

Raising the “bar”

Unmatched Skin health and Beauty benefits from a new sustainable soap technology – Stratos

- Basic soap bars (also called Toilet Soaps in some countries) date back more than 3000 years and are one of the most widely used products the world over. Yet for the most part, their composition (and hence benefits) has remained largely unchanged.
- Currently, most basic soap bars comprise up to 60–70% Total Fatty Matter (TFM) or 60–70% Oil. But such a high content is not needed for cleaning or lathering, and a significant portion of this TFM is “wasteful”.
- Moreover, the extremely high volumes of soap sold globally lead to them having a high environmental and greenhouse gas (GHG) footprint.
- Unilever’s new, breakthrough, and patented and patent-filed innovation (called Stratos) replaces up to 25% of the “wasteful” TFM with natural ingredients like plant-based polysaccharides and skin benefit actives.
- The team’s research suggests these new lower TFM “bathing bars” are superior in terms of sensorials, skin health, and beauty benefits, measured through clinical studies, while also significantly reducing their environmental impact.
- Furthermore, consumers across different countries (with varying water qualities) perceived that the new bars gave them a superior in-use experience, making their skin feel softer and smoother, with an even-toned, radiant glow.

‘Take a bath’ – this age-old cleansing exhortation has been a part of everyday life for most humans, irrespective of their socio-economic status. Despite technological advancements, the past 3000 or so years have seen little change in the composition of basic (a.k.a. toilet) soap bars. Such soap bars, made primarily from oil and characterized mainly by their Total Fatty Matter (TFM) content, are best described by a brick-and-mortar model: the bricks (made of hard soap from long chain fatty acids) provide structure, and the mortar (made of soft soap from short chain fatty acids) delivers the actual lathering and cleansing activities. The soap bricks

can comprise up to 60–70% of the soap bar, but they contribute little to the soap’s main function – cleansing. These bricks are largely insoluble and simply get washed down the drain during use.

The lower TFM Stratos bar outperformed the high TFM bars in all skin health and beauty metrics along with the sensory and value metrics measured.

Scientists in Unilever R&D, led by Dr Vibhav R. Sanzgiri (Executive Director R&D HUL and Global Head R&D Skin Cleansing, Unilever), have developed a new breakthrough technology which they call “Stratos”. They have “created space” in the soap bar formula by replacing up to 25% of the structuring, non-essential soap bricks with skin benefit agents including natural plant-based polysaccharides (which also help in structuring the bar), vitamins, and skin care ingredients. Extensive and published studies show that Stratos bars deliver a better consumer sensorial experience and higher functionality as seen in dermatologist conducted clinical studies while reducing the greenhouse gas (GHG) footprint.

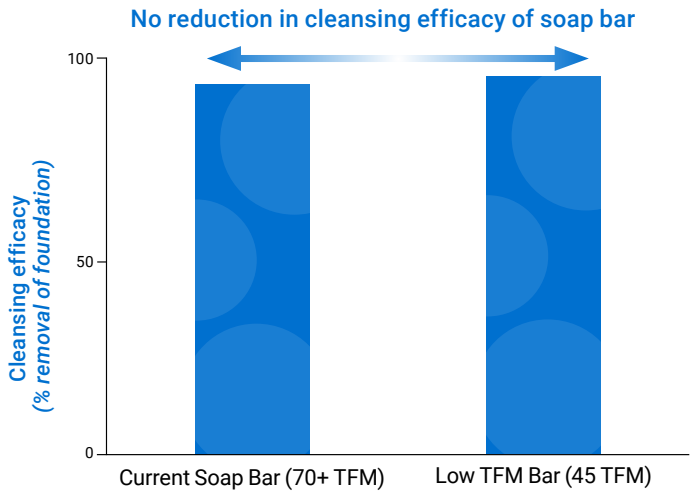


Figure 1. Cleansing efficacy of current soap bar compared to low TFM bar.

Raising the bar Unilever researchers first published their findings in a paper in the *Journal of Surfactants and Detergents* and have since then presented extensive independently tested consumer and clinical data on the sensorials, skin health, and beauty benefits of the Stratos bars in poster format at conferences held in North America, the Middle East, and Europe in 2024. Amazingly, their studies demonstrated that soap/bathing bars with up to 50% less TFM than conventional toilet soaps with 76–78% TFM, when well-formulated, show uncompromised cleansing efficacy, removing dirt and germs just as well as the current marketed high TFM bars (Figure 1).

