



Health
Canada Santé
Canada

*Your health and
safety... our priority.*

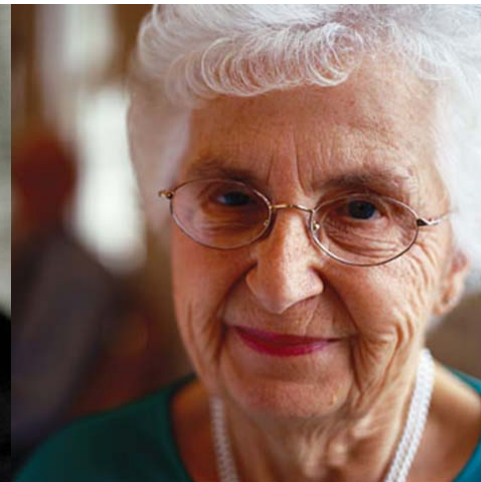
*Votre santé et votre
sécurité... notre priorité.*

The future of food safety

Dr. Kirsten Mattison

Bureau of Microbial Hazards

Health Canada



Canada

When is the future?

- In 5 years? 10 years? 20 years? 30 years?

Further away is more difficult to predict

Food generation



Food production

Marketing



Healthy eating



Food safety technology



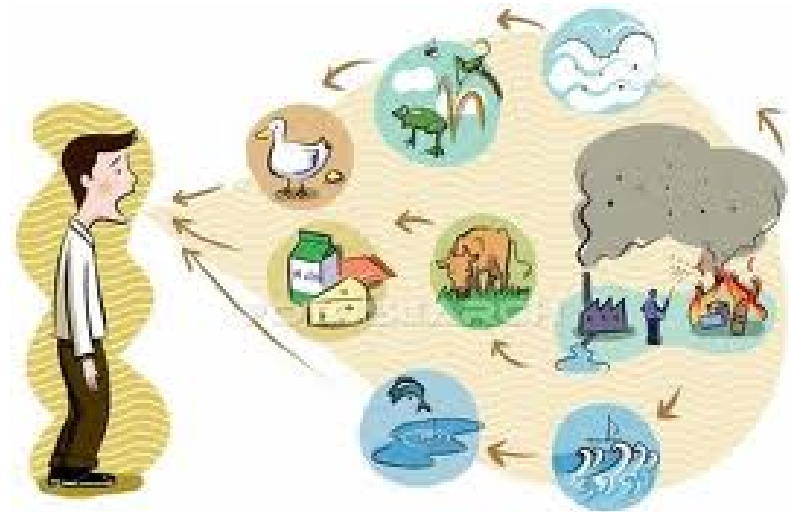
One World One Health concept

- Originally conceived for human-animal interface
- Very important for all aspects of public health

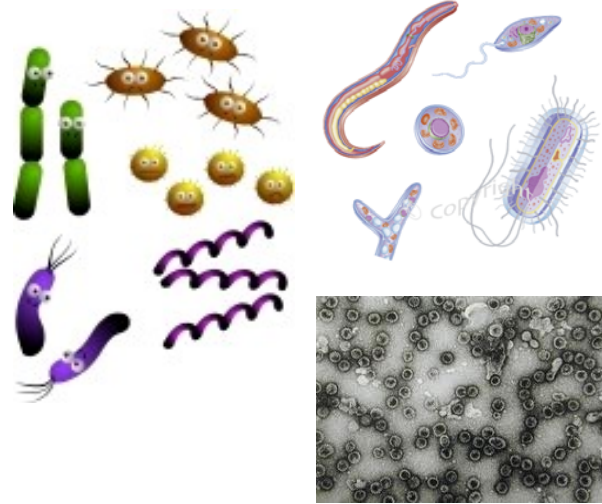


The importance of food

- Food brings together
 - Public health
 - Environment
 - Agriculture
 - Commerce
 - Personal values



The future of food safety



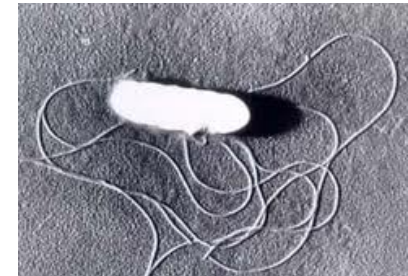
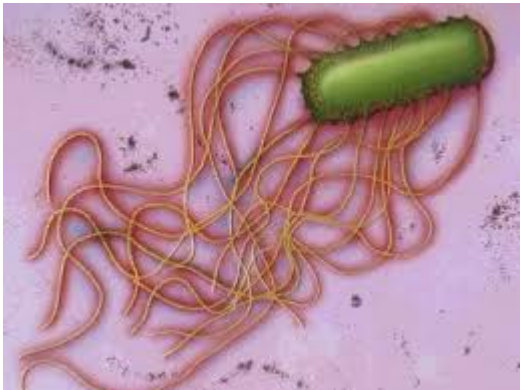
- Traditional foodborne pathogens
- Emerging foodborne pathogens
- Novel foods/food technologies



