

Traceability

Key to Safety, Quality and Productivity

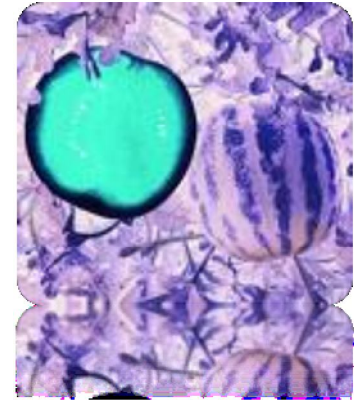
Khairuddin Md Tahir & Audrey Yong

**International Seminar on Consumer Trends &
Export of Tropical & Subtropical Fruits
15 July 2008**

Agenda

1. Definitions
2. Traceability Drivers
3. Food Supply Chain
4. Traceability Systems
5. Technologies Applied
6. Food Safety Incidences
7. Quality & Grading
8. M-FIT Project
9. Summary





1. Definitions

Traceability

EU General Food Law

“The ability to trace and follow a food, feed, food-producing animal or substance intended to be, or expected to be incorporated into a food or feed, through all stages of production, processing and distribution.”

Source: (EC) 178/2002, Art 18

ISO22005:2007

“The ability to follow the movement of a feed or food through specified stage(s) of production, processing and distribution.”

Source: ISO 22005:2007 (First Edition)

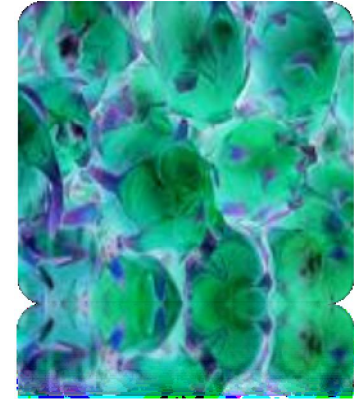
ISO9001:2000

“The ability to trace the history, application or location of that which is under consideration

Traceability can relate to

- the origin of materials and parts,
- the processing history, and
- the distribution and location of the product after delivery.

Source: ISO 9001:2000 (Third Edition)



2. Traceability Drive

In Food Sector

Traceability Drivers

Commercial Requirements & Market Access

- GlobalGap, British Retail Consortium – Global Food Standard (BRC), Safe Quality Food (SQF) and International Food Safety (IFS) etc

Food Safety & Quality

- ISO22000:2005 (Food Safety Management System) and ISO22005:2007 (Traceability in the Feed & Food Chain)
- Target Recall and Product Withdrawal

Legislation

- EU General Food Law 2002 and US Bioterrorism Act 2002

Traceability Drivers

Competitive Advantages

- Brand Differentiation and Product Differentiation

Productivity

- Optimize Production, Improve Efficiency and Increase Profitability

Environment Sustainability

- Round Table Sustainable Palm Oil Principle & Criteria, GlobalGap and Organic Farming Certification

Energy & Resource Use

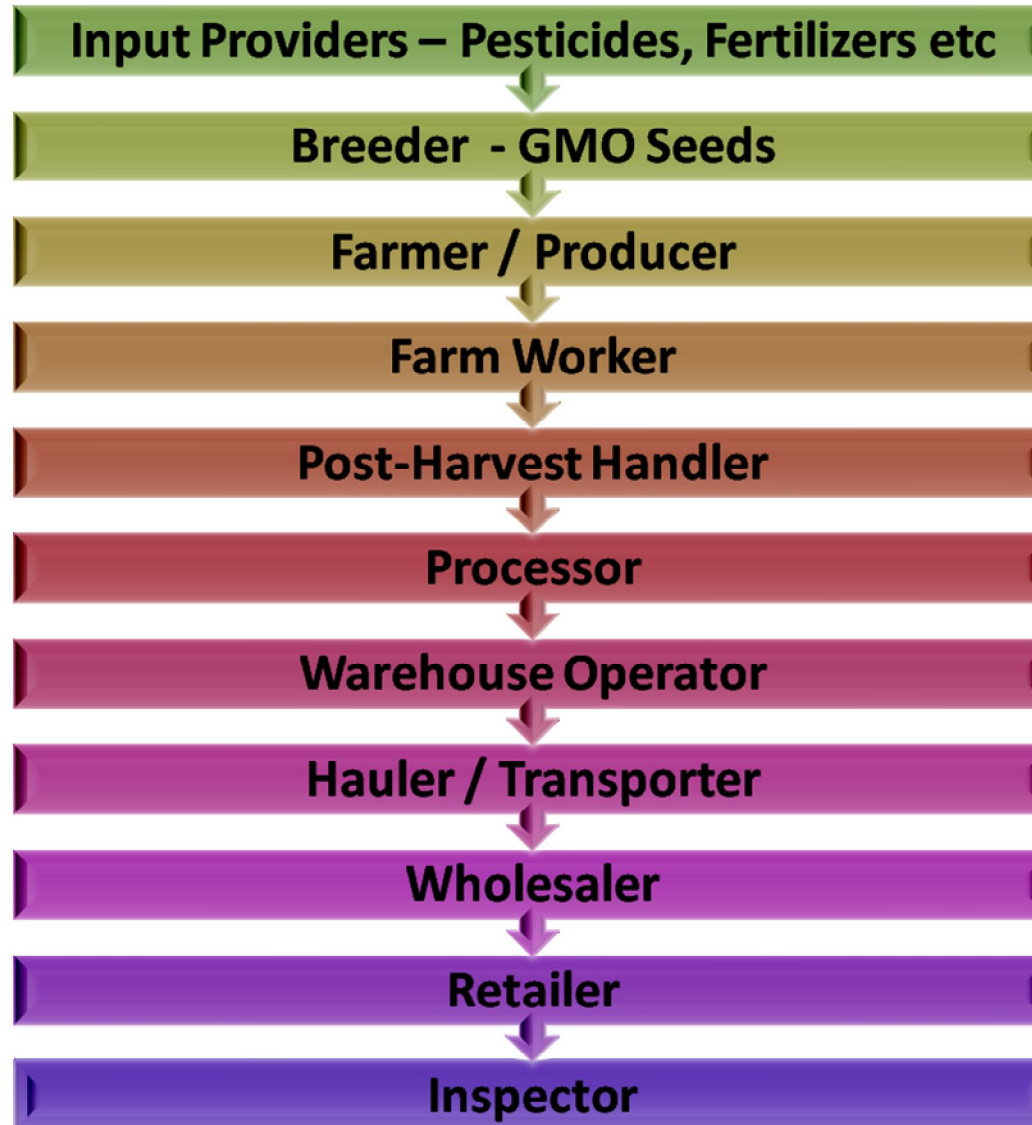
- Ecological / Carbon Footprint, Food Miles, and Green House Gas Reduction

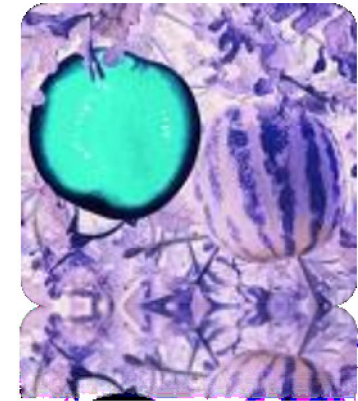


3. Food Supply Chain

Tropical Fruits

Tropical Fruit Sector





4. Traceability System

Worldwide

EU Trace Project

<http://www.trace.eu.org/menu/project/>



Tracing the origin of food



Home

About TRACE

Contact us

Sitemap

- Work Programme
- TRACE partners
- TRACE results
- Horizontal issues
- Advisory board
- Events
- Publications
- Press releases
- Intranet
- News admin
- TRACE brochures
- TRACE video

TRACE: delivering integrated traceability systems that will enhance consumer confidence in the authenticity of food

TRACE aims to improve the health and well-being of European citizens by delivering improved traceability of food products.

The 5 year project sponsored by the European Commission will provide consumers with added confidence in the authenticity of European food through complete traceability along entire fork to farm food chains. **TRACE** will develop cost effective analytical methods integrated within sector-specific and -generic traceability systems that will enable the determination and the objective verification of the origin of food. It will focus firstly on mineral water, cereals, honey, meat and chicken but will have wider applicability to other commodities.



Overview - Trace

Aim

- To improve the health and well-being of European citizens by delivering improved traceability of food products

Project Timeline

- 5 years project sponsored by the European Commission (2005 – 2009)

