



HIGH-OLEIC SOYBEAN OIL:

**DELIVERING HEALTHY FAT
AND HIGH PERFORMANCE**



Custom content for US Soy
by Food Dive's Brand Studio



After decades of seeing it as a nutritional villain, Americans are finally learning to view fat for what it really is: an essential macronutrient.

Whether credit for this goes to advances in nutrition research, smarter scientific reporting, popular keto and paleo diets, or even social media, the result is that fat is no longer a liability in product formulations or on food service menus.

And John Jansen, vice president for oil strategy at the United Soybean Board (USB), believes it's about time. "The American public's relationship with fats and oils has been rocky," he said. "But that's all the more reason to celebrate what looks to me like a clearer understanding of where — and which — fats can contribute positively to diets."

But Jansen, with his long tenure in the oils industry, is no stranger to manufacturing and food service needs, nor to consumer motivations. "For consumers, the bottom line is still taste. For manufacturers, the bottom line for packaged-food and restaurant brands is reliable, cost-effective product performance."

Is there an oil that can deliver on all these needs?

Not only does high-oleic soybean oil (HOSO) have zero trans fat; it delivers better functionality in formulation, too, with greater stability, longer fry life and a neutral taste that everyone appreciates.

Need proof? "The evidence is out there," Jansen said. "The soybean industry has done extensive functionality testing on high-oleic soybean oil. But more important, we're already enjoying the benefits on shelves and menus."



NUTRITION NATION: LIVING IN A BETTER-FOR-YOU ERA

Taste may still be king, but we're living in a better-for-you era nonetheless, wherein even indulgent snacks, baked goods and deep-fried favorites have to clean up their acts or risk alienating consumers.

"We know this not only from observations," Jansen added, "but based on in-depth research that USB has conducted to learn more about public perceptions around nutrition."

USB's 2019 Consumer Attitudes and Nutrition Study found that about half (48%) of those surveyed considered nutrition a "very important" factor when choosing brands or foods, with 43% considering it "somewhat important."



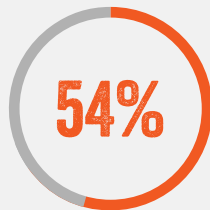
would **pay more** for healthier versions of their favorite foods

"Add those percentages together," Jansen said, "and you see the remarkable degree to which consumers now buy based on nutrition. Even better: 65% of the shoppers we polled said they'd pay more for healthier versions of their favorite foods. Brands can't afford to ignore that."

FROM AVOIDED TO ESSENTIAL: AMERICA'S EVOLVING VIEW OF FAT

This better-for-you thinking extends even to fats and oils — some of which, for the first time in recent history, are getting sized for healthy halos of their own.

More than 78% of consumers now agree that not all fats are unhealthy, according to data from Research and Markets¹, while 47% of respondents to Packaged Facts' 2016 National Consumer Survey cited healthy fats and oils as a "highly important" factor when choosing which foods to eat.²



are **more likely to eat somewhere** that used oils lower in saturated fat.

Fat's reputational rehabilitation has even hit food service, where 74% of the participants in USB's Consumer Attitudes and Nutrition Study claimed to be at least somewhat interested in which oils a restaurant uses, and 54% said they'd be more likely to eat somewhere that used oils lower in saturated fat.

"I can't tell you enough how encouraging these numbers are," Jansen said. "Attitudes like these reflect real nuance in how consumers see fats and oils these days."





NUANCED VIEWS: NOT ALL FATS ARE CREATED EQUAL

But baked into that nuance is the fact that while consumers are learning to appreciate fat's nutritional value, they don't value all fats' and oils' nutritional merits equally.

According to an April 2020 consumer survey from the International Food Information Council Foundation, 69% of respondents ranked olive oil among their top-three healthiest fats, with the next most popular options being avocado and canola oils, each ranking top-three with 36% of respondents.³ Yet while coconut oil — a saturated fat — was a top-three healthy pick with 34% of consumers, other saturated fats, such as ghee and lard, landed on the healthy podium with only 8% and 3%, respectively.

Results like these don't just underscore consumers' discriminating stance toward fats and oils, they also show how much

consumers have to learn about the nutritional differences they're discriminating for and against. USB's Consumer Attitudes and Nutrition Study tells a similar story.

