INDUSTRIES OF INDIA

S O A P

Ash, Fat, Foam - Source Companion

KETINENI RAMARAO

How to read this companion

Every claim in SOAP - Ash, Fat, Foam that rests on an outside source carries a bracketed tag in the text, [C1] through [C78]. This companion is the key to those tags. Each entry names the source, the facts the book draws from it, and how the source was consulted. Sources marked READ full were read in their entirety during the writing; sources marked READ record or READ core sections were consulted in the relevant parts. Where a capture failed or a claim could not be supported by the consulted text, the entry says so and the book's text was corrected or the claim removed. The numbering is not contiguous: some tags were consolidated or dropped during editing, and their entries record where the material went.

The sources

[C1] ACI, "Soaps & Detergents History", cleaninginstitute.org - Babylon 2800BC cylinders, Ebers 1550BC, Mount Sapo legend, Leblanc 1791, taxes, chemistry unchanged until 1916, WWI/WWII fat shortages -> synthetics, 1850 US soap industry growth. READ full. https://www.cleaninginstitute.org/understanding-products/why-clean/soaps-detergents-history

[C2] OpenStax Organic Chemistry 27.2 "Soap" - saponification eqn, salting out, micelles, hard-water scum, syndet sulfonates. READ full. https://openstax.org/books/organic-chemistry/pages/27-2-soap

[C3] EXARC Journal 2024/3, Sally Pointer, "An Experimental Exploration of the Earliest Soapmaking" - perfume-cloth scenario, egg test, pseudo-Galen, Pompeii fullonica myth, Galen/Pliny/Martial refs. READ full PDF. https://exarc.net/ark:/88735/10759

[C4] Wikipedia, "Soap" - strigil, Pliny Gauls/hair dye, Aretaeus balls, sapo etymology. READ core sections. https://en.wikipedia.org/wiki/Soap

[C5] soaphistory.net, "First Soap" - 2200BC tablet formula, Ebers, saipo, soapwort. READ full. https://www.soaphistory.net/soap-history/first-soap/

[C6] Wikipedia, "Nabulsi soap" - qilw/lime, dukshab, 40 cycles/8 days, 30 factories 1907, 5000 tons, exports, UNESCO Dec 2024. READ full. https://en.wikipedia.org/wiki/Nabulsi_soap

[C7] Wikipedia, "Aleppo soap" - 3-day boil, laurel 2-20%, plank-walking, aging, gold/green, UNESCO Dec 2024, Zosimos c.300AD. READ full. https://en.wikipedia.org/wiki/Aleppo_soap

[C8] Wikipedia, "Castile soap" - brine skimming/white soap, Antwerp 1567, 1630s monopoly scandal + washerwomen campaign, Libelle 1436. READ full. https://en.wikipedia.org/wiki/Castile_soap

[C9] Wikipedia, "Marseille soap" - 1370 first maker, Edict of Colbert 1688, 72%, 180,000t 1913, 122 firms 1924, UPSM 4 firms 2023. READ full. https://en.wikipedia.org/wiki/Marseille_soap

[C10] OpenLearn, "The history of soapmaking" - Sumerian wool scouring, whale/olive/tallow 16th c., speckled-soap ban, Gladstone 1853 repeal, Nobel dynamite/glycerine. READ full. https://www.open.edu/openlearn/history-the-arts/history/history-science-technology-and-medicine/history-science/the-history-soapmaking

[C11] Wikipedia, "Leblanc process" - 1783 prize 2400 livres, 1791 patent/St-Denis 320t, 1794 seizure, 1801 return, 1806 suicide; UK 1816 Tyne, salt tariff 1824, Muspratt Liverpool/Flint, Tennant Glasgow, 1852 140k vs 45k t, 1870s British output, HCl 5.5t + galligu 7t per 8t soda, 1839 lawsuit, 1863 Alkali Act 5%; Solvay 1861, 90% by 1900; Nob End orchids. READ full. https://en.wikipedia.org/wiki/Leblanc_process

[C12] OCL/Leray 2023, "Contribution of Chevreul to lipid chemistry" - 1813 pork-fat soap papers, margaric/oleic/stearic acids, +5% water mass, no-oxygen, 1823 book, glycerine naming, Scheele 1783, stearic candle 1825, centenary banquet. READ full. https://www.ocl-journal.org/articles/ocl/full_html/2023/01/ocl230006s/ocl230006s.html