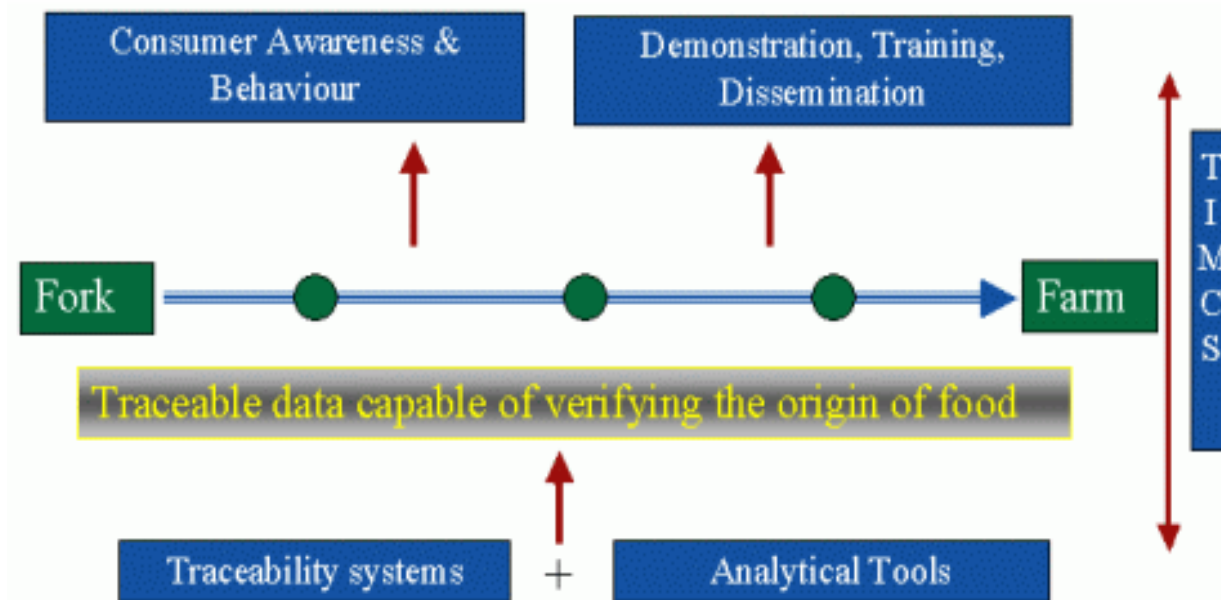
Sectors

- Mineral Water, Cereals, Honey, Meat, and Chicken



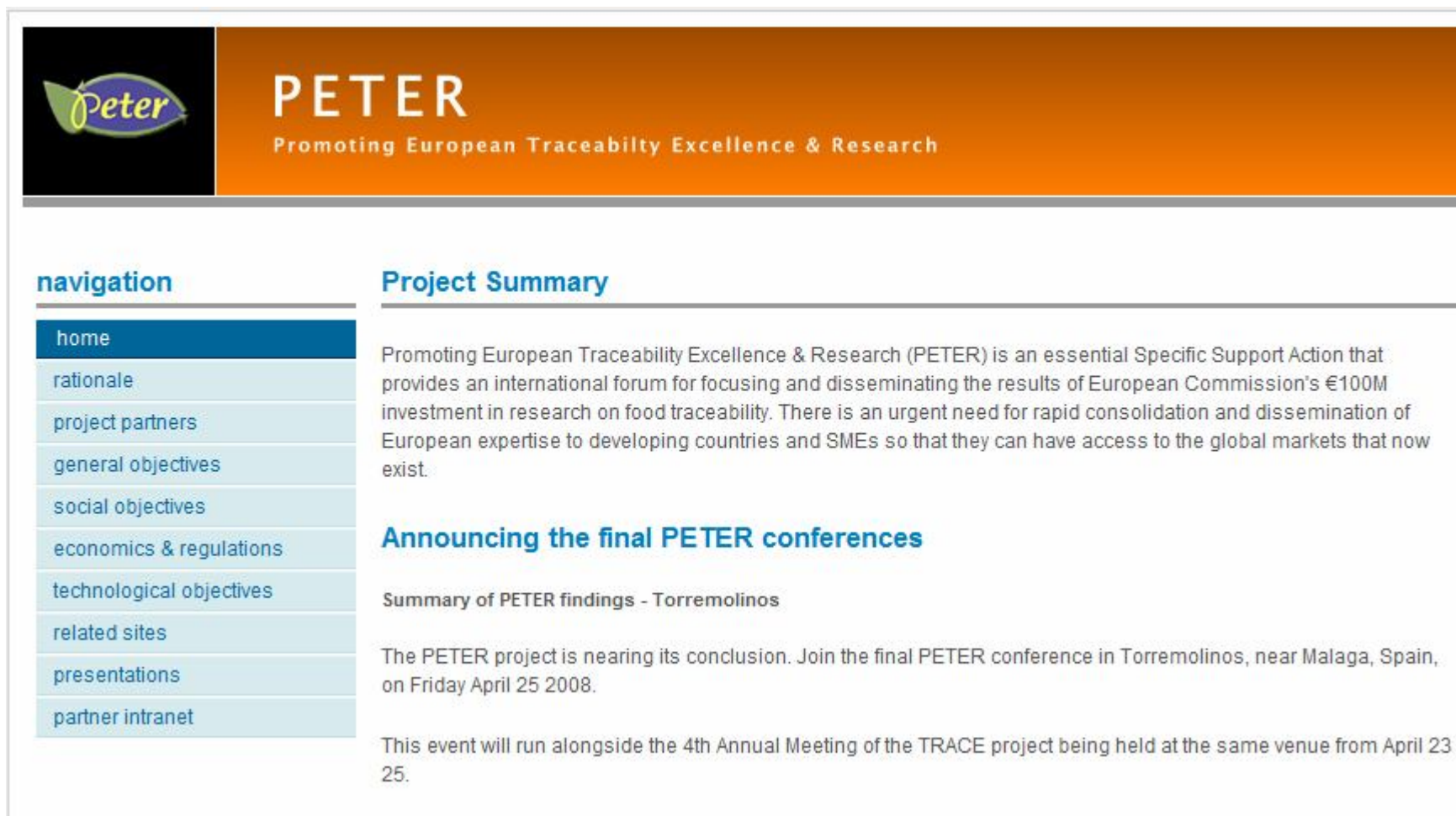
Trace Working Groups

- Analytical Tools Group
- Traceability System Group
- Consumer Behavior & Awareness Group
- Technology Transfer Group
- Management & Communication Group



PETER Project

<http://www.eu-peter.org/>



PETER
Promoting European Traceability Excellence & Research

navigation

- home
- rationale
- project partners
- general objectives
- social objectives
- economics & regulations
- technological objectives
- related sites
- presentations
- partner intranet

Project Summary

Promoting European Traceability Excellence & Research (PETER) is an essential Specific Support Action that provides an international forum for focusing and disseminating the results of European Commission's €100M investment in research on food traceability. There is an urgent need for rapid consolidation and dissemination of European expertise to developing countries and SMEs so that they can have access to the global markets that now exist.

Announcing the final PETER conferences

Summary of PETER findings - Torremolinos

The PETER project is nearing its conclusion. Join the final PETER conference in Torremolinos, near Malaga, Spain, on Friday April 25 2008.

This event will run alongside the 4th Annual Meeting of the TRACE project being held at the same venue from April 23 - 25.

Overview - PETER

Aims

- Promoting European Traceability Excellence & Research (PETER) is to provide an international forum for focussing and disseminating the results of European research on traceability
- Facilitate global trade by developing harmonised traceability practices

Project Timeline

- 2 years EC Specific Support Action project commencing in April 2006

Key Projects

- Co-Extra
- TRACE
- SEAFOODPlus
- FoodTrace
- GTIS CAP
- GeoTraceAgri
- DNA-TRACK
- ALCUEFOOD
- Oliv-TRACK



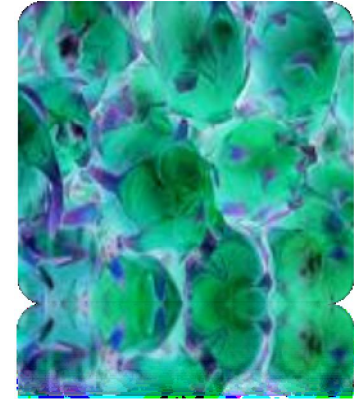
GTIS-CAP

Specific Support Action
Contract n° 006468 (SSPE)



Gers Chamber of
Commerce and
Industry geomatics
technology centre
website





5. Technologies Appl

Traceability

Bar Coding

- Barcodes are widely used to implement Auto ID Data Capture (AIDC) systems that improve the speed and accuracy of computer data entry



QR-Code



DataMatrix



Cool-Data-Matrix



Aztec



000133



Code 128



Trillcode



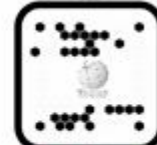
Quickmark



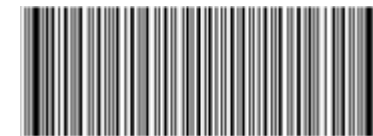
Shotcode



mCode



Beetagg



Code 93

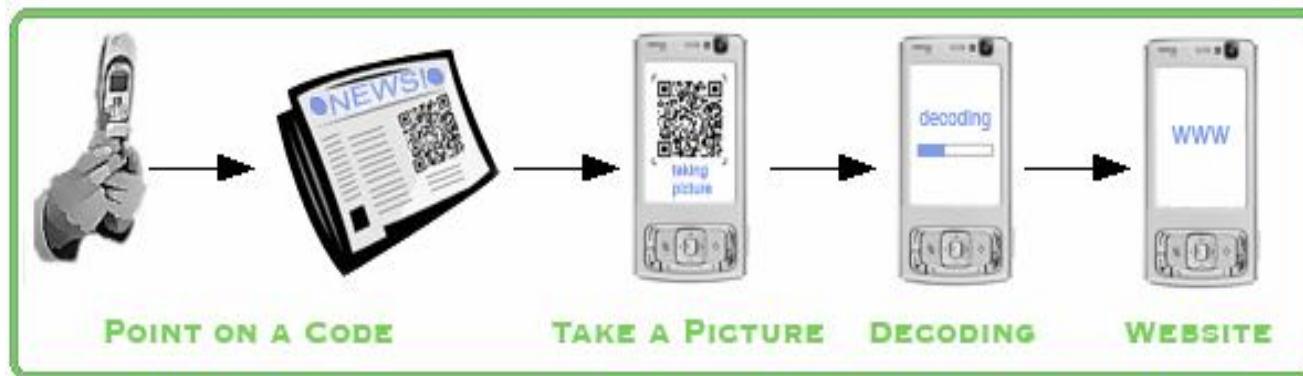
QR Code / 3D Barcode

1D Barcode

Source: Wikipedia

Mobile Tagging

- Reading out a 2D- or 3D-barcode by using a camera in a mobile device



Source: Wikipedia

Genetic Marker

- A genetic marker is a known DNA sequence
- A genetic marker may be a short DNA sequence
- A single base-pair change (single nucleotide polymorphism) or a long one, like mini satellites

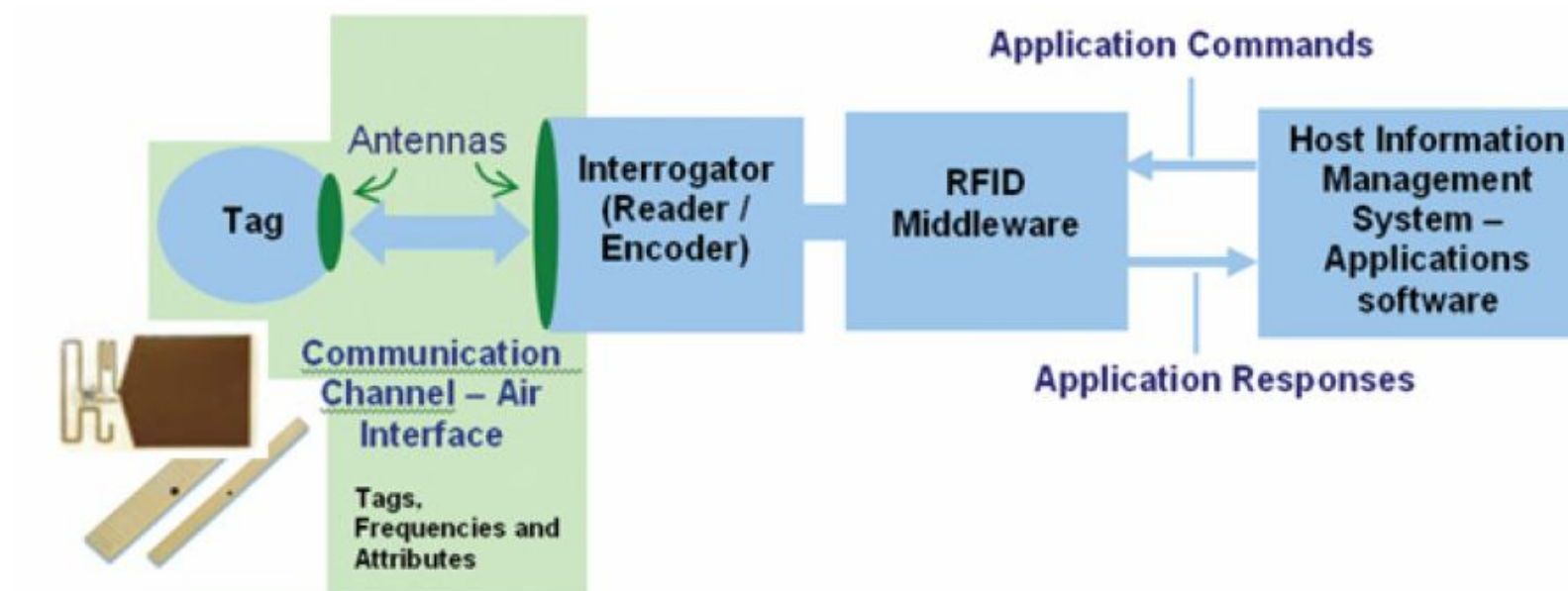
Some commonly used types of genetic markers are:

- [RFLP](#) (or Restriction Fragment Length Polymorphism)
- [AFLP](#) (or Amplified Fragment Length Polymorphism)
- [RAPD](#) (or Random Amplification of Polymorphic DNA)
- [VNTR](#) (or Variable Number of Tandem Repeat)
- [Microsatellite](#) Polymorphism
- [SNP](#) (or Single Nucleotide Polymorphism)
- [STR](#) (or Short Tandem Repeat)
- [SFP](#) (or Single Feature Polymorphism)

Source: Wikipedia

RFID

- RFID = Radio Frequency Identification
- Practical solutions include Tags, Reader(s), RFID Middleware and Back-end application solution



Animal Tracking



Industry initiative

- A CCIA tag is applied to the ear prior to leaving the farm of origin
- Established 2001, enforcement from 2002
- 6 different tags from 5 different vendors have been qualified



