



Small Drinking Water Systems Project

Home Water Test Kits Buyer Beware!

D. Ciliska, M. Kerssies, J. Kim
For the National Collaborating
Centre for Methods and Tools



Background

As part of the collective project on small drinking water systems in Canada being coordinated by the National Collaborating Centres for Public Health. This fact sheet is intended to contribute evidence to inform policy and practice with the intent of improving these systems.

Question

Participants in several small drinking water system consultations across Canada in 2009 requested information about home water test kits (please visit www.nccph.ca for more information). Specifically, they wanted to know:

- 1) Do commercially available water test kits accurately test what they claim to measure?
- 2) Do these kits reliably give the same result on a second sample of water taken at the same time from the same source?

Search

Only home water test kits were included in the search. Tests that require sending water samples to a lab were not included. Kits were identified through the following sources:

1. Phone calls to head offices of major retailers in Canada (Ace Hardware, Canadian Tire, Costco, Home Depot, Home Hardware, Lowes, Rona, True Value, Walmart) to determine which water test kits were sold.
2. Search of online databases (CINAHL, MEDLINE) using the following terms: home, bacteria, contaminants, E. coli, parasites, herbicide, pesticide, heavy metals AND test AND water.
3. Google search using the same terms, limited to products available in North America.

Data Collection

Telephone and/or email contact was made with companies that produced water test kits to collect the following data:

- the test's purpose, cost and availability
- data about the test's precision, accuracy, sensitivity and false positives and negatives.

Findings

Twelve water test kits were reviewed (see next page). Information about the test properties was not available on any of the product-specific websites or from telephone calls to the companies. The only data were from an independent examination of two water test kits (for nitrate and atrazine/simazine) done by the US Environmental Protection Agency (EPA) (Batelle, 2001; Batelle, 2004). For the nitrate test, up to 38% of the time the test indicated that no nitrate was in the water when it was actually there (false negative). Up to 14% of the time, the test showed nitrate in the water when it was not actually there (false positive). The atrazine/simazine test kit had a false positive rate of 14%. In addition, Consumer Reports tested Watersafe All-In-One Drinking Water Test Kits and found that of 14 kits, all detected low levels of most contaminants and all gave correct readings for hardness. However, four of the kits failed to give any results for bacteria (Anonymous, 2006).

Conclusion

Home water test kits may indicate a problem with drinking water, but very few independent evaluations have been conducted. In addition, the two kits tested by the EPA were subject to false positive and false negative results, limiting confidence that these kits are accurate and dependable screening tools.

Recommendation

Since home water test kits have a limited ability to test accurately for problems, concerned homeowners should only use the kits for a quick or preliminary check. To be sure, homeowners should take their water samples to a local laboratory for testing. This service is free in most jurisdictions in Canada. Information for accessing this service is available through local health authorities or public health departments.

References

Anonymous (2006). Test tap water for a drop in the bucket. *Consumer Reports*, 71(9), 6.

Batelle (2001). Environmental Technology Verification Report. *NECif-NTK Nitrate Test Kit*. Retrieved from http://www.battelle.org/environment/pdfs/verifications/water/verifications/01_vr_nec_fntk.pdf

Batelle (2004). Environmental Technology Verification Report. *Watersafe Pesticide Test*. Retrieved from http://www.battelle.org/environment/pdfs/verifications/water/verifications/01_vr_silverlake.pdf

For more information on this project, please visit

www.nccph.ca

Table 1 – Home Water Test Kit Data

Name of Kit	Available for Purchase	Test Method	Cost (\$)	Screens For	Precision	Accuracy	Sensitivity	False Positive	False Negative
Bacteria in Water- The Do it Yourself Kit	http://www.prolabinc.com/products.asp?kit=bacteria Home Depot, Lowes, Ace, True Value	Bacteria medium	\$9.95	bacteria	—	—	> 5 colonies	—	—
Drinking Water Test Kits	http://www.drinkingwatertestkit.com/	Not stated	\$34.95	bacteria, lead, pesticides, nitrates, nitrites, chlorine, chloride, hydrogen sulfide, pH, and hardness	—	—	—	—	—
First Alert Drinking Water Test Kit	http://www.firstalertstore.com/store/catalog.asp?item=1213 Target	Test vials/strips	\$16.99	bacteria lead pesticides (Atrazine/Simazine) nitrate	—	—	> 0 colonies 15 ppb 3 ppb/4 ppb 10 ppm	—	—
NECI F-NTK Nitrate Test Kit	http://nitrate.com/store/index.php?main_page=product_info&Path=12&products_id=55	Reagent	\$30.00	nitrate	—	80–100%	5 ppm	0–14%	32–38%
Pesticides in Water- The Do it Yourself Kit	http://www.prolabinc.com/products.asp?kit=pesticides Home Depot, Lowes, Ace, True Value	Test strips	\$9.95	pesticides (Atrazine, Simazine)	—	—	3–4 ppb	—	—
PurTest Home Water Analysis	http://www.ohiopurewaterco.com/shop/customer/home.php?cat=293	Test vials/strips	\$39.89	bacteria (E.coli & coliform) lead	—	—	> 0 colonies 15 ppb	—	—
Water Quality Test Kit	http://www.sensafe.com/487986.php	Test vials/strips	\$39.99	nitrates lead pesticides (Atrazine, Simazine) bacteria (E.coli)	—	—	10 ppm 15 ppb 3 ppb/4 ppb > 1 colony/100 ml	—	—
Water Quality - Do it Yourself Kit	http://www.prolabinc.com/products.asp?kit=waterquality Home Depot, Lowes, Ace, True Value	Test strips	\$9.95	nitrates copper	—	—	10 ppm 1 ppm	—	—
Water Safe All-in- One Drinking Water Test Kit	www.discovertesting.com	Test vials/strips	\$19.95	bacteria lead nitrates pesticides (Atrazine, Simazine)	—	—	> 0 colonies 15 ppb 10 ppm 15 ppb	—	—
Watersafe Lead	http://www.h2okit.com/	Test strips	\$9.95	lead	—	—	15 ppb	—	—
Watersafe Pesticide Test Kit	www.discovertesting.com	Test strips	\$9.95	Atrazine, Simazine	66%	85%	3–4 ppb	14%	0%
Watersafe Well Water Test Kits	http://www.discovertesting.com/WellWaterTestKit	Test strips	\$24.95	bacteria lead pesticides (Atrazine, Simazine)	—	—	> 0 colonies < 15 ppb 3–4 ppb	—	—

NOTES: Some kits are available on many websites; only one is provided as an example.
— = data not available