Foodborne pathogens

- Bacterial pathogens traditionally associated with foodborne disease

For e.g. Salmonella, Escherichia coli, Listeria monocytogenes, Vibrio spp., Clostridium botulinum



The future of traditional pathogens

Outbreaks in new/unexpected food commodities



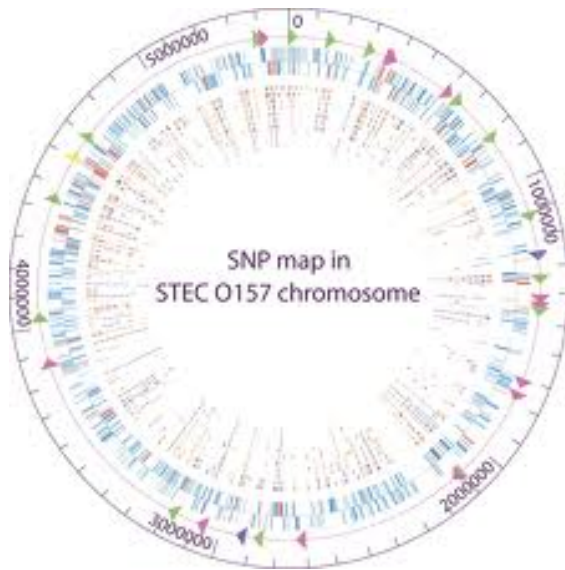
The future of traditional pathogens

Larger outbreaks in traditional pathogen-commodity pairs



The future of traditional pathogens

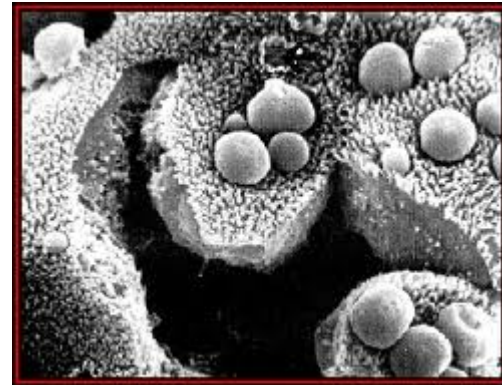
Emerging strains with new virulence characteristics



Emerging pathogens

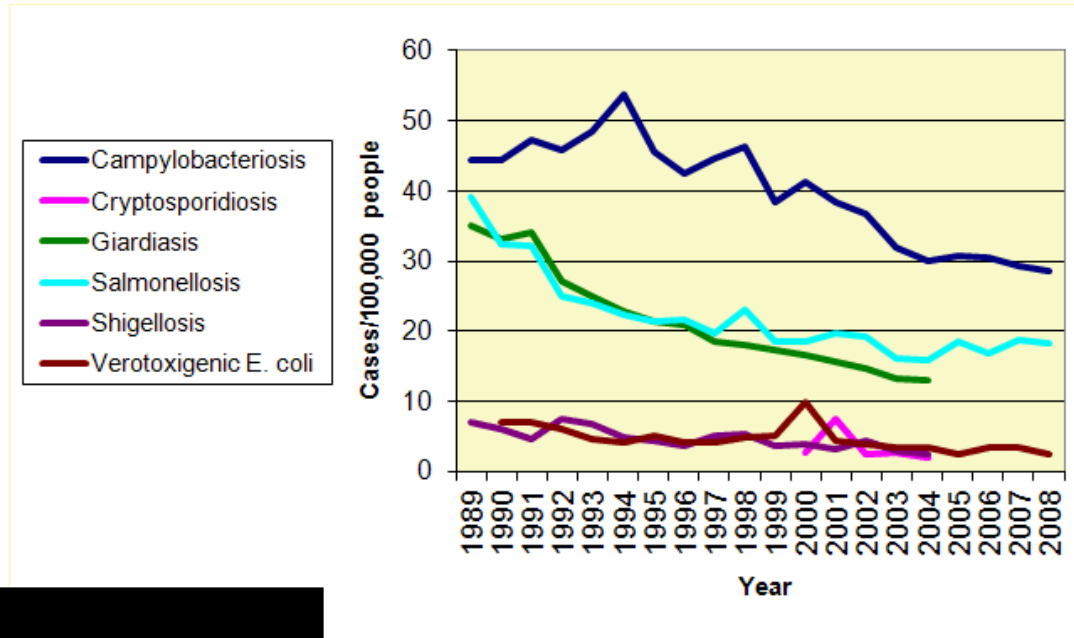
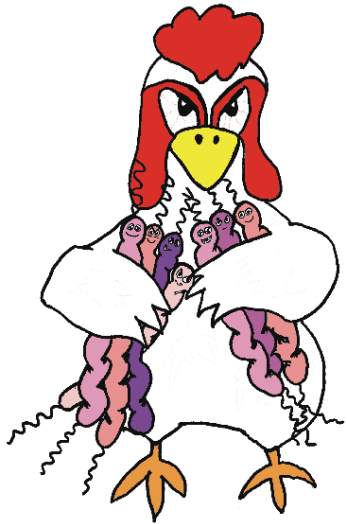
- Bacterial, viral or parasitic pathogens not traditionally monitored in the context of foodborne disease

