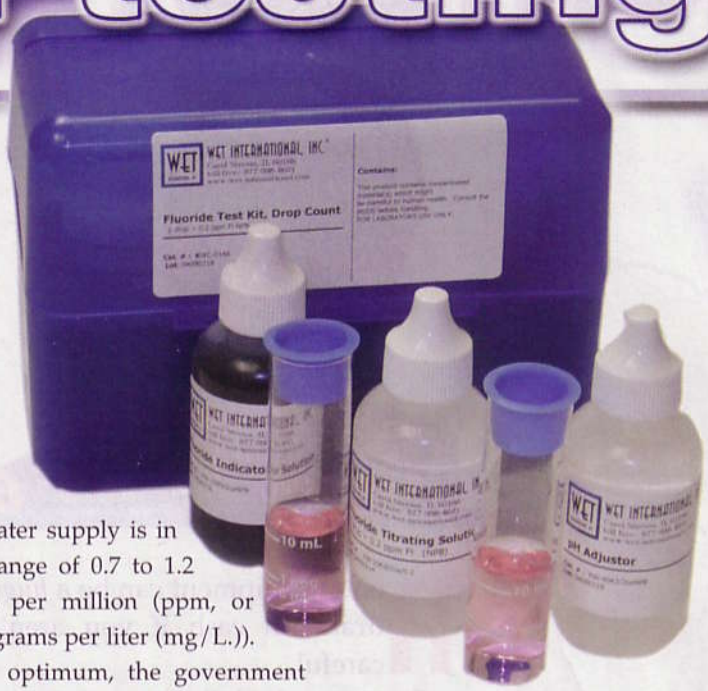
Offer fluoride information – and testing

Debate topic or not, fluoride may be on customers' minds.

By Mario C. Uy



Sixty years have passed since fluoride was first introduced into American public water supplies, but fluoridation continues to be a controversial topic in many communities.

Almost everyone has heard that fluoridated water reduces tooth decay, especially among children. The dental profession, led by the American Dental Association (ADA), takes this view, citing numerous epidemiological studies. Some toothpaste manufacturers also cite the advantages of fluoride in their products.

Opponents of fluoridation believe that it can have detrimental health effects, and cite studies which they say have shown no difference in dental health in communities with and without fluoridated water.

Whichever view your customers take, a water treatment dealer can at least educate them about certain aspects of fluoride in their water.

Fluoride levels and health

According to the ADA, the US Public Health Service has stated that the optimum concentration of fluoride in a public water supply is in the range of 0.7 to 1.2 parts per million (ppm, or milligrams per liter (mg/L.)).

By optimum, the government means that fluoride levels in this range are sufficient to help reduce tooth decay while minimizing the occurrence of dental fluorosis.

Dental fluorosis is a condition in which the tooth enamel of young children can be discolored or pitted as a consequence of the child having ingested too much fluoride. The ADA claims that older children and adults are not at risk for dental fluorosis.

In the 1990s, the ADA adds, the National Research Council of the National Academy of Sciences concluded that the US Environmental Protection Agency's (EPA) maximum contaminant level (MCL) of 4 ppm for naturally occurring fluoride in drinking water was "appropriate as an interim standard."

The ADA has also quoted the EPA as saying in 1997 that there was no evidence at the time of adverse medical effects of fluoride at levels below 8 ppm.

Sometime this year, a subcommittee of the National Academy of Sciences is expected to complete a new review of available research that will re-evaluate EPA's 4 ppm MCL and its secondary MCL of 2 ppm. This effort will attempt to determine whether the EPA guidelines are adequate to protect children from possible adverse health effects of fluoride.

Opponents cite ill effects

On the other side of the argument, fluoride has been assailed by its opponents as a potential carcinogen, mutagen, rat poison and an industrial waste by-product. These opponents cite a number of studies to support their case; among these claims are that:

- Fluoride as low as 0.2 ppm can cause problems such as dental fluorosis.
- Fluoride as low as 4 ppm can cause skeletal fluorosis, characterized by stiffness and deformity in the spinal column, hips, knees, and other joints.

