

HOS products also hold promise in animal feed for monogastric animals like poultry and swine. End-use products, such as pork, chicken meat, eggs, and fish, derived from animals fed with HOS-enriched diets, could offer health benefits to consumers due to their improved fat content.

Exploring the options

Despite the potential benefits, the use of HOS in animal feed remains underexplored. We conducted a two-part study to address gaps in understanding how the benefits of HOS translate to animal feed and end-use animal products, as well as consumer preferences and demand for animal products derived from HOS-fed animals.

Study 1 reviewed existing applications of HOS in animal feed to assess the impact on feed meals and end-use animal products, particularly fat profiles. Study 2 involved a nationwide survey to evaluate consumer preferences and willingness-to-pay (WTP) for chicken, pork, eggs, and salmon with HOS-fed claims. We also investigated whether consumer awareness of the benefits of HOS influences demand.

Study 1: literature review on HOS in animal feed

Two key findings emerged from this literature review.

1. Including HOS into animal feed for broilers, hens, hogs, and aquaculture leads to a marked increase in the levels of monounsaturated fatty acids from 40% to 695%, and a significant decrease in polyunsaturated fatty acids of up to 80%. These shifts suggest HOS can substantially improve the nutritional quality of animal feed, and potentially improve the health attributes of the resulting animal products.
2. When commodity soybean oil is substituted with HOS in animal feed meals there is a decrease in saturated fatty acid content of the resulting animal product from approximately 3% to 19%, and an increase in monounsaturated fatty acids content by 11% to 172%.

Study 2: consumer preferences for HOS-fed enriched products

A nationwide survey assessed consumer preferences and WTP for various animal products with and without the presence of a “high oleic soybean fed enriched” (HOS-Fed Enriched) claim. The survey was conducted in July 2023 with 2,252 U.S. food shoppers and designed to simulate retail purchase decisions for four animal-based products: eggs, chicken thighs, bacon, and salmon. Respondents were randomly assigned to one of these product categories with product labels including

HOS-Fed Enriched, Animal-Welfare Certified, USDA Organic, Non-GMO Project Verified, and No Antibiotics Ever.

To assess the influence of health-related information on consumer choices, we included a message on the health benefits of HOS-fed enriched products alongside the health claim (Figure 2) for the chicken study. The survey also gathered data on the importance consumers place on various animal diets.

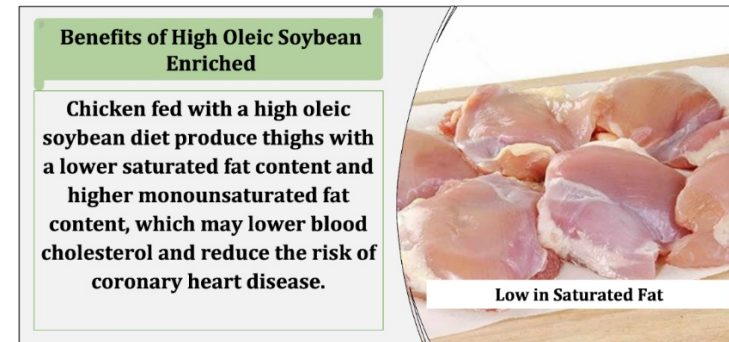


Figure 2. Example of information treatment – chicken.

Key findings

1. Consumer preferences for animal feeding practices vary by product.
2. Consumers initially showed negative WTP for HOS-fed enriched products like chicken thighs, eggs, and bacon when no health information was provided. After learning about the health benefits of HOS, WTP increased significantly: salmon +975%, eggs +286%, chicken +268%, and bacon +222%.
3. Regional variations in WTP were significant. Educating consumers about HOS benefits increased WTP across all regions, with the Western and Northeastern regions showing the most substantial gains.

Healthier, sustainable food production

Exploring the use of high-oleic soybeans (HOS) in animal feed offers significant opportunities for developing healthier animal-based products. As consumer demand for nutritious options grows, incorporating HOS into animal diets presents a strategic opportunity to reshape the animal protein value chain and marketing strategies.

There is great potential for the soybean industry and animal agriculture to differentiate products through HOS-fed enrichment. Aligning production practices with evolving consumer preferences and nutritional trends is essential, with ongoing research needed to support informed decisions. Adopting HOS enables farmers and producers to meet the growing demand for healthier, more sustainable food choices.

