

## Water in the Spotlight: Tap or Bottled



by Dominique Huret

**With numerous and noisy campaigns targeted at bottled water and its impact on the environment, it is easy for consumers to be misled on the crucial point of bottled and tap water health and safety benefits. Dominique Huret, Water Expert of Cape Decision, reviews the conclusions of Professor Stephen Edberg of Yale University, who has been studying drinking water for 25 years.<sup>1</sup>**

Dr. Stephen C. Edberg is professor at the Department of Laboratory Medicine and Internal Medicine of the Yale University School of Medicine. He is also a Director of the Clinical Microbiology Laboratory of Yale-New Haven Hospital.

Tap water is probably the most controlled food product in Europe. Thanks to the hard work from various players, its image as polluted water is slowly disappearing. Tap water is free and does not need any packaging, which is a great advantage for the environment. However, transport and constant quality remain serious challenges.

On the other hand, bottled water is a sealed product, undergoing various and extensive quality controls. In Europe, up to 99% of these bottled waters are mineral or spring waters of exceptional quality.

### Fundamental differences in product intrinsics and regulatory framework

Running and tap water quality control are competences of local, regional or

national authorities. The European Council Directive/EC98/83 on the quality of water intended for human consumption serves as guideline. Water quality supervision varies in each country.

To comply with the regulation, about 50 parameters must be checked for quality: organoleptic (smell, color, taste), microbiological (virus and bacteria), unwanted substances (nitrates and fluorine), toxic elements (lead and chromium), pesticides and original water composition (PH level and calcium). Daily samples are required for "official" analysis but operating units also take their measurements for their own quality surveillance.<sup>2</sup>

Bottled water belongs to the food product category. As such, it has to comply with the laws on consumer protection (health), respect for environment (packaging and catch basin) and finally commercial laws (labelling). Each single bottle has to meet standards, laws and European directives. Breaches can be fatal for brand owners: product recall, production stand still or declassification.

### Quality assurance and standards for tap or bottled waters

Municipalities responsible for tap water are allowed to work out the annual average of quality measurements. So, tap water might exceed maximal toxicity for a few months and then get back in line but the annual average will respect the standard.<sup>3</sup>

Corrective actions will be taken and consumers be informed but except on severe cases, water will continue to flow and be consumed. Crucial to the economic life and because such a small part is dedicated to drinking, the water supply is seldom switched off.

Domestic/household water consumption generally accounts for 150 to 200 liters per day and person. But only 1 to 2% of this amount goes to water intended for drinking purposes. This

represents 1.5 to 3 liters including all water based drinks.

### Tap and bottle waters do not share similar origin

Tap water is issued from either underground source (water table), or surface water (rivers, lakes or water treatment station). The choice of providers is often limited by geographical and supply constraints. Tap water ends up being a mix of various origins with related traceability issues. Obviously, surface waters are more sensitive to human pollution. Microorganisms like cryptosporidium, Giardia and other viruses can easily spoil it.

Mineral and spring waters are exclusively coming out from highly protected underground sources. Both waters benefit from careful monitoring against any sort of pollution. Original purity is their main asset. Mineral water enjoys a stable mineral composition over time, allowing for health benefit claims. For these bottled waters, any quality breaches lead to immediate and dramatic consequences.

The European Directive 2009/54 specifies the regulations on water concessions granting, quality follow-up, labeling and spring protection.

### Volume and treatment of both waters have little in common

Municipal water treatments vary in function of the quality of the water, the local health awareness and the own national legislation. Surface waters require compulsory treatment for obvious reason



Photos: Cape Decision



of exposure to pollution and the presence of aquatic life. Recent scientific progress has been tremendous in the cleaning process of polluted surface waters. Underground waters can be pure and drinkable as such, so their treatments are often lighter. But in case of water table pollution of bottled waters, the damages are nearly irreversible.

Two types of treatments co-exist. Firstly, physical processes consist mainly of sand filtration and coagulation or flocculation. Chemical processes use disinfection techniques with chlorine, ozone or ions swaps for nitrate removals or water softening. Strongly monitored, mineral and spring waters do not undergo disinfection treatment since they are microbiologically pure. Filtration, micro-filtrations and aerobic treatments are used. If any, the allowed alterations may not change the original water composition. Lately, very selective extractions have been authorized for fluorine removal for instance. Of course, treated water volumes do not stand comparison. While every day, the French leader Evian filters 4,100 cubic meters of water, a medium sized town needs to sanitize 30 to 50 times this volume for running water.

#### Distribution channels have nothing in common

Tap water reaches the consumer thanks to a great pipe network built over the last century. The cost of water delivery

is very low for the private user, but maintaining the system represents a financial strain for many collectivities and operators. Leaks in these ageing water pipes can sometimes reach up to 40% of the total water flow. If the water leaves the cleaning station pure, two main contamination risks remain along the pipes. Water and sewage pipes sometimes share the same trenches with the risk of cross contaminations. Pressure changes in water pipes can also affect the tap water quality.

Bottled water transport and packaging take their toll on the environment with a certain carbon footprint. Of course, the packaging protects the intrinsic product qualities; tamper evidence bands, sealed

containers and ultra clean/aseptic bottling all limit pollution risks all the way to the consumer. Severe control of food contact PET composition are taking place. Batch coding traceability allowing possible product recalls are additional product quality guarantees.

#### Any health concerns, Doctor Edberg?

"The true policy questions should be: how do we encourage more people to drink more water? With obesity and diabetes being true public concerns, drinking more water can be very beneficial to a healthier diet. Water, whether from a municipal water system or in a bottle, is one of the best option for people to meet their hydration needs."<sup>4</sup>

Isn't it time for both water to coexist peacefully on our tables? Tap, water fountains, carafes, coolers, prestigious or daily bottles, on-the-go mono-doses; they all contribute to better public health.

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- <sup>2</sup> Sources: Eureau, Ci eau, Tapped the water
- <sup>3</sup> Sources: Stephen C. Edberg, US Senate testimony September 2008, Scientific board [www.notre-planète.info](http://www.notre-planète.info) of 23<sup>rd</sup> June 2009.
- <sup>4</sup> Sources: Stephen C Edberg, US Senate testimony September 2008, Scientific board [www.notre-planète.info](http://www.notre-planète.info) 23<sup>rd</sup> June 2009.

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