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MY LORD! INCREASE ME IN KNOWLEDGE.

FST- 407. FOOD SAFETY AND LAWS 3(3-0)

Program: B. Sc. (Hons). Food Science and Technology
Semester: IIV (SS + Ex-PPP)
Academic Year: Fall -2020
Session: 2018-2022

Course Teacher:

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12/3/2020
12/3/2020

CONTENTS - A

1. **Food Safety**
2. **Characterization of food hazards: biological, chemical and physical**
3. **Hazards from natural origin**
4. **Hazards produced during food processing, storage and preparation**
5. **Hazards associated with nutrient fortification**
6. **Food Safety systems, GMP, TQM**
7. **HACCP**
8. **Pakistan Standards and Quality Control Authority**
9. **Pure Food Rules**
10. **Punjab Food Authority**
11. **International Organization for Standardization**
12. **National Standard for Drinking Water Quality**
13. **Food labeling**
14. **Concept of Halal, Islamic food laws and regulations**
15. **Consumer laws in Pakistan**
16. **The World Trade Organization (WTO)**
17. **Codex Alimentarius**

FST-407. L # 15. FOOD SAFETY SYSTEMS

- **FOOD SAFETY SURVEILLANCE SYSTEMS**
- **FSSS: MONITORING & SURVEILLANCE**
- **FSSS - PURPOSE**
- **BURDEN OF ILLNESS PYRAMID**
- **SYSTEMS FOR FOOD SAFETY SURVEILLANCE**
 - **GMP**
 - **TQM**
 - **HACCP**
 - **FSMS-ISO22000:2005**
 - **Halal Certification**

