

Tallow sales set to rise

Sales of tallow are forecast to increase due to growing demand from the renewable diesel, oleochemical, feed and personal care sectors

Jens Kastner

The global market for tallow, traditionally a common ingredient in the production of soaps, detergents and lubricants, is undergoing change, driven by rising consumption of meat products alongside increasing demand from the biofuels, pharmaceutical, cosmetic and feed industries.

To put things into perspective, US-based market research and consulting company Grand View Research estimated the global market size for tallow was worth US\$8.1bn in 2022, with the cattle/bovine segment having the largest share at 46.8% in terms of revenue.

In terms of regional variations, the Asia Pacific region held a dominant revenue share of 45.1% last year.

Grand View Research predicts a global compound annual growth rate (CAGR) of 6.6% from 2023-2030.

Bavarian plant

In an organic manufacturing plant in Bavaria, Germany, the dynamics driving food and personal care-related demand for tallow are evident.

At the facility, the start-up Bone Brox obtains organic beef tallow as a side product from producing premium bone broths. The broth company recommends using beef tallow as an add-on to their broths or to use the tallow as a frying oil, replacing plant-based oils.

Bone Brox says that beef tallow is more

similar to the fat in the human body than plant-based oils, citing scientific studies that advocate that saturated fatty acids should no longer be avoided.

"We only use tallow from organic grass-fed cattle that has more beneficial omega-3 than fatty acids, unlike more conventionally raised cattle that is fed with soyabean and corn and contains more potentially harmful omega-6 fatty acids," Jin-Woo Bae, a co-founder of Bone Brox, tells *OFI*.

"When using our tallow for frying, it is much more heat-stable than, for example, olive oils and can fry at high temperatures as tallow has a high smoking point. Belgian fries are a good example as they are traditionally double-fried in beef tallow, instead of plant-based frying oil."

Bone Brox obtains most of the tallow as a by-product from the skimming of fat during the production of bone broth with the organic cattle being sourced from Bavaria.

Scaling up

The company is currently preparing to scale up by also looking for cattle sources in Scandinavia and is looking into launching tallow-based skin care products which it says would be helpful for the treatment of neurodermatitis and other skin disorders.

"Tallow-based cosmetics are a promising niche even though they run counter to the prevailing vegan zeitgeist," Bae adds.

US start-up

Similarly, in the USA, start-up Bello Tallow offers a range of tallow-based personal care products designed to improve skin

cell health due to the similar make-up it has to human skin.

In a note, Bello Tallow says that high quality tallow starts with the purest highest quality suet from the American Grassfed Association (AGA).

Bello Tallow says that only suet is used in its tallow products, not trim fat, as "suet tallow is far more nutrient dense with higher levels of cancer-fighting CLAs [conjugated linoleic acid], oleic, palmitic and stearic acids, omega-3 fatty acid, [plus] bioavailable vitamins A, D, E, K. In addition, it's non-greasy," the company adds.

US tallow production

Meanwhile, the North American Renderers Association (NARA) tells *OFI* that it forecasts US tallow production in 2023 to be slightly lower than 2022 at 2.83M tonnes; white grease output will be down 2% at 730,000 tonnes and poultry fat up some 10%, at just over 1M tonnes.

One reason for the steady production (and demand) is that rendered fats are now classed in the USA as low CI (carbon intense) raw materials by the biofuel industry, arising from the fact that they are by-products.

There is expanding supply of low CI fats in the USA due to industry demand to reduce carbon emissions.

This includes purchases from the oleochemical sector that regularly uses more than 50% of inedible tallow production. Biofuels also account for approximately 24% of the total use of low CI rendered animal fats in the USA. Pet food, while a growing customer of low CI fats, is starting from a low base and accounts for around 5% of use.



