



## FORTIFIED WATER

You're in the gym and you stroll over to the refreshment counter and say "Can I have a bottle of water please?" The seller asks "What kind?" You repeat, "Bottled!" He points to the wide variety of water bottles on display in the refrigerator – the colours are catchy, the labels are bold and you become confused when you are faced with the decision – plain water or water fortified with calcium, vitamin C or fibre? Sweetened with sugar or sugar substitutes? Grapefruit, lime, cucumber, mango or strawberry flavoured? The natural element from the earth is not as simple as it once was and our expectations of it have grown.

Over the years, consumers have got accustomed to seeing an increasing variety of bottled waters on the market. This has now been taken to a new level, with a new generation of "fortified

water" being offered to consumers thirsty for the nutritional benefit they claim to offer.

### What is Fortified Water?

Fortification is the addition of one or more essential nutrients to a food, whether or not it is normally contained in the food, for the purpose of preventing or correcting a demonstrated deficiency of one or more nutrients. Fortified water, also known as enhanced or functional water, has been modified to incorporate not only nutrients but also other dietary



factors that it would not normally contain. The variety of products available list among the ingredients fruit and vegetable extracts, vitamins, minerals and electrolytes, herbal supplements, caffeine, and antioxidants. There are specialty products for sports enthusiasts, expectant mothers, menopausal women and even dogs.

By most standards, products marketed as bottled or packaged drinking water should contain no added ingredients except for fluoride and antibacterial agents. This means that many of the products on the market with added sweeteners and flavourings fall into a category of drinks called water beverages.

### The Evolution of Fortified Water

The idea of water fortification is not an entirely new phenomenon. As long as 7,000 years ago, the

wine made from fermented grapes would be mixed with water. This wine helped kill microorganisms that lived in the water, lengthened storage time and enriched the water with the vitamins and minerals from the grapes. This wine/water mixture was also regarded as having medicinal properties and was used as a pain reliever, disinfectant and digestive supplement.

Lime and lemon juices added to drinking water were used in the 18th century to prevent or treat scurvy (the result of vitamin C deficiency) in British sailors on long journeys out at sea. Problems similar to this inspired the development of modern-day fortified water. Today, a look at supermarket shelves in the Caribbean will reveal a growing number of fortified water brands with varying additives.

### Is Fortified Water Beneficial to Health?

Many manufacturers of fortified water make elaborate health claims, much of which are yet to be scientifically proven. Claims are made about various products' abilities to improve memory, promote weight loss, and lessen the effects of hangovers. Others are said to relieve sore muscles or tension and strengthen the immune system.

What has, in fact, been demonstrated is the role of water in hydration, and the role of fortified water in the replacement of electrolytes lost during endurance activities, and as an effective inexpensive intervention

in preventing and controlling deficiencies of micronutrients such as fluorine, iodine and iron.

### Hydration and Replenishment

Water is essential for chemical reactions in the body, for the release of energy from foods, in the digestive process, in the transport of nutrients and in the removal of waste products from our bodies. Water is involved in the regulation of the body's temperature via the production of sweat, and is a component of the body fluids that lubricate the joints and provide a cushion for the spinal cord, brain and babies in the womb. Getting enough fluids each day is therefore very important in order for the body to carry out all these functions. These fluids can come not only from plain water but also from drinks, soups and other foods such as fruits and vegetables. Failure to take enough fluids can lead to dehydration and its consequent complications.

Hydration is a good thing and fortified water, with its enhanced flavours and purported health benefits, has encouraged some people to drink more. Whether intentionally or unintentionally, enhanced water is able to promote the drinking of water instead of calorie laden sodas and sweetened juices and therefore offers benefits when compared with these alternatives.

Fortified water enhanced with electrolytes such as sodium, chloride and potassium helps to replenish those electrolytes lost during physical activity such as high intensity exercise for 60

minutes or more. However, exercising at moderate levels for short periods does not result in significant losses of electrolytes, and hydration with plain water is sufficient.

### Prevention and Control of Deficiency Diseases

At the 1992 International Conference on Nutrition (ICN), among the strategies and actions recommended for the alleviation of micronutrient malnutrition was the fortification of water (along with foods) with necessary micronutrients when feasible, if existing food supplies fail to provide adequate levels in the diet. Research shows that the use of potable drinking water as a vehicle for nutrient fortification is a highly effective approach to combating deficiency diseases, particularly among low socioeconomic populations. An example of this is the widespread fluoridation (addition of fluorine) to public water supplies to improve dental health, and iodisation for the control of iodine deficiency disease (IDD) in some countries.

Recent studies also confirm that this approach can also be used in the control and treatment of iron deficiency anaemia – the most common form of anaemia in the world, affecting approximately 1.62 billion people worldwide. Young children form one of the population groups most affected by iron deficiency anaemia, and in a study conducted in Brazil in 2001, 221 pre-school children aged 6-59 months participated in a large-scale intervention study

investigating the feasibility and logistics of long-term iron fortification of drinking water. Results revealed that daily consumption of iron-fortified drinking water in day-care facilities was an effective means of reducing and controlling moderate and severe anaemia in pre-school children. Interventions such as the fortification of water within institutions have the potential for widespread benefits, since water fortification is simple, inexpensive and easily distributed, and its consumption can readily be monitored.

#### Fortified Water – Too Much of a Good Thing?

New research predicts that bottled water in its various forms may soon overtake carbonated sodas as the world's number one beverage. Though this may initially seem to be a good thing, consumers may be surprised to find out that a search of the ingredients listed on the labels of fortified water reveals that many are more like soft drinks since they are often sweetened with sugar or artificial sweeteners. Regular consumption of products sweetened with sugar can contribute to health problems such as high blood sugar levels, and the

high calorie content leads to obesity. Consumers therefore need to read labels more carefully to see if they can afford these extra calories that may lead to increased fat deposition.

The large variety of fortified water brands now available could mean that many people are getting too much of certain vitamins and minerals, which can have adverse health effects. For instance, consumption of calcium enriched water in diets that already meet calcium requirements can lead to other minerals such as zinc and iron competing with each other. Intakes above the approved maximum levels of vitamin D and calcium may increase the risk of developing kidney stones. In many cases, also, the form of the fortificant (the added nutrients) used may not be very useful to the body. Iron for instance, if added in insoluble form, is flushed from the body without benefit.

Additionally, it is arguable whether some types of enhanced water offer much benefit in the Caribbean setting. Protein enriched water, for instance, is not very relevant to the diets of many persons in the Caribbean whose protein intakes exceed dietary recommendations.

#### There is No Substitute for a Healthy Diet

Overall, the decision to regularly consume fortified water is a personal choice and one that should be made only after knowing all the accurate facts. If consumers decide that fortified water is their water of choice, they must be prepared to read the labels to get information on serving size and ingredients. The fact is that nutrition and health claims on many of these beverages have not been substantiated and more research is needed on their benefits.

Fortified water should not replace a balanced diet. In comparison to a balanced diet or vitamin and mineral supplements which provide a greater concentration of nutrients, these drinks are very expensive. Prices are typically higher than that of regular bottled water and several times higher than tap water, which in most countries of the Caribbean is safe to drink, particularly after boiling or other purification.

There is no simple solution to a healthy disease-free life. The best approach remains the combination of a balanced diet, physical activity and adequate rest and relaxation.

#### For further information contact:

Caribbean Food and Nutrition Institute  
UWI Campus, P.O. Box 140, Kingston 7  
Jamaica, W.I.

Caribbean Food and Nutrition Institute  
UWI Campus, St. Augustine  
Trinidad, W.I.

Visit us at our website: <http://www.paho.org/cfni>