Healthy Rural Living?

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A national meeting of the Canadian Institute of Public Health Inspectors was held May 10-12 in Saskatoon. The meeting brought together health inspectors from across Canada including the newly formed territory, Nunavut. Health Inspectors are the people who try to make sure that food and water is safe for human consumption. They carry this out by enforcement of public health regulations as well as educating the public about safe practices.

An opening address was given by the Chief Medical Health Officer for Saskatchewan, Dr. David Butler-Jones. Dr. Butler-Jones gave an overview of various health concerns including infant mortality. Infant mortality, Dr. Butler-Jones stated, is generally higher among poor people except in Sweden. Dr. Butler-Jones saw this as a success for Swedish social policies and a model for other countries. There are, however, other factors that may affect infant mortality and Saskatchewan residents should know:

- Saskatchewan has consistently had the highest infant mortality rate in Canada averaging 8.6 deaths per 1,000 live births throughout the 1990s (1993-1996 for which final data is available). Sweden's infant mortality is less than half of this.
- Saskatchewan is below the average poverty level in Canada. Provinces with a similar ratio of rural to city people and poverty levels include New Brunswick and Nova Scotia. These two provinces have infant mortality rates considerably lower than Saskatchewan (averaging 5.6 and 5.9 deaths per 1,000 live births) respectively from 1993-1996. These rates are closer to Sweden's infant mortality rate of 4.0 than Saskatchewan's.

So if poverty is not the sole factor in infant deaths, what are the other contributions? One factor may be unsafe drinking water supplies. The very young and the elderly are many times more susceptible to waterborne illnesses than the general population. Consider the following:

- Two diseases that can be spread by water, Beaver Fever and Hepatitis A were two and three times more common per capita in Saskatchewan than the national average (1993-1996 average data).
- In Saskatchewan the number of reported Hepatitis A cases increased from 64 in 1994 to 450 in 1996. Compare this to New Brunswick and Nova Scotia where the combined total number of reported Hepatitis A cases was 19 in 1996. It is generally accepted practice to multiply the reported cases of waterborne illnesses by 10 or more to reflect actual numbers.
- The total number of Hepatitis A cases in New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland, the Northwest territories and Yukon was 25 in 1996.
- Saskatchewan had 18 times more cases of Hepatitis A than all of these provinces combined. On a per capita basis the rate of Beaver Fever was 4 and 5 times higher in Saskatchewan than in Nova Scotia and New Brunswick; for Hepatitis A the Saskatchewan rate was 14 and 71 times higher.
- Some may argue that the high proportion of aboriginal people in Saskatchewan is responsible for these high numbers. The Safe Drinking Water Foundation does not have access to separate statistics for different ethnic groups, but consider that in the Northwest Territories there are 40,000 aboriginal people while in Saskatchewan there are 111,000. While there were 450 cases of Hepatitis A in Saskatchewan there were only 2 cases in the Northwest Territories.
- In addition, water sources in rural Saskatchewan will typically contain high levels of naturally occurring dissolved organic material. When this water is chlorinated large quantities of new chemicals are formed; the amount of these chemicals are higher in rural Saskatchewan than in the rest of Canada. The concern is that they can potentially cause spontaneous abortions and cancer.

A presentation on Point of Use Treatment was made by Dr. Harry Grenawitzke from the National Sanitation Foundation (NSF) in the United States, a major testing organization in the world for such devices. Point of Use Treatment Devices are water treatment units that are put into a house (at the point of water use) rather than equipment in a water treatment plant (from which water is distributed). Water treatment

equipment dealers and government agencies (for example Sask Water) will use the NSF certification to point out that even rural Saskatchewan water can be made safe with little effort (see *Real and Perceived Water Quality Solutions* in the May 1999 issue of the Rural Councillor).

Dr. Grenawizke expressed concerns about the limitations of NSF certification, which is valid only for treating microbially safe water (typically water that has been treated in a larger city) but the majority of rural water used in Saskatchewan. Most NSF certification is also carried out in California on water with low levels of dissolved organic material; such water has more in common with Rocky Mountain water than agricultural runoff, which feeds small reservoirs and shallow ground water across the Prairies. This makes NSF certification for treatment of rural prairie water questionable.

