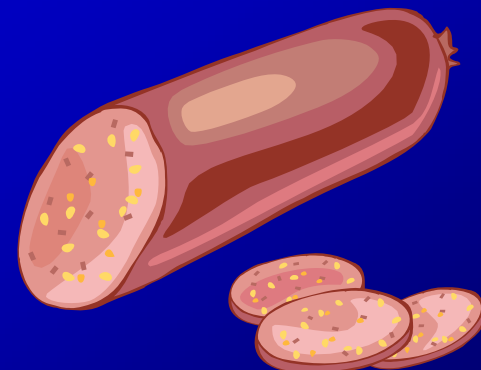
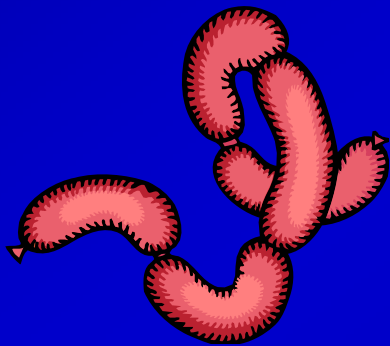


# Meat Preservation

## Sausage



# Objectives

- Explain methods for sausage production
- Examine the variety of meats made through sausage production



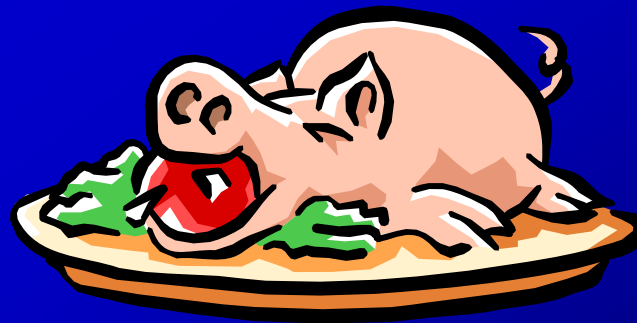
# What is a Sausage?

- Word sausage is from word *Salsus*
  - *Salsus* means salt or preserved
- Is a chopped or comminuted and seasoned meat
- Can be:
  - Fresh
  - Cured
  - Smoked
  - Heat processed
- Contain non-meat ingredients



# History of Sausage

- Reason for discovery of America and trade with Asia
- Used to be “Bags of Mystery”
  - Historically were made from by-products and left-overs
- Modern sausage is made from lean trimmings
  - Cheek, jowl, and heads from beef pork and poultry



# Why are sows used for Sausage?



# Types of Sausage

<b>Sausage classification</b>	<b>Characteristics</b>	<b>Examples</b>
<b>Fresh sausage</b>	<b>Uncooked, uncured fresh meats, chopped, seasoned and usually put in casings</b>	<b>Bulk fresh pork sausage, country-style pork sausage, bratwurst</b>
<b>Dry and semidry sausages</b>	<b>Cured meats, dried, may be smoked</b>	<b>Pepperoni, salami, cervelat</b>
<b>Cooked sausages</b>	<b>Meat cured or uncured, chopped, seasoned, cooked and sometimes smoked</b>	<b>Liver cheese, braunschweiger, liver sausage</b>
<b>Cooked, smoked sausages</b>	<b>Cured meat, chopped, seasoned, smoked and cooked</b>	<b>Bologna, wiener, cotto salami</b>
<b>Uncooked, smoked sausages</b>	<b>Fresh meat, cured or uncured, smoked and must be cooked before serving</b>	<b>Smoked country-style pork sausage, smokies, mettwurst</b>
<b>Luncheon meats and loaves</b>	<b>Often made into loaves but sliced, cured or uncured meat, cooked but usually not smoked</b>	<b>Chopped ham, blood and tongue pudding, head cheese</b>



