

## Which Bottled Water Is The Best?

by

James P McMahon

**People often ask me which bottled water is the best.** I wish the answer were as easy to derive as the question is to ask. As with most things the American consumer is grossly under informed about the differences between various bottled waters and so it is my hope to address that lack of information and attempt to answer the question.

The first thing you have to know is that there are various kinds of bottled water and these are not directly comparable to one another. The International Bottled Water Association provides the following description of different water types on their website:

### What are the different types of bottled water?

The International Bottled Water Association (IBWA) website states (1):

The 'FDA has established a bottled water Standard of Identity to define the several different types of bottled water based on specific characteristics of the product. Bottled water products meeting the Standard of Identity may be labeled as bottled water or drinking water, or one or more of the following terms:

**Spring Water** - Bottled water derived from an underground formation from which water flows naturally to the surface of the earth. Spring water must be collected only at the spring or through a borehole tapping the underground formation feeding the spring. Spring water collected with the use of an external force must be from the same underground stratum as the spring and must have all the physical properties before treatment, and be of the same composition and quality as the water that flows naturally to the surface of the earth.

**Purified Water** - Water that has been produced by distillation, deionization, reverse osmosis or other suitable processes while meeting the definition of purified water in the United States Pharmacopoeia may be labeled as purified bottled water. Other suitable product names for bottled water treated by one of the above

processes may include "distilled water" if it is produced by distillation, deionized water" if it is produced by deionization or "reverse osmosis water" if the process used is reverse osmosis. Alternatively, "\_\_\_\_ drinking water" can be used with the blank being filled in with one of the terms defined in this paragraph (e.g., "purified drinking water" or "distilled drinking water").

**Mineral Water** - Bottled water containing not less than 250 parts per million total dissolved solids may be labeled as mineral water. Mineral water is distinguished from other types of bottled water by its constant level and relative proportions of mineral and trace elements at the point of emergence from the source. No minerals can be added to this product.

**Sparkling Bottled Water** - Water that after treatment, and possible replacement with carbon dioxide, contains the same amount of carbon dioxide that it had as it emerged from the source. Sparkling bottled waters may be labeled as "sparkling drinking water," "sparkling mineral water," "sparkling spring water," etc.

**Artesian Water/Artesian Well Water** - Bottled water from a well that taps a confined aquifer (a water-bearing underground layer of rock or sand) in which the water level stands at some height above the top of the aquifer.

**Well Water** - Bottled water from a hole bored, drilled or otherwise constructed in the ground, which taps the water aquifer.'

As you can see, the differences vary widely. The typical consumer may be familiar with Perrier, which is a sparkling water, Arrowhead or Poland Springs, which are popular spring waters, or the Coke and Pepsi brands of 'highly purified' tap water.

### **So Which Water is the Best?**

The second issue might be to qualify the discussion of what the word 'best' means. That word could mean different things to different people. For instance when I ask Michael Mascha, publisher of *Fine Waters*, about publishing this article he responded with, "I have a hard time determining which is the best water as I enjoy especially the difference in waters. It would be similar to ask what is the best wine or chocolate. The range is the beauty. Having said this I think it is important that the waters fall into a certain set of ranges in order to be drinkable."

To some consumers like Michael, best might be found in a particularly delightful taste. Others might be drinking bottled water to achieve specific health benefits not found in untreated tap water. Many people in the U.S. today are drinking bottled water because of a growing fear of the contaminants in tap water.

To be completely fair and unbiased one must allow each individual to determine what they mean when referring to their favorite bottled water. But for the purposes of this discussion and my particular clientele I want to focus on the issue of health.

Increasingly there are growing concerns about the leaching of phthalates, known endocrine disrupters, as well as antimony (2) from water in plastic bottles. Other concerns include bacteria. The Natural Resources Defense Council compiled an extensive list of test results from bottled water they collected and sampled. (3)

Other health concerns that pertain to bottled water include the physical characteristics of the water, including pH (acidity) and the presence or absence of minerals. For the sake of comparison I've compiled the following chart of the pH and mineral content of some popular spring waters:

