

Hand Wash Provides Protection



In a unique initiative aimed at heightening hand hygiene awareness, leading health soap Lifebuoy, embarked upon an oath taking drive in 60 special schools that included schools for blind, and under-privileged children to give the hand hygiene oath in both, verbal and sign languages, in Mumbai on October 14th on the eve of Global Handwashing Day which is celebrated worldwide on October 15th every year.

To mark the occasion of Global Handwashing Day, *Consumer VOICE* is bringing you a comparative lab test of 9 popular as well as regular selling brands of hand wash liquids available in the Indian market. Earlier *Consumer VOICE* had User Tested 'Antibacterial' Liquid and bar soaps in 2010. At that time of our research, we had found 'Triclosan' to be the main culprit in so far as it posed not only an unnecessary added risk to a pointless product category but also, it could actually prove to be hazardous to both consumer and environmental health.

Key Findings

1. Fem was found most efficient in removal/killing of microbes followed by Sach and Lifebuoy.
2. Savlon was found most acceptable in sensory as well as application tests followed by Santoor and Palmolive.
3. Dettol and Palmolive did not contain Triclosan and claimed in removing germs but found not very effective.
4. Santoor, Savlon and Palmolive did not meet the minimum requirement of TFM.
5. Care Mate, Sach and Chandrika had synthetic detergent more than recommended limits and also low in TFM content.

Human skin provides a favourable environment for the existence and multiplication of a variety of microbes.

Manufacturers claim that conventional toilet soap washes away the germs but does not kill them. The function of an antibacterial or antiseptic soap is not only to clean the skin, but also to drastically reduce the bacterial count on the skin. This prevents skin infections and perspiration odour caused by the decomposition of perspiration by bacteria.

In our Laboratory tests we find that anti-bacterial soaps 'kill' the bacteria to a large extent but ironically all the brands tested claim

that their soap 'fight' germs. None of the manufacturers has said that their product is an anti bacterial hand wash soap but from our findings based on BIS regulations we understand that 6 out of 8 brands are actually anti- bacterial in nature. They act as a germicide, and hence it should be indicated on the labelling, the exceptions were Dettol and Palmolive which we found did not contain Triclosan and hence we feel that they failed to match our test parameters. Interestingly, Lifebuoy also did not contain Triclosan but it came second in our overall rating and the reason is the presence of Tricarban (a cousin of Triclosan). Worldwide there is a huge uproar against Triclosan and we had earlier reported

in *Consumer VOICE* about the damage that Triclosan can cause to human health and environment.

According to Bureau of Indian Standards Triclosan and Trichlorocarbanilide should not exceed 1 percent by mass either singly or in combination, the entire range of 7 brands that had Triclosan or Tricocarb had much less than 1%. Our comprehensive consumer test proves that these liquids actually do more than what they claim to be doing, which is they 'kill' bacteria, rather than just 'wash' or 'remove' them and Triclosan, the added chemical is the one that does the trick. According to regulations mandated by the BIS, Who has declared permissible limits of the chemicals. In the tested brands were not only safe, but also an additional cover for consumer protection.

Why use antibacterial soaps?

None if the tested brands even those brands with Triclosan and Triclocarb claims to specifically "Kill" any germs. Their claims used the following terms like 'fights', 'protects' or 'removes'. According to studies Triclosan Kills and BIS mandate recommends inclusion of Triclosan in liquid antibacterial soaps. None of the brands claim to be specifically "antibacterial". But sum of our tested product contain Triclosan and act as anti bacterial agents "killing" bacteria.

In brands Dettol and Palmolive which do not contain Triclosan or Triclocarb also "wash"/'remove' bacteria without "Killing" them, which in any case is not what they claim. Hence these two brands might be relatively safer for the environment.

The All Important Anti-bacterial Performance Test

Antibacterial activity test was conducted to compare the

Parameter Brands	Overall Score Out of 100	Antibacterial Performance Tests				
		Anti Bacterial Activity		Zone of inhibition	Contact kill	Overall Score
		Serial dilution	Substantivity			
		Score Out of 4	Score Out of 8	Score Out of 7	Score Out of 7	Score Out of 26
Fem	88.736	4	7.57	7	7	25.57
Chandrika	82.727	4	7.30	7	7	25.30
Care Mate	81.393	4	6.64	7	7	24.64
Sach	78.272	4	7.45	7	7	25.45
Savlon	78.035	4	6.70	7	7	24.70
Santoor	76.415	4	7.34	7	7	25.34
Lifebuoy	83.207	4	7.44	7	7	25.44
Dettol	64.64	1.33	3.07	1.33	1.33	7.06
Palmolive	57.847	1.33	3.44	1.33	1.33	7.43

effectiveness of antibacterial chemicals present in liquid soap solution and to find out how much bacteria is reduced after the application of the soap. Here a swabs test was conducted, by first applying liquid soap on the hands and their after the soap was washed away. In our assumption, the germicide (the agent in the soap that kills the bacteria) should be retained on the skin. In addition, antibacterial activity should be retained on the skin for some period after the wash so as to provide protection on the skin. Two other tests on 'Zone of

Inhibition' and 'Contact Kill' were also conducted.

