



# MODULE 4. Sustainable Food System



## Migrants' Integration through Culinary Arts Cooking Cultures

*Erasmus + Programme [2019-1-KA204-074418]*



**symplexis**





## PRIORITY FOR CULINARY SECTOR POSITIONS

There are many professions in the culinary sector. We have gathered some of these professions under 4 groups, based on the jobs of the people who participated in the “Cooking Cultures” surveys. These profession groups and the professions in them are as follows and are indicative:

**1. Chef and Cooking Professionals:** Chef, Assistant chef, Meat processor, Gastronomy Specialist, Confectioner, Baker, Pastry Chef, Culinary Art Technician, Boutique chocolatier and some local chefs (Pizzeria Chef, Kebap chef (Kebapçı) etc.)

**2. Kitchen Industry Managers / Experts:** Restaurant Specialist, Kitchen manager, Catering Company Manager, Dietician, Food Engineer, Food Technology Technician

**3. Customer Services:** Bar attendant, Service attendant, Service manager, Supplier, Courier, Waiter, Chief waiter, Komi, Cashier/Phone customer service

**4. Cleaning staff/Expert:** Scullery attendant, Dishwasher, Hygiene Staff, Sanitation Staff



## PRIORITY FOR CULINARY SECTOR POSITIONS



Not all modules (training courses) we create are a priority for all of these professions. This grouping is made to explain the priorities of the trainings given according to the professions at national and international level. Three types of prioritization systems have been stated. These priorities and meanings are as follows;



**HIGH PRIORITY**

***This module is a high priority for this profession group.  
This professional group should definitely receive this training.***

**MEDIUM PRIORITY**

***This module is of medium priority for this profession group. This professional group is recommended to take this module.***

**LOW PRIORITY**

***This module is of low priority for this profession group. It is not necessary for the professional group to receive this module.***

## PRIORITY FOR CULINARY SECTOR POSITIONS



So, is this module a priority for your profession? Please view priorities by profession groups below.

The priority of the “**Sustainable Food Systems**” module for professional groups are as follows:

**MEDIUM PRIORITY**

**1. Chefs and Cooking Professionals**

**HIGH PRIORITY**

**2. Kitchen Industry Managers / Experts**

**MEDIUM PRIORITY**

**3. Customer Services**

**MEDIUM PRIORITY**

**4. Cleaning staff/Expert**



## AIMS & OBJECTIVES



This module will introduce the migrant learners in the following topics:

1. What is sustainability and the significance of sustainable food
2. The fact that sustainability is not only environmentally, but also socially and economically important.
3. Systems in the sustainable food chain
4. Sustainable nutrition and its importance in the kitchen sector
5. Quality control and preservation of products used in the food industry; who will implement them and how
6. How to avoid food waste
7. What can be done to ensure sustainable food



## LEARNING OUTCOMES



Upon completion of this module, the learners will be able to:

**LOut1:** To understand what information will integrate migrants into employment

**LOut2:** To analyze important of sustainable food

**LOut3:** To remember how to protect sustainable food for future generation



## KEYWORDS

- Sustainable Food
- Nutrition
- Quality Control
- Preservation
- Utilization
- Waste
- Production
- Distribution
- Consumption





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# UNIT 1: INTRODUCTION TO SUSTAINABILITY





## Topic 1: What is Sustainability?

**Definition of sustainability** is the ability to make the life of humanity permanent while ensuring the continuity of production and diversity. In other words, sustainability is the ability to meet our own needs without compromising the needs of future generations.

Making sustainability a lifestyle is significant for every individual in the world. Understanding sustainability must be indispensable especially for people working in the food and beverage industry in terms of the continuity of production.



Figure 1: <https://medium.com>





## Topic 2: When Did It Enter Our Life?

The public was first has met the sustainability concept through the report titled "**Our Common Future**" published in 1987 by the World Commission on Environment and Development working in the scope of the United Nations.

The definition of **sustainability** in the report was realized like that: "Humanity has the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs."

At the point, we are at today, although there is a general consensus that the world resources and the environment are moving towards the limit of depletion as a result of human activities, it is a common idea that sustainability can only be achieved by using the resources offered by nature at a rate that allows them to be renewed automatically.





## Topic 3: Why is Sustainability Important?

Individuals have a great responsibility for sustainability. Individuals have to first interiorize the importance of sustainability and set an example for society through changing their daily life habits such as lighting, warming, cleaning, and even nutrition, and thus contribute to the future.

On the other hand, those working in the food and beverage sectors, which are the most necessary sectors for the continuity of life, have to know and be aware of the processes of sustainability.





## Topic 3: Why is Sustainability Important?

Knowing the factors that constitute sustainability in order to ensure the sustainability of production or management enables a person involved in the production or management process to create a socially, environmentally, and economically integrated sustainability process.

If you are an individual working in the food and beverage industry, let's examine the components of sustainability together in the next topic.

For a better understanding of sustainability, please watch the video on the link:

<https://www.youtube.com/watch?v=rmQby7adocM>





## Topic 4: What are the Components of Sustainability?



Although the protection of the environment comes to mind when we say what is sustainability, the concept of sustainability is a holistic approach that includes ecological, economic, and social dimensions together.

