

Secondary Engagement Programme

Christmas Term

Grade 10

Activity Sheets

Agricultural Science



MINISTRY OF EDUCATION



**MINISTRY OF EDUCATION  
SECONDARY ENGAGEMENT PROGRAMME  
OCTOBER 2020**

**WEEK 4**

**LESSON # 2**

**GRADE :10**

**SUBJECT : AGRICULTURAL SCIENCE  
TOPIC : DISTRIBUTION OF MAJOR CROPS  
SUB TOPIC : FOOD SECURITY AND FOOD SAFETY**

## **Objectives**

To recognize the importance of food security.

To recognize the importance of food safety.

## FOOD SECURITY

Food security is a measure of the availability of food and individuals' ability to access it.

It exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.

Incorporates a measure of resilience to future disruption or unavailability of critical food supply due to various risk factors including droughts, shipping disruptions, fuel shortages, economic instability, and wars.

Household food security exists when all members, at all times, have access to enough food for an active, healthy life.

The Food and Agriculture Organization of the United Nations, or FAO, identified the four pillars of food security as availability, access, utilization, and stability.

With the increasing food import bill placing significant strain on CARICOM economies, achieving food security is a regional priority.

Food security in the Caribbean requires the revitalization of sustainable local food production systems.

## **Measurement of food security**

Food security can be measured by calorie to intake per person per day, available on a household budget.

In general, the objective of food security indicators and measurements is to capture some or all of the main components of food security in terms of food availability, accessibility, and utilization/adequacy.

Several measurements have been developed to capture the access component of food security. These include:

**Household Food Insecurity Access Scale (HFIAS)** – continuously measures the degree of food insecurity (inaccessibility) in the household in the previous month.

**Household Dietary Diversity Scale (HDDS)** – measures the number of different food groups consumed over a specific reference period (24hrs/48hrs/7days).

**Household Hunger Scale (HHS)**- measures the experience of household food deprivation based on a set of predictable reactions, captured through a survey and summarized in a scale.

**Coping Strategies Index (CSI)** – assesses household behaviors and rates them based on a set of varied established behaviors on how households cope with food shortages.

## Pillars of food security



## **Pillars of food security**

**Food availability** relates to the supply of food through production, distribution, and exchange. Because food consumers outnumber producers in every country, food must be distributed to different regions or nations.

Food distribution involves the storage, processing, transport, packaging, and marketing of food. Food-chain infrastructure and storage technologies on farms can also affect the amount of food wasted in the distribution process.

Poor transport infrastructure can increase the price of supplying water and fertilizer as well as the price of moving food to national and global markets.

**Food access** refers to the affordability and allocation of food, as well as the preferences of individuals and households.

Poverty can limit access to food, and can also increase how vulnerable an individual or household is to food price spikes.

Access depends on whether the household has enough income to purchase food at prevailing prices or has sufficient land and other resources to grow its own food.

There are two distinct types of access to food:

- direct access, in which a household produces food using human and material resources
- economic access, in which a household purchases food produced elsewhere.

Location can affect access to food and which type of access a family will rely on.

## **Pillars of food security**

**Food utilization** refers to the metabolism of food by individuals.

Food ingested must be safe and must be enough to meet the physiological requirements of each individual.

Food safety affects food utilization, and can be affected by the preparation, processing, and cooking of food in the community and household.

Nutritional values of the household determine food choice. Access to healthcare is another determinant of food utilization, since the health of individuals controls how the food is metabolized.

Sanitation can also decrease the occurrence and spread of diseases that can affect food utilization.

Education about nutrition and food preparation can affect food utilization and improve this pillar of food security.

**Food stability** refers to the ability to obtain food over time.

Food insecurity can be transitory, seasonal, or chronic. In transitory food insecurity, food may be unavailable during certain periods of time.

At the food production level, natural disasters and drought result in crop failure and decreased food availability.

Civil conflicts can also decrease access to food. Instability in markets resulting in food-price spikes can cause transitory food insecurity.

Other factors that can temporarily cause food insecurity are loss of employment or productivity, which can be caused by illness.

Seasonal food insecurity can result from the regular pattern of growing seasons in food production.



# FOOD SAFETY

**Food safety** is used as a scientific discipline describing handling, preparation, and storage of food in ways that prevent food-borne illness.

The occurrence of two or more cases of a similar illnesses resulting from the ingestion of a common food is known as a foodborne disease outbreak.