FSSS: MONITORING & SURVEILLANCE

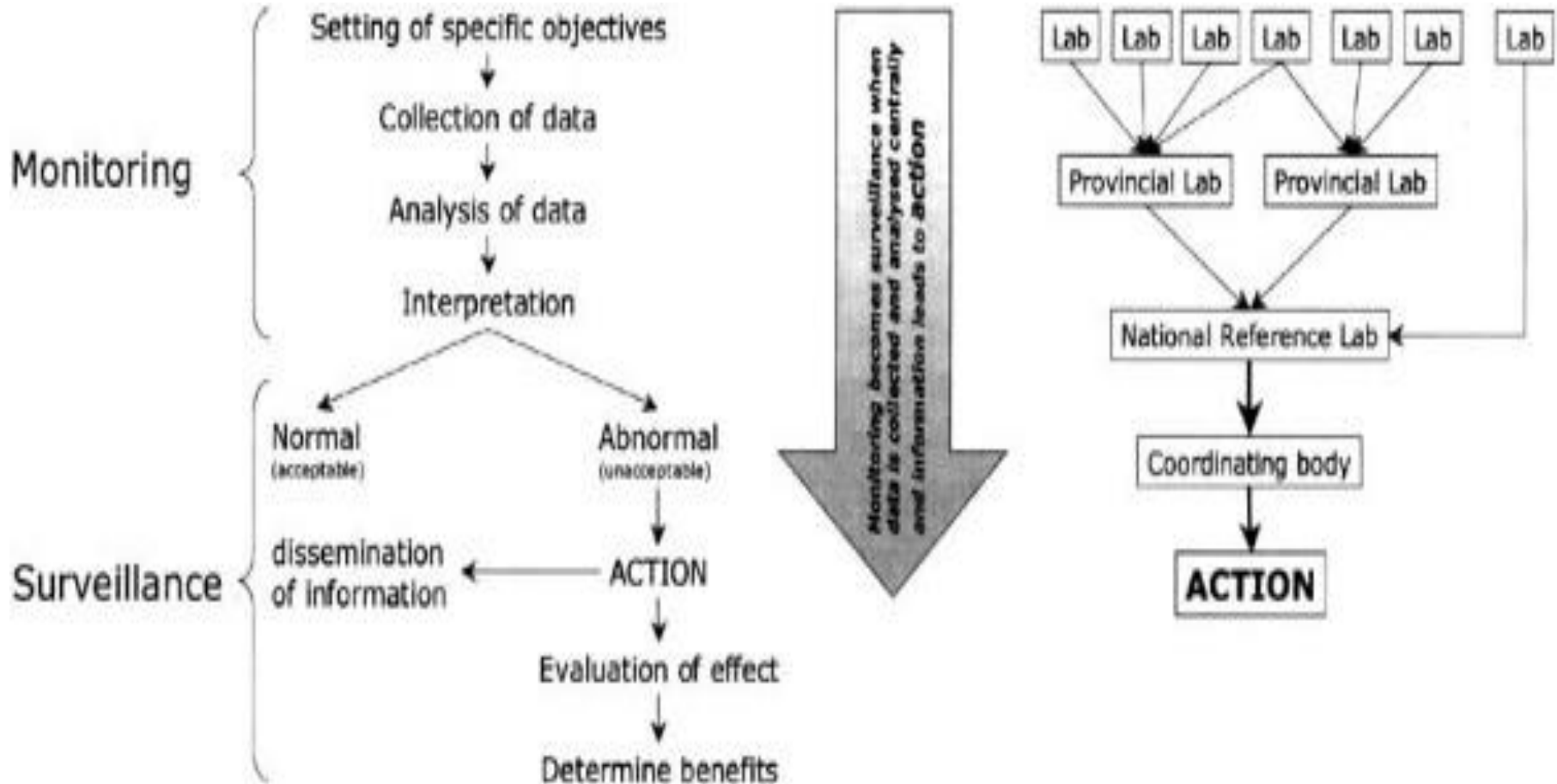
Monitoring

"The **performance** and **analysis** of routine **measurements**, aimed at **detecting changes** in the **environment** or **health status** of **populations**".

Surveillance

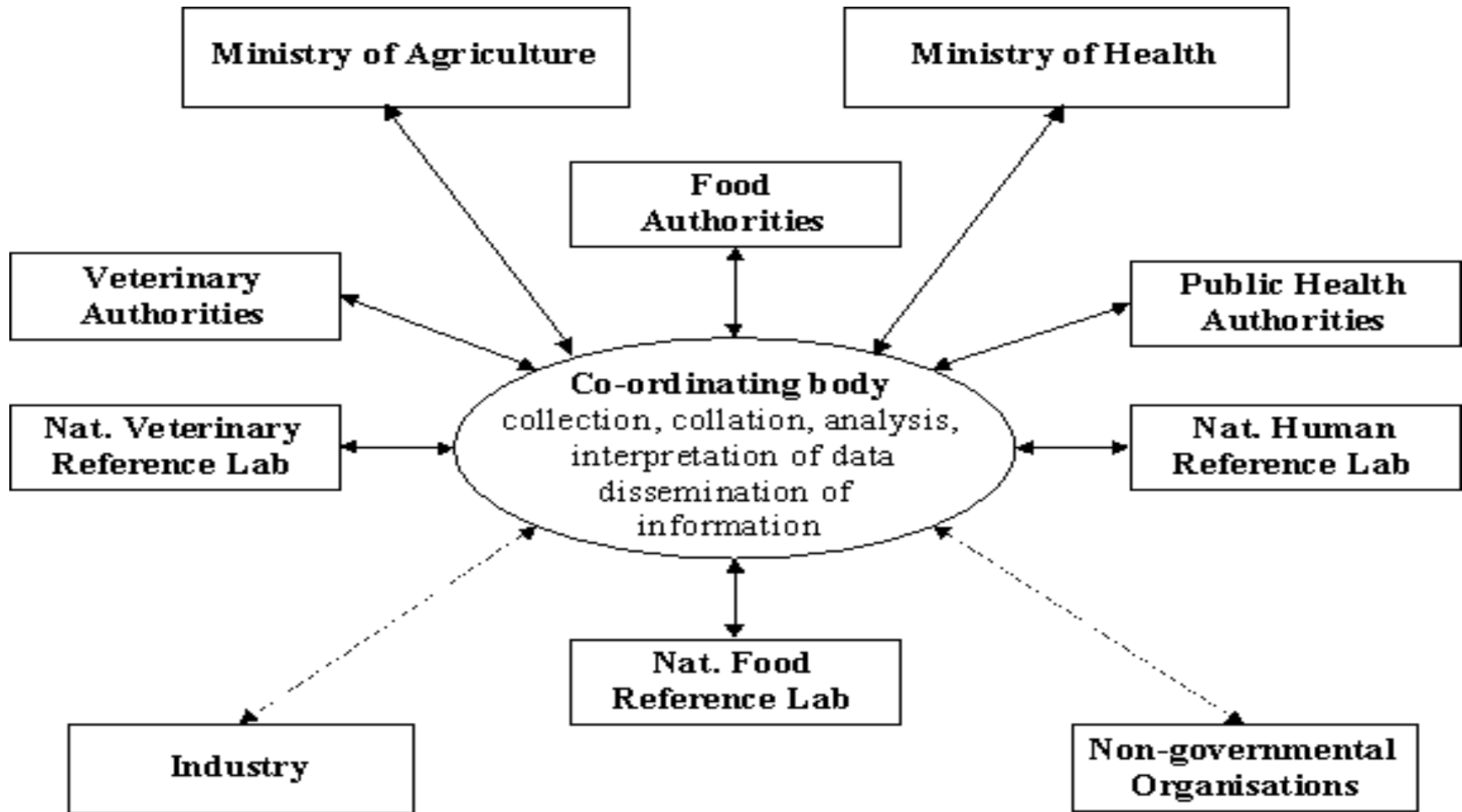
"The **ongoing systematic collection, collation (compare), analysis** and **interpretation** of data, followed by the **dissemination** of **information** to all those **involved** so that **directed actions** may be taken." (WHO/CDS/CSR)

