Summary of evaluation

This report summarizes the evaluation results of a membrane filter known by the tradename ‘LifeStraw® Family 1.0’ under Round I of the World Health Organization (WHO) International Scheme to Evaluate Household Water Treatment Technologies (the Scheme). Evaluation followed the requirements of the WHO protocol for batch filtration technologies and comprised a desk review of existing laboratory data on the product’s performance against bacteria, viruses and protozoa. Based on the review of existing data, the product meets WHO performance criteria and is classified as providing Comprehensive protection (★★★) against bacteria, viruses and protozoa.
Background

Evaluation under the Scheme is based on performance criteria set out in Evaluating Household Water Treatment Options: Health-based targets and microbiological performance specifications (WHO, 2011). The criteria were determined by applying quantitative microbial risk assessment methods outlined in the WHO Guidelines for Drinking-water Quality (2011) and set out log\textsubscript{10} reduction targets against bacteria, viruses and protozoa (Table).

### WHO performance criteria for household water treatment technologies

<table>
<thead>
<tr>
<th>Performance classification</th>
<th>Bacteria (log\textsubscript{10} reduction required)</th>
<th>Viruses (log\textsubscript{10} reduction required)</th>
<th>Protozoa (log\textsubscript{10} reduction required)</th>
<th>Interpretation (with correct and consistent use)</th>
</tr>
</thead>
<tbody>
<tr>
<td>★★★</td>
<td>≥ 4</td>
<td>≥ 5</td>
<td>≥ 4</td>
<td>Comprehensive protection</td>
</tr>
<tr>
<td>★★</td>
<td>≥ 2</td>
<td>≥ 3</td>
<td>≥ 2</td>
<td>Targeted protection</td>
</tr>
<tr>
<td>★</td>
<td>Meets at least 2-star (★★) criteria for two classes of pathogens</td>
<td></td>
<td></td>
<td>Little or no protection</td>
</tr>
<tr>
<td>–</td>
<td>Fails to meet criteria for 1-star (★)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Product description

The LifeStraw® Family 1.0 is an ultrafiltration membrane device that removes microbial contaminants from water as it is fed through hollow fibre membranes under gravity. The Family 1.0 is the hanging version of the LifeStraw range of filters. It comprises a 2 L reservoir that is attached to a hose that connects to the hollow fibre membrane cartridge. The filter does not come with a safe storage container, and has to be hung or suspended above the storage container to be filled. The full product description, illustrations and use instructions can be found at: www.vestergaard.com.

Evaluation approach

The laboratory data reviewed were from performance testing of the LifeStraw® Family 1.0 against bacteria (Escherichia coli), viruses (MS2 coliphage) and protozoa (Cryptosporidium), based on the United States Environmental Protection Agency (US EPA) Guide Standard for Microbiological Water Purifiers (1987). The submitted data were reviewed against the technology test protocol for Batch Filtration Technologies V 1.0 (2015).

Results

The test organisms and test procedure applied to generate the existing laboratory data were deemed comparable to those of the Scheme and sufficient to determine the performance of the product. Based on the review, the LifeStraw® Family 1.0 meets or exceeds the three-star (★★★) performance targets for bacteria, viruses and protozoa.
Interpretation and application of results

Performance is classified in three ascending tiers ★ (one-star) ★★ (two-star) and ★★★ (three-star), as shown in the table. Both three- and two-star products provide Comprehensive protection against all three microbial groups. One-star products meet performance targets for only two of the three microbial groups, providing Targeted protection.

Performance classification

Based on the review of the laboratory data submitted, the LifeStraw® Family 1.0 meets or exceeds three-star performance targets for bacteria, viruses and protozoa. As such, the LifeStraw® Family 1.0 is classified as providing Comprehensive protection (★★★).

Considerations for product selection

<table>
<thead>
<tr>
<th>Microbial conditions</th>
<th>Effective against bacteria, viruses and protozoa; can be used under all microbial water quality conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physicochemical water characteristics</td>
<td>Can be used in both turbid and non-turbid water</td>
</tr>
<tr>
<td>Product information and labelling</td>
<td>Check that the device is appropriately labelled and has clear instructions for use</td>
</tr>
</tbody>
</table>

References


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The results in this report reflect the performance level that the product was found to meet at the time of testing. WHO cannot guarantee that the products reported herein will continue to meet the stated performance levels. Furthermore, the results contained in this report may not be used by manufacturers, suppliers or any other parties for commercial or promotional purposes.

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