Many do not grow outside of animal host and detection can be challenging



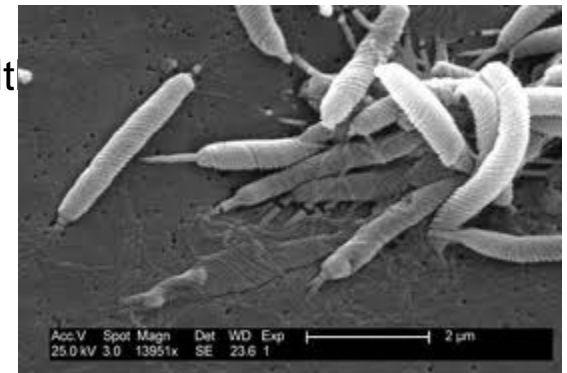
Campylobacter jejuni and coli

Estimated that 1 in 100 Canadians are infected every year



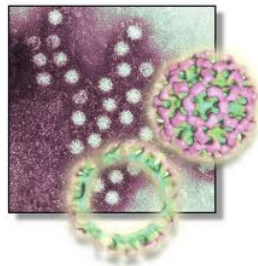
Emerging *Campylobacter*-related organisms

- *Arcobacter* spp. (Genus proposed in 1992;
Association with disease not well understood. No human volunteer studies, clinical samples are not generally tested for this organism.
- *Arcobacter butzleri*
4th most common campylobacter-like species recovered in France/Belgium
Classified as a serious hazard to human health by the International Commission on Microbiological specifications for Foods.
outbreak in 10 children in Italy
- *Helicobacter pullorum*
associated with diarrheal disease, but human health

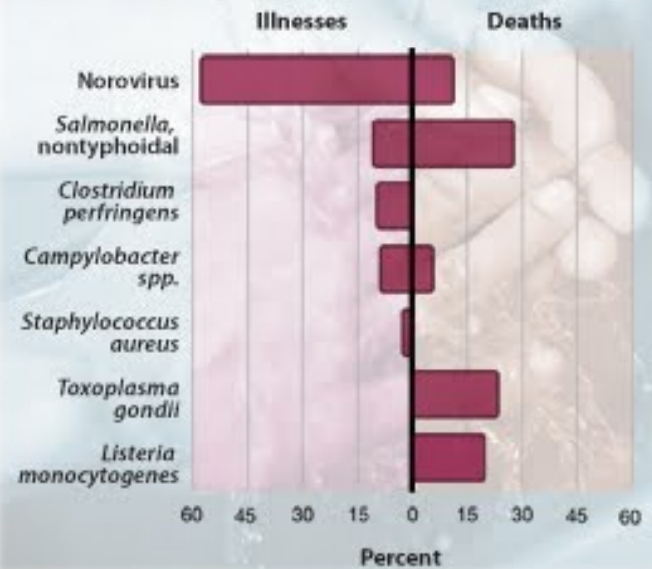


Norovirus

- First recognised in 1972 (Norwalk, OH, 1968)
- Prevalence of molecular detection methods has led to an increase in detection



Top pathogens contributing to domestically acquired foodborne illnesses and deaths, 2000–2008



Cyclospora cayetanensis

Background:

- identified as a protozoan parasite of the human small intestine in 1993
- causes profuse and prolonged diarrhea, as well as abdominal pain, nausea, vomiting, fatigue, fever

Transmission

- transmitted by food and water; not person-to-person or zoonotic
- foodborne outbreaks in North America began in 1995; associated with fresh imported produce
- currently, 99% of cases in U.S. are foodborne
- 151 cases in Canada (2008); number is dependent on outbreaks



Novel foods and novel food technologies

- How do we define novelty in Canada?

