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Making a Suggestion for Minimum Mineral Composition Limits in Drinking Water

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Abstract

According to test results, the amount of synthetic pesticides and metal pollutants in modern Indian foods is extremely low. In terms of public health, minerals cannot be contrasted with artificial pesticides. Minerals are present in food and water to some level. The public's health could be seriously threatened by mineral deficiencies. Additionally, there is a risk of manufactured mineral water. The Food Safety Authority should define minimum limitations for the ionic elements of mineral water in accordance with Indian, American, European Union, and World Health Organization rules as well as drinking water guidelines.

Keywords: Brix, Total Dissolved Solids, and Pesticides.

Abbreviations

Organization of Official Analytical Chemists (AOAC); Brix: A refractometer is used to measure concentration, specifically the percentage of sugar in syrup, represented as a degree.Union européenne FDA or US FDA: Food and Drug Administration (US); EFSA: European Food Safety Act; FSS Act: Food Safety and Standards Act, passed in India in 2006; Food Safety and Standards Regulation, an Indian food regulation implemented in 2011 in accordance with the Food Safety and Standards Act of 2006 (FSSAI), Anions (negatively charged) and cations (positively charged) are two types of electrically charged constituents that make up inorganic compounds. Ionic Contents of Minerals: The concentrations of specific ions in water, such as calcium, magnesium, sodium, copper, chloride, and sulphate; National Program on Organic Production Organic Compounds: Chemical compounds often composed of the atoms carbon, hydrogen, oxygen, nitrogen, and sulphur; Production (India); Organic farming or organic agriculture: Contradiction: Synthetic pesticides are primarily organic substances, but the farming practise that avoids them is referred to as organic farming; this contradiction is not apparent in Hindi, however, because organic farming is known as Jaivic Krushi, which translates to "bio-farming"; Parts per million, or ppm (milligrammes of a constituent per kilogramme of composition, or very nearly milligrammes of solute per litre of solvent in the case of water as the solvent); Total Dissolved Solids, Reverse Osmosis, and WHO GDWQ: Recommendations from the World Health Organization.

Introduction

Most synthetic pesticides used to protect crops on farms are organic substances. The minerals that make up the inorganic content is naturally present in water and food, of course, but modern industrialization and urban growth have significantly increased the amount of minerals that enter the biosphere as pollutants. Neem (Azadirachta indica) juice is now accepted as a natural crop protection agent in India, where agriculture has recently moved toward organic practises and away from synthetic pesticides.

It stands to reason that pesticide levels in Indian food should be declining. The test results largely support this presumption. However, mineral content has also frequently been found at negligible concentrations in processed foods from India.Since deforestation has been a problem in India, food low in minerals may result from soil erosion [1]. Possibly Since deforestation has been a problem in India, food low in minerals may result from soil erosion [1]. In India, it's possible that both natural mineral water and reverse osmosis are used in the food processing process.However, the possibility of mineral water fabrication cannot be ruled out because to the relatively low 150 ppm lower limit for total dissolved solids and the absence of a lower limit for the ionic elements of mineral water in the 2011 Food Safety and Standards Regulation. Foods lacking in minerals may cause a number of illnesses in people. The author of this article recommends raising the lowest TDS limit and setting minimum standards for the full ion profile of mineral water.

Resources and Procedures:

An Indian food product's contamination test profile:

Indian food products, especially milk and water, have minimal levels of metal and pesticide pollutants. Analytical studies of sugar syrup-based chhana (a type of soft cheese) sweets from northern Rajasthan show that certain heavy metals and industrial pesticides are virtually completely absent.

According to the report, all of the pesticides (mentioned in FSSR 2011) are too low to be identified using standard test equipment utilising the AOAC technique [2] along with cadmium, arsenic, mercury, and tin. It would be important to note that the FSSR permits up to 250 ppm of tin in canned foods. Tin concentration in canned chhana sweets has been confirmed to be less than 0.10 mg per kilogramme, according to the analysis.The maximum lead and copper concentrations for such a product are 2.5 and 30 ppm, respectively, and an accredited laboratory has indicated that these concentrations exist as 0.05 mg per kg and 0.26 mg per kg, respectively. Two problems come up in this context: first, if the FSSR standards for metal and pesticide contamination are strict enough, and second, whether Indian foods, including water, are mineral deficient while being organic.

Low mineral and pesticide contamination:

One thing is certain: Indian agriculture is quickly moving toward organic methods nowadays. This accomplishment might be seen as the NPOP's (National Program on Organic Production) success story as well as the effect on farmers of the substantial pesticide-cancer association (equal to or stronger than the correlation between tobacco and cancer). Farm food, milk, and water would all obviously be organic if synthetic pesticides were not used quite heavily in farming. It is also true that India has experienced a rapid horizontal urban expansion that may be approaching saturation. It is possible to assume that the tendency toward "no development" or "vertical expansion" of urban areas will lead to perhaps declining metal contamination in water streams.

the potential for low mineral status:

The FSSAI proposed a lead maximum limit of 0.2 ppm on June 25, 2015.0.3 ppm for brassica vegetables and 0.1 ppm for fruits and vegetables overall [3]. According to regulation from 2011, the lead and tin tolerance limits for these goods had been 2.5 ppm as foods not specified. The same for cadmium was proposed in 2015 for leafy vegetables and a number of fruiting vegetables to be 0.2 and 0.05 ppm, respectively, down from 1.5 ppm in other foods. If there is a significant discrepancy between the already permitted level and the observed data, the Authority may feel free to propose making the upper limit for metal contamination in other goods more stringent.