Sustainability has 3 main components. These components are; environmental protection, economic growth, and social development. These concepts have to be managed in a balanced manner in order to ensure sustainability.

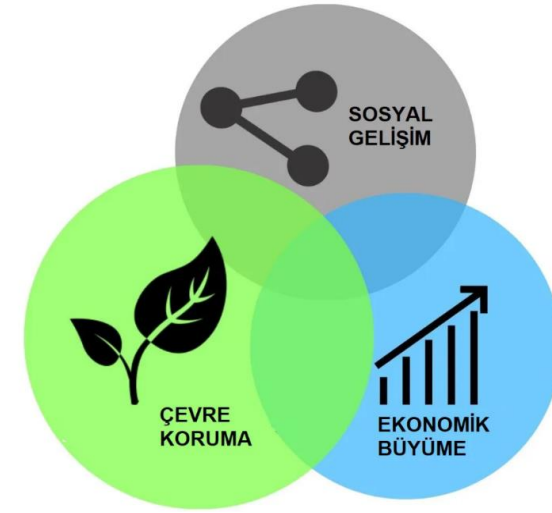


Figure 2: <https://tr.pinterest.com>





## Topic 4: What are the Components of Sustainability?

### A. Environmental Protection

The fundamental principle of sustainability focuses on the fact that the resources in the environment and nature are exhaustible and therefore use these resources with rational approaches. The integrity and flexibility of ecosystems are preserved.

### B. Economic Growth

Sustainability focuses on ensuring economic growth that will bring prosperity to societies without harming the environment. While the consumption of goods and services increases, it is aimed to increase human welfare.

### C. Social Development

Sustainability supports social development by focusing on the topic of achieving a satisfactory level of health, life, and education quality for all societies. In addition to the enrichment and strengthening of human relations, it is ensured that people can reach their goals individually and as a group.





## Topic 5: Introduction to Sustainable Food Systems

### 5.1. What are Sustainable Food Systems

Food systems are activities that include all elements related to the production, processing, distribution, preparation of food and the environmental, social, and economic impacts that interact with these activities.

The sustainable food system refers to a long-term structure that will contribute to food safety, the needs of future generations, and the protection of natural resources within the framework of the concept of sustainability. The aforementioned system has to be evaluated from various aspects due to its relationship with different fields.



Figure 3: <http://apelasyon.com>





## Topic 5: Introduction to Sustainable Food Systems

It is crucial for every individual working in the food industry to understand and interiorize a sustainable food system. Because if food is not made sustainable, every individual working in the sector will lose their job. Therefore, for a sustainable food system, every individual working in the food industry must carefully read this section and take action.

The concept of sustainable food has been created by taking into account the effects of the production and consumption of food, which is important for our health, on the resources in the world.

The mentioned concept includes the sensitivity of protection of the environment, natural resources, and healthy nutrition until the food is ready for consumption and during the consumption phase.





## Topic 5: Introduction to Sustainable Food Systems

Every individual working in food systems from production to consumption process must consider it as a business ethic to prevent harm to the environment and natural resources in order to provide sustainable food, firstly at the local and then at the national level.

The global food system consists of local and national food systems. Local food system; is defined as “local food production, processing, distribution and consumption affecting the environmental, economic, social sphere and food sphere”.

Local food systems often interact with each other. The national food system refers to the system that transcends the local food system at the national level.



Figure 4: <http://ntv.com.tr/>





## Topic 5: Introduction to Sustainable Food Systems

Sustainable food systems require the efficient and effective use of resources by taking into account the economic, social, and environmental impacts at almost every stage of the chain from farm to table.

An employee in the food industry must understand that s/he is an important part of the sustainable food system and need to know the value chain of food in order to use resources more efficiently. This is discussed in detail in the next section.

If you want to better understand sustainable food, please do not forget to watch the video on the link:

<https://www.youtube.com/watch?v=PyiVf26C5pc>





## Topic 5: Introduction to Sustainable Food Systems

### 5.2. Value Chain Parts in terms of Sustainable Food Systems

For every person working in the production, processing, distribution, and preparation process of the food industry, knowing the whole process of food systems provides a better understanding of the work done. For example, when a cook who cooks food with food knows all the steps of the food system, s/he knows that that food is not only produced but also processed and offered to his/her for use.

Although this is not vital for a cook, it makes him/her can consider more inclusive towards his/her work. As a result, s/he realizes that s/he cannot exist without the producer and processor and that they are all one.







## Topic 5: Introduction to Sustainable Food Systems

Let us assume a restaurant operator. This operator must know all the actors involved in the process and contact each actor in order not to be alienated from his/her work and to ensure the sustainability of the restaurant. It is compulsory for an operator to know how the product to be bought to be produced, processed, and distributed in order to maintain the quality of the business.

The totality of all processes in the food system is sometimes referred to as the food chain and is seen to be summarized by slogans such as "from field to table".







