Relevant Research Article Summaries

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1. Dixon, B., et al. 2013. *Detection of Cyclospora, Cryptosporidium, and Giardia in ready-to-eat packaged leafy greens in Ontario, Canada*, Journal of Food Protection, 76(2): 307–313.

A total of 544 retail samples of ready-to-eat packaged leafy greens were collected in Ontario. Most of the products were grown in the United States, but some were from Canada and Mexico. *Cyclospora* spp., *Cryptosporidium* spp., and *Giardia duodenalis* were found in 1.7%, 5.9%, and 1.8% of the samples, respectively.

2. Roche, S.M., et al. 2012. *Drinking water consumption patterns in Canadian communities (2001–2007)*, Journal of Water and Health, 10(1): 69–86.

A pooled analysis of seven cross-sectional studies from Newfoundland and Labrador, Waterloo and Hamilton Regions (Ont.), and Vancouver, East Kootenay, and Northern Interior Regions (B.C.) were performed to determine the drinking water consumption patterns of Canadians. The mean volume of tap water consumed was 1.2 L/day, with a large range of 0.03–9.0 L/day. Approximately 25% of participants were classified as bottled water users, meaning that 75% or more of their total daily water intake was bottled, and 48.6% of participants used an in-home treatment method to treat their tap water.

3. Alcalde, L., et al. 2012. *Removal and relationships of microbial indicators in a water treatment and reclamation facility*, Journal of Water and Health, 10(4): 549–556.

Monitoring of treatment results over one year showed that reclamation treatments present a different efficiency in indicator microorganism removal depending on the type of microorganism. The study concluded that it is not suitable to use any of the bacterial indicators evaluated to predict the content of virus or spores of sulfite-reducing clostridia.

4. Sanborn, M., and Takaro, T., 2013. *Recreational water-related illness*, Canadian Family Physician, 59: 491–495.

This review found a 3%–8% risk of acute gastrointestinal illness (AGI) after swimming. The high-risk groups for AGI are children younger than 5 years of age, especially if they have not been vaccinated for rotavirus, and elderly and immunocompromised patients. Participants in sports with a lot of water contact such as triathlon and kite surfing are also at high risk. Even activities involving partial water contact such as boating and fishing carry a 40%–50% increase in risk of AGI compared with nonwater recreational activities.

5. Stanczyk, N.M., et al. 2013. *Aedes aegypti mosquitoes exhibit decreased repellency by DEET following previous exposure*, PLOS ONE, 8(2): e54438.

DEET is one of the most widely used mosquito repellents. Recent studies have found certain insects are unaffected by its presence. This study found an increase in insensitivity to DEET on a second exposure by previously DEET-sensitive mosquitoes. This initially suggested they may have adapted to DEET, possibly by associating it with the presence of a host arm and were able to “overcome” the natural repellent effect. This would be consistent with other studies showing that mosquitoes can learn to respond differently to odours to maximize feeding success.

6. Hutcheson, C., et al. 2013. *Microbes in pool filter backwash as evidence of the need for improved swimmer hygiene – Metro-Atlanta, Georgia, 2012*, MMWR, 62(19): 385–388.

Filters physically remove contaminants. Filter concentrate samples were collected at public pools in Atlanta to determine microbial load. *Pseudomonas aeruginosa* and *E. coli* were detected in 59% and 58% of samples, respectively.

7. Amburgey, J.E., et al. 2012. *Removal of Cryptosporidium and polystyrene microspheres from swimming pool water with sand, cartridge, and precoat filters*, Journal of Water and Health, 10(1): 31–42.

Researchers evaluated swimming pool filters, common in the United States, for removing *Cryptosporidium* oocysts. One and 5 µm diameter polystyrene were used in a hot tub with interchangeable sand, cartridge, and precoat (DE and perlite) filters. Precoat filters demonstrated pathogen removal efficiencies of 2.3–4.4 log. Sand and cartridge filters had average *Cryptosporidium* removals of 0.19 log (36%) or less. The combined low filter removal efficiencies of sand and cartridge filters and the chlorine-resistant properties of *Cryptosporidium* could indicate a regulatory gap warranting further attention.