	Arrowhead	Poland Spring	Fiji	Callistoga	Evian	San Pellegrino	Trinity Springs	Volvic	Perrier
pH	6.12-7.6	6.02-7.6	7.5	5.84-6.71	7.18	7.7	9.0	7	5.46
Calcium	6-53	3.7-8.2	17	6.0-8.4	78	208		10	147.3
Chloride	.73-8.2	1.9-8.8		.74-2.6	2.2	74.3	.7	8	21.5
Bicarbonate	42-190	7.2-20		36-44	357	135.5		65	390
Fluoride	0.05-1.2	.052-.20		Nd		.52	1.3		0.12
Magnesium	1.5-20	.76-1.4	13	1.5-2.9	24	55.9		6	3.4
Nitrate	.05-.75	.13-.75		.06-.57	3.8	.45		1	18
Potassium	0.7-4.4	.59-.74		1.8-3.8	.75	2.7		6	0.6
Sodium	2.1-20	2.4-4.7		3.8-9.5	5	43.6	19.3	9	9
Sulfates	.64-32	.81-5.1		Nd-2.1	10	549.2	6	7	33
Tds	81-260	26-60	210	54-100	?	1109	59	109	475
type	Spring	Spring	Artesian	Sparkling mineral	Still Mineral	Sparkling Mineral	Mineral Spring	Spring	Sparkling Mineral
Source (4)									

Again one can observe a wide range of variation among different waters. That begs the question from a health perspective what set of physical characteristics is ideal? I would venture to suggest that a pH of 7.4 to 7.6 is ideal. This is the pH of human blood and optimum for drinking water. Some people prefer to drink highly alkaline water, in the range of 8 or 9. And while some people may enjoy the taste of low pH acidic water some health advocates and practitioners suggest that acidic drinks and foods contribute to increasing the body's vulnerability to disease. (5)

Additionally there is increasing evidence from a number of studies funded by the World Health Organization that people who drink water containing minerals experience lower rates of disease than those who drink water with the minerals removed. (6) Of specific concern are the presence of calcium and magnesium in water. Both contribute significantly to an individual's health. One Canadian study compares the mineral content and potential health effects of minerals in water. (7)

The WHO debate has caused the Water Quality Association (ie: the US water treatment industry) to hold discussions about the health impacts of removing minerals through both the Reverse Osmosis and Water Softening technologies. A recent seminar discussed the benefits of adding these two minerals back into water after treatment. When I prescribe reverse osmosis treatment for my customers I always recommend a post membrane calcium filter. This provides calcium but perhaps more importantly increases the pH of otherwise acidic RO water. This may be why Coca-Cola adds magnesium (epsom salts) to its RO treated Dasani water.

Total dissolved solids (tds) is the sum total of all the minerals in water. While minerals are desirable there is a range of suitability. Since tds is comprised of a number of substances, high levels will affect the taste of water and may also affect toxicity. (8) Generally, a low tds is considered by some health practitioners to be more hydrating. EPA has set it's Maximum Contaminant Level for tds in drinking water at 500 mg/l for aesthetic purposes. Water with a very low tds, say 30 or less, will have a sharp crisp taste, perhaps considered 'clean' by some. A higher tds, in the range of 150 to 250, provides more 'mouth feel' or 'taste'.

Returning momentarily to the issue of preference, some people may enjoy the distinct flavor of the mineral waters such as Perrier or Pellegrino. It is the high tds and high sulfates that contribute to the unique taste. I personally prefer a water (tap or bottled) with a tds in the range of 40 to 225.

There's another issue of importance from an environmental perspective. That's the issue of transportation energy. Ideally, consumers should choose water produced locally. It has been said that it takes a quart of oil to import one bottle of Fiji water. (9) That's a ridiculous waste of energy. A responsible consumer has to consider the transportation costs of using any particular product. Ideally, you'll drink local water.

A final point is appropriate to this discussion. I drink bottled water when I'm away from home or on the road. Most public water supplies are of similar quality to bottled water. The differences may be quite minor with the notable exception of the presence of chlorine or chloramine and their carcinogenic byproducts. Drinking chlorinated tap water has been linked to increased rates of cancer. (10) Other specific and potentially harmful contaminants may also be present. With appropriate treatment most tap water can be made to be of equal or higher quality than any of the spring waters and certainly than any of the 'highly purified' bottle waters available in the marketplace today. There is no reason you can't have bottled water quality in your own home. The key is in the treatment.

When I prescribe a water treatment system for my customers, I review their water quality issues and then tell them what I would choose for my own family. My major concern and that of my customers is drinking healthy water. So, when I pick bottled water I look for a spring water to obtain beneficial minerals in moderate amounts with a pH of 7.4 or higher. And, if it's available, I'll choose a glass container over plastic to avoid the possibility of leaching. You can choose the bottled water that suits your purpose, whether that's to experience a delightfully unique taste to compliment a fine dinner or a healthy and environmentally appropriate choice.

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Jim McMahon is an ecologist with over 30 years experience, some ten plus years dealing with various water quality issues. He provides consulting services and [home water purification systems](#) to individuals and businesses throughout the U.S., working from his home overlooking a headwaters stream in Brookside, Utah. You may learn more about how to make your tap water healthy by visiting [What Kind of Water Should You Drink At the Tap](#).

## References

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