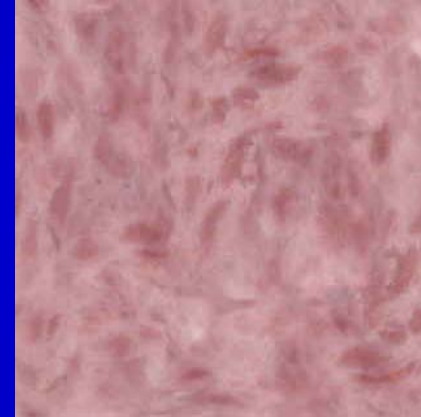
# Sausage Varieties

<i>Sausages</i>		
Berliner	Luncheon loaves (continued)	Salami
Blood sausage	Jellied corned beef	B.C. salami
Bologna	Jellied tongue	Beer
Bratwurst	Liver and bacon	Capri
Braunschweiger	Liverwurst	Catania
Cervelat	Macaroni and cheese	Cooked
Chorizo	Meat and cheese	Corti
Consenza	Meat	Cotto
Country-style pork sausage	Olive	De Lusso genoa
Farmer sausage	Pickle and pimento	Genoa
Frankfurter	Poultry roll	German
Fresh pork sausage	Souse	Golden west milano
Goteberg	Spiced veal	Italian
Gothaer	Tongue	Kosher
Head cheese	Turkey roll	Liguria
Holsteiner	Veal	Lombardia
Knackwurst (knoblauch)	Luncheon roll	Sicilian
Kolbassi	Messina	Sorrento
Lebanon bologna	Mettwurst	Savona genoa
Liver sausage	Minced ham	Sandwich spreads
Luncheon loaves	Mortadella	Scrapple
Cheese	Pepperoni	Smoked pork sausage
Chicken roll	Pescara	Strassburger
Dutch	Piccolo	Summer sausage
Ham	Polish sausage (kielbasa)	Swedish sausage
Head cheese	Pork roll	Thuringer (fresh, smoked)
Honey		Veal sausage
		Vienna
		Wiener wurst



# Common Sausage Varieties

- Luncheon Meats (bologna)
  - Modern use of pork trimmings
  - Comminuted or chopped
  - Contains few seasonings





# Uncommon Sausage Varieties

- Head Cheese
  - Mixture of meats held together by a gelatin
  - Used in salads, sandwiches and as hors d'oeuvres
  - Traditional meats



# Consumption of Sausage

<i>Variety</i>	<i>Billion Pounds</i>	<i>Percent</i>
Fresh sausage	1.356	17.2
Dry and semi-dry sausages	0.593	7.5
Frankfurters and wieners	1.825	23.1
Bologna	0.879	11.1
Sliced luncheon meats	1.267	16.0
Liver sausage, specialty items, and other sausages	1.583	20.0
Vienna and other canned sausages	<u>0.395</u>	<u>5.0</u>
Total	7.898	99.9



# Sausage Ingredients

- Animal Tissues-
  - A. Meat – striated skeletal muscle (trimmings)
  - B. Meat by-products – Non-skeletal, smooth muscle
    - Most high quality sausage are void of by-products
- Water (moisture)
  - Usually in the form of ice
  - Helps cool product and adds weight



# Sausage Ingredients

- Curing Ingredients
  - A. Salt
  - B. Spices – plant leaves, seeds, stems or roots
  - C. Flavorings – man made
  - D. Color developers – nitrites, ascorbates
- Sweeteners
  - Non-meat ingredients
    - Sugars, honey, etc.



# Sausage Ingredients

- Binder and Fillers
  - A. Binder – Binds water and helps emulsify
  - B. Filler – Binds water, lowers costs (decreases meat contents)
  - C. These products are usually from soy, cereals, and milk proteins
- Casings
  - A. Natural
    - Intestines
    - Bladders
    - Stomachs
  - B. Artificial
    - Paper/cellulose



# Sausage Ingredients

- Binders/Extenders
  - Hold meat together and allow it to form
    - Starch
    - Soy
    - Collagen
    - Onions
    - Rice
    - Skin
    - Phosphates
    - Non-Fat Dried Milk



# Meat Properties for Sausages

- Binding Index
  - Relative amount of salt soluble, heat coagulable protein (SSHCP)
  - Bull meat has an arbitrary BI set at 100
- Color Index
  - Measures the relative amount of myoglobin
  - Bull meat CI set at 100
- Moisture: Protein Ratio
  - $\text{Moisture, \%} / \text{Protein, \%}$