Why remove particles from water?

Some of the particles in water are microorganisms, such as viruses, bacteria and parasites. The parasites include the Beaver Fever parasite as mentioned here. The Beaver Fever parasite causes frequent diarrhea, bloating, abdominal cramps, fatigue, low-grade fever, malaise (muscular aches and pains), and weight-loss. Symptoms typically subside after 2-3 weeks, but chronic relapsing diarrhea may occur. One virus has been mentioned here, the Hepatitis A virus, can cause abrupt onset of fever, mailaise, anorexia, nausea, abdominal discomfort followed by jaundice (malfunction of the liver). Symptoms vary in severity from mild illness for 1 to 2 weeks to severely disabling disease lasting several months. There is a 0.6% fatality ratio for this disease. Removing particles from water including these disease-causing organisms has therefore been set as a high priority for the Safe Drinking Water Foundation.

The Safe Drinking Water Foundation has made particle removal (including microbes) and dissolved organic matter removal (naturally occurring dissolved organic material) its two main research priorities. After we have dealt with these two issues, we can use the NSF certification to determine which treatment unit can provide treatment of the water before consumption.

Dr. Nelson Fok of Capital Health in Edmonton delivered some strong messages to the health inspectors. His messages were clear. Parasites in drinking water are not an environmental issue so don't look to environment agencies for a solution. Dr. Fok emphasized that supplying unsafe drinking water may see health departments become liable for the illnesses that result. The issue of liability is sure to regularly surface over the next several years. Knowing as little as possible about waterborne illnesses is not good liability protection. In our recent newsletter, the Safe Drinking Water Foundation tries to raise awareness of liability issues as they relate to rural municipalities (http://safewater.org).

In my presentation "Drinking Water Quality in Rural Areas", I expanded on the challenges facing Canada's rural areas. Compared to other developed countries, Canada is not well positioned to deal with rural water issues. Drinking water is designated as a provincial responsibility. In Saskatchewan, the two agencies responsible for the safety of drinking water, Saskatchewan Environment and Saskatchewan Health, have not addressed the need to improve the safety of rural drinking water. Federal Canadian agencies are also doing very little, simply because it is a provincial mandate. Government agencies may be at a disadvantage when trying to tackle technical problems as the technical problems may be overshadowed by political agendas.

Therefore, non-government-organizations (NGOs) that operate on the basis of technical, rather than political merit, will provide the necessary framework to bring in academia, government agencies at all levels, industry, and other NGOs to work together to solve the drinking water problems that rural areas face. While government agencies can still play a positive role, it will take far more commitment than what has been expended during the past ten years. The Safe Drinking Water Foundation was established as a vehicle for action based on technical merit.

Why remove dissolved organic matter from water?

Dissolved organic matter is present in high levels in most rural prairie water supplies. It will give the water a distinct colour, taste and odour. This organic matter will also react with chlorine forming different organic compounds that can cause different medical problems including spontaneous abortions and cancer. The power of the chlorine to kill microbes is also decreased as it is instead reacting with the dissolved matter (rather than the particulate). More than half of the dissolved organic matter present in rural water should be removed before chlorination to avoid problems. This is difficult and is the reason why the Safe Drinking Water Foundation has set the removal of dissolved organic material as one of its priorities.

The Safe Drinking Water Foundation's Board is made up of internationally recognized scientists that donate their time in the pursuit of safe drinking water solutions for rural areas. As Executive Director, I donated over 500 hours of my time during 1998. The Safe Drinking Water Foundation's role as a leading advocate for safe drinking water was recognized by SARM; we held two workshops at their annual meeting in March. More recently, we discussed rural water quality issues at the Annual Meeting of the Canadian Institute of Public Health Inspectors, as well at the Cosmopolitan Club (Saskatoon).

The Safe Drinking Water Foundation now has individual and community/corporate members from British Columbia to New Brunswick. Community members include rural municipalities, as well as health boards, all committed to making safe drinking water available for all Canadians. Check our web site to learn how you can become a member http://safewater.org, email us at info@safewater.org, fax us at 306-975-5143, or give us a call at 306-934-0389. With your help we can change the statistics! ■