In this way food safety often overlaps with food defense, to prevent harm to consumers.

The tracks within this line of thought are safety between industry and the market and then between the market and the consumer.

Food safety considerations include the origins of food including the practices relating to food labelling, food hygiene, food additives and pesticide residues, as well as policies on biotechnology and food, guidelines for the management of government import, and export inspection and certification systems for foods.

In considering market to consumer practices, the usual thought is that food ought to be safe in the market and the concern is safe delivery and preparation of the food for the consumer.

Food can transmit pathogens which can result in the illness or death of the person or other animals. The main mediums are bacteria, viruses, mold, and fungus.

Pathogens can be introduced into foods no matter how many precautions are taken. The five key principles of food hygiene, according to WHO, are:

Prevent contaminating food with pathogens spreading from people, pets, and pests.

Separate raw and cooked foods to prevent contaminating the cooked foods.

Cook foods for the appropriate length of time and at the appropriate temperature to kill pathogens.

Store food at the proper temperature.

Use safe water and safe raw materials.

# THREATS TO FOOD SAFETY

Food contamination can be...

## BIOLOGICAL

When a food is contaminated by a living organism or a substance produced by a living organism.

## PHYSICAL

When a foreign object enters a food at any stage of the production process.

## CHEMICAL

When a food is contaminated by contact with a chemical substance. Chemical contaminants can be "natural" or "artificial".

## **Food contamination**

Food contamination happens when foods are corrupted with another substance. It can happen in the process of production, transportation, packaging, storage, sales and cooking process. The contamination can be physical, chemical and biological.

### **Physical contamination**

Physical contaminants (or 'foreign bodies') are objects such as hair, plant stalks or pieces of plastic and metal. When the foreign object comes into the food, it is a physical contaminant.

If the foreign objects are bacteria, both a physical and biological contamination will occur.

Common sources to create physical contaminants are: hair, glass or metal, pests, jewelry, dirt and fingernails.

### **Chemical contamination**

Chemical contamination happens when food is contaminated with a natural or artificial chemical substance. Common sources of chemical contamination can include: pesticides, herbicides, veterinary drugs, contamination from environmental sources (water, air or soil pollution), cross-contamination during food processing, migration from food packaging materials, presence of natural toxins or use of unapproved food additives and adulterants.

### **Biological contamination**

Biological contamination refers to food that has been contaminated by substances produced by living creatures, such as humans, rodents, pests or microorganisms.

