



Poultry and poultry products - risks for human health

Consumption

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INTRODUCTION

Unless all the necessary precautions are taken along the poultry production, marketing and processing chains, poultry meat and eggs can be contaminated by infectious agents that are harmful to humans. Poultry products can also be contaminated with the antimicrobial and anti-parasitic drugs or pesticides used on farms. The ingestion of antimicrobials can cause antimicrobial-resistant bacteria to develop in humans.

Campylobacter and *Salmonella* infections are among the most important food safety hazards. These bacteria account for more than 90 percent of all reported cases of bacteria-related food poisonings worldwide. Most of these cases are related to the consumption of poultry and poultry products, but all domestic livestock are potential reservoirs of infection. Reported cases of *Campylobacter* and *Salmonella* infections are believed to represent only a fraction of the true number of cases.

Consuming raw or undercooked poultry or poultry products has been implicated as a potential risk factor for human cases of influenza H5N1 infection (HPAI). Poultry meat should be well cooked, with the core temperature reaching 70°C for at least one second during cooking.

Data on food-borne diseases in low-income countries are scarce. There is no precise and consistent global information about the full extent of the occurrence of food poisoning and the costs related to unsafe food. Symptoms are often mild and cases are not reported, but their importance is thought to be substantial.

RISK FOR CONSUMERS

In many countries, eating habits have undergone major changes over the last two decades. The middle class is growing, and this group of people eats more meat and goes out more often for meals. Migration from rural to urban areas has also resulted in changed eating patterns. New food production, preparation and distribution techniques have developed in response to these changes. There is a large increase in “fast food” and other ready-to-eat foods, which means that consumers have less control on the selection, preparation and storage of the meat they consume.

Children and people in stress situations, such as those facing malnutrition, war or natural disasters, are especially at risk of food-borne bacterial diseases. The main symptom is diarrhoea, and infection can be fatal (with 0.01 percent mortality in infected people in high-income countries). As the causal agent is a bacterium, these diseases can be treated by antibiotics, but access

to treatment is difficult in many low-income countries. Another problem is the development of resistance to antibiotics among zoonotic bacteria.

PRODUCTION SYSTEMS

Backyard poultry production is an important activity for many rural households. Consumption of meat and eggs from this production system is considered safe because of the habits usually observed among consumers purchasing or preparing birds from backyard poultry production. Preparation is usually just after slaughter. Because a chicken provides one meal for a family, there are usually no leftovers. The meat is thoroughly cooked, which reduces the risk associated with the consumption of sick birds that is observed in many poor rural areas. If birds are infected, there is risk of human infection with pathogens during the handling of live birds and during preparation.

People with little or no experience of poultry farming may invest in smallholder intensive poultry production and may build a small broiler or layer chicken house, often near new settlements or suburbs. In these small-scale operations, the use of antibiotics – which is sometimes adopted to compensate for poor performance resulting from inexperience in management – is not adequate. The risk of consumers ingesting antimicrobials and/or antibiotics is particularly important.

In general, poultry meat and egg products from large-scale commercial operations are subject to efficient control processes and are safe. Large companies normally take considerable care to avoid bad publicity resulting from the commercialization of unsafe food products. However, one of the most common problems for large-scale commercially produced poultry meat in low-income countries is the lack of refrigeration during marketing. Table 1 gives an overview of risk factors for food-borne diseases related to the consumption of poultry and poultry products from production systems in low-income countries.

REDUCING RISKS

The appearance of clinical signs in infected humans, and the importance of these signs will depend on several factors. On a chilled carcass taken out of the refrigerator, most bacteria need an adaptation time of about two hours before they start to multiply. Usually, only high numbers of bacteria will cause disease, and only in more vulnerable people. Consumers can reduce the risk of bacterial food-borne diseases by refrigerating the meat from the moment it is bought until the moment of preparation (heating)

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TABLE 1
Quality control and risk factors in low-income countries

Characteristics	Production system		
	Backyard	Smallholder intensive	Industrialized
Production chain	Short	Medium	Long
Quality control during production	-	±	+++
Quality control during slaughter	-	±	+++
Product	Live birds	Live or locally slaughtered birds	Frozen parts, defrosted at the market
Contact between consumer and live product	+++	++ in live-bird markets or poultry shops	-
Refrigeration chain	Not necessary, immediate preparation of whole carcass	Often not available	Often interrupted because of long chain
Consumer risk from bacterial contamination	+	++	+++ if refrigeration chain is broken
Consumer risk from resistant bacteria	-	+	+
Consumer risk from veterinary drugs residues and pesticides residues	-	+++	-

+ = present; - = absent

for consumption. Temperature and cooking time are critical in minimizing risk. Contaminated parts are less likely to cause food poisoning problems if the meat is well cooked. However, some bacterial toxins are heat-stable, and will not be deactivated. Proper attention to minimizing bacterial contamination and proliferation is required from slaughter until cooking. Coagulated blood, blood pudding and chicken-and-duck blood soup can contain harmful pathogens if not well cooked.

The World Health Organization (WHO) has elaborated the Five Keys to Safer Food programme (<http://www.who.int/foodsafety/consumer/5keys/en/>). Messages for food handlers and consumers have been developed, to decrease the incidence of food-borne diseases. Educational and training tools have also been developed. Education is an important measure for preventing risks to human health from poultry products.

Knowledge = prevention!

Thoroughly cooking in stew pans is fairly common in developing countries. The widely practised habit of washing the skin or

cutting the surface of the poultry meat before cooking helps to reduce bacterial contamination.

CONSUMER PROTECTION

The pattern of food-borne disease outbreaks has changed during the last two decades. In the past, most outbreaks were acute and localized, and resulted from a high level of contamination. Now, more outbreaks affect several countries at once, resulting from low-level contamination of widely distributed commercial food products. Risks of the contamination of poultry products by residues and bacteria exist everywhere, owing to the globalization of poultry production and trade. Counteracting this, the relative risk of contaminated poultry products reaching the market has reduced in the last decade, thanks to faster and more reliable diagnostic tools, the establishment of a world epidemiological alert system, and overall improvement of hygiene standards. The availability of efficient antibiotic treatments has also reduced the impact of food-borne diseases.

As most food safety hazards related to poultry come from the immediate health risks of ingesting foods contaminated with zoonotic bacteria, regulation and testing efforts have focused on reducing the incidence of this type of contamination. Over recent decades, the food chain approach has been recognized as a valuable step forward in ensuring food safety from production to consumption. Such a system can also control contamination with pesticides and veterinary drugs along the production and marketing chains.

The many and varied routes of contamination mean that many actors have a role in reducing risk, including feed mill operators, farmers, chicken processors, retailers, supermarkets, restaurants, takeaway establishments, health authorities, legislators, governments and consumers.

Flock health, the structure of the poultry food chain (short or chilled), the quality of control procedures during production and supply processes and on the final product – all contribute to the marketing of safe poultry meat and eggs.

WHO has set up a Food-borne Disease Burden Epidemiology Reference Group (FERG), which harmonizes international efforts



Coagulated blood for consumption

to estimate and reduce the global importance of food-borne diseases. This will help countries to estimate the magnitude of food-borne illnesses and to evaluate progress in their control. FERG will provide initial estimates of the importance of food-borne diseases worldwide by 2012. An international network of laboratories, alert systems and collaboration among authorities assist in solving food safety problems.

FURTHER READING

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