Photo: Adobe Stock

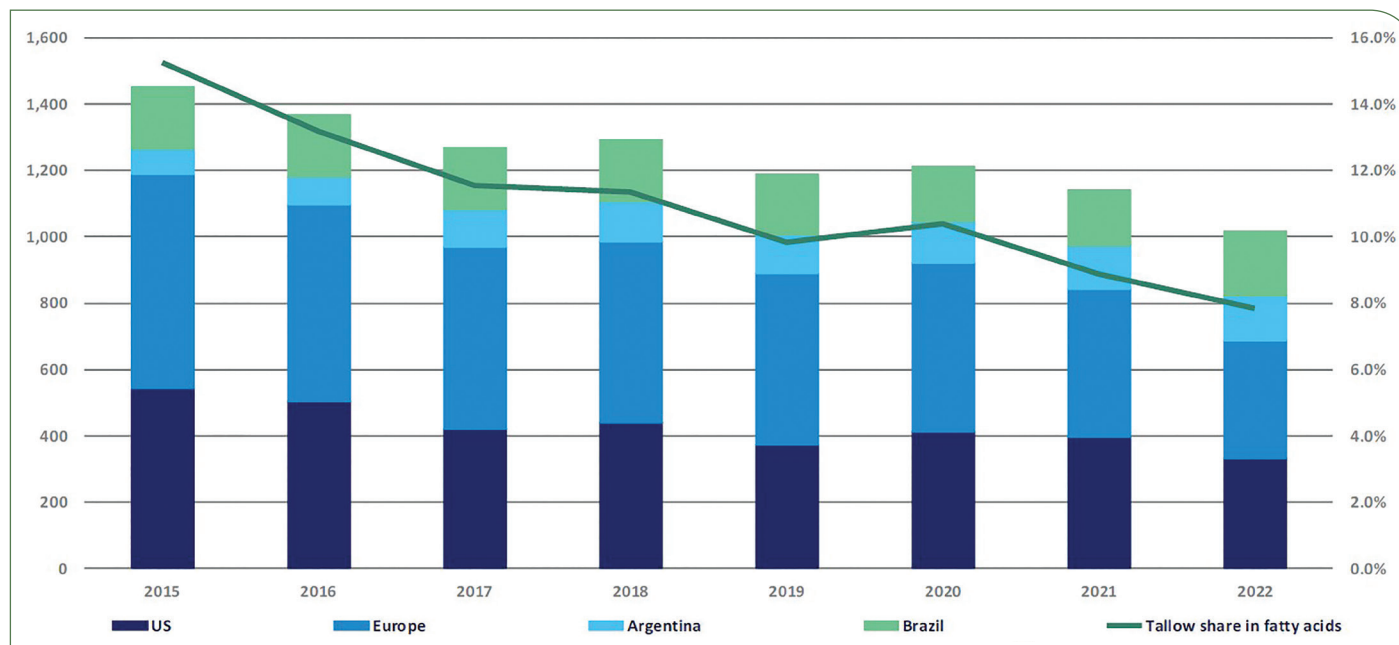


Figure 1: Use of tallow in fatty acid production ('000 tonnes)

Source: C Midgley, Global Data

US tallow imports

The USA became a net importer of tallow in 2021 for the first time. In 2023, US imports of tallow are forecast by NARA at approximately 650,000 tonnes and used cooking oil (UCO) imports are forecast to exceed 1M tonnes.

"We see demand remaining steady to strong in the next year," Kent Swisher, president and CEO of NARA, tells *Oils & Fats International*.

"The supply-side outlook remains stable, and we foresee a levelling out of the market as the biofuel sector matures. But we have not seen a new normal yet. The cattle cycle is a couple of years away from correcting, which will increase tallow supply. Looking at US Department of Agriculture (USDA) 10-year slaughter projections, we can project total US rendered fat production to increase by approximately 500,000 tonnes [annually] by 2031."

Swisher adds that until recently, traditional rendered fat markets have been in decline since the 1990s.

The fast-food industry was once a large consumer of tallow for frying French fries (chips), but that demand shifted to seed oils in the late 1980s and early 1990s.

