ST. LOUIS REGIONAL FOODSHED STUDY

MISSOURI COALITION
FOR THE ENVIRONMENT

2024

St. Louis Regional Foodshed Study - 2024

The Missouri Coalition for the Environment is grateful for the valuable support of its many individual and foundation donors who make our work possible. Thank you.

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INTRODUCTION

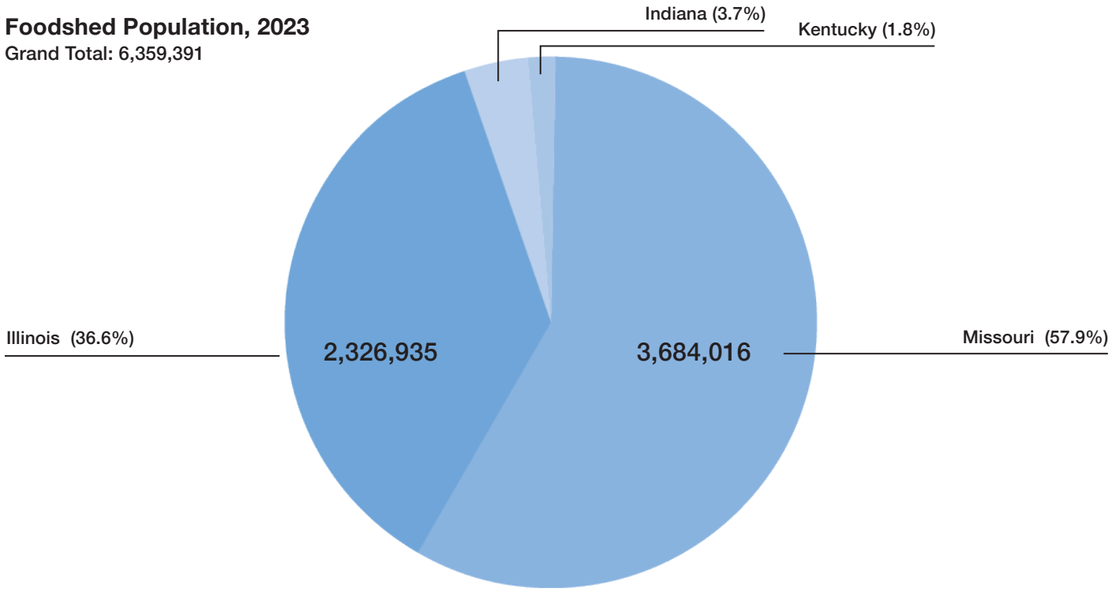
Our food system is often perceived as an agricultural issue, rather than as one that is interlinked with climate change. However, practices employed by large-scale agriculture have significantly exacerbated the ecological crisis. Techniques such as monoculture—the cultivation of a single crop in a given area over several consecutive seasons—have detrimental effects on our air, food, land, and water. Monoculture depletes soil nutrients and fertility, making the land more vulnerable and leading to increased use of pesticides and fertilizers, which creates a vicious cycle. This overuse contaminates the atmosphere and contributes to greenhouse gas emissions through the disposal, transportation, and manufacturing of these chemicals. Many fertilizers are derived from fossil fuels, further intensifying the greenhouse effect and affecting global temperatures. The majority of American cropland is dominated by large-scale farming. Thus, agriculture is a crucial piece of the climate change puzzle.

Individuals can help address this issue by prioritizing foods grown with environmentally-responsible practices, reducing fossil fuel dependence, and enhancing soil health. Supporting local farms that incorporate sustainable farming practices such as polyculture or seasonal crop rotation helps to maintain soil vitality and minimizes the use of chemical pesticides and fertilizers. As consumers, we can choose organic products, support small-scale vendors over large-scale operations, and vote for politicians who advocate for sustainable farming practices.

The 2024 St. Louis Regional Foodshed Study will examine the population, land, economy, and food production processes within the St. Louis Regional Foodshed, highlighting how large-scale agriculture and farmland consolidation are worsening environmental issues that impact the pace of climate change. Missouri Coalition for the Environment releases an update to this study every five years when the U.S. Department of Agriculture releases new agricultural data in its Census of Agriculture. We hope that by reading this study, readers will feel empowered to advocate for change in the food and farming components of the climate change puzzle.

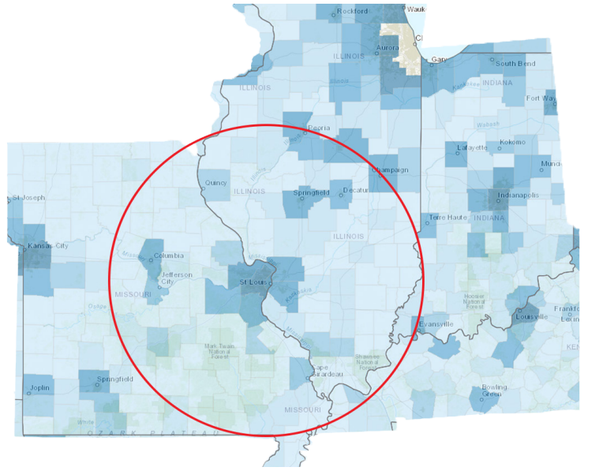
1 POPULATION

Foodshed Population, 2023
Grand Total: 6,359,391

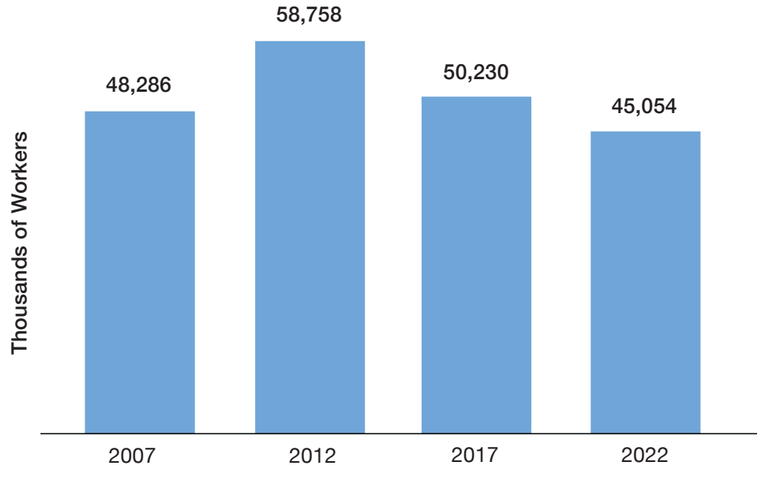


The St. Louis Regional Foodshed spans the 150-mile radius around St. Louis City. The Foodshed radius encompasses 129 counties across four states[1]—Missouri, Illinois, Indiana, and Kentucky. In this diverse landscape, the populations across these four states contribute significantly to the overall dynamics of the Foodshed. As of 2023, together, these states' populations within the Foodshed totaled 6,359,391.[2] Our hope is to help residents of the Foodshed better understand the relationship between our land, environment, food, health, and economy within our region.