As Jansen stated, consumers in that study rated omega-3 fatty acids tops for health, with 76% considering them "somewhat" or "very" healthy. "But despite the fact that omega-3s are themselves polyunsaturated fats, only 30% of consumers rated polyunsaturated fat in general as 'somewhat' or 'very' healthy."

Likewise, 58% of respondents rated olive oil — rich in monounsaturated oleic acid — as "very healthy," but only 34% considered monounsaturated fat itself "somewhat" or "very" healthy.

"So the industry has some work to do in making sure that consumers understand which fats and oils qualify as 'healthy,'" Jansen said. "Confusion is still out there, and with more consumers open to trying healthy options, the industry has an opportunity to educate. What healthy oil consumers want might even be one they don't know about yet."

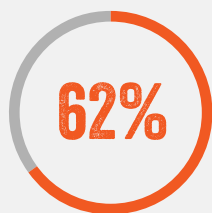
A CHALLENGE WRAPPED IN AN OPPORTUNITY: CAN OIL DELIVER NUTRITION AND PERFORMANCE?

USB's Consumer Attitudes and Nutrition Study found that 72% of those surveyed didn't know that 100% U.S.-grown soybean oil is heart healthy — but that 62% of those consumers would be more likely to buy it if they did.

Thus, the industry faces a call to reformulate for healthier fat profiles — and to let consumers know about it. “CPG brands and food service operators alike can capture these consumers by developing foods and menu items that feature the healthful lipids they now welcome in their diets,” Jansen said.

But as much as consumers prioritize nutrition, they prioritize a food's taste, aroma, texture and appearance even more. “So if switching out one oil for a more nutritious alternative means changing those parameters and falling short of consumer expectations,” Jansen said, “it's not worth it.”

Furthermore, added Richard Galloway, a contractor for Qualisoy, product and menu developers want fats and oils that meet their behind-the-scenes needs. “That means oxidative stability, especially in extended frying and high-heat processes, and shelf-life maintenance in finished products,” he said. “Bakers need proper creaming, a good working range, and the right height and spread in finished baked goods. And increasingly, we're all looking for environmentally sustainable oils with transparent sourcing, reliable supplies and a reasonable price. And yes, that is a very tall order.”



of consumers would be **more likely**
to buy U.S.-grown soybean oil if
they knew it was heart healthy.

SOY



FROM PHOS TO HOSO: HOW A TRANS-FAT BAN SPARKED OIL INNOVATION

In years past, the oils that met all those needs were partially hydrogenated vegetable oils (PHOs).

But PHOs have a downside: They're a significant source of trans fatty acids, which science now links to increased risk for coronary heart disease. One study even associated a 2% increase in energy intake from trans fats with a 23% increase in the incidence of coronary heart disease.⁴

So in 2015, the Food and Drug Administration (FDA) revoked trans fats' GRAS status, giving the industry until 2018 to reformulate them out of products and off menus. Yet the industry and academia were investigating alternatives decades before the FDA stepped in.

One key innovation: oils with higher levels of monounsaturated oleic acid, an omega-9 fatty acid that's not only healthier than trans fats but also stable and functional.

Considerable scientific evidence has been built up around oleic acid's apparent ability to improve heart health by reducing blood cholesterol and improving insulin sensitivity⁵; to decrease expression of important cholesterol transport proteins⁶; and to help lower blood pressure⁷ — among other purported benefits.

In food production, oleic acid, as a monounsaturated fat, is less liable to oxidation than polyunsaturated fats. The benefits are longer fry life, longer packaged-food shelf stability and less rancidity over time.

“Oleic acid appears naturally at levels up to around 85% in olive oil, and at fairly high levels in canola oil, too, although it’s present to some degree in most vegetable oils, including soybean oil,” Galloway explained.

In food production, oleic acid, as a monounsaturated fat, is **less liable to oxidation than polyunsaturated fats.**

But while the oleic acid content of native soybean oil hovers around 20% to 25%, the U.S. soy industry, through investments in researching soybean varieties with enhanced functional and nutritional characteristics, developed a soybean oil with even higher oleic acid levels — high-oleic soybean oil — and in so giving another option to the roster of PHO alternatives.