Mandatory RFID tagging

- All tags have visual and electronic unique identification number
- The unique number is maintained until the point of export of carcass inspection where animal is either accepted for consumption or condemned

Fine Wine

The logo for ePROVENANCE features a stylized purple 'e' and 'P' above a cluster of white circles representing grapes. Below this, the word 'ePROVENANCE' is written in a white, serif font.

ePROVENANCE



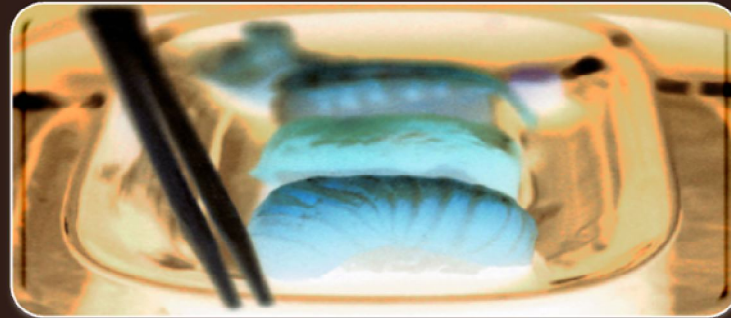
RFID tag embedded in
wine bottle

- Temperature logged 3x per day
- Internet-enabled data base for authentication

Objectives

- Ensure deviation from suitable environmental conditions can be tracked
- Anti-counterfeit

Conveyor Belt Sushi



Traditional operation

- Colour coded plates indicates different price level
- Plates bar coded to verify time on belt for food safety purposes

RFID enhanced operation

- Content, time when dish was made and placed on the plate recorded for every plate
- Provide accurate real-time inventory information to chefs
- Less waste
- More accurate for billing purposes

Wal-Mart Initiative

The Wal-Mart logo, featuring the words "WAL-MART" in blue, bold, sans-serif capital letters with a white star between the two words, set against a white rectangular background.

Ambitious initiative

- Launched 2003
- Required top 100 suppliers to label pallets and cases from 2005 onwards
- RFID enabled 12 of 130 distribution centers by 2006

Status

- 600 of 60,000 suppliers are participating
- 600 of 4000 shops RFID enabled (2006)
- Main issues reported: cost of readers, tags and systems and readability for products containing metal, liquids and frozen food
- Refocused on RFID enabling stores instead of distribution centers



6. Food Safety Incidents

Worldwide

Food Safety Incidence

Media has reported many food safety outbreaks in the last 5 years

Contaminants	Food / Category	Country Affected	Year
Dioxin	Mozzarella Cheese	Italy	2008
Methamidophos (Insecticide)	Chinese Dumplings	Japan	2008
Melamine (Pesticide)	Wheat Protein	USA	2007
Salmonella	Chocolate	UK, Ireland	2006
Sudan I (Food Colouring)	Sauce	UK, Canada	2005
Bird Flu (H5N1)	Poultry	Asia	2003

EU RASFF



Rapid Alert System for Food & Feed (RASFF)

- It is a network
- Notification of direct or indirect risks to human health
- Deriving from food and feed
- Including Pet Food

Notification Types



alert notifications

Alert notifications are sent when the food or feed presenting the risk is on the market and when rapid action is required. Alerts are triggered by the Member State that detects the problem and that has initiated the relevant measures, such as withdrawal/recall. The notification aims at giving all the members of the network the information to verify whether the concerned product is on their market, so that they also can take the necessary measures.



information notifications

Information notifications concern a food or feed for which a risk has been identified, but for which the other members of the network do not have to take rapid action, because the product has not reached their market. These notifications mostly concern food and feed consignments that have been tested and rejected at the external borders of the EU.



news notifications

Any type of information related to the safety of food or feed which has not been communicated by a Member State as an "alert" or an "information" notification, but which is judged interesting for the food/feed control authorities in the Member States, is classified and made available as a news notification.

Rejected Notifications 2006

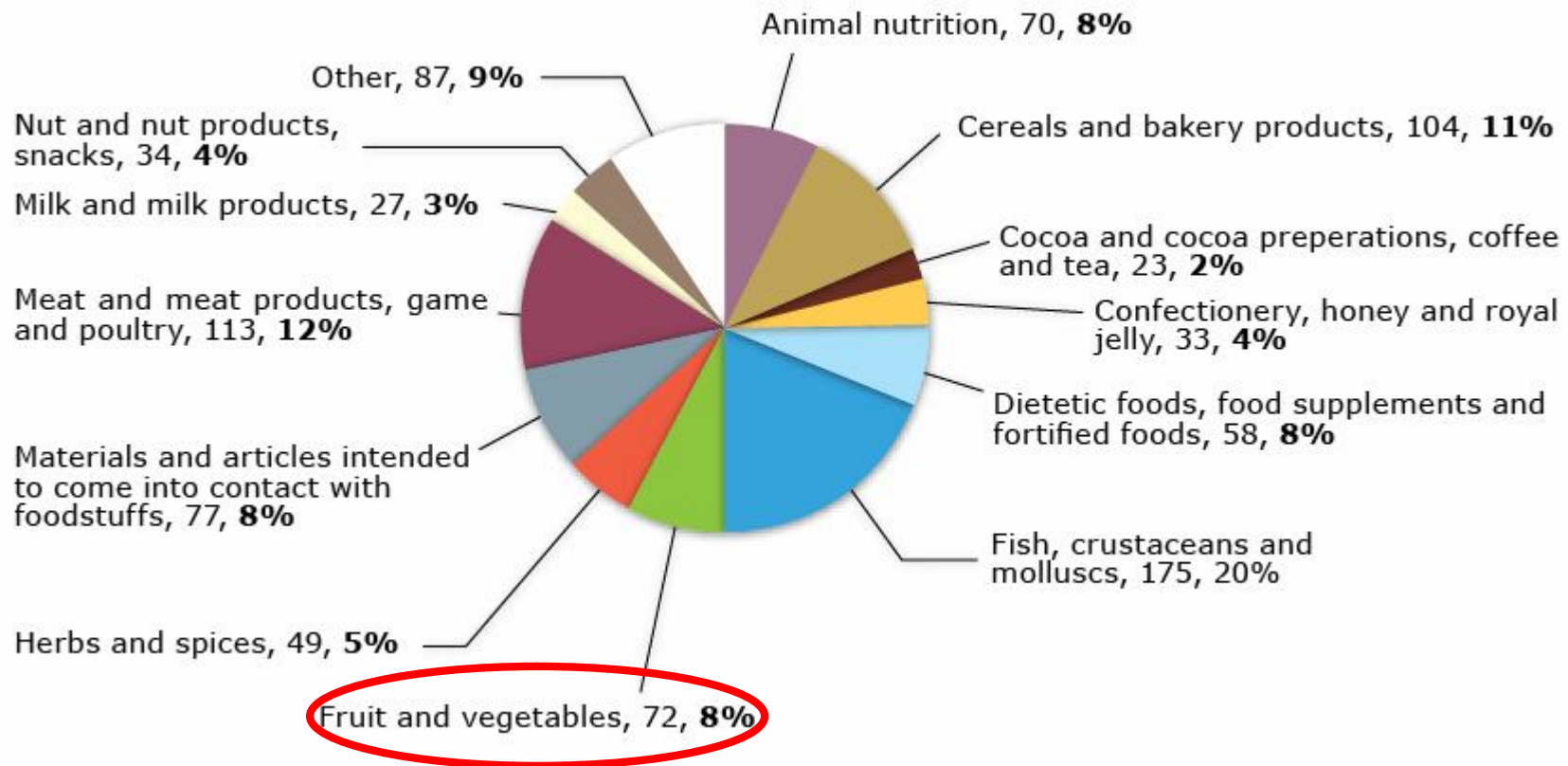
Type of hazards identified in the rejected notifications

adulteration	1
composition	1
food additives	4
GMO / novel food	1
heavy metals	1
labelling absent / incomplete / incorrect	12
microbiological contamination	12
migration	6
not determined / other	32
organoleptic changes	3
packaging defective / incorrect	3
pesticide residues	12
(potentially) pathogenic micro-organisms	47
residues of veterinary medicinal products	3
Total	139