"In the mid-90s, we exported over 60% of our tallow, but those markets have steadily declined due to trade restrictions, consumer preferences, and an oversupply of lower value lipids that have slowly replaced tallow in export markets," Swisher explains.

"For example, the USA can no longer export tallow to the European Union [EU], China, and Japan to name a few, due to trade restrictions."

Squeeze on tallow markets

The 13th ICIS World Oleochemical Conference in Prague, Czech Republic, in October 2023, presented a more valuable clue as to where the bigger picture is headed.

Caroline Midgley, director of biofuels and oleochemicals at GlobalData (formerly UK-based LMC International) noted a squeeze on tallow markets.

According to Midgley, tallow for fatty acid production is declining due to greater competition from renewable diesel production – a trend that is strongly driven by government policies.

In the EU, for example, the third version of the renewable energy directive (RED III) mandates the replacement of fossil fuels with renewable energy in transport.

Member states can choose between a 14.5% GHG (greenhouse gas) target or a 29% energy replacement target in 2030, which potentially raises demand for non-crop feedstocks such as tallow.

US Renewable Fuel Standard

Similarly, the US Renewable Fuel Standard (RFS) is a national mandate that requires a specific volume of biomass-based diesel to be used each year.

In 2023, the volume required is 2.82bn gallons (10.67bn litres), rising to 2.89bn gallons (10.93bn litres) in 2024.

To the north, Canada's Clean Fuel Regulations, for its part, has a final target for emissions cuts in 2030 of 14.7% and 15% for gasoline and diesel, respectively.

"Biofuel regulations in the EU and the USA are increasing demand for waste oils which is leading to scarcity and higher prices for tallow, with sustainable aviation

fuel (SAF) a new and growing source of demand for waste oils," Midgley says.

"Tallow markets are being squeezed, particularly in the USA, which has seen the output of renewable diesel surge to record levels in 2023; the USA is now a net importer of tallow."

The situation is also having a tangible impact in New Zealand, where the Meat Industry Association of New Zealand recently reported that over the last two years, local tallow exporters had increased trade with the USA, due to higher returns from growing biofuels demand.

In 2022/23, New Zealand tallow exports to the USA were worth NZ\$215M (US\$130M), a 54% increase on the previous year. Singapore remained the next largest market with exports worth NZ\$38M, with smaller volumes of exports to Malaysia and the Philippines.

However, overall tallow exports were worth NZ\$267M in the period, largely unchanged from the previous year.

Rising prices

A recent study by Cerulogy, a UK-based consultancy for low carbon and clean fuels, found that while it is difficult to draw any firm conclusion from the data available on the extent to which demand from the biofuel industry has caused animal fat prices to increase in relation to vegetable oil prices, it was clear that prices for both have risen significantly in real terms.

"Manufacturers of pet food, animal feed and oleochemicals are paying about twice as much in real terms for Category 3 animal fats [low-risk material such as carcass parts from healthy animals, animal waste from the food industry, kitchen and

dining waste and food of animal origin that is unfit for human consumption] as they were 20 years ago," Cerulogy says.

"There is great concern within the animal fat consuming industries that the ongoing renewable diesel boom will continue to push Category 3 prices higher."

However, the report also says that sales prices of Category 1 tallow (high-risk material, such as the brain and spinal cord of older cattle) are relatively low.

This reflects higher handling costs for biofuel producers when transporting and processing this material after purchase.

This notion of difficult handling and transportation working against the use of tallow is supported by researchers at Germany's Agency for Renewable Raw Materials (Fachagentur Nachwachsende Rohstoffe, FNR).

Sebastian Kienast, a FNR project manager for waste material recycling and usage, tells *OFI* that within the last eight years since FNR's inauguration, it had not dealt with any tallow projects.

The projects that were conducted sought to replace petrochemicals with biological fats as feedstocks in industrial processes to produce oils, fats, lubricants, and adhesives and other products.

