

Logo

106-E, Kamla Nagar, New Delhi-110007, India.
Tel: 91-11-23843955, 23845654, 23845886, +918800733955
Mobile: +91-9811043595
Email: npcs.ei@gmail.com, info@entrepreneurindia.co
Website: www.entrepreneurIndia.co

The Complete Book on Meat Processing and Preservation with Packaging Technology

Code: NI162	Format: paperback
Indian Price: ₹1275	US Price: \$125
Pages: 540	ISBN: 9788178330310
Publisher: Asia Pacific Business Press Inc.	

Description

Meat was originally processed to preserve it, but since the various procedures cause so many changes in texture and flavour it is also a means of adding variety to the diet. Processing also provides scope to mix the less desirable parts of the carcass with lean meat and in addition is a means of extending meat supplies by including other foodstuffs such as cereal in the product. Food preservation is a method of maintaining foods at a desired level of properties or nature for their maximum benefits. Preservation usually involves preventing the growth of bacteria, yeasts, fungi, and other micro organisms (although some methods work by introducing bacteria, or fungi to the food), as well as retarding the oxidation of fats which cause rancidity. Today, meat is processed with salt, colour fixing ingredients, and seasonings in order to impart desired palatability traits to intact and comminuted meat products. Products intermediate to these categories are sectioned, or chunked and formed meats. There are various methods for the preservation of meat; curing, dry curing, smoking, canning, freezing dehydration, fat extraction (wet or steam rendering), etc. Meat curing agents include sodium chloride, nitrite, ascorbate or erythorbate and possibly sodium phosphate, sucrose, dextrose, or corn syrup and seasonings. The salt content of processed meats varies 1 to 12%, according to the type of product. Many intact and comminuted, cured meat products are smoked to impart a desirable smoked flavour and colour. The smoking process many also include a drying or cooking cycle, depending on the product. Canned meats may be processed to be commercially sterile or semi preserved. The objective of commercial sterilization is to destroy all harmful bacteria or bacteria that may cause spoilage of the product under normal unrefrigerated storage. However, the process does not kill the spores of all heat

resistant bacteria. Frozen meat can be kept at low temperatures for many months. Freezing and subsequent thawing produce changes in the structure of meat that affect its physical properties. If meat is frozen very rapidly at low temperatures, the ice crystals are small and form within the fibers. The drip loss upon thawing is generally greater in slow frozen than in quick frozen meat. Freeze drying meat extends shelf life and reduces weight. The meat is readily defrosted by immersing in water before cooking. Under optimum processing and storage conditions, reconstituted meats have acceptable flavour, colour, texture and nutrient retention.

The meat packing industry handles the slaughtering, processing, packaging, and distribution of animals such as cattle, pigs, sheep and other livestock. The basic purpose of packaging is to protect meat and meat products from undesirable impacts on quality including microbiological and physio chemical alterations. Packaging protects foodstuffs during processing, storage and distribution from contamination by dirt (by contact with surfaces and hands), microorganisms (bacteria, moulds, and yeasts), parasites (mainly insects), toxic substances (chemicals), influences affecting colour, smell and taste (off odour, light, oxygen), loss or uptake of moisture. As such, due to the recent up gradation of preservation techniques, the preservation industry is also growing almost at the same rate as the food industry which is about 10 to 12% per year.

Some of the fundamentals of the book are meat product, simultaneous flavouring and tenderizing, synthetic flavouring, preservation: moisture retention and surface protection, antimicrobial treatment, antioxidant application to freeze dried meats, packaging and handling for storage and transportation, continuous steam cooking of ground meat, activators of natural proteolytic enzymes, isotonic enzyme solution with specific activity, inactivation of enzymes with high pressure, etc.

The origin of meat processing is lost in antiquity but probably began when primitive humans first learned that salt is an effective preservative and that cooking prolongs the keeping quality of fresh meat. This book includes the processing of fresh meats, the different curing agents, method of curing, smoking and manufacturing of various meat products such as sausages, canned meat, cured and smoked meats etc. The book is very useful for entrepreneurs, technocrats and those who want to venture in to this field.