Source: RASFF Report 2006

Alert Notifications 2006

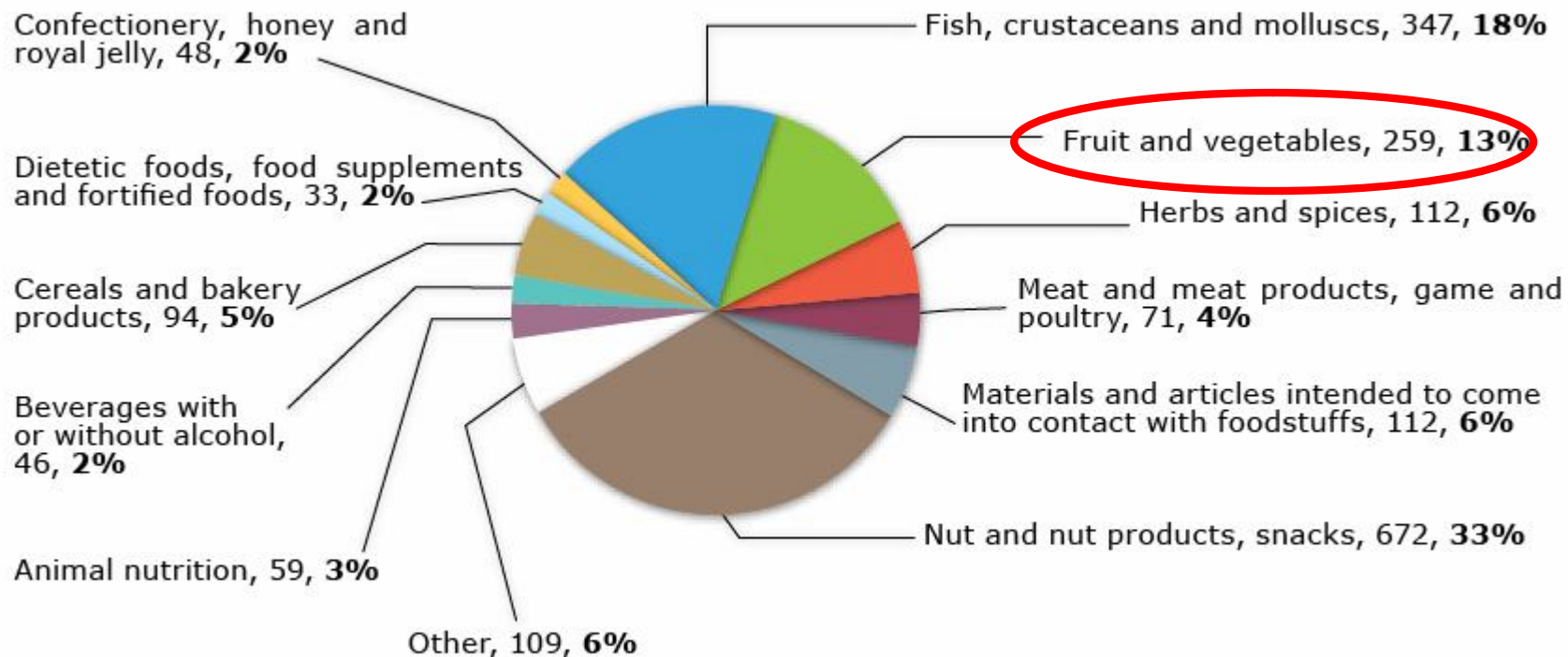
Alert Notifications by Product Category



Source: RASFF Report 2006

Information Notifications 2006

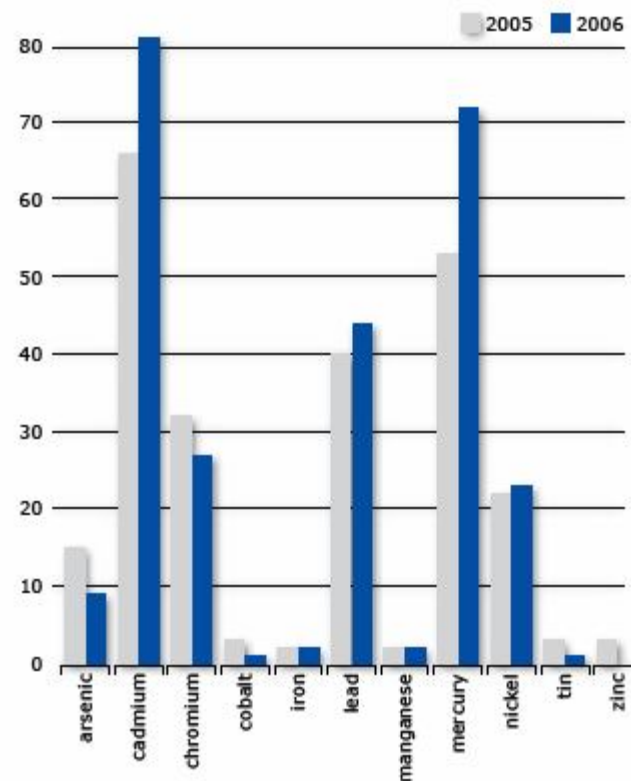
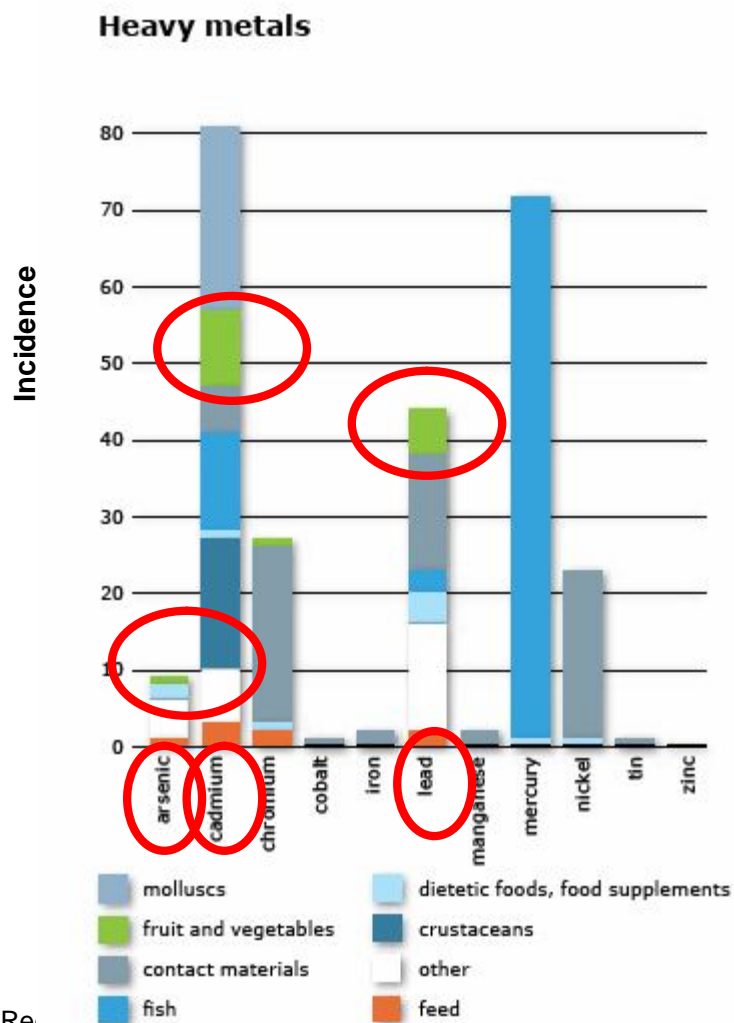
Information Notifications by Product Category



Source: RASFF Report 2006

Information Notifications 2006

Heavy Metal Notification



Source: RASFF Report 2006

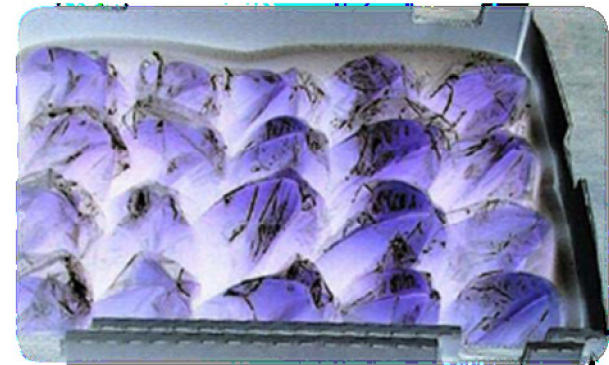


7. Quality & Grading

Starfruit

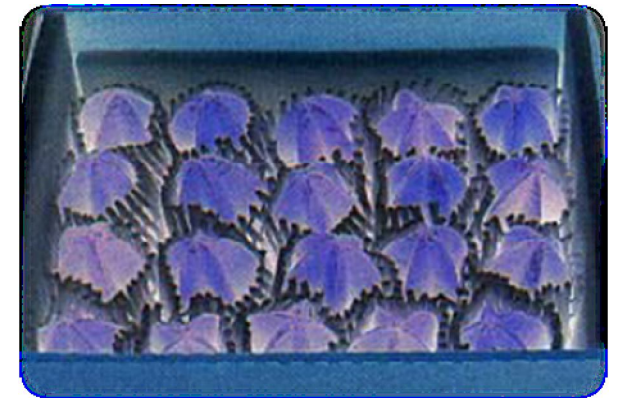
GAP to Preserve Quality

- Inspection at Farm
 - Remove fruit fly infested fruits
 - Discard damaged fruit
 - Post harvest cleaning in insect-proof facilities
- Transportation to Packing House
 - Insect-proof cold trucks
- Facilities at Packing House
 - Insect-proof storage facilities
 - Cold room



Post Harvest Handling

- Packaging
 - Individually wrapped with protective materials
 - Packing boxes with cushion
 - Air holes covered with plastic netting
- Storage Conditions
 - Sealed boxes
 - Storage temperature of 5 – 10°C
 - Relative humidity of 85 – 90%



STARFRUIT (Carambola) BOX NO. : []

TEMPERATURE: 6°C

INSPECTOR CODE: []

DATE OF INSPECTION: []

COLOUR INDEX

2	3	4	5
●			

COUNT: 18, 24, 30, 36

SIZE: L, M, S

WEIGHT: 3.5 KG, 1.8 KG

AIR SHIPMENT: []

SEA SHIPMENT: []

↑↑

Storage Temp & Storage Life

Type of Fruits	Storage Temperature	Storage Life
Yellow Fruits (25% on the skin)	20 – 30°C	1 – 3 weeks
	10 – 15°C	5 weeks
	5°C	9 weeks
Fruits with less than 25% yellow skin	-	Do not withstand long storage periods; prone to chilling injuries

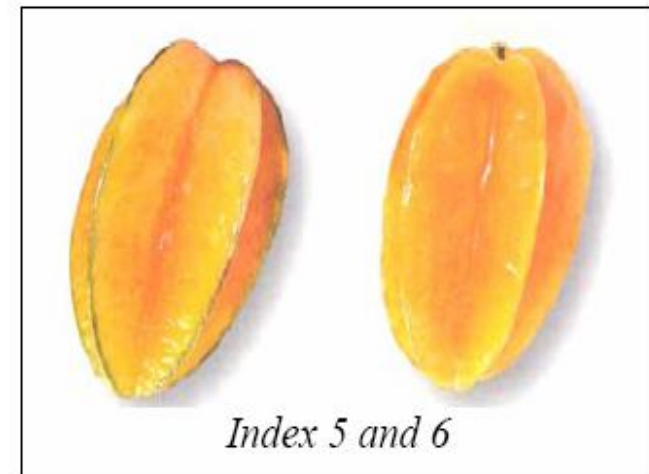
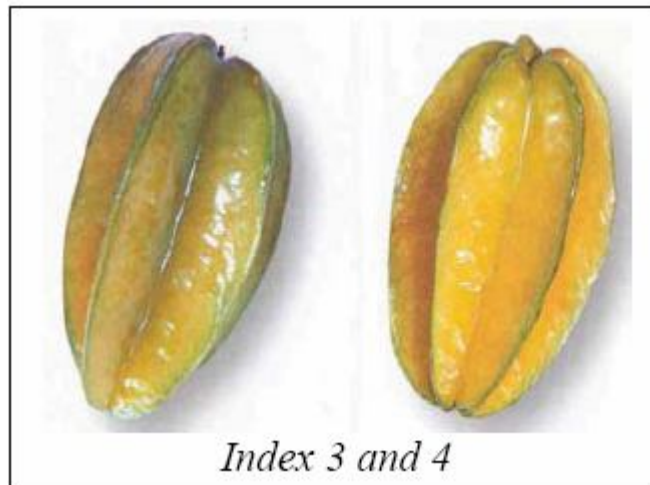
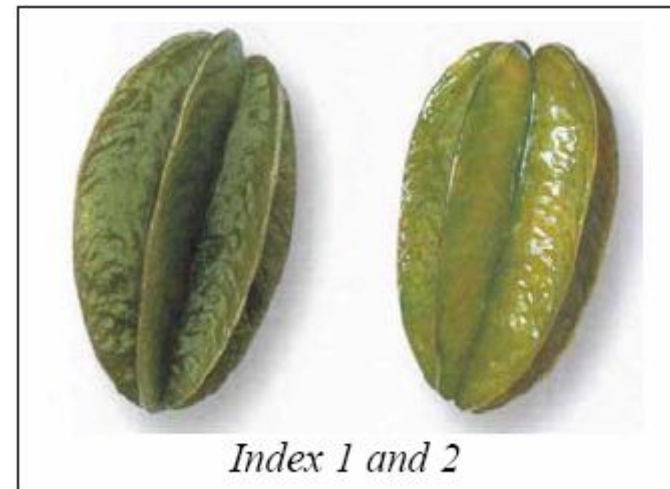
Grading of Starfruit

Grade	Specification	Range of Flexibility (Maximum)			
Premium	Fruits are collected from same cultivar, fresh and clean. Uniform size and maturity index and free from damages.	Maturity ≤ 3% Freshness ≤ 5% Damages ≤ 3% Abnormality ≤ 3% Size uniformity ≤ 5%			
1	Fruits are collected from same cultivar, fresh and clean. Uniform size and maturity index and slight or free from damages	Maturity ≤ 5% Freshness ≤ 5% Damages ≤ 5% Abnormality ≤ 3% Size uniformity ≤ 10%			
2	Fruits are collected from same cultivar, fresh and clean. Uniform size and maturity index and slightly damaged.	Maturity ≤ 10% Freshness ≤ 10% Damages ≤ 10% Abnormality ≤ 10% Size uniformity ≤ 10%			

Source: FAMA – standard specification and grading for carambola. MS 1127

Colour Index

Colour index	Indicator
1	The whole fruit is green
2	The fruit turns light green
3	The fruit turns to yellowish green
4	The fruit turns to greenish yellow
5	The whole fruit turns yellow
6	The whole fruit turns orange



Source: Federal Agricultural Marketing Authority (FAMA), Ministry of Agricultural Malaysia

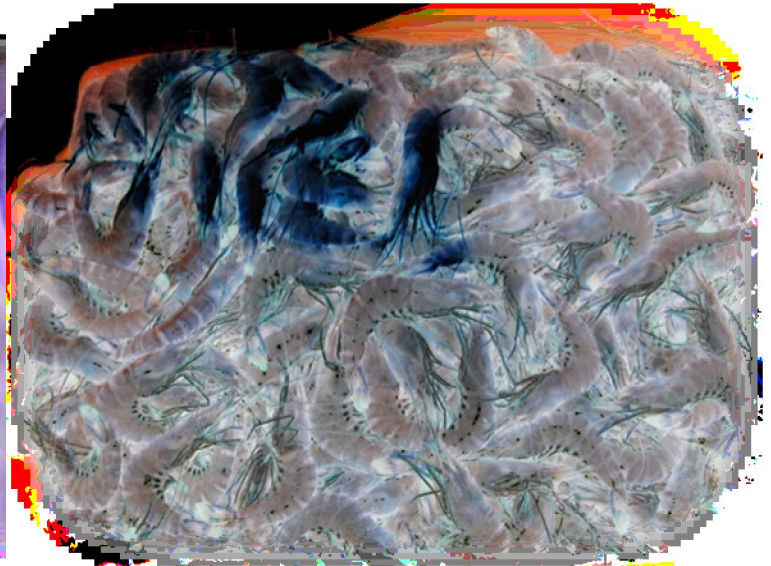


8. M-FIT Project

Malaysia Food Information &
Traceability (M-FIT)

M-FIT

Malaysia Food Information & Traceability
(M-FIT) Project covers Poultry, Starfruit
and Prawn.

