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Short Term Training Course (STTC) “Safety and Quality in Innovative Food Production Systems”

20-26 May, 2018

Asian Institute of Technology, Thailand

Lecture 5:

Food Safety Legislations and Laws



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FOOD SAFETY LEGISLATION AND LAW

International Perspective Of Food Safety Standard And Protocols

- ❑ In February, 1955, USDA's Food Safety and Inspection Service issue a rule: **All meat and poultry establishments develop, adopt and implement a HACCP Plan.**
- ❑ Since December, 1955, all food companies in the European Union, have been give a Directive to have in place an **effective HACCP system.**
- ❑ In North America, the GATT treaty indicates that documents developed by **CODEX will play a role in any disagreements among nations concerting food products.** HACCP will be part of the basis for any decision.

CODEX ALIMENTARIUS COMMISSION

A “**Format for Codex Commodity Standards and their Content**” is provided by the **General Principles of the Codex Alimentarius**.

It includes:

- **Scope**- including the name of the standard.
- **Description, essential composition and quality factors**- defining the minimum standard for the food;
- **Food additives** –only those cleared by FAO and WHO may be used;
- **Contaminants**;
- **Hygiene and weights and measures**;
- **Labelling**- in accordance with the CODEX GENERAL STANDARD
- **Method of analysis and sampling**.

GENERAL PRINCIPLES OF⁵ CODEX ALIMENTARIUS

- Purpose:** ➤ To guide and promote the elaboration and establishment of **definitions and requirements**
- Scope:** ➤ Includes provisions in respect to **food hygiene, food additives, residues of pesticides and veterinary drugs, contaminants, labelling and presentation, methods of analysis and sampling, and import and export inspection and certification**
- Nature:** ➤ Every **country's laws and administrative procedures** contain provisions with which it is essential to comply.
➤ A codex standard for any food or foods should be drawn up in accordance with the **Format for Codex Commodity Standards**.
- Revision:** ➤ Committed to revision as necessary of **Codex standards and related texts** to ensure that are consistent with an reflect current scientific knowledge and other relevant information.

DEFINITIONS FOR THE PURPOSES OF THE CODEX ALIMENTARIUS

- Food** Any substance, whether processed, semi-processed or raw, which is **intended for human consumption**, and includes drink, chewing gum and any substance which has been used in the manufacture, preparation or treatment of food'
- Food hygiene** Conditions and measures necessary for the production, processing, storage and distribution of food designed to ensure a safe, sound wholesome produce fit for **human consumption**.
- Food additive** Any substance added intentionally to **food for a technological (Organoleptic) purpose**. However, it does not include "contaminants" or substance added to food for maintain or improving nutritional qualities.

Organizational Structure ⁷

The Codex Alimentarius Commission consists of the following main organizational elements:

- **Commission;**
- **Executive Committee;**
- **Codex Secretariat;**
- **Codex subsidiary bodies.**



The Commission is the **decision-making body** of the Joint FAO/WHO Food Standards Programme.

The commission consists of:

- member governments; and
- international government and non-government organizations which have official observer status with the Commission.

Organizational Structure – Subsidiary Bodies

Codex Committee on:

Subject Committees

1. Food Additives
2. Contaminants in Foods
3. Food Hygiene
4. Food Import and Export Inspection and Certification System
5. Food Labelling
6. General Principles
7. Methods of Analysis and Sampling
8. Nutrition and Food for Special Dietary Uses
9. Pesticide Residues
10. Residues of Veterinary Drugs in Food

Commodity Committees

1. Fats and Oil
2. Fish and Fishery Products
3. Fresh Fruits and Vegetables
4. Milk and Milk Products
5. Processed Fruits and Vegetables
6. Cereals, Pulses and Legumes
7. Cocoa Products and Chocolate
8. Natural Mineral Waters
9. Sugars
10. Vegetable Proteins
11. Meat Hygiene

Establishing Maximum Residue Limits for Pesticides

- Countries nominate pesticides to be evaluated for consideration in the Codex system after review at national level is completed.
- Countries request manufacturers to propose pesticide for inclusion in the system. A proposal presented by the United States is being considered for joint National and Codex Evaluations.
- Proposed pesticides are prioritized by an ad hoc working group chaired by Australia that meets via electronic media.
- Considers up to 4 new pesticides and review of older pesticides. This is a 5-year working list finalized at the annual meeting.

Adopted from USDA

Establishing Maximum Residue Limits for Pesticides *(continued)*

- Pesticide toxicology data provided by the manufacturer is evaluated by the Joint Meetings on Pesticide Residues (JMPR), an expert group of independent scientists. The group meets once a year.
- JMPR determines “acceptable daily intake” (ADI) for the pesticide candidate (U.S. equivalent is reference dose). The ADI is determined by long term exposure studies based on selected toxicology endpoints.



22/05/61

Adopted from USDA

Establishing Maximum Residue Limits for Pesticides *(continued)*

11



- An acute reference dose is established if there is a potential acute toxic endpoint for the pesticide, based on a single or daily commodity serving.
- Manufacturers submit to JMPR residue field trials to determine the residue levels based on Good Agricultural Practices (GAPs). The number of trials is based on climate and soil conditions.

Establishing Maximum Residue Limits for Pesticides 12 *(continued)*

- Exposure is defined as the projected maximum residue times the expected consumption of the commodity by an individual.
- Consumption is based on 13 international diets determined by the Global Environmental Management System (GEMS) developed by WHO. (Before 2006 only 5 representative diets were considered.)
- The Maximum Residue Limit is recommended by JMPR taking into account the SUM of exposures for the pesticide resulting from uses in different crops. The sum of exposures (residues x consumption) is supposed to be less than the ADI.

Establishing Maximum Residue Limits for Pesticides *(continued)*


13

- JMPR also reviews existing pesticides on a 15-year cycle. Toxicology and Residue Chemistry can be done in different years.
- Periodic reviews can result in a modification of the MRL or in its deletion if the use is no longer supported by the manufacturer.
- 2008 examples—*fenvalerate*, *metalaxyl*.



Adopted from USDA

The 8-Step Process

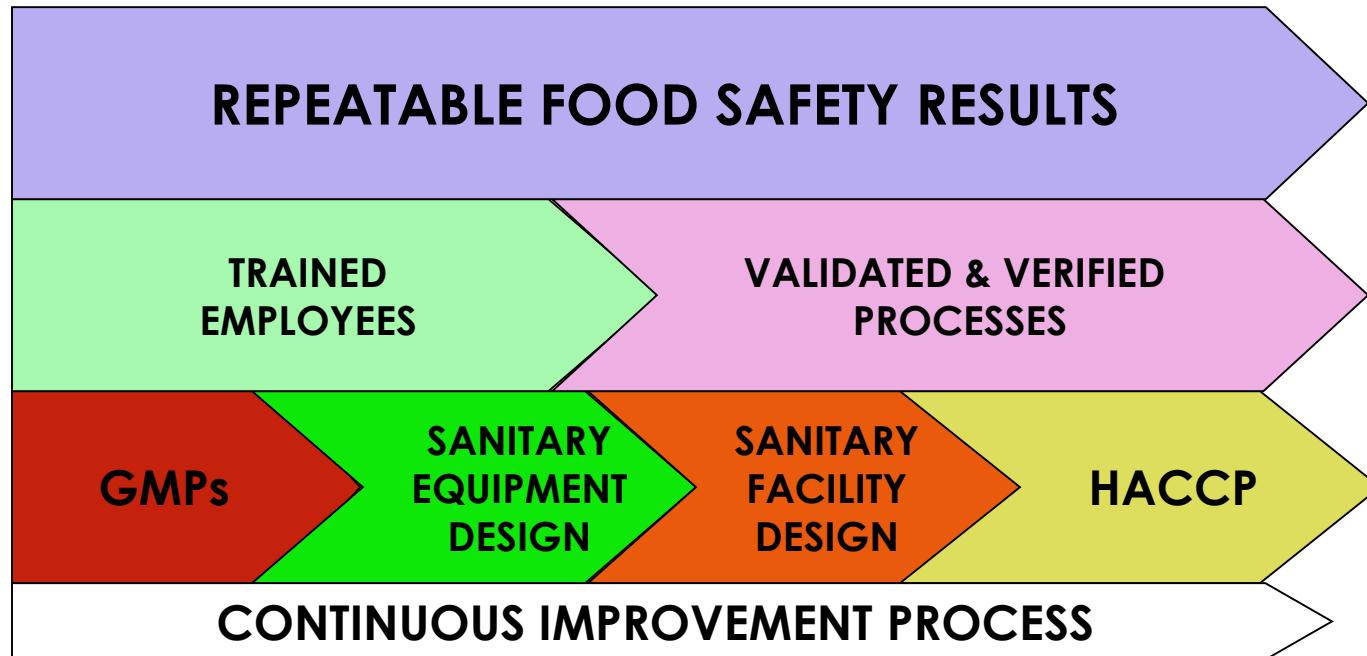
- 
1. Proposal to set an MRL for a pesticide - commodity use or additional commodity uses entered into the system
 2. First evaluation of toxicology and residue chemistry by JMPR to determine MRL
 3. MRL submitted by CCPR to member countries and other interested parties for first round of comments
 4. Discussion of MRLs at CCPR annual plenary
 5. MRL submitted by CCPR to the Commission to be reviewed for consistency with Codex general standards

