



C. The Main Food Hazards

C1 Introduction

Today's food supply is probably safer than it has ever been. Two factors, however, have led to increased pressure on food producers to certify that "safe" production practices are being used to produce food. The first is centralization of our food supply. Food production and processing facilities have become larger; thus, food contaminated anywhere during production or processing has the potential to affect a much larger number of people than ever. The second factor is our specialized urban society. The majority of buyers and consumers today never see the farm, perhaps not even the region, where their food is produced. Without first-hand knowledge, they need other assurances of food safety.

Food safety hazards must be kept in perspective. Most risks cannot be totally eliminated; rather, they can only be kept to a minimum. We must remember that despite the fact we face these hazards every day, most of us remain healthy.

C2 Hazards

C2.1 Pathogenic Bacteria

Salmonella, for example, live in the gut of many species of livestock, wildlife and pets. Not all

pigs carry this organism, and some carry it without showing any signs of disease. That makes it difficult to determine whether or not a pig is a carrier. Contamination of utensils or meat with a small amount of intestinal content from an animal that carries the organism can spread it at the processor stage. If the consumer then fails to cook the contaminated meat sufficiently, or neglects to clean up utensils and hands after working with it, the bacteria can lead to diarrhoea, vomiting and fever. In the very young, the elderly, and the immunosuppressed AIDS or cancer patient, these bacteria can cause severe disease.

To reduce the risk of illness from foodborne bacteria, three things can be done:

1. The levels of organisms in the pigs' farm environment can be reduced;
2. Processing techniques to reduce contamination in the slaughter plant can be improved; and
3. Consumers and institutions can be educated to handle raw meat properly during preparation and cooking.

Presently, it is impractical to expect to completely eradicate pathogenic bacteria from all farms, since they are found virtually everywhere in the

environment. Research has proven that basic sanitation practices used on the farm can reduce the number of *Salmonella* carrier pigs going to slaughter. Farms with inadequate rodent control programs, for example, often have higher levels of *Salmonella*. We have learned that control measures for *Salmonella* seem to be equally effective against other bacterial pathogens. But we don't have all the answers. There is a need for further research in this area to better understand how pathogenic bacteria can be controlled on the farm.

C2.2 Broken Needles

Broken needles are uncommon, but they do occur. When a needle breaks and remains in a pig's muscle, it is usually detected during processing. If, however, the needle is buried in a large cut such as the ham, it could escape detection and make it to the consumer's kitchen. Although rare, this hazard is an important one. It need only happen once to damage consumer confidence in the pork industry. Fortunately, this is an easy hazard to control.



C2.3 Antibacterial Drug Residues

Drug residues in pork are rare. They occur only in one-tenth of one percent of carcasses tested. The two main drug residue concerns in meat are reactions by consumers allergic to certain drugs and the development of drug-resistant bacteria. Drug residue in pork is one hazard we can realistically expect to completely eliminate on farms.

C2.4 Development of Drug Resistant Bacteria

The use of antibiotics in livestock operations has led to concern that strains of drug-resistant bacteria could be transferred to humans, and drug resistance is increasing in both humans and animals. Until we fully understand what role growth-promoting drugs play in resistance, it is important to keep the use of antibacterial drugs in livestock to a minimum.

C2.5 Parasites

C2.5.1 *Trichinella*

This parasite is the reason why past generations have tended to overcook pork. *Trichinellosis* has historically been associated with garbage feeding and poor hygiene. Production methods used by today's modern swine operations, combined with a

ban on the feeding of uncooked garbage and rigorous testing at slaughter, have virtually eliminated *Trichinella* in Canada.

C2.5.2 *Toxoplasmosis*

Cats are the main carriers of this parasite. Many humans have developed immunity because of exposure to cat feces in their own home. This parasite presents a risk when pregnant women are exposed to *Toxoplasma* for the first time. Birth defects may occur as a result.

This parasite has a two-stage life cycle. Kittens and newly-infected cats shed the organism in their feces. Pigs that eat cat feces may develop cysts in the meat. The cysts, if consumed in undercooked meat, can cause human disease. Humans can also contract the disease by handling cat feces. To reduce the on-farm risk, cats — especially kittens and nursing queens — should be kept out of the barn and away from feed bins and pig feed.

C2.5.3 *Other Parasites*

Other parasites, such as tapeworms, can be passed to humans in pork; however, these parasites are virtually unknown in Canada. Our cold climate, good hygiene, and the fact that we rear pigs indoors, make this risk negligible.

C2.6 Metals (e.g. cadmium, lead, mercury, selenium, zinc)

Metals may accumulate in meat when animals are exposed to high concentrations of them. Fortunately, many heavy metals tend to concentrate in bone and non-edible tissue first. Without due care, however, it is possible for medicating feed ingredients such as arsenilic acid to reach toxic levels in meat. A federal testing program in Canada routinely monitors all meats and contamination rates are extremely low.

C2.7 Other Drug Residues

No hormones are licensed for use in growing pigs in Canada. In addition to this legislative safeguard, a federal testing program is in place to routinely monitor pork for hormone presence.

C2.8 Mycotoxins

Molds produce toxins in grains under certain conditions of moisture and temperature. Pigs are more sensitive than other livestock to mycotoxins and cannot tolerate high levels. Concern that some toxins may accumulate in the meat and produce adverse effects on people has never been substantiated for any of the mycotoxins that occur in Canada.