# Meat Properties for Sausages

Meat	Protein	Moisture	Fat	Collagen <sup>2</sup>	Color <sup>3</sup>	Bind <sup>4</sup>
	----- (%) -----				--- (index) ---	
Bull meat, full carcass	20	68	11	20	100	100
Cow meat, full carcass	19	70	10	21	95	100
Beef shank meat	19	73	7	66	90	80
Beef chucks	18	61	20	30	85	85
Beef trimmings, 90% lean	17	72	10	30	90	85
Beef trimmings, 75% lean	15	59	25	38	85	80
Beef plates	15	34	50	—	—	—
Beef flanks	13	43	42	—	55	50
Beef head meat	17	68	14	73	60	85
Beef cheeks, trimmed	17	68	14	59	10	85





# Spices

- Regional Sausages
  - Many sausages are regional because that is where spice is grown
  - Even with trade, spice regions produce the best sausage
- Spice trades
  - Reason for discovery of Asia and America



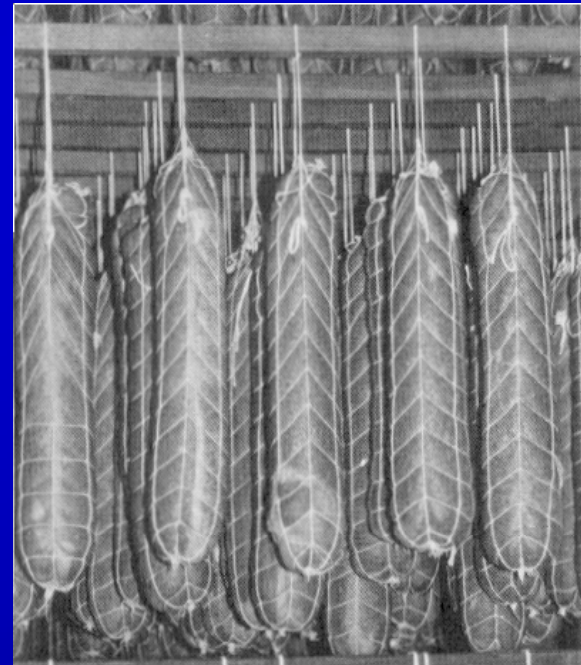
# Spices

<u>Product</u>	<u>Spice</u>
Breakfast Sausage	Sage
Italian Sausage	Fennel
Polish Sausage	Garlic
Bratwurst	Onions
Protein Added	Mustard
Color Enhancement	Paprika



# Dry VS. SemiDry

- Only difference is moisture content
- Tangy flavor comes from starter culture (fermented)
- Dry Sausages (Salami)
  - Generally not cooked
  - Require 21 to 90 days to dry
- Semi dry sausage (summer sausage)
  - Generally cooked
  - Require fermentation