FSSS: MONITORING & SURVEILLANCE



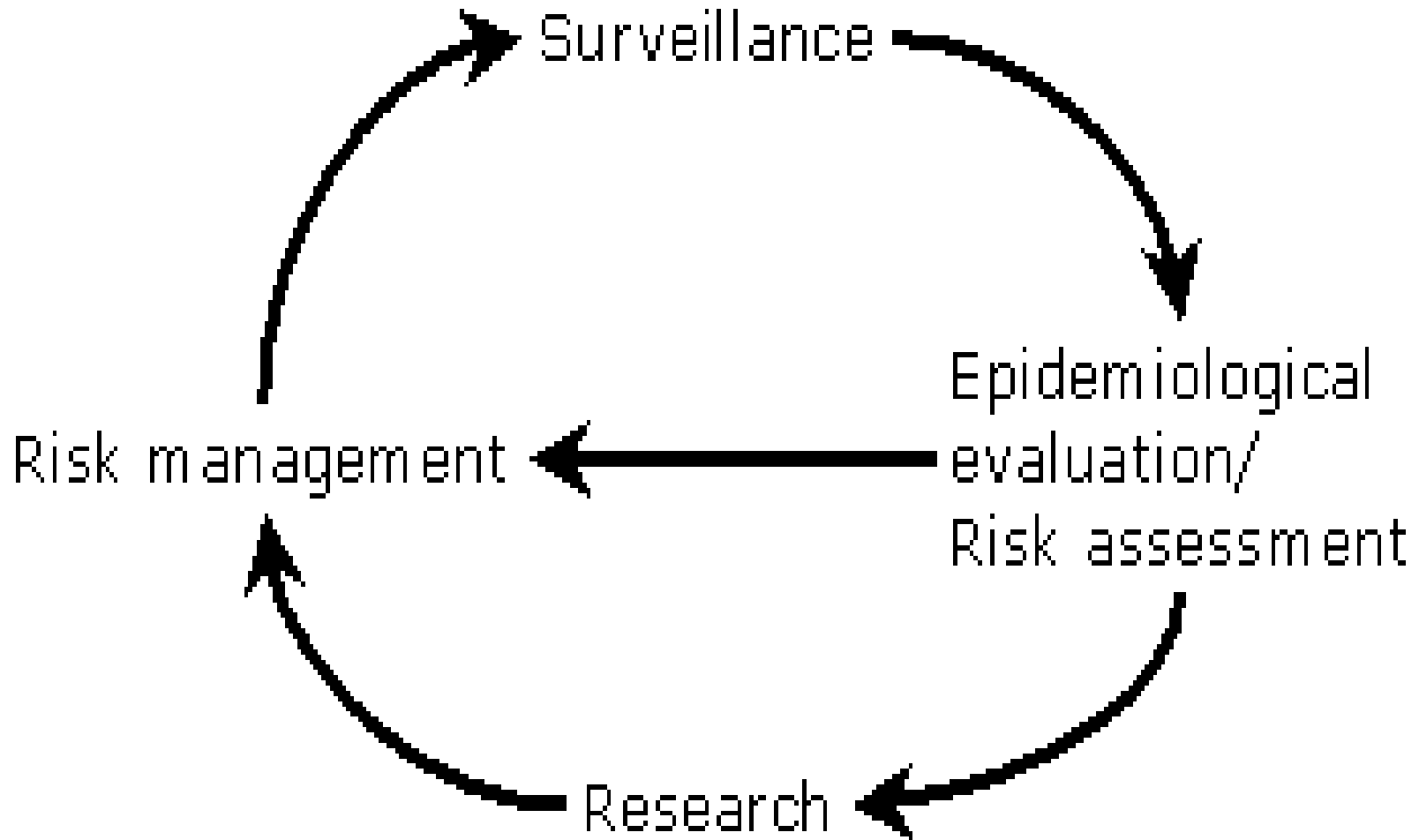
GRAPHIC PRESENTATION ILLUSTRATING THE RELATION BETWEEN MONITORING AND SURVEILLANCE

FSSS: MONITORING & SURVEILLANCE



SCHEMATIC PRESENTATION OF THE COLLECTION, COLLATION, ANALYSIS AND INTERPRETATION OF SURVEILLANCE DATA AND THE SUBSEQUENT DISSEMINATION OF INFORMATION TO ALL THE MAJOR STAKEHOLDERS IN FOOD SAFETY

FSSS: MONITORING & SURVEILLANCE



THE CYCLE OF PUBLIC HEALTH PROTECTION, ILLUSTRATING THE ROLE OF SURVEILLANCE IN SUPPORTING RISK ASSESSMENT, RISK MANAGEMENT AND FORMULATING NEW RESEARCH EFFORTS