Content

1. MEAT PRODUCT

Curing

Comminution

Smoking

Canning

Freezing

Dehydration

By-Products

2. TENDERNESS

Feed Additives

Balanced Electrolyte Composition

Ante-Mortem Enzyme and other Treatments

Stabilized, Purified Enzyme Preparation

Enzyme and Antibiotic Synergism

Controlled Enzyme Distribution

Uniform Enzyme Distribution

Treated and Standardized Enzyme Solution

Activators of Natural Proteolytic Enzymes

Collagen Diminution Agents

Reversibly Inactivated Enzymes

Pre-Rigor Mortis Enzyme Treatment

Enzyme and Antibiotic Synergism

Tenderization of Connective Tissue

Cold Water Buffered Enzyme Solution

Isotonic Enzyme Solution with Specific Activity

Buffered Enzyme Combined with Gelatin

Pre-Rigor Mortis Injection

Water Injection

Water and Gas Injection

Water and Cellulose Gum Injection

Whole Blood or Whole Milk Injection

Post-Rigor Mortis Enzyme Treatment

Tenderizer Composition

Aerosol Tenderizing Compositions

Enzyme with Higher Sodium Phosphates

Enzyme with Basic Pyrophosphate Salts

Balanced Activity of Papain and Bromelin

Enzyme with Nonlinear Phosphates in Saline

Enzyme and Fat Combination

Gas as Tenderizer Carrier

Inactivation of Enzymes with High Pressure

Carbon Dioxide or Oxygen Atmosphere

Enzyme, Chelating Agent, and Starch

Tragacanth Addition

Meat Pieces with Tenderized Core
Aging at Elevated and Controlled Temperatures
Variable Dew Point Control
Vacuum Packaged Cuts
Diathermal Heating
Controlled Atmosphere
Electron Beam Generator Radiation
Forced Dry Air Circulation
Treatment with Additives
Sodium Chloride and Pyrophosphate Synergism
Increased Injection Level of Sodium
Chloride and Phosphate
Marination and Refrigeration
Sodium Bicarbonate and Vinegar
Treatment with High-Pressure Gaseous Atmosphere
Oxygen
Carbon Dioxide
Solution Application Devices
Automatic Spraying Apparatus
Jet Injection Apparatus
Mechanical Tenderizing
Composite Steaks by Mechanical Method
Composite Steaks by Cryogenic Method
Compressed Cuts Mechanically Tenderized
Action of Supersonic Energy
Isometric Tensioning
Method for Tenderness Measurement
Tenderness Measuring Apparatus
3. FLAVOUR AND TENDRENESES
Simultaneous Flavouring and Tenderizing
Action of Molds and Bacteria
Action of *Thamnidium elegans*
Pre-Rigor Mortis Injection of *Aspergillus niger* Mycelium
Acid Activation of *Thamnidium elegans*
Anta-Mortem injection of *Thamnidium* and *Aspergillus*
Thamnidium and Antibiotic Synergism
Action of *Pseudomonas* and *Achromobacter*
Combined Action of Flavouring and
Tenderizing Agents
Monosodium Glutamate Eliminates Mutton Flavour