## Topic 5: Introduction to Sustainable Food Systems



Figure 5: <https://www.guzelyasa.com.tr/>

The food we consume reaches us thanks to the food chain that allows food to move systematically from producer to consumer. Every step of the food chain requires the existence and use of natural and human resources. When some impact happens in any part of this chain which can be likened to a domino, affects the whole chain.





## Topic 5: Introduction to Sustainable Food Systems



Figure 6: <https://www.yenisafak.com/>

### 5.2.1. Production

Production has fundamental importance as the first circle of the food chain, and its structure have to be built by considering all factors in order to ensure sustainability in the food system.

People who situated or work in any area of the food chain must know that the most significant step in the food chain is production. An employee involved in production processes must know that the most important part of food is agriculture.





## Topic 5: Introduction to Sustainable Food Systems

A disruption or development related to agriculture will affect every individual who works or wants to work in the food production sector, at the same level. In other words, understanding agriculture and the importance of agriculture concerns equally both an agricultural engineer involved in the production process and the person who preserves food.

Therefore, in order to ensure the sustainability of production, agriculture have to be made sustainable, and for this, especially those working in the sector must care about agriculture.





## Topic 5: Introduction to Sustainable Food Systems

In the production phase of food, agriculture is a field that directly concerns everyone. In the most basic terms, the fact that food is produced by agriculture makes us dependent on it for our survival. Agriculture can also be seen as a kind of industry that generates income for people who own and work in agricultural land.

Although agriculture is a way of life for many people, crop and animal production and the agricultural industry are the areas that use natural resources such as soil and water most. In this respect, agriculture has an effect on the living conditions of not only humans but many species.

Today, the irrigable area of 10 square kilometers can provide enough food for 3,000 people. In other words, agriculture has given an opportunity for a significant increase in the population.





## Topic 5: Introduction to Sustainable Food Systems

The production capacity of the world has determined the economic and social progress of humanity, and food and crop shortages posed a serious threat, as happened in the 18th century.

Today, about a quarter of the available land in the world is used for food production, almost all of these areas are suitable for agriculture.

However, due to intensive and unsustainable agricultural production methods, these lands have been degraded and the soil has been lost.



Figure 7: <https://blog.nxfacil.com.br/>





## Topic 5: Introduction to Sustainable Food Systems

In this context, in addition to the efficient use of infrastructure and technology, it is very significant that the producers, especially the small-scale ones, are aware of these developments. At this point, the efficiency of agricultural extension and training services have a great role in providing productivity.

People who are active in the production process have to accelerate the elimination of the restrictive factors in production for preventing the disruption of the production process and effecting of future generations from the production process.





## Topic 5: Introduction to Sustainable Food Systems

### 5.2.2. Processing and Distribution

In addition to employees working in the production process of food, individuals involved in processing and distribution processes also have great importance in terms of sustainable food systems. If you are a supplier or a food processor who wants the sustainability of the food system, please read this article.

The transformation of agricultural raw materials into food and beverage products by processing is the field of the food industry. On the other hand, sustainable food production "is producing quality, healthy food, and beverage by processing the agricultural raw materials and as care about many factors in all process until the consumption.







## Topic 5: Introduction to Sustainable Food Systems

In this context, prioritizing energy and water use, resource and waste management, that is, in this process, as in agriculture, the goal of ensuring continuity in all areas involved, rather than just achieving the result, ensures sustainability.

As mentioned in agriculture, if the enterprises in the field of the industry have knowledge about these concepts and continue their work with this responsibility, it will provide a real system to be mentioned.



Figure 8: <https://www.smallenterprisesforwomen.com/>







## Topic 5: Introduction to Sustainable Food Systems

In terms of sustainability, packaging included in food processing, the design must be done to reduce the negative effects of the product on the environment, and it should be used efficiently with recycling after use.

In order to enable to progress to sensitivity in production successfully to the last circle of the chain, the infrastructure of the transportation networks must be strong. Poor infrastructure, losses, and transportation prevent the selling of products at good prices.



Figure 9: <https://blog.esri.com.tr/>





## Topic 5: Introduction to Sustainable Food Systems

In addition, when difficult conditions prevail, there will be fewer proper buyers and food losses will be reflected in prices. In many developing countries, farmers can get half of the world market price.

When the value chain is more effective, the urban consumer will be able to limit the price. With better infrastructure in terms of spreading information, the knowledge of the market will increase, and the dependency relationship will decrease.



## Topic 5: Introduction to Sustainable Food Systems



In addition to its effect on the price-earning relationship, transportation also has environmental effects in terms of sustainability. Transportation by land, sea, iron, and air has an important role in terms of environmental impact and loss of transported products.

Increasing of the environmental awareness of a supplier or courier that transports food will be beneficial for environmental sustainability and make the world more livable.



## Topic 5: Introduction to Sustainable Food Systems



### 5.2.3. Consumption

The food consumption process is the distribution of food to the end-user. Consumption patterns and habits; are shaped by economic structure, technological progress, historical heritage, environmental, sociological, cultural, and psychological factors.