The "urban core" of the region contains the Missouri counties of St. Louis City, St. Louis County, St. Charles, and Jefferson, and the Illinois counties of Monroe, St. Clair, and Madison. These urban core counties are home to 35% of the Foodshed's population. The St. Louis Regional Foodshed is a diverse system of different markets, regulations, and populations, creating an interconnected food system.



Hired Farm Workers in Foodshed, 2007-2022



The number of hired farm workers in the Foodshed has steadily decreased since 2012, with 45,054 people hired[3] as farm labor in 2022. As shown in the graph above, the Foodshed's agricultural workforce declined by approximately 10% between 2017 and 2022. This decline is caused by many interrelating factors including labor shortages, immigration policy,[4] developments in agricultural technologies that increase farm productivity while decreasing the need for manual labor, and a decrease in total number of farms.[5] Indeed, from 2017 to 2022, the total number of farms in the Foodshed decreased by about 7%, from 87,885 to 82,011.[6]

While only 1% of the Foodshed's workforce is directly employed by the agriculture sector, every individual has an economic impact on the Foodshed when they choose how to spend their money on food. To support local farmers in our Foodshed, consumers should make an effort to buy locally-grown products when available. Buying fresh, locally-grown products has other benefits as well — these foods often taste better, have more nutrients, and leave a smaller carbon footprint than those that travel thousands of miles to reach your table.[7] By analyzing agricultural trends relating to land use and the economy in the next two chapters, we hope to inspire readers to ask more questions about where our food comes from and how we can foster sustainable agricultural practices as Foodshed consumers.

[1] Moniteau, MO; Monroe, MO; Montgomery, MO; Morgan, MO; New Madrid, MO; Oregon, MO; Osage, MO; Perry, MO; Phelps, MO; Pike, MO; Pulaski, MO; Ralls, MO; Randolph, MO; Reynolds, MO; Ripley, MO; St. Charles, MO; Ste. Genevieve, MO; St. Francois, MO; St. Louis, MO; St. Louis City, MO; Scott, MO; Shannon, MO; Shelby, MO; Stoddard, MO; Texas, MO; Warren, MO; Washington, MO; Wayne, MO; Adams, IL; Alexander, IL; Bond, IL; Brown, IL: Calhoun, IL; Cass, IL; Christian, IL: Clark, IL; Clay, IL; Clinton, IL; Coles, IL; Crawford, IL; Cumberland, IL; De Witt, IL; Douglas, IL; Edwards, IL; Effingham, IL; Fayette, IL; Frankling, IL; Fulton, IL; Gallatin, IL; Greene, IL; Hamilton, IL; Hancock, IL; Hardin, IL; Jackson, IL; Jasper, IL; Jefferson, IL; Jersey, IL; Johnson, IL; Lawrence, IL; Logan, IL; McDonough, IL; McLean, IL; Macon, IL; Macoupin, IL; Madison, IL; Marion, IL; Mason, IL; Massac, IL; Menard, IL; Monroe, IL; Montgomery, IL; Morgan, IL; Moultrie, IL; Perry, IL; Piatt, IL; Pike, IL; Pope, IL; Pulaski, IL; Randolph, IL; Richland, IL; St. Clair, IL; Saline, IL; Sangamon, IL; Schuyler, IL; Scott, IL; Shelby, IL; Tazewell, IL; Union, IL; Wabash, IL; Washington, IL; Wayne, IL; White, IL; Williamson, IL; Gibson, IN; Posey, IN; Vanderburgh, IN; Ballard, KY; Carlisle, KY; Crittenden, KY; Livingston, KY; McCracken, KY; Union, KY.

[2] County Totals: Annual Population Estimates, U.S. Census (August 2024), https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk (add geographies for Illinois, Indiana, Kentucky, and Missouri and then select counties in Foodshed).

[3] 2022 Census of Agriculture. USDA, National Agricultural Statistics Service, 2019. Vol. 1, Chapter 2: County Level Data. Missouri, Table 7. Hired Farm Labor -- Workers and Payroll: 2022.; 2017 Census of Agriculture. USDA, National Agricultural Statistics Service, 2022. Vol. 1, Chapter 2, County Level Data. Illinois, Table 7. Hired Farm Labor -- Workers and Payroll: 2022.; 2022 Census of Agriculture. USDA, National Agricultural Statistics Service, 2022. Vol. 1, Chapter 2, County Level Data. Indiana, Table 7. Hired Farm Labor -- Workers and Payroll: 2022.; 2022 Census of Agriculture. USDA, National Agricultural Statistics Service, 2022. Vol. 1, Chapter 2, County Level Data. Kentucky, Table 7. Hired Farm Labor -- Workers and Payroll: 2022. (Hereinafter any reference to a 2022 Census of Agriculture Table is referencing each table of the same name in the County Level Data for each state in the St. Louis Regional Foodshed).

[4] Alejandro Gutiérrez-Li, "Feeding America: How Immigrants Sustain US Agriculture" (Houston: Rice University's Baker Institute for Public Policy, July 19, 2024), https://doi.org/10.25613/Z5BY-GZ22.

[5] Mehrabi, Z. Likely decline in the number of farms globally by the middle of the century. Nat Sustain 6, 949–954 (2023). https://doi.org/10.1038/s41893-023-01110-y.

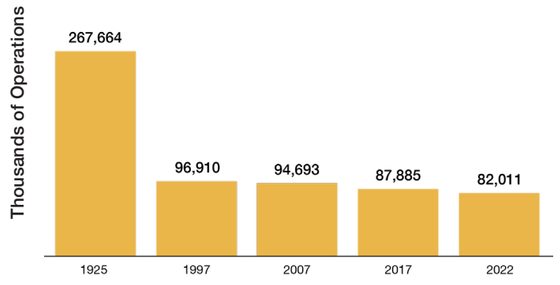
[6] 2022 Census of Agriculture, Table 8. Farms, Land in Farms, Value of Land and Buildings, and Land Use: 2022 and 2017.

[7] Magdoff, Fredd and Harold Van Es. "Building Soils for Better Crops," 4th ed., Series 10. Sustainable Agriculture Research & Education. 2021. https://www.sare.org/wp-content/uploads/Building-Soils-for-Better-Crops.pdf.

2 LAND

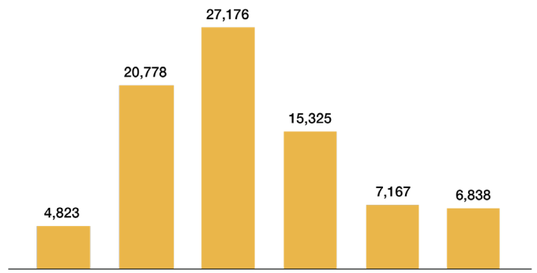
The St. Louis Regional Foodshed encompasses 43,919,986 acres of land,[8] dedicating much to farming and agricultural operations. In 2022, there were 82,011 farms operating within the Foodshed – a decrease since 2017, when there were 87,885 farming operations.[9] The counties with the most farm operations in 2022 were in Missouri: Franklin County with 1,657 operations and McLean County with 1,488 operations.[10] While the USDA Census of Agriculture provided no data for St. Louis City, we know from partners on the ground that numerous urban farms have started in the City in recent decades.