Adopted from USDA

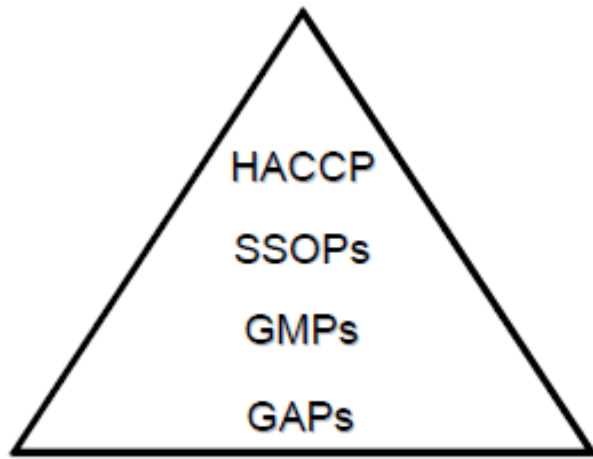
The 8-Step Process

6. MRL submitted to Governments for second round of comments
7. MRL moves to step 8 or the proposed MRL is held at step 7:
 - Due to uncertainties regarding ADI (7A)
 - Is referred back to JMPR based on new toxicology or residue chemistry information (7B)
 - Because of issues raised by Government(s) (7C)
8. CCPR recommendation to the Commission for adoption. If there were no Government objections at step 4 – the MRL goes to the Commission for adoption as a step 5/8. When the Commission approves, the term CXL applied. During a periodic pesticide review, if the manufacturer does not support maintaining the CXL by submitting revised information, the CXL is recommended for deletion using the same process.

THE FOOD SAFETY EQUATION



Food Safety Program Hierarchy



- **Good Agricultural Practices (GAPs; Voluntary)**
- **Good Manufacturing Practices (GMPs; Mandatory for processors)**
- **Sanitation Standard Operating Procedures (SSOPs; Voluntary)**
- **Hazard Analysis and Critical Control Points (HACCP; Voluntary)**

GAP, SSOP and GMP are prerequisites for developing a HACCP plan

HAZARD ANALYSIS AND CRITICAL CONTROL POINT





HAZARD ANALYSIS CRITICAL CONTROL POINT

Originally developed by Pillsbury Company working along with NASA and US Army laboratories at Natick, to ensure the safety of food for the astronauts.

Based on **FMEA – Failure, Mode, and Effect Analysis System** which entailed looking at what could potentially go wrong at each stage in and operation along with possible causes and likely effects before developing effective control mechanisms

- HACCP is a system which identifies, evaluates, and controls hazards which are significant for food safety.
- It is a preventative system of hazard control rather than reaction or point inspection to decrease a hazard.
- Food processors can use HACCP to **identify hazards**, **establish controls** and **monitor the controls** in the case of harmful microorganisms or chemical and/or physical contaminants in food.



HAZARD ANALYSIS CRITICAL CONTROL POINT

HACCP focuses inspection activities on the critical areas of food safety and will ensure a scientific basis for controls operating in the food Industry. It requires a long-term commitment by industry management in each food premises and vessel.

HACCP can be applied throughout the food chain from producer to consumer. Wherever possible, the whole food processing and distribution system should be evaluated for possible HACCP application

HACCP Benefits



- Enhanced Food Safety and reduced risk of food borne diseases;
- Providing greater confidence to customers;
- Reduction in production costs through reduced wastage;
- Facilities compliance with statutory requirements;
- Current and potential hazards can be identified and removed or diminished.

HACCP Preliminary Preparations



1. Assemble HACCP team
2. Describe the product and its distribution
3. Identify intended use and customer of the product
4. Develop a flow diagram
5. Check the flow diagram

HACCP Principles



1. Conduct **Hazard Analysis**
2. Determine the **Critical Control Points** using **decision trees**
3. Establish **Critical Limits**
4. Establish a system **to monitor** control of the CCP
5. Establish the **corrective action** to be taken when monitoring indicates that a particular CCP is not under control
6. Establish procedures for **verification** to confirm that the HACCP system is working effectively
7. Establish **documentation** concerning all procedures and records appropriate to these principles and their application.



HACCP Terminology

Critical Control Point (CCP)

- An operation at which a preventive or control measure can be exercised that will eliminate, prevent or minimize hazards to an acceptable levels.

Decisions tree

- A sequence of questions applied to each process step with a potential hazard to identify critical step.

Critical limits

- The value of monitored action which separates the acceptable from unacceptable

To monitor

- To conduct a planned sequence of measurements to assess the control of a CCP.

Corrective action

- A specified prompt action to be taken when the criteria are not met or when the result of monitoring the CCP indicates a trend toward loss of control.

Verification

- Review of monitoring records to determine whether the HACCP system is in place an functioning as planned and to ensure that monitoring is carried out effectively and efficiently .

DECISION TREE TO IDENTIFY CCPS

Q1

Do control preventive measure(s) exist ?

Yes

No

Modify step, process or product

Is control at this step Necessary for safety ?

Yes

No

Not a CCP

Stop

Q2

In this step specifically design to eliminate or reduce the likely occurrence of a hazard to an Acceptable level ?

No

Yes

Q3

Could contamination with identified hazard(s) occur in excess of acceptable level(s) or could These increase to unacceptable level(s) ?

Yes

No

Not a CCP

Stop

Q4

Will a subsequent step eliminate identified hazard(s) or reduce likely occurrence to an acceptable level?

Yes

No

Not a CCP

Stop

CRITICAL CONTROL POINT

CASE STUDY 1: CANADIAN EGG GRADING

	Canada A		Canada B	Canada C
Shell	Clean, sound		Sound, slightly soiled and stained	May be cracked, up to 1/3 stained, no dirt
Air cell size	4.8mm		9.6mm	No limit
Yolk	Outline indistinct, round, reasonably well centred		Outline visible, moderately oblong	Outline prominent, may be oblong in shape.
Broken-Out Appearance	Yolk fairly well rounded and erect, surrounded by thick albumen		Yolk slightly flattened and enlarged, surrounded by moderately thin albumen	Yolk enlarged or flattened, surrounded by very thin albumen
Weight	Size	Weight (at least)	At least 49g per egg	No restrictions
	Jumbo	70g		
	XLarge	64g		
	Large	56g		
	Medium	49g		
	Small	42g		
	Pee Wee	42g		

HACCP PLAN

The HACCP plan includes ten (10) major forms.