Consumption has a dominant impact with its flexibility and open to change aspects in the short and long term for the sustainability, at value chain in terms of narrow sense, at the system in terms of comprehensive sense.



## Topic 5: Introduction to Sustainable Food Systems



Figure 10: <https://www.ulusalpost.com/>

Determining an effective food production strategy can provide economic benefits in an environmentally friendly manner, but the fact that consumption trends are not in the same direction will prevent reaching a completely sustainable food system.

Today, more resources are consumed than ever before and fundamental changes have to be experienced in this sense in order to achieve national and global sustainable development.





## Topic 5: Introduction to Sustainable Food Systems

Although it is generally accepted that the wealthy people consume excessively and the poor people consume insufficiently, the consumption trend has a much more complex structure than this assumption due to health, economic, and environmental reasons.

The global imbalance in food consumption along with nutrition and waste of food obstacle to achieving sustainability.

Any employee in the food or kitchen industry is also a direct consumer of food. Firstly, employees in this sector must move away from unconscious consumption tendencies. A pastry cook working





## Topic 5: Introduction to Sustainable Food Systems

In the kitchen sector must consume the food s/he uses for cake making effectively and prevents waste of food as best as s/he can.

Consumer rights need to be known in order for the consumption department to function properly in the food chain, to prefer safe food, and to ensure that the consumer has access to safe food, and in this sense, food consumer organizations have important duties.





# UNIT 2: SUSTAINABLE NUTRITION







## Topic 1: Nutrition

Nutrition has a crucial place in ensuring the efficiency of food systems and food safety because proper nutrition is a precondition for a healthy life.

There are some fundamental concepts that indicate nutritional status. Knowing these concepts encourages an employee who produces in the food sector to create healthy products-menus while producing, and this encourages a healthy diet to be popular.



Figure 11: <https://tr.pinterest.com/>





## Topic 1: Nutrition

So, if you are an individual who wants to be a cook, dietician etc. in a food industry, do you know the following definitions which are the most basic nutritional concepts?

The concept of "malnutrition" is the unbalanced consumption of the foods that should be consumed for a healthy life in an inadequate or excessive amount.

“Undernutrition” refers to taking inadequate the nutrition requirements constantly.

The concept of "hidden hunger" means to the inadequate intake of some essential nutrients such as iron and folic acid, although sufficient energy and protein is consumed.

“Overnutrition” means chronically consuming more energy than required and is a condition that can cause obesity.



## Topic 1: Nutrition



Figure 12: <https://www.scoop.it/>

The contents of these concepts also emphasize the importance of the food use and food reliability dimensions of the food safety. Just reaching and consuming food will be insufficient to fulfill the purpose of a sustainable food system and its contribution to food safety will be limited to that extent.





## Topic 1: Nutrition

The need for calories, which is the measurement of the amount of energy contained in food and beverages, varies according to age, physical activity, height and weight, and some hormones such as thyroid, drugs used and disease status.

The change in food consumption trends has a significant effect especially in the field of health. While nutritional diseases occur in low- and middle-income countries, obesity occurs in many developing countries in parallel with the globalization of food systems.

The sources of malnutrition are diverse and surrounded by the economic, social, political, cultural and physical environment





## Topic 1: Nutrition

Therefore, discussing the malnutrition requires integrated activities and complementary initiatives in agriculture and the food system, in natural resource management, in public health and education, and in wider policy areas.

In addition to the economic dimension, directing consumption habits and creating awareness will create positive results in nutrition.





## Topic 2: Sustainable Nutrition and Its Principles



Figure 13: <https://besinler.net/>

FAO defines sustainable nutrition as a form of live that is nutritious, safe, healthy, protective of the ecosystem, accessible, fair, economically accessible, and naturally sourced.



## Topic 2: Sustainable Nutrition and Its Principles



### Sustainable Nutrition Principles

If you are an individual who wants to work or work in the kitchen sector, you should first apply the following suggestions which for sustainable nutrition as a professional requirement yourself and then integrate them into society;

- ✓ Keep adequate and balanced nutrition.
- ✓ Prefer vegetable protein sources instead of animal based proteins (eggs, meat, milk).
- ✓ Take care to consume at least 5 portions of fruit and vegetables a day.
- ✓ Pay attention to the consumption frequency and amount of packaged foods containing sugar, fat and salt.





## Topic 2: Sustainable Nutrition and Its Principles

- ✓ Increase your intake of legumes, whole grains, and oilseeds such as hazelnuts, walnuts or almonds.
- ✓ Prefer fish that are hunted with sustainable fishing (caught in season, no risk of fishing).
- ✓ Consume vegetables and fruits in their season.
- ✓ Take care to consume local foods and shop from local producers.
- ✓ Maintain your ideal body weight and strive to reach the ideal body weight.
- ✓ Think about and question where and how all the foods coming to your table comes from.
- ✓ Reduce your intake of red meat, processed meat products and animal fat.