Crunching numbers on the Farm Workforce Modernization Act



Zachariah Rutledge



Clare McGrady

Zachariah Rutledge and Clare McGrady, Michigan State University Department of Agricultural, Food, and Resource Economics

Undocumented farmworkers make up roughly half of the U.S. workforce, and their employment is a key part of ongoing farm labor policy discussions. Recently proposed legislation known as the Farm Workforce Modernization Act (FWMA) would provide a pathway to legal status for undocumented farmworkers under certain conditions. We estimate the number of undocumented Michigan crop farmworkers who would be eligible for legal work authorization under the recently proposed FWMA.

Under Title 1 of the FWMA, undocumented crop workers who have worked in U.S. agriculture for at least 180 days over the last two years would receive legal work authorization under a special Certified Agricultural Worker (CAW) status. We used data from the National Agricultural Worker Survey (NAWS) to estimate the share of the workforce that would be CAW eligible, and the Quarterly Census of Employment and Wages (QCEW) to estimate the number of crop farmworkers employed in Michigan. Combining these data sources provides the information required to estimate a lower bound for the number of farmworkers who could get regularized in Michigan.

According to the 2022 QCEW, there are about 20,000 full-time equivalent non-H2A crop production jobs on the books of Michigan farm employers. However, worker turnover throughout the year means the number of individual farm employees is higher than 20,000. As such, our estimates are conservative and provide the minimum number of farm employees that could gain access to legal work authorization under the FWMA. Due to data limitations, we do not provide estimates for animal production workers, who account for some 10,000 year-round equivalent jobs in Michigan.

CAW eligibility

We estimate at least 5,000 undocumented crop farmworkers could be eligible for CAW status throughout the state. Here are CAW eligible worker estimates by the leading counties:

- Ottawa County – at least 730 workers
- Kent County – at least 460 workers
- Macomb Count – at least 330 workers
- Kalamazoo County – at least 310 workers
- Van Buren County – at least 260 workers

The minimum number of farmworkers eligible for CAW status by county across the state of Michigan is shown in Figure 1. Most of the eligible workers are in the southwestern part of the state.

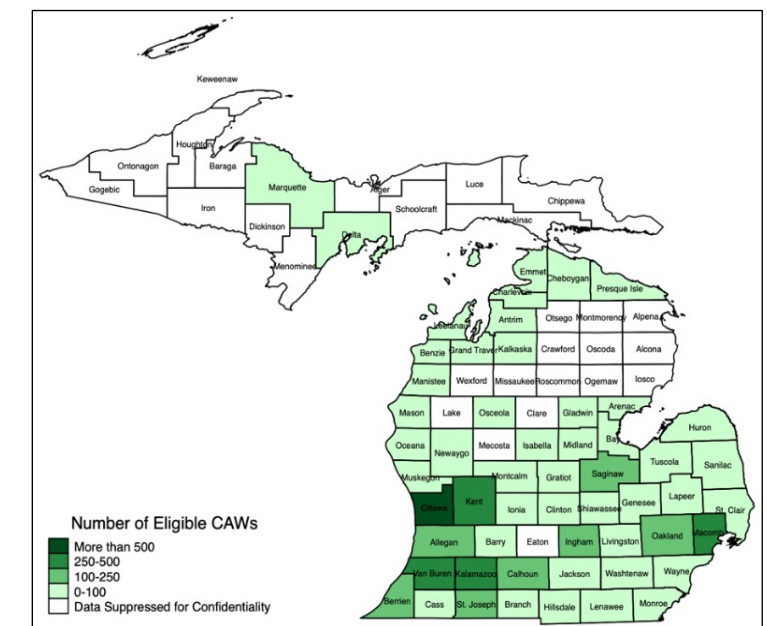


Figure 1: Minimum number of crop farmworkers in Michigan eligible for CAW status.

Access to green cards

CAW eligible crop workers could apply for permanent resident status (green card) if they continue to perform farm work in the U.S. under Title 1 of the FWMA. Farmworkers who have performed at least 10 years of U.S. farm work would be eligible to apply for a green card after four additional years of farm work if they continue to work on U.S. farms at least 100 days per year. Those who have worked less than 10 years in U.S. farm work could apply for a green card after eight additional years of farm work.

The share of the crop workforce in the Lake region eligible for a green card in four years is about 12%, or 47% of the CAW eligible workforce. This share translates to at least 2,400 Michigan crop production farmworkers.

The minimum number of crop production employees in each county eligible to obtain a green card in four years is shown in Figure 2. The leading counties are Ottawa County (340 workers), Kent County (220), Macomb County (160), Kalamazoo County (150), and Van Buren County (120).