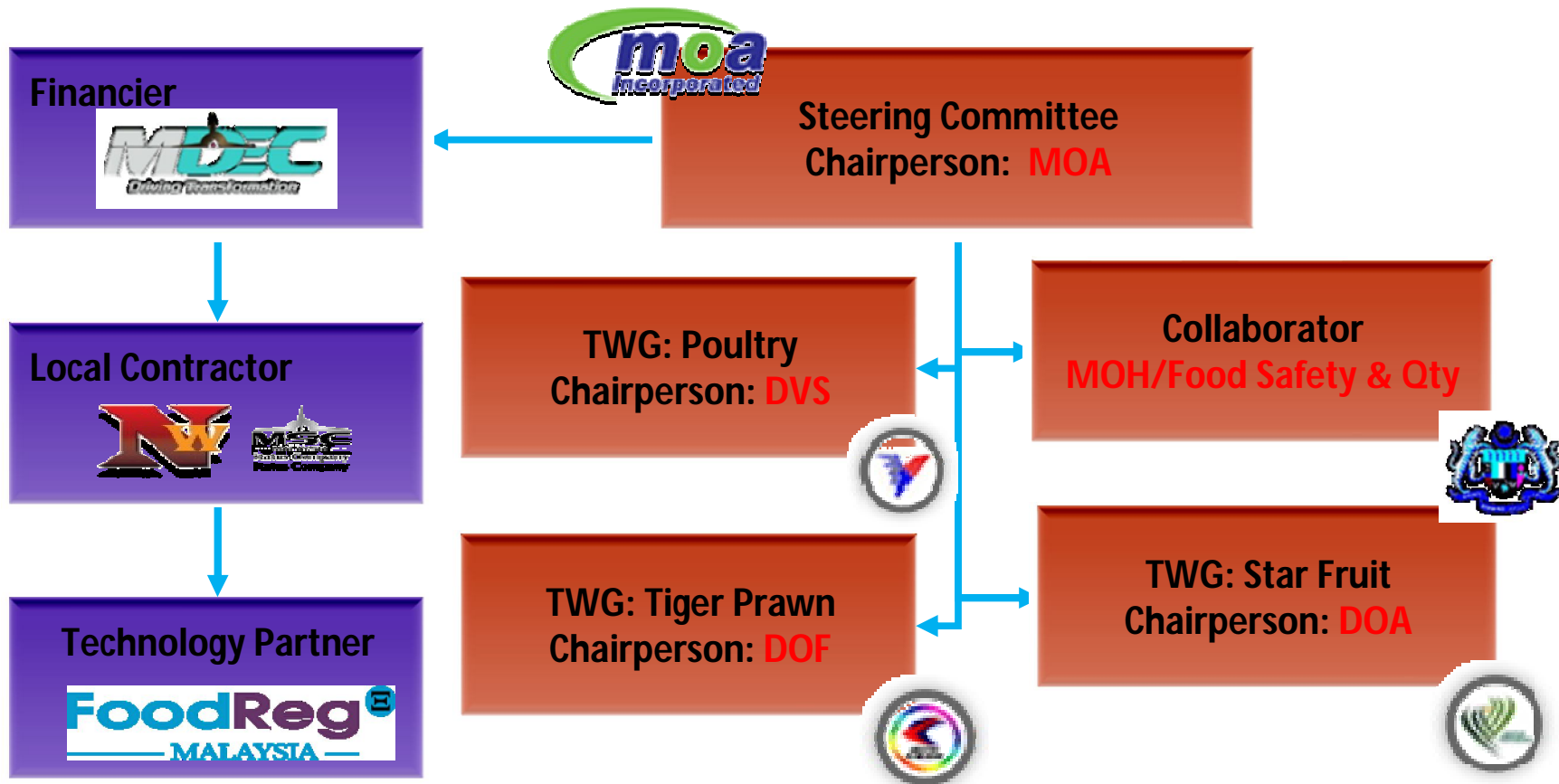


M-FIT Objectives

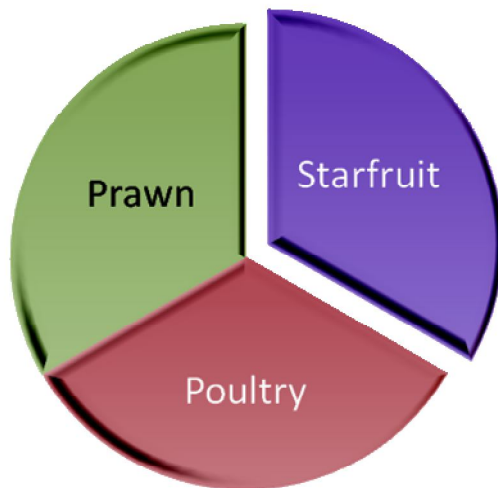
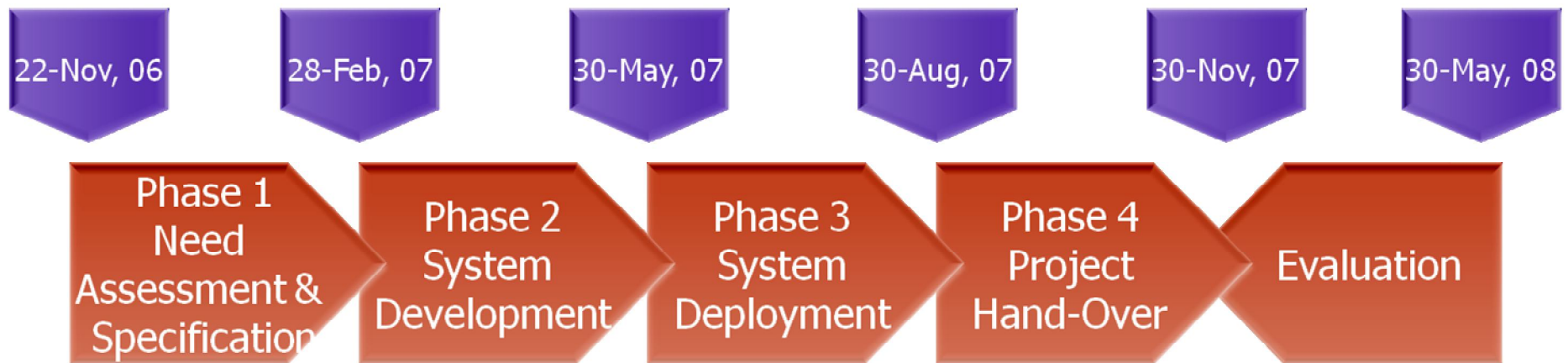
A Malaysian 'Information Hub' is an integrated database of the entire supply food chain, for domestic and export market leading to:

- **Better operations, food quality and information flow** from farmers to consumers
- **Compliance to national and international standards**
- Establishing Malaysia as a **source of high-quality and safe food products**