CENTRALLY CO-COORDINATED MICROBIOLOGICAL PROJECTS PERFORMED IN DENMARK IN 2003, WITH THE NUMBER OF SAMPLES INVESTIGATED

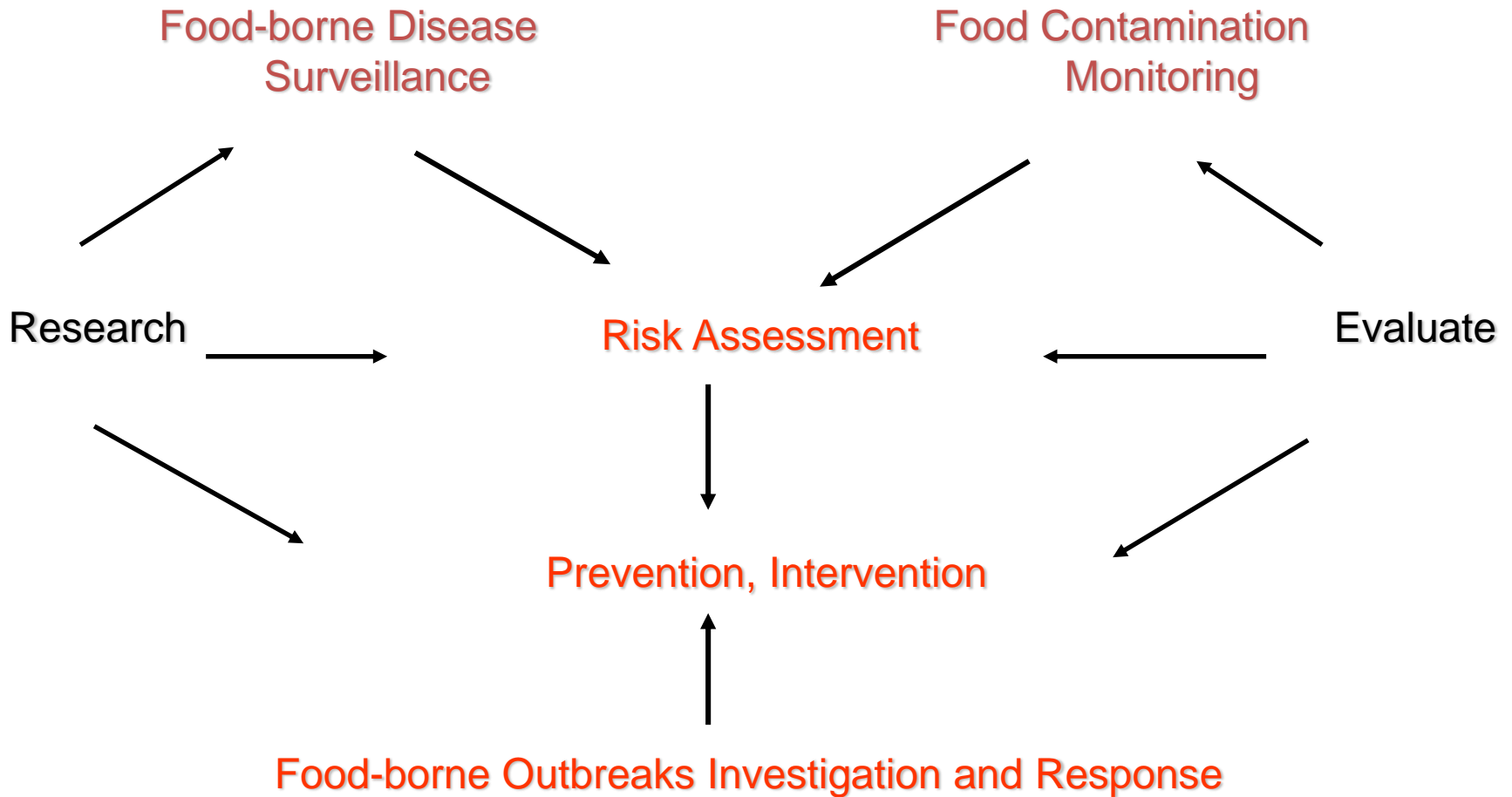
Aim	Project	Samples
Risk Profiling	Presence of VTEC O26, O103, O111 and O143 in beef cattle	1500
	Presence of Campylobacter in pre-cut ready-to-eat salad	500
Risk Assessment	Effect of different reduction strategies on the number of Campylobacter on broilers at slaughter level	2000
	Presence and number of Campylobacter on turkeys during slaughter combined with antibiotic resistance testing	1500
Risk Management	Surveillance programme on antibiotic resistance in bacteria from foods (DANMAP)	1000
	Listeria monocytogenes in ready-to-eat foods	1200
	Vibrio in seafoods (EU control campaign)	1000
	Total	8700

