



An Ounce of Prevention

An ounce of prevention is said to be worth a pound of cure. Researcher Dr. Colin Gill is looking at ways to safeguard Alberta meat products and provide consumers with peace of mind.

When was the last time you looked in the fridge and wondered, "What's this growing in here?". It may be the colourful green, white, and black patterns of mold on food that's been left too long. Or maybe it's last year's Science Fair project. These problems are self-inflicted, caused by questionable handling and storage of food in the home, but we have every reason to believe the food we bring home is perfectly safe – don't we?

Even with all the regulations we have on food handling and processing there is the chance that there are bacteria growing on that package of raw meat in the fridge. And some of these bacteria may well be the dangerous pathogens of *Escherichia coli* (E. coli) or Salmonella. Assuming that people recognize their own responsibility for food safety in the home by taking the proper precautions when dealing with raw meat to avoid the possibility of pathogen contamination, the question becomes, "What safeguards are in place to protect the meat before it reaches the supermarket shelves?".

Food Process Controls

In Canada, as well as internationally, food products are subject to a series of regulations and process controls, applied at every step from the food's raw state until it reaches the consumer's hands. Since the 1920s, process controls have been used as a way of guaranteeing the quality and safety of the end product. The basis is that the end

product can only be guaranteed if the materials that went into it, and the subsequent processes used, are well known and understood. The Hazard Analysis: Critical Control Point system (HACCP, commonly pronounced "ha-sip") recently emerged as an international practice, designed to help commercial agencies guarantee the safety and quality of raw products, such as meat, through analysis and prevention of food safety hazards before they occur.

The canning process is a good example of the application of the Critical Control Points approach. Canned products are considered safe provided two things occur: the can is completely sealed, and it is heated to a temperature that kills all of the bacteria in the food. In this example, both the sealing and heating of the can are considered critical points; the potential hazards can either be controlled or eliminated. If the contents of the can are sampled at the critical point of heating, researchers can determine what effect the process has had on the food's microbiology. This allows them to determine if there is any chance of disease contamination based on what has happened to the bacteria present. The HACCP system provides another control for the quality and safety of the food in commercial systems.

Applying HACCP Principles

Agriculture and Agri-Food Canada researcher Dr. Colin Gill



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- Dr. Colin Gill, AAFC

believes HACCP will be effective only if it is based on appropriate microbiological data. Gill and his team work with small samples of meat, and they are interested in the points in the various stages of processing at which pathogenic bacteria are added to or removed from it. With the testing of meat and the high regulation of the processing procedures, it is possible to develop an understanding of what has happened to the product, in terms of the microbiology, up until the point of sampling.

The researchers look at the bacteria to determine what is happening to the microbiology and assess whether or not the pathogens may be present in the sample, with a low number indicating that the pathogens are infrequent and therefore the product is safe for consumption. Gill points out that this research provides the commercial sector with a better chance of product control.

Each sample contains a variety of bacteria. It is important to keep in mind that not all E. coli bacteria are harmful; in fact most mammals, including humans, have the bacteria already present in their gut. Some are indicator bacteria for pathogens, some are harmless forms of E. coli and others may be dangerous pathogens such as E. coli O157H. Such testing allows food to be kept safe.

Safe Food for Confident Consumers

E. coli research in Alberta, funded in part by Alberta Agricultural Research Institute and Alberta Livestock Industry Development Fund Ltd., is aimed primarily at improving and aiding the commercial meat processing industry, thus improving the industry in significant ways. As Gill points out, “The goal of our research is to ensure public health and increase market quality of meat products.”

The extra control on raw products leads to healthier and higher quality products for consumers. Further, world-class food safety processes help to settle the minds of Canadian and international consumers alike. This in itself may help in the boosting of Alberta's economy by helping to rebuild Canada's reputation in the international beef market. The research that Gill and his team are doing is essential to keeping Canada's meat industry competitive and effective by recovering and expanding our share of the world market.

Most importantly, Gill's research is also all about the health and safety of the general public. So, thanks to research, the answer is yes – we do have every reason to be confident that the food we buy is both delicious and safe. **r&d**

Canada's Food Safety Initiatives at a Glance

- Canada's objective is to be the world leader in food safety, innovation, and environmentally responsible production and to be the best at meeting the needs of consumers at home and abroad.
- The On-Farm Food Safety Recognition Program (OFFSRP) was formally announced by the Honourable Minister Lyle Vanclief in June 2002 as part of the Agriculture Policy Framework (APF). Industry-developed OFFS programs and government recognition of these programs will enhance Canada's domestic and international reputation as a leader in food safety and quality. This, in turn, could mean expanded markets for Canadian products.
- The Food Safety Enhancement Program (FSEP) is the Canadian Food Inspection Agency's (CFIA) approach to encourage and support the development, implementation, and maintenance of the U.S. Food and Drug Administration's (FDA) Hazard Analysis: Critical Control Point (HACCP) systems in all federally registered establishments of the meat, dairy, honey, maple syrup, processed fruit and vegetable, shell egg, processed egg, and poultry hatchery sectors.
- Under the APF, separate farm and off-farm programs will provide financial assistance for adopting HACCP principles on farms and in food processing plants, including provincially-inspected meat and dairy processors, avoiding issues in the first place rather than inspecting them afterward.
- The FDA's HACCP is a U.S. National Food Safety initiative designed to provide a systematic approach to the identification, evaluation, and control of food safety hazards. The program was designed in the early 1970s for keeping food safe in outer space. The current HACCP is designed for use in all segments of the food industry from growing, harvesting, processing, manufacturing, distributing, and merchandising to preparing food for consumption. The HACCP addresses food safety through the analysis and control of biological, chemical, and physical hazards from raw material production, procurement and handling, to manufacturing, distribution and consumption of the finished product.