[C16] Wikipedia, "Lever Brothers" - founded 1884/1885, Hough Watson glycerine+vegetable oil process, 450 t/week by 1888, Bromborough Pool, Port Sunlight village 1888-1914, HCB forced labour Congo 1911-1945, US entry 1895, Margarine Unie merger 1929, brands Sunlight/Lifebuoy/Lux/Vim. READ full. https://en.wikipedia.org/wiki/Lever_Brothers

[C18] Unilever Archives, "Lifebuoy turns 130" - Apr 1894 launch 4d/lb, 12oz bar carbolic, scrub-everything ads, lifeboatman pack, WWI trenches, 1926 Clean Hands Campaign + Pro Valetudine badge, 1933 toilet soap, B.O. coinage. READ full. https://www.archives-unilever.com/discover/stories/lifebuoy-turns-130

[C19] Unilever Archives, "The Story of Sunlight" booklet - trademark Feb 1884, first ads North England railway stations 1885, cartons 1886, Port Sunlight 1888, yearbook 1895, production ceased at Port Sunlight 2000, global dish-wash brand 2024. READ full. https://archives-unilever.com/media/_file/website-documents/52155-unilever%20sunlight%20booklet%2024pp%20proof%2018th%20july.pdf

[C20] Wikipedia, "Ivory (soap)" - 1879 James Norris Gamble + Harley Procter Psalm 45 name, Sept 1879 trademark, whipped air, It Floats, 2004 archivist Ed Rider debunks accident story, stopped floating 2023, pH 9.5, ingredients. READ full. https://en.wikipedia.org/wiki/Ivory_Soap

[C21] P&G / advertising histories via Ivory article - independent lab analysis vs castile soaps, 99 44/100% Pure slogan. READ. https://en.wikipedia.org/wiki/Ivory_Soap

[C22] As C20 - It Floats 1891 slogan, aerated bar, accident legend debunked by P&G archivist 2004. READ. https://en.wikipedia.org/wiki/Ivory_Soap

[C23] Wikipedia, "Procter & Gamble" - 1837 Cincinnati founding, candlemaker Procter + soapmaker Gamble, Norris sisters marriage, pork-packing Cincinnati lard. READ full. https://en.wikipedia.org/wiki/Procter_%26_Gamble

[C24] As C23 - Civil War Union Army soap/candle contracts, Camay, Palmolive (B.J. Johnson 1898 palm+olive), profit-sharing. READ. https://en.wikipedia.org/wiki/Procter_%26_Gamble

[C25] Wikipedia, "Bubbles (painting)" - Millais 1886 A Child's World, Barratt £2,200 purchase, added Pears bar, Marie Corelli attack, grandson admiral nicknamed Bubbles, Lady Lever Gallery. READ full. https://en.wikipedia.org/wiki/Bubbles_(painting)

[C26] Wikipedia, "Pears (soap)" - Andrew Pears 1789 transparent amber soap, first registered brand, Barratt advertising. CONSOLIDATED during editing: Pears material in the book is cited to C10 (OpenLearn) and C4 (Wikipedia, "Soap"), which carry the same facts; this tag no longer appears in the text.

[C27] Wikipedia, "Soap opera" - Painted Dreams Oct 20 1930 WGN Irna Phillips first serial, soap-sponsor origin of name, The Archers 1950 longest-running, Coronation Street 1960, open narrative/cliffhanger form, Time 1976 daytime richest market. READ full. https://en.wikipedia.org/wiki/Soap_opera

[C28] Cincinnati Enquirer (cincinnati.com), P&G soap opera history - P&G sponsor of daytime serials, Radio Beauty School 1927 Camay, Ma Perkins WLW Aug 14 1933/NBC Dec 4 1933, Oxydol's Own Ma Perkins, 7,065 episodes 27 years Virginia Payne, Guiding Light 1937 White Naphtha, TV 1952, day radio drama died Nov 25 1960. READ full. https://www.cincinnati.com/story/news/2017/10/04/our-history-p-g-put-soap-soap-opera/732149001/

[C30] SCC/library.scconline.org, "Synthetic detergents" technical review - German Patent 336558 naphthalene alkylation+sulphonation, Nekal A/BX 1917 wetting agents, Igepon T ~1925, fatty alcohol hydrogenation, Drene/Dreft 1930s, Vel 1938, alkyl aryl sulphonates (keryl/dodecyl benzene, Friedel-Crafts). READ full. https://library.scconline.org/cdn-1708619077821/Synthetic-Detergents-Types-Applications.pdf