Number of Farm Operations in Foodshed, 1925-2022



The data in the table above depicts the number of farm operations in the Foodshed over time. Since 1925, farm consolidation has steadily increased, with smaller farms merging into larger ones. This trend is the result of several factors, including: government policies that disproportionately support large farms over small ones; technological advancements that benefit only farms large enough to afford them; labor shortages; and the irreversible destruction of workable farmland due to urban sprawl. As a result, the number of farms has decreased while the size and productivity of the remaining farms have grown.

Number of Farms by Farm Size, 2022

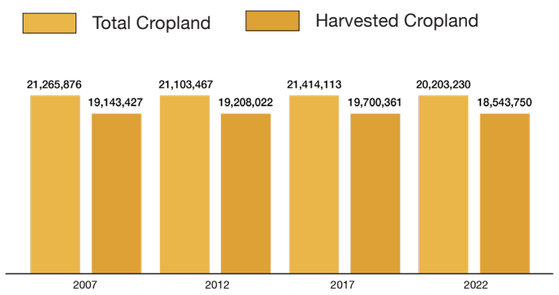


In 2022, the average farm size in the Foodshed was 373 acres, which falls into the "large farm" category. The graph above illustrates the number of farms in each farm size in the Foodshed in 2022. Since 2017, the Foodshed's total acreage of very small farms (1-9 acres) decreased by 28.7% since 2017, from 6,766 to 4,823 acres. In that same time, small farms (10-49 acres) decreased by 3%, mid-sized farms (50-179 acres) decreased by 5%, and large farms (180-499 acres) dropped by 10%. Very large farms (500-999 acres) decreased by 8% and the largest category - farms exceeding 1,000 acres - fell by 10%.[11]

The data indicates a general decline in very small and mid-sized farms from 2017 to 2022. This trend may reflect the consolidation of smaller operations or economic pressures that make it difficult for these farms to continue. The average farm size of 373 acres highlights how larger farms are enduring while smaller farms continue to decline. In contrast, while there is a decrease in the largest two categories of farms, it is less severe, suggesting that larger operations may be better equipped to handle economic challenges or are absorbing smaller farms.

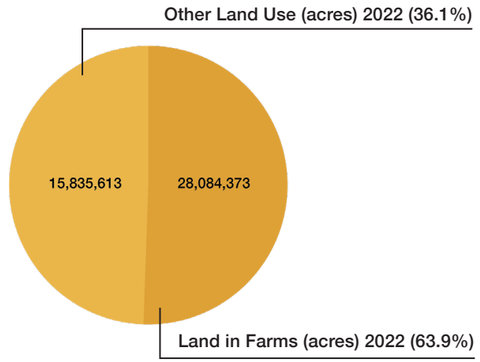
In 2017, approximately 66.1% of the Foodshed land, or 29,035,361 acres, was classified as "land in farms."[12] The USDA defines "land in farms" as agricultural land used for crops, pasture, or grazing, it also includes woodland and wasteland. By 2022, this percentage decreased to 63.9% or 28,084,373 acres of land in farms. Farmland decrease is likely due to urban sprawl and other development pressures farmers have endured over the past five years. Other land use in 2022 made up 36.1%, or 15,835,613 acres, in the Foodshed.[13]

Total Cropland and Harvested Cropland



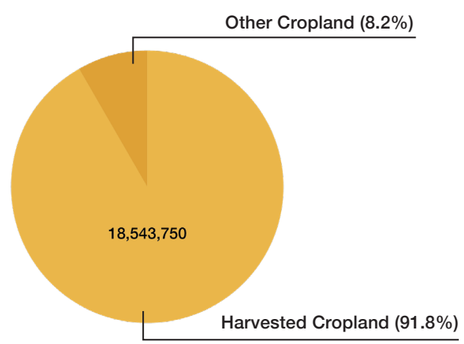
Although the increase of cropland that was not harvested is a positive, its portion of total cropland still remains low and reflects that generally, farms in the Foodshed are maximizing the amount of land they can farm as much as possible. With less land remaining idle, there is now an increased risk of soil degradation and higher reliance on fertilizers, which could worsen water pollution through runoff and groundwater seepage. As agricultural practices intensify, it is crucial to monitor these changes to mitigate environmental impacts.

Land in Farm as Proportion of Total Foodshed Land, 2022



Both the total cropland and harvested cropland in our Foodshed decreased from 2017 to 2022. In 2017, total cropland covered 21,414,113 acres, but by 2022, it had reduced to 20,203,230 acres.[14] Harvested cropland also fell from 19,700,361 acres in 2017 to 18,543,750 acres in 2022. However, the proportion of harvested cropland remained relatively stable, with a slight decrease from 91.9% in 2017 to 91.8% in 2022, leaving 8.2% unharvested.[15] This trend could indicate that farmers are seeing the value of letting a small portion of their land to lay fallow, allowing that land's soil microbes to rest from constant nutrient availability for crops. This trend could also reflect degradation or crop loss on the unharvested cropland.

Harvested Cropland as a Percentage of Total Foodshed Cropland acres, 2022

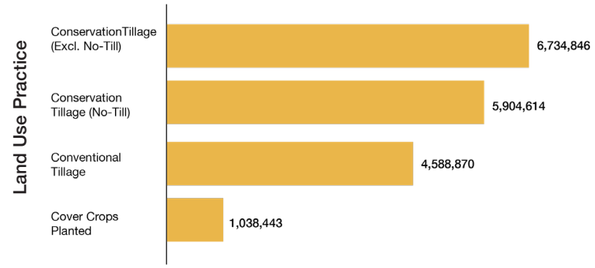


ON FARM CONSERVATION PRACTICES

Additionally, farmers may leave cropland unharvested where crops have failed or been abandoned, and use land for summer fallow, cover crops, or soil improvement that is not pastured or grazed. Conversion of pastures and grazing areas into cropland may also occur with further improvements.

The management of cropland in 2022 reveals a diverse range of practices. The figure below shows the acreage devoted to different land use practices across the Foodshed in 2022.

Cropland Practices by Acreage, 2022



The data reveals an emphasis on conservation tillage practices within land use. Conservation tillage, excluding no-till, covers a substantial 6,734,846 acres, while no-till accounts for an additional 5,904,614 acres.[16] This indicates a large number of farmers see the benefit of using practices that protect soil health and minimize disturbance across a significant portion of farmland.