Salami



# Sausage Casings

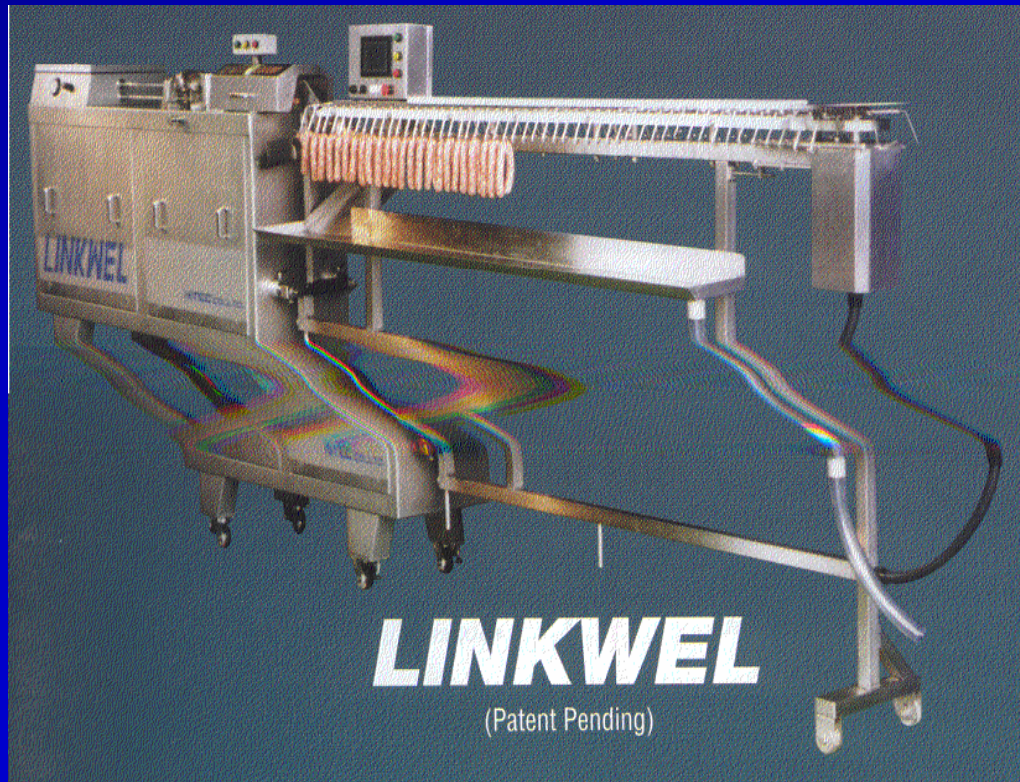
- Casing determines shape of sausage
- Natural Casings
  - Made from stomachs, intestines and bladders
  - Mostly from pigs and sheep
- Manufactures/Artificial
  - Made from cotton linters, paper pulp and beef hides