[C31] Wikipedia, "Laundry detergent" - builders ~50%/surfactants 15%, phosphates introduced 1930s, soap predominant until 1950s, branched ABS poor biodegradability -> LAS mid-1960s, German alkyl sulfate 1917 Allied blockade response, FEWA/Dreft. READ full. https://en.wikipedia.org/wiki/Laundry_detergent

[C32] Wikipedia, "Procter & Gamble" - Tide laundry detergent introduced 1946, Prell 1947, Joy 1949. READ. https://en.wikipedia.org/wiki/Procter_%26_Gamble

[C33] mediabistro/Ogilvy, "50 Years of Dove: The Story of a Brand (1955-2005)" - Product X early 1953, Ogilvy Hewitt Ogilvy Benson & Mather, first ads 1955, 1/4 Cleansing Cream, Dove Won't

Dry Your Skin Like Soap Can, stearic acid point of difference, real women testimonials late 1960s, 2005 self-esteem campaign direction. READ full. https://www.mediabistro.com/wp-content/uploads/freelancers/454745/9bJKVI0M6lMEDNp8z8hOlCQTt.pdf

[C34] Wikipedia, "Softsoap" + LA Times obit - 1980 Robert R. Taylor, Minnetonka Corporation Chaska MN, bought 100M pump bottles (year's capacity of only two domestic manufacturers), $25M in six months, sold to Colgate-Palmolive 1987. READ full. https://en.wikipedia.org/wiki/Softsoap https://www.latimes.com/local/obituaries/la-me-robert-taylor-20130912-story.html

[C35] FDA consumer update, "Skip the Antibacterial Soap; Use Plain Soap and Water" - 2016 final rule, 19 active ingredients incl. triclosan/triclocarban no longer marketable in consumer antiseptic washes, no evidence superior to plain soap and water. READ full. https://www.fda.gov/consumers/consumer-updates/skip-antibacterial-soap-use-plain-soap-and-water

[C37] Unilever company timeline - 1955 Dove launches first soap bar in US, 1957 beauty cleansing bar patented blend of mild cleansers + moisturising cream, rinse cleaner than soap. READ full. https://www.unilever.com/our-company/our-history-and-archives/1950-1980/

[C48] WHO ELENA, "Hand washing promotion for preventing diarrhoea" - diarrhoea risk reduction. READ full. https://www.who.int/tools/elena/review-summaries/wsh-diarrhoea--hand-washing-promotion-for-preventing-diarrhoea

[C69] PMC Mijaljica et al. 2022, "Skin Cleansing without or with Compromise" - skin pH 4-6, soap alkaline pH, barrier disruption, syndet history, France 1975 act, soap = salt of fatty acids C12-18. READ full. https://pmc.ncbi.nlm.nih.gov/articles/PMC8954092/

[C70] MIT BLOSSOMS, "The Science of Soap Bubbles" - surface tension concept, minimal area/minimal potential energy, colours of soap bubbles lesson, classroom teaching. READ full. https://web.mit.edu/blossoms/videos/lessons/science_soap_bubbles/

[C71] Wikipedia, "Plateau's laws" - four laws (smooth surfaces, constant mean curvature, 120 deg triple edges, 109.47 deg tetrahedral vertices), instability of other configurations, Jean Taylor proof via geometric measure theory (1976 Annals; Almgren & Taylor Sci Am July 1976). READ full. https://en.wikipedia.org/wiki/Plateau%27s_laws

[C73] Tallow Chandlers' Company, "Tallow" - rendering process, 2Mt exports, 7-7.5Mt world production, fatty acids to soap. READ full. https://www.tallowchandlers.org/the-company/history/tallow

[C74] Wikipedia, "Joseph Plateau" - gazed into Sun 25s in retinal-persistence experiment, attributed later blindness to it (uveitis also possible), 1829 doctorate, phenakistiscope 1832. READ full. https://en.wikipedia.org/wiki/Joseph_Plateau

[C75] Wikipedia, "Soap bubble" - interference colours off front/back of thin film, drainage within film, iridescence. READ full. https://en.wikipedia.org/wiki/Soap_bubble

[C76] Morgan Library & Museum catalogue, Boys "Soap-bubbles and the forces which mould them" - three lectures, London Institution, Dec 30 1889 / Jan 1 & 3 1890, juvenile audience. READ record. https://www.themorgan.org/printed-books/434827

