INDUSTRIES OF INDIA

Beer

Field, Kettle, Glass - Source Companion

KETINENI RAMARAO

PRIVATE LIBRARY EDITION · 2026

How This Companion Works

Every numbered source below was consulted during the writing of Beer: Field, Kettle, Glass. Each entry records the publication, its link, what was actually read (full text, extract, abstract or page), and the claims in the book the reading supports. In the book's text, superscript numbers point to these entries.

Entries read in full say so; entries read as extracts or abstracts are marked as such, and the claims drawn from them are limited to what the extract showed. Forecasts and modelled figures are used as forecasts. Where a source could not be read beyond its title or listing, it was either verified by re-fetching before printing or the claim was cut. Company financial figures are from the companies' own results reporting; industry statistics are from the Brewers Association, the Beer Institute, Kirin's annual consumption study, BarthHaas and the World Brewing Alliance's Oxford Economics study, as listed.

88 sources follow.

S1

Kirin Holdings, "Global Beer Consumption by Country in 2024" (press release, 22 Dec 2025)

https://www.kirinholdings.com/en/newsroom/release/2025/1222_01.html

READ: page text. Global beer consumption 194.12M kl in 2024 (+0.5%); China #1 for 22nd straight year (down 3.7%); India +14.6% fastest of top 25; Asia 32.6% share for 17th year; Czech per-capita 148.8 L, top for 32nd straight year; Japan 33.7 L per capita.

S2

Oxford Economics for World Brewing Alliance, "The Global Beer Sector's Economic Contribution" (2025)

https://www.oxfordeconomics.com/wp-content/uploads/2025/02/WBA_Global_Beer_Report_WEB.pdf

READ: highlights via search extract + PDF abstract. Beer sector supported $878bn of global GDP in 2023 (0.8% of global GDP); $98bn direct brewer contribution; $281bn upstream supply-chain and wage-induced; $499bn downstream; 86% of brewer supplies purchased in-country.

S3

Dietrich, L. et al., "The role of cult and feasting in the emergence of Neolithic communities. New evidence from Gobekli Tepe", Antiquity 86 (2012)

https://doi.org/10.1017/s0003598x00047840

READ: abstract + search extract. Large stone troughs at Gobekli Tepe (up to ~160 L) with residues indicating oxalate; evidence of probable beer-like fermentation at feasting site ~9500 BC. NOTE: authors state Feigl test limits; phrased cautiously in book.

S4

McGovern, P. et al., "Fermented beverages of pre- and proto-historic China", PNAS 101 (2004)

https://pmc.ncbi.nlm.nih.gov/articles/PMC539767/

READ: full text extract. Jiahu (Henan) ~7000 BC: mixed fermented beverage of rice, honey, hawthorn/grape confirmed chemically; earliest known; Shang/Western Zhou sealed bronze vessels with preserved liquids; mould-based saccharification system for rice/millet.

S5

"Symposium: Did Man Once Live by Beer Alone?", American Anthropologist 55(4) (1953)

https://doi.org/10.1525/aa.1953.55.4.02a00050

READ: abstract. Braidwood symposium formally asking whether beer demand motivated cereal domestication; framing for beer-before-bread debate.

S6

"A hymn to Ninkasi: translation", ETCSL, University of Oxford

https://etcsl.orinst.ox.ac.uk/section4/tr4231.htm

READ: opening of translation. Sumerian hymn c.1800 BC doubling as brewing recipe (bappir beer-bread, soaking, sweetening, filtering); Ninkasi goddess of beer.

S7

British Museum, "A sip of history: ancient Egyptian beer" (blog)

https://www.britishmuseum.org/blog/sip-history-ancient-egyptian-beer

READ: full. Beer treated as food; pyramid builders' daily ration 1 1/3 gallons (over 10 pints); Hathor "Lady of Drunkenness".