Cover crops are used on 1,038,443 acres, which, while smaller in comparison to conservation tillage, still represents a notable effort to enhance soil health and prevent erosion.[17] The desire by farmers in the Foodshed to use cover crops far exceeds what

"ANECDOTES FROM FARMERS AND FEDERAL POLICY REPORTS ILLUSTRATE THAT MANY FARMERS ARE NOT ABLE TO IMPLEMENT COVER CROPS ON THEIR FARMS WITHOUT GOVERNMENT ASSISTANCE SO IT IS LIKELY THAT THE ACREAGE DESIGNATED TO COVER CROPS IN THE FOODSHED WOULD BE FAR HIGHER IF THE FEDERAL GOVERNMENT INCREASED FUNDING FOR THE CSP PROGRAM."

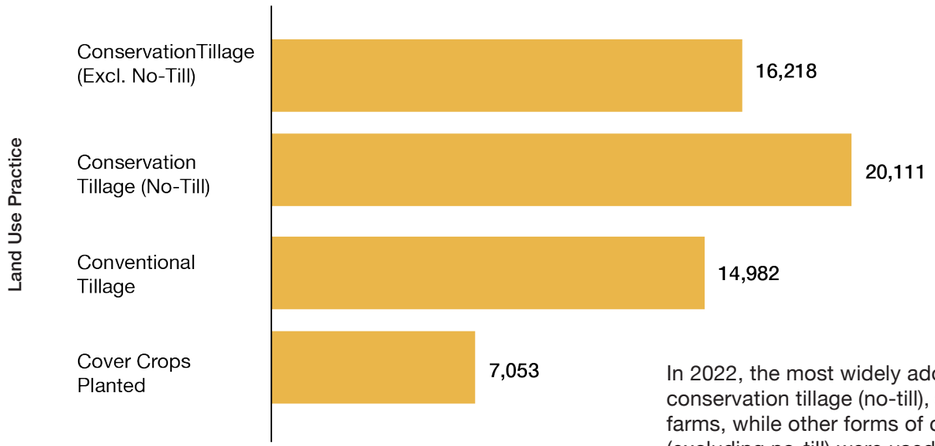
one might think by comparing this acreage to the acreage where farmers use conservation tillage and no-till. The federal Conservation Stewardship Program (CSP) provides funding to farmers to implement conservation practices on their farms and cover crops are the most common practice implemented with these funds in all four states of the Foodshed. Unfortunately, far more farmers apply for CSP funds than the federal government gives these states for farmers, as seen in the table below.[18]

State Rank	State Name	2020 CSP Applications	2020 CSP Contracts	% of Applicants Awarded Contracts
24	Kentucky	563	230	41%
27	Illinois	1,245	428	34%
31	Missouri	1,608	490	30%
32	Indiana	372	103	28%

Anecdotes from farmers and federal policy reports illustrate that many farmers are not able to implement cover crops on their farms without government assistance so it is likely that the acreage designated to cover crops in the Foodshed would be far higher if the federal government increased funding for the CSP program. Readers who are interested in learning more about how to advocate for more CSP funds can visit MCE's webpages about the federal Farm Bill.

The table below illustrates the number of operations that used each of these important conservation land use practices in 2022.

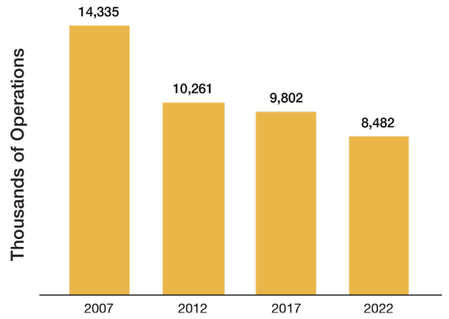
Cropland Practices by Number of Operations, 2022



In 2022, the most widely adopted practice was conservation tillage (no-till), employed by 20,111 farms, while other forms of conservation tillage (excluding no-till) were used on 16,218 farms. Reducing soil disturbance through conservation tillage practices offers considerable benefits for farmers and the environment compared to conventional tillage. It is encouraging to see that conservation tillage is more prevalent than conventional tillage, and we anticipate this gap will continue to widen in the coming years.

Cover crops play a crucial role in protecting soil from erosion and providing various benefits for farmers. And as stated earlier, although the number of operations planting cover crops is relatively low, this practice is the most common among those for which farmers seek government conservation funds. Thus, recognizing the value of cover crops through financial incentives and government support remains vital for widespread adoption.

Operations Using Rotational Grazing, 2017-2022



Additionally, rotational grazing practices have decreased significantly from 2007 to 2022. This trend mirrors the broader shift observed in farmland, with most livestock animals being raised in confinement in the Foodshed. Rotational grazing practices are generally advantageous for farmland. They improve soil health by allowing pastures to recover, enhance grassland productivity, reduce erosion, and support biodiversity. These practices help maintain a healthy ecosystem and can lead to more resilient and productive pastures.[19]

However, they do come with challenges, such as the need for initial investment in infrastructure, careful management to prevent overgrazing, and the time and labor required for effective implementation. Despite these challenges, rotational grazing practices, when executed properly, offer significant benefits for sustainable land management.

With the total area of farmland in the Foodshed diminishing and cropland practices still signaling intensification of agricultural practices, the Foodshed farmland is at risk for diminished soil health and overall environmental quality. Policy changes are needed to promote mid-sized farms and enhance the adoption of conservation land use practices to better safeguard our land. Initiatives like the Known and Grown STL program aim to encourage conservation practices and rotational grazing within the St. Louis Regional Foodshed, supporting more sustainable land management and farming practices.

[8] 2022 Census of Agriculture, Table 8. Farms, Land in Farms,Value of Land and Buildings, and Land Use: 2022 and 2017

[9] 2022 Census of Agriculture, Table 8. Farms, Land in Farms, Value of Land and Buildings, and Land Use: 2022 and 2017.

[10] 2022 Census of Agriculture, Table 8. Farms, Land in Farms, Value of Land and Buildings, and Land Use: 2022 and 2017.

[11] 2022 Census of Agriculture, Table 8. Farms, Land in Farms, Value of Land and Buildings, and Land Use: 2022 and 2017.

[12] Census of Agriculture, Appendix B. Nat'l Agric. Statistics Serv., USDA. https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_2_County_Level/Missouri/moappxb.pdf.

[13] 2022 Census of Agriculture, Table 8. Farms, Land in Farms, Value of Land and Buildings, and Land Use: 2022 and 2017.

[14] 2022 Census of Agriculture, Table 8. Farms, Land in Farms, Value of Land and Buildings, and Land Use: 2022 and 2017.

[15] 2022 Census of Agriculture, Table 9. Harvested Cropland by Size of Farm and Acres Harvested: 2022 and 2017.

[16] 2022 Census of Agriculture, Table 41. Land Use Practices: 2022 and 2017.

[17] 2022 Census of Agriculture, Table 41. Land Use Practices: 2022 and 2017.

[18] *See Closed out: How U.S. farmers are denied access to conservation programs,* National Sustainable Agriculture Coalition (September 13, 2021), https://sustainableagriculture.net/blog/closed-out-how-u-s-farmers-are-denied-access-to-conservation-programs/.

