

Ideas on the Edge



Food Fight

THE BATTLE LINES KEEP SHIFTING IN THE STRUGGLE TO KEEP OUR FOOD SAFE. AN ADVANCED FACILITY AT THE UNIVERSITY OF GUELPH HELPS RESEARCHERS FIND NEW WAYS TO FIGHT.

The micro-organisms that contaminate our food can be deadly—and creative.

“Organisms are always adapting to new environments,” explains Dr. Mansel Griffiths of the University of Guelph. “That’s why every so often we see the emergence of an organism that we didn’t

anticipate as being a food-borne problem.” Dr. Griffiths points to the example of BSE (bovine spongiform encephalopathy); “mad cow disease,” as BSE is popularly known, is caused by an agent that no one thought could jump the species barrier.

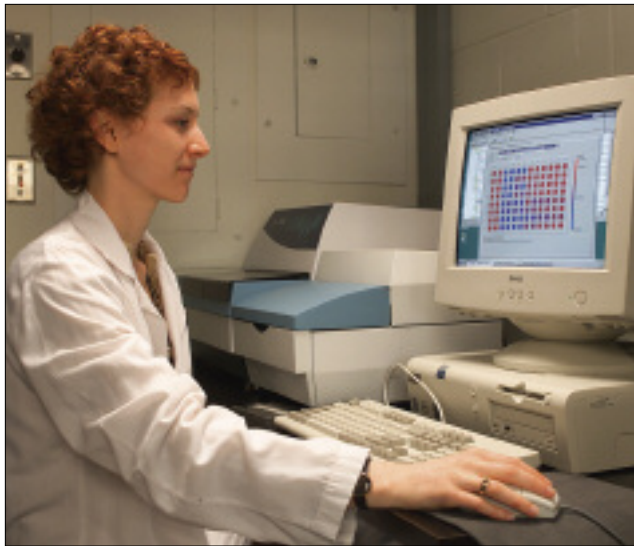
“These sorts of things come along all too regularly,” says Dr. Griffiths, “and we could face a fairly significant public health disaster if we don’t have the capacity to deal with them.”

A keystone of that capacity in Ontario is the

Canadian Research Institute for Food Safety (CRIFS) at the University of Guelph. Dr. Griffiths is the Director. The Institute, which was funded in part by an investment from the Ontario

RESEARCH THAT MATTERS
REAL-WORLD BENEFITS FOR ONTARIANS:

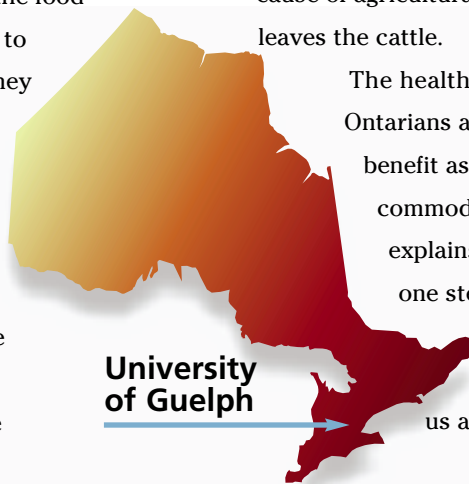
- applications in making Ontario’s food supply safer
- competitive edge in the global trade in food



Project: Creation of the Canadian Research Institute for Food Safety (CRIFS)
Institution: University of Guelph
Research Discipline: Engineering/Materials Science and Technology
Principal Investigator: Mansel Griffiths
Trust Investment: \$2,998,242
CFI Investment: \$2,998,242
Total research investment from all sources: \$8,067,968

Innovation Trust, houses a suite of equipment that gives researchers a versatile set of tools for understanding how contaminating organisms enter the food system, how they develop resistance to anti-microbial treatments, and how they can be detected and eliminated.

One focus has been on bacteriophages—viruses that infect bacteria. There are two ways that these phages can be useful against food contamination: to signal the presence of harmful bacteria, and to destroy them. Dr. Griffiths is focusing on the



first approach, making use of the phenomenon of bioluminescence—the emission of light by living organisms in response to certain stimuli. In one example, he’s been able to take a naturally-occurring phage that attacks salmonella bacteria and genetically modify it so that the salmonella cells emit light when the phage infects them. The goal is to perfect a test that involves introducing the modified phage to a food sample, then testing the sample for the presence of light that would indicate salmonella contamination.

The advantage of this new kind of test is that it could be carried out in a matter of hours, instead of the days it takes for the more traditional method of growing a culture. The shorter the testing process, the quicker the meat or other food product can come to market—and the less time it’s exposed to further risk of contamination.

Other scientists are looking for ways to adhere bacteriophage to the paper or plastic film in which food comes wrapped, either as part of a contamination detection system, or to actually attack contaminating bacteria. Still others are researching the use of phage in cattle feed to attack and destroy *E. coli* 0157—a major cause of agricultural contamination—before it even leaves the cattle.

The health implications of all this research for Ontarians are obvious. But there’s an economic benefit as well. “Trade in food and agricultural commodities is a global business these days,” explains Dr. Griffiths. “If research can keep us one step ahead of the game in terms of food safety, it’s going to improve our ability to export products, and give us a competitive edge in a global market.”



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Infrastructure for Innovation About the Ontario Innovation Trust

The Ontario Innovation Trust was created in 1999 by the Government of Ontario to invest in research equipment and facilities at Ontario’s universities, colleges, hospitals and other non-profit research institutions. The Trust is governed by a volunteer Board of Directors, according to the terms of a Trust agreement established by the Ontario government. A small permanent staff looks after day-to-day operations.

Since its inception, the Trust has committed almost \$843 million to strengthen Ontario’s position in the global marketplace of ideas. This represents more than a third of the \$2.44 billion in total funding that has been invested in Trust-supported projects.