S8

"The Code of Hammurabi" (trans. L.W. King), CommonLit

https://www.commonlit.org/texts/the-code-of-hammurabi

READ: statutes 108-110 verbatim. Tavern-keeper (feminine) statutes: grain-payment fraud drowned; failure to arrest conspirators death.

S9

Hierakonpolis Expedition, "Breweries" (site report)

https://www.hierakonpolis-online.org/index.php/explore-the-predynastic-settlement/breweries

READ: full page. Predynastic installations HK24/HK11C, 6-16 conical vats ~20 US gal each, emmer + barley + Christ's Thorn jujube recipe, ~100 gal/day per installation, "industrial scale."

S10

Jennings, J. et al., ethnoarchaeology of chicha production, Cuzco (Journal of Anthropological Research 71)

https://www.journals.uchicago.edu/doi/10.3998/jar.0521004.0071.303

READ: abstract. Chicha central to Andean political economies and reciprocity; 15 archaeological indices of domestic chicha production.

S11

Liége review, "Traditional sorghum beers" (Orbi)

https://orbi.uliege.be/handle/2268/142889

READ: abstract. African traditional beers from malted sorghum/millet/maize; names (ikigage, merissa, doro, dolo, pito, amgba, tchoukoutou); rich in calories, B vitamins, lysine; short shelf life.

S12

Rogerson, C., "The sorghum beer industry of South Africa" (Taylor & Francis, 2019)

https://doi.org/10.1080/19376812.2019.1589735

READ: abstract. SMM/indigenous beers vs clear barley beers; women brewers; commodification of sorghum beer, formal industry's regional consolidation.

S13

Gallone, B. et al., "Domestication and Divergence of Saccharomyces cerevisiae Beer Yeasts" / Steensels & Verstrepen review (Curr. Opin. Biotechnol. 2017)

https://doi.org/10.1016/j.copbio.2017.08.005

READ: abstract. Beer yeast domestication most pronounced among Saccharomyces; S. pastorianus = S. cerevisiae x S. eubayanus hybrid; lager >90% of world beer market.

S14

Carlsberg Group, "Purifying yeast" (corporate history)

https://www.carlsberggroup.com/pursuit-of-better/scientific-discoveries/purifying-yeast/

READ: full page. Emil Chr. Hansen isolated single-cell pure culture 1883; 'Saccharomyces Carlsbergensis' first production-scale use November 1883; wild yeast, not only bacteria, caused beer sickness.

S15

Carlsberg Foundation, "Timeline of the Foundation's history"

https://www.carlsbergfondet.dk/en/about-the-foundation/our-history/timeline-of-the-foundation-s-history/

READ: extract. J.C. Jacobsen biography; foundation origins.

S21

Wikipedia, "Brewing"

https://en.wikipedia.org/wiki/Brewing

READ: full article. Malting/mashing/lautering/boiling/fermenting/conditioning process steps; saccharification temperatures; adjuncts (rice, maize); fermentation by-products.

S22

Wikipedia, "Hops"

https://en.wikipedia.org/wiki/Hops

READ: full article. Hop botany, alpha acids/isomerisation, antibacterial role, history (first documented cultivation Hallertau 736; gruit replacement), world production regions.

S23

Wikipedia, "Beer"

https://en.wikipedia.org/wiki/Beer

READ: full article. Ingredients, foam proteins, nitrogen dispense, styles, strength, serving, industry data.

S24

"Burton-upon-Trent as a centre of brewing" (J. Inst. Brewing, 1987)

https://doi.org/10.1002/j.2050-0416.1987.tb04474.x

READ: abstract. Burton water's calcium/magnesium salts (gypsum) shaped flavour and keeping quality; "Mecca" of brewing biochemistry.

S16

Ziliak, S., "Retrospectives: Guinness and Gosset" / Student (1908) discussion, Statistical Science

https://doi.org/10.1214/ss/1009212520

READ: extract. Gosset published "The probable error of the mean" (Biometrika 1908) as "Student" due to Guinness policy; birth of the t-test in brewery quality work.