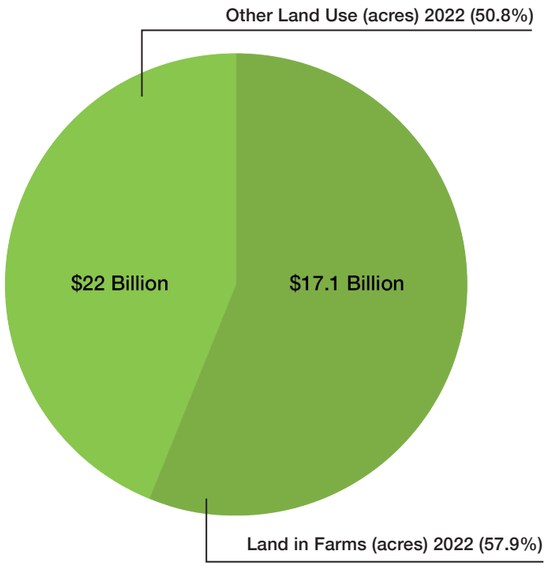
[19] 2022 Census of Agriculture, Table 41. Land Use Practices: 2022 and 2017.

3 FOOD ECONOMY

MONEY SPENT AND THE BREAKDOWN OF THE "FOOD DOLLAR"

Food is a necessity on which our Foodshed residents spend a significant amount of money. In 2017, it is estimated that the Foodshed's six million residents spent an estimated $29.6 billion on food.[20] The total estimate was extrapolated from national per capita food expenditure data and adjusted to current dollar values. This trend only increased in 2022. Spending on "food at home" reached an estimated $17.1 billion, while expenditures on "food away from home" soared to $22 billion. The total spending on all food amounted to $39.1 billion, illustrating a notable increase in the economic focus on dining out.[21] This shift highlights the growing dependence on food spent away from home and the rising cost of food spent away from home. The increased costs are driven by rising expenditures at restaurants and other food service establishments. This trend raises concerns as the gap between food spent at home and away from home widens. Not only does this impact nutritional and health outcomes, but it also affects various food production sectors.

Total Amount Spent on Food in Foodshed, 2022



WHO GETS OUR FOOD DOLLARS

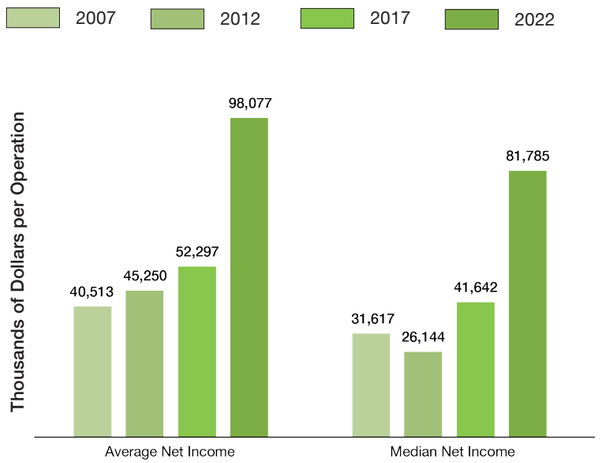
The food service industries are increasingly concentrating on the distribution of food dollars. For instance, in 2017, farmers and ranchers received only 7.8 cents per dollar spent on food, a share that had been declining over recent years. However, it is likely that due to the increased investment in local food purchasing during the 2020 global pandemic while conventional supply chain disruptions occurred, farmers and ranchers saw an increase to a record 8.1 cents per dollar in 2021. In 2022, this share slightly decreased to 8.0 cents per dollar, reflecting the economic impacts on the farming sector in the post-COVID-19 era.[22] Although there were slight increases in farm production share between 2002-2003 and 2009-2013, the trend has been largely downward.

This decrease in the farm production share is part of a broader pattern affecting most sectors of the food industry, with a rapid increase in the share of food dollars going to food services. This shift is partly due to higher costs associated with food away from home, which involves more middlemen and additional service premiums. For example, services like UberEats add significant costs to meals due to restaurant preparation, delivery fees, and platform charges.

FARM INCOME

Farm income has changed substantially between 2017 and 2022. In 2017, the average net income of farm operations in the Foodshed was $52,297, with a median net income of $41,642. By 2022, the average net income had risen to $98,077, and the median net income increased to $81,785. This significant increase in farm income is a result of the federal investments made for farmers during the COVID-19 pandemic through the Inflation Reduction Act.[23]

Net Income of Farm Operations, 2007-2022



Part of the inequality in the food system is the reality that many individuals have limited access to transportation These individuals would benefit the most from food deliveries, yet the cost of delivery is often prohibitive or, if used, cuts significantly into food-insecure individuals' wallets. Policy advancements that make food delivery more affordable for food-insecure households, particularly in coordination with SNAP, WIC, and TANF users, could help ensure that those already utilizing government safety net programs can access the food resources covered by these programs through delivery services. This approach would support those most in need of assistance in accessing food.

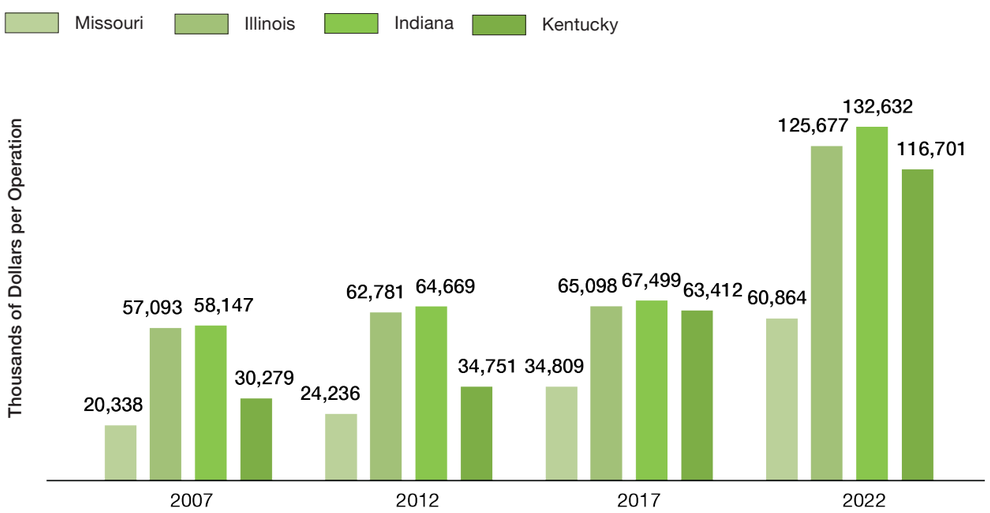
The smaller difference between average and median net incomes in 2017, compared to earlier years like 2012, suggests that most farm operations are now experiencing higher net incomes. This shift indicates that fewer operations with extremely high incomes skew the data. In 2022, the trend continues, with rising average net incomes and a more balanced distribution of incomes.