FOOD SAFETY SURVEILLANCE SYSTEMS

The **surveillance systems** have a twin **purpose**

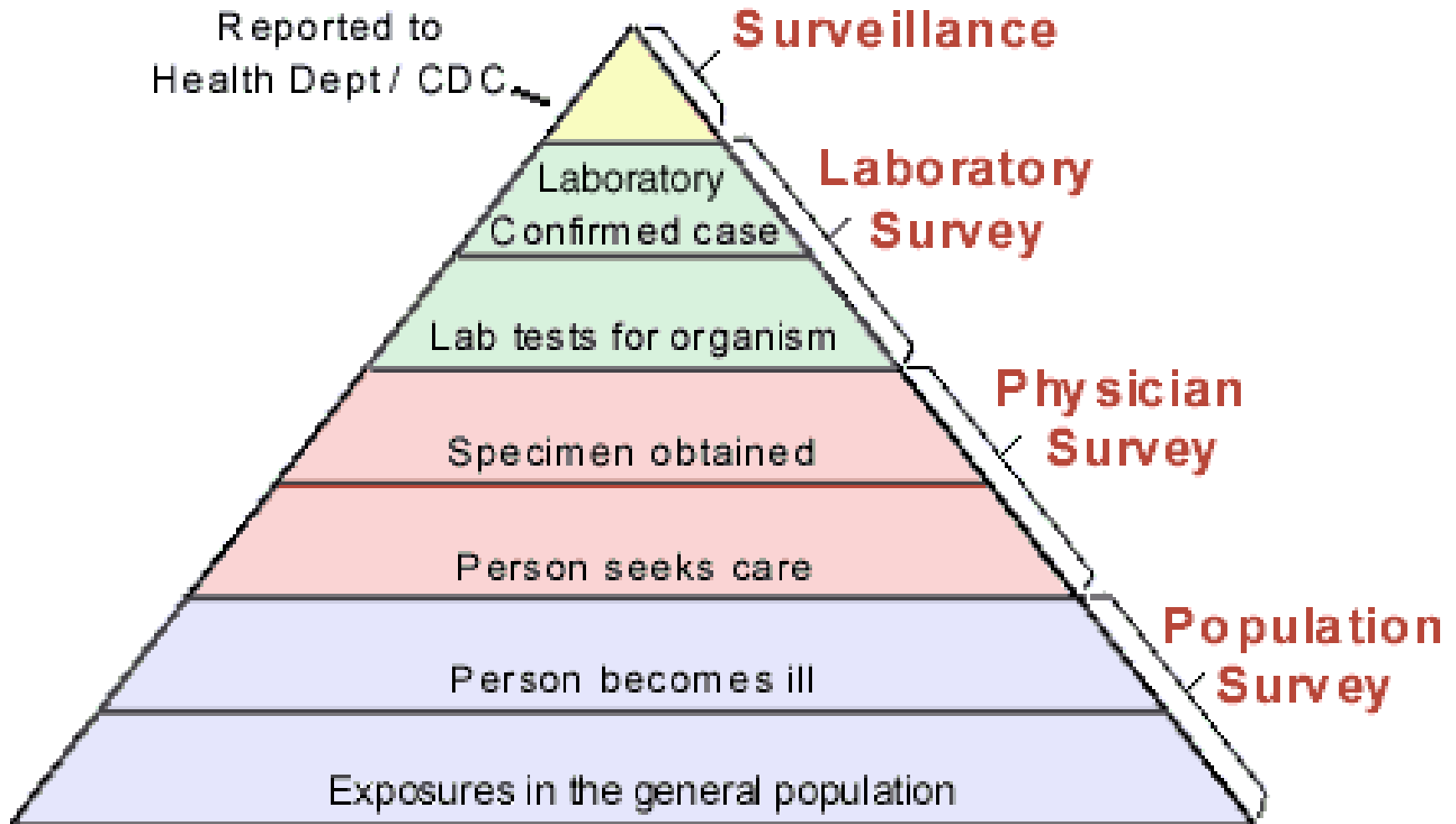
- Initial is to **notice, control** and **stop** **foodborne** disease **outbreaks**
- Most of the countries have such **surveillance** and **response systems** in place; however, the **effectiveness** and **coverage** of these **systems** vary from country to country

