

Food Packaging Technology
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Week – 01
Lecture – 01

Welcome to the NPTEL course Food Packaging Technology. The course will be handled by two faculty members. Myself, Dr. Maya Raman. I am an Associate Professor at the Department of Food Science and Technology and along with me Dr. Jenny Ann John, she will also be joining. She is also an Assistant Professor in the department. In the first module, we will be discussing about food packaging. There will be a brief introduction about the Food Packaging Technology and in the following sessions, we will be discussing about the need for food packaging.

Why we need to do the food packaging? What is the importance of food packaging? and we will also discuss about the role of food packaging in increasing the shelf life and preserving the nutritional qualities and what are the different packaging materials that are generally used and what are their characteristics? In the coming sessions, we will discuss about the type of packaging materials, ie paper as a packaging material and how the paper can be developed and what are the different tests that can be used to analyse the quality of paper? How it is compatible with the food? Those things will be determined and in the next session, we will be discussing about glass, which is used as packaging material. Glass, of course, has different applications It is not only in the food industry, but we will be concentrating mainly on the glass as containers, that are used mainly for food packaging and again in the next session, we will be discussing about metals as a packaging material that is specifically used in the Canning industry and pasteurising industry. So, we will be discussing those things and what are the different types of metals that are used for canning and how it is developed? What do you mean by lacquer and what is the importance of lacquer in developing cans and preserving the product and in the final session of the module 1, we will be discussing about different types of flexible materials or the plastics, that are used in packaging industry or food packaging system. In the module 2, we will be discussing about different forms of packaging that is again related to the flexible packaging system and here we will be discussing about rigid and semi-rigid forms of packaging and how these packaging systems can be adopted in different industries that is dehydrated foods, frozen foods, dairy products, fresh fruits, vegetables and in animal based products, beverages and also in the case of microwave food products. In the third module, we will be discussing about the design of packaging materials and we will also discuss about the different tests that can be done to analyse to evaluate the quality of packaging material.

It may include water vapour transmission rate, oxygen transmission rate. We will also check the bursting strength, compression strength and we will also see what is Cobb's test and what is the different texture analysing machines or universal testing machine that can be used to analyse the quality of the packaging systems. So, those things will be discussed and also the safety aspects of packaging materials will also be discussed under this module. Let's watch some videos on the different tests that can be done in packaging materials. And in the fourth module we will discuss about different types of packaging systems that is active packaging, modified atmospheric packaging, aseptic packaging, biodegradable plastics and edible packaging.

Now these are coming up actually the packaging is used or it's a container which contains the food and which will extend the shelf life of the product but most of the packaging materials they may have poor barrier properties, they may allow water or moisture to enter into the package or gas may enter into the package. For these reasons the shelf life may not be extended, the product may spoil easily. To overcome this, there are some changes brought in the packaging system and one is the active packaging system, where we actively maintain the environment inside the package and that is called active packaging and in modified atmospheric packaging, we modify the atmosphere inside the packaging. Actually it is carbon dioxide, oxygen and nitrogen, the three gases, so we manipulate or play with these gases and maintain the contents and we see that the product shelf life can be extended. Similarly, aseptic packaging it is more similar to the canning process or the canning packaging system where again it is to see that the product remains protected from the microorganisms and extended shelf life and again it is the nutrients are well preserved and protected and the biodegradable plastics and edible packaging system, they are coming up actually the more and more researches are being done in this area it is because plastics they have negative impacts on the environment because of its continuous usage, the plastics have degraded to microplastics which enters into the animal system and other living systems through leaching and other means and which causes or which are responsible for other health issues.

So, for these reasons attention is given to this aspect of the plastic materials or the packaging materials. So, biodegradable plastics they are basically based on natural materials or which have shorter life span and they get degraded easily. So, those aspects will be discussed under this head and edible packaging materials are those packaging materials that can be consumed along with the food so you don't have to discard it and it can be consumed as such and even if it is discarded it will be degraded easily so again it will not have any negative impact on the environment. Both biodegradable and edible packaging materials they are eco-friendly and in the fifth module we will be discussing about various machineries and equipments that are used to develop different packaging materials and under this we will be discussing about vacuum packaging machines and

then controlled atmospheric and modified atmospheric packaging machine gas packing machines, seal and shrink packaging machine. The plastic materials for example they can be used to protect the containers.

So, they can be shrunked when you are giving heat, they can be shrunk and they attach to the packaging system and it helps in holding the material together. So, this is more useful during transportation. So, these machines will also be discussed and we will also discuss about form and fill sealing machine, aseptic packing system, retort pouches. Now, retort pouches is of significant importance and lot of attention is being paid to the retort pouches. So, we will also discuss about different layers of retort pouches and what are the importance of retort pouches.

Then, bottling machines and carton making machines. Finally, we will discuss about the printing machines and what are the different aspects or different criterias that need to be considered while printing. So, this will be the details in the module 5 and with this let's enter into the details. Thank you