"SMALL TO MID-SIZED FARMS ARE DISAPPEARING DUE TO DIFFICULTY COMPETING WITH LARGE CORPORATIONS. THIS TREND RESULTS IN THE LOSS OF REGIONAL FARMS THAT SUPPLY INSTITUTIONS LIKE RESTAURANTS AND RETAILERS."

COMPARING INCOMES BY STATE:

- **Missouri:** Increased from $34,809 in 2017 to $60,864 in 2022.
- **Illinois:** Rose from $65,098 in 2017 to $125,677 in 2022.
- **Indiana:** Jumped from $67,499 in 2017 to $132,632 in 2022.
- **Kentucky:** Increased from $63,412 in 2017 to $116,701 in 2022.[24]

Average Net Income of Farm Operations by State, 2007-2022
States only include countries in Foodshed (150 mile radius of St. Louis)



All states show an increase in average net income, which is promising for the local food economy. However, the farmland data in Chapter 2 reveals a national trend of large farms consolidating into even larger operations while small farms are increasing in number. Small to Mid-sized farms are disappearing due to difficulty competing with large corporations. This trend results in the loss of regional farms that supply institutions like restaurants and retailers.

Residents should encourage restaurants to source locally in addition to supporting local farmers through increased purchases of local produce. This approach benefits the environment and the health of the St. Louis Regional Foodshed and strengthens the local economy. Keeping more food dollars within the region and supporting local agriculture can help reduce the economic and environmental costs associated with importing food.

In summary, the St. Louis Regional Foodshed food expenditure surged from $30.5 billion in 2017 to $39.17 billion in 2022, with a marked increase in spending on “food away from home.” This shift highlights a growing dependency on dining out and emphasizes the economic strain on farmers, who saw a modest increase in their share of the food dollar—from 7.8 cents in 2017 to 8.0 cents in 2022. Although average farm incomes rose significantly during this period, the consolidation of large farms and the decline of small to mid-sized operations pose challenges for the local food system. To address these issues and support local agriculture, residents should prioritize purchasing local produce and encourage local sourcing in restaurants, which would benefit both the economy and the environment.

[20] *See* Food Expenditure Series, USDA Economic Research Service (July 18, 2024), https://www.ers.usda.gov/data-products/food-expenditure-series/ (choose Table 6, “Normalized food expenditures by all purchasers and household final users” and find data under “All Purchasers”).

[21] *See* Food Expenditure Series, USDA Economic Research Service (July 18, 2024), https://www.ers.usda.gov/data-products/food-expenditure-series/ (choose Table 6, “Normalized food expenditures by all purchasers and household final users” and find data under “All Purchasers”).

[22] "Quick Facts." *Food Dollar Series,* Economic Research Service, U.S. Department of Agriculture, 15 July 2023, www.ers.usda.gov/data-products/food-dollar-series/quick-facts/.

[23] 2022 Census of Agriculture, Table 4. Net Cash Farm Income of the Operations and Producers: 2022 and 2017.

[24] 2022 Census of Agriculture, Table 4. Net Cash Farm Income of the Operations and Producers: 2022 and 2017.

4 WHAT WE GROW

The St. Louis Regional Foodshed's landscape in 2022 was marked by notable shifts in cropland use compared to 2017.

First, there has been a noticeable reduction in the total acreage dedicated to “Food System” crops,[25] decreasing from 19.9 million in 2017 to 18.6 million in 2022.[26] This reduction suggests a potential land use shift within the Foodshed. However, the persistent focus on “Food System” crops reflects the ongoing national trend of specialization in agriculture. Crop specialization is driven by economic factors, technological advancements, and favors commodity crops for export. However, it can come with environmental costs, such as soil degradation and reduced crop diversity.

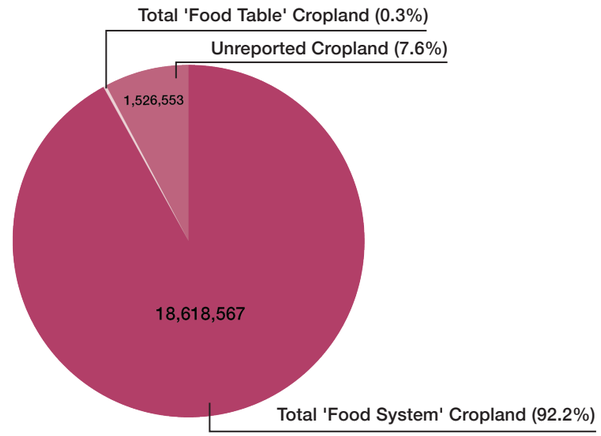
The contrast between the extensive land used for "Food System" crops and the relatively small acreage dedicated to "Food Table" crops highlights an imbalance in crop production. This disparity underscores the need for greater diversification in agricultural practices. By enhancing local food security and sustainability, our Foodshed can benefit from a more holistic approach to crop production—balancing the current trend of specialization with a renewed focus on diverse and environmentally responsible farming practices.

MCE encourages farms within the Foodshed to grow more “Food Table” crops with which we can feed our region. Our 2019 St. Louis Farm to Institution Feasibility Study found that there is increasing demand from consumers for “Food Table” crops grown with environmentally-responsible practices. To accommodate this demand, MCE launched the Known & Grown STL program to help educate environmentally-conscious consumers by promoting local farmers employing sustainable practices. We encourage those who live within 150 miles of St. Louis to purchase from farmers in the Known & Grown STL program as much as possible.

It is important to note that the USDA’s Census of Agriculture does not report the total number of acres designated to a specific crop at the county level when a county has fewer than three farms producing a specific product or when the data could reveal individual farm details. For instance, while no acreage for artichokes is reported in our Foodshed, the census indicates that farms in two counties do grow this crop. As fewer farms produce "Food Table" crops and more operations focus on "Food System" crops, much of the acreage for vegetables, fruits, and tree nuts was excluded from the 2022 Census of Agriculture. Recent examples include cantaloupe, honeydew, and watermelon, which were removed from the 2022 Census of Agriculture due to their minimal production.

