

## WATER UK BRIEFING NOTE



### MINERAL SALTS AND HARDNESS

#### SUMMARY

- **UK water suppliers place the highest priority on assuring the quality of water provided to their customers.**
- **All waters contain naturally occurring mineral salts such as calcium and magnesium, which dissolve from the rocks through which the raw water passes.**
- **The actual mineral composition of drinking water varies widely.**
- **These minerals contribute to the taste and natural character of drinking water.**
- **There are few specific standards for minerals in the EU Drinking Water Directive, although there is a general requirement that waters should not be aggressive to plumbing systems.**
- **Some epidemiological studies have found an association between hardness and/or magnesium in drinking water and heart attacks that indicates a possible weak protective action.**
- **WHO is currently reviewing the evidence to determine if this can be confirmed and if so, whether there is sufficient evidence to recommend a minimum level of calcium and magnesium in water which has been artificially demineralised**
- **There is no suggestion at this time that naturally soft waters should be artificially hardened.**

#### TECHNICAL BACKGROUND

##### Where do mineral salts come from?

All natural water contains some naturally occurring dissolved mineral salts, the most important of which are the salts of calcium and magnesium. At the levels normally found in UK drinking waters these minerals are normally considered to improve the taste of drinking water. However, certain groundwaters have higher levels of minerals which can impart a stronger taste and which may be noticed by people who are used to drinking water that is soft. For most customers the most noticeable aspect of hard water is the deposition of limescale in appliances and the plumbing and heating systems of buildings.

Although conventional water treatment does not have any effect on the mineral content of drinking water there are some areas in which the water supplier centrally softens the water in order to reduce hardness and problems with scaling. In many parts of the world, including the UK, consideration is being given to desalination of seawater as a new

resource. Because this removes almost all the minerals, minerals are routinely added back before the water is supplied as drinking water.

### **What standards apply to mineral salts in drinking water?**

The mineral composition can influence the corrosion potential of water, which has to be controlled in certain situations. There are no specific standards for calcium and magnesium.

Many different epidemiological studies have been published on possibly impact of essential minerals in drinking water on health. Many found a significant protective association between increasing water hardness or calcium and/or magnesium concentration and acute myocardial infarction (heart attack). There is some supportive evidence from both experimental and clinical investigations that suggests a mechanism by which this could occur. Although drinking water is usually a minor source of these ions, it is a stable source and some individuals appear to be marginal in their nutritional status for calcium and magnesium. For these people drinking water may provide an important contribution to calcium and magnesium intake. In spite of this there remain a number of uncertainties and there is currently insufficient evidence or justification for suggesting that naturally soft water supplies should be artificially hardened.

### ***How is the quality of drinking water assured?***

In the past, there was a minimum EU hardness standard for supplies that practised central softening related to taste and corrosion. With the increasing consideration of desalination, which requires remineralisation to prevent corrosion and improve taste, the possibility has been raised as to whether this process should be engineered to include a minimum level of calcium and magnesium. This subject is currently under discussion by WHO in the development of guidelines for desalination. Should standards be developed then water suppliers will ensure that they adopt the most appropriate ways of meeting those standards.

Water UK recognises the importance of this subject and is monitoring discussions about how the science can be improved and the practical and other considerations that might arise in a range of differing circumstances.