

Fresh Meat Technology Handbook

Author: NIIR Board of Consultants and Engineers

Format: paperback

Code: NI102

Pages: 540

Price: Rs 975 | US\$ 100

Publisher: NIIR PROJECT CONSULTANCY SERVICES

Shipping: 3 days

About the Book

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.

Note: This book is also known as 'The Complete Book on Meat Processing And Preservation with Packaging Technology', NI162.

Contents

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 AnTimacrobial 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 Spilage 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
 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 Spilage 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

NIIR PROJECT CONSULTANCY SERVICES (NPCS) is a reliable name in the industrial world for offering integrated technical consultancy services. NPCS is manned by engineers, planners, specialists, financial experts, economic analysts and design specialists with extensive experience in the related industries.

Our various services are: Detailed Project Report, Business Plan for Manufacturing Plant, Start-up Ideas, Business Ideas for Entrepreneurs, Market Research, Manufacturing Process, Machinery, Raw Materials, Project Feasibility, Investment Opportunities, Technical Consultancy and Startup Help.

NPCS also publishes process technology books, technical books, startup books, directory, business database, detailed project reports and market research reports.

Our Detailed Project Report aims at providing all the critical data required by entrepreneurs for starting new business ventures.

NIIR PROJECT CONSULTANCY SERVICES

106-E, Kamla Nagar, New Delhi-110007, India

Email: npcs.india@gmail.com **Website:** <https://www.niir.org/>