



Effectiveness of domestic water filters

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ABSTRACT

A laboratory study was carried out to determine the best domestic water filter with respect to cost, volume of treated water, and effectiveness in improving the quality of potable water. Six types of filters were tested including sand, five micron cartridge, ceramic, carbon block, ultra violet (UV) sterilization unit, and reverse osmosis combined filters. Water samples were collected upstream and downstream of each type of filter. These samples were analyzed for pH, EC, TDS, TSS, turbidity, TOC, chlorine concentration, and various bacteria. Also, the volume of treated water produced by each type of filter was measured. The laboratory results indicated that inlet water had low salinity (TDS value 275–438 mg/l), low TSS (0–7 mg/l), chlorine (0.13–0.78 mg/l) contents, and high content of bacteria (1–1212 MPN/100 ml). The results revealed that the membrane of the RO combined filter set was exposed to severe damage by the residual chlorine in the water, rendering the membrane unable to reduce water salinity effectively and causing high total bacteria counts in the filtered water. Additionally, a biological slime layer formed at the surfaces of cartridge filters, and produced high values of TSS and bacteria in the filtrate samples. The results showed that the best type of filter was the five micron filter on the basis of cost, volume of filtered water, and improvement in water quality.

Keywords: Potable water; Ceramic filter; UV sterilization unit; Residual chlorine; Total coliform bacteria; RO combined filter

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