Application of Dry Tenderizer and Flavouring Materials

Inhibition of Warmed-Over Flavour

4. FLAVOURING

Meat Hydrolysates and Extracts

Acid Hydrolysis of Water-Insoluble Meat Residue

Fractionation of the Flavour Precursor

Hydrolysis of Meat

Bone Hydrolysates and Extracts

Continuous Counterflow Hydrolysis

Continuous Hydrolysis

Protein Hydrolysate

Synthetic Flavouring

Cysteine and Glyceraldehyde Base

Cysteine and Ribose

Derivatives of Mercapto-Acetaldehyde

α -Ketobutyrate, Inosinate, and Glutamate Base

Nitrite and Amino Acids

Cysteine, Sugar, Inosinate, and Protein Hydrolysate Base

Cysteine, Thiamine and Proteinaceous Substance Base

Ribose, Glycerol, Proline, Cysteine, and Methionine

Amino-Carbonyl Complexes from Protein Hydrolysates

Heat-Treated Slurried Meat and Ascorbic Acid

5. COLOUR

Ante-Mortem Treatment

Adrenalin and Ascorbic Acid

Treatment with Gaseous Atmosphere

Carbon Monoxide

Oxygen Under Pressure

Ammonia

Hemoglobin Base Colouring Compositions

Stable Compositions in Liquid and Paste Form

Compositions in Dry Powder Form

Chemical Treatment

Certified Monoazo Red Dyes

Ascorbate, Phosphate, and Citrate

Ascorbate, Gelatin, and Monosodium Glutamate

Imidazole

Metal Ions Ashed from Biological Tissues

Beta-Carotene

Nicotinic Acid Spray

Mechanical Treatment

Removal of Residual Blood

Protection of Bone Colour of Primal Cuts

6. INTEGRAL TEXTURE

Natural Exudate as Binder

Surface Treatment to Release Exudate

Mechanical Pricking to Release Exudate and

Freezing to Integrate

Compression to Release Exudate

Cryogenic Method

Enzyme Sodium Chloride Binding Action

Salt-Soluble Proteins

Scoring to Release Exudate

Polyphosphate as Bonding Agent

Polyphosphate Injection

Repeated Slow Freezing and Thawing

Bindingd Agents

Wheat Gluten

Gums

Binding Matrix

7. PRESERVATION : MOISTURE RETENTION AND SURFACE PROTECTION

Long Chain Hydrocarbon Coating

Fatty Alcohol or Fatty Acid Protective Film

Preliminary Ice Coating

Intermediate Glycerol Layer

Intermediate Water Layer

Lactic Acid-Fatty Acid Triglycerides

Water-in-Oil Emulsion Containing Gum

Mixture of Mono- and Diglycerides in Oil

Acetylated Monoglycerides

Plastic Coating

Ethylcellulose Plasticized with Mineral Oil

Ethylcellulose Plasticized with Edible Oil

Plasticized Cellulose Propionate Containing Glycol

Amorphous Polypropylene

Chemical and other Treatments

Sodium Chloride and Phosphate Solution

Injection of Water and Citric Acid

Hydrated Sodium Tripolyphosphate

Coating Powder Containing Syrup and Starch

8. ANTIMICROBIAL TREATMENT

Antibiotics

Ante-Mortem Injection

Ante-Mortem or Post-Mortem Injection

Combined with Air-Tight Packaging

Treated Absorbent Material

Coated or Impregnated Packaging Material

Addition of Nystatin or Myprozine

Various antimicrobial and Antimicrobial Agents

Plant Extracts

Spore Germination with Gibberellin

Sterilization with Nitric Oxide Atmosphere

Ethylene and/or Propylene Oxide to Destroy Trichinae

Increased Acidity to Destroy Foot-and-Mouth Virus

High Pressure Carbon Dioxide or Oxygen Atmosphere

Thermal Decontamination and

Oxygen Impermeable Packaging

Chlorine-Containing Aqueous Spray Solution

Microbial Spolage Indicator

Design and Compositions

9. IONIZING RADIATION

High Pressure Oxygen Atmosphere to Improve Colour

Combusted Fuel Gas Atmosphere to Improve Flavour

Ante-Mortem Adrenalin Injection to

Retard Enzymatic Deterioration

Antibiotic and Sorbic acid Treatment

Saline Medium to Eliminate off-Flavours

Sodium Chloride and Nitrite or Nitrate as

Bacterial Spore Sensitizers

Sterilization with Carbon Dioxide under Pressure

Sodium Chloride Treatment Prior to Blanching

Irradiation Apparatus

Design of a Resonant Transformer Type Cathode Ray

Irradiator

10. OTHER METHODS OF PRESERVATION

Dehydration Methods

Solvent Dehydration

Drying Without Case Hardening

Preservation of Flavor

Antioxidant Application to Freeze-Dried Meats

Deodorization of Raw Meat

11. PACKAGING AND HANDLING FOR

STORAGE AND TRANSPORTATION

Various Methods of Packaging

Vacuum Packaging and Storage Below 5°C

Hot Carcass Processing and Impermeable Packaging

Vacuum Packaging and Hot Water Spraying

Processing of Partially Cooled Carcass

Controlled Atmosphere Environment

Cryogenic Oxygen-Nitrogen Atmosphere

Carbon Dioxide-Oxygen-Nitrogen Atmosphere

12. COOKING METHODS

Broiling in Oxygen-free atmosphere with

Intense Infrared Heat

Continuous Steam Cooking of Ground Meat

Controlled Electrical Cooking

High Pressure Roasting in Air Medium

Cooking Between Compressed Plates

Roasting in Suspended State

Directory Section

1. MEAT PRODUCT

Curing

Comminution

Smoking

Canning

Freezing

Dehydration

By-Products

2. TENDERNESS

Feed Additives

Balanced Electrolyte Composition

Ante-Mortem Enzyme and other Treatments

Stabilized, Purified Enzyme Preparation

Enzyme and Antibiotic Synergism

Controlled Enzyme Distribution

Uniform Enzyme Distribution

Treated and Standardized Enzyme Solution

Activators of Natural Proteolytic Enzymes

Collagen Diminution Agents

Reversibly Inactivated Enzymes
Pre-Rigor Mortis Enzyme Treatment
Enzyme and Antibiotic Synergism
Tenderization of Connective Tissue
Cold Water Buffered Enzyme Solution
Isotonic Enzyme Solution with Specific Activity
Buffered Enzyme Combined with Gelatin
Pre-Rigor Mortis Injection
Water Injection
Water and Gas Injection
Water and Cellulose Gum Injection
Whole Blood or Whole Milk Injection
Post-Rigor Mortis Enzyme Treatment
Tenderizer Composition
Aerosol Tenderizing Compositions
Enzyme with Higher Sodium Phosphates
Enzyme with Basic Pyrophosphate Salts
Balanced Activity of Papain and Bromelin
Enzyme with Nonlinear Phosphates in Saline
Enzyme and Fat Combination
Gas as Tenderizer Carrier
Inactivation of Enzymes with High Pressure
Carbon Dioxide or Oxygen Atmosphere
Enzyme, Chelating Agent, and Starch
Tragacanth Addition
Meat Pieces with Tenderized Core
Aging at Elevated and Controlled Temperatures
Variable Dew Point Control
Vacuum Packaged Cuts
Diathermal Heating
Controlled Atmosphere
Electron Beam Generator Radiation
Forced Dry Air Circulation
Treatment with Additives
Sodium Chloride and Pyrophosphate Synergism
Increased Injection Level of Sodium
Chloride and Phosphate
Marination and Refrigeration
Sodium Bicarbonate and Vinegar
Treatment with High-Pressure Gaseous Atmosphere