S17

Carlsberg Group, "The invention of the pH scale"

https://carlsberggroup.com/pursuit-of-better/scientific-discoveries/ph-scale/

READ: full page text (re-fetched and read). S.P.L. Sorensen, Director of the Carlsberg Laboratory Department of Chemistry 1901-1938, developed the pH scale in 1909 (0-14) and demonstrated its significance for biochemical reactions including brewing; applications since countless across all fields.

S18

Nobel Prize, "Eduard Buchner - Biographical"

https://www.nobelprize.org/prizes/chemistry/1907/buchner/biographical/

READ: extract. Buchner's 1897 paper "On alcoholic fermentation without yeast cells"; 1907 Nobel Chemistry.

S19

Libkind, D. et al., "Microbe domestication and the identification of the wild genetic stock of lager-brewing yeast", PNAS 108 (2011)

https://www.pnas.org/doi/10.1073/pnas.1105430108

READ: abstract. S. eubayanus identified in Patagonian Nothofagus (beech); wild parent of lager yeast hybrid.

S20

Norwegian Institute for Cultural Heritage Research (immateriellkulturarv.no), "Traditional farmhouse brewing with kveik in Western Norway"

https://www.immateriellkulturarv.no/en/bidrag/traditional-farmhouse-brewing-with-kveik-in-western-norway/

READ: extract. Farm-specific kveik cultures preserved in families; research suggests kveik may be 1,500+ years old.

S25

Soufflet Malt, "Our operations"

https://www.soufflet malt.com/our-operations/

READ: full page. 3.6M tonnes malting capacity, network of malthouses near growers/transport.

S26

USDA Foreign Agricultural Service, "Production - Barley" (PSD)

https://www.fas.usda.gov/data/production/0430000

READ: database landing verified. Global barley production series by country (used for producer ranking only).

S27

Mozny, M. et al., "Climate-induced decline in the quality and quantity of European hops", Nature Communications 14 (2023)

https://www.nature.com/articles/s41467-023-41474-5

READ: full extract. Ripening ~20 days earlier; yield -0.13 to -0.27 t/ha; alpha -34.8% Celje, -15.6% Hallertau; projected -4-18% yield, -20-31% alpha by 2050; ~90% of hop regions covered.

S28

Brewery History journal, "From Herbal Medicine to Hops" (No. 183)

https://www.breweryhistory.com/journal/archive/183/HerbalToHops.pdf

READ: opening. Gruit herbal mixtures pre-hop; transition to hopped beer in medieval Europe.

S29

BarthHaas, "BarthHaas Report 2024/25"

https://www.barthhaas.com/fileadmin/user_upload/01-barthhaas-2022/Resources/BarthHaas_Report/2025/eng/Web_BarthHaas_Report_2024_25..pdf

READ: highlights (world market data: hop production and alpha production in mt). Used as the industry's annual statistical reference.

S30

Ecolab, "CDP Water-Use Efficiency Index Insights Brief"

https://www.ecolab.com/-/media/Widen/Sustainability/Ecolab_CDP_Water-Use-Efficiency-Index-Insights-Brief.pdf

READ: extract. Breweries plateau at ~2.5 hl water per hl beer with reduction measures alone; further gains need reuse/recycling.

S31

Historisches Lexikon Bayerns, "Purity Law, 1516"

https://www.historisches-lexikon-bayerns.de/Lexikon/EN:Purity_Law%2C_1516

READ: full article (re-fetched and read 1 Nov 2026). 1516 Bavarian Landesordnung by Dukes Wilhelm IV and Ludwig X, agreed at the Ingolstadt Landtag; earlier municipal rules: Nuremberg 1302-05, Weimar 1348, Landshut 1409, Munich 1487 (Duke Albrecht IV: hops, barley, water), Landshut 1486, Bamberg 1489, Duchy of Bavaria-Landshut 1493; wheat/rye reserved for bakers; hops for preservation; term "Reinheitsgebot" a 20th-century coinage (first traced use 1909 Reichstag); German Beer Tax Act 1906 extended it Reich-wide; ECJ ruling 12 March 1987 allowed non-compliant imports.

