

Mathematical Models of Infectious Diseases and Social Issues

Nita H. Shah

*Department of Mathematics, Gujarat University, Ahmedabad,
India*

Mandeep Mittal

*Department of Mathematics, Amity Institute of Applied
Sciences, Amity University, Noida, India*

A volume in the Advances in
Medical Technologies and Clinical
Practice (AMTCP) Book Series



Chapter 10

Transmission of Water and Food Waste in Aquaponic Systems

Moksha H. Satia

Department of Mathematics, Gujarat University, Ahmedabad, India

ABSTRACT

In order to conserve natural resources, the quest for recycling water and food waste culture is ongoing. One of the possible and good ways to reuse these wastes is hydroponic culture. It is an advanced technology that cultivates plants without soil. Instead of using root system, it needs nutrient-rich water. Most of the nutrients used in hydroponic culture come from aqua culture, the branch for propagation, emergence, and maintenance of aquatic (water) organisms. Humans convolve aqua culture with hydroponic culture that has come up as an aquaponic system. It has been universally adopted for indoor food production. The solution arising out of this system has eliminated the lack of vegetable and fish. The continuous nature of these cultures gives rise to the system of non-linear ordinary differential equations. This system is investigated through logistic growth rate. Logistic growth rate offers an oscillating threshold. The simulative results analyse the periodicity of the system solutions, which will help the ecosystem survive.

DOI: 10.4018/978-1-7998-3741-1.ch010