In numerous instances, it has been found that the levels of synthetic pesticides and heavy metals including tin, arsenic, cadmium, and mercury are too low to be picked up by AOAC procedures utilising standard precision tools. If there are no pesticides in foods, it is fantastic. However, the near lack of metals, which are often expected to be present to some degree in water, milk, and agricultural output, suggests that there may be a mineral shortfall, especially in areas with limited diversity.minerals in the water being used the source of water utilised has a significant impact on the mineral content of processed foods. Since the water coming from a dam is essentially rainwater, the dissolved solids level is obviously smaller. The amount of dissolved minerals in canal water from rivers may be larger than that from dams. In the case of groundwater, there is a considerably greater likelihood of still larger mineral levels.

Water dissolved solids: WHO recommendation:

The World Health Organization's Guidelines for Drinking Water Quality (WHO GDWQ) background document, which was professionally edited by Ms. Marla Sheffer of Ottawa, Canada, and was dated April 3, 2016, [7] makes specific references to studies regarding the effects of TDS on humans. According to early epidemiological studies' findings, low TDS levels in drinking water may have positive impacts, even though negative consequences have been noted in only two small studies. Consumers typically tolerate water with TDS values below 1000 mg/Liter, though tolerance may change depending on the situation, claims Document.

Additionally, it says that water with extremely low TDS levels would not be acceptable to customers due to its bland, insipid flavour; water with high TDS levels might be.It goes on to say that water with extremely low TDS concentrations may put off consumers due to its flat, insipid flavour, and water with high TDS concentrations may do the same due to the taste that results (not suiting). Although the maximum and minimum TDS levels in water are not determined by this paper, it may persuade readers to accept 500 ppm as the typical content. The author of this page concurs with the US FDA, which defines mineral water as water with at least 250 ppm TDS that comes from an underground water source that is geologically and physically protected and to which no minerals may be added.

Discussion

It would be pertinent to take into account the concerned analytical reports of potable water, agricultural products, and processed food items in light of the current legal provisions of low lower TDS limits and no lower limits of constituents for natural mineral water, which frequently indicate the low concentrations of cadmium, arsenic, mercury, and tin less than 0.10 ppm, not exactly determined (better to say detected) by standard test procedures. Dieticians and nutritionists typically advise restricting intakes of sodium (while its deficiency may cause severe edoema, vomiting, and diarrhoea) and a few minerals, such as antimony, arsenic, barium, cadmium, chromium, copper, cyanide, fluorides, lead, manganese, mercury, nickel, nitrates, nitrites, and selenium, which are regarded legally However, copper is quite concerned with how well the human body functions. The function of cytochromes depends on copper, and its lack can lead to a deadly anaemia (on the other hand, a high copper consumption of more than 2.5 mg per day may cause kidney damage due to its enhanced absorption from the intestines) [8]. Foods, including water, are the main sources of calcium, phosphorus, magnesium, sulphur, iron, copper,

iodides, manganese, cobalt, zinc, fluorides, molybdenum, and selenium, which are fundamental to the health of human and animal bodies [8]. It appears that the body needs nearly all of the minerals, which are not created by the body but exist as a result of ingesting food and water, in fairly balanced levels. Clearly, establishing minimum ions levels in natural mineral water is a significant legal issue. Perhaps it's also essential to rule out the option of using mineral water.

Natural mineral water is a phenomenon that extends beyond just the realm of food preparation. In fact, the aetiology (origin or cause) of mineral water production at the source (wells or rivers) level could be regarded human activity of deforestation leading to soil erosion (degradation). In nations like India where large-scale destruction of forests and grasslands has occurred, thick forestation must be seriously pursued in order to preserve the mineral components of natural mineral water (groundwater). Therefore, to prevent the fabrication of mineral water, both the legislative establishment of minimum standards for natural mineral water and dense forestation are necessary.

Conclusion

The author intends to advise I a TDS limit of 250-750 mg/Kg for natural mineral water (the present limit in FSSR is 150-750 mg/Kg) in order to reduce the likelihood of mineral water fabrication and to increase the mineral profile of groundwater sources. (ii) The TDS limit for packaged drinking water is 200 to 500 mg/Kg (at this time, FSSR has not determined the minimum TDS limit for packaged drinking water). (iii) define a minimum limit for all mineral constituents (perhaps not known globally) (iv) extensive forestation for soil and water conservation in countries like India where deforestation has been a common occurrence.

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