Graph 4.1 shows the distribution of Foodshed land dedicated to various cropland categories. "Food Table" crops account for 0.3% of the land, while "Food System" crops make up 92.2%. Unreported cropland comprises 7.6%, and "Non-Food" crops represent a negligible 0.03%, too small to be depicted on the pie chart.[27]

Graph 4.1 Cropland Acreage by Contribution to Food System, 2022



Crop (Non-Food)	Acres Harvested (Reported)	Counties w/ Unreported Acreage/ Total Counties Producing Crop
Aquatic Plants	2	0/1
Bedding Plants Totals	107	36/53
Bulbs & Corns, etc	7	3/6
Cut Christmas Trees	1,142	37/63
Cut Flowers/Cultivated Greens	121	32/44
Flowering Plants, Potted	8	23/28
Flower Seeds	12	14/16
Foliage Plants	0	8/8

Crop (Non-Food)	Acres Harvested (Reported)	Counties w/ Unreported Acreage/ Total Counties Producing Crop
Grasses & Legumes	5,371	17/27
Hops	3	5/6
Miscanthus	67	3/4
Propagative Material	8	9/11
Short Term Woody Crops	0	0/8
Sod	0	0/0
Sunflower	46	12/15
Tobacco	50	2/4

McLean and Sangamon counties in Illinois remained the top producers of "Food System" crops. McLean County reported a total of 447,437 acres, while Sangamon County reported 421,722 acres. This represents a reduction from 2017, when McLean County recorded 580,678 acres and Sangamon County recorded 483,093 acres.[28]

In contrast, Mason County, Illinois has increased its acreage for “Food Table” crops from 24,371 in 2017 to 31,201 acres in 2022, indicating a growing recognition of the value of producing diverse, locally consumed crops. This change may reflect a rising consumer demand for such produce, which promotes sustainable farming practices.

The graph also highlights that in 2022, data for 7.6% of the land, or 1.5 million acres, was withdrawn by the USDA. Since this land was unreported, it is impossible to tell what type of crop may have been on these acres. One small portion of Foodshed cropland—6,895 acres, or 0.03%—is used to grow “Non-Food” crops. These “Non-Food” crops are shown in the chart below. Grasses and legumes being the most harvested crop.

“Food Table” crops were reported to be grown on only 0.3% of our total Foodshed cropland. This tiny portion amounts to 51,215 acres of land.[29] “Food Table” crops are essentially fruits and vegetables that are ready to be eaten with minimal processing. The very small percentage of land dedicated to growing these directly consumable foods indicates again that our Foodshed is not growing food for people in the region to eat, resulting in the need to import fresh food, causing food dollars to leave the region. The tables below display data for the different vegetables, fruits, and tree nuts grown in our Foodshed. Pumpkins were the most harvested vegetable, apples the most harvested fruit, and pecans the most harvested nut.

Crop (Vegetable)	Acres Harvested (Reported)	Counties w/ Unreported Acreage/ Total Counties Producing Crop
Artichokes	0	2/2
Asparagus	25	35/45
Beans, Green, Lima	1	3/4
Beans, SNAP	7,590	48/72
Beets	6	33/38
Broccoli	10	30/34
Brussel Sprouts	0	13/13
Cabbage, Chinese	1	22/23
Cabbage, Head	48	32/45
Cabbage, Mustard	0	6/6
Carrots	8	22/28
Cauliflower	2	20/22
Celery	0	9/9
Chicory	0	8/8
Cucumbers	95	35/68
Daikon	2	5/6
Eggplant	21	28/34
Escarole & Endive	1	4/5
Garlic	18	29/40
Ginger Root	0	4/4
Greens, Collard	8	16/17
Greens, Kale	18	26/34
Greens, Mustard	11	12/13
Greens, Turnip	11	10/11
Herbs, Dry	0	0/0
Herbs, Fresh Cut	11	22/31
Horseradish	1,633	9/12
Lettuce	20	36/52
Mushrooms	0.4	12/20
Okra	11	31/39
Olives	0	1/1
Onions, Dry	18	31/42
Onions, Green	8	29/37
Parsley	1	9/10
Peas, Chinese (Sugar & Snow)	3	16/17
Peas, Green (Excl. Southern)	2	17/18
Peas, Green, Southern (CowPeas)	0	0/0
Peppers, Bell	99	35/67
Peppers, Chile	38	36/56
Potatoes	43	48/67
Pumpkins	11,791	44/86
Radishes	11	29/37
Rhubarb	3	17/18
Spinach	3	28/31
Squash	128	47/70
Sweet Corn	2,002	52/84
Sweet Potatoes	15	22/31
Taro	0	0/0
Tomatoes, In the Open	337	42/94
Turnips	7	20/26
Watercress	0	2/2
Vegetable Seeds, In the Open	0	0/0
Vegetable Seeds, Under Protection	9,167	15/19
Vegetable Seeds, Other	20	16/23

Crop (Fruit & Tree Nuts)	Acres Harvested (Reported)	Counties w/ Unreported Acreage/ Total Counties Producing Crop
Almonds	0	2/2
Apples	307	41/70
Apricots	0	4/4
Aronia Berries	3	6/7
Berries, Other	0	0/0
Blackberries	119	51/74
Blueberries	84	41/56
Cherries, Sweet	4	11/14
Cherries, Tart	7	26/29
Chestnuts	66	16/20
Elderberries	74	17/20
Figs	2	5/7
Hazelnuts	1	6/7
Kumquats	0	0/0
Nectarines	0	9/9
Peaches	139	54/73
Pears	16	44/52
Pecans	334	44/55
Persimmons	6	16/19
Plums & Prunes	9	21/27
Pomergranates	0	1/1
Raspberries	10	25/30
Strawberries	53	50/60
Tree Nuts, Other	4	7/8
Walnuts, English	0	0/0

"THE EXTENSIVE CULTIVATION OF THESE CROPS OFTEN LEADS TO MONOCULTURE PRACTICES, WHICH CAN DEPLETE SOIL NUTRIENTS, REDUCE BIODIVERSITY, AND INCREASE VULNERABILITY TO PESTS AND DISEASES."

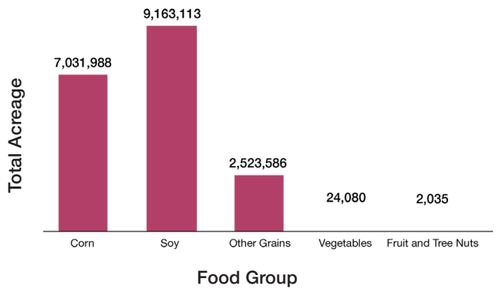
Crop (Food System)	Acres Harvested (Reported)	Counties w/ Unreported Acreage/ Total Counties Producing Crop
Barley	4,551	16/27
Buckwheat	0	0/0
Corn, Grain	6,983,022	2/121
Corn, Silage	48,966	22/92
Emmer & Spelt	0	3/3
Grapes	797	49/70
Hay	1,383,173	1/128
Haylage	147,437	7/125
Oats	3,260	9/35
Rice	97,942	4/10
Rye	5,852	31/45
Sorghum Grain	16,390	32/59
Sorghum Silage	665	15/19
Sorghum Syrup	0	1/1
Soybeans	9,163,113	3/122
Triticale	237	4/6
Wheat	763,159	5/115

The final category, “Food System” crops are largely used for livestock feed, oil, ethanol production, and processed foods. Farmers are encouraged to grow these products due to multiple federal agriculture programs. The federal Farm Bill continues to provide monetary assistance to farmers producing commodity crops such as corn and soybeans through the Farm Bill’s Commodity and Crop Insurance Titles—this effectively acts as a financial disincentive to grow specialty crops and employ sustainable agriculture practices. The largest two “Food System” crops throughout the country and within our Foodshed are corn and soybeans.

