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Commentary

Growth of microorganisms in food: intrinsic and extrinsic factors

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INTRODUCTION

Food supply is basically from plants and animals or products derived from them. In interaction with food, food supply can contain microorganism. These microorganisms use food products as a source of nutrients for their own growth; by these it causes possibilities of disadvantage which is deterioration of food ("spoil"). Or advantage to human by interactions between microorganisms and food for example curd. Food bio preservation technique is used to control pathogenic and spoilage microorganisms in foods by antimicrobial metabolites, which are taken from certain microorganisms. The most commonly used bacteria for preservation is lactic acid bacteria (LAB) due to their unique properties and they are harmless to humans. Probiotics bacteria is a friendly bacteria it helps to improve human health by improving digestion system and promoting human body's natural immunity, example of probiotics in food is milk, yogurt, cheese. By presence of harmful microorganism or contamination in food during various stages such as consumption by many pathogenic microorganisms or handling between production foods borne diseases takes place this leads to health illness, wastage of food and economic loss. There are 2 factors affecting the growth of microorganisms in foods Intrinsic factors and extrinsic factors.

Intrinsic factors

These are inherent in the food. Hydrogen ion concentration for most organisms grows best at weakly alkaline or neutral, pH usually between 7.5 and 6.8. Few microorganisms such as bacteria, molds and yeasts grow in a wide pH range. Acidophilic are the microorganisms that are able to grow in acid environment pH of around 2.0. In acidic condition Yeasts and molds grow under, whereas in alkaline conditions vibrio cholera are grown. Except mycobacteria most bacteria are killed in strong alkaline environment or strong acid Moisture content in a food medium is important for growth of microorganisms if there is lack of free water microorganisms will not grow. For microorganism nutrients content in the food is an important source for requirement of carbohydrates, water, sulphur, vitamins, minerals, proteins, phosphorus, energy, lipids, and nitrogen for growth. Antimicrobial properties in food also inhibit microbial growth; some foods have biological structures that prevent microbial entry.

Extrinsic factors

This factor is external to the food that affects microbial growth. The growth of organisms is caused by the environmental temperatures. Few organisms are able to grow at certain temperatures. Psychrophilic organisms grow best at about 20°C but also down to -10°C in unfrozen media. Mesophilic organisms grow between 25°C and 40°C with an optimum growth temperature close to 37°C none of the mesophilic bacteria are able to grow below 5°C or above 45°C pathogenic bacteria belong to this group. Thermophilic organisms grow at temperatures above 45°C, their optimum growth temperatures is between 50°C and 70°C mostly this bacteria are found in food industry especially in processed foods. Various microorganisms require for growth, either absence of oxygen (anaerobic), low oxygen tension (microaerobic) or high oxygen tension (aerobic). The amount of moisture in the atmosphere or food environment is relative humidity, foods with low water activity placed at high humidity environment take up water, and get spoiled easily for example, dry grains.

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