8. Yang, H., et al. 2013. *Sanitizing effectiveness of commercial “active water” technologies on E. coli O157:H7, Salmonella enterica and Listeria monocytogenes*, Food Control, 33: 232–238.

Electrochemically activated water (ECAW) (electrolyzed water) is effective in inactivating bacteria, but their generation typically uses high current and voltage. Retail products that produce “active water” by using mild electrical current are available. Researchers found ECAW water can provide more than 5 and 4 log reduction of *E. coli*, *Listeria*, and *Salmonella*.

on liquid culture and stainless steel surfaces, respectively. In contrast, treatment of liquid cultures with any of the commercial technologies resulted in nonsignificant bacterial cell reductions greater than 0.5 log cfu/mL. No reductions were observed when treating any of the water generated on dried metal surfaces. The results indicate that treatment with any of these portable technologies had no noticeable antimicrobial activity.

9. Feliciano, L., et al. 2012. *Efficacies of sodium hypochlorite and quaternary ammonium sanitizers for reduction of Norovirus and selected bacteria during ware-washing operations*, PLOS One, 7(12): e50273.

Food service establishments are required to achieve a minimum microbial reduction of 5-logs from tableware and food preparation utensils. Researchers used ceramic plates, drinking glasses, and stainless steel forks as food contact surfaces and contaminated them with cream cheese and reduced-fat milk inoculated with murine Norovirus, *E. coli*, and *Listeria*. The sanitizing solutions tested were 200 ppm of sodium hypochlorite and QAC, with tap water as control. A Hobart dishwasher with a proper hot water connection and pressure and a three-compartment sink with sanitizing soaking at 24°C and 30 seconds by disinfectants were used. Even though sanitizers appeared to slightly enhance the reduction of Norovirus, there was still a considerable amount of virus on the contaminated surfaces. Researchers noted that the required 5-log reduction is based on studies designed for the reduction of bacterial populations but not viruses. The study results found viruses to be more resistant to the common sanitizers used in restaurants.

10. Budtz-Jorgensen, E., et al. 2013. *An international pooled analysis for obtaining a benchmark dose for environmental lead exposure in children*, Risk Analysis, 33(3): 450–460.

Calculations on best fit models showed a Benchmark dose (BMD) of about 0.1 to 1.0 µg/dL being the dose leading to a loss of one IQ point.

11. Smith, B.A., et al. 2013. *A risk assessment model for E. coli O157:H7 in ground beef and beef cuts in Canada: evaluating the effects of interventions*, Food Control, 29: 364–381.

A quantitative risk assessment model was developed to evaluate the public health risks associated with the consumption of ground beef and beef cuts. Combinations of interventions applied at pre-harvest and throughout processing resulted in the greatest relative risk reductions through their effects on both prevalence and concentration of the pathogen in cattle faeces and on cattle carcasses. Analysis of conditions reflective of current practise in Canada indicated that risks from consumption of ground beef were approximately two to three orders of magnitude greater than those for beef cuts, suggesting that risk management measures should focus on the former product to maximize benefits to public health.

12. Jameson, L.J., et al. 2013. *Pet rats as a source of hantavirus in England and Wales. 2013*, Eurosurveillance, 18(9): pii = 20415.

Researchers reported the detection of a strain of Seoul hantavirus in pet rats in England and Wales. The discovery followed an investigation of a case of haemorrhagic fever with renal syndrome in Wales. Sequencing confirmed the virus to be similar, but not identical to, a previously reported UK strain from wild rats.

13. Ryan, M.O., et al. 2013. *Acceptable microbial risk: cost-benefit analysis of a boil-water order for Cryptosporidium*, Journal AWWA, 105(4): 51–52.

A cost-benefit analysis was used to identify a threshold level of risk for issuing a boil water order (BWO). Results suggested that a daily risk of nine illnesses out of 10,000 people exposed would justify a BWO. Given typical 3-log removal of oocysts during treatment, this risk level would correspond to a finished water concentration of 0.046 oocysts/L and a raw water concentration of 46 oocysts/L.