The Antibacterial test was divided into two - the serial dilution test and the substantivity test. In the serial dilution test the liquid soap is diluted and kept in test tubes for incubation for 24 hours. The sample should pass as clean, if there is any turbidity then that means there is bacterial growth.

The substantivity test was conducted to find out if the antibacterial activity of the liquid handwash continued even after the soap is rinsed away, which means that the hand wash is providing protection to the skin.

Brand Claims

Brand	Claims
Fem	Fight Germs, 14 times better protection from Harmful germs.
Chandrika	Gentle, Moisturising Germ Protection.
Care Mate	Tough On Germs; Germ Control.
Sach	Fights Germs.
Savlon	Gentle Protection; Remove Germs.
Santoor	Gentle, Moisturising Germ Protection.
Lifebuoy	Balanced Protection From Germs. Protection from Germs, removes germs from skin surface.
Dettol	10 Times Better Protection Against Wide Range Of Germs. Fights germs leaving hands soft and totally clean Recommended by IMA.
Palmolive	Removes Germs.

Comparative Test

The zone of inhibition test was done to find out if the bacteria could be washed away even after the soaps were diluted higher than 1:1000. And the Contact Kill test was conducted to measure the rate of killing of bacteria. Fem topped the all important Anti-Bacterial Test followed by Chandrika and Care Mate

Triclosan is what makes the soap antibacterial

The antibacterial soaps are expected to contain Triclosan (TCN) up to a 1% of the total volume. As per BIS, Triclosan is considered to be an effective antibacterial agent.

In all these tests, except Dettol and Palmolive, all the brands qualified to be effective in 'killing' the germs significantly. Dettol and Palmolive did not contain TCN (Triclosan) but claimed to be '10 times better protection against wide range of germs (be 1 0 0 % sure)'

and 'remove germs' respectively. All brands, except Dettol and Palmolive, were found to be effective in killing the germs.

It is surprising that Dettol and Palmolive, both acceptable brands, and known for antibacterial properties commanding high consumer loyalty should not have passed the test. Since both did not declare the presence of TCN on their labels, consumers need to understand that these brands will not be effective for killing of bacteria, but will do what any ordinary soap would do, that is, wash away bacteria.

Savlon leads in sensory tests

In a general test conducted to judge the properties of liquid soaps in terms of lather richness, fragrance, smoothness on use, washing ability, irritation and allergy on regular & consistent use, Savlon was the most acceptable brand. The panel chose **Santoor** in the second place followed by **Palmolive**.

Good anti bacterial soaps have more lather

The base materials as TFM and synthetic detergents are responsible for the rich, soft and silky lather. It was highest in Fem (18.9%), Dettol

(18.5%) and Care Mate (17.02%) well above the minimum requirements. However, Santoor (6.82%) Savlon (8.36%) and Palmolive (9.12%) had the lowest quantity of TFM thus not meeting the BIS requirements.

Synthetic Detergent lowers the better

Care Mate (10.08%), Sach(9.58%) and Chandrika (8.80) had highest quantity of synthetic detergent much above the BIS recommended limit of 2%. This may be because Synthetic detergents are cheaper than TFMs. Ideally a balance mixture of TFM and synthetic detergent would be a good option, as long as it is in quantities as per BIS requirements. Taking into account BIS requirements, Fem(1.04%), Dettol (0.27%), and Lifebuoy (1.53%) were rated on the top and also found very safe for skin (of hands) for repeated use. *In order to qualify for Eco-mark labelling of India, high quantity of Synthetic detergent in the toiletries is considered to be harmful to the environment and should not be contained in their composition.*

Some of our test results at a glance

All pass in Chemical parameters: The brands were tested for chemical parameters like Rosin Acid of Total Fatty Matter, Free Caustic Alkali, Free Carbonate Alkali and Matter Insoluble in Alcohol. All the brands were found to be meeting the BIS requirements thus safe for repeated use on hands.

Labelling, packaging and net weightsatisfactory: The mandatory labelling of the products like Total Fatty Matter (TFM), Matter insoluble in alcohol, Antibacterial agent, Month and year of manufacture, Indication of the source of manufacture, were found to be satisfactory. So also were the net weight and method of

"Fem tops the overall ranking followed by Lifebuoy & Chandrika."

Consumer Alert: Triclosan and Triclocarb

Animal studies have shown both the chemicals, Triclosan and Triclocarb, can interfere with hormones critical for normal development and function of the brain and reproductive system. Triclosan has been associated with lower levels of thyroid hormone and testosterone, which could result in altered behaviour, learning disabilities, or infertility. Triclocarban has been shown to artificially amplify the effects of sex hormones such as estrogen and testosterone, which could promote the growth of breast and prostate cancer.

