AGRO FOOD PROCESSING AND PACKAGING TECHNOLOGY

FOOD LAWS

Introduction
Food safety and standard act
The ABCD of FSSA
Salient features of FSSA
Responsibilities of the food business operator
Improvement notices
Offences and penalties
Licensing and registration
Nutrition labelling
Requirements
Content on label
Hazard analysis and critical control point (HACCP) IS 15000
Principles of HACCP
Features
Some salient points are
Benefits of HACCP
License process
Food safety management systems certification scheme (IS/ISO 22000)
Features
Benefits
Licence procedure
ISI Mark: Bureau of Indian Standards (BIS, 1986)
Features
License procedure
Weight and Measure Act
Regulations
Package Commodity Act
Regulations

READY-TO-EAT SNACKS EXTRUSION TECHNOLOGY

Introduction
Materials and methods
Raw materials
Dehulling and milling
Formulations used
Extrusion conditions for lab scale extruder
Spicing of samples
Sensory evaluation
Physical characteristics
Proximate composition
Consumer acceptability of extruded snacks
Results
Sensory evaluation
Physical parameters of the extrudates
Proximate composition of the extrudates
Consumer evaluation of products

POTATO CHIPS

Introduction
Materials and methods
Procurement of raw material
Preparation of potato chips
Fat analysis
Sensory Evaluation
Statistical analysis
Results and discussion

READY TO EAT PROTEIN RICH FOOD BARS

Introduction
Formulation and preparation of protein rich food bars
Results
Organoleptic evaluation of protein rich rood bars
Proximate chemical composition, mineral content and IVPD of most acceptable protein
in rich food bars

**GRADING AND SORTING FOOD PRODUCTS USING COMPUTER**

Introduction
Digital image processing
Fundamental steps in image processing
Image acquisition
Image preprocessing
Image segmentation
Image representation and descriptioner
Image recognition and interpretation
Elements of digital image processing system
Automatic grading and sorting of food products using computer vision systems
Bakery products
Fruits
Vegetables
Grains
Limitations of the system

**IQF FREEZING AND APPLICATION**

IQF Spiral Freezers
Applications
Benefits
Low operation cost
Impingement Polybelt Tunnel Freezer
Applications
Modular IQF fluidized tunnelfreezer
Multipass belt tunnel freezer
Applications
Tray IQF fluidized tunnel freezer
Applications
Drag-thru-dolly tunnel freezer
Application

**FOOD CANNING**

Plant site
Factory building
Water supply and drainage
Workers
Machinery and equipment
Canning method
Key processes
Sorting and grading
Washing
Peeling, coring and pitting
Hand peeling
Peeling, coring and pitting by machine
Peeling by heat
Lye peeling
Blanching
Can filling
Syruping or brining
Lidding or clinching
Exhausting
Sealing
Processing/Manufacturing
Heat penetration in cans
Manufacturing processes
Non-acid Vegetables
Effect of altitude on processing time
Effect of altitude on processing pressure and temperature
Effect of acidity on sterilization
Effect of processing on strain in can
Cooling Testing
Labelling, storing and packing

FRUITS CANNING TECHNOLOGY

Canning of fruits
Apples
Storage
Washing
Grading
Peeling and coring
Blanching
Canning
Filling
Exhausting
Sterilizing
Cooling
Mangoes
Oranges
Papaya
Pineapple
Harvesting
The Ginaca machine
Trimming
Slicing
Grading and packing
Prevacuumizing
Syruping
Double seaming
Processing
Cooling
Crushed pineapple
By products
Peaches
Grading
Cutting and pitting
Cutting and pitting by hand
Cutting and pitting by machine
Peeling and washing of clingstone of peaches
Slicing
Cans
Filling
Syruping
Peeling and washing, freestone peaches
Steaming
Scalding in water
Combination of steam and lye
Sorting
Grading
Exhausting
Closing
Processing
Cooling
Storage
Pears
Grading
Peeling and coring
Grading and filling
Syruping
Exhausting
Closing
Process
Cooling