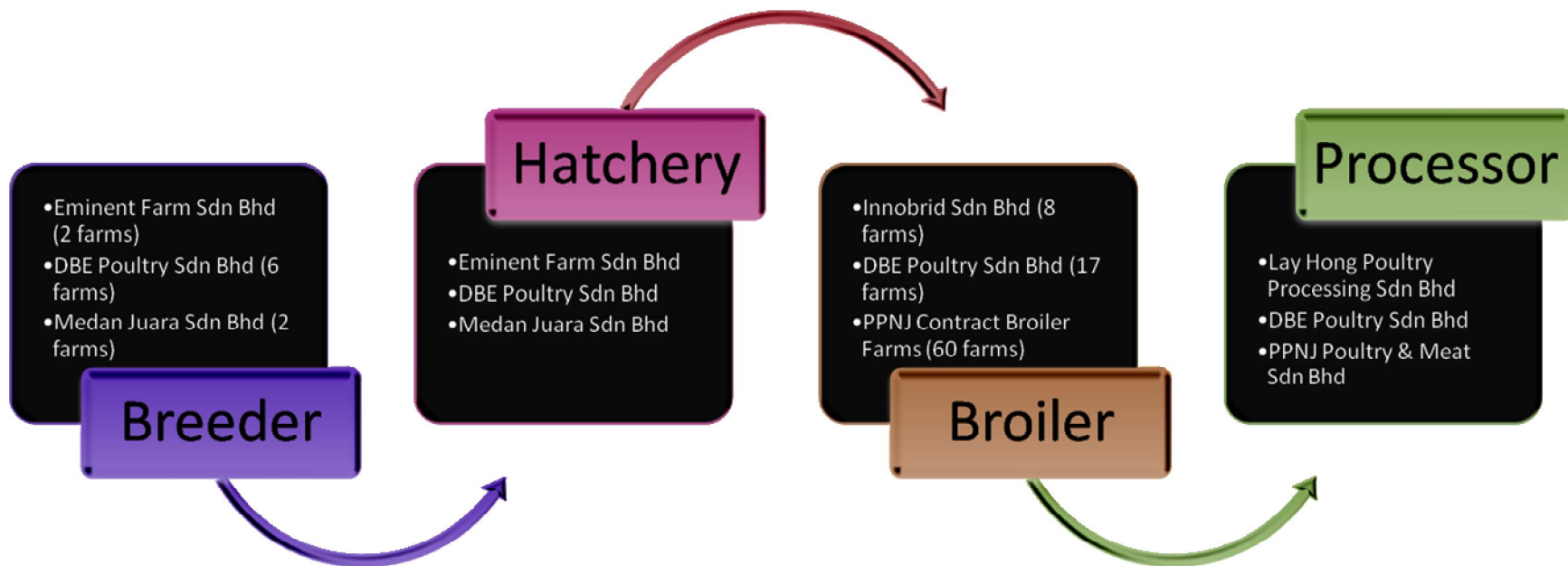
M-FIT Project Background



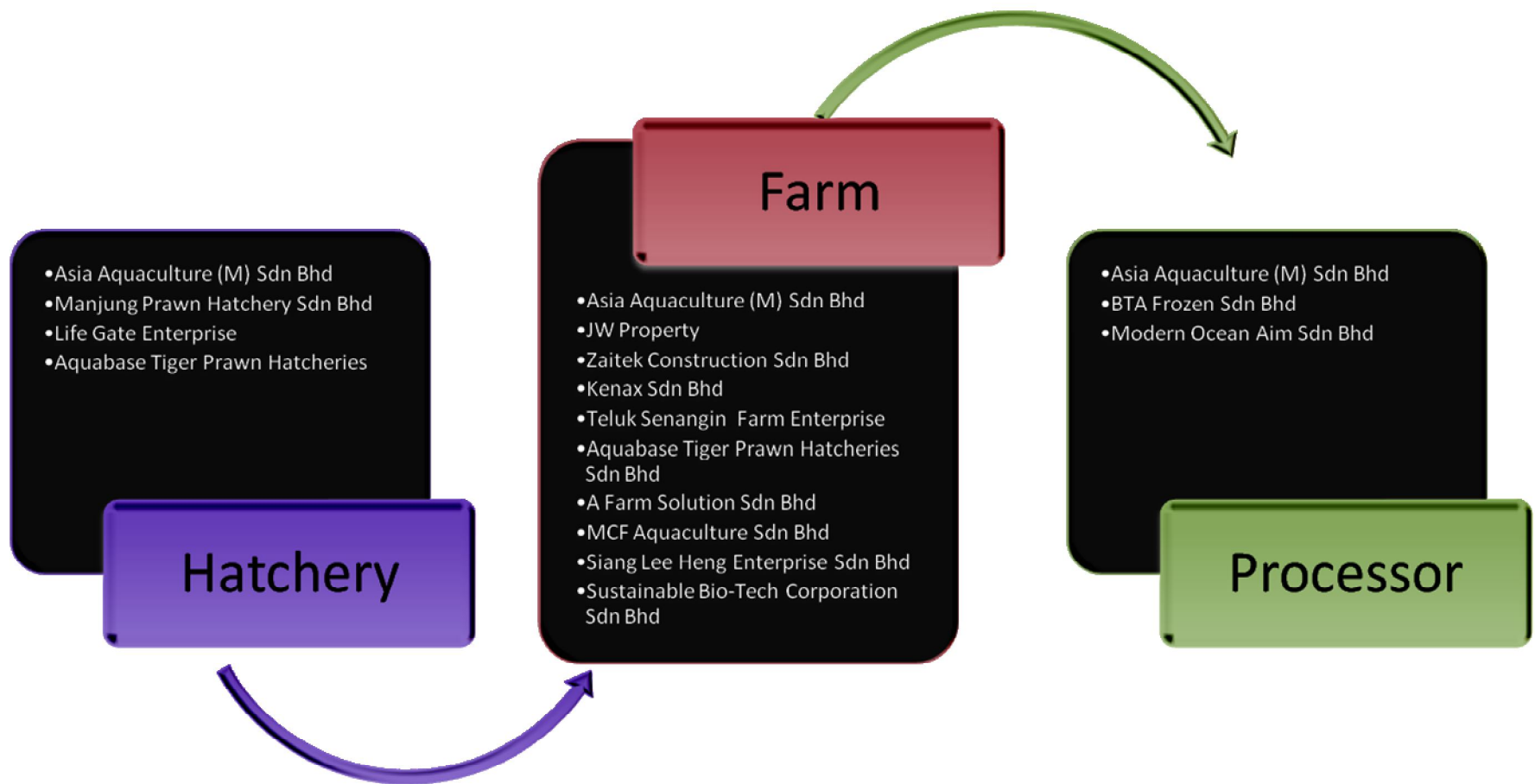
M-FIT Project Timeline



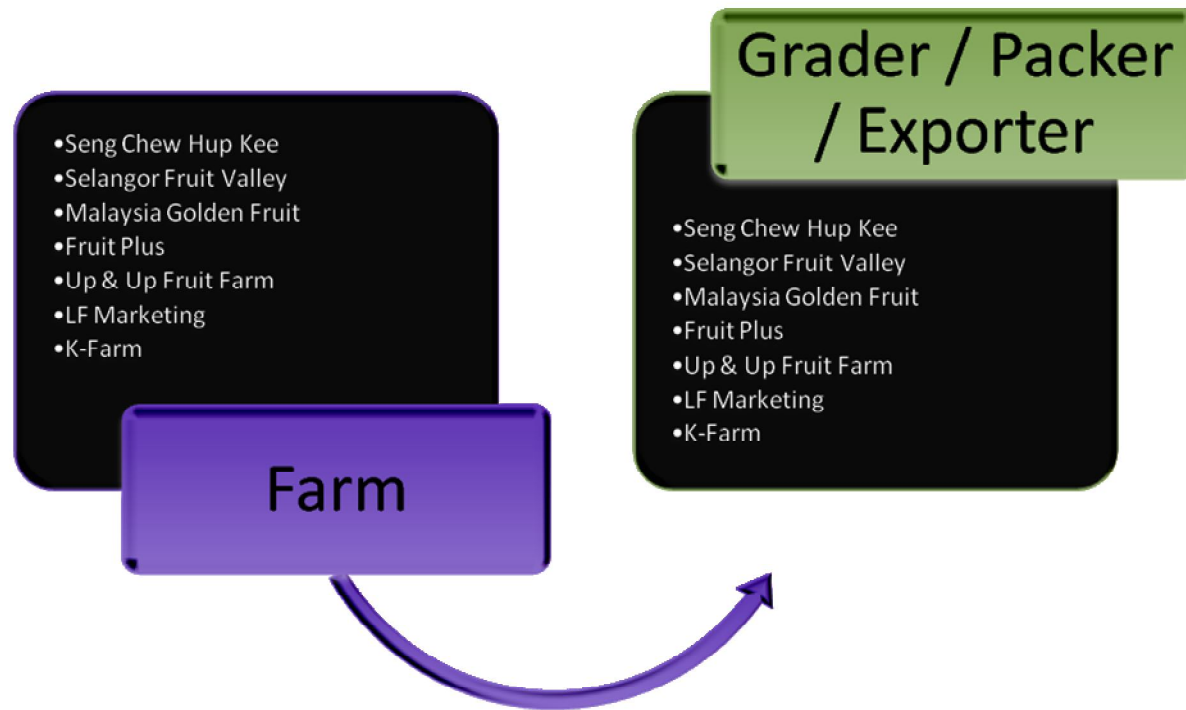
Poultry Sector



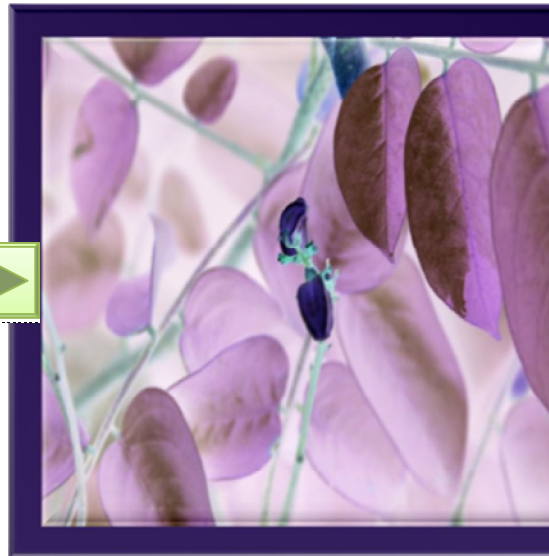
Prawn Sector



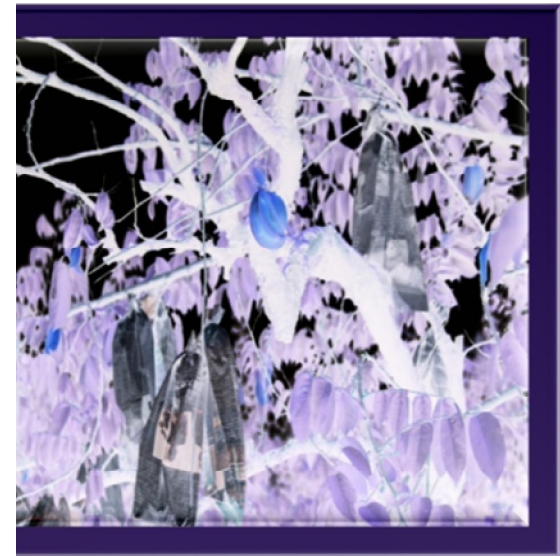
Starfruit Sector



Starfruit Farm



Starfruit Farm



M-FIT System - Farm

Processes	Tracepoints - Farm Activities
<input checked="" type="checkbox"/> Farm Activities ▶	SF Land Preparation
<input checked="" type="checkbox"/> All	SF Soil Fumigation (if applicable)
	SF Training of Farm Workers
	SF Planting
	SF Substrate sterilization (if applicable)
	SF Seed Treatment
	SF Receive
	SF Irrigation
	SF Cultural Practices
	SF Fertilization
	SF Pesticide Spraying
	SF Pest Surveillance
	SF Harvest
	SF Farm Waste Management
	SF Produce Analysis Sampling

Pesticide Spraying

The screenshot shows a web form titled "SF Pesticide Spraying". On the left, three purple callout boxes labeled "Block", "Pesticide", and "Quantity" have red arrows pointing to specific fields in the form. The form is organized into sections: "Date of action", "Where", "Crop", and "Pesticide data".

SF Pesticide Spraying	
Date of action	28-05-2008 10:34:42
Where	Block Sub-block
Crop	
Pesticide data	Type/brand of pesticide
	Pesticide received ID
	Target pest
	Quantity of pesticide
	Quantity of water (gallon)
	Area of application
	Spraying method
Equipment used	

Stock Management

FoodReg® Lookup FRID Search [Go to Developer Area](#)

Main menu General Data Reports System administration

Enter data Trace query execution **Stock management** Search by reference or tracepoint Search by critical limit

[Main menu](#)

Stock management

Product **Stock Level**

Tracepoint ▲▼×	Stock reference ▲▼×	Item reference ▲▼×	Date ▲▼×	Current measure	Actions
Received Product Stocking	Baja1		07-07-07 20:33:00	571	
Received Product Stocking	Racun2		06-07-07 20:03:00	58.8	

<< < > >> Go to page Rows per page Refresh Page 1 of 1

Reindex all stock

Productivity Monitoring

The screenshot shows the FoodReg Management Dashboard with the following data:

Management Dashboard (circled in red)

