FOOD SECTOR ROADMAP

DOST Food Safety Program

Integrated Food Safety R&D Program
- R&D to Support Risk Assessment in Philippine Food
- R&D in Support to Food Industry (Informal Sectors, Food Manufacturers, Food Service)
- R&D to Support Food Testing of Microbiological & Chemical Hazards
- Establishment of Food Safety R&D Hubs

Enhancement of Testing Capabilities on Food Safety
- Development and Implementation of systems and procedures for new food safety related parameters
- Integration and promotion of new food safety related parameters to customers under the OneLab network

DOST Human Resource Development Program on Food Safety
- Accreditation/Recognition of Trainers/Food Safety Teams and Harmonized Training Modules
- Training and Benchmarking for Food Safety Teams
- Local and International Linkages and Collaboration on Food Safety

Knowledge/Technology Transfer and Policy Advocacy Program on Food Safety
- Food Safety Technology Forum
- Translation of Food Safety R&D Results and S&T Activities into Policies
- Food Safety Awareness Training for MSMEs
- Strengthening of DOST Advocacy on Promotion of Food Safety

Research and Development
- Salmonella dipstick for selected food matrices
- Development of Dipstick for Salmonella Detection in Select Food Matrices
- Development of Food Safety Guidelines for Food Service Sector
- Development of Grading System for Food Establishments
- DOST Food Safety HRD
- OneLab (Food Safety component)

Laboratory Testing
- Integration and promotion of testing for food safety related parameters

POSSIBLE SOLUTIONS

P 50 M
- Harmonization of Food Safety Training Modules
- Development of Dipstick for Salmonella Detection in Select Food Matrices
- Development of Food Safety Guidelines for Food Service Sector
- Development of Grading System for Food Establishments
- DOST Food Safety HRD
- OneLab (Food Safety component)

P 150 M
- Prevalence studies (Heavy Metals, Pesticide Residue and Mycotoxin in Rice and Corn)
- Food safety risk profiling
- Pilot Total Diet Study
- Impact assessment of food safety trainings
- Accreditation of Food Safety Training providers

P 37 M
- Food Safety Web App
- Peanut butter standards development
- Knowledge Transfer of TQM to Food MSMEs

P 40 M
- Risk Profiling Center
- Development of ASEAN Harmonized Test Methods for Food Safety Parameters
- Food Safety Summit

VISION
Safe food for everyone, by everyone, through science, technology and innovation

2018
Research and Development
Salmonella dipstick for selected food matrices
Human Resource Development
DOST-Unified Food Safety Training modules
Laboratory Testing
Integration and promotion of testing for food safety related parameters

2019-2020
Research and Development
Survey results on farm and market practices of rice and corn farmers and retailers
Draft Food Safety Guidelines
Draft Grading system and Food inspection checklist for food establishments
Risk profiles on priority food hazard and commodity combinations
SOPs and protocols for conduct of TDS

Human Resource Development
Trained DOST Food Safety Teams

MILESTONES

P 50 M
- Harmonization of Food Safety Training Modules
- Development of Dipstick for Salmonella Detection in Select Food Matrices
- Development of Food Safety Guidelines for Food Service Sector
- Development of Grading System for Food Establishments
- DOST Food Safety HRD
- OneLab (Food Safety component)

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- Prevalence studies (Heavy Metals, Pesticide Residue and Mycotoxin in Rice and Corn)
- Food safety risk profiling
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- Accreditation of Food Safety Training providers

P 37 M
- Food Safety Web App
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- Knowledge Transfer of TQM to Food MSMEs

Problems/Concerns:
- Food-borne diseases
- Product detentions
- Inadequate technical support for MSMEs
- Knowledge gap on food safety of Philippine Food Supply
- Lack of science-based evidence for food safety policies and guidelines

OVERALL OUTCOMES
To provide food safety related services to meet customer satisfaction;
To develop and implement effective systems, processes and protocols on food safety
To develop and enhance human resource on food safety;
To develop and institute strategies and mechanisms to sustain the food safety program
## Integrated Food Safety Program

Safe food for everyone, by everyone, through science, technology, and innovation

### PARTICIPATION

DOST, DOST Regional Offices, DOST Research and Development Institutes, Department of Agriculture, Department of Health, Food and Drug Administration, Food and Development Center, Higher Education Institutions

### INPUTS

- Financial Support
- Staff/Personnel
- Research Facility
- Equipment

### ACTIVITIES

- R&D to support Risk assessment in Philippine Food Industry
- R&D in support to Food Industry (Informal Sector, Food Manufacturer, Food Service)
- R&D to Support Food Testing of Microbiological and Chemical Hazards
- Establishment of Food Safety R&D Hubs
- Enhancement of Testing Capabilities for Food Testing
- Human Resource Development
- Knowledge/Technology Transfer and Policy Advocacy