Oxygen

Carbon Dioxide

Solution Application Devices

Automatic Spraying Apparatus

Jet Injection Apparatus

Mechanical Tenderizing

Composite Steaks by Mechanical Method

Composite Steaks by Cryogenic Method

Compressed Cuts Mechanically Tenderized

Action of Supersonic Energy

Isometric Tensioning

Method for Tenderness Measurement

Tenderness Measuring Apparatus

3. FLAVOUR AND TENDRENESS

Simultaneous Flavouring and Tenderizing

Action of Molds and Bacteria

Action of *Thamnidium elegans*

Pre-Rigor Mortis Injection of *Aspergillus niger* Mycelium

Acid Activation of *Thamnidium elegans*

Anta-Mortem injection of *Thamnidium* and *Aspergillus*

Thamnidium and Antibiotic Synergism

Action of *Pseudomonas* and *Achromobacter*

Combined Action of Flavouring and

Tenderizing Agents

Monosodium Glutamate Eliminates Mutton Flavour

Application of Dry Tenderizer and Flavouring Materials

Inhibition of Warmed-Over Flavour

4. FLAVOURING

Meat Hydrolysates and Extracts

Acid Hydrolysis of Water-Insoluble Meat Residue

Fractionation of the Flavour Precursor

Hydrolysis of Meat

Bone Hydrolysates and Extracts

Continuous Counterflow Hydrolysis

Continuous Hydrolysis

Protein Hydrolysate

Synthetic Flavouring

Cysteine and Glyceraldehyde Base

Cysteine and Ribose

Derivatives of Mercapto-Acetaldehyde

a- Ketobutyrate, Inosinate, and Glutamate Base

Nitrite and Amino Acids

Cysteine, Sugar, Inosinate, and Protein Hydrolysate Base

Cysteine, Thiamine and Proteinaceous Substance Base

Ribose, Glycerol, Proline, Cysteine, and Methionine

Amino-Carbonyl Complexes from Protein Hydrolysates

Heat-Treated Slurried Meat and Ascorbic Acid

5. COLOUR

Ante-Mortem Treatment

Adrenalin and Ascorbic Acid

Treatment with Gaseous Atmosphere

Carbon Monoxide

Oxygen Under Pressure

Ammonia

Hemoglobin Base Colouring Compositions

Stable Compositions in Liquid and Paste Form

Compositions in Dry Powder Form

Chemical Treatment

Certified Monoazo Red Dyes

Ascorbate, Phosphate, and Citrate

Ascorbate, Gelatin, and Monosodium Glutamate

Imidazole

Metal Ions Ashed from Biological Tissues

Beta-Carotene

Nicotinic Acid Spray

Mechanical Treatment

Removal of Residual Blood

Protection of Bone Colour of Primal Cuts

6. INTEGRAL TEXTURE

Natural Exudate as Binder

Surface Treatment to Release Exudate

Mechanical Pricking to Release Exudate and

Freezing to Integrate

Compression to Release Exudate

Cryogenic Method

Enzyme Sodium Chloride Binding Action

Salt-Soluble Proteins

Scoring to Release Exudate

Polyphosphate as Bonding Agent

Polyphosphate Injection

Repeated Slow Freezing and Thawing

Binding Agents

Wheat Gluten

Gums

Binding Matrix

7. PRESERVATION : MOISTURE RETENTION AND SURFACE PROTECTION

Long Chain Hydrocarbon Coating

Fatty Alcohol or Fatty Acid Protective Film

Preliminary Ice Coating

Intermediate Glycerol Layer

Intermediate Water Layer

Lactic Acid-Fatty Acid Triglycerides

Water-in-Oil Emulsion Containing Gum

Mixture of Mono- and Diglycerides in Oil

Acetylated Monoglycerides

Plastic Coating

Ethylcellulose Plasticized with Mineral Oil

Ethylcellulose Plasticized with Edible Oil

Plasticized Cellulose Propionate Containing Glycol

Amorphous Polypropylene

Chemical and other Treatments

Sodium Chloride and Phosphate Solution

Injection of Water and Citric Acid

Hydrated Sodium Tripolyphosphate

Coating Powder Containing Syrup and Starch

8. ANTIMICROBIAL TREATMENT

Antibiotics