PREPARATION OF FRUIT JUICES, SQUASHES & CORDIALS

Sherbet
Equipment for fruit juices
Washing equipment
Sorting equipment
Extraction equipment
Halving and turning machines
Continuous screw expeller press
Plunger type press
Roller type press
Double operation
Basket press
Rack and cloth press
Straining or screening equipment
Setting or sedimentation
Filtration equipment
Deaerator and flash pasteurizer
Fruit beverages
Preparation and preservation
Selection and preparation of fruit
Juice extraction
Deaeration
Straining, filtration and clarification
Use of fining agents
Enzymes
Chemical finings
Clarification by freezing
Clarification by heating
Preservation of fruit juices
Pasteurization
Bottle method or Holding pasteurization
Pasteurization by over flow method
Preparation of fruit beverages
Fruit beverages
Squashes and cordials
Orange squash
Extraction of Juice
Preparation of squash
Grapefruit squash
Lemon squash
Lime squash
Lime juice cordial
Jaman squash or syrup
Mango squash
Peach squash
Phalsa squash
Pineapple squash
Plum squash
Syrups

TECHNOLOGY OF VEGETABLES CANNING
Comparison of fruits and vegetables

Okra
- Filling and exhausting

Mushrooms
- Sorting of washing
- Blanching
- Size-grading
- Filling
- Canning

Peas
- Vining
- Cleaning
- Grading
- Blanching
- Grading and maturity
- Brine
- Fill of cans
- Exhausting
- Cooling
- Cabbage
- Pumpkin
  - Washing and preparation for canning
    - Pulping
    - Canning
    - Beans
    - Vining
    - Grading
    - Blanching
    - Filling
    - Exhaust
    - Cooling
- Potatoes
- Washing
- Preheating
- Peeling
- Inspection and trimming
  - Size grading
  - Filling
  - Sealing and processing
  - Cooling
  - Carrots
  - Washing
  - Grading
  - Blanching
  - Peeling
Slicing of dicing
Canning

POULTRY PROCESSING

Slaughter and bleeding
Scalding
Defeathering
Evisceration
Chilling
Packaging
Nutritive value
Eggs and egg products
Nutritive value
Egg quality
Evaluation of egg quality
Egg grading
Egg processing
Egg freezing
Dried eggs
Egg substitutes
Other products
Leavening power
Binding and thickening
Emulsifying power
Tenderizing
Moisture retention
Flavour
Nutrition
Colour

AQUA FARM

Selection of region
Site selection
Soil
Water
Land
Other factors
Design of aqua farm
Design of earthen ponds
Size and depth
Earthen embankment
Type and shape
Inlet and outlets
Free board
Design of hatchery
Determination of main parameters
Other facilities
Estimation in fish farm construction

PULSE PRODUCTION

Improved varieties
Ridge/raised bed planting
Bio-fertilizers
Foilar spray of urea
Sulphur application
Weed Management
Seed priming
Remunerative cropping systems
Integrated wilt management
Integrated management of helicoverpa
IIPR Mini Dal Mill

PRODUCTION PROCESS OF LARGE CARDAMOM

Growth requirements
The plant
Wild relatives
Varieties
Propagation
Inflorescence and pollination
Nutrient management
Disease management
Insect pest management
Flowering and harvest
The fruit
Production
Post-harvest processing
Benefit Cost analysis
Trade

RICE-FISH POULTRY FARMING

Field layout
Fish
Poultry
Productivity of the system
Economics
Employment generation
Water requirement
Nutritional status of soil

ORGANIZED DAIRY FARMS

Components of animal shelter
Foundation
Pillars
Walls
Loft
Roof
Feeding manager
Stall
Stanchion
Passages
Water provision
Night lighting
Manure pits
Calf stalls
White washing
Loafing yard
Other facilities
Surroundings
Dairy animal shelter models
Model for specialized large herd of 100 cows and 72 followers in hot and dry or hot and humid climatic zone