Product Description	Form #1
1. Product name(s)	Shell Egg (A, B, C)
2. Important product characteristics (a_w , pH, salt, Preservatives,...)	None
3. How it is to be used	Raw as and ingredient, cook before serving.
4. Packaging	Primary packaging: pulp, styrofoam cartons, pulp and plastic trays Secondary: cardboard boxes, wire baskets Tertiary package: wooden pallets, hardboard boxes
5. Shelf life	6 weeks after packaging
6. Where it will be sold	Retail, Hotel, Restaurant, Institution & Further Processors
7. Labelling information/ instruction	Date of expire, company code, grade, Keep refrigerated
8. Special distribution	Less than 13° C during long haul transportation

Date: _____

Approved by: _____

HACCP PLAN

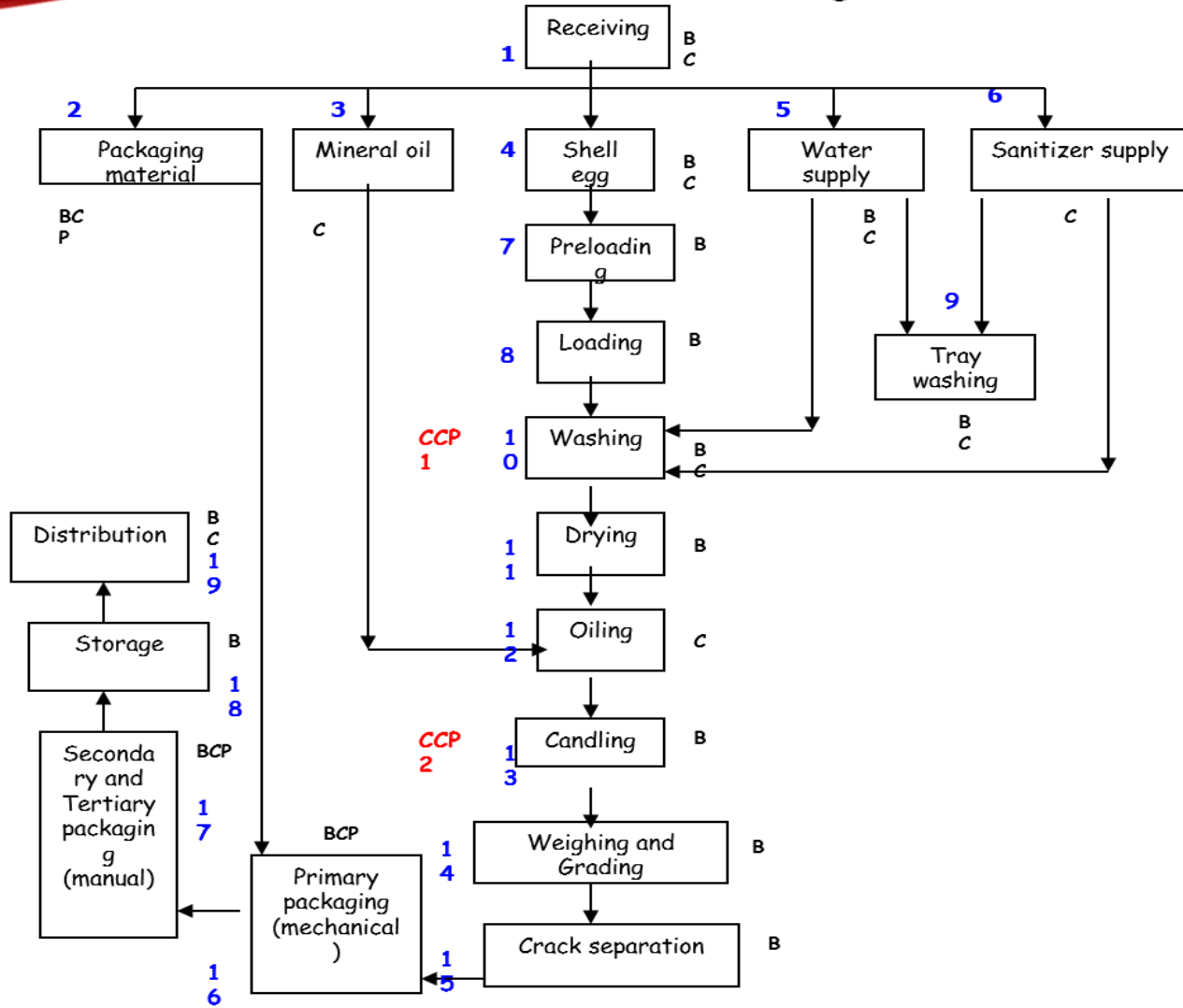
List of Product Ingredients and Incoming Material		Form #2
Egg Product	Non-Egg Products	Packaging Material
Shell Egg B,C	Water B,C	Pulp, styrofoam cartons, pulp and plastic trays, cardboard boxes, wire baskets, wooden pallets, B,C,P
Bactericidal Agents		
Egg and tray sanitizer C		
Mineral oil C		
Labelling ink C		

Date: _____

Approved by: _____

Process Flow Diagram

Form #3



Egg weighing and grading



Egg candling



Packaging

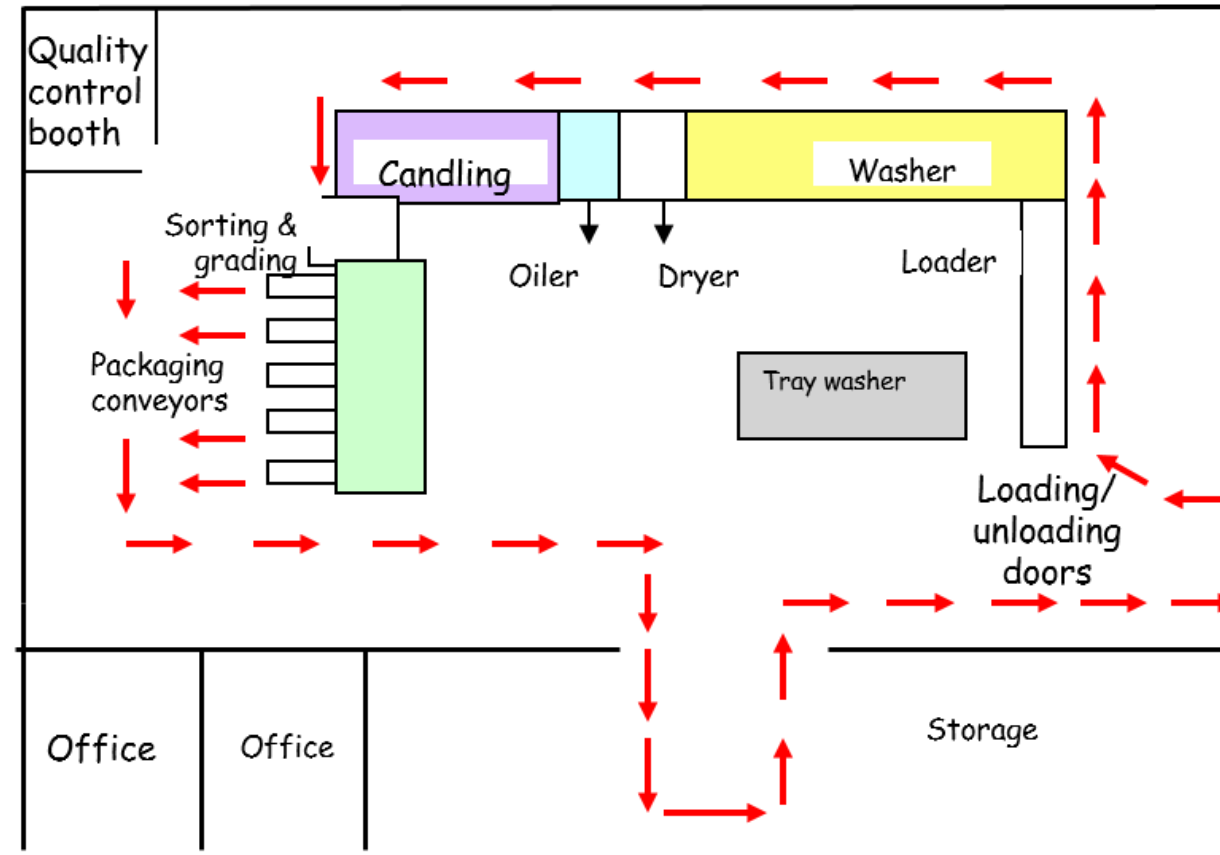
Date: _____

Approved by: _____

Plant Schematic

Form #4

← Product flow in the plant



Date: _____

Approved by: _____

HACCP PLAN

List all Biological Hazards		Form #5
Identified Biological Hazards (Bacteria, Parasites, Viruses...)	Controlled at	
Incoming materials		
Shell Egg (crack, leak, dirt on the shell, pathogen inside)	On Farm HACCP, Loading, Washing, Candling	
Water	Refer to prerequisite program Premises (checking water potability regularly)	
Packaging materials	Refer to prerequisite program Transportation and Storage (checking at receiving and safe storage)	
Processing Step		
#1 Receiving (receiving of packaging, shell eggs, necessary chemicals)	Refers to Transportation and Storage	
# 10 Washing	No prerequisite program CCP 1	
#13 Candling	No prerequisite program CCP 2	