Total Inputs Per Fruiting Cycle

- Fertilizers
- Pesticides

Starting date: 01-01-2008 | Ending date: 31-03-2008

Total Outputs Per Fruiting Cycle

- Harvests
- Despaches

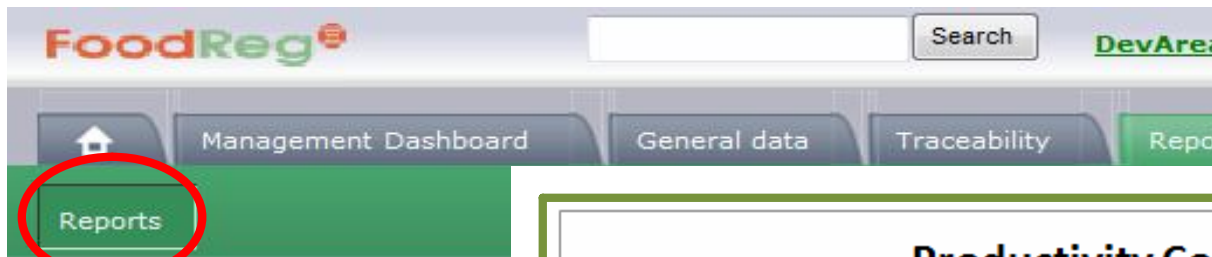
Fertilization	
Total Fertilizers	700 Kg

Pesticides Spraying	
Total Pesticides	500 L 200 Kg

Harvest	
Total Harvests	10000 Kg

Despatch	
Total Despaches	8000 Kg

Productivity Comparison



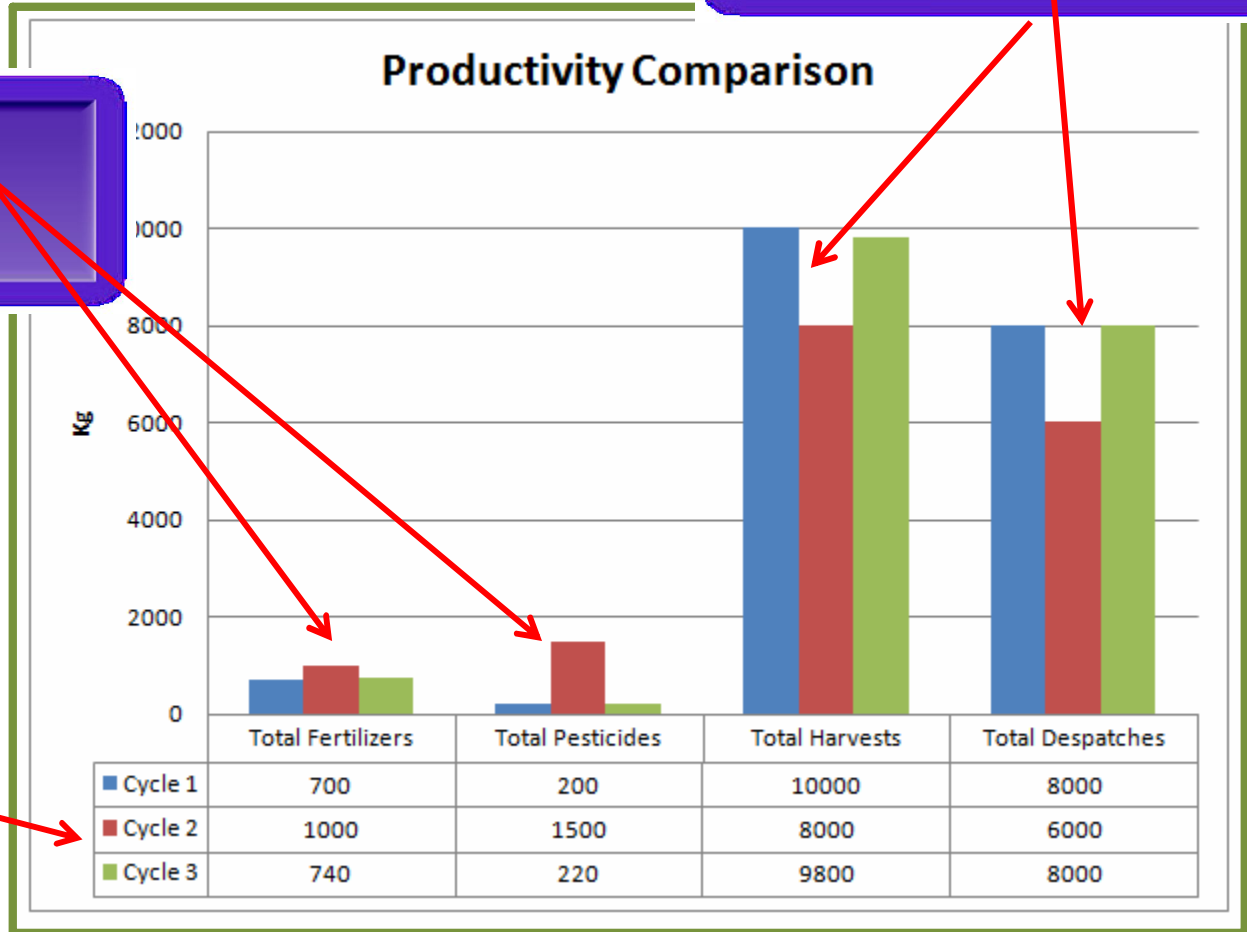
Comparison of Outputs

- Harvests
- Despatches

Comparison of Inputs

- Fertilizers
- Pesticides

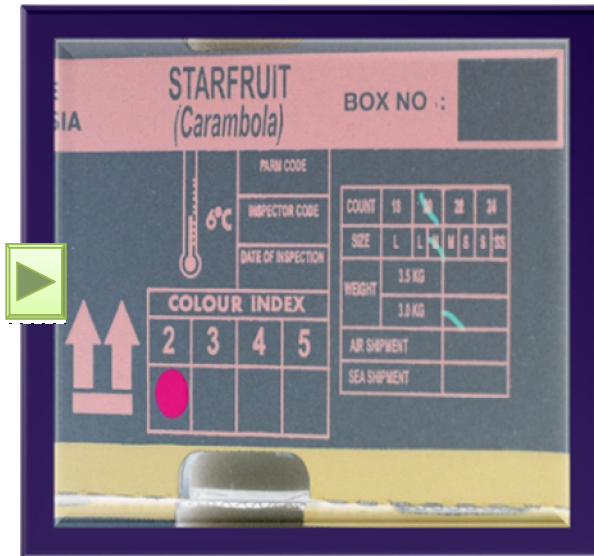
Fruiting Cycle



Mobile Data Entry



Grader/Packer/Exporter (GPE)



GPE Operations

The screenshot displays a software interface for GPE Operations. On the left, a sidebar menu titled 'Processes' is visible, with 'GPE Activities' selected and highlighted in yellow. Below it, 'All' is also listed. The main content area is titled 'Tracepoints - GPE Activities' and contains a list of seven tracepoint activities, each underlined:

- [SF GPE Receive](#)
- [SF GPE Post Harvest Treatment](#)
- [SF GPE Grading & Packing](#)
- [SF GPE Quality Inspection](#)
- [SF GPE Waste Management](#)
- [SF GPE Despatch](#)
- [SF GPE Phyto-Sanitary Inspection](#)


Grading & Packing



Delivery ID




Brand


Grade





SF GPE Grading & Packing



Date of action  28-05-2008 10:42:58


Input  Delivery ID or Collection ID 

Produce   


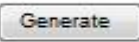

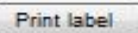



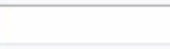





Quantity  

Brand    

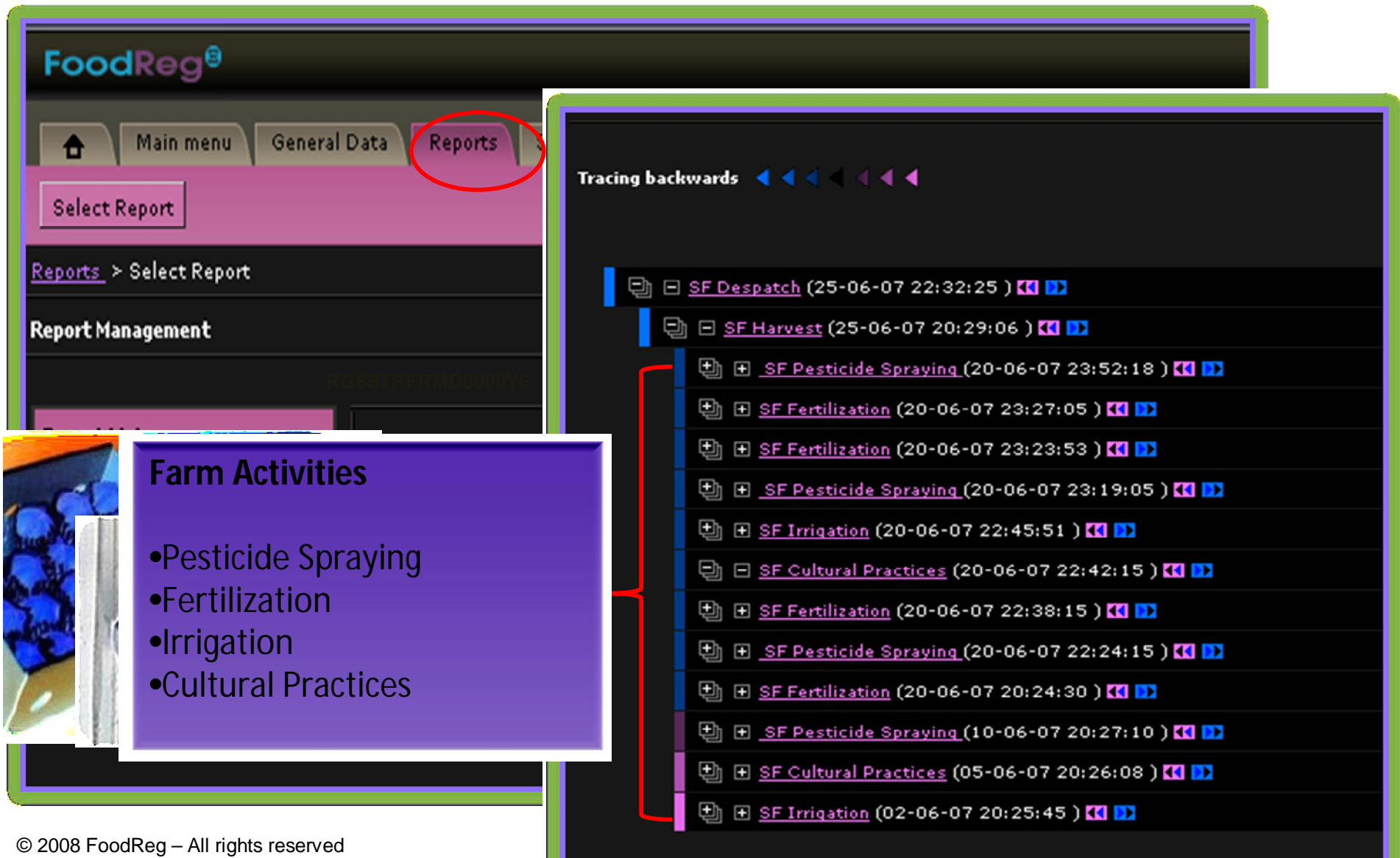
Output  0 items 

Please create the information and click the add button 

No entries found

Lot ID	 	
		
Grade	  	
Packing size (nos per box)	  	
Number of boxes		
Quantity	 	

Records Retrieval



The screenshot displays the FoodReg interface. The 'Reports' menu item is circled in red. Below it, a 'Select Report' button is visible. The 'Report Management' section shows a breadcrumb trail: 'Reports > Select Report'. The main content area is titled 'Tracing backwards' and shows a list of activities with expandable icons and navigation buttons. A red bracket on the left side of the activity list points to a callout box.

