Oncology & Cancer

Extended Abstract

Effectiveness of Groundwater Treatment for Drinking Use and Dairy and Food Processing

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Abstract

Groundwater supplies should undergo comprehensive water quality testing to ensure suitability for drinking water and dairy production purposes. Evaluation of chemical characteristics and microbiological quality as well as treatment processes applied for the removal of contaminants from groundwater extracted from Al-Sag aquifer in Buraydah, Qassim region were investigated. The tested water samples from both well sources and effluents were found to have total dissolved solids, electrical conductivity and turbidity values within the acceptable limits of Saudi standards and WHO guidelines. Of course, the reduction percentages were the same for EC and TDS (58.6-93.6%) while it scored 0.0-100% for turbidity due to the adopted treatment processes. Chemical characteristics such as total alkalinity, chloride, nitrate and hardness were also found to be within the permissible levels of both Saudi standards and WHO guidelines. The effectiveness of the adopted treatment processes led to decrease such chemical parameters percent in the treated groundwater by about 54-82.9, 56.9-82.6, 29.0-95.8 and 7.9-98.2%, respectively. Moreover, mineral contents such as iron and cadmium in both raw and treated groundwater were below the detection limit. Groundwater contained fluorine at low levels than permissible limits set by local and international standards; therefore, fluoridation process must be taken into consideration for drinking use. Zinc content of the treated water was within the allowed concentration required by the Saudi standards and the WHO guidelines. While, nickel and lead contents in three groundwater sources were found to be higher than those postulated and recommended by the Saudi standards and WHO guidelines. However, water treatment at all studied stations was fair enough to remove these hazards and secure water. In regards to microbiological quality, the treated groundwater was found to be totally free from coliform organisms with almost undetectable level of viable count rendering them quite safe for drinking use and dairy-food processing.

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