30

Date: _____

Approved by: _____

HACCP PLAN

List all Chemical Hazards Form #6	
Identified Biological Hazards (Bacteria, Parasites, Viruses...)	Controlled at
Incoming materials	
Egg sanitizer and ink	Prerequisite program (food grade type is used)
Water	Refer to prerequisite program Premises (checking water potability regularly)
Packaging materials	Refer to prerequisite program Transportation and Storage (checking at receiving and safe storage)
Processing Step	
#10 Washing	No prerequisite program CCP 1
#12 Oiling	Prerequisite program (food grade oil is used)

Date: _____

Approved by: _____

HACCP PLAN

List all Physical hazards		Form #7
Identified Biological Hazards (Bacteria, Parasites, Viruses...)	Controlled at	
Incoming materials		
Packaging materials	Prerequisite program "Transportation and Storage"	
Processing Step		
#16 Packaging (pre contamination or faulty equipment)	Prerequisite program (checking at receiving and equipment maintenance)	

Date: _____

Approved by: _____

HACCP PLAN

Critical Control Point Determination					Form #8
Category and Identified Hazard Determine if fully controlled by Prerequisite Program(s) If YES, indicate Prerequisite Program and proceed to next identified hazard. If NO, proceed to question 1 (Q1)	Q1. Could a control measure(s) be used by the operator at any process step? If NO = not a CCP + identification on how this hazard will be controlled before and after the process + proceed to the next identified hazard If YES = description + next question (Q2)	Q2. Is it likely that contamination with the identified hazard could occur in excess of the acceptable level or could increase to an unacceptable level? If NO = not a CCP + proceed to the next identified hazard If YES = next question (Q3)	Q3. Is this process step specifically designed to eliminate/reduce the likely occurrence of the identified hazard to an acceptable level? If NO = next question (Q4) If YES = CCP + go to last column	Q4. Will a subsequent step eliminate the identified hazard or reduce likely occurrence to an acceptable level? If NO = CCP + go to last column If YES = not a CCP + identify subsequent step + proceed to the next identified hazard	CCP Number + proceed to next identified hazard
Incoming Material: Shell Egg					
<i>Biological</i>					
1. Birds contaminated with Salmonella bacteria	No, controlled at the farm level HACCP program				
2. Dirt , leakers	Yes, during loading, washing, candling	Yes	N/A		
Processing Step: Candling					
1. Dirt, leakers, blood spot	Yes, washing	Yes	Yes		CCP2

Date: _____

Approved by: _____

HACCP PLAN

List all biological, chemical and physical hazards which
Form #9
are not controlled by the operator

Identify hazards

Indicate the way the hazard
could be addressed

Temperature abuse in
retail store and in
customer level

Refrigeration instruction, cooking
instruction, customer awareness
etc.

Date: _____

Approved by: _____

HACCP PLAN

HACCP Plan					From #10
Hazard Description	Critical limits	Monitoring procedures	Deviation procedures	Verification procedures	HACCP records
Processing Step #13: Candling CCP2					
The candler or candling machine is not efficient and missing to discard potential leakers, dirty and blood spotted eggs	Not more than leakers in 5 dozens	Quality assurance personnel checks for leakers, dirt etc. in randomly selected samples on daily monitoring basis	If random sampling shows deviation beyond critical limits, operations line is stopped, candler replaced, machine checked. The lot produced during deviation is identified and reworked.	Quality Assurance (QA) manager verifies the monitoring logs once a week and record.	Egg monitoring log QA Manager's report

Date: _____

Approved by: _____

EXAMPLE OF FORM: DESCRIPTION AND INTENDED USED OF PRODUCT

Name of product	
Description	
Packaging	
Conditions of storage	
Shelf life	
Instructions on the label	
Consumer group	
Recommendation further processing required before consumption	

EXAMPLE OF RAW MATERIAL MONITORING REPORT:
XYZ CO., LTD.
RAW MATERIAL MONITORING REPORT

DATE _____ INSPECTED BY _____ REVIEWED BY _____

Fish	Time	Suppliers	Quantity	Temp	Texture	Odor	Eyes/ gills	Accept/ reject

Remarks _____

Example of Metal Check Report:
XYZ Co., Ltd.
Metal Check Report

Date _____

Inspected by _____

Reviewed by _____

Time	Checking response	Remarks

Example of Notice of Unusual Occurrence and Corrective Action:
XYZ Co., Ltd.
Notice of Unusual Occurrence and Corrective Action

Production Date _____ Time _____ Code _____

PROBLEM: _____

Reported by _____ Date _____

CORRECTIVE ACTION TAKEN:

Operated by _____ Date _____

Result: _____

Reviewed by _____ Date _____

Example of Temperature Monitoring Report :

XYZ Co., Ltd.

Temperature Monitoring Report

Date _____ Checked by _____ Reviewed by _____

Time	Gutting		Mince washing		Rotary screen		Refining		Screw press		Mixing	

Example of Daily Sanitation Check List :

XYZ Co., Ltd.

Daily Sanitation Check List

Date _____ Time _____ Inspected by _____ Reviewed by _____

- | | |
|------------------------------------|--|
| 1. Plant surrounding | 14.Silent cutter, freezing pans |
| 2. Floors | 15.Freezers |
| 3. Walls | 16.Offal containers, disposal area |
| 4. Drains | 17.Hand washing and
disinfecting facilities |
| 5. Ceilings | 18.Personnel hygienic practices |
| 6. Lightings | 19. aprons, gloves and hair nets |
| 7. ventilations | 20.Jewelry |
| 8. Pest control | 21.Toilet facilities |
| 9. fish containers | 22. ice room |
| 10. tables, knives, cutting boards | 23.Water treatment |
| 11.Washing tanks, washing drum | 24.Ingredients store room |
| 12.Deboners, rotary screens | |
| 13.Refiners, screw press | |

G= Good

F= Fair

I= Need

Improvement



FOOD AND NUTRITION LABELING

“Label”

means any tag, brand, mark, pictorial or other descriptive matter, written, printed, stencilled, marked, embossed or impressed on, or attached to, a container of food.

“Labelling”

includes any written, printed or graphic matter that is present on the label, accompanies the food, or is displayed near the food, including that for the purpose of promoting its sale or disposal.

The goal of food labeling is to provide consumers with information that is factual and relevant. The food label allows consumers to compare one product to another, gives instructions for safe handling and storage, lists ingredients to help consumers select foods with ingredients they want or need to avoid, and identifies the firm responsible for the product.

Are the **LABELS** on Your Food **DECEIVING** You?



PACKAGED TO DECEIVE



Citric Acid (Provides Tartness), Potassium And Sodium Citrate (Control Acidity), Aspartame (Sweetener), Maltodextrin, Magnesium Oxide (Prevents Caking), Contains Less Than 2% Of Natural Flavor, Lemon Juice Solids, Acesulfame Potassium (Sweetener), Soy Lecithin, Artificial Color, Yellow 5 Lake, BHA (Preserves Freshness).

Natural Lemonade, Really?

- Artificial sweeteners: Aspartame & Acesulfame Potassium
- Soy Lecithin ... made from genetically modified soy
- Maltodextrin (made from GMO corn) is to starch what High Fructose Corn Syrup is to sugar: a highly-processed, man-made, and fake.
- Artificial Colors: Yellow 5 Lake
- Preservatives: BHA



THEN ... WHAT'S SO NATURAL ABOUT CRYSTAL LIGHT?

Only one official language is required

Allergens should be listed in brackets after the ingredient

Nutrient analysis table mandatory if any claims are made on the label

OAT MUFFIN MIX

INGREDIENTS

Oatmeal flour, brown sugar, oat bran, polydextrose, dextrose, raising agent, salt.

BESTANDELE

Meelblus, bruinsuiker, haverzemel, polydextrose, dekstroze, opsmittel, sout.