## Topic 2: Sustainable Nutrition and Its Principles

- ✓ Preserve the food you buy in the suitable conditions.
- ✓ Don't waste any food. Evaluate the juices or parts of food such as stems and leaves.
- ✓ Reduce the use of packaging, plastic bags, and choose recyclable products that can be used repeatedly and do not harm the environment.

If you want to learn more about sustainable nutrition, watch the video:

<https://www.youtube.com/watch?v=I20YI2gRYOA>

<https://www.youtube.com/watch?v=iSCxkvvBA0Q>





# UNIT 3: QUALITY CONTROL, PRESERVATION, AND USE OF FOOD





## Topic 1: Quality Control of Food

**Food Quality:** It is the combination of properties that distinguish a food from others, play a role in the choice of food by consumers, and each can be measured and controlled separately.

Food quality is a factor that also affects the quality of the food production process. Food sector stakeholders (producers, processors, etc.) who want to obtain quality products pay attention to the quality of the food and learn the factors affecting the quality.

If you are a stakeholder in the food industry and do not know the factors that affect food quality, you have to read the following contents as soon as possible for a quality output process.





## Topic 1: Quality Control of Food

### Factors affecting food quality;

- Raw material quality,
- Quality of semi-finished products, auxiliary materials and preservatives used in production,
- Personnel qualification,
- Packaging materials used,
- Tools and equipment used, technology and method applied in production,
- Storage, preservation and marketing conditions.





## Topic 1: Quality Control of Food

If you are a cafe manager, or an industrial manager who ensures the product is processed and presented to the end user, you have to pay attention to every point from the personnel to the quality of the raw material in order to increase the quality of a product offered.

Also, if you are a staff member or manager involved in the food production process, you have to meet the systems that increase food safety. Ensuring food safety is part of the process that affects food quality.



Figure 14: <http://prevencionar.com.pe/>





## Topic 1: Quality Control of Food

Today, there are official standards that measure food safety. HACCP is an official quality and control system used in our country and includes these standards. Certain controlled businesses and institutions may have these documents.

Having this certificate through meeting the HACCP quality standards in order to increase the reliability of the product of an institution producing or serving food will increase the reputation of the institution.

So, what exactly is this system? If you are a person involved in the food process, how much priority it has for you? Let us analyze it together.





## Topic 1: Quality Control of Food

### What is HACCP?

HACCP is a product reliability system which established the based on determine and ensure the hygiene conditions required for healthy food production (personnel hygiene, equipment hygiene, raw material hygiene, ambient hygiene, etc.), determine the reasons that may pose a health risk for the consumer during the production and service phase, and eliminate these reasons.

Watch the video to better understand what HACCP is:

<https://www.youtube.com/watch?v=AgocMgeKZVw>





## Topic 1: Quality Control of Food

The HACCP manager/staff takes the following steps to ensure food safety;

### What are the HACCP Principles and Implementation Steps?

There are 7 principles in the HACCP system. Each of these principles describes how to make and maintain management plans in the process. Let us explain the HACCP principles and implementation steps incrementally.







# Topic 1: Quality Control of Food

## ***A. Making Hazard Analysis***

The aim of the first step is to prevent the hazards such as injury and illness. Biological, chemical and physical damage are identified, and studies are carried out to prevent them before they occur. In the first step, the hazard definition is done.

Due to the possibility of the occurrence of the hazard, the damage it will cause is emphasized. Then, risks and hazards are categorized, and studies are started to reduce unwanted situations.





## Topic 1: Quality Control of Food

### ***B. Determining the Critical Control Points***

This step defines how control and supervision can be implemented. Determining critical control points aims to eliminate the food safety hazard. If it is not possible to eliminate the hazard, it will bring it to the minimum level that will not harm anyone.

### ***C. Setting Hazard Boundaries***

In this step, the minimum/maximum values that a physical, chemical or biological parameter have to be controlled are determined. After the critical control points are determined, the borders are set by scientific methods. At this stage, assistance can be obtained from regulatory standards, experts and experimental data.





## Topic 1: Quality Control of Food

### ***D. Establishing Monitoring Procedures***

It is extremely crucial to monitor the process in order to facilitate the management process. In this step, the planned observation and measurement index is determined. Monitoring and tracing is used to detect deviations in the process. At this stage, where continuous monitoring and tracing are done, operations and practices are also recorded.

### ***E. Implementing Corrective Actions***

This step is for to prevent to unsafe food reaching the consumer. If there has been a deviation in the previous stages, out of control products may enter the market. This step is aimed at preventing the distribution of products and goods for which damage has not been detected in the process.





# Topic 1: Quality Control of Food

## *F. Record Keeping Methods*

The HACCP system records contain a general summary of the hazard analysis. The purpose of this record summary is for audit, and preventing the critical situations.

HACCP fundamental principles and each process in the application steps are recorded. Thereby, these recorded data can be a guide in solving significant problems in the future and in current applications.





## Topic 1: Quality Control of Food

### ***G. Verification Procedures***

This step includes recording review, independent testing, and observation/monitoring methods. Verification procedures, the last step in the HACCP principles, outline specific ways and methods. In the last step of HACCP, the validity of the plan is measured. Scientific processes are taken as a basis when measuring and auditing. If the verification phase is also properly defined within the framework of the general standard rules, the HACCP system is approved.

