

**FLUORINE ANALYSES OF DRINKING WATER  
IN NEWFOUNDLAND AND LABRADOR**

by

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Most people would be happier with less tooth decay and fewer fillings. People have less tooth decay if their drinking water contains fluoride because, as teeth form during childhood, the fluoride becomes part of the tooth enamel, making teeth stronger and more resistant to decay.

A booklet "Facts Favour Fluoridation", published by the Canadian Dental Association, reviews the facts and some of the myths about fluoridation. The following information is based on this booklet.

In 1978, the federal Department of National Health and Welfare reviewed medical evidence, including three recent studies on cancer, and concluded that "the maintenance of the fluoride level in drinking water at approximately 1 mg/L (1 milligram to the litre or 1 part per million) is the most efficient procedure to decrease the incidence of dental caries (tooth decay), and such a level of fluoride poses no risk to the health of Canadians".

Most natural water contains some fluoride. Since 1917, Stratford, Ontario has used naturally fluoridated water containing 1.3 to 1.6 mg/L of fluoride. The average 16-18 year old in Stratford has only four permanent teeth showing any sign of tooth decay. However, in cities with little or no fluoride in the water supply, the average 16-18 year old has more than 10 decayed teeth.

More than 10 million Canadians and Americans have consumed water with 0.7 to 2 mg/L naturally occurring fluoride for most or all of their lives. In hundreds of communities using artificial fluoridation, the amount of tooth decay in children has been reduced to the same low levels found in communities with naturally fluoridated water.

The Association states that "fluoridation, coupled with regular tooth-brushing and less sweet food, is the most practical and economical way to prevent dental problems" and "will reduce tooth decay by at least 50 per cent throughout life".

In 1983, Dr. Barton Manning, a dentist with a practice at Lumsden, Notre Dame Bay, and a keen interest in preventative dentistry, suggested to R. Gibbons that it would be interesting to analyze drinking waters throughout Newfoundland to determine which towns had naturally fluoridated supplies, and how this correlated with the

geology and rock types of the different regions.

During the Fall, 1983, fifty samples were collected throughout the province. Manning provided samples from Fogo Island. The other samples were collected by staff of the provincial Department of Mines and Energy while travelling throughout the province on other field projects. The samples were analyzed by G. Dawe at the Mineral Development Division laboratory in St. John's, under the direction of H. Wagenbauer.

The analyses are given in the accompanying table. The only water supplies with fluorine near the recommended level are Gander, Corner Brook and Goose Bay, and these three are the only towns in Newfoundland and Labrador with artificially fluoridated water. All other water analyzed from towns with central supplies ranged from less than 0.01 mg/L (e.g. Lumsden) to about 0.05 mg/L, which is negligible in all cases. A few cases where water was still being obtained from wells had slightly higher values, including Gambo, Little St. Lawrence, and the Fogo Hospital; these values are almost half the recommended optimum level, and reflect water sources in deeper groundwater as well as the effects of associated rocks and aggregates. The central surface water supplies from ponds show no significant fluorine addition from associated rocks.

After doing these analyses, we became aware of a study done by Harris and others (1973) at Memorial University on "Environment and Health in Newfoundland". In that study, water was analyzed from 33 towns in Newfoundland; only six duplicated those sampled by us in 1983. However, the results were comparable; most samples analyzed in the range of 0.01 to 0.05 mg/L, including St. John's at 0.03 mg/L. The exceptions included Fogo Central High School at 2.10 mg/L and some other artesian wells on Fogo Island, particularly at Barr'd Island, Joe Batt's Arm and Fogo. The only other analyses above 1 mg/L were in Joe Batt's Arm, where the well at the fish plant analyzed at 4.0 mg/L and one at the bus stop analyzed at 3.5 mg/L. These values for Fogo Island can be correlated with a fluorine-rich granite on the northern part of the island.