Ante-Mortem Injection

Ante-Mortem or Post-Mortem Injection

Combined with Air-Tight Packaging

Treated Absorbent Material

Coated or Impregnated Packaging Material

Addition of Nystatin or Myprozine

Various antimicrobial and Antimicrobial Agents

Plant Extracts

Spore Germination with Gibberellin

Sterilization with Nitric Oxide Atmosphere

Ethylene and/or Propylene Oxide to Destroy Trichinae

Increased Acidity to Destroy Foot-and-Mouth Virus

High Pressure Carbon Dioxide or Oxygen Atmosphere
Thermal Decontamination and
Oxygen Impermeable Packaging
Chlorine-Containing Aqueous Spray Solution
Microbial Spolage Indicator
Design and Compositions

9. IONIZING RADIATION

High Pressure Oxygen Atmosphere to Improve Colour
Combusted Fuel Gas Atmosphere to Improve Flavour
Ante-Mortem Adrenalin Injection to
Retard Enzymatic Deterioration
Antibiotic and Sorbic acid Treatment
Saline Medium to Eliminate off-Flavours
Sodium Chloride and Nitrite or Nitrate as
Bacterial Spore Sensitizers
Sterilization with Carbon Dioxide under Pressure
Sodium Chloride Treatment Prior to Blanching
Irradiation Apparatus
Design of a Resonant Transformer Type Cathode Ray
Irradiator

10. OTHER METHODS OF PRESERVATION

Dehydration Methods
Solvent Dehydration
Drying Without Case Hardening
Preservation of Flavor
Antioxidant Application to Freeze-Dried Meats
Deodorization of Raw Meat

11. PACKAGING AND HANDLING FOR STORAGE AND TRANSPORTATION

Various Methods of Packaging
Vacuum Packaging and Storage Below 5°C
Hot Carcass Processing and Impermeable Packaging
Vacuum Packaging and Hot Water Spraying
Processing of Partially Cooled Carcass
Controlled Atmosphere Environment
Cryogenic Oxygen-Nitrogen Atmosphere
Carbon Dioxide-Oxygen-Nitrogen Atmosphere

12. COOKING METHODS

Broiling in Oxygen-free atmosphere with
Intense Infrared Heat
Continuous Steam Cooking of Ground Meat

Controlled Electrical Cooking
High Pressure Roasting in Air Medium
Cooking Between Compressed Plates
Roasting in Suspended State
Directory Section

About NIIR Project Consultancy Services (NPCS)

NIIR Project Consultancy Services (NPCS) is a reliable name in the industrial world for offering integrated technical consultancy services. Its various services are: Pre-feasibility study, New Project Identification, Project Feasibility and Market Study, Identification of Profitable Industrial Project Opportunities, Preparation of Project Profiles and Pre-Investment and Pre-Feasibility Studies, Market Surveys and Studies, Preparation of Techno-Economic Feasibility Reports, Identification and Selection of Plant and Machinery, Manufacturing Process and/or Equipment required, General Guidance, Technical and Commercial Counseling for setting up new industrial projects and industry. NPCS also publishes various technology books, directories, databases, detailed project reports, market survey reports on various industries and profit making business. Besides being used by manufacturers, industrialists, and entrepreneurs, our publications are also used by Indian and overseas professionals including project engineers, information services bureaus, consultants and consultancy firms as one of the inputs in their research.

NIIR PROJECT CONSULTANCY SERVICES
106-E, Kamla Nagar, New Delhi-110007, India.
Tel: 91-11-23843955, 23845654, 23845886, +918800733955
Mobile: +91-9811043595
Email: npcs.ei@gmail.com, info@entrepreneurindia.co
Website: www.entrepreneurIndia.co