Furthermore, laboratory studies suggest that Triclosan and Triclocarban may be contributing to antibiotic resistance in bacteria known to cause human infections. Surveys of the U.S. population from ages 6 to over 65 have found residues of triclosan in over three-quarters of people. Though Triclosan has been measured in house dust, most people are likely to be exposed by applying products that contain Triclosan to their skin. One study of nursing mothers found higher levels of triclosan in blood and breast milk of women who used personal care products containing triclosan. Most of these products get washed down the drain, where they enter our waterways and are then transported widely throughout the environment. Triclosan is one of the most frequently detected chemicals in streams across the U.S. and both Triclosan and Triclocarban are found in high concentrations in sediments and sewage sludge where they can persist for decades. In the environment, antibacterial compounds could disrupt aquatic ecosystems and pose a potential risk to wildlife. Traces of Triclosan have been found in earthworms from agricultural fields and Atlantic dolphins. In the lab, Triclosan has been shown to interfere with development of tadpoles into frogs, a process that is dependent on thyroid hormone. There it better to avoid anything labelled "antibacterial" or "antimicrobial" which contains Triclosan or Triclocarban, such as soaps, gels, cleansers, toothpaste, cosmetics and other personal care products. www.simplesteps.com

packaging of the antibacterial liquid soaps.

Dettol lathers the most

From a users point of view Liquid soaps should generate a rich and smooth lather as soaps are expected to do. Here we followed the shaving creams specification. The results showed that Dettol soap lathers the most followed by Fem and the least lather was formed by Chandrika. A good handwash will form more lather with little quantity of soap.

Conclusion

Fem tops the overall ranking followed by Lifebuoy & Chandrika as most effective in the antibacterial properties. It is surprising that Dettol and Palmolive, who have a large

consumer base, did not perform up to the mark because they did not contain TCN. Curiously enough, they declared on their label to be effective in removing the germs. But as we discussed they did not

"Kill" the germs, which might make them safer for their environment. **To conclude Fem is the best value for money as being one of the top performer as well as lowest priced as compared to others.**

Global Hand washing Day 2011 aims to bring about a change by raising awareness with children, school teachers and parents who will join celebrities, government officials, NGO ambassadors and members of the private sector in taking the oath of hand washing with soap, to present as an example of a powerful public health intervention.



Global Hand washing Day 2010 was hugely successful with 200 million people and 700,000 schools in more than 100 countries celebrating the event. This year promises to be even bigger with more children, teachers, parents, celebrities and government officials planning to motivate millions to lather up to prevent life-threatening diseases such as diarrhea and acute respiratory infections. www.hul.co.in



Comparative Test Performance Score of Liquid Hand Wash

Brand/Parameter	Pack Size, ml	Wt. %	Hand Wash Containing Triclosan						Hand Wash*				
			FEM	Chandrika	Care mate	Sach	Savlon	Santoor	Lifebuoy	Dettol	Palmolive		
MRP/RP in ₹			1000	250	250	250	250	250	250	200	135	250	
			150/149.5	55/55	55/55	60/55	55/55	55/55	55/55	45/35	33/33	60/60	
I. Chemical Tests													
1. Total Fatty Matter (TFM)	20	18.44		14.59	15.82	10.13	7.82	3.05	3.57	15.08	17.88	8.41	
2. Rosin Acids of TFM	4	4.0		3.78	3.4	3.95	4.0	4.0	4.0	3.7	2.80	3.05	
3. Free Caustic Alkali	4	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
4. Free Carbonated Alkali	4	3.62		3.24	3.05	2.80	4.0	4.0	3.24	3.74	3.55	2.92	
5. Matter Insoluble in Alcohol	4	3.09		3.25	3.14	3.38	3.17	3.28	3.28	3.44	3.34	3.20	
6. Synthetic Detergent	5	2.61		4.85	5.0	4.94	4.43	4.74	4.74	3.33	1.5	4.77	
7. Triclosan	5	4.75		2.0	1.37	1.50	4.25	4.25	2.25	1.88	1.0	1.37	
8. Lather generation	6	5.48		4.09	4.38	5.12	4.38	4.38	5.34	4.90	6.0	4.93	
II. Antibacterial performance													
A. Antibacterial Activity													
i) Serial dilution test	4	4		4	4	4	4	4	4	4	1.33	1.33	
ii) Substantivity test	8	7.57		7.3	6.64	7.45	6.7	7.34	7.34	7.44	3.07	3.44	
B. Zone of inhibition	7	7		7	7	7	7	7	7	7	1.33	1.33	
C. Contact kill	7	7		7	7	7	7	7	7	7	1.33	1.33	
III. Sensory Tests	12	8.676		8.627	8.093	8.502	9.235	9.035	9.035	8.697	8.51	8.767	
IV. General Parameters													
1. Packing	2	1.5		2	1.5	1.5	2	2	2	2	2	2	
2. Marking	5	4		4	4	4	4	4	4	4	4	4	
3. Net Weight	3	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Overall Score	100	88.736		82.727	81.393	78.272	78.035	76.415	76.415	83.207	64.64	57.847	

Rating: >90 – Excellent *****, 71-90- Very Good ****, 51-70- Good ***, 31-50- Average **, upto 30 – Poor *

Sensory Tests were conducted on (Colour, Appearance, Lather, Fragrance, feel after use, Irritation/Allergy)

*Claim removes germs but does not contain Triclosan (Antibacterial Agent).