The product of an operator or cook whose HACCP system is approved gains a reliable quality in the market. On the other hand, the perspective of the person who wants to work or works in any field in the kitchen sector is positively affected to his/her working place.

If you are working in any field in the food sector and your institution does not have any information about HACCP, please convey what you know about this system and the benefits of the system to your manager.





## Topic 2: Food Preservation

The purpose of all methods used in food preservation is to prevent or limit changes in the structure of the food.

Microorganisms that cause deterioration in various preservation methods are deactivated by killing, or even if they remain alive, conditions are provided to prevent their reproduction and activities in the environment.

Food preservation is an issue that must be learned in all areas of the food industry. For example, if you are a pizza chef, and if you do not store the products you will use in making pizza in suitable environments, your products will deteriorate in a short time.



## Topic 2: Food Preservation



Figure 15: <https://www.brigitte.de/>

Or, if you are a business that sells meat products, and if you cannot store the meat in a suitable environment, the meat will spoil and the profitability of the business will disappear. Therefore, you have to preserve your products by finding the preservation way for your product or business.

So, which preservation method is suitable for your product or business?

Let us find the answer to this by reading the preservation methods section.





## Topic 2: Food Preservation

Food preservation methods are;

### 2.1. Preservation by Heat Treatment

The basis of this method is the killing of microorganisms in foods which are in airtight containers at high temperatures. For this reason, glass jars, bottles and tin cans are used as containers.

Autoclaves are used for heat treatments above 100°C, and at temperatures below this, different open mechanism are used.

For example, when you boil the tomatoes, which are widely used today, and store them in glass cans, you can have the opportunity to use tomatoes in winter which were prepared in summer. For a person working in the food industry, being able to offer the foods whenever customers want, by preserving the food in its season will increase the quality.







## Topic 2: Food Preservation

### 2.2. Preservation by Cold Application

Cold application can be done by preservation in cold, or by freezing.

#### 2.2.1. Preservation in Cold

It is the making the resistance of food to temperatures of 0 ° C or slightly above. This cooling process is carried out by using cold night air in areas where the temperature difference between day and night is high.





## Topic 2: Food Preservation

### 2.2.2. Preservation by Freezing

In this method, foodstuffs are preserved by frozen below  $-18^{\circ}\text{C}$ . This method provides long-term protection than preservation in cold. Frozen foods are stored at  $-20^{\circ}\text{C}$ . Their transportation until consumption have to be done by a continuous process called cold chain.

If you are running a restaurant, you can preserve the any food in any session thanks to the freeze machine, and be able to offer your target group. This will increase the preferability of your business.





## Topic 2: Food Preservation

### 2.3. Preservation by Drying

The principle of this method is to increase the durability period by reducing the water content of the food. Drying is the oldest food preservation method. By reducing the amount of water in food to certain levels in various ways, an environment preventing enzymes and working of microorganisms is created. Drying is done naturally in the sun, or artificially in the facilities.



Figure 16: <https://tr.pinterest.com/>





## Topic 2: Food Preservation

### 2.4. Preservation with Preservatives

Chemical preservatives can also be used in amounts specified in the Food Additives Regulation to increase the stay life of foods to assist food preservation methods.

These are antimicrobial substances that prevent the growth and work of microorganisms and antioxidants that prevent bitterness and changes in foods due to the effect of oxygen. Preservatives kill mold fungi, bacteria and yeast or inhibit their activity.





## Topic 2: Food Preservation

Substances such as salt, sugar and vinegar added to foods to prevent microbiological spoilage are also included in the preservative group, but these substances are themselves food items and the amount of use is not limited like chemical preservatives.

Salt and vinegar are used for the preservation of many vegetables, namely making pickles. Sugar is used to turn fruits into jam, marmalade, and syrup. Jam is form of fruits which are made resistance thanks to sugar in various shapes. It is possible to preserve it as an open for a long time due to its high sugar content





## Topic 2: Food Preservation

### 2.5. Other Preservation Methods

Preservation by irradiation uses rays such as gamma and beta that can inactivate deeper microorganisms and enzymes.

As a result, assuming that you work or want to work in the kitchen field, you must use one or more of the above methods to increase your food sustainability.





## Topic 3: Use and Waste of Food

The most effective method of using food is to not waste it first. Food waste is the most fundamental factors affecting sustainable food.

Food waste is that unnecessarily supplied of food due to unconscious consumption habits but not consumed, and thrown away.

Unfortunately, one of the biggest parts which cause the food waste is the service personnel, managers, etc. people working in the kitchen field. In order to ensure the sustainability of the food, the priority is to prevent waste.





## Topic 3: Use and Waste of Food

Another benefit of preventing food waste is profitability. If food waste is prevented, you can achieve the same output by purchasing fewer products. In this way, not much money is given and waste is prevented.

So, what should be considered for food waste?

For that, let us examine the next topic carefully.