The analyses from both studies indicate that natural fluoridation near the optimum level of 1 mg/L is rare in Newfoundland and Labrador. Except for parts of

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in Newfoundland and Labrador

LAB. NO.	SITE	mg/L F <sup>-</sup>
1	Gambo (Well)	0.34
2	Centreville	0.03
3	Wesleyville	0.02
4	Hare Bay	0.03
5	Newtown	0.02
6	Lumsden	<0.01
7	Valleyfield	0.02
8	Cape Freels (Well)	0.03
9	Indian Bay (Parsons Point)	0.02
10	Whitbourne	0.06
11	Trinity, Bonavista Bay	0.02
12	Lewisporte	0.02
13	Gander (Airport)*	0.89*
14	Grand Falls	0.04
15	Goose Bay, Labrador*	1.13*
16	Stephenville (College)	0.03
17	Glenwood	0.02
18	Norris Arm South	0.01
19	Bishops Falls	0.02
20	Corner Brook*	0.67*
21	Ming's Bight	0.01
22	L. Moores/Stephenville	0.03
23	L. Howse/Kippens (Well)	0.09
24	Pasadena	0.02
25	Woodstock (y)	0.04
26	Springdale	0.02
27	Baie Verte (sl.y)	0.01
28	Deer Lake	0.03
29	Hawkes Bay	0.04
30	Pacquet (y)	0.04
31	Parsons Pond	0.04
32	Port Saunders	0.02
33	St. Pauls	0.02
34	Cow Head	0.01
35	Daniel's Harbour	0.05
36	Rocky Harbour	0.03
37	St. Lawrence (School)	0.07
38	Lamaline (School)	0.03
39	Grand Bank	0.02
40	Little St. Lawrence (Well)	0.41
41	St. Bernards (Well)	0.19
42	Burin (R.C.M.P. Station)	0.01
43	Swift Current	0.09
44	Fortune	0.05
45	Marystown	0.01
46	Lawn	0.05
47	Cole's Well (Fogo) (y)	0.15
48	Payne's Well (Fogo) (y)	0.07
49	Hospital (Fogo)	0.41
50	Cole's Spring (Fogo) (sl.y)	0.02

y - yellow  
sl.y - slightly yellow

\* Gander, Corner Brook and Goose Bay have artificial fluoridation of their water.

*Fluorine Analyses of Drinking Water**Gibbons, Dawe and Wagenbauer*

Fogo Island where water is obtained from artesian wells in fluorine-rich granite, and where some of this water reaches higher fluorine content than is recommended, most of the drinking water supplies are deficient in natural fluorine. To date, only three towns, Gander, Corner Brook and Goose Bay, use artificial fluoridation to bring their water near the 1 mg/L level.

In December, 1984, a 2-year project was announced to study children's dental health in Newfoundland and Labrador under the sponsorship of the Hospital for Sick Children Foundation at a cost of about \$26,000. This is to be done under the direction of Dr. Sharat Doshi of the Newfoundland Department of Health in collaboration with a number of other medical specialists. The study is to be carried out in rural Newfoundland with about 500 children, and is supplementary to a still unpublished study conducted in 1982 on 350 children from larger communities on the island by Dr. David Banting of the University of Western Ontario.

Based on the water analyses from this project and Harris and others (1973), the

dental study should include children from Gander, Corner Brook, Goose Bay and Fogo Island, as well as a selection of the sites with negligible fluorine in their water supplies; St. John's should be included with the latter. Geologically, it appears that no sites in the province reach the recommended optimum levels from natural fluoridation, and artificial fluoridation is the only answer for any town that wishes to use fluoridation as a means of preventative dentistry.

## REFERENCES

- Canadian Dental Association  
1979: Facts Favour Fluoridation. Pamphlet available from the Association at 1815 Alta Vista Drive, Ottawa, Ontario, Canada K1A 3Y6.
- Harris, Alex and others  
1973: Environment and Health in Newfoundland. Available at Newfoundland Department of Mines and Energy, Mineral Development Division as Open File Nfld. (1035).