S32

Guinness World Records, "Oldest working brewery"

https://www.guinnessworldrecords.com/world-records/113929-oldest-working-brewery

READ: full entry. Weihenstephan Abbey: brewing licence 1040, continuous production since; Weltenburg 1050 second-oldest.

S33

Wikipedia, "Trappist beer"

https://en.wikipedia.org/wiki/Trappist_beer

READ: full article. International Trappist Association criteria, abbey beers, history of monastic brewing.

S34

Bennett, J., "Ale, Beer, and Brewsters in England" (Oxford Univ. Press, 1996)

https://doi.org/10.1093/oso/9780195073904.001.0001

READ: abstract + chapter abstract. Women brewed/sold most medieval English ale; male takeover after 1350; brewsters, ale-tasters, regulation.

S35

GLIAS (Greater London Industrial Archaeology Society), "London's brewing history in Australia" (LIA 21)

http://www.glias.org.uk/journals/LIA21_Adams_Perrett.pdf

READ: extract re-read from PDF text. Whitbread Chiswell Street Boulton & Watt rotative engine installed 1785 (drawings June 1784; first brewery rotative was Henry Goodwyn's Red Lion, May 1784); oldest surviving B&W rotative in operating condition; survives in Powerhouse Museum, Sydney. Thrale's Newcomen engine 1770 raised water.

S36

Wikipedia, "London Beer Flood"

https://en.wikipedia.org/wiki/London_Beer_Flood

READ: full article. Meux & Co Horse Shoe Brewery, 17 Oct 1814; 22-ft porter vat burst; 128,000-323,000 imperial gallons; 8 deaths; excise rebate; end of giant wooden vats.

S37

Wikipedia, "Porter (beer)"

https://en.wikipedia.org/wiki/Porter_(beer)

READ: full article. Porter's 18th-c. London rise, industrial-scale production, aging vats, decline and revival.

S38

Wikipedia, "Carl von Linde"

https://en.wikipedia.org/wiki/Carl_von_Linde

READ: full article. First refrigeration system (dimethyl ether) built by Maschinenfabrik Augsburg for Spaten Brewery, 1873; later ammonia cycles.

S39

Craft Beer & Brewing / Oxford Companion to Beer, "Sedlmayr, Gabriel the Younger"

https://www.beerandbrewing.com/dictionary/VqABoFJRGL

READ: full entry. Sedlmayr persuaded Linde to install experimental refrigerator at Spaten 1873; year-round lager; Spaten largest Munich brewery; Helles 1894.

S40

Prazdroj (Pilsner Urquell), "History"

https://www.prazdroj.cz/en/our-story/history

READ: full page. 5 Oct 1842, Josef Groll brewed first batch of Pilsen beer at the Burghers' Brewery.

S41

Wikipedia, "Josef Groll"

https://en.wikipedia.org/wiki/Josef_Groll

READ: full article. Groll (1813-1887) first brewer of Pilsner; "Father of the Pilsner"; pale lager inspired more than two-thirds of beer produced today.

S42

Google Patents, US468226A (W. Painter, "Bottle-sealing device")

https://patents.google.com/patent/US468226

READ: full patent. Crown cork cap patented/published 2 Feb 1892: flanged metallic cap with concavo-convex sealing disk.

S43

History.com, "First canned beer goes on sale"

https://www.history.com/this-day-in-history/january-24/first-canned-beer-goes-on-sale

READ: full article. 24 Jan 1935, Krueger (with American Can Co.) delivered 2,000 cans in Richmond, VA; 91% of drinkers approved.

S44

University of Toledo (Canaday Center), "Owens-Illinois timeline"

https://www.utoledo.edu/library/canaday/services/exhibits/oi/OIExhibit/timeline.htm

READ: extract. Michael Owens' automatic bottle machine (1899 Machine Number Two) - automation of bottle production.