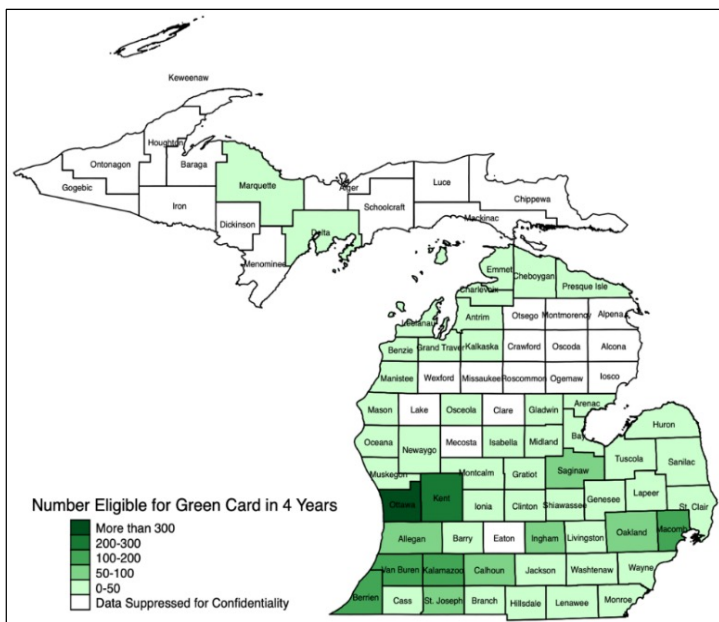


Figure 2: Minimum number of Michigan crop farmworkers eligible for permanent resident status after four years.

The share of the crop workforce in the Lake region that would be eligible for a green card in eight years is 13%, or 53% of the CAW eligible workforce. We estimate at least 2,600 Michigan crop farmworkers would be eligible for a green card in eight years.

We estimate at least 5,000 undocumented crop farmworkers could become eligible for CAW status throughout Michigan.

Figure 3 shows the minimum number of workers in each county that would be eligible for a green card after eight years. The counties with the most eligible workers are Ottawa County (at least 380), Kent County (240), Macomb County (180), Kalamazoo (160), and Van Buren (140).

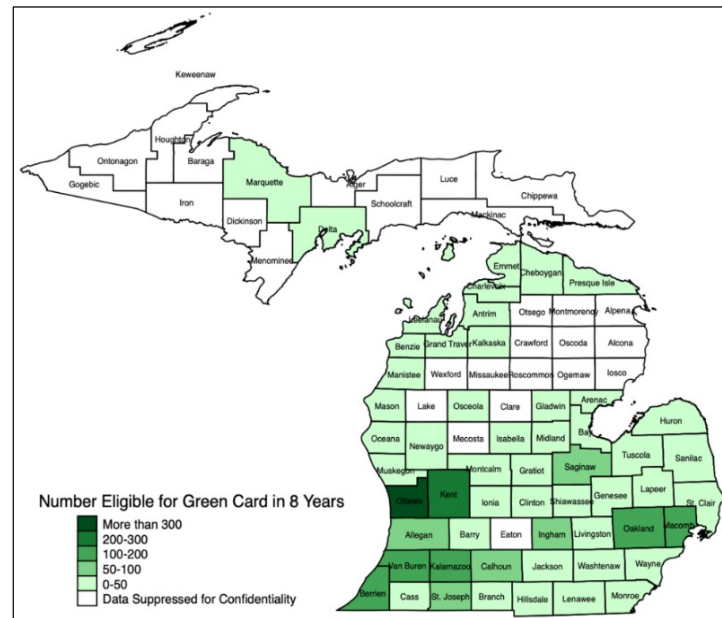


Figure 3: Minimum number of crop farmworkers eligible for permanent resident status after eight years.

Implications for Michigan

Regularization of undocumented farmworkers has important implications for Michigan's rural communities. Farmworker advocates have long sought a pathway to legal status and argue it would reduce worker vulnerability and promote employee welfare.

From a production standpoint, regularization could pose new production challenges if employees leave agricultural work for other sectors of the economy once they obtain a green card. This type of trend would likely lead to increased demand for the H-2A visa program – which typically is more costly and administratively burdensome.

The FWMA contains provisions for changing the H-2A program rules to make it easier and more efficient for producers to use, including a cap on the minimum wages paid to H-2A employees and a fixed number of multi-year visas for employees to work in dairy, livestock, and other year-round industries that are currently ineligible for the H-2A program.