POLYHOUSE TECHNOLOGY FOR PRODUCTION OF VEGETABLES

Polyhouse
Polyhouse/greenhouse construction tips
Plastic low tunnels
Sil trench
Site selection
Raising off season nursery
Raising plant propagation material
Production of fresh vegetables
Vegetable seed production in polyhouse
Maintenance of germplasm
Production of breeder seeds
Hybrid (F1) seed production
Benefits of poly/green house in temperate regions

PRODUCTIVITY OF GOATS

Criteria for selection of good goats
Features of unproductive goats
Criteria for checking the general health of goats
Housing of goats
Advantages of artificial insemination in goats
Milk secretion is different in goats
Milking of goats
Machine milking of goats
Criteria for producing better quality milk from goats
Quality testing of goat milk
Chevon production in goats
Comparison of goat meat with chicken and mutton
Steps for prevention of disease in goats
Difference between goats and sheep

CONTINUOUS PROCESSING OF RTD TEA AND COFFEE BEVERAGES

The integrated Extraction System (IES)
Concentration of tea and coffee extracts
High quality tea concentrates
High quality coffee concentrates

COLD CHAIN SUPPLY

Current state of Indian agricultural industry
The Indian food processing industry
The food supply chain
Food supply chain cluster
The cold chain
Supply chain expertise
Food packaging
Standards
Food safety and hygiene
Importance of freezing and cold chain in food production and distribution
Spoilage
Microbial Spoilage
Autolytic Spoilage (enzymatic)
Oxidative Spoilage
Refrigeration and freezing
Quality of frozen food vs. fresh

PROCESSING AND PRESERVATION OF FISH

Drying
Natural drying
Mechanical drying
Solar drying
Salting
Smoking
Fermenting
Boiling
Canning

**UHT PLANT FOR MILK IN ASEPTIC POUCHES**

Complete unit of UHT Plant
Economical
Principle of operation
UHT sterilizer
Automatic UHT plant
Balancing equipment
The process of sterilization
Cleaning
Homogenizer
Functional description
CIP system
Functional description
Coding unit
Film web controller
Pouch counter
Specifications for packaging material
Recommendations of the packaging film

**PLANT ECONOMICS OF AQUACULTURE SHRIMP FARMING**

Plant & Machinery
Fixed Capital
Raw Materials
Total Working Capital/Annum
Total Capital Investment
Turn Over/Annum

**PLANT ECONOMICS OF CANNING AND PRESERVATION OF VEGETABLES**

Plant & Machinery
Fixed Capital
Raw Materials
Total Working Capital/Annum
Total Capital Investment
Turn Over/Annum

**PLANT ECONOMICS OF CANNING OF FRUITS AND VEGETABLES**
PLANT ECONOMICS OF COLD SUPPLY CHAIN

PLANT ECONOMICS OF DAIRY FARMING (BUFFALOES KUNDI)

PLANT ECONOMICS OF DAIRY FARMING (JERSEY COWS) & MILK PROCESSING

PLANT ECONOMICS OF FROZEN FOOD BY IQF TECHNOLOGY
Total Capital Investment
Turn Over/Annum

PLANT ECONOMICS OF FRUIT JUICE IN TETRAPACK

Plant & Machinery
Fixed Capital
Raw Materials
Total Working Capital/Annum
Total Capital Investment
Turn Over/Annum

PLANT ECONOMICS OF GRAM DALL/PULSE MILL

Plant & Machinery
Fixed Capital
Raw Materials
Total Working Capital/Annum
Total Capital Investment
Turn Over/Annum

PLANT ECONOMICS OF GREEN HOUSE/POLY HOUSE

Plant & Machinery
Fixed Capital
Raw Materials
Total Working Capital/Annum
Total Capital Investment
Turn Over/Annum

PLANT ECONOMICS OF MANGO PULP

Plant & Machinery
Fixed Capital
Raw Materials
Total Working Capital/Annum
Total Capital Investment
Turn Over/Annum