FRAMEWORK

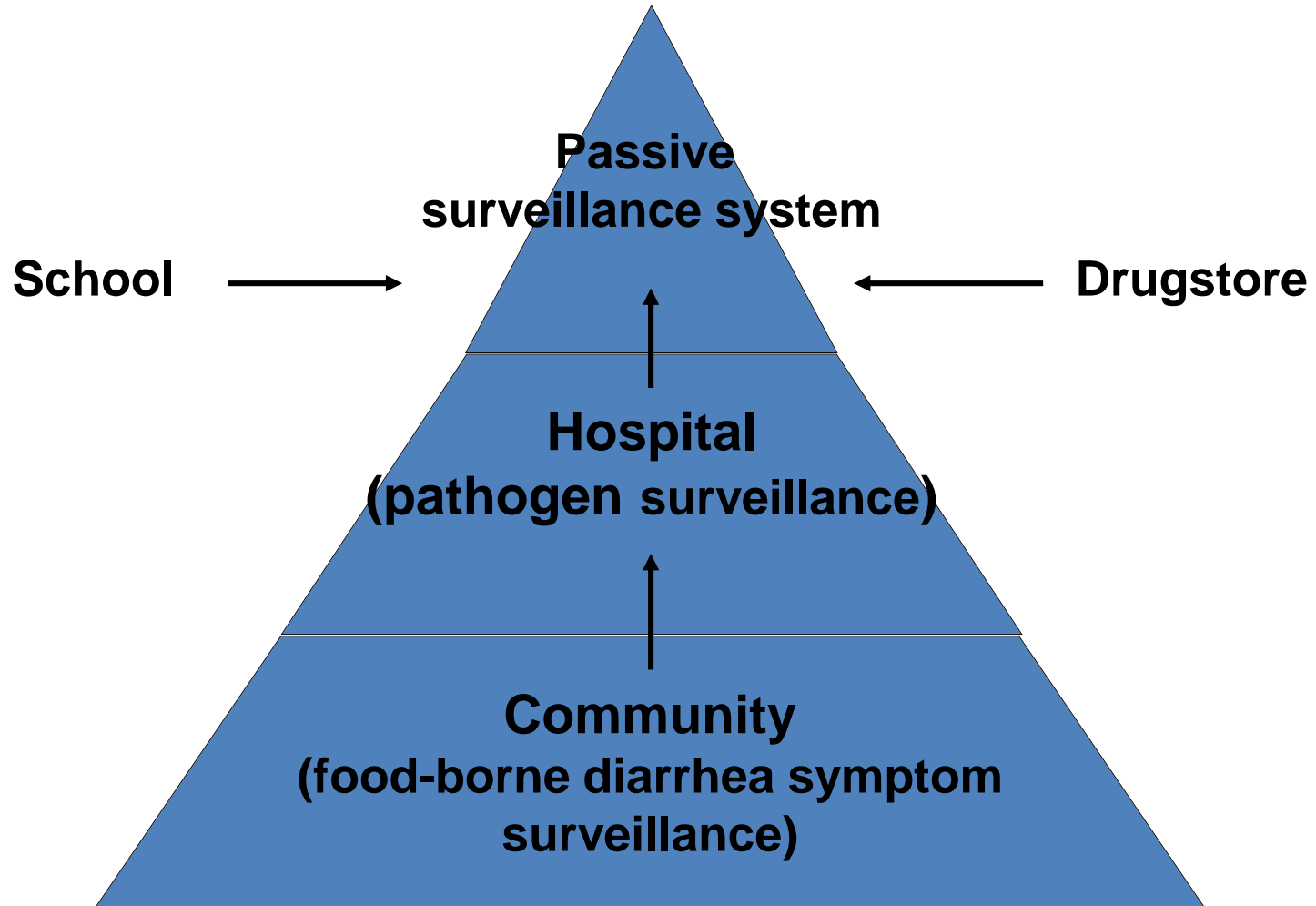


BURDEN OF ILLNESS PYRAMID

Cases reported through passive surveillance represent fraction of actual number of cases in community



FOOD-BORNE DISEASE SURVEILLANCE



The Current Surveillance Pyramid

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FST-407. L # 16. FOOD SAFETY SYSTEMS-II

FS & FSSS AIMS

- Food safety is defined as the provision of **safe, nutritious** and **wholesome** food to the **masses**.
- It provides the **assurance** that food will not cause any **harm / hazard** to the **consumer** when it is prepared or eaten according to its intended use.
- The **basic aim** of any **food safety system** is to **protect** the food from possible **contamination** and especially the consumer from **toxicity, diseases** or **ailments** caused due to the intake of **unsafe** food.
- Keeping customers and employees **safe** will help to make the industry a better location to work in and a place where customers will willingly return.

FAO/WHO GUIDES: FSSS

- According to **FAO/WHO**, food control / safety **system** is the **mandatory regulatory activity** of **enforcement** by **national** and **local** authorities to provide consumer **protection** and **ensure** that all foods during **production**, **handling**, **storage**, **processing** and **distribution** are **safe**, **wholesome** and **fit** for human **consumption**; **conform** to **safety** and **quality** requirements and are **honestly** and **accurately** **labelled** as prescribed by law.

FAO/WHO TARGET: FSSS

- There are several quality systems in vogue to achieve the targets set by **FAO/WHO**. These include Total Quality management (TQM), Good Manufacturing Practices (GMP), Hazard Analysis and Critical Control Point (HACCP), and Food Safety Management System (FSMS-ISO 22000:2005).