No history of safe use

Genetically modified foods

Foods that have been processed in a way that causes them to undergo a major change



www.novelfoods.gc.ca

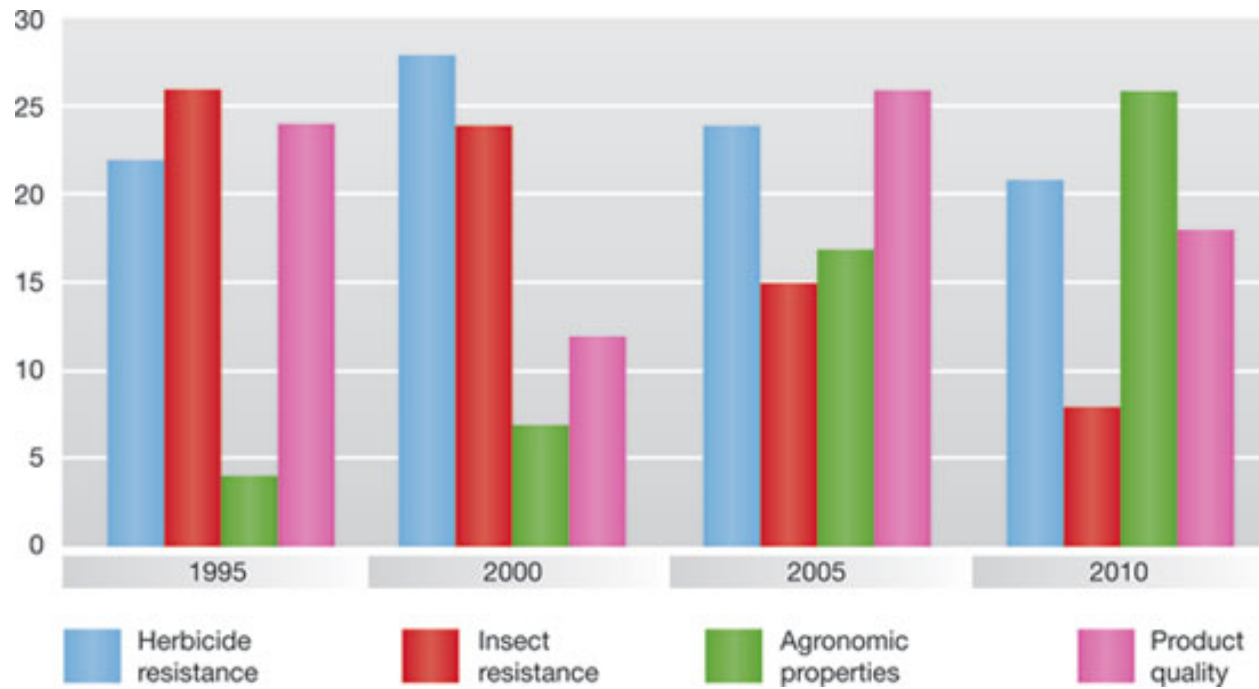


Trends in novel foods

- Improved health effects
- Improved food safety
- Improved growth
- Improved pest/pesticide resistance
- (Improved environmental impact)



Trends in GM traits



GM traits in crops undergoing trials in the USA (1995–2010)