"I assume that tallow is not among the potentially promising feedstocks our clients are looking at, because there won't be enough supply of it here in Germany, and transportation and quality control would be too expensive," Kienast says.

Reduced meat consumption

German government policies, set by a coalition in which the Greens are a partner, "are clearly aiming at the reduction of meat consumption and cattle herd sizes to reduce carbon emissions, which means domestic supply of tallow will be even lower in the future," Kienast adds. "Of course, it is a different equation in places that have major cattle industries, such as Latin America, the USA or Australia."

The Association of the German Biofuels Industry (Verband der Deutschen Biokraftstoffindustrie, VDB) tells *OFI* that it expects a slow decline in the domestic supply of animal fats as meat consumption is declining – a trend seen elsewhere, for example, in the UK.

Against this backdrop, an expansion of production capacities for animal fat methyl ester is not expected, at least in Germany.

Although the German GHG quota requires petroleum companies to reduce

the greenhouse gas emissions of the fuels they put on the market by a specific percentage, national lawmakers have wanted to pre-empt competition for the use of the raw material and fraud through false declaration.

As a result, tallow, together with UCO, is currently legally limited to a maximum of 1.9% of the energy used in the transport sector.

In addition, biodiesel production from waste oils and fats is more complex than using fresh vegetable oil, VDB points out.

Tallow must first be cleaned of contamination in the fat melt.

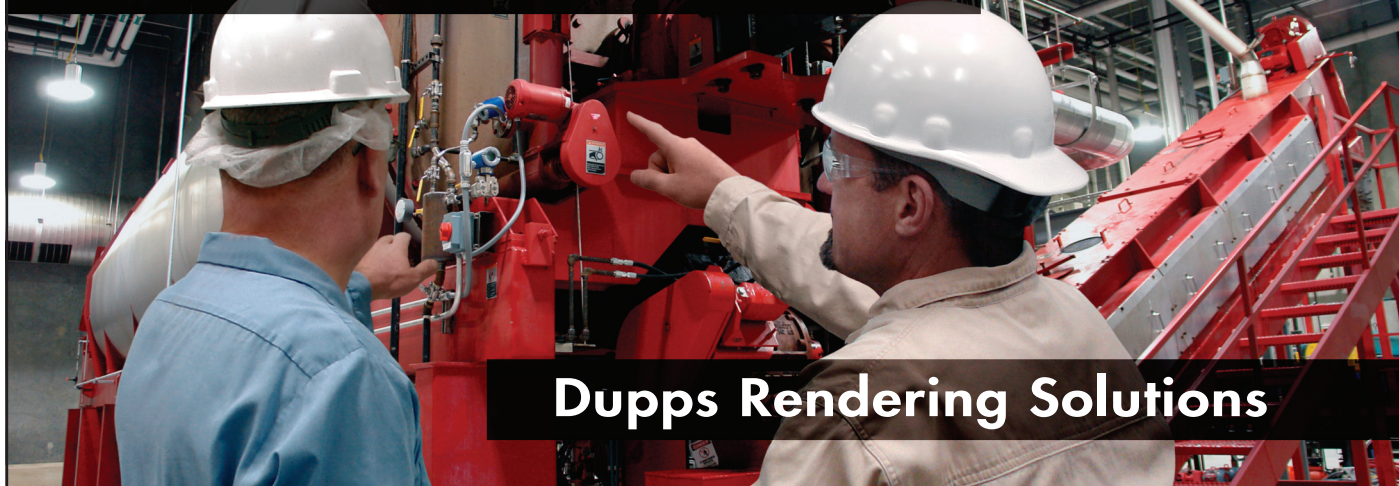
The high concentrations of free fatty acids typical of waste raw materials are then removed so that they can be processed into biodiesel, together with the main components of tallow triglycerides.

The tallow must also be heated throughout the production process, so that it remains liquid.

Various non-governmental organisations have also carried out campaigns to calculate how huge Germany's pig production would have to be to provide a larger proportion of the energy used in the transport sector through tallow.

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