ETHNIC FOODS : FSSS

- For **ethnic** foods, a number of **certification** systems have emerged, among which **Kosher** and **Halal** Food Certification deal with foods consumed by **Jews** and **Muslims**, respectively.
- The primary **mandate** of all these systems is to provide the consumer with food which is **safe** and according to his **desires**.

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FST-407. L # 17.

TOTAL QUALITY MANAGEMENT

TQM

TOTAL QUALITY MANAGEMENT

- TOTAL QUALITY MANAGEMENT (TQM) IS A SET OF MANAGEMENT PRACTICES OR APPROACH THROUGHOUT THE ORGANIZATION, GEARED TO ENSURE THAT THE ORGANIZATION CONSISTENTLY MEETS TO CUSTOMER REQUIREMENTS.
- IT PLACES STRONG FOCUS ON PROCESS MEASUREMENT AND CONTROLS AS MEANS OF CONTINUOUS IMPROVEMENT.

TOTAL QUALITY MANAGEMENT

- TQM **IMPROVES** THE **QUALITY** BY ENSURING **CONFORMANCE** TO INTERNAL REQUIREMENTS.
- THE MAIN DRIVING FORCE OF TQM IS **LONG TERM SUCCESS** THROUGH CUSTOMER **SATISFACTION**.
- **TQM** IS OFTEN **ASSOCIATED** WITH THE **DEVELOPMENT**, **DEPLOYMENT** AND **MAINTENANCE** OF **ORGANIZATIONAL SYSTEMS** THAT ARE REQUIRED FOR VARIOUS BUSINESS PROCESSES.

TOTAL QUALITY MANAGEMENT

- THE **BASIS** OF TQM IS TO **MINIMIZE THE ERRORS** OCCURRING DURING THE **MANUFACTURING OR SERVICE** PROCESS, INCREASE CUSTOMER **SATISFACTION**, **STREAMLINE SUPPLY CHAIN MANAGEMENT**, **MODERNIZE THE EQUIPMENT AND ENSURE JOB ORIENTED TRAINING**.
- IN A TQM **EFFORT**, **ALL MEMBERS** OF THE ORGANIZATION **PARTICIPATE** IN IMPROVING **PROCESSES, PRODUCTS, SERVICES AND THE CULTURE** IN WHICH THEY WORK.
- **ONE** OF THE PRINCIPAL **AIMS** OF TQM IS TO **LIMIT ERRORS TO 1 PER 1 MILLION** UNITS PRODUCED.

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FST-407. L # 18.

GOOD MANUFACTURING PRACTICES

GMP

GOOD MANUFACTURING PRACTICES

- Good manufacturing practice (GMP) is a **quality system** designed to **ensure production** of **good quality products** in a **clean and safe environment**.
- **Quality**, in a **nutshell**, relates to **consumer satisfaction**.
- This **system** is **composed** of **guidelines** that **outline** different aspects of **production** and **testing** which can have an **impact** on the **quality** of a product.

GOOD MANUFACTURING PRACTICES

Good manufacturing practices lie at the heart of quality and comprise a variety of practices that include:

- Quality assurance of **raw** materials
- **Record keeping** of all materials throughout the **manufacturing** process
- **Standards** for **cleanliness** and **safety**
- **Qualifications** of **manufacturing personnel**
- In-house **testing**
- **Production** and **process controls**
- **Warehousing** and **distribution.**

GOOD MANUFACTURING PRACTICES

- Thus GMP involves basic **guidelines** starting from **receiving** of **raw** materials till the **final** production and also the **recall traceability procedures**.
- These guidelines are a **series** of general **principles** that must be **observed** during **manufacturing**.
- When a company is **setting** up its **quality program** and **manufacturing** process, there may be many ways it can **fulfil GMP** requirements.
- It is the **company's** **responsibility** to **determine** the **most effective and efficient quality process**.

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FST-407. L # 19.

HAZARD ANALYSIS CRITICAL CONTROL POINTS

HACCP

HAZARD ANALYSIS CRITICAL CONTROL POINTS

- Hazard analysis critical control points (**HACCP**) is a concept that has its origin in the **US Army** and **NASA**.
- The idea behind the HACCP **approach** is **to develop** a **plan** that **anticipates** and **identifies** places in the **production process** known as critical control points (**CCPs**) where **contaminants** might be **introduced** or other **food safety concerns** can be identified.
- Where **critical limits** are **exceeded** **corrective** action must be taken and documented.

HAZARD ANALYSIS CRITICAL CONTROL POINTS

HACCP comprises of **Seven basic Principles**

1. Analyze hazards
2. Identify critical control points
3. Establish preventive measures with critical limits for each control point
4. Establish procedures to monitor the critical control points
5. Establish corrective actions to be taken when monitoring shows that a critical limit has not been met
6. Establish verification procedures
7. Establish effective record keeping to document the HACCP system

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FST-407. L # 20.