Our Foodshed grows 7,031,988 acres of corn for grain and silage and 9,163,113 acres of soybeans.[30] Nearly every county in the Foodshed cultivates one or both of these crops. The table above shows all “Food System” crops and their acreage, while the graph below illustrates the amount of acreage and production of food crops in our Foodshed, highlighting the predominance of corn and soy production above all other “Food System” crops.

The dominance of corn and soybeans in our Foodshed has significant implications for both local agriculture and the broader food system. The extensive cultivation of these crops often leads to monoculture practices, which can deplete soil nutrients, reduce biodiversity, and increase vulnerability to pests and diseases. Additionally, the focus on these commodity crops contributes to a reliance on large-scale agricultural systems and can limit the diversity of local food options. To address these challenges, it is crucial to promote crop diversification and support the cultivation of a wider variety of crops. By doing so, we can enhance soil health, improve resilience against environmental issues, and create a more balanced and sustainable food system that better meets the needs of our community.

Total Acreage Dedicated to Each Crop Category



[25] The definitions of “food system crops” and “food table crops” are detailed in the original 2014 St. Louis Regional Food Study. Vatterott, Melissa. *Saint Louis Regional Food Study.* www.moenvironment.org/our-work/sustainable-food.

[26] 2022 Census of Agriculture, Table 24. Selected Crops Harvested: 2022; Table 25. Field Crops: 2022 and 2017, and Table 26. Field Seeds, Grass Seeds, Forage, Hay, and Silage: 2022 and 2017.

[27] 2022 Census of Agriculture, Tables 24-29, 31.

[28] 2022 Census of Agriculture, Tables 24-26.

[29] 2022 Census of Agriculture, Tables 28-29, 31.

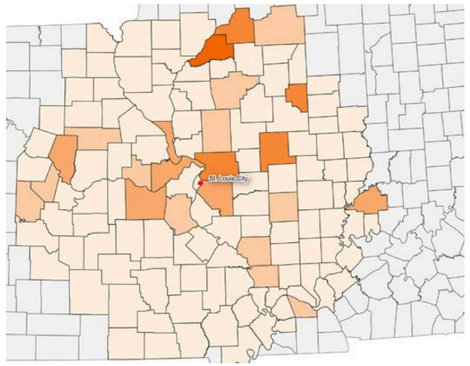
[30] 2022 Census of Agriculture, Table 26. Field Seeds, Grass Seeds, Forage, Hay, and Silage: 2022 and 2017.

5 WHAT WE RAISE

The St. Louis Regional Foodshed raises a variety of animals for products such as meat, wool, hair, and milk. Over 24 different types of animals were reported to be raised in the Foodshed by the 2022 USDA Census of Agriculture as shown in Figure 5-1. **In 2022, cattle calves were the most common type of animal raised in the Foodshed with at least one operation in all 128 counties raising the animals.**[31] However, the animals with the highest total inventory in the Foodshed were chickens raised specifically for chicken meat, also known as broilers. Discussion of trends for the most common animals raised in the Foodshed are later in this chapter.

"...WE CAN EXPECT THAT AS FARMS INTENSIFY THEIR PRODUCTION AND GROW IN SCALE, THERE WILL BE FEWER BUT LARGER LIVESTOCK FARMS IN OPERATION. THIS MEANS THAT EVEN IF THE NUMBER OF CAFOS ARE DECREASING, THEIR NEGATIVE IMPACT WILL INCREASE IF OPERATIONS GET BIGGER AND POLLUTE MORE. "

The map below shows the number of Concentrated Animal Feeding Operations or CAFOs spread across the counties. CAFOs in our Foodshed raise cattle, chickens, hogs, turkeys, and more indoors to produce meat, dairy, or eggs in huge quantities. These operations use processed “Food System” crops, such as corn, to feed their animals and emphasize maximizing output while minimizing input. However, CAFOs’ practices of livestock production create many environmental issues—waste from the operations pollutes surrounding water and air, negatively affecting the health of surrounding populations and the ecosystems of the connecting waterways. Visit MCE’s Concentrated Animal Feeding Operations webpage for more information on the impacts of CAFOs on our health and environment.[32]



Food Table Acres by County in Foodshed, 2017

- 0 - 59 acres
- 59 - 187 acres
- 187 - 439 acres
- 439 - 7,288 acres
- 7,288 - 24,371 acres

Figure 5-1 Animal Raised in Foodshed, 2022

Animal Type	Number of Animals in Inventory	Counties w/ Unreported Number/ Total Counties Raising Animal
Alpacas	1,180	24/44
Bison	263	20/25
Cattle, Including Calves	2,043,898	3/128
Cattle, Beef Cows	813,803	36/128
Cattle, Milk Cows	28,435,422	37/129
Chickens, Broilers	16,291,244	31/106
Chickens, Egg Layers	4,917,593,458	31/106
Chukars	8,126	6/10
Deer	1,182	12/21
Ducks	8,969	25/110
Elk	93	12/14
Emus	221	6/11
Horses & Ponies	48,899	2/128
Mules & Burros & Donkeys	5,966	15/123
Hogs	3,824,493	25/122
Geese	1,372	37/76
Goats, Total	48,215	6/125
Goats, Angora	366	32/44
Goats, Meat & Other	32,854	33/123
Goats, Milk	6,234	46/105
Guineas	5,190	26/96
Llamas	165	17/28
Ostriches	10	2/3
Peafowl, Hens & Cocks	783	35/57
Pheasants	728	12/19
Pigeons & Squab	606	16/22
Poultry, Other	0	1/1
Quail	31,449	22/36
Rabbits, Live	3,402	30/64
Sheep, Including Lambs	81,395	8/123
Turkeys	3,395,579	38/98

In 2013, our Foodshed had 481 Concentrated Animal Feeding Operations (CAFOs).[33] MCE was unable to find more recent CAFO data for the entire Foodshed; however, as of August 2024, Missouri had a total of 508 Concentrated Animal Feeding Operations.[34]

Although it would theoretically be better for our health for the number of CAFOs to decrease, we can expect that as farms intensify their production and grow in scale, there will be fewer but larger livestock farms in operation. This means that even if the number of CAFOs are decreasing, their negative impact will increase if operations get bigger and pollute more.

The growth and intensification of the agricultural industry has resulted in fewer local animal products being supplied to consumers. According to the federal bill H.R. 2933 (2020), the top four largest pork packers have controlled 71% of the national market over the past thirty years.[35] In the same time span, the top four beef, sheep, poultry, and fluid milk processors have controlled 85%, 57%, 53%, and 50% of the market, respectively. This oligopoly in agriculture has specifically resulted in a few companies controlling large CAFOs in Missouri. China's Smithfield Foods owns several operations in the Foodshed, as does Brazil's JBS. Since these large industrial producers are not locally owned, food dollars are leaving the region while also polluting local communities. Recent policy changