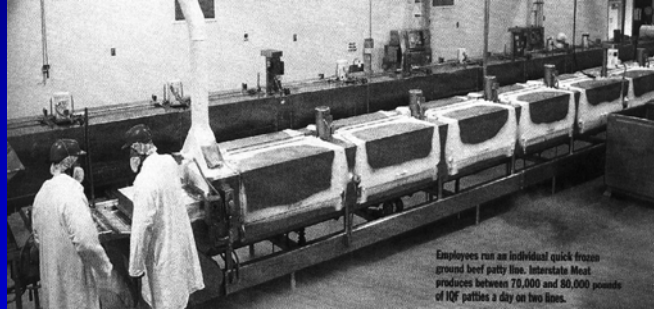
- A form of portion control
- Low value product
 - High cost for consumer



Spiral Freezer for Patties



Liquid Nitrogen Tunnel



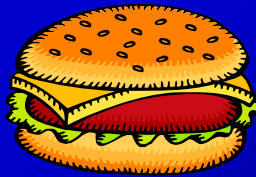
USDA-FSIS Regulations for Ground Beef

- Ground Beef or Chopped Beef
 - No more than 30% fat
 - Cannot add any more fat than what is in the trim
 - Can't add stored or extra fat supplies
 - No more than 25% of meat can come from the cheek



Hamburger

- Cannot contain more than 30% fat
- Can have added fat and seasonings
- Cheek meat is limited to 25%
- Hamburger cannot contain added water, binders or extenders



Ground Beef and Textured Vegetable Protein (Soy)

- Label for ground beef or Hamburger that contains soy or other extender
- Must contain above statement on ingredients



Imitation Ground Beef or Beef Patties

- Can contain anything
 - Fat
 - Seasonings
 - Water
 - Defatted beef
 - Defatted tissue has been rendered at a temperature that won't denature the proteins (re-inspected cook products)
 - Very Cheap
 - McD, BK, Wendys



Unique Extender Added to Meat

- Carrageenan
 - Isolated from red seaweed
 - Thickens, gels, stabilizes and suspends proteins
 - Widely used in food industry



How do we do this?



Why do we eat fat?

- Flavor – fatted foods taste better
- Texture – better mouth feel
- Learned preference
 - As adults we tend to repeat what we learn as children
- Low fat diets can be unhealthy
- Recommendation
 - 30% of calories from fat



Processing Continued

- Restructuring Meat Products
 - Method to increase value of cheap meats
 - Muscles are separated and re-shaped into desired shape
 - Use massage or tumbling to extract protein to stick meat pieces together
 - Or use binder such as **alginate**



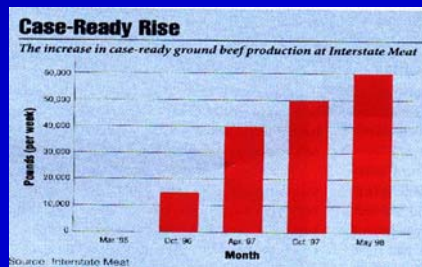
Processing Continued

- Aging
 - Wet Aging
 - Meat is aged in vacuum package
 - Safe but slower than other aging mechanisms
 - Dry Aging
 - Meat is hung in low humidity room
 - Increases bacterial contamination
 - Primarily used for restaurant trade



Processing Continued

- Case Ready Meats
 - Most rapidly growing division of meat industry
 - Meat products are shipped to supermarket in sale ready package



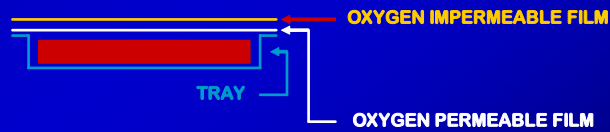
Advantages of Case Ready Products

- Less handling of product
- Lower microbial loads (less handling)
- More efficient use of labor
- No need to ship trim or fat for ground beef production
- Increased shelf life
- No need for in-store butcher



Why haven't we seen Case Ready Sooner?

- Consumers expect bright red meat
- Older packaging material was air tight
- Recent packaging developments allow for oxygen exchange
 - Impermeable film is removed prior to placement on shelf



Newest Trend in Meats Processing

- Home Meal Replacements
 - Dinner in a box



- Functional Foods
 - Fruit Smoothies



The End