A close-up photograph of several green soybean pods hanging from a stem. The pods are covered in fine, white, fuzzy hairs. The background is a soft-focus green, suggesting more foliage.

THE HOSO ADVANTAGE: **WHY HIGH-OLEIC SOYBEAN OIL** **CHANGES THE GAME**

“The development of high-oleic soybean oil was a triumph for the U.S. soy industry and for formulators,” Galloway declared. Research teams at universities and private companies used techniques ranging from genetic engineering to gene editing to conventional plant breeding to create oils with oleic acid contents as high as 70% to 75%.

“That translates into noticeable formulation advantages,” Galloway continued. In food manufacturing, high-oleic soybean oil resists oxidation, extending the shelf life of packaged foods and baked goods. Shortenings made with high-oleic soybean oil also exhibit shortening textures, working ranges, oil-binding, moisture-barrier and creaming properties comparable to those of PHOs, making them great drop-in replacements.

High-oleic soybean oil has a neutral flavor that, unlike corn, olive or palm oil, won’t interfere with the taste of products made with it. “It’s so stable,” Galloway said, “manufacturers don’t need to add natural or synthetic antioxidants to control oxidation or prolong shelf life. That shortens ingredient statements, which today’s consumers love.”


Because high-oleic soybean oil is so heat- and oxygen-stable — it has an oxidative stability index of 25 hours, Galloway noted — food service operators appreciate its longer performance in high-temperature and extended-frying applications compared with competitor vegetable oils. “And remember,” Galloway said, “extended fry life equals cost savings.”

And by resisting oxidation, high-oleic soybean oil is less likely to polymerize and leave buildup on frying equipment, even after extended frying. That reduces the need for equipment maintenance and, again, lowers operating costs.

Consumers benefit from high-oleic soybean oil, too. On the health side, it has three times more healthy monounsaturated fatty acids than competitive conventional vegetable oils and contributes less saturated fat than palm oil.

In 2018, the FDA authorized the use of two qualified health claims stating that oils high in oleic acid — including high-oleic soybean oil — may reduce the risk of coronary heart disease.⁸ “And high-oleic soybean oil always contains zero grams of trans fat per serving,” Galloway added.

But what Galloway said he thought consumers would appreciate most about high-oleic soybean oil might be what they were least likely to notice: That when formulators use it to replace PHOs or other fats, “the finished product is just as delicious, creamy, crispy, fluffy — basically, the finished product tastes the same,” he said. “Consumers won’t know the difference.”

A photograph of a person wearing a blue baseball cap and a grey t-shirt, smiling while working in a kitchen. They are standing next to a large industrial fryer. A white text box is overlaid on the image, containing text about high-oleic soybean oil.

High-oleic soybean oil is **less likely to polymerize and leave buildup** on frying equipment, even after extended frying.



THE PROOF IS IN THE PRODUCT: FUNCTIONALITY TESTS AND USER TESTIMONIALS

But don't take his word for it; Qualisoy, in partnership with Stratas Foods, conducted a series of functionality and sensory tests comparing high-oleic soybean oil with comparable high-oleic and high-stability oils in food service and manufacturing applications.

A 24-day french-frying study that compared high-oleic soybean oil against high-oleic sunflower, mid-oleic sunflower, conventional soybean, and 75% and 65% oleic canola oils found high-oleic soybean oil performed consistently with high-oleic sunflower oil and better than high-stability options, such as 75% oleic canola oil.

High-oleic soybean oil also yielded among the lowest levels of total polar material (TPM) percentages in the study, indicating

less polymerization and, thus, longer fry life. "TPM percentages measure polymer formation," Galloway explained, "and they rise the more an oil is used. So a lower TPM rise means fewer polymers and longer fry life for the oil — which is what operators want."

In an extension of the study, conducted with Product Dynamics, high-oleic soybean oil performed consistently with other high-stability oils in sensory evaluations, emerging as a top performer on overall likability. As Galloway pointed out, "U.S. consumers are familiar with the flavor that soybean oil produces. The same is true with high-oleic options, and consumers like the results."

That's what the operators of Wing Barn, a restaurant with seven southern Texas locations, found when they switched their frying oil to a blend of high-oleic and conventional soybean oils. The operators have enjoyed longer fry life and less polymerization on fryers, saving them significant money. As owner Bobby Saenz said, "Sixty-five percent of our business is fried, so it's extremely important to have a high-quality fry oil. With the high-oleic soybean blend, results are amazing at this point. At the end of the day, it saves us money."