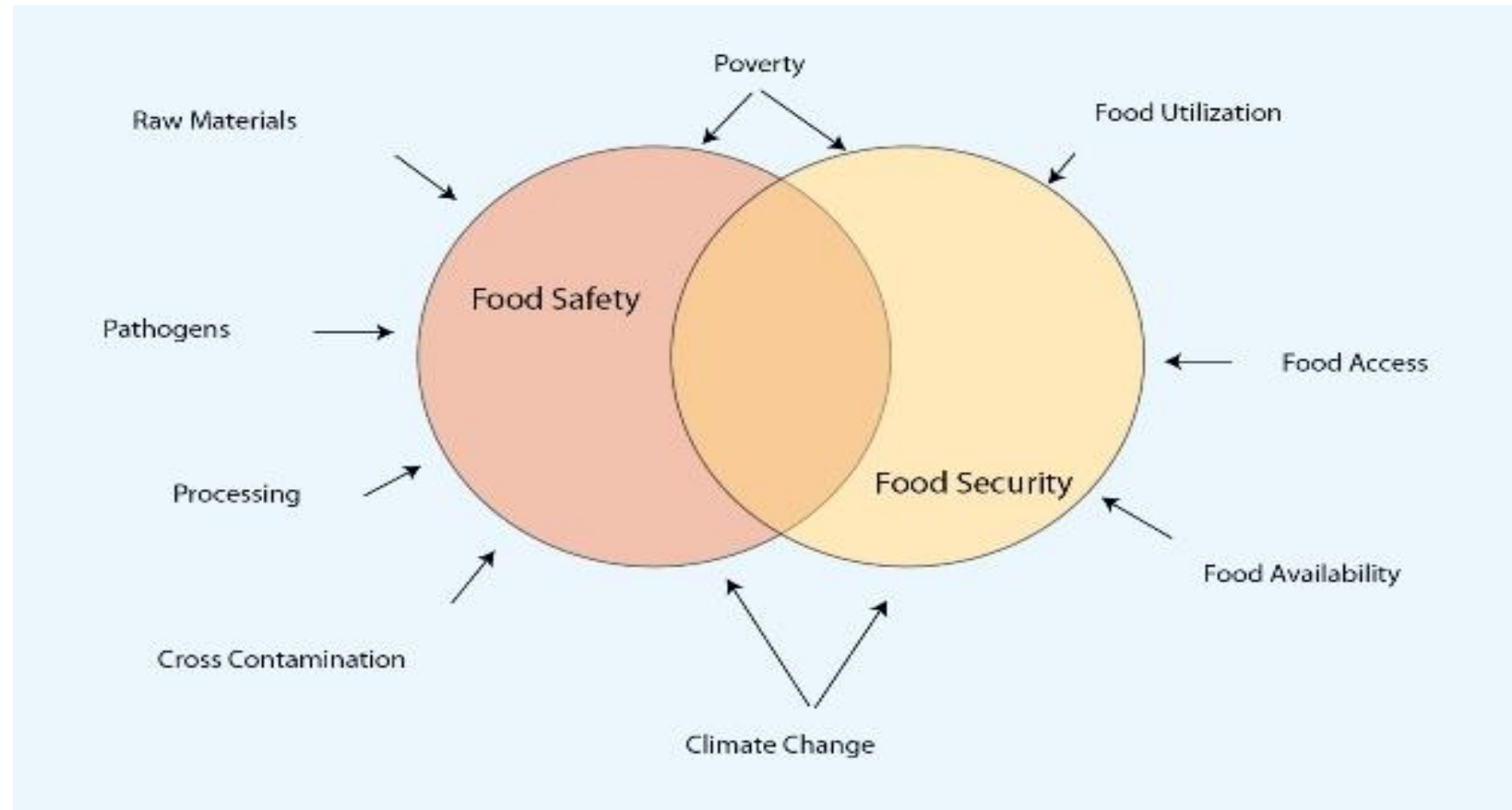
This includes bacteria contamination, viral contamination, or parasite contamination that is transferred through saliva, pest droppings, blood or faecal matter.

Bacterial contamination is the most common cause of food poisoning worldwide.

## Interrelationship of food safety and food security.

Food security is the adequacy of food to society, the equitable distribution, confirmed supply, fair access and, sustained sources.

Food safety encompasses many facets of handling, preparation and storage of food to prevent illness and injury. Food security means the availability of food for everyone without any shortages.



**MOOC**

**Food Safety and HACCP**  
(Hazard Analysis and Critical Control Points)  
**ON COVID 19**

**FOOD SAFETY**



## Food Safety Health Advice To Prevent The Spread of Virus



Wash all food carefully.



Cook meat well.



Drink lots of fluids.



Don't share food, utensils, water bottles or cups.



Clean surfaces such as tables with antibacterial bleach wipes.



Use different chopping boards and knives for raw meat and cooked foods.



Eat lots of Vitamin C to strengthen your immune system.



For more info on Coronavirus visit our website: [fscluster.org](http://fscluster.org)



**FOOD SECURITY CLUSTER**



## **Review questions**

1. Differentiate between food security and food safety.
2. Discuss two pillars of food security.
3. Why is it important to measure food security in your country.
4. Discuss two threats to food safety.
5. Explain the acronym HACCP.

## **References**

R. Ramharacksingh, 2011. Agricultural science for C.S.E.C examination Macmillan publishers.  
S. Ragoonanan, 2011. Agriculture for C.S.E.C revision course. Caribbean Educational publishers.

<https://www.Nature.Com/scitable/knowledge/library/food-safety-and-food-security-68168348/>

[https://en.Wikipedia.Org/wiki/food\\_security](https://en.Wikipedia.Org/wiki/food_security)

## **video link**

[https://www.Youtube.Com/watch?V=okika8\\_rx2e](https://www.Youtube.Com/watch?V=okika8_rx2e)

<https://www.Youtube.Com/watch?V=uumauikjiqq>

[https://www.Youtube.Com/watch?V=qiy19\\_kvuew](https://www.Youtube.Com/watch?V=qiy19_kvuew)

[https://www.Youtube.Com/watch?V=fatk14ve\\_o](https://www.Youtube.Com/watch?V=fatk14ve_o)

<https://www.Youtube.Com/watch?V=wo5mid90wmg>