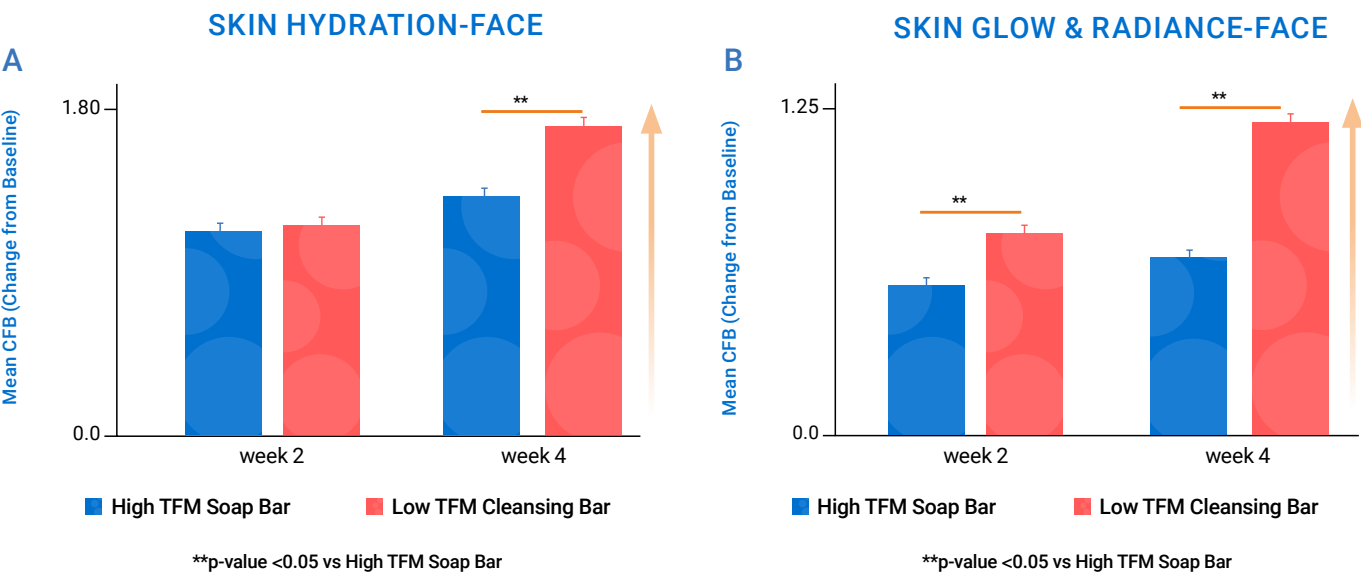


Figure 2: Dermatologist evaluation on face of A) skin hydration, B) skin glow and radiance calculated basis MSCR-G&R-Composite scale (n = 67 and n = 64 for low and high TFM bars respectively) at 2 and 4 weeks.

But what about skin health and beauty benefits? To answer this, the researchers turned to dermatologist/expert conducted human clinical studies, unconcepted consumer tests conducted by independent agencies, and *in-vitro* assays in the laboratory.

Results comparing their lower TFM prototype soap/bathing bars with high TFM marketed toilet soap bars focused on understanding the skin barrier benefits in

terms of skin hydration, clarity, glow and radiance. Independent expert dermatologist assessments and instrumental measures were used in these clinical studies. The data showed that the novel lower TFM Stratos bars were superior to the high TFM marketed soaps on the clinical metrics measured (Figure 2).

In-vitro experiments provide clues to the modes of action that deliver efficacy with a clear signalling of genes linked to skin health

benefits. There was a close correlation seen between the genes triggered and the benefits seen in clinical studies. The lower TFM Stratos bars also significantly modulated UV-induced melanin pathways compared to untreated controls, while the high TFM bars did not, thus explaining why the Stratos bars delivered anti-hyperpigmentation benefits leading to glowing, even-toned skin.

Consumers can perceive the difference

Stratos bars were tested independently in unprompted studies with thousands of consumers globally across different income strata – and it was evident that Stratos bars provided superior perceivable benefits on consumer sensorials like lather, fragrance, and skin feel. These superior benefits were also seen across various geographies and countries with different water qualities. Along with superior skin benefits, these novel lower TFM soap/bathing bars also have significantly lower GHG emissions and hence are more sustainable and environment friendly (Figure 3). Thus, with an improved performance and environmental profile, these new lower TFM Stratos bars provide win-win solutions for people and planet. However, current regulations in some countries mandate a minimum level of TFM in soap/bathing bars (regardless of its impact on performance) and there are myths suggesting the quality of soaps is directly linked simply to TFM levels. However, considering the promising data for the benefits of lower Total Fatty Matter bars, regulatory bodies are urged to change their regulations from defining a vertical TFM-based compositional standard to horizontal performance-based standards which are more consumer relevant. The Stratos technology enabling change is here. Surely, now is the time.

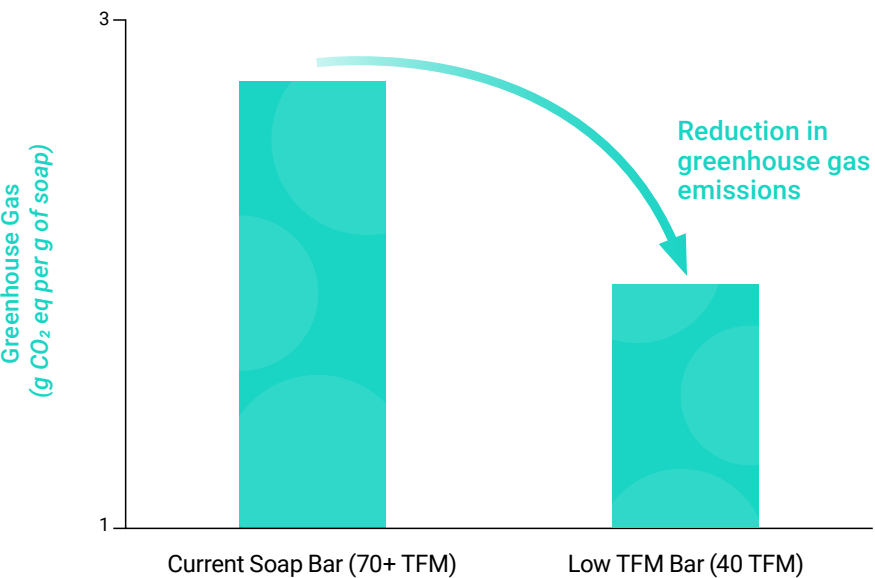


Figure 3. Greenhouse gas footprint of current soap bar compared to low TFM bar.

Personal response

What inspired you to conduct this research?

Unilever is the world's largest manufacturer of soap/bathing bars, which often is the only product consumers use for beauty and personal care. We are, therefore, raising the functional superiority and the consumer benefits of our soaps to deliver real, consumer-perceivable and clinically proven skin care and beauty benefits by replacing wasteful Total Fatty Matter (TFM) in soap bars with natural

materials like plant polysaccharides and skin benefit ingredients. Another key objective of this research and publishing the work is to debunk myths and fallacies surrounding the use of TFM alone as a metric of soap/bathing bar superiority and to instil confidence with consumers and regulators to help modernise and update regulations from being composition driven, to make them more consumer relevant and performance driven.

Details



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Bio

Unilever has an established R&D global capability in the materials and interfacial sciences of surfactants and soaps. In partnership with leading experts in the areas of structuring, foams, processing, and skin health and immunity, the team has undertaken numerous consumer and clinical studies to build a deep understanding of the role of TFM in soap bars on skin health and hygiene. The published work is a result of those collaborations.

Further reading

Dastidar, SD, et al, (2023) Revisiting the role of total fatty matter in soap bars, *Journal of Surfactants and Detergents*, 26(6), 1–10.

Sachdev, M, et al, (2024a) Cleanically Effective Soap Bars for SOC. Poster presented at 20th Annual Skin of Color Society Scientific Symposium, San Diego, March 2024.

Sachdev, M, et al, (2024b) Mild Sustainable Cleansing Bars with Plant-based technology for Superior Skin Barrier Benefits. Poster presented at Jeddaderm, Jeddah, February 2024.

Sachdev, M, et al, (2024c) Low TFM Soap bars – A transformative approach to safe and holistic cleansing for better skin barrier health. Poster presented at the European Academy of Dermatology and Venereology, Amsterdam 2024.

Sachdev, M, (2024d) Why is it important to check the TFM value of your bathing soap? *Times of India*, Jun 30, 2024. Available online: timesofindia.indiatimes.com/articleshow/111338046 [Accessed 19/11/24]

