Predictive modeling: Tool for finding the microbial behavior in food.

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Description

Food contains a wide range of microorganisms such as bacteria, yeasts, and molds, causing food spoilage and it cause health risks when the food is consumed. If not sterile, the food has its natural flora and a transient flora reflecting its environment. Therefore before consumption, the food must be properly pasteurized or sterilized. To ensure food safety we must destroy all the microbes present in the food and prevent their growth.

The food gets contaminated and hazardous during the delay in food processing and distribution. These require a positive approach and resolution through the pooling of accumulated knowledge. As a result of rapid evolution in the industrial sector, there are pressures to continually improve both products and processes. predictive models software predict the growth or inactivation of microorganisms for studies of quantitative food in the food industry.

Predictive modeling: Several mathematical models have been developed to predict the growth of pathogenic and spoilage microorganisms in foods from the data generated by studying growth rates at different pH, water activity, temperature, and preservative conditions in the laboratory media, with suitable computers helping in the rapid analysis of the huge data. Two kinetic based models that take into consideration, the effect of culture parameters on the growth rate of microorganisms are:

Square root model: This model is based on the linear relationship between the square root of growth rate and the temperature. This model is very effective when we use one or two parameters. The effectiveness of this model decreases when several parameters are used in combination to control microbial growth.

Sigmoidal model: This model was developed by the U.S. Department of Agriculture (USDA) to predict microbial growth in a food system controlled by various parameters and has been tested in laboratory media to determine the growth rate of various microorganisms and chemical parameters. This model is used for its simplicity and chemical parameters are often used for effectiveness.

Predictive microbiology is very interesting and important, and with the advent of computers and subsequent developments, data processing has become easier and faster. Most of the studies on this aspect have so far been done in laboratory settings, and a very limited number of studies have been done in food systems.

Microorganisms can pollute food, thus causing food decay and health diseases when the food is consumed. Foods are not hygienic; they have a natural flora and a bacteria reflecting their environment. To confirm food is harmless, we must destroy these microbes or inhibit their growth

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