Switching from the fryer to the oven, Matt Lewis and Renato Poliafito, owners and operators of Baked, a Brooklyn, NY, bakery, have their own success stories about working with high-oleic soybean oil.

As Lewis noted, “It’s important to choose carefully when selecting an oil to complement your dessert. Oils often add needed moisture, but they also have distinct flavor profiles when used across applications with different ingredients.” So when looking for a fat with neutral flavor, he uses high-oleic soybean shortening “because it plays a crucial role in moisture while letting the ingredients’ prominent flavors shine.”

A Qualisoy/Stratas study comparing high-oleic soybean shortening against high-oleic canola, conventional soybean, canola, partially hydrogenated and palm bakery shortenings found that sugar cookies made with high-oleic soybean and conventional soybean shortenings had a more tender mouthfeel than those made with other shortenings, and generated average height, weight and spread measures comparable to cookies made with partially hydrogenated shortenings.

Tests in white cakes found that high-oleic soybean shortening produced cakes that most resembled those made with partially hydrogenated shortening. And as Poliafito said, “Soy shortening adds the perfect spring to cake sponges that’s almost impossible to achieve with an all-butter recipe.” He suggested swapping out one quarter of a formulation’s butter for soybean shortening in a one-to-one ratio “to give your cakes that extra lift.”



“[High-oleic soybean shortening] plays a **crucial role in moisture** while letting the ingredients’ prominent flavors shine.”

Matt Lewis,
OWNER AND OPERATOR OF BAKED, A BROOKLYN, NY, BAKERY





THE SUSTAINABILITY STORY: HOMEGROWN HIGH-OLEIC SOYBEAN OIL

Yet besides locking in product performance, formulators have to think more carefully about where their fats and oils come from and how they got here. USB's Consumer Attitudes and Nutrition Study found that a whopping 73% of consumers claimed that eating sustainably produced food was important to them — and as Jansen pointed out, formulating sustainably “isn't just smart marketing. It's the right thing to do.”

U.S. soybean farmers agree, and they've been adopting farming practices designed to reduce land-use impact by 10%, soil erosion by an additional 25% and total greenhouse gas emissions by 10% while increasing energy-use efficiency by 10% — all by 2025.

“COVID-19 also has us thinking more about supply chains,” Jansen said. And here again, U.S.-grown high-oleic soybean oil is ahead of the game.

Expansive acreage puts U.S. soybeans closer to more Americans than any other oilseed.⁹ That geographic dispersion renders the crop less vulnerable to regional weather extremes. And the U.S. soybean industry projects that by 2023, high-oleic soybean plantings will hit 1.5 million acres, making them America's fourth-largest grain and oilseed crop. “For processors worried about supply bottlenecks now and in the future,” Jansen said, “that should come as some relief.”

But none of this can come at the expense of affordability. Fortunately, the price premium on high-oleic soybean oil is similar to that for high-oleic canola oil, Galloway noted, “and it'll fall as high-oleic soybean volumes increase.” And because U.S. soybeans are grown in 40 states, transportation costs take less of a budget bite than with imported alternatives and, again, should drop even further as domestic acreage grows.

HERE'S HOW: STEPS TO A SUCCESSFUL SWITCH

There's a lot to love about high-oleic soybean oil. As Jansen said, "The facts tell a compelling story." But even more compelling are "the results developers see when they evaluate high-oleic soybean products in their own formulations."

Both Jansen and Galloway have some suggestions for product developers considering such evaluations.

"I always say, 'Start with the finish,'" Jansen said. "In other words, think about the impact that switching to high-oleic soybean oil will have on the finished product or menu item, and whether or not consumers will be onboard with any noticeable changes that arise."

He added that brands have to account for how an ingredient such as high-oleic soybean oil can build upon a larger product narrative. "Sustainability, sourcing, nutritional advantages: Does this oil fit with these key points in a brand's story?" he noted as important questions to ask.





US SOY

Galloway emphasized the need for simplicity in kitchens and on production floors — and he pointed out that “high-oleic soybean oil has proved repeatedly to be a great drop-in replacement for costlier oils.”