[C29] EPA AP-42 ch. 6.8, "Soap and Detergents" - kettle saponification to 1940s, salt separation/neat soap, crutcher, flakes/cast/milled bars/spray-dried powder, post-1940s continuous high-temperature fat splitting + fractionation + glycerin recovery, spray-dryer tower detail. READ full. https://www.epa.gov/sites/default/files/2020-10/documents/c06s08.pdf

[C36] Knud-Hansen 1994, "Historical Perspective of the Phosphate Detergent Conflict" (Univ. of Colorado Conflict Research Consortium WP 94-54) - 1959 detergents 30-50% phosphate builder, 1967 avg 9.4% P, 1 lb P grows 700 lb algae, 10,000 lakes, Lake Erie aged 15,000 yrs/50, 20,000 lb/day P, 2,600 sq mi anoxic, 1970-72 fight, Canada Water Act 1970 8.7%/2.2%, NTA episode, Sept 15 1971 press conference + NYT next day, Lever Surgeon General ad, court defeats, 1985 bans, 1993 two Tide boxes, Erie recovery. READ full. https://www.intractableconflict.org/www_colorado_edu_conflict/workpap/94-54.htm

[C38] Ballestra S.p.A., soap plant brochure - continuous saponification reactor + vacuum dryer to noodles, 2-30 t/h neat soap, vapour recovery/zero effluent, finishing line: amalgamators, roll-mills, duplex vacuum plodders, cutters, stampers. READ full. https://www.ballestra.com/storage/316/SOAP-BALLESTRA.pdf

[C39] Soap and Detergent Association, "Glycerine: an overview" (1990) - Scheele 1779 olive oil + litharge, sweet principle of fat, 1783 publication, Chevreul naming 1811 glykys, 1823 patent, Nobel dynamite 1866 kieselguhr, Panama Canal 8,000 t explosive ~4,000 t glycerine, 1,500 end uses, soap lye crude 80% / saponification crude 88%, dynamite glycerine grade. READ full. https://www.cleaninginstitute.org/sites/default/files/research-pdfs/Glycerine_-_an_overview.pdf

[C40] Colgate-Palmolive, "Our History" - Colgate 1806 Dutch Street starch/soap/candles, 1817 first ad, 1864 B.J. Johnson Milwaukee, 1872 Cashmere Bouquet first milled perfumed toilet soap trademark, 1898 Palmolive Soap introduced, sold in 88+ countries. READ full. https://www.colgatepalmolive.com/en-us/who-we-are/history

[C41] Wikipedia, "Palm oil" - 77.3 Mt 2023-24 (Indonesia 57%), basis of Sunlight/Palmolive, foaming agent in nearly every soap/shampoo/detergent, 70% of personal care products, 200+ ingredient names, PFAD to soaps, IUCN 2018 efficiency vs biodiversity, deforestation, Sumatran orangutan critically endangered, CGF 2010 net-zero-2020 missed as of 2023. READ full. https://en.wikipedia.org/wiki/Palm_oil

[C42] Wikipedia, "Roundtable on Sustainable Palm Oil" - founded 2004, Zurich seat, 5,650 members 94 countries, ~52M tonnes certified fruit 2016, criticisms both directions (peatland draining; low CSPO demand). READ full. https://en.wikipedia.org/wiki/Roundtable_on_Sustainable_Palm_Oil

[C43] MOMG (Malaysian Oleochemical Manufacturers Group) - 1980 first plant Prai, 20% of global oleochemical capacity, palm/palm kernel feedstocks, soap/detergent/surfactant major end use. READ full. https://www.momg.org.my/industry

[C44] WHO Guidelines on Hand Hygiene in Health Care (NCBI NBK144018), historical perspective - Semmelweis 1847 Vienna, 16% vs 7%, chlorinated lime, fall to 3%, failure to convince, recognize-explain-act, father of hand hygiene; 1980s first national guidelines; 2002 CDC/HICPAC alcohol rub standard; Pittet Geneva 2000 multimodal; WHO strategy pilot 2007-8. READ full. https://www.ncbi.nlm.nih.gov/books/NBK144018/

[C45] CDC, "Handwashing Facts" (2024) - diarrhoea -23-40%, immunocompromised -58%, respiratory -16-21%, school absenteeism -29-57%, 1 in 3 child diarrhoea + 1 in 5 child respiratory infections protectable, 19% global post-toilet handwashing, antibiotic-resistance link. READ full. https://www.cdc.gov/clean-hands/data-research/facts-stats/

[C46] WHO news, 15 Oct 2025 - first global Guidelines on Hand Hygiene in Community Settings (with UNICEF, Global Handwashing Day), hand hygiene as public good/government responsibility, 1.7B lacked basic services at home in 2024 incl. 611M no facility, diarrhoea -30% / ARI -17%, 2030 target needs doubling (11-fold LDCs). READ full. https://www.who.int/news/item/15-10-2025-new-guidelines-on-community-hand-hygiene-to-help-governments-reduce-the-spread-of-infectious-diseases

[C47] UNICEF/WHO, "State of the World's Hand Hygiene" (2021) - 2.3B could not wash hands with soap and water at home in 2021, 670M no facility, 1.9B projected to still lack at 2030 rate. READ full. https://data.unicef.org/wp-content/uploads/2021/10/State-of-the-Worlds-Hand-Hygiene-report-2021.pdf

[C49] Pall Thordarson, The Guardian (12 Mar 2020), "The science of soap - here's how it kills the coronavirus" - virus lipid bilayer weakest link, soap dissolves membrane, house of cards, soap vs alcohol disinfectants, grandmother's bar of soap. READ full. https://www.theguardian.com/commentisfree/2020/mar/12/science-soap-kills-coronavirus-alcohol-based-disinfectants

[C50] Fortune Business Insights, "Soap Market Size, Share, Growth & Trends Analysis" - global soap $50.68B 2025, $53.52B 2026, $87.36B 2034, CAGR 6.32% 2026-34, APAC 39.25% 2025. READ full. https://www.fortunebusinessinsights.com/soap-market-102841

[C51] Grand View Research, "Bar Soap Market (2026-2033)" - $34.2B 2025 to $50.2B 2033, CAGR 5.0%, APAC 40.0% 2025, hygiene awareness driver, vegan/plastic-free trend, bars last 5-6x liquids (Go For Zero Jan 2026), synthetic bars >90% revenue 2025. READ full. https://www.grandviewresearch.com/industry-analysis/bar-soap-market-report

[C52] Expert Market Research, "Top 6 Soap Manufacturers & Companies Worldwide 2026" - P&G, Unilever, Henkel, Church & Dwight, Colgate-Palmolive, Nice Group; $51.69B 2025 to $82.61B 2035 CAGR 4.8%. READ full. https://www.expertmarketresearch.com/blogs/top-soap-manufacturers

[C53] Kao Group corporate history - Nagase Shoten 1887, Kao Sekken 1890 affordable high-quality facial soap, kanji king of flowers / sounds like face, professors' certificate of analysis in paulownia box, railway billboards + geisha posters, founder's will. READ full. https://www.kao.com/global/en/corporate/history/globalhistory/

[C54] Lion Corporation corporate history - Tomijiro Kobayashi founds T. Kobayashi & Co. 1891, Yanagihara riverside Kanda, soap + match raw materials. READ full. https://www.lion.co.jp/en/company/history/timeline/

[C55] Dr. Bronner's, "150 years & 5 generations" - Laupheim 1858, liquid castile 1880s/90s, Emanuel emigrates 1929, drops Heil, parents killed Auschwitz/Theresienstadt, 1948 founding, Pershing Square lectures -> lecture printed on labels, 1960s counterculture icon, still family-owned. READ full. https://www.drbronner.com/blogs/ourselves/the-dr-bronners-story

[C56] Clean the World, "About Us" - founded 2009, 8,599 hotel participants, 32M lb waste diverted, 100M+ recycled bars donated, WASH Foundation. READ full. https://cleantheworld.org/about-us/about-us-overview/

[C58] oldandinteresting.com, "Laundry history 1800s" - dolly tubs/dollies, washboards metal/glass, soap rest, wet wash/bag wash services, mangle woman box mangle pennies. READ full. http://www.oldandinteresting.com/history-of-washing-clothes.aspx

[C78] Global Handwashing Partnership, "Soap Fact Sheet: Soap Making" - Babylon tablet 2200 BC, Egyptian soap-like substance, Roman pomade, China evidence. READ full. https://globalhandwashing.org/wp-content/uploads/2020/04/Soap-Making_Fact-Sheet_2014-08-22_en.pdf