



# Zoonotic diseases

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**P**oultry meat is by far the most popular food product worldwide. Several factors contribute to the popularity of this product, of which sensory, dietary and economic factors are most important. There are no primary religious restrictions associated with the consumption of poultry meat, but it has to be realized that due to religious considerations, hygiene during the slaughter process sometimes can be negatively influenced.

Foods of animal origin and poultry products in particular are often found contaminated with potentially pathogenic microorganisms.

They include:

## Salmonella

One of the principal reservoirs of salmonella is poultry. Poultry has been linked with one-third of the food-borne outbreaks; the contamination rate of which ranges from 5-79% in India. Studies revealed that undercooked eggs were the major source of sporadic salmonella infection. Intensive poultry rearing and cross contamination of carcass and eggs during handling and scalding are found to add significantly high numbers of salmonella in them. *Salmo-*

*nella enteritidis* phage type 4 (PT<sub>4</sub>) has become a major problem of chicken in Europe, emerging as the major cause of salmonella in humans especially to the very young, elderly and to immuno compromised individuals. Efforts to control salmonella infections in poultry are with the exception of those caused by pathogenic serovars, driven by public health considerations rather than expectations that dramatic improvements in production efficiency will be achieved.

## Campylobacter

It has been shown that a small drop of raw chicken juice can be sufficient to provide an infective dose to humans. Campylobacteriosis is a significant food borne zoonoses primarily in relation with consumption of undercooked poultry and poultry meatproducts. Thermophilic *Campylobacter jejuni* is frequently isolated from the intestinal tract of clinically unaffected commercial and free living avian species. *Campylobacter coli*, is occasionally isolated from the intestinal tract of an avian host and *Campylobacter laridis* is isolated from marine birds particularly gulls. *Campylobacter enteritis* does not usually require antibiotic therapy, as the disease is self-limiting. In developing countries where the disease is hyperendemic, clinical illness in adults is rare due to early acquisition of immunity by children persistently exposed to infection. Unlike salmonella, campylobacter will not replicate in foods stored below 30°C. Thermal inactivation occur at 48°C so they will not survive pasteurization or typical meat cooking procedure.

## Listeriosis

Listeriosis in birds is most frequently found in chickens, ducks, geese, turkeys and canaries. Young and immunologically compromised humans are also susceptible to this disease. Surveys have shown that 15-66% of fresh or frozen samples contains *Listeria monocytogenes*. The organism is found in soil, sewage, silage, surface water and faeces. It is capable of surviving in soil for 1-2 years. Pasteurization at 75°C will kill the organism in 10 seconds. The organism grows better on poultry than on other kinds of meat. Live poultry can become intestinal carriers of the patho-

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gen during rearing and spread may be by contact with infected bird and through faeces. Most human cases are sporadic and because of some-times very long incubation period, it is particularly difficult to identify the foods involved.

### **Clostridium perfringens**

It is a part of the normal gut flora of poultry birds. During the slaughter process, contamination of the carcass with faeces can occur. This contamination can survive cooking and subsequent cooling produces the anaerobic conditions for the bacterial multiplication. Foods particularly implicated include meats and poultry particularly as stews and casseroles. Human food poisoning is usually associated with type-A strains. As the nature of illness in human is relatively mild, many outbreaks are not reported.

### **Staphylococcus aureus**

As in other food animals, coagulase positive staphylococci are frequently present on the skin and in the nasopharynx of poultry. Levels of contamination may be higher on end-of-lay hens than on broilers. Among the relatively few strains that form food-poisoning enterotoxins those producing types C and D toxins are most common. Proper temperature control is a major factor in reducing the risk of *Staphylococcus aureus* outbreaks.

### **Verotoxin producing *Escherichia coli***

Although poultry are not an important source of *E. coli* infection in man, there are few cases of the infection. Various serotypes of *E. coli* are capable of producing verocytotoxin but O157:H7 is the one most often involved in human illness. Enteric diseases caused by the organism may lead to the development of Haemorrhagic uremic syndrome (HUS) and death.

## **OTHER ZOOSES**

### **New Castle Disease**

The virus is chiefly a pathogen of the domestic fowl and considered being the most serious poultry disease throughout the world. Transmission in birds occurs by aerosol or ingestion of contaminated faeces. Infection is generally disseminated and spread with the movement of birds (exotic pets, show birds, wild birds, waterfowls and domestic poultry), people, rodents, fomites and poultry products. The virus can survive for weeks at a cool environmental temperature or several years if kept frozen. The main hazard to man is amongst workers in poultry packaging stations where

evisceration of infected carcasses appears to be the main source of infection. During outbreaks in broiler houses, poultry keepers develop conjunctivitis.

### **Avian Influenza**

It is a viral disease of most avian species manifested by short course and high mortality. Influenza viruses are typed in A, B or C and are antigenically distinct but only type A, has been isolated from humans, animals and birds. Scientists have postulated that ducks are the original reservoirs of the viruses which thrive in duck's intestines and then passed into water with their faeces which in turn enter the respiratory tract of animals particularly pigs where they become adapted for survival in humans. Direct contact and aerosol are the main modes of transmission leading to respiratory distress in humans.

### **Avian Chlamydiosis**

It is an acute or chronic contagious disease of turkeys, ducks, chicken, pheasants, pigeons, cage birds and migratory birds. Spread of infection is by inhalation or ingestion of fecal dust containing chlamydia. Carrier birds shed chlamydia in their secretions and excretions. Pigeons are suspected of being disseminators of infection. Diseased turkeys may also cause infection in abattoir employees engaged in turkey handling and processing. Respiratory tract is the principal portal of entry leading to pneumonia and kerato conjunctivitis in man.

### **Histoplasmosis**

It is an acute/chronic disease, which is caused by dimorphic, and intracellular fungus called *Histoplasma capsulatum*. It is a saprozooses as soil contaminated with dropping of birds (in poultry houses, roosts and buildings) is a rich source of fungus due to presence of increased amount of nitrogen in the faeces and exposure to such soil is an important source of infection to man. Benign respiratory disease is seen in humans and is a serious threat to agricultural workers, sewer workers and sweepers in high-risk areas.

Other zoonotic diseases related to poultry, which are of less importance but are worth mentioning, include Aspergillosis, Candidiasis, Ringworm and Cryptococcosis. Proper personal and occupational hygiene, health education and hygienic processing of meat can reduce the risk of zoonotic diseases to a great extent.