S45

UK Intellectual Property Office blog, "The red triangle that made history: 150 years of UK trade mark no. 1" (2026)

https://ipo.blog.gov.uk/2026/01/08/the-red-triangle-that-made-history-celebrating-150-years-of-uk-trade-mark-no-1/

READ: full article (re-fetched and read 1 Nov 2026). Trade Marks Registration Act 1875 in force 31 Dec 1875/1 Jan 1876; Bass secured marks 1, 2 and 3, red triangle = UK00000000001, in use on bottles since the 1850s; within six years of registration appeared in Manet's 1882 A Bar at the Folies-Bergere (Bass bottles in both corners); later Braque and Picasso cubist works; James Joyce mentions the Bass label in Ulysses; marks now owned by AB InBev; original Bass brewery closed 2005.

S46

Packaging Dive, "Cans increased share again as overall beer shipments declined in 2023"

https://www.packagingdive.com/news/beer-institute-packaging-mix-aluminum-cans-glass-bottles-ball-crown-oi/732475/

READ: full article. Beer Institute 2023 US packaging mix: 64.1% aluminium cans, 26.9% glass, ~8% draft; imports 55% glass.

S47

Budweiser (Anheuser-Busch), "History"

https://us.budweiser.com/history

READ: extract (re-fetched and read 1 Nov 2026). Eberhard Anheuser's Bavarian Brewery; Adolphus Busch joined 1864; 1876 Budweiser developed with St. Louis bottler Carl Conrad as a lighter lager; 1901 broke 1 million barrels; Prohibition diversification (Bevo); Clydesdales debuted 7 April 1933.

S48

Heineken, "History"

https://www.heineken.com/global/en/history

READ: full page. Gerard Adriaan Heineken bought De Hooiberg 1864; first brewery quality-control lab.

S49

Irish Times, "St James's Gate: a brief history"

https://www.irishtimes.com/business/st-james-s-gate-a-brief-history-1.1308346

READ: extract. Arthur Guinness signed 9,000-year lease on St James's Gate, Dublin, 1759, 45 pounds/year.

S50

Stadt München, Open Data: "Oktoberfest 1985-2025"

https://opendata.muenchen.de/dataset/oktoberfest/resource/e0f664cf-6dd9-4743-bd2b-81a8b18bd1d2

READ: dataset description. Annual Oktoberfest statistics: duration, visitors, beer price, beer consumption, chicken price/consumption.

S51

Wikipedia, "Campaign for Real Ale"

https://en.wikipedia.org/wiki/Campaign_for_Real_Ale

READ: full article. CAMRA founded 1971 by four men; revival of cask ale; consumer campaigning.

S52

Wikipedia, "India pale ale"

https://en.wikipedia.org/wiki/India_pale_ale

READ: full article. IPA origins in Burton export trade; hopping for the sea voyage; modern revival.

S53

Kerr, K.A., "The American brewing industry and prohibition" (Business History Conference paper)

https://thebhc.org/sites/default/files/kerr.pdf

READ: extract. Only ~160 firms reappeared in 1933; prohibition accelerated consolidation; near beer; refrigeration/yeast sidelines.

S54

Swinnen & Briski et al., post-1933 brewery entry study (KU Leuven/Lirias)

https://lirias.kuleuven.be/retrieve/297f8940-c7d9-4abf-a200-87a97a4ad6dd

READ: abstract. ~200 breweries selling beer by 7 April 1933; ~50/month entry; 607 by end of 1933.

S55

American Craft Beer Hall of Fame

https://www.americancraftbeerhalloffame.com/home-1-2

READ: extract. Fritz Maytag rescued Anchor Brewing 1965; Anchor Steam regarded as first American "craft" beer.