(Continued on page 38)

For more information:

For more information on this topic, go to **www.watertechonline.com** and enter keyword: **Fluoride**.

(Continued from page 36)

- Exposure to fluoride at 1 ppm in drinking water over a long period of time may calcify ligaments and tendons, causing arthritic pains; prolonged exposure to fluoride has a cumulative effect on bones and teeth.

The ADA and other fluoride proponents question the validity of such studies — such as whether the studies have adequately controlled for non-fluoride factors affecting health. Dentists also note that dental fluorosis can be caused simply by children ingesting too much fluoride in toothpaste or in prescription fluoride dietary supplements.

In any case, in areas where natural fluoride levels in water exceed the maximum contaminant level, municipalities treat the water to reduce the levels accordingly. In areas where natural fluorides do not exist, some municipalities will add fluoride compounds.

Fluoride sources

The most common form of fluoride added to public drinking water supplies is hydrofluorisilicic acid, a white or straw-colored liquid which can be a by-product of the production of phosphate fertilizers and other chemical compounds. Some fluoride opponents claim that it also contains other substances such as mercury, arsenic, lead, and beryllium.

Other fluoride compounds added to water supplies can be in the form of sodium fluoride, a white powder or crystal, or sodium fluorosilicate, a white or yellowish crystalline material.

Fluoride is also found in sources other than drinking water, such as in fluoridated toothpaste, seafood, beverages (soda, beer, wine, tea, juice), and some

(Concluded on page 40)

Fluoride testing procedures at a glance

The usual methods for determining fluoride are:

- Colorimetric method using Zirconium-dye complex indicator; and
- Electrometric method using ion-selective electrodes.

Research and testing laboratories also use other expensive or sophisticated methods like Inductively Coupled Plasma (ICP).

The new titration method utilizes a methodology that is recognized by the AOAC International.

— *M.U.*

(Continued from page 38)

processed foods (canned foods, cereals, infant formulas).

Testing in demand

Consumers are becoming more sophisticated and are demanding easier and more affordable ways for monitoring water quality and the operation of their treatment systems. Dealers who are not able to meet this demand will be at a disadvantage.

A water treatment dealer can test a customer's drinking water for fluoride levels. If the level is excessive by the standards of the EPA or some other source, or the customer simply determines that they wish to reduce the amount of fluoride they ingest, the dealer can recommend an appropriate treatment system. Reverse osmosis and distillation have been cited as among the systems that can reduce fluoride levels.

Testing fluoride used to be a daunting task. Dealers would send water samples to laboratories, a process that required a waiting period for test results. In the meantime, prospects would lose interest and sales were lost.

Spectrophotometers can be used in the field to provide instant fluoride test results. However, they are expensive and complex, and therefore are not commonly used.

Today, fluoride can be tested on site instantly, easily and affordably by using simple titration test kits...

Titration kits

Today, fluoride can be tested on site instantly, easily and affordably by using simple titration test kits similar to the ones used for water hardness.

Armed with these tools, dealers can quickly indicate to customers whether there is a need for fluoride treatment, possibly increasing opportunities for add-on sales.

POU/POE dealers might also consider providing test kits to customers as part of the promotion of an equipment purchase. □

Mario C. Uy is with WET International Inc., a Carol Stream, IL-based company supplying private label test kits and reagents to the water treatment industry worldwide. Uy can be reached at mariouy@wet-international.com or (877) 938-4621.

Two sides in the fluoride debate

In the debate over fluoridation of public water supplies, there are a number of advocates. Two major ones are:

- The American Dental Association (ADA), based in Chicago, IL, is the 152,000-member professional association of dentists. It is a strong proponent of water-supply fluoridation as way of reducing tooth decay. More information about the ADA and the research it cites as supporting fluoridation is available on its Web site: www.ada.org.
- The Fluoride Action Network (FAN), based in Burlington, VT, is a non-profit coalition of environmentalists, physicians, scientists and others. FAN describes its role as "seeking to broaden public awareness about the toxicity of fluoride compounds and the health impacts of current fluoride exposures." Its Web site is: www.fluoridealert.org.

— Editor