### OUTPUTS

- Scientific data on food safety risks for Philippine population
- Food safety related services developed, promoted, and provided to customers
- Food Safety Systems and protocols developed and implemented
- Stakeholders trained on various aspects of food safety management
- Food Safety R&D Hubs
- Harmonized Food Safety Training Modules
- Research Publications
- Policy Recommendations

### OUTCOMES

- Adoption of policy recommendations
- Development of new standards
- Increased compliance and implementation of food safety standards and regulations
- Increase in local and export market access of food products
- Reduced food wastage and improved productivity
- Harmonized Food Safety Training Modules
- Research Publications
- Policy Recommendations

### IMPACTS

- Improved food safety decision making process
- Reduced foodborne and waterborne illnesses
- Lower business risks and increased profitability
- Improved trade and competitiveness of food industries
- Increase in consumer confidence on food safety assurance
FOOD SECTOR ROADMAP

Food Innovation Program

SCOPE
Product Innovation
- Development of Intermediate Food Products/Ingredients
- Innovative Products Using Local Sources
- Utilization of Food Processing By-Products

Enabling Systems for Food Innovation
- Improvement of Competencies of Food Innovation Centers
- Bringing Products to Market, Operations Management, and Mechanisms for Sustainability
- New Food Processing Technologies for Local Industries
- Locally-developed Food Processing Equipment

Specific Industry or Regional Concerns
- Effect of iodization on salt processing and product characteristics
- Product diversification of Stevia for different food applications
- Development of process for extended shelf-life of lechon
- Development of community-based system for pasteurization and stabilization of milk
- Process improvement, optimization of fermentation, and development of packaging materials for wines
- Process Improvement for Local Industries (CRADLE)

40M
- Collagen and Gelatin from By-products of Fish Processing Industry
- Fish Oil, Proteases, and Hydrolysates from By-products of Fish Processing
- Pilot-Scale Production of Spray-Dried Powder Dextran and High Fructose Syrup using Whole Cell (Leuconostoc mesenteroides isolates) ITDI Fermentation Technology
- Development of Low Heat and Low Humidity (L2H2) Drying System for DOST Malnutrition Reduction Program (DOST-MRP) Facilities
- From Pest to Valued Commodity: Black-Chin Tilapia (Sparidae salmonaeon)
- Valorization of carabao’s milk produced in Western Visayas for the ‘new normal’

85M
- Development of Innovative Food Products from Colored Philippine Tubers and Root Crops through the UPLB-DOST Food Innovation Center
- PIC Concept to Launch Food Product Development Approach
- Thermal Processing of Selected Materials Using Agilized-Type Retorts
- Development of Mobile Modular Food Processing Facility (MMFFP) Development and Quality of Soysage using Okara
- Extension of Shelf-Life of Rice Meal in Microwaveable Container
- Production of Dietary Fiber using Sugarcane Bagasse from Raw Sugar Manufacturing
- Valorization of carabao’s milk produced in Western Visayas for the ‘new normal’

POSSIBLE SOLUTIONS
2018-2020
- Dextran and High Fructose Syrup from local sugarcane and coconut water
- Chitosan Powder
- LH2 Dryer Design and Prototype
- Sunmi from Black Chin Tilapia
- Optimized Tupig, Bukayo, Biningka
- Spray-dried egg white powder
- Raw material screening and washing protocols for salvaged eggs for value-adding processes
- Rolled out upgraded equipment to 18 Regional FICs

2021
- Colored sweet potato, yam, and taro flour (3)
- Fish Collagen and Gelatin
- Fish Oil, Proteases, and Hydrolysates
- Frozen Fish Loaf
- LH2 Dryer in DOST-FNRI and DOST-MRP Facility
- Stage-gate filter system for product development
- Mature Coconut Water Beverage Variants / Prototypes
- Enhanced capabilities of local experts on thermal validation
- Mature Coconut Water Beverage Variants / Prototypes

2022
- New stevia product variants
- Shelf-life stable lechon
- Specially bread and noodles, alcoholic and non-alcoholic beverages, yoghurt, and comminuted meat products made from sweet potato, yam, and taro flour
- Database of the relevant characteristics of colored Philippine tuber and root crops flour
- Thermally processed products with optimized thermal schedule and improved batch quality
- 2 Modules for Mobile Modular Food Processing Facility
- Soysage from Okara
- Rice Meal in microwaveable containers
- Sugarcane Bagasse Dietary Fiber
- Improved processing and production lines of industry partners
- Spray-dried carabao’s milk

VISION
Sustainable and globally competitive food products with FICs as the leading S&T Food Innovation Hubs

DIFFERENTIATION
Industry specific strategies to foster innovation and address the S&T requirements of the Philippine Food Sector

MILESTONES
- Need for improvement or innovation in technology
- Gaps on local manufacturer’s ability to consistently deliver the required level of quality and food safety.