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Footnote: Estimates for CAW eligibility in counties not mentioned in the article can be found at https://www.zachrutledge.com/uploads/1/2/5/6/125679559/online_table.pdf.

The state of foreign ownership of U.S. agricultural land

David L. Ortega and Lin Lin, Michigan State University
Department of Agricultural, Food, and Resource Economics



David Ortega

Lin Lin

The rise in foreign holdings of agricultural land in the U.S. has generated significant interest across both public and private sectors in recent years. Foreign holdings have been viewed as a threat to the food and national security, and concerns have also been raised regarding its impact on American farmers' livelihood.

Foreign holdings of U.S. agricultural land must be reported to the U.S. Department of Agriculture (USDA) according to the 1978 Agricultural Foreign Investment Disclosure Act (AFIDA) (Brown, 2023a). Agricultural land, as defined by AFIDA, includes land used within the past five years for farming, ranching, forestry, or timber production that exceeds 10 acres in the aggregate, or has annual gross receipts above \$1,000 U.S. from the sale of the farm, ranch, or timber products (7 C.F.R. § 781.2(b), 1993).

As of 2022, foreign holdings of agricultural land account for just 3.4% (43.4 million of the 1.3 billion acres) of privately held agricultural land in the U.S. across all 50 states (USDA, 2023). The amount of foreign-owned agricultural land has increased by 67% since 2011. According to the USDA, here's how foreign-held agricultural land is categorized by use:

- 48% is forest land (timber or forest)
- 28% is cropland
- 21% is pastureland and other agricultural land

Three states with the largest acreage of foreign-held agricultural land are Texas, Maine, and Colorado (Figure 1). Except for Maine, foreign holdings of U.S. agricultural land are concentrated in the western and southern parts of the U.S. (USDA, 2023). From 2012 to 2017, foreign holdings of agricultural land increased modestly by an average of 0.6 million acres per year. Since 2017, the number has risen to an average of 2.9 million acres increase per year (USDA, 2023). Over the 10 years, while an increase in foreign holdings is observed in all categories of agricultural land, the most significant change is the 145% increase in foreign-held cropland, with the change largely due to transactions of some wind energy companies on a large amount of land (USDA, 2023).

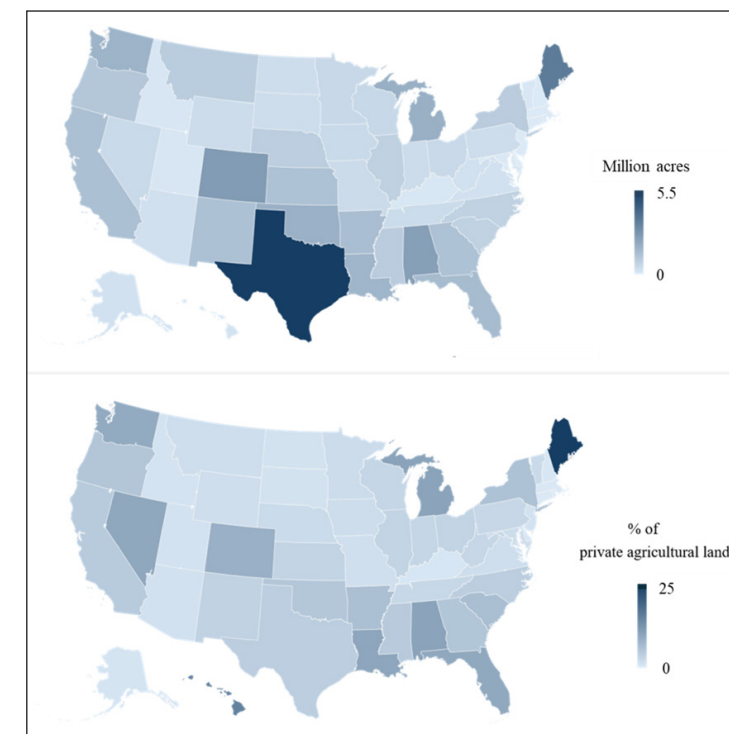


Figure 1. Foreign holdings of state agricultural land as of 2022.
Data source: USDA (2023).

Some of the biggest foreign investors of U.S. agricultural land are from Canada and European countries such as the Netherlands, Italy, the United Kingdom, and Germany (Figure 2). Together, they contribute to more than half of the total foreign-held agricultural land (USDA, 2023). Canadian investors alone account for 32% of the total foreign-held U.S. agricultural land, with 55% of the land it holds being forest land, and 36% being cropland (USDA, 2023).