

Comparative study of shelf life of Canned food

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Abstract: The main objective of the present study was to analyze the perishability of canned food materials. Commercially available canned food materials; Sweet Corn, Chicken Sausages, Pineapple Slices were taken and crushed to make liquid paste/puree. All the purees were put in the respective beakers. After these preparations, they were kept at 4°C and 37°C. Samples were taken after every 24 hours. The streaking was done on agar plates to see the extent of growth of microbes. It was observed that the plates kept at 4°C did not show growth of any microorganism even after two days, whereas plates kept at 37°C showed contamination or bacterial growth, although the extent of contamination was different in all the three i.e Sweet Corn, Chicken Sausages, Pineapple Slices. It was observed that maximum contamination was observed in Chicken Sausages and relatively less contamination in Sweet Corn and Pineapple Slices. This may be due to less preservatives present in Chicken Sausages, which on longer exposure to external atmosphere got contaminated.

Keywords: Canned food, Shelf life, Contamination, Perishability.

INTRODUCTION

Food is required for our daily metabolic activity. When the food is kept in open for longer time it gets contaminated due to bacterial growth in that food. It can lead to food poisoning if we eat that contaminated food. The bacteria or other microorganisms grow on it and it will smell bad. If a person happen to eat such food, one can experience stomach pain, diarrhea and vomiting amongst other symptoms. Bacteria can be found in the environment all around us some of the bacteria are good for us but most of the bacteria which grow in food are harmful.

The presence of harmful substances like bacteria and chemicals in our food can lead to food poisoning (Buchanan and Palumbo;1985, Chaudhry *et al.*, 1998; Loir; 2003). Many bacteria's like *Staphylococcus aureus*, *Clostridium perfringens*, *Salmonella typhi* etc. are the few which are commonly present in contaminated foods and results in food poisoning. Even WHO, also discussed contribution of contaminated food towards the diseases (Hald *et al.*, 2016). Due to the busy lifestyle of people, sometimes it is not possible to prepare and consume fresh food. To compensate this, use of canned food comes into practice (Cleveland *et al.*, 2001 and Sharif *et al.*, 2017). Carefully documented procedures are followed by food manufactures to minimize the contamination of food by preparing and packing them in a sterilized environment (Banga *et al.*, 2003; Sandarani *et al.*, 2018). However, when we bring this food back to our homes and open them for consumption, the food is perishable so the bacteria and other microbes in our surroundings come in contact with the food and lead to contamination. That is why fresh, canned and packet food, once opened, must be consumed as soon as possible.

MATERIALS AND METHODS

Sample: Canned Sweet Corn, Canned Chicken Sausages, Canned Pineapple Slices,

Experimental Design

1. The whole experiment was divided into three sets: Each set consist of three beakers having 25ml of canned food *i.e.* Chicken sausage, Sweet Corn, Pineapple Slices.

Set I: 3 beakers were marked as (Chicken sausage, Sweet Corn, Pineapple Slices) and were kept in refrigerator at 4°C. **Set II:** 3 beakers were marked as (Chicken sausage, Sweet Corn, Pineapple Slices) and were kept in incubator at 37°C Overnight. **Set III:** 3 beakers were marked as (Chicken sausage, Sweet Corn, Pineapple Slices) and were kept in incubator at 37°C for two days.



Fig. 1: Beakers containing canned food puree/paste of Chicken Sausages, Sweet Corn, and Pineapple Slices.

2. The petri dish prepared with the agar was stored in a refrigerator. Before the start of the experiment, remove the petri dish from the refrigerator to allow it to normalize at room temperature.
3. Beakers kept at 4°C and for overnight incubation were removed from the refrigerator and the incubator. Took small amount of sample from each beaker and streaking was done and the plates were kept in incubator for 24 hours at 37°C. Observed the colonies next day.
4. Next day took out two day incubation beakers from the incubators and took small amount of sample from each beaker and streaking was done agar plates and kept them in incubator for 24 hrs at 37°C. Colonies were observed next day.

RESULTS AND DISCUSSION

The results of the experiment showed that at low temperature i.e. 4°C, the shelf life of food is more as no contamination was seen in that case. Whereas when we keep the food at 37°C, the level of contamination increases as discussed in table 1 and figs 2, 3, 4 below.

Table 1. The effect of different temperatures on the perishability of different canned foods.

Experimental Set	Temperature	Chicken Sausages	Pineapple Slices	Sweet Corn
I	4°C	No Contamination	No Contamination	No Contamination
II	37°C	High Contamination	Less contamination as compared to Chicken Sausages	Very Less contamination as compared to Chicken Sausages & Pineapple Slices
III	37°C	Very High Contamination as compared to One day incubated Chicken Sausages	High contamination as compared to One day incubated Pineapple Slices	High contamination as compare to one day incubated sweet corn

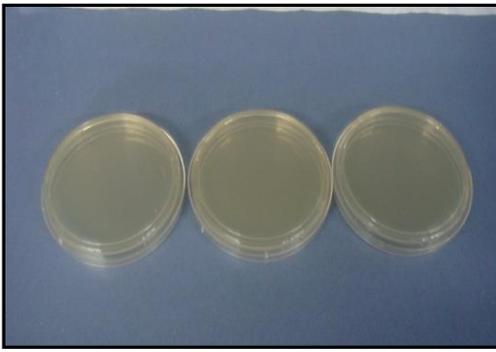


Fig. 2: Agar plates kept at 4°C

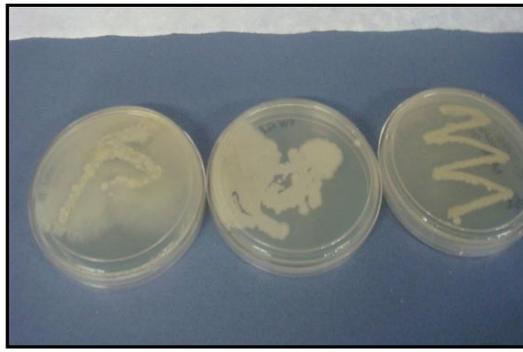


Fig. 3: Agar plates at 37°C overnight



Fig. 4: Agar plates kept for two days at 37°C

It is concluded that Chicken Sausages has least shelf life after opening the can as it got contaminated or decomposed very fast so it should be consumed fast once the can is opened, or food poisoning may occur on consumption. It is interesting to note that Pineapple Slices got contaminated more as compared to Sweet Corn. Hence, we can say that shelf life of Sweet Corn and Pineapple Slices is more than Chicken Sausages/ Meat.

CONCLUSION

The present study is thus a step forward to make people aware that though most of us know and believe that the canned food have long shelf life even then it must be consumed within limited time span as they are also very prone to microbes. These food can get contamination once opened. Thus, study is of great importance, as it throws light on the perishability of different Canned Food Materials.

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