# Simple and Reliable Tests That Homeowners Can Use to Determine the Microbial Drinking Water Quality of Rainwater Collected from Roofs and Stored in Cistern Tanks

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Clean water piped to homes is taken for granted by people in developed countries. In developing countries, large populations are not supplied with clean water piped into their homes. Even in developed countries, many houses do not receive piped water. Since water is a daily necessity, people will use the most feasible source of water for their needs. Surface sources, (rivers, streams, lakes) are often used but are not always available. Groundwater is another source but often requires sophisticated technology, including use of pumps. Another simple alternative source is to use the roofs of homes to collect rainwater and store water in cisterns (tanks) for all household uses, including drinking water. However, the quality of water in cisterns generally contains high concentrations of total bacteria as well as fecal indicator bacteria and cannot meet drinking water standards. We previously reported that drinking water standard for cistern water should not be as stringent as EPA drinking water standard (<1 total coliform/100 ml and a more practical standard of 10 fecal coliform/100 ml is generally safe for consumption. Since it is difficult to disinfect water in cisterns with chlorine, we have recommended use of UV light or use of natural sunlight to either heat water or use the rays of sunlight to disinfect cistern water. For homeowners, it is not practical to test cistern waters using standard methods for total coliform and fecal coliform. To address this need, we showed that the hydrogen sulfide ($H_2S$) test is a simple, reliable test that homeowners can use to test their own water for drinking water quality because this test does not require special equipment, does not require incubator and the black colored water showing contamination can be easily read by homeowners. The criticism of this test is that it does not actually measure levels of total or fecal coliform. A more recent test called Aquasure Pro 3000 developed by Aquasure Technologies Inc. (Huntsville, Ontario, Canada), uses EPA approved reagents and measures total coliform and *E. coli* in water samples. This test requires electricity or batteries. As with the $H_2S$ test, the Aquasure Pro 3000 test was field tested by analyzing the quality of cistern water samples and water collected from the faucets of 10 homes in the Tantalus-Round Top area of Honolulu, Hawaii. The results showed that the homeowners could easily read positive and negative results based on fluorescent color of the water. Some of these homes had

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installed UV disinfection systems or used ceramic filters, which reduced the concentrations of fecal bacteria in their drinking water supply. These simple tests can be easily used by homeowners to determine the microbial quality of any source of water used for drinking.