Despite its continuous growth, the food processing sector’s full potential is hindered by:
- Low investments in research and development, technology transfer and upgrading
- Continued dependence on imported raw materials

70M
- Effect of iodization on salt processing and product characteristics
- Product diversification of Stevia for different food applications
- Development of process for extended shelf-life of lechon
- Development of community-based system for pasteurization and stabilization of milk
- Process improvement, optimization of fermentation, and development of packaging materials for wines
- Utilization and value-adding of coconut processing by-products
- Development and quality improvement for emerging coconut products (vinaigre, butter, aminos)
**FOOD SECTOR ROADMAP**

**DOST Halal Program**

**Research and Development**
- Processing, packaging and labeling
- Logistics and Marketing
- Halal Assurance System (HAS)
- Halal Traceability Framework

**HRD and Knowledge Transfer**
- Training modules for Halal Assurance System
- Curriculum Modules for Halal Shariah, Halal Science, Halal Food Production, Safety, Processing and Hygiene, Halal Logistics and Marketing, and Halal Banking and Finance
- Small Enterprise Technology Upgrading Program (SETUP) – Innovation Fund (#Fund) Support for Halal MSMEs
- Advocacy/Information drive campaign on the S&T Halal
- Halal Knowledge Center

**Enhancement of Halal Verification Capabilities in Support to Halal Assurance Systems**
- Halal Verification (HVL)
- Promotion and marketing of HVL services
- Testing of raw materials, food products, non-food products for alcohol content, presence of porcine, pesticide and drug residues, heavy metals, nutritional content, etc.

**POSSIBLE SOLUTIONS**

**2021**

- 121M
  - Banana products (banana chips, banana catsup, and frozen banana)
  - Bakery products (pandesal and loaf bread)
  - Halal native delicacies (jah, baulo, and pyuto)
  - Regional Muslim delicacies (linapayan, kumukunsi, suman, pastil and tipas)
  - Emulsified meat products (sausage, nuggets, and burgers)
  - Technical guidelines (chicken and chicken by-products)
  - Training Need Assessment
  - Curriculum Development
  - Competency Building

- 14M
  - Blockchain of Halal-and-Tayeb Cacao Products
  - HAS Dehydrated Fruits, Vegetables, and Rootcrops
  - HAS Food Ingredients

**2022**

- 35M
  - Halal Knowledge Transfer
  - Halal Tourism

**Research and Development**
- HAS Manual of Dried and Powdered Onion, Garlic, Black Pepper, and Chili
- Halal-compliant of Processed Dried and Powdered Onion, Garlic, Black Pepper, and Chili
- Halal-compliant of Processed Dried Mango, Coconut, Pineapple, Carrots, Malunggay, Cassava, Sweet Potato, and Ube
- MOA/MOU with industry partners
- Improved ITDI Halal dedicated processing partners
- Developed Halal Transparent Tracking System
- Cacao Product Traceability Protocol

**HRD and Knowledge Transfer**
- IP-copyright of the 3 modules
- Trainer’s training of DOST FST on the 3 modules
- Online database on Halal for the public
- Implementation of Certificate Course on Halal in 3 SUCs (USM, SKSU, and CMU)

**Halal Laboratories**
- Expanded Halal laboratory testing scope
- Method validation of Halal and toyibban test (porcine, meat authenticity, alcohol, pesticide, and fatty acid profiling)
- Performed actual analysis of samples using internationally recognized methods
- Conducted IQA to include HVL methods and procedures
- Participated to relevant PT programs
- Sustained ISO 17025 accreditation for DOST 4A and 11 and acquired for BARMM and DOST 12
- Harmonized testing fees on the new methods

**Competitive Philippine Halal industries**

**MILESTONES**

- Developed HAS Manual for 16 food and 4 cosmetics/toiletries Halal-compliant products
- ITDI R&D Facility for Halal Food Processing
- Developed Halal Training Needs Assessment
- Conducted Halal Training Needs Assessment
- 28 DOST personnel, 3 PHISGOC trained as trainers on Halal-HACCP: 41 industry and PHISGOC personnel trained
- 1 Certificate Course on Halal (Halal Principles and Concepts, Halal Food Production, and Halal Food Processing)
- 3 Training Modules on Halal Concepts and Principles, Halal Assurance System, and Halal Management System
- DOST 4A and 11 accredited to ISO 17025:2017 offering the following services under OneLab (porcine DNA detection by RT-PCR and ethanol determination by GC-FID)
- 3 Muslim chemists trained on the laboratory management system, operation of specialized equipment, actual chemical analyses

Develop and implement a DOST-wide R&D agenda and program in response to RA No. 10817 to enhance the competitiveness of the Halal export industry in the Philippines.