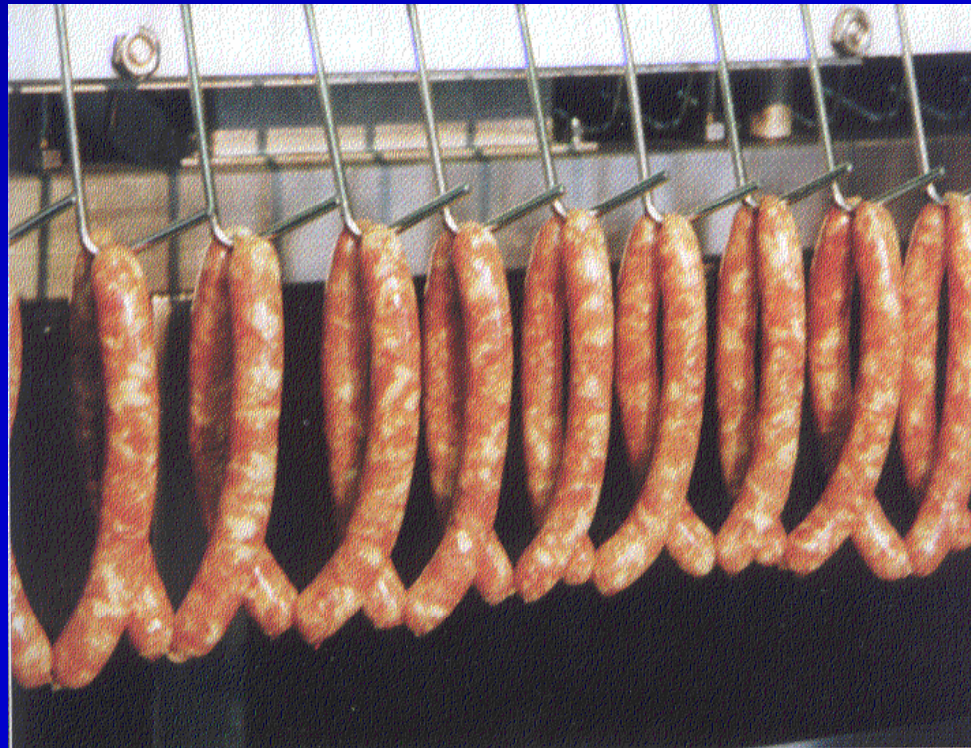
# Sausage Stuffer



# Industrial Sausage Stuffer



# Umm, Yummy

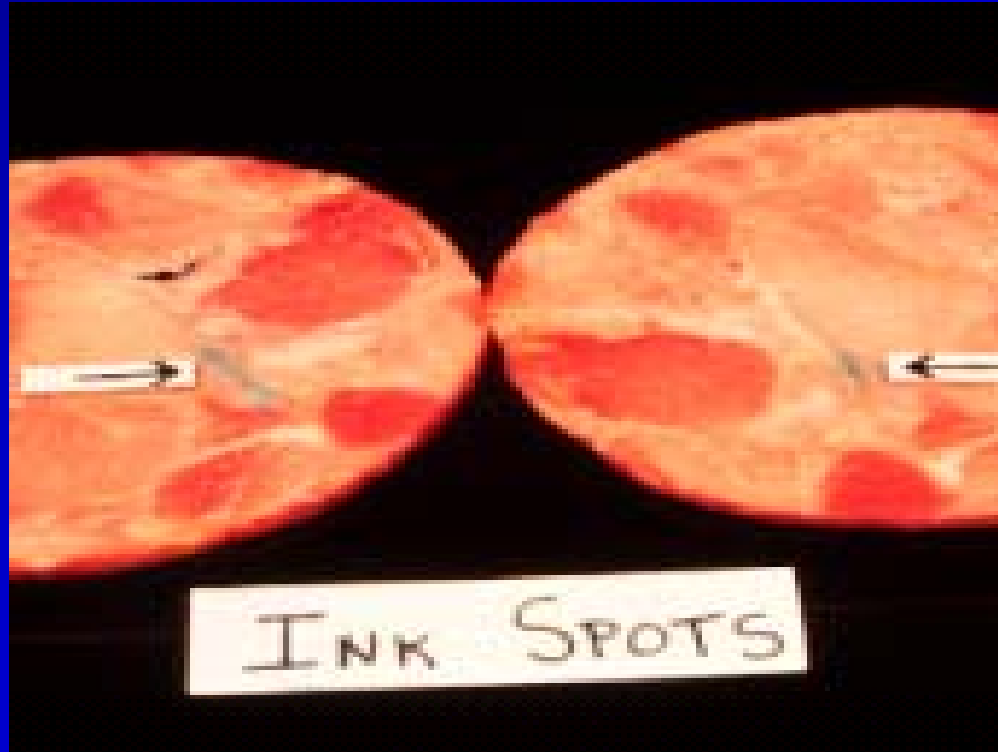


# Sausage Defects

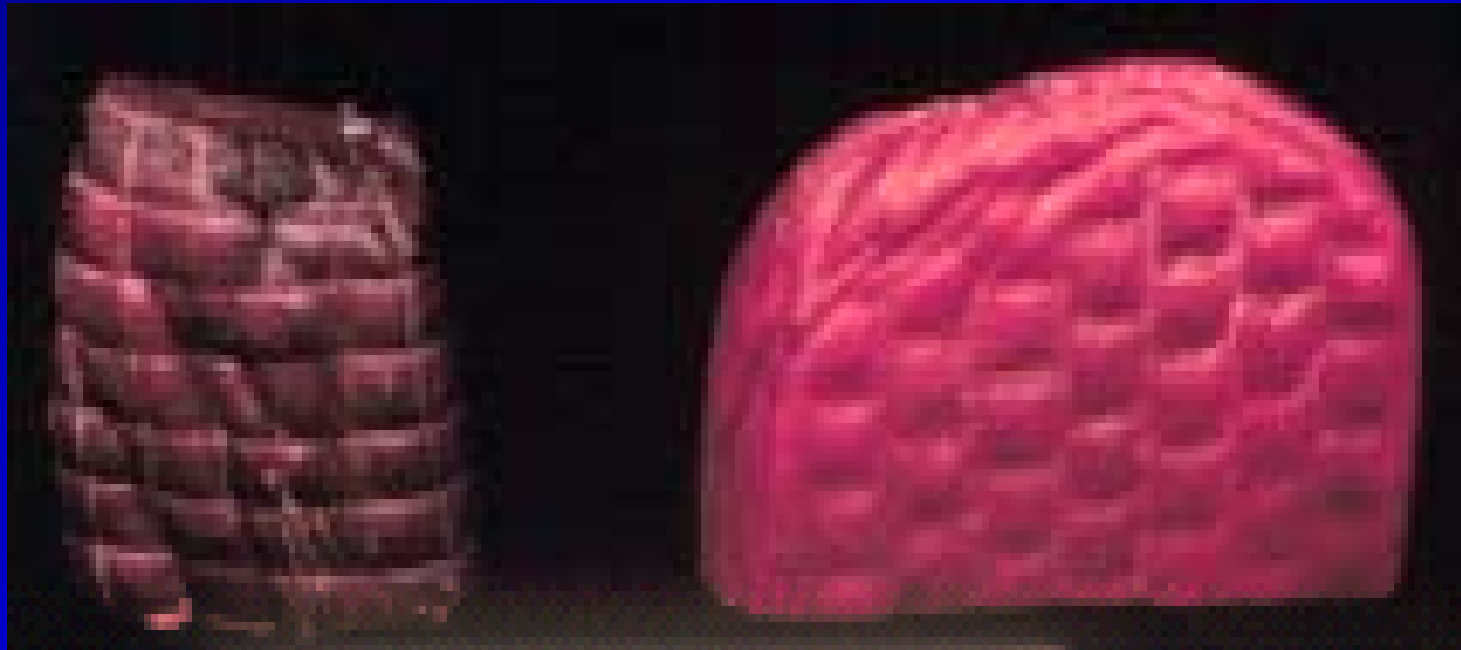




# Ink Spots



# Smoke house too cold (muddy smoke)



# Humidity



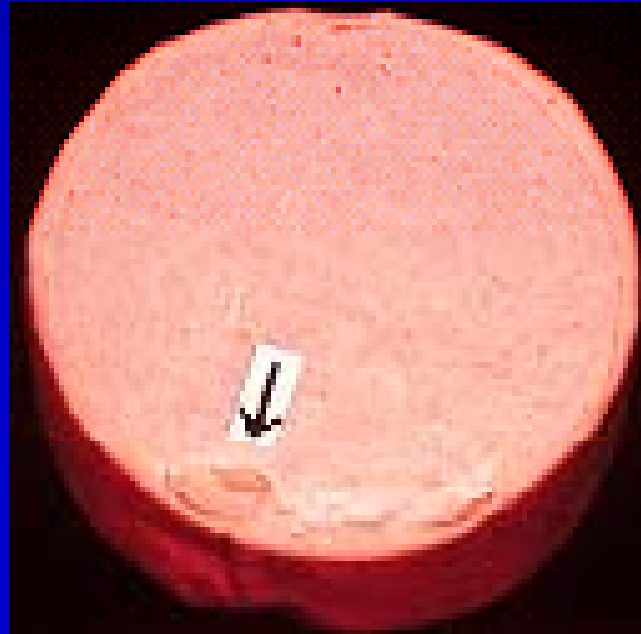
# Sausage Contact



# Mold Growth



# Gelatin Pocket



# Fat Cap



# Ground Too Fine

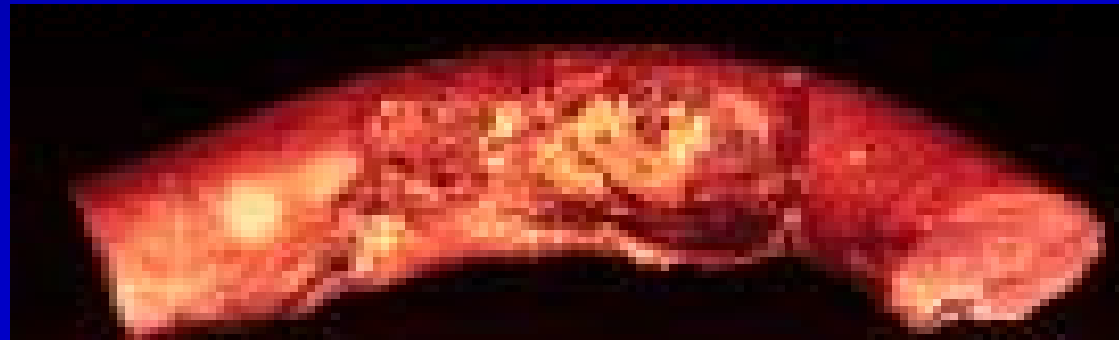




# Poor Stuffing



# Stuffed Too Tight



# THE END