S56

Brewers Association, "Brewers Association Reports 2024 U.S. Craft Brewing Industry Figures" (15 Apr 2025)

https://www.brewersassociation.org/association-news/brewers-association-reports-2024-u-s-craft-brewing-industry-figures/

READ: full release. 2024: craft 23.1M barrels; volume share 13.3%; retail value $28.8bn (+3%); 9,796 operating breweries; openings/closings; taproom job growth.

S57

Reuters, "China's Snow jumps Bud Light to be world No 1" (2009)

https://www.reuters.com/article/us-world-idUSTRE52U60B20090331/

READ: full article. Snow (SABMiller/China Resources) passed Bud Light; 61M hl in 2008; InBev's $52bn Anheuser-Busch takeover Nov 2008 context.

S58

Yang, C., "Commercial beer brewing in Qingdao" (Twentieth-Century China)

https://doi.org/10.1179/tcr.2007.14.1.29

READ: abstract. German-British brewery opened Qingdao 1903; origin of Tsingtao; colonial consumption history.

S59

Wikipedia, "Beer in Japan"

https://en.wikipedia.org/wiki/Beer_in_Japan

READ: full article. Meiji-era origins, Sapporo 1876, Asahi Super Dry 1987, happoshu/third-beer tax categories.

S60

Constellation Brands, "2024 Year in Review"

https://www.cbrands.com/blogs/stories/constellation-brands-2024-year-in-review

READ: full page. Modelo Especial #1 US beer by dollar sales; 200M cases in a 52-week period.

S61

Reuters, "AB InBev, SABMiller deal wins U.S. approval" (2016)

https://www.reuters.com/article/business/finance/ab-inbev-sabmiller-deal-wins-us-approval-adds-craft-beer-protections-idUSKCN1011YH/

READ: full article. $107bn merger; combined group to make nearly 30% of world beer; largest-ever consumer products deal at the time.

S62

AB InBev, FY2024 results press release (SEC exhibit)

https://www.sec.gov/Archives/edgar/data/1668717/000119312525042839/d902611dex991.htm

READ: extract. FY24 revenue $59,768M (+2.7% organic); revenue/hl +4.3%.

S63

Heineken N.V., "Heineken N.V. reports 2024 full year results"

https://www.theheinekencompany.com/newsroom/heineken-nv-reports-2024-full-year-results/

READ: full release. Revenue EUR 35,955M; beer volume +1.6% organic; Heineken brand +8.8%.

S64

Carlsberg Group, "FY 2024 Financial Statement"

https://www.carlsberggroup.com/reports-downloads/fy-2024-financial-statement/

READ: key figures. Revenue DKK 73,585M (2024).

S65

China Resources Beer, "Final Results for the year ended 31 December 2024" (HKEX)

https://www1.hkexnews.hk/listedco/listconews/sehk/2025/0318/2025031800253.pdf

READ: extract. Consolidated turnover RMB 38,635M; EBIT +2.9%; premiumisation strategy.

S66

Molson Coors, "2024 Fourth Quarter and Full Year Results"

https://ir.molsoncoors.com/news/news-details/2025/Molson-Coors-Beverage-Company-Reports-2024-Fourth-Quarter-and-Full-Year-Results/default.aspx

READ: full release. FY2024 net sales $11,627M (-0.6%).

S67

Krones, "Annual Report 2024"

https://www.krones.com/en/company/investor-relations/reports/krones-group-annual-report-2024/

READ: extract. Revenue EUR 5,460.7M (2024); order backlog EUR 4,289.5M.

S68

WHO Regional Office for Europe, "No level of alcohol consumption is safe for our health" (4 Jan 2023)

https://www.who.int/europe/news/item/04-01-2023-no-level-of-alcohol-consumption-is-safe-for-our-health

READ: full statement. WHO 2023 position on alcohol and cancer risk.

S69

NIQ, "BevAl Non-Alcohol Beer, Wine and Spirits" (Aug 2025)

https://nielseniq.com/global/en/wp-content/uploads/sites/4/2025/08/NIQ-BevAl-Non-Alcohol-Beer-Wine-and-Spirits-August-2025.pdf

READ: extract. US off-premise non-alc BevAl approaching $1bn ($925M), +22% growth.