If you want to reinforce the food preservation methods, you can watch the video on the link:

<https://www.youtube.com/watch?v=gRi6e-xm6Pw>



Figure 17: <https://www.greenbiz.com/>







## Topic 3: Use and Waste of Food

### How to Prevent Food Waste?

Food waste must be prevented at the levels of both consumers and producers and sellers. Every person working in the kitchen field is a consumer in daily life as well as being a producer and seller.

Prevention of food waste must be a discipline for people working in the kitchen sector, and they must interiorize this in their normal lives outside of work. Therefore, people working in the sector should pay attention to the following recommendations.





## Topic 3: Use and Waste of Food

If we give examples of some measures for this;

### For consumers:

- ✓ Change begins at home, planning, shopping list, refrigerator.
- ✓ Plan your menus. Thus, you may shop as much as you need, know in advance how to make use of leftover meals, and prevent waste.
- ✓ When preparing your shopping list, focus on the foods you really need and that you plan to cook and prepare in a short time.
- ✓ If you are shopping weekly, buy only the products you will eat that week. Keep in mind that products that stay in your refrigerator for a long time are less likely to turn into food.
- ✓ Find out how best to preserve any food to increase this possibility. For example, some vegetables need to be aired and some should be preserved in vacuum containers. As you learn these rules, you will solve the secret of keeping foods as fresh longer.





## Topic 3: Use and Waste of Food

### For Producers and Sellers:

- ✓ Retailers' little surprises play a role in filling our shopping baskets with unnecessary products. The "special price, buy one get one" etc. campaigns organized by the producers or brand cause us to turn to products that we do not think to buy and probably do not need much. For this reason, organizing "buy one get one" campaigns especially in perishable food products increases the possibility of the second product bought as surplus going to waste.
- ✓ In order to prevent this, the markets in the UK restrict the "buy one get one" campaigns.
- ✓ Cooking and preserving suggestions written on the packaging can also offer a good solution to the consumers in terms of preventing waste.





## Topic 3: Use and Waste of Food

- ✓ The most controversial issue regarding food waste is the expiry date labels. Disposal of eatable foods just because the date on the label is expired is a problem that is common all over the world.
- ✓ Another method suggested to deal with this problem is to simplify food labels and to give two dates to be more clearly understood by the consumers.
- ✓ "Expiry date" for perishable foods; "Quality consumption date" for nonperishable foods (e.g., "this product is recommended to be consumed before xx).

Taking the above precautions while you are in the process of producing or selling food will benefit for both yourself and your environment. Certainly, watch the awareness raising video about food waste by accessing the link:

<https://www.youtube.com/watch?v=6RlxySFrkIM&t=50s>



## Topic 4: Factors Affecting Food Safety and Sustainable Food Systems



Protecting sustainable food and ensuring food safety are not only realized with our direct actions but also our indirect actions. For example, although preventing food waste positively affects the profitability of a food business operator in the short term, its profitability may be negatively affected by external factors in the long run.

For this reason, you must learn about the other factors affecting sustainable food and exhibit behaviors that will have a positive effect to them, regardless of the area of the kitchen sector you work in.



## Topic 4: Factors Affecting Food Safety and Sustainable Food Systems



The factors affecting sustainable and reliable food can be explained as follows:

### 4.1. Biological Diversity

Biodiversity has a significant role in the sustainability of food systems to ensure food safety globally. Biodiversity is defined as the diversity at the level of genes, species and ecosystems.

Plant genetic resources in food and agriculture are the crucial components of the agricultural biodiversity. Genetic diversity includes traditional varieties and modern culture varieties and provides flexibility and adaptation to food production and climate change.



## Topic 4: Factors Affecting Food Safety and Sustainable Food Systems



Changes in production systems, mechanization, diseases, improper production practices, changing cultural structure, population growth, urbanization and climate change are the causes of the risk of extinction of animal and plant genetic resources.

Research & Development studies on plant genetic resources are necessary for a dynamic ecosystem and sustainable agriculture.

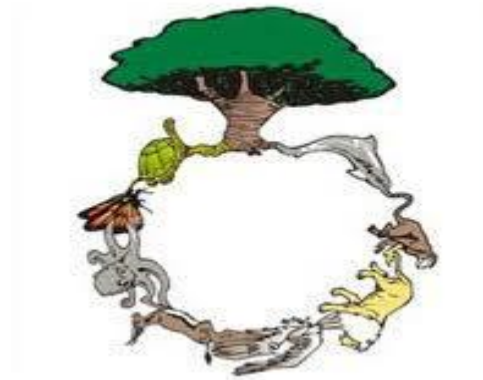


Figure 18: <https://globalperspectives.info/>





## Topic 4: Factors Affecting Food Safety and Sustainable Food Systems

Animal genetic resources also play a significant role in food safety. Animal genetic resources studies are crucial for shaping animal raising systems by considering resource sustainability, considering potential resources and future needs.

Biodiversity has an active role in the protection and maintenance of cultural and local factors that are important for sustainable nutrition order.