PLANT ECONOMICS OF NAMKEENS (KURKURE TYPE SNACK FOOD)

Plant & Machinery
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<th>Plant &amp; Machinery</th>
<th>Fixed Capital</th>
<th>Raw Materials</th>
<th>Total Working Capital/Annum</th>
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<th>Turn Over/Annum</th>
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<td><strong>PLANT ECONOMICS OF PINEAPPLE, TOMATO, FRUIT JUICE AND OTHER PRODUCTS BOTTLING PLANT</strong></td>
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<td><strong>PLANT ECONOMICS OF POTATO CHIPS WITH NITROGEN PACKING (ON IMPORTED M/C)</strong></td>
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<td><strong>PLANT ECONOMICS OF PROTEIN FROM SOYABEAN</strong></td>
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Turn Over/Annum

PLANT ECONOMICS OF READY TO EAT FOODS IN TETRA PACKS

Plant & Machinery
Fixed Capital
Raw Materials
Total Working Capital/Annum
Total Capital Investment
Turn Over/Annum

PLANT ECONOMICS OF RICE SORTING/GRADING PLANT

Plant & Machinery
Fixed Capital
Raw Materials
Total Working Capital/Annum
Total Capital Investment
Turn Over/Annum

PLANT ECONOMICS OF SEEDS GRADEING AND PROCESSING

Plant & Machinery
Fixed Capital
Raw Materials
Total Working Capital/Annum
Total Capital Investment
Turn Over/Annum

PLANT ECONOMICS OF SNACK FOOD (CRAX SIZE) (ROLL AND BALL TYPE)

Plant & Machinery
Fixed Capital
Raw Materials
Total Working Capital/Annum
Total Capital Investment
Turn Over/Annum

SUPPLIERS OF PLANT AND EQUIPMENTS FOR FOOD PROCESSING AND ALLIED INDUSTRY
The book *Agro Food Processing and Packaging Technology* covers Food Laws, Ready to Eat Snacks Extrusion Technology, Potato Chips, Ready to Eat Protein Rich Food Bars, Grading and Sorting Food Products Using Computer, IQF Freezing and Application, Food Canning, Fruits Canning Technology, Preparation of Fruit Juices, Squashes & Cordials, Technology of Vegetables Canning, Poultry Processing, Aqua Farm, Pulse Production, Production Process of Large Cardamom, Rice-Fish Poultry Farming, Organized Dairy Farms, Polyhouse Technology for Production of Vegetables, Productivity of Goats, Continuous Processing of RTD Tea and Coffee Beverages, Cold Chain Supply, Processing Preservation of Fish, UHT Plant for Milk in Aseptic Pouches, Plant Economics of Aquaculture Shrimp Farming, Plant Economics of Canning and Preservation of Vegetables, Plant Economics of Canning of Fruits and Vegetables, Plant Economics of Cold Supply Chain, Plant Economics of Dairy Farming (Buffaloes Kundi), Plant Economics of Dairy Farming (Jersey Cows) & Milk Processing, Plant Economics of Frozen Food by IQF Technology, Plant Economics of Fruit Juice in Tetrapack, Plant Economics of Gram Dall/Pulse Mill, Plant Economics of Green House/Poly House, Plant Economics of Mango Pulp, Plant Economics of Namkeens (Kurkure Type Snack Food), Plant Economics of Pineapple, Tomato, Fruit Juice and Other Products Bottling Plant, Plant Economics of Potato Chips with Nitrogen Packing (On Imported M/C), Plant Economics of Poultry and Hatchery Farming, Plant Economics of Protein From Soyabean, Plant Economics of Ready to Eat Foods in Tetra Packs, Plant Economics of Rice Sorting/Grading Plant, Plant Economics of Seeds Grading and processing, Plant Economics of Snack Food (Crax Size) (Roll and Ball Type), Suppliers of Plant and Equipments for Food Processing and Allied Industry.