

Safe Drinking Water in Jeopardy: Rural Canadians get contaminated drinking water from livestock and human waste run-off

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In the April 7, 2008 issue, the Canadian Medical Association Journal (CMAJ) takes a closer look at Canada's drinking water issues; this is commendable. It is correctly stated that these issues are a Rural versus an Urban issue. Canadian cities have some of the best quality raw water sources in the world tapping into only lightly polluted very large rivers and lakes. The cities also have both the financial and technical resources to treat these water sources to provide excellent quality drinking water. For example, similar to other cities, the water treatment processes for Calgary takes a few of hours to complete.

A multitude of techniques are used to treat a *raw water supply* that is an order of magnitude cleaner than the average rural water supply based on dissolved organic carbon content (Calgary's raw water also excels in many other tests). As with other cities, Calgary treats its water to both the Canadian Drinking Water Quality Guidelines and also to US Environmental Protection Agency Regulations. The federal or provincial guidelines and/or regulations are of little relevance to most cities. They treat the water to even higher standards. The cities are concerned about liability and the potential very high cost of illnesses associated with contaminated water.

Contrast this with rural Canada. The water supplies are typically very small and of poor quality. The water has drained mostly farmland with close contact with livestock and human waste. While the bacterium *E. coli* has made most media headlines, there are parasites, viruses and organic material that can also be quite difficult to remove from this raw water. Most large cities would have significant difficulties treating this type of water; rural communities only treat their raw water supplies using a few processes minutes long. This is the crux of the problem. Rural water treatment plants need better treatment than cities because of the poor quality raw water sources: yet, the opposite is true. Is there any wonder that most rural water treatment plants cannot meet current Canadian Drinking Water Quality Guidelines?

In many rural communities, the drinking water is only assessed against a small sub-set of the guidelines. Health Canada, for example, is heavily relying on 5 out of more than 50 health parameters in the guidelines to assess treated water quality on reserves. Four of these parameters (total coliforms, *E.coli*, and free and total chlorine) are also the basis for most boil water advisories. Solutions to boil water advisories typically result in adding greater levels of chlorine, which "fixes" all of these problems. No treatment plant necessary — *you just need chlorine*. Indian and Northern Affairs Canada has done a commendable job

on water treatment plant operator training. This, however, does not solve the problem when the treatment equipment can be likened to a tea strainer, yet what is really required, at the very minimum, is a coffee filter.

There are two solutions to this problem. Pipe the water in from regional treatment plants, which sometimes makes financial sense, but microbial issues, such as Mycobacteria growth, must be considered. A simpler and universal solution would be better water treatment systems for rural water users.

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