Farm Activities

- Pesticide Spraying
- Fertilization
- Irrigation
- Cultural Practices

The activity list includes the following entries:

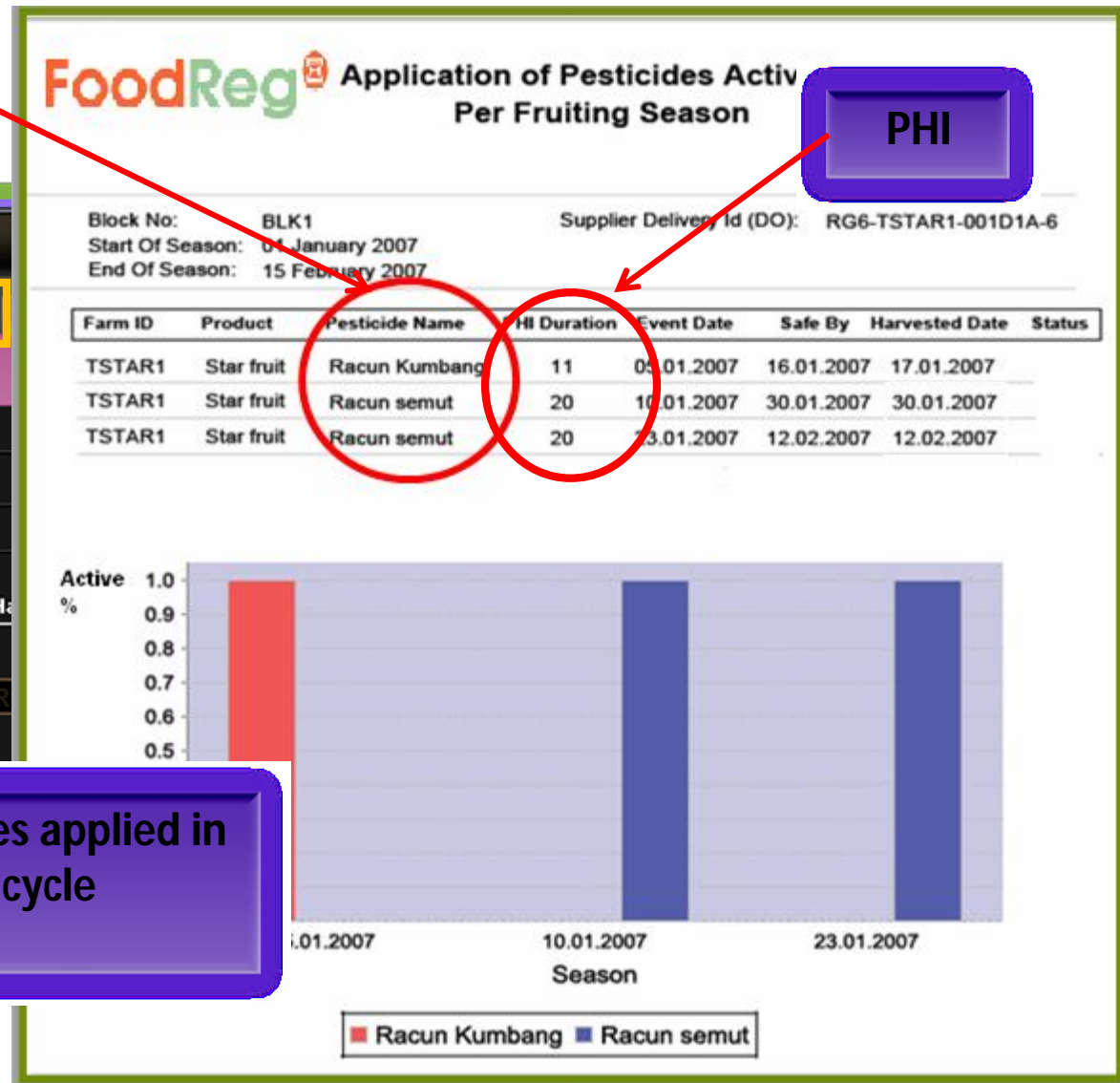
- SF Despatch (25-06-07 22:32:25)
- SF Harvest (25-06-07 20:29:06)
- SF Pesticide Spraying (20-06-07 23:52:18)
- SF Fertilization (20-06-07 23:27:05)
- SF Fertilization (20-06-07 23:23:53)
- SF Pesticide Spraying (20-06-07 23:19:05)
- SF Irrigation (20-06-07 22:45:51)
- SF Cultural Practices (20-06-07 22:42:15)
- SF Fertilization (20-06-07 22:38:15)
- SF Pesticide Spraying (20-06-07 22:24:15)
- SF Fertilization (20-06-07 20:24:30)
- SF Pesticide Spraying (10-06-07 20:27:10)
- SF Cultural Practices (05-06-07 20:26:08)
- SF Irrigation (02-06-07 20:25:45)

Consumer/Buyer Gets...

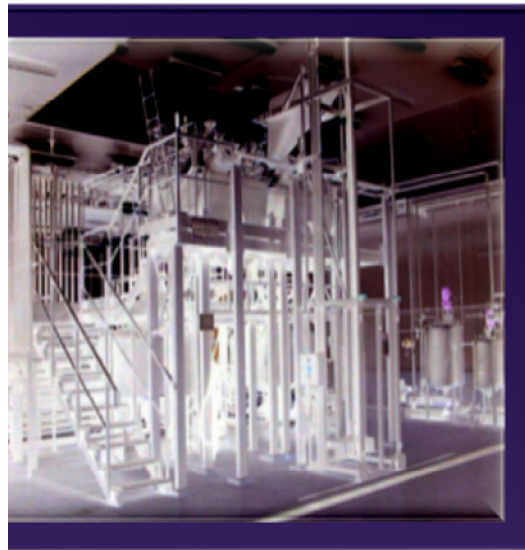
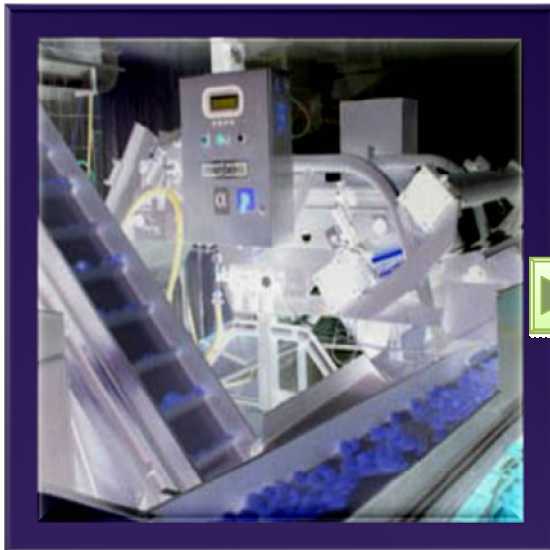
Type of Pesticides

PHI

The screenshot shows the 'Reports' section of the FoodReg interface. A yellow box highlights the 'Reports' tab, and a pink box highlights the 'Select Report' button. Below the menu, there is a 'Report Management' section. To the right, a small image shows a box of 'BELIMBING' pesticide with a barcode and a label that says 'Please enter H...'. Below the image is a purple callout box with the text 'Type of pesticides applied in a fruiting cycle'.



Processing Plant



Pre-requisite Program

[Home](#) | [General data](#) | [Planning](#) | [Operations](#) | [Queries and reports](#) | [Basic Traceability](#) | [System administration](#) | [Preferences](#)

[Preliminary steps](#) | [Prerequisite programs](#) | [HACCP plan](#) | [Verification planning](#) | [Planning status](#)

[Planning](#) > [Planning status](#)

Approval of safety plan

Prerequisite programs

- Water control
- Cleaning and disinfection
- Pest control
- Training & examination
- Supplier control
- Hygiene
- Control of refrigeration chain
- Residue treatment
- Infrastructure & equipment

Prerequisite programs		
Water control	RG6-TPOULT-001D06-7	●
Cleaning and disinfection	RG6-TPOULT-001D07-F	●
Pest control	RG6-TPOULT-001D08-B	●
Training and examination of the workers in food hygiene	RG6-TPOULT-001D09-A	●
Supplier control	RG6-TPOULT-001D0A-E	●
Hygiene	RG6-TPOULT-001D0B-D	●
Control of the refrigeration chain	RG6-TPOULT-001D1T-C	●
Residue treatment	RG6-TPOULT-001D0D-3	●
Infrastructure and equipment	RG6-TPOULT-001D1O-4	●

HACCP Plan

Preliminary steps

- HACCP team
- List of products & activities
- Product description
- Process flow diagram & verification
- Hazard analysis & preventive measures

Preliminary steps		
Hazard team	RG6-TPOULT-001D01-A	●
List of products and activity description	RG6-TPOULT-001D02-3	●
Product description	RG6-TPOULT-001D03-7	●
Process flow diagram and verification in plant	RG6-TPOULT-001D04-4	●
Hazard analysis and preventive measures	RG6-TPOULT-001D05-4	●
HACCP plan		
Determination of CCPs	RG6-TPOULT-001D0E-8	●
Critical limits	RG6-TPOULT-001D0F-2	●
Monitoring procedures and corrective actions	RG6-TPOULT-001D0G-5	●
HACCP summary	RG6-TPOULT-001D2H-0	●
Verification planning		
Verification procedures	RG6-TPOULT-001D0H-4	●

HACCP Plan

FoodReg Search [DevArea](#) Language English (GB) ▾

Home General data **Planning** Operations Queries and reports Basic Traceability System administration Preferences

Preliminary steps Prerequisite programs **HACCP plan** Verification planning Planning status

[Planning](#) > Planning status

Approval of safety plan

Preliminary steps		
Hazard team	RG6-TPOULT-001D01-A	●
List of products and activity description	RG6-TPOULT-001D02-3	●
Product description	RG6-TPOULT-001D03-7	●
Process flow diagram and verification in plant	RG6-TPOULT-001D04-4	●
Hazard analysis and preventive measures	RG6-TPOULT-001D05-4	●
HACCP plan		
Determination of CCPs	RG6-TPOULT-001D0E-8	●
Critical limits	RG6-TPOULT-001D0F-2	●
Monitoring procedures and corrective actions	RG6-TPOULT-001D0G-5	●
HACCP summary	RG6-TPOULT-001D2H-0	●
Verification planning		
Verification procedures	RG6-TPOULT-001D0H-4	●

HACCP plan

- Determination of CCPs
- Critical limits
- Monitoring procedures & corrective actions
- HACCP summary

Verification planning

- Verification procedure

Consumer Confidence

Origin, Food Safety, Halal Status of Product

Origin

Halal Compliance

HACCP Compliance

Production Code : 080508H		
Product Identifier : RG6STRFRMD0000Y6		
Product Type : Starfruit Juice		
Brand Name : GPO Fresh		
Manufacturer : GPO		
Halal Certificate No. : JAKIM/GPO/FF/001		
Halal Certificate Validity : 01-01-2009		
No.	Halal Trace Check Status	Status
1	Overall Status	✓
2	Supply Chain Identified :	✓
	Ingredient Sources ?	
	Packaging Sources ?	
3	Ingredient Safety :	✓
	Ingredient HACCP ?	
	Ingredient Halal ?	
4	Processing Safety :	✓
	Product Halal ?	
	Product HACCP ?	
5	Product Transporter Check :	✓
	Samak Status ?	

Cost Model

- Base License Fee
 - HQ, Farms, GPE
- Electronic Records
 - Usage
- Data Maintenance
 - Database Hosting, Data Security, System Redundancy, Auto-Backup, Online and Phone Support Services
- Add-on Modules
 - HACCP, PRP, Audit etc

Example for Illustration

- A tropical fruit franchise with 50 contract farmers

Base Cost	Cost
HQ Access License Fee	Fixed Cost
Farms/GPE Access License Fee	Fixed Cost

Enjoy Group Discount

Usage	Cost
Group Usage Fee	Variable

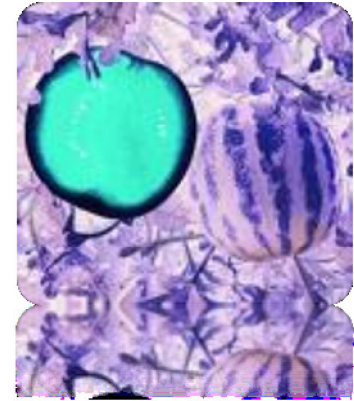
Enjoy Bulk Usage Discount

Maintenance	Cost
Group Maintenance Fee	Variable

Disc space and support fee

Benefits of the Cost Model

- No expensive server to maintain. Just a basic PC with internet access or mobile phone
- Remote access – anywhere, anytime
- Unlimited users per site
- All packages includes:
 - Database Hosting,
 - Data Security Features - Secure Login, IDS, Firewall, etc
 - System Redundancy and Auto-Backup,
 - Online and Phone Support Services



9. Summary

Benefits

- Continuous improvement on supply chain operation and productivity
- Boost export potential, market access & product differentiation
- Comply to national & international regulatory requirements of traceability & quality assurance system
- Meeting consumer's demand & expectation

Future Prospects

- Growing concerns for sustainability and impact on environment
- Improved paperwork flow in dealing with government such as Application of Licence / Export Certificate
- Ancillary functions, such as premise / stock security, worker productivity, worker safety & health, waste / effluent management

Thank You

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