

Fats for health and beauty: Giving soybean oil a new role in serving society

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Soybeans could provide consumers with safer sunscreens and other personal care products, scientists report. Credit: United States Department of Agriculture

Scientists today reported development of a new method for converting soybean oil into a highly effective bio-based sunscreen active ingredient that does not carry the potential health concerns of ingredients in some existing sunscreens. The new, natural sunscreen agent could replace petroleum-derived ingredients in a variety of personal-care products, they reported at the 239th National Meeting of the American Chemical Society (ACS) being held here this week.

It was among more than 12,000 scientific reports scheduled for presentation at the meeting, one of the largest scientific gatherings of 2010.

Joseph Laszlo, Ph.D., who headed the research, pointed out that sales of sunscreens and other skin-care products that protect against the damaging effects of ultraviolet (UV) light have been booming. Driving the multi-billion-dollar-per-year market are consumers who are better informed about the link between overexposure to the sun and [skin cancer](#) and sunlight's effects in giving skin an aged appearance. At the same time, however, concerns have arisen over certain ingredients in today's mainstay sunscreens. "One, for instance, is a substance known as oxybenzone that is a suspected hormone disruptor that could contribute to the disruption of aquatic species reproduction."

"We're trying to provide nature-inspired skin-care materials that avoid such health concerns and at the same time have fewer adverse environmental impacts," Laszlo said. He is with the U.S. Department of Agriculture's Agricultural Research Service in Peoria, Ill. Sunscreens are among the substances, termed "pharmaceuticals and [personal care products](#) (PPCPs)," that constitute a relatively new family of [water contaminants](#) with potential [adverse health effects](#) on wildlife and people.

Sunscreens protect against skin cancer by shielding the body from two types of [UV light](#). One is UV-A, which absorbs deep in the skin and is linked to reactive oxygen species (ROS) formation. The other is UV-B, which causes sunburn. Some sunscreen ingredients generate ROS when exposed to UV-A, which can damage DNA.

For years, the sunscreen industry focused on offering UV-B protection to prevent sunburn. Laszlo and colleagues have developed technology for converting [soybean oil](#) into a biobased active ingredient for sunscreen

products. It involves incorporating ferulic acid, found naturally in hundreds of plants, into soybean oil.

The use of ferulic acid along with vegetable oil produces a water-resistant material capable of absorbing both UV- A and UVB light. In addition, it can be used as an anti-aging and anti-wrinkle product, Laszlo said. Called feruloyl soy glycerides (FSG), the material is produced commercially by iSoy Technologies Corporation and used in several cosmetic products in the U.S. and Asia.

"The skin ages not just from exposure to the sun but also from air pollutants and other environmental effects," Laszlo said. "We believe that this molecule (ferulic acid) could prevent some of the damage caused by the free-radical processes involved in those environmental exposures. That's particularly important for preserving the integrity and health of skin tissue. The approach builds on knowledge that antioxidants consumed in the diet or applied topically can prevent some of that damage."

In his ACS presentation, Laszlo reported on various aspects of FSG production, clinical safety and efficacy test results and his group's recent discoveries on the antioxidant effects of one major component of FSG.

"Our findings support the hypothesis that FSG can protect sensitive cellular components and reduce the impacts of skin sun exposure," he said. "Our work also demonstrates how agricultural materials can be used to craft safe and useful consumer products."

Provided by American Chemical Society

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