S70

The Business Research Company, "Non Alcoholic Beer Market Size"

https://blog.tbrc.info/2024/01/non-alcoholic-beer-market-size/

READ: extract. Global non-alcoholic beer market $20.08bn (2023) to $21.94bn (2024), CAGR 9.3% (market-research estimate).

S71

Journal of the Institute of Brewing, vacuum-distillation dealcoholisation study (2019)

https://onlinelibrary.wiley.com/doi/full/10.1002/jib.591

READ: abstract. Vacuum distillation for alcohol-free beer; aroma-compound outcomes; blending approaches.

S72

Wikipedia, "Tsingtao Brewery"

https://en.wikipedia.org/wiki/Tsingtao_Brewery

READ: full article. Founded 15 Aug 1903 as Germania-Brauerei (Anglo-German joint stock, Kiautschou Bay leased territory); first beer served 22 December 1904; accounts for over 50% of China's beer exports; ~15% domestic share; sold to Dai-Nippon 1916; 2024 revenue CNY 32.14bn.

S73

Wikipedia, "New Albion Brewing Company"

https://en.wikipedia.org/wiki/New_Albion_Brewing_Company

READ: full article. Founded October 1976 by Jack McAuliffe, Suzy Stern and Jane Zimmerman in Sonoma; acknowledged as the first US microbrewery of the modern era; first batch 1977; bottle-conditioned ales; closed November 1982; blueprint influence on the craft, microbrewing and brewpub movements (Sierra Nevada, Mendocino).

S74

Wikipedia, "Gin Craze"

https://en.wikipedia.org/wiki/Gin_Craze

READ: full article. Gin consumption surged in first-half 18th-century Britain, especially London; Parliament passed five major control acts (1729, 1736, 1743, 1747, 1751); the Gin Act 1751 pushed respectable licensed selling; craze mostly ended by 1757 on grain prices and licensing; Hogarth's Gin Lane 1751.

S75

Wikipedia, "Anheuser-Busch"

https://en.wikipedia.org/wiki/Anheuser-Busch

READ: full article. Adolphus Busch first American brewer to use pasteurization; first to use mechanical refrigeration and refrigerated railroad cars (introduced 1876; 40 cars by 1877, 200 by 1883, 850 by 1888); first to bottle beer extensively; that reach made US Budweiser the first national beer brand; St. Louis Refrigerator Car Co. 1878.

S76

Wikipedia, "Oktoberfest"

https://en.wikipedia.org/wiki/Oktoberfest

READ: full article. First held 12 October 1810 for Crown Prince Ludwig's wedding; city council control from 1819; around 7 million visitors annually (record 7.2M in 2023, about 7.4M litres); cancelled for cholera, wars and hyperinflation, and in 2020 and 2021 during the COVID-19 pandemic.

S77

Wikipedia, "2021 United Kingdom natural gas supplier crisis"

https://en.wikipedia.org/wiki/2021_United_Kingdom_natural_gas_supplier_crisis

READ: full article. High gas prices forced CF Industries to halt fertiliser plants in Teesside and Cheshire (2021); pure CO2 is a Haber-process by-product, so the shutdowns cut commercial CO2 supply to food and drink; government short-term deal September 2021; Ince plant shut permanently June 2022.

S78

Wikipedia, "Drunk driving law by country"

https://en.wikipedia.org/wiki/Drunk_driving_law_by_country

READ: full article. BAC limits vary by country: 0.05% common across much of Europe and Africa; 0.08% in the UK (England and Wales), Canada, and parts of the US (0.05-0.08 by state); zero-tolerance and total-ban countries exist (WHO 2018 data); penalties from fines to imprisonment.

S79

Wikipedia, "Saccharomyces cerevisiae"

https://en.wikipedia.org/wiki/Saccharomyces_cerevisiae

READ: full article. First eukaryotic genome completely sequenced, released 24 April 1996 (about 12.16M base pairs, ~6,275 genes, 16 chromosomes); model organism of biotechnology; industrial yeast-production history.

S80

Wikipedia, "Institute of Brewing and Distilling"

https://en.wikipedia.org/wiki/Institute_of_Brewing_and_Distilling

READ: full article. Roots to 1886 when ten scientists formed The Laboratory Club, which became the Institute of Brewing; Operative Brewers' Guild 1906; merged as Institute and Guild of Brewing 2001; renamed IBD 2005; publishes the Journal of the Institute of Brewing.

S81

Wikipedia, "Adulterated food"

https://en.wikipedia.org/wiki/Adulterated_food

READ: full article. Adulterant testing from Frederick Accum (1820); Arthur Hill Hassall's 1850s Lancet studies led to the Adulteration of Food and Drink Act 1860; Postgate's campaign led to the Sale of Food and Drugs Act 1875, basis of modern UK food law and the public-analyst system.

S82

Wikipedia, "Homebrewing"

https://en.wikipedia.org/wiki/Homebrewing

READ: full article. US homebrewing over 0.5% ABV illegal until 1978, when H.R. 1337 was signed by President Carter, repealing federal restrictions; Papazian founded the American Homebrewers Association within months; Complete Joy of Home Brewing 1984; state-level legalisation completed 2013 (Alabama, Mississippi).

S83

Wikipedia, "Beer Orders"

https://en.wikipedia.org/wiki/Beer_Orders

READ: full article. The Beer Orders: Supply of Beer (Tied Estate) Order 1989 (SI 1989/2390) and (Loan Ties, Licensed Premises and Wholesale Prices) Order 1989 (SI 1989/2258), made December 1989 under the Fair Trading Act 1973 after the MMC report; forced large brewers to divest or free thousands of tied pubs; revoked 2003.

S84

Wikipedia, "Beer Judge Certification Program"

https://en.wikipedia.org/wiki/Beer_Judge_Certification_Program

READ: full article. BJCP formed 1985 (first exam at the AHA conference, Estes Park); joint AHA/HWBTA sponsorship; independent volunteer-run after 1995; certifies and ranks beer judges.

S85

Wikipedia, "Budweiser Budvar Brewery"

https://en.wikipedia.org/wiki/Budweiser_Budvar_Brewery

READ: full article. Budweiser Buergerbraeu founded 1795 by German-speaking citizens of Budweis, brewing Budweiser Bier from 1802 and shipping to the US from 1875; Busch encountered it and named his 1876 beer Budweiser; Czech Joint-Stock Brewery (Budvar's predecessor) incorporated 1895 in Ceske Budejovice; state-owned; trademark coexistence.

S86

Wikipedia, "Pink Boots Society"

https://en.wikipedia.org/wiki/Pink_Boots_Society

READ: full article. Founded 2007 by Teri Fahrendorf after her "Road Brewer" trip (original list of 60 women brewers posted August 2007); first meeting at Craft Brewers Conference 2008; women-in-brewing professional association with scholarships.

S87

Wikipedia, "Hard seltzer"

https://en.wikipedia.org/wiki/Hard_seltzer

READ: full article. Brewed/fermented sugar base; SpikedSeltzer first commercial batches 2013; wider popularity from 2018; White Claw's 2019 viral take-off (shortages; Bloomberg: maker a multibillionaire by Nov 2019); White Claw revenue over $4bn in 2020; brand share table (White Claw 50%, Truly 24.9%).

S88

Wikipedia, "Beerhouse Act 1830"

https://en.wikipedia.org/wiki/Beerhouse_Act_1830

READ: full article. Act "to permit the general Sale of Beer and Cyder by Retail" (11 Geo. 4 & 1 Will. 4. c. 64), royal assent 23 July 1830; liberalised brewing and beer retail in response to the gin houses; repealed 1993.