In addition to ensuring adequate food supply by maintaining the ecological balance, preserving biodiversity in the food use component of food safety and in the consumption ring of the food chain is an inevitable action in terms of proper nutrition.







## Topic 4: Factors Affecting Food Safety and Sustainable Food Systems

### 4.2. Water and Drought

One of the most important problems faced by the world for the continuation of life is the decrease of water resources and drought that are affecting all areas of life from economy to urban and rural life, from nutrition to cleanliness. Drought issue is an area that have to be tackled with great importance in terms of ensuring and improving food safety.

Drought has many negative effects on food production such as harvest losses, low yield in crop and animal production, increasing of animal deaths, increasing of insect invasions and plant and animal diseases, damage to fish habitat, forest fires, land degradation and soil erosion.



Figure 19: <https://www.dailymotion.com/>





## Topic 4: Factors Affecting Food Safety and Sustainable Food Systems

### 4.3. Climate Change

Climate change is defined as "a change in climate as a result of human activities that directly or indirectly disrupt the composition of the global atmosphere, in addition to natural climate change observed in comparable time periods".

It is widely accepted that climate change creates negative effects on the lives of all living things as a result of the deteriorating global ecological system and this effect is increasingly making itself displayed and, in this context, it is one of the leading global problems.



## Topic 4: Factors Affecting Food Safety and Sustainable Food Systems



One of the most significant areas affected by climate change is agricultural production.



Figure 20: <https://veme.digital/>

Changes in agricultural production and the farming areas significantly affect the food existence of the world. Changes in food production, along with other factors, are expected to affect food prices also in the future, limiting poor families and communities' access to adequate and quality food.



## Topic 4: Factors Affecting Food Safety and Sustainable Food Systems



### 4.4. Price Fluctuations

Food prices are considered to be one of the most important elements of food safety, as they directly affect people's income and purchasing power.

### 4.5. Mismanagement of Agricultural Lands

Most of the food required for the survival of people on earth is supplied from agricultural lands and 99.7% of the consumed food is obtained from the soil, while only 0.3% is obtained from water.



## Topic 4: Factors Affecting Food Safety and Sustainable Food Systems



Figure 21: <http://www.elder.org.tr/>

Considering this situation, the protection and management of agricultural land have great importance in meeting the food needs of humanity. However, in addition to natural reasons such as erosion, agricultural lands become infertile due to socioeconomic reasons such as the use of agricultural lands for non-agricultural activities and getting small of parcel size because of portion of inheritance.



## Topic 4: Factors Affecting Food Safety and Sustainable Food Systems



### 4.6. Rapid Urbanization

Increasing urbanization increases demand for agricultural products with increasing income, and this situation requires that farmers, food companies, local and national economies have to satisfy this growing demand. This circumstance is an obstacle to ensuring rural and urban food safety.



Figure 22: <http://coyku.blogspot.com/>



## Topic 4: Factors Affecting Food Safety and Sustainable Food Systems



In addition to the effect of the increase in the urban population on the agricultural production supply, its effects on the ecological system are also significant. The urban population uses and consumes more nature than the rural population, with food, energy, water and land consumption.

Developments such as the increase in urbanization, consequently the consumption of natural resources, in contrast the decreasing agricultural labor force with the decrease of the rural population show that the increasing dimension of urbanization will be a greater obstacle in ensuring food safety in the future.







## Topic 4: Factors Affecting Food Safety and Sustainable Food Systems

### 4.7. Biofuel Production

Biofuels are gas, liquid and solid products obtained through the realizing the various biochemical and/or thermochemical transformation process of agricultural products, wood, animal, plant and municipal wastes.



Figure 23: <https://docplayer.biz.tr/>



Biofuel production does not increase the greenhouse gas effect. This slows down the negative effects of climate change.



## Synopsis



This module has been created to provide information about sustainable food systems, explain how to provide sustainable food and raise awareness about food waste.

The module has been created for people who work or want to work in the kitchen field. The subject of the module has not the same priority for every occupational group working in the kitchen field, but it has been determined as high priority for some occupational groups and lower priority for others.





## Synopsis

A person who receives this training will learn following from the training;

- Why sustainable food systems are important for future generations
- How to ensure sustainable food
- What are the stages of food chain processes
- The importance of nutrition and sustainable nutrition
- How to avoid food waste
- Factors affecting sustainable food



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## Online Additional Materials & Resources



### 1. Sustainability

<https://www.youtube.com/watch?v=rmQby7adocM>

### 2. Sustainable Food

<https://www.youtube.com/watch?v=PyiVf26C5pc>

### 3. Sustainable Nutrition

<https://www.youtube.com/watch?v=I20YI2gRYOA>

<https://www.youtube.com/watch?v=iSCxkvvBA0Q>



## Online Additional Materials & Resources



### 4. What is HACCP

<https://www.youtube.com/watch?v=AgocMgeKZVw>

### 5. Food Preservation

<https://www.youtube.com/watch?v=gRi6e-xm6Pw>

### 6. Food Waste

<https://www.youtube.com/watch?v=6RlxySFrkIM&t=50s>





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# Thank you for your attention!



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