NUTRIENT INFORMATION		
	PER 100g (100g)	% RDA
ENERGY	1175 kJ	
PROTEIN	7.8 g	15.6
CARBOHYDRATE	72.8 g	
TOTAL FAT	2.1 g	
SATURATED FAT	1.8 g	
*PER 100g (100g)		
ENERGY	679 kJ	
PROTEIN	8.3 g	16.6
CARBOHYDRATE	25.1 g	
TOTAL FAT	5.7 g	
SATURATED FAT	3.5 g	

* ONE SERVING = 1 x 35g MUFFIN

RDA Recommended daily allowance for persons 17 years of age and over

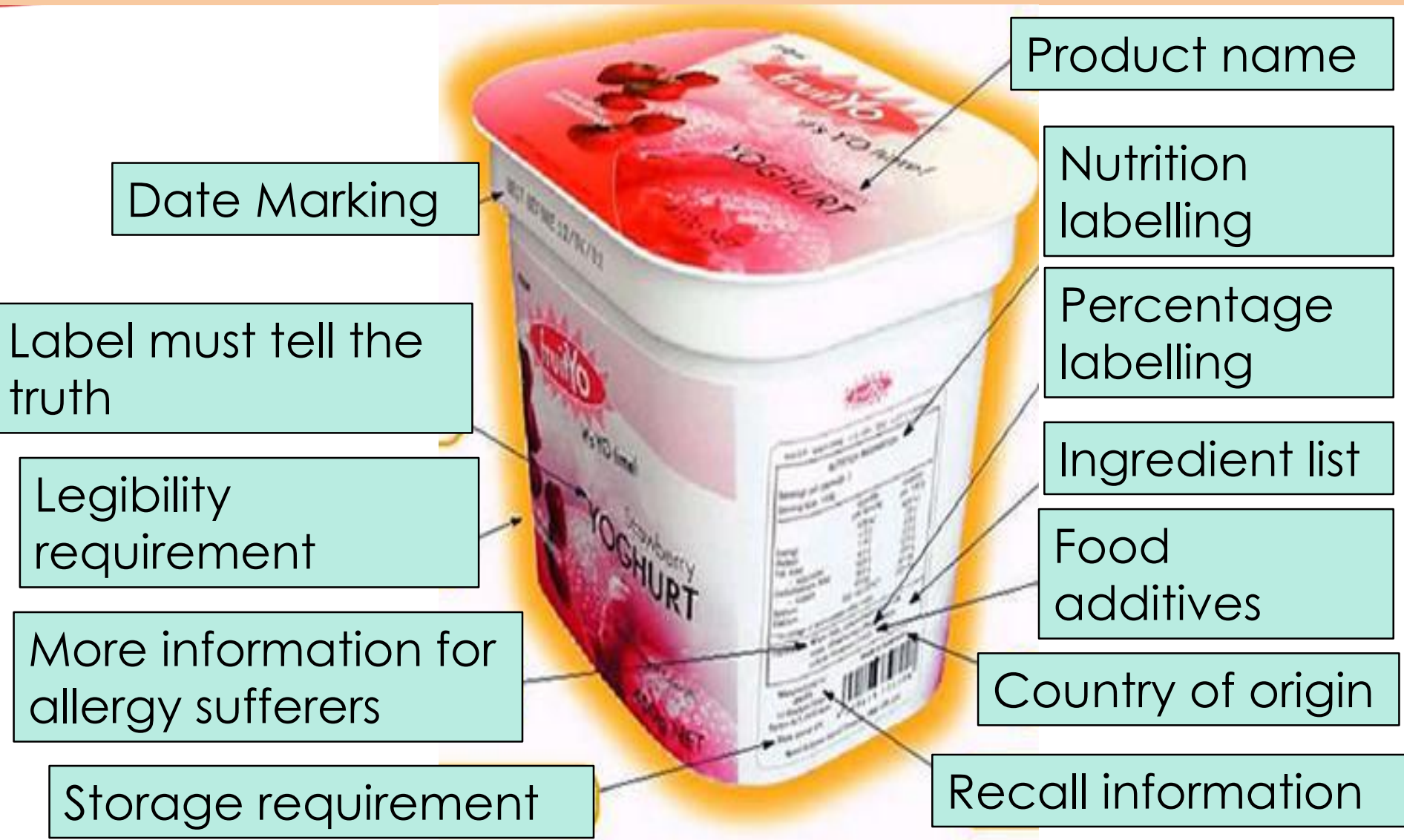
CONTAINS NO PRESERVATIVES, FLAVOURANTS OR COLOURANTS.

Ingredients must be listed in descending order of mass

Nutrient analysis table must be in the prescribed format

Nutrient analysis must be carried out by SANAS approved lab, if claims are made on the label

INFORMATION ON THE LABEL



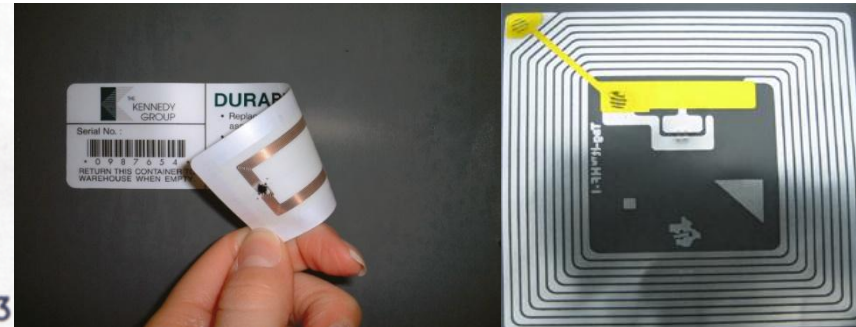
Symbols used on packages and labels

47

- ❖ Many types of symbols for package labelling are nationally and internationally standardized.
- ❖ For consumer packaging, symbols exist for product certifications, trademarks, proof of purchase, etc.
- ❖ Some requirements and symbols exist to communicate aspects of consumer use and safety.



Radura symbol used on irradiated foods.



Bar codes (below), Universal Product Codes, and RFID labels are common to allow automated information management.



USDA organic symbol



Recycling directions, Resin identification code, and package environmental claims have special codes and symbols.



SAFETY, SUSTAINABILITY, QUALITY

TOTAL TRACEABILITY

DEFINITION OF TRACEABILITY

1. EU 178/2002

“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” (article 3 (15)) (OJL 2002).

2. Codex Alimentarius Commission

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

DEFINITION (CONTD)

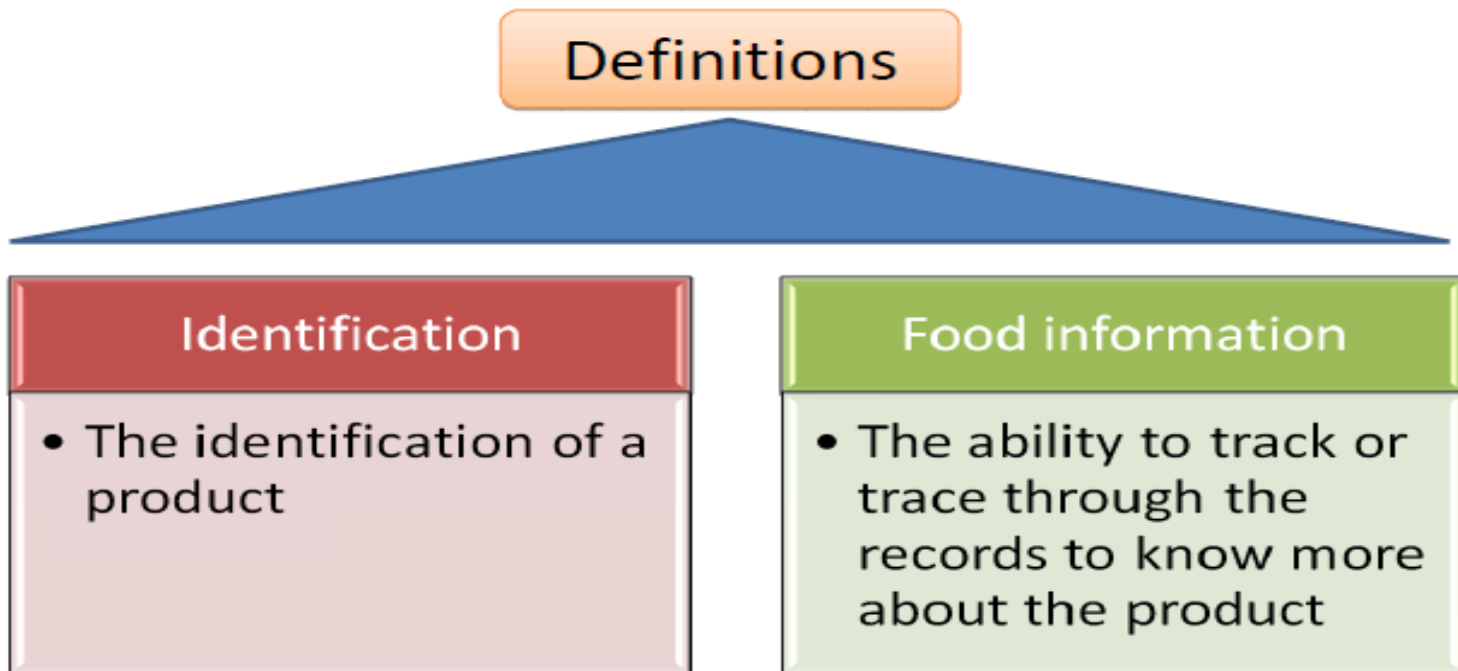
3. US Food and Drug Administration (FDA)

“the ability to identify by means of paper or electronic records a food product and its producer, from where and when it came, and to where and when it was sent” (OECD, 2003).

