Towards understanding studies in association of foods, microorganisms and humans.

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Accepted on March 27, 2018

Introduction

Foods, microorganisms, and humans are interestingly associated with each other that historically evolved into transformation of raw food material into different food products, degradation of food quality leading to food spoilage, and causing animal and human illness. Studying the interaction of microorganisms with food is known as food microbiology which includes microorganisms causing food poisoning, food spoilage, preservation of food, in addition to the growth characteristics and pathogenesis of microorganisms in food processing [1].

Because foods are nutrient-rich that provide a rich nutrient source with physiochemical parameters, like pH and water activity, they are excellent environments for microorganisms, and thus they have a profound impact on food**,** leading to products with an inadequate shape or appearance and becoming either undesirable or unacceptable for human consumption [2]. It has been estimated that about 25% of all *foods* produced globally are lost due to microbial *spoilage* [3]. However, the exploitation of the metabolic machinery of microbes in a positive way as applications to make new fermented product, is a rapidly expanding field of food industry and business activity that worth billions of dollars in different countries around the world. The **global fermented foods and drinks market** is expected to register an annual growth rate (CAGR 2018-2023) of 7.2% during the next 5 years (2018-2023). The market is competitive and driven by the increasing health and wellness market trend and the growing beverages market demand. The yoghurt and fermented milks market in 2014 was worth USD 55.01 billion. Alcoholic drinks gained a significant market share, which accounted for 28% of the market and is expected to continue the same owing to their wide adaptability and availability [4].

On the other hand, food is a transmission vehicle for food-borne pathogens which are the leading causes of illness and are responsible for millions of cases of infectious gastrointestinal diseases each year, costing billions of dollars in medical care and lost productivity; eventually, leading to death killing millions of people annually in different countries around the world. It has been estimated that about 30% of people in industrialized countries suffer from a food-borne disease each year (about 76 million cases of illness, 325,000 hospitalization cases, and as many as 5000 deaths in the United States annually) [5]. To understand the mechanism of pathogenesis, scientists perform numerous studies on various food-borne pathogens (*Listeria monocytogenes*, *Salmonella* spp., *E. coli* O157:H7) to discover their virulence factors and the related genes and defining the genetic and phenotypic features responsible for their pathogenesis. For this reason, food-borne pathogens are assayed for antimicrobial resistance patterns and screened for virulence-associated genes involved in capsule synthesis, adherence, tissue colonization, invasion, toxin production, and motility. Moreover, emergence of new food-borne pathogens and food-borne diseases driven by factors such as pathogen evolution, changes in agricultural and food manufacturing practices, and changes to the human host status are likely of their interests [6].

Along the side of the expectations about the emergence of resistance to antimicrobial agents which became a global public health problem as a result of use and misuse of antibiotics, scientists are working to find and formulate antimicrobial agents in order to eliminate these pathogens. In the last twenty-five years, investigators around the world are reporting the emergence and spread of antibiotic resistance in food-borne bacteria. Threlfall et al. reported that the use of antimicrobials for prophylaxis in food producing animals has been an important factor in the emergence of strains with resistance to certain antimicrobials [7]. For example and since the early 1990s there has been a dramatic increase in resistance to antimicrobial drugs in *Salmonella enterica* and *Campylobacter* spp., and to a lesser extent in Vero cytotoxin-producing *Escherichia coli* O157 from cases of human infection in developed countries. A particularly important aspect of this increase has been the widespread dissemination of a multiply drug-resistant (MR) *S. typhimurium* strain of definitive phage type (DT) 104 in food animals.

Food microbiology has seen an explosion in our knowledge of the application of microorganisms to make and protect our food that we eat and has witnessed important events of developments and became an exciting applied field that has attracted many scientists and students at universities, research centers, and government agencies around the world. Advances in biology, biochemistry, and molecular biology, as well as engineering, have vastly extended our understanding of the nature and activities of these organisms and our ability to capitalize on, and manipulate, those activities for health and industrial applications. Large numbers of opportunities await investigation to understand of the nature of bacteria (beneficial, spoilage, and disease-causing microorganisms), parasites, fungi, and viruses, and developments and advances in their detection, identification, quantification, and control (for example, safe thermal processes for commercial sterilization); hygiene; and food safety. For this reason and to understand studies in association of foods, microorganisms, and humans, and to keep up with the overall growth and rapid advances in

microbiology and food microbiology in particular, Journal of food Microbiology is launched to project the role of microbes in strengthening as well as contaminating the food we eat by providing a comprehensive overview on microbial activity on the food processing, preservation, enriching nutrient values, and food safety. The new Journal of Food Microbiology focuses to share and disseminate the latest research developments on topics including; Food Safety, Fermentation, Probiotics, Microbial Pathogens, Anti-microbial preservatives, Food additives, Microbial contamination, Food poisoning, Edible microbial colourants, Food Service, and Processing, biofilm contamination, and Food borne diseases. To fulfill its mission and through the different features; original research articles, review articles, case studies, editorials, perspectives, and commentaries, Journal of Food Microbiology aims to cater the needs of dieticians, nutritionists, medical practitioners, healthcare providers, food processing industries, academicians and students indulged in studying the role of microbes in enriching and contaminating the food we consume [8].

References

1. https://www.omicsonline.org/scholarly/food-microbiology-journals-articles-ppts-list.php
2. Dousset X, Jaffres E, Zagorec M. Spoilage: Bacterial Spoilage. In: The Encyclopedia of Food and Health. Ed Caballero B, Finglas P, Toldra F. Academic Press, Oxford 2016;5:106-12.
3. Bondi M, Messi P, Halami PM, et al. Emerging Microbial Concerns in Food Safety and New Control Measures. BioMed Res Int. 2014;1-3.
4. https://www.mordorintelligence.com/industry-reports/fermented-foods-drinks-market
5. Hileman B. Food Irradiation. Chem Eng News. 2007;85(3):41-43.
6. John D, Floros RN, William F, et al. Feeding the World Today and Tomorrow: The Importance of Food Science and Technology. 2010;9:1-28.
7. Threlfall EJ, Ward LR, Frost JA, et al. The emergence and spread of antibiotic resistance in food-borne bacteria. Int J Food Microbiol. 2000;62:1-5.
8. http://www.alliedacademies.org/journal-food-microbiology/

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