

# Iodine status varies across Canada, raising deficiency risk in some regions

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Iodine deficiency, a public health concern resolved decades ago, may be making a comeback due to changing eating habits, according to new findings by McMaster University researchers.

Scientists measured [iodine](#) levels in urine samples collected from 800

adults in Vancouver, Hamilton, Ottawa and Quebec City.

"Iodine is an essential micronutrient that is relevant to fertility, cognitive development, and immune health," explains Philip Britz-McKibbin, a professor in the Department of Chemistry and Chemical Biology and lead author of a new study looking at adult iodine levels in some Canadian communities.

Iodine plays a key role in many health functions, as it is needed for synthesis of thyroxine hormone, especially during pregnancy and for childhood development. Roughly one billion people around the world are iodine-deficient and it is the leading preventable cause of irreversible cognitive impairment in children.

The results, published recently in the journal *Nutrients*, showed a surprising regional variation in iodine status across Canada.

While residents in Hamilton and Ottawa showed sufficient iodine levels, those from Vancouver and Quebec City were more often deficient in iodine and showed higher exposure to iodine uptake inhibitors, which prevent the body's absorption of iodine.

"That's a double whammy," Britz-McKibbin says. "If you have low dietary iodine intake and are also exposed to ubiquitous environmental iodine uptake inhibitors like nitrate and thiocyanate, you have even greater risk for [iodine deficiency](#). Such regional variations in iodine deficiency risk among Canadians haven't been reported before."

The team identified three major sources of iodine: iodine supplements, prescribed thyroxine hormone and diet.

Iodine is found in very few foods, with the best natural source being [seaweed](#), says Britz-McKibbin. It is also found in seafoods, purposely

iodized table salt, and in dairy, by way of chance.

"Most of the iodine in dairy comes from sanitation practices. Iodine-based antiseptics are typically used on the teats of the cows between milking, and leak into the milk supply," he explains. Differences in these practices mean the iodine content of milk and dairy products varies significantly between regions.

Severe iodine deficiency occurs only rarely in Canada. Goiter, a swelling of the thyroid gland in the neck caused by severe iodine deficiency, is not often seen, but the sub-clinical effects of moderate and mild iodine deficiency are still concerning.

"A great public-health success story has been the prevention of goiter-causing iodine deficiency disorders with the introduction of iodized table salt," Britz-McKibbin says. Recent trends in eating and cooking, however, are changing the effectiveness of universal salt iodization programs. For example, more people are following vegetarian and vegan diets or using non-iodized salt products, which could leave them lacking iodine.

People are also not cooking at home as much as they used to and they are eating more processed foods, which may be high in salt but not necessarily iodized salt.

Meanwhile, public health messaging that suggests people reduce their sodium intake may be limiting another source of dietary iodine.

"Reducing salt to extremely low levels may lead to iodine deficiencies, and so public health policies targeted at salt reductions should consider these unintended harms," says Salim Yusuf, a co-author of the study who is Executive Director of the Population Health Research Institute and Distinguished University Professor of Medicine at McMaster.

Britz-McKibbin says more understanding of iodine is necessary, which could come from more regular testing of iodine levels, since excessive iodine intake can also contribute to adverse health effects.

"Regular monitoring would allow us to get an assessment of the iodine nutritional status of a population, and public health could modify their guidance based on that information," he says, noting that Denmark, Australia and New Zealand have started fortifying bread with iodized [salt](#).

"With changes to people's diets, it may be time to rethink how to improve iodine intake, perhaps fortifying certain staple foods or beverages that would ensure most people would ingest adequate levels for optimal health."

**More information:** Stellena Mathiapparanam et al, The Prevalence and Risk Factors Associated with Iodine Deficiency in Canadian Adults, *Nutrients* (2022). [DOI: 10.3390/nu14132570](https://doi.org/10.3390/nu14132570)

Provided by McMaster University

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