



Aero Microbiology Services Section Front Page

What is Aero Microbiology?

Aero microbiology is the study of living microbes which are suspended in the air. These microbes are referred to as bio aerosols. Though there are significantly less atmospheric microorganisms than there are in oceans and in soil, there is still a large enough number that they can affect the atmosphere. Once suspended in the air column, these microbes have the opportunity to travel long distances with the help of wind and precipitation, increasing the occurrence of widespread disease by these microorganisms. These aerosols are ecologically significant because they can be associated with disease in humans, animals and plants. Typically microbes will be suspended in clouds, where they are able to perform processes that alter the chemical composition of the cloud, and may even induce precipitation.

OBJECTIVE

The presence of microorganisms in air and their sources, the relation of airborne dust and endotoxin, the sources of atmospheric microbial contamination in food processing plants, the mechanisms of airborne particle deposition, the importance of airborne microbes, the survival of microorganisms in air, methods of air sampling, airborne microbial populations in food processing plants, control of airborne microorganisms in food processing plants, and the general issue of microorganisms in air and their impact on food safety. The purpose was to bring together scattered information about airborne microorganisms and review their importance in food protection and sanitation.

APPLICATIONS

OUTDOOR

- Airborne crop pathogen
- Waste Disposal
- Germ Warfare

INDOOR

- Private Homes And Office Buildings
- Hospitals And Laboratories
- Space Flight
- Public Health

DEVELOPMENTS

The most prevalent microorganisms, viruses, bacteria, and fungi, are introduced into the atmosphere from many anthropogenic sources such as agricultural, industrial and urban activities, termed microbial air pollution (MAP), and natural sources. These include soil, vegetation, and ocean surfaces that have been disturbed by atmospheric turbulence. The airborne concentrations range from nil to great numbers and change as functions of time of day, season, location, and upwind sources. While airborne, they may settle out immediately or be transported great distances. Further, most viable airborne cells can be rendered nonviable due to temperature effects, dehydration or rehydration, UV radiation, and/or air pollution effects. Mathematical microbial survival models that simulate these effects have been developed.

REQUIREMENT

FOOD MANUFACTURE:

Microorganisms that have been transported through the air and have settled on, or in, the material are involved in various fermentation products. Productions of alcoholic beverages, vinegar, sauerkraut, ensilage, dairy products, etc., are often due to microbial activity.

SPOILAGE OF FOODS AND FERMENTATION PRODUCTS:

Microorganisms are often troublesome in the home and in industry where foods and other fermentation products are prepared. In industrial processes, where particular organisms are to be grown, to supply sterile air free from contaminating organisms is a considerable problem.

ONGOING RESEARCH

- Probing the Aerosol microbiome of New York City's Subway System.
- An Assessment of a New Meat Research Complex