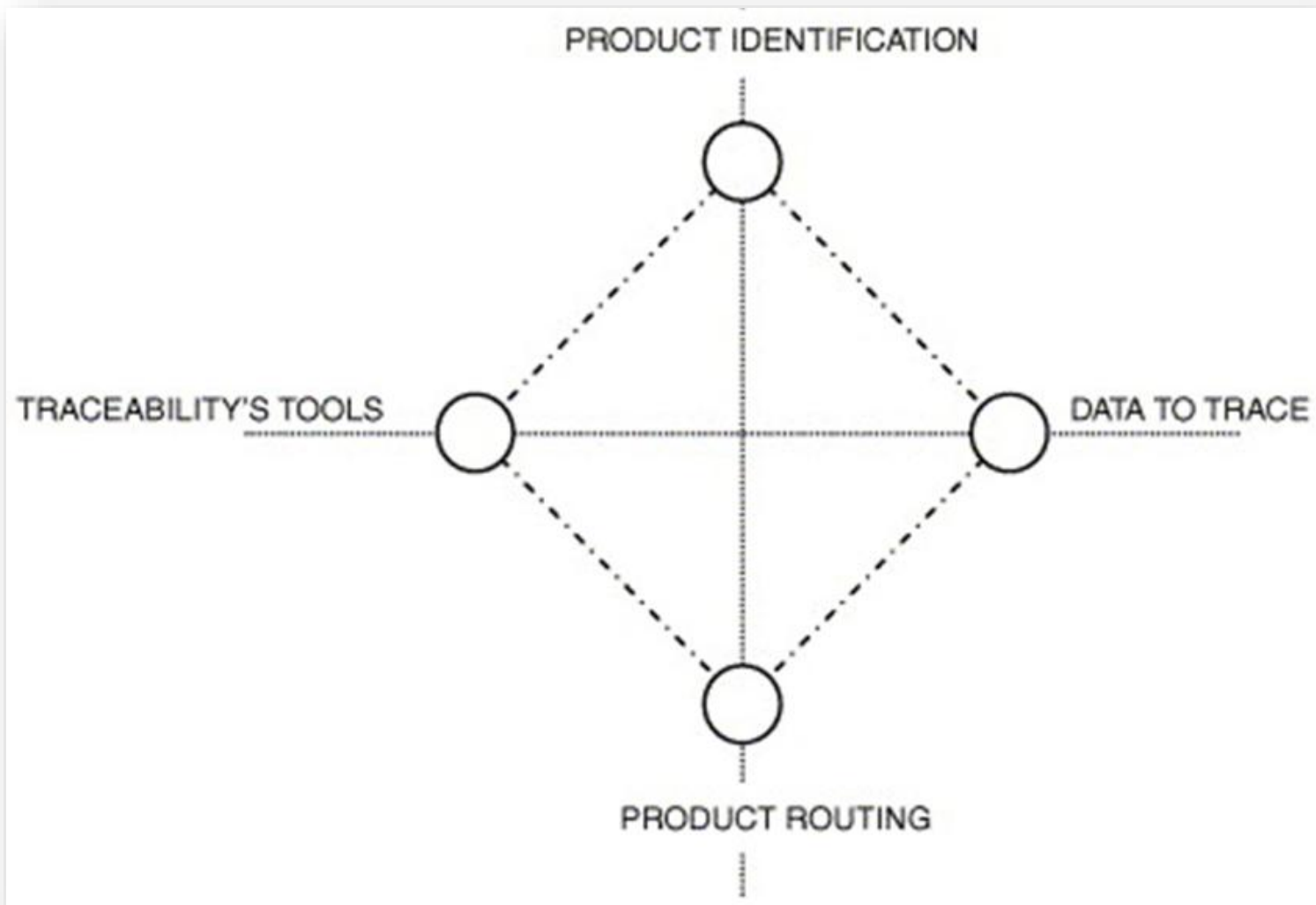
4. ISO

“ability to trace the history, application or location of an entity by means of recorded identifications” (ISO 8402).

Traceability is defined as a 'watch word' for consumer and regulatory confidence with respect to food quality, food safety and the infrastructure for producing, processing and delivering food products from the point of origin to the point of sale.