Tait and Barker EMBO reports (2011) 12, 763 - 768



Improved health effects

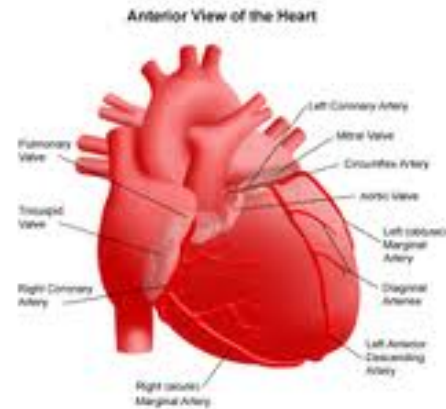
- For example,

Phytosterols in

- Yoghurt
- Margarine
- Eggs

Omega-3 fatty acids in

- Pork
- Milk
- Juice



Improved food safety

- For example,



UV-treated juice

High pressure treated
deli meats



Improved resistance

- Insect resistant crops
- Herbicide resistant crops
- Drought tolerant crops

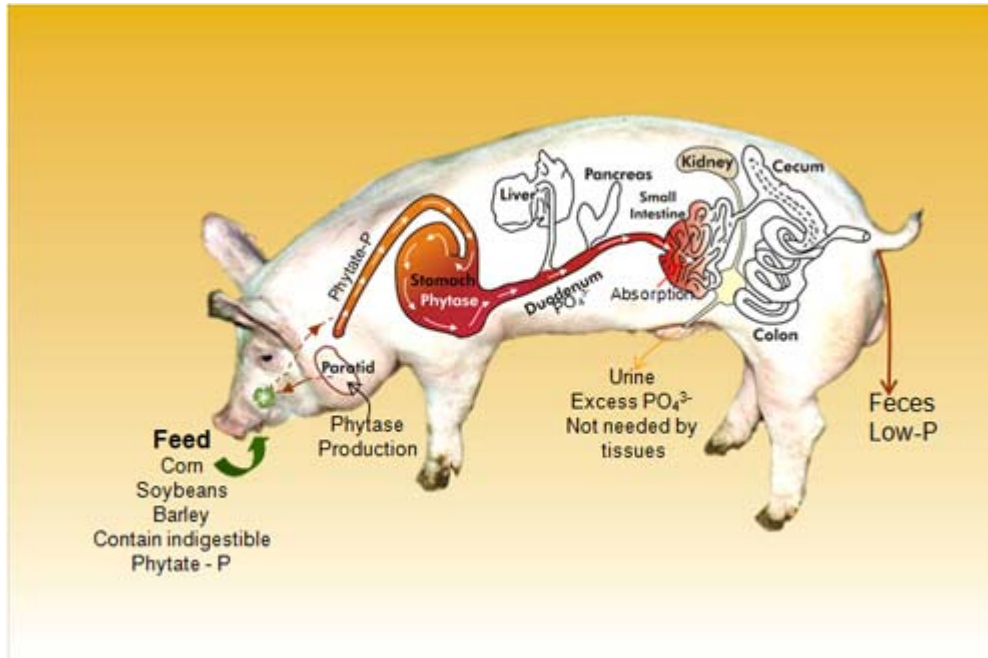


How do we look into the future?

- The Future of Novel Foods and Regulatory Frameworks Enabling Public Safety , Innovation and Competitiveness to 2030, October 4-5, 2011, Ottawa
- Literature, works in progress
- Research projects



A Canadian example



- Enviropig™
- <http://www.uoguelph.ca/enviropig/>

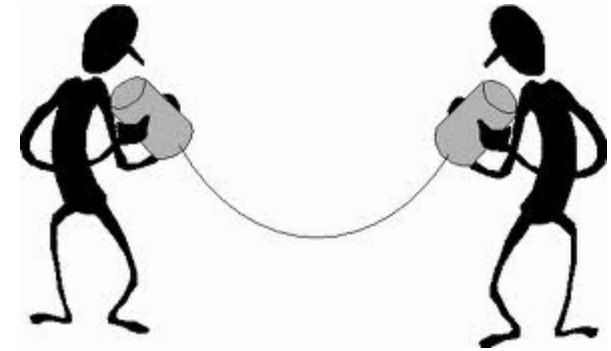


How do we keep up with these trends?



Communicate

Collaborate



Engage



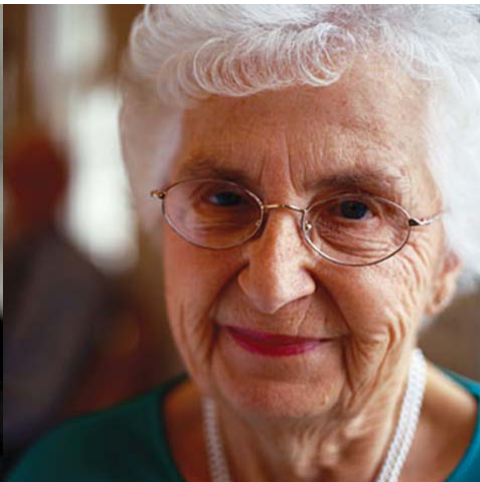


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Thank you



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