SOY PRODUCT INNOVATIONS

Building on current market trends to support Minnesota soybean farmers

mnsoybean.org

Demand for soybean oil and meal is continuously changing. With a close eye on current market trends, the checkoff funds projects that will **best support** soybean farmers in today's evolving marketplace. By utilizing new technologies, the checkoff **transforms** familiar products into new opportunities, **improving and employing** advanced techniques to create new, value-added uses for soy.

As demand **increases** for soybean oil for biodiesel, it has become imperative to find new avenues to use soybean meal. Taking this into consideration, the checkoff funded **21** soy product innovation projects in two topic areas: soybean oil and soybean meal. Below are some of the highlighted projects from 2023.

SOYBEAN MEAL FERTILIZER –
AGRICULTURAL UTILIZATION RESEARCH INSTITUTE

Description
The objective of the soybean meal fertilizer market analysis is to study the potential of various value-chains for soybean meal-based fertilizers and soil amendments in horticultural markets such as residential lawns and gardens, greenhouses, non-share nurseries and managed turf.

Product need
With more soy crush facilities coming online in the future, there is a demand for more soybean meal in the marketplace.

Researcher
Harold Stanislawski, Becky Philipp

How will product impact the soybean industry?
The project will help identify and assess market opportunities for soybean meal use in horticultural fertilizers and soil amendments, analyze soybean meal and blends in value-added fertilizer and soil amendment products and build a report on high-potential markets and commercialization avenues.

SOY 3-D EDIBLE PRINTING INK –
NORTH DAKOTA STATE UNIVERSITY

Description
The objective of this project takes a different approach and looks to utilize soybean meal's protein and fiber as a component in 3-D printing ink to increase the gelling properties and sensory acceptability of soybean meal. Currently, the insoluble fiber in soybean meal has a negative effect on nutrition and printability when considered as a 3D printing ink.

Product need
3D print cooking is a new, emerging technology that has the potential to be a home-kitchen cooking style to produce food with personalized flavor, appearance and nutrition.

Researcher
Minwei Xu

How will product impact the soybean industry?
This project would develop a new use for soybean meal and add value to soybean oil byproducts, which would benefit soybean farmers with soybean meal capitalization.

For questions on specific projects, contact Mike Youngerberg at mike@mnsoybean.com.

SOYBEAN HULLS FOR BIODEGRADABLE PLASTIC –
SOUTH DAKOTA STATE UNIVERSITY

Description
The objective of this project is to find a safer alternative to regular plastics using cellulose found in soybean hulls. Cellulose is biodegradable and has a low density with a strong, stiff structure and meets the desirable needs for plastics. This proposal looks to develop value-added functional products such as biodegradable films by extracting cellulose from soybean hulls and solubilizing cellulose using inorganic salts using economical and versatile methodology.

Product need
Plastics are versatile and cost-effective materials with a wide variety of functionalities. With plastic waste being a complex, social, economical and environmental problem, safer alternatives need to be developed. Even with countries across the globe imposing restriction on plastics, there still exists a pressing scientific need to find alternatives to plastics.

Researcher
Dr. Srinivas Janaswamy

How will product impact the soybean industry?
This project will benefit soybean producers by leading to an economical multi-function conservation method that has potential for soybean hulls management toward not only improving value, but also addressing the perils of plastic.

Minnesota harvested **370 million bushels** in 2022 and processed **50%**, equating to **185 million** bushels processed. That would total roughly **4.347 million tons** of soybean meal and nearly **278 million gallons** of soybean oil.

In just the past couple years alone, Minnesota has boosted its crushing capacity from **600K bushels** per day to **800K**.
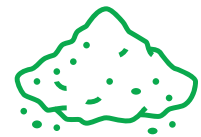
ECONOMIC IMPACT OF
MINNESOTA'S SOYBEANS

Soybean Production

Revenue: $7.395B

Crushing

Revenue: $1.014B

Soy Oil Refining

Revenue: $160M

Soy Biodiesel Production

Revenue: $31M

FOOD + FUEL

80% MEAL
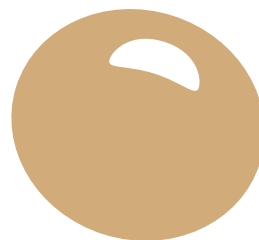The primary component of soybeans is meal.

97% ANIMAL FEED
U.S. soybean meal is used to feed poultry and livestock.

3% FOOD PRODUCTS
Soybean meal is used in food products like protein alternatives and soybean milk.

20% OIL
The other soybean component is oil.

61% FOOD
Soybean oil is used for frying and baking food, as a vegetable oil and as an ingredient in foods like salad dressing and margarines.

31% BIODIESEL & BIOHEAT
Biodiesel and bioheat account for nearly one-third of soybean oil usage.

8% INDUSTRIAL USES
Soybean oil is converted into industrial uses like paints, plastics and cleaners.