FOOD TRACEABILITY FRAMEWORK



Traceability System

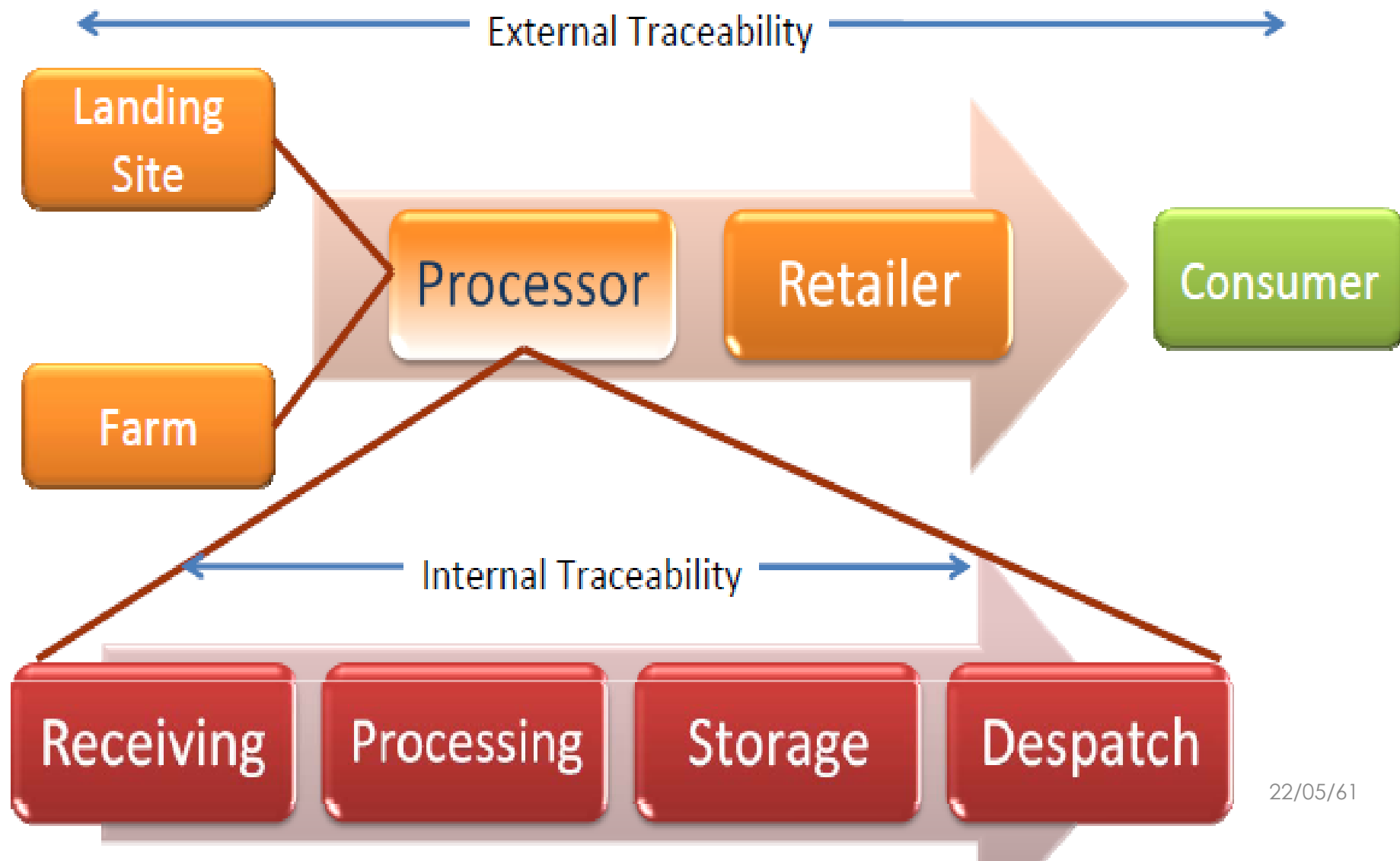


Paper-based



Electronic-based

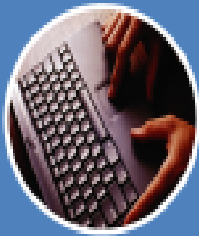
External and Internal Traceability



Components of Traceability System

55

Business goals – tracking and tracing



Technology



Information



Process



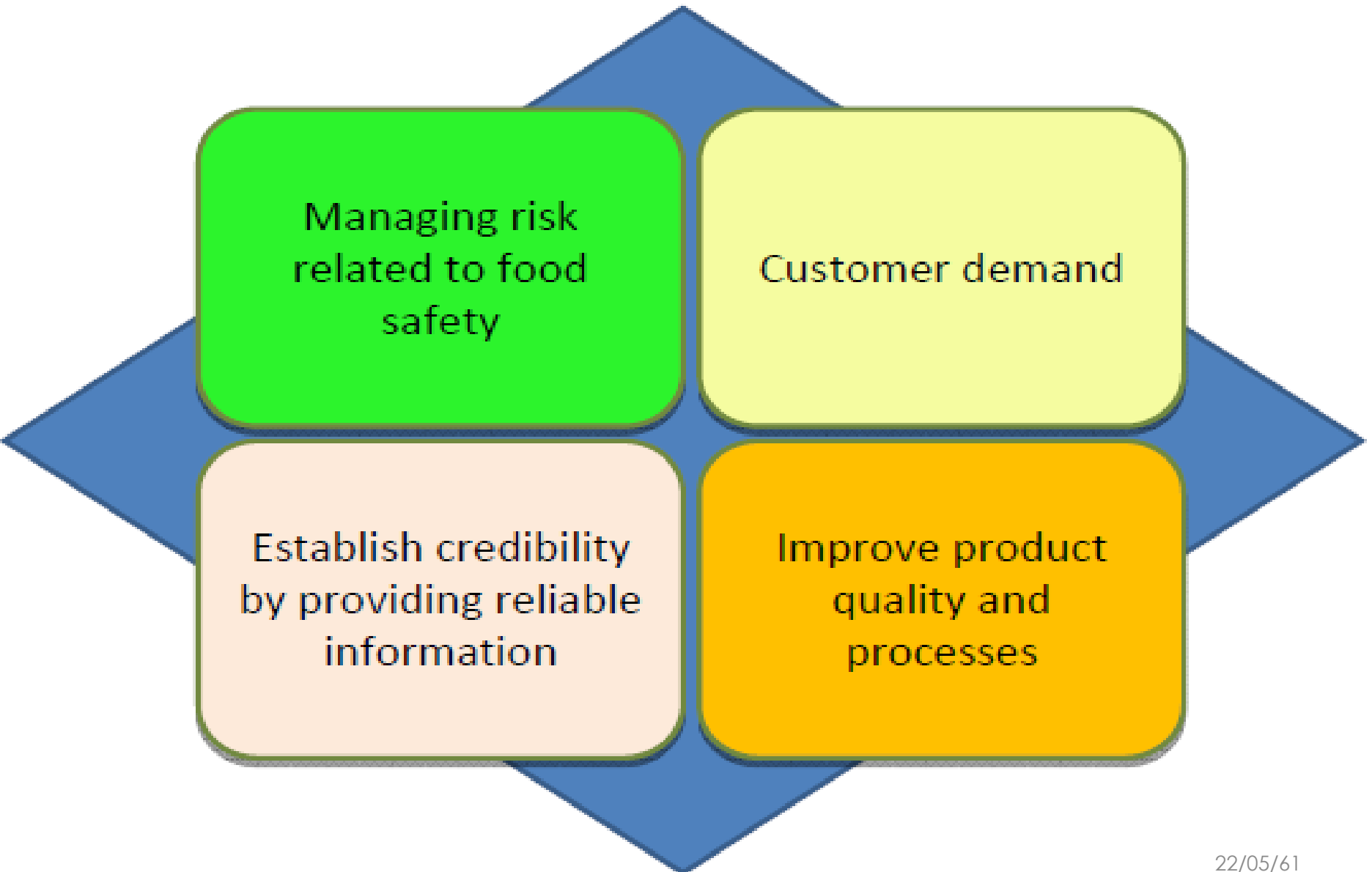
Organization



Implementation

Traceability Objective

56

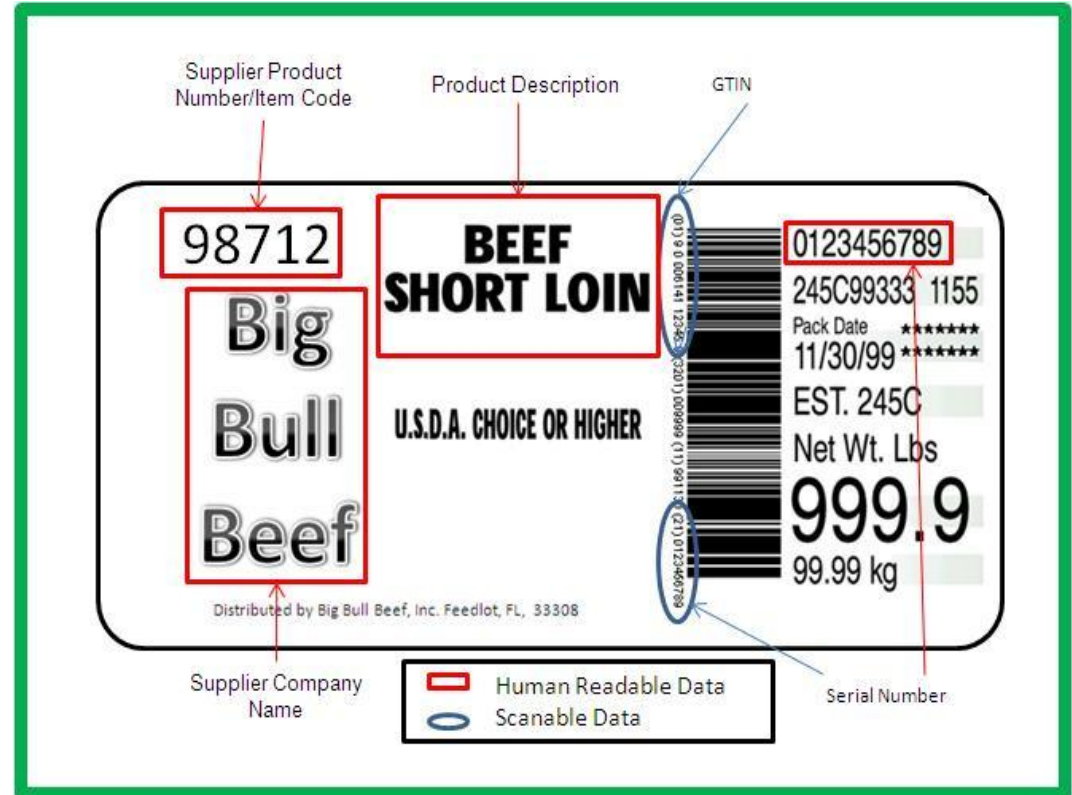


Traceability Information

1. Product / Lot Identification
2. Handling of the information
3. Storage of the information
4. Transformation of the information to the customers