FSMS ISO 22000:2005

FSMS ISO 22000:2005

- Food **S**afety System (**HACCP**) and Food **Q**uality System (**ISO-9001**) were amalgamated to form a new system i.e. **Food Safety Management System (ISO-22000)**.
- This system **specifies requirements** for a **Food Safety Management System** where an organization in the food chain **needs to demonstrate** its **ability** to control food safety **hazards** to ensure that food is **safe** at the time of human **consumption**.

FSMS ISO 22000:2005

- It is **applicable** to all **organizations**, regardless of **size**, which are involved in any **aspect** of the food chain and **wish** to **implement** systems that consistently provide **safe** products.
- The **means** of meeting any requirements of **ISO-22000** can be accomplished through the use of **internal** and/or **external** resources.

FSMS ISO 22000:2005

ISO-22000 specifies **requirements** to enable an organization to:

- **Plan, implement, operate, maintain** and **update** a **food safety management system** aimed at providing **products** that, according to their **intended** use, are **SAFE** for the consumer.
- **Demonstrate** compliance with applicable **statutory** and **regulatory** food safety requirements.
- **Evaluate** and **assess customer requirements** and demonstrate **conformity** with those mutually agreed customer requirements that relate to food safety, in order to enhance **customer satisfaction**.

FSMS ISO 22000:2005

- Effectively **communicate** food safety **issues** to their **suppliers**, **customers** and relevant interested **parties** in the food chain.
- **Ensure** that the organization **conforms** to its stated food safety **policy**.
- **Demonstrate** such **conformity** to relevant interested parties.
- **Seek certification** or **registration** of its food safety management system by an **external** organization, or make a **self-assessment** or **self-declaration of conformity to ISO 22000**.

FST-407.L # 21.

HALAL FOOD CERTIFICATION

HALAL FOOD CERTIFICATION

- Halal Food Certification is basically **not** a **safety surveillance system** *per se*, but it is a system by which **foods** are certified based on the **Islamic Injunctions**.
- **Muslims** have been **ORDERED** to eat only **Halal** (Lawful, Permissible) foods and refrain from the **Haram** (Unlawful, Prohibited).

HALAL FOOD CERTIFICATION

- The **Halal** or **Lawful animals** are all those that have **split hooves** and **masticate** the cud (ruminants).
- These include **cows, buffaloes, camels, llama, deer,** and the like.
- Halal **birds** are **poultry, duck, turkey, quail** and **similar** species.
- As far as foods of **water origin** are concerned, according to “**Sunnih**” school of thought, all **fish** are lawful, while the “*Asna Ashria*” (‘Shia’) school of thought consider only fish with **fins** and **scales** are lawful

HALAL FOOD CERTIFICATION

- Another **requirement** for **Halal** is that all **land animals** and **birds** must be **slaughtered** in specific **manner** that ensures **complete bleeding**.
- From amongst foods of **plant** origin, all plants that nourish and do not cause **harm** to the human body are permitted.
- All **intoxicants** are **prohibited** in **Islam**

HALAL FOOD CERTIFICATION

- On the other hand, the **UNLAWFUL** animals are all those that **either do not have split hooves, or do not chew the cud.**
- This includes **pork, carnivorous** animals, etc.
- **Birds** of prey are not permissible in Islam.
- Moreover, all **reptiles, amphibians** and **poisonous** animals are **UNLAWFUL.**
- Thus **snakes, lizards, frogs, crocodiles** and similar animals are **not permitted in Islam.**

HALAL FOOD CERTIFICATION

- Another **requirement** for a food to be **HALAL** is its being “**TAYYAB**” or **CLEAN**.
- This ensures that the food produced for the **Muslims** must be **clean** and without any **health hazards**.
- Halal food **certification** involves **procedures** that whatever food is being processed in a facility **meets the Islamic injunctions**.
- The **HALAL** certification body **receives information** on the **ingredients** and **processes** from the **applicant company**.
- It then analyses this information and determines whether any **unlawful** ingredient is being **used** or **not**.

HALAL FOOD CERTIFICATION

- If the **certification body** is **satisfied** that the **ingredients** are **LAWFUL** then it sends its **Audit Inspector(s)** to visit the facility.
- The **equipment**, the **process** and the **premises** are inspected that there is **no contamination especially**, from any **non-halal source**.
- The **Audit Inspectors** also **ensure** that the **company** is following all the **hygienic** principles for the production of **SAFE** or '**TAYYAB**' food.
- Once **satisfied**, a certificate is issued to the company for the specific products.

HALAL FOOD CERTIFICATION

- Halal **certificate** is an **authority** that the particular industry is following the **Islamic** Principles and is producing **HALAL** and **SAFE** foods for the specifically for **Muslims** or any one
- It is, in **fact**, a **Safety Certificate** as well and non-Muslim consumers also attracted.