

# Editorial: foodborne pathogens: hygiene and safety

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Editorial on the Research Topic

Foodborne Pathogens: Hygiene and Safety

## Introduction

The foodborne outbreaks occurred in last decades highlight the importance of the development and implementation of preventive measures and programs aiming at ensuring food safety on one hand and constituting a common basis for the hygienic production of food on the other hand. In particular, a *farm to fork approach* has been applied in all sectors of food production chain in order to improve hygiene and reduce all potential biological hazards. The food supply chain is very complex because of the differences in food composition and processing and this can result in emergence and re-emergence of foodborne pathogens. However, many factors related to an increase in foodborne illness have been reported, such as the change in eating habits and consumer preferences, increased international travels, change in food processing, production and distribution, pathogen adaptation to new environments, acquisition of virulence factors and antimicrobial drug resistance by microorganisms, advances in pathogen detection methods, inadequate sanitation and vector control measures, inadequate public health services, including consumer information ( [Smith and Fratamico, 2018](#) ). This Research Topic titled “ Foodborne Pathogens: Hygiene and Safety” focuses on important food safety concerns such as the potential presence of pathogens in food as well as their toxins/metabolites, the resistance to antibiotics or sanitizers, and other virulence characteristics. It includes four reviews and 44 original research papers. The main foodborne pathogens studied herein are: *Campylobacter jejuni*, *Cronobacter sakazakii*,

*Escherichia coli*, *Listeria monocytogenes*, *Salmonella* spp., and *Staphylococcus aureus*, but some other researches deal with *Helicobacter pylori*, *Klebsiella pneumoniae*, *Vibrio parahaemolyticus*, mycobacteria, and molds as well. Studies on characterization and genetic typing of foodborne pathogens, detection methods and inactivation of these microorganisms by natural preservatives derived from plant sources, essential oils and biocontrol, and influence of probiotics are also reported.

## **Prevalence and Monitoring of Pathogens in Food**

Foodborne diseases represent one of the most important public health troubles worldwide. The potential of foodborne pathogens to cause illness or even death in consumers highlights the importance of such events and consequent need of their monitoring and prevention. Millions of cases of foodborne illnesses and/or chronic complications are reported in many countries every year ( [Heredia and García, 2018](#) ). Li S. et al. studied the prevalence and characteristics of Non-typhoidal *Salmonella* isolated from poultry meat (broilers and spent hens) from supermarkets in China. Three serotypes were identified in 40 *Salmonella* strains and *Salmonella* Enteritidis resulted as dominant. The antibiotic resistance was tested as well, showing the highest rates to ampicillin for the strains isolated from commercial broilers, and to nalidixic acid for those isolated from spent hence. Thung et al. investigated the prevalence of *Salmonella* spp. in different beef meat samples from retail markets in Malaysia as well as the virulence genes and antimicrobial resistance. Eight different serovars were identified and *Salmonella* Agona was the predominant one. All 23 isolates were resistant at least to three antibiotics. Colello et al. determined the prevalence of

*Salmonella* spp. in 764 samples collected from swine farms, slaughterhouses, boning rooms, and retail markets. The strains were classified into five serotypes (i. e., *Salmonella* Typhimurium, *Salmonella* Kentucky, *Salmonella* Brandenburg, *Salmonella* Livingstone, and *Salmonella* Agona) and showed different resistance to antibiotics.

The microbiological quality (mesophilic aerobic bacteria, total coliforms, yeasts, and molds) and safety level ( *E. coli* O157: H7, Shiga toxin-producing *E. coli*, *Salmonella* Enteritidis, *Salmonella* Typhimurium, *Listeria* spp., and *L. monocytogenes* ) of organic and conventional vegetables from Malaysia were evaluated. *Salmonella* spp., *L. monocytogenes* , and *Listeria* spp. were the most representatives, with no trend between organically or conventionally grown vegetables ( Kuan et al. ). The presence of total and pathogenic *V. parahaemolyticus* strains was detected in short mackerel samples collected from different retail markets in Malaysia. The antimicrobial susceptibility profiles were also studied, showing a resistance to penicillin G and ampicillin ( Tan et al. ).

The genetic diversity as well as the antibiotic resistance and biofilm formation of *Cronobacter* spp. recovered from spices and cereals were studied by Li Y. et al. *Cronobacter sakazakii* was the most common species, and 62. 5% of 40 *Cr. sakazakii* strains were non-biofilm producers. Parra-Flores et al. evaluated the presence of *Cr. sakazakii* , microbiological levels of aerobic plate count and *Enterobacteriaceae* in dairy product batches associated with a recent food alert in Chile.

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