Speaking of cost, Galloway advised formulators to consider the financial and operational dividends that accrue from high-oleic soybean oil’s longer shelf and fry life — “and keep those savings in mind when factoring in high-oleic soybean oil’s modest premium,” he added.

“High-oleic soybean oil has proved repeatedly to be a **great drop-in replacement for costlier oils.**”

Richard Galloway,
CONTRACTOR FOR QUALISOY

Finally, he invited formulators to connect with USB to discuss applications testing and user experiences, as well as how to ramp up their own high-oleic soybean oil evaluations. “There’s a lot we’ve learned about how to get the most out of this oil, whether in manufacturing or at restaurants,” he said. “And we’re here to help you learn it, too.”

SOURCES:

1. Research and Markets, "Consumer Insights in Food, Nutrition and Health 2019," December 2018: https://www.researchandmarkets.com/reports/4806897/consumer-insights-in-food-nutrition-and-health?utm_source=BW&utm_medium=PressRelease&utm_code=mjq5n3&utm_campaign=1298470+-+2019+Consumer+Insights+in+Food%2c+Nutrition+and+Health%3a+Digestive+Wellness%2c+Good+Carbs%2fBad+Carbs%2c+Fat+Reborn%2c+Plant-Based%2c+Alcohol-free&utm_exec=chdo54prd
2. Packaged Facts National Consumer Survey. February 2016, Page 18.
3. The International Food Information Council Foundation, "Consumer Survey: Purchasing Behaviors, Eating Decisions and Health Perceptions of Dietary Fats and Oils," July 6, 2020: <https://foodinsight.org/consumer-survey-purchasing-behaviors-eating-decisions-and-health-perceptions-of-dietary-fats-and-oils/>
4. Mozaffarian, D. et al. New England Journal of Medicine, "Trans fatty acids and cardiovascular disease," Vol. 354, No. 12. April 13, 2006: 1601-13.
5. Verschuren, W. M., Jacobs, D. R., Bloembergen, B. P., Kromhout, D., Menotti, A., Aravanis, C., Blackburn, H., Buzina, R., Dontas, A. S., & Fidanza, F. "Serum total cholesterol and long-term coronary heart disease mortality in different cultures. Twenty-five-year follow-up of the seven countries study," JAMA, 274(2), 131-136: <https://pubmed.ncbi.nlm.nih.gov/7596000/>
6. Chen, J., Li, Q., Zhang, Y., Yang, P., Zong, Y., Qu, S., & Liu, Z. Journal of Physiology and Biochemistry, "Oleic acid decreases the expression of a cholesterol transport-related protein (NPC1L1) by the induction of endoplasmic reticulum stress in CaCo-2 cells," 2011. 67(2), 153-163: <https://doi.org/10.1007/s13105-010-0058-y>
7. Verschuren, W. M., Jacobs, D. R., Bloembergen, B. P., Kromhout, D., Menotti, A., Aravanis, C., Blackburn, H., Buzina, R., Dontas, A. S., & Fidanza, F. "Serum total cholesterol and long-term coronary heart disease mortality in different cultures. Twenty-five-year follow-up of the seven countries study," JAMA, 274(2), 131-136: <https://pubmed.ncbi.nlm.nih.gov/7596000/>
8. United Soybean Board, "FDA Authorizes Qualified Health Claim For Oils High In Oleic Acid," November 21, 2018: <https://www.unitedsoybean.org/article/fda-authorizes-qualified-health-claim-for-oils-high-in-oleic-acid>
9. Qualisoy.com, calculations based on counties with production to furthest point in the continental United States, per USDA NASS database.

SSOY

United Soybean Board's 78 volunteer farmer-directors work on behalf of all U.S. soybean farmers to achieve maximum value for their soy checkoff investments. These volunteers invest and leverage checkoff funds in programs and partnerships to drive soybean innovation beyond the bushel and increase preference for U.S. soy. That preference is based on U.S. soybean meal and oil quality and the sustainability of U.S. soybean farmers. As stipulated in the federal Soybean Promotion, Research and Consumer Information Act, the USDA Agricultural Marketing Service has oversight responsibilities for USB and the soy checkoff. For more information on the United Soybean Board, visit unitedsoybean.org.

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