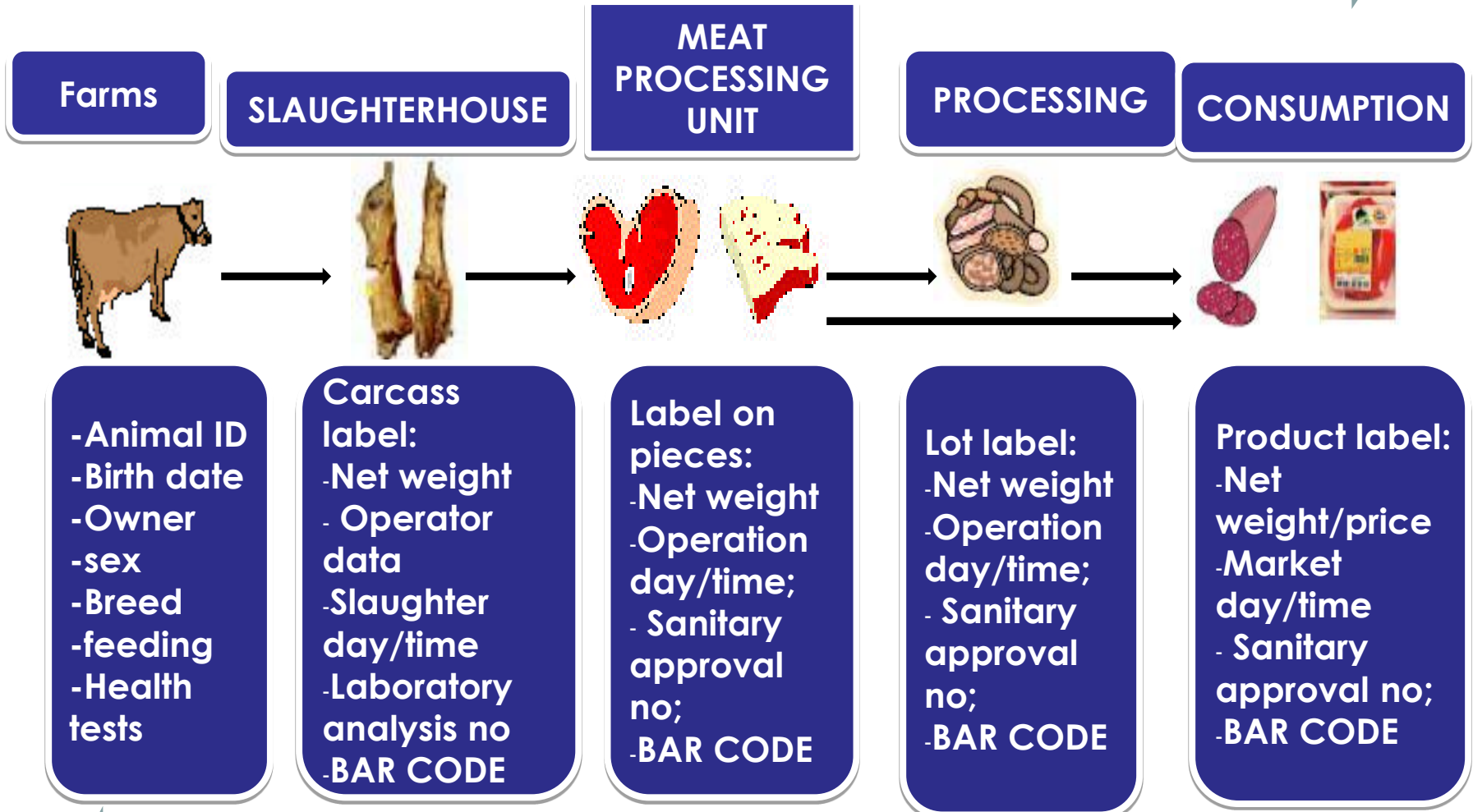
Post-slaughter Traceability: An Example of Meat Processing

- Traceability activity after slaughtering
- Keeping individual animal information to the product
- Maintaining individual animal information from birth to retail
- when the carcass is fabricated, they should be marked with the animal's ID number and can be linked to the farm of origin.



PRODUCT LABELING

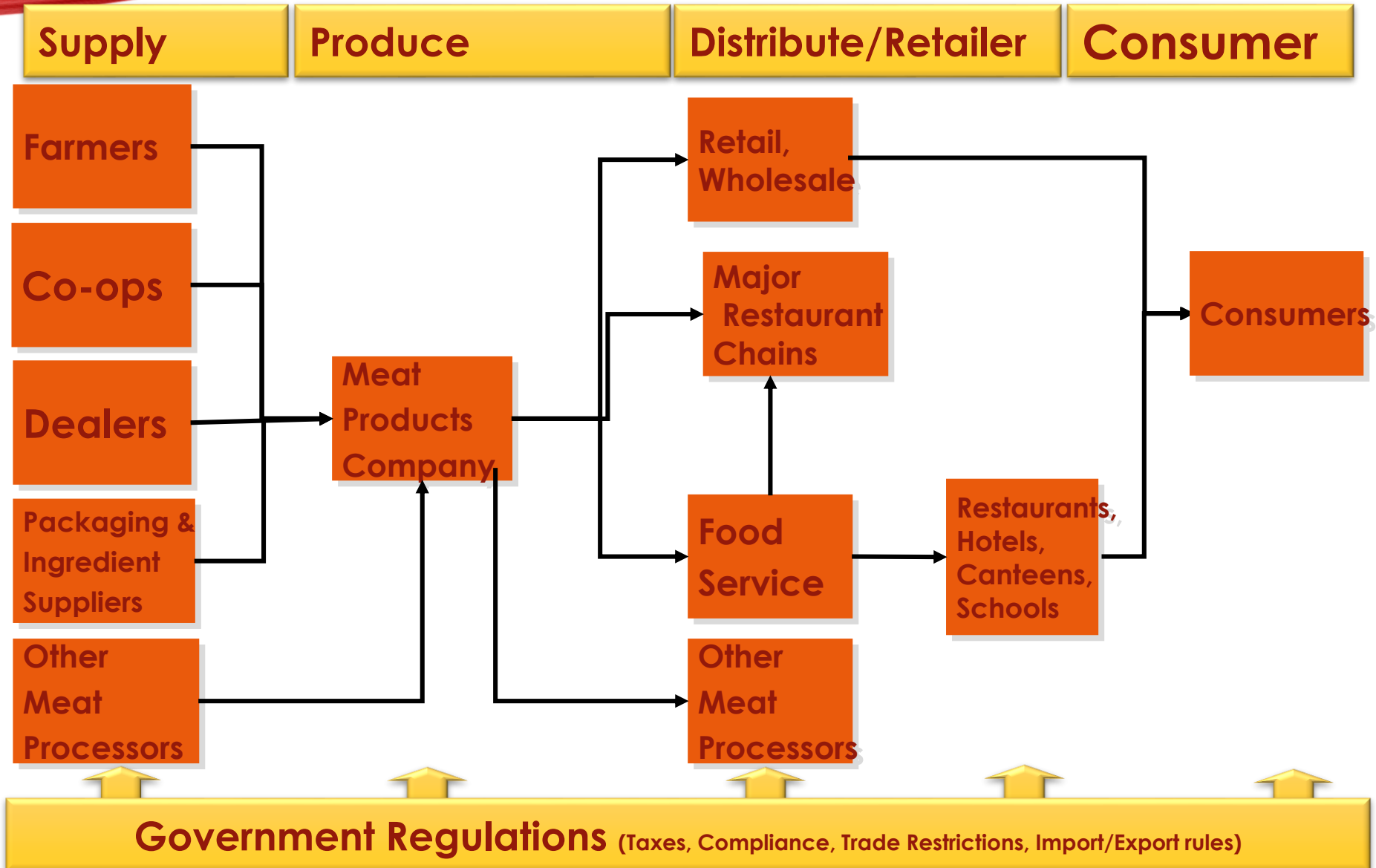
DOWNWARD TRACEABILITY



UPWARD TRACEABILITY

MEAT SUPPLY CHAIN

60



The background features dynamic, flowing waves of color. At the top, a thick, vibrant red wave curves across the frame. Below it, a thinner, more ethereal yellow wave flows. At the bottom, another thick red wave curves upwards, overlapping with a yellow wave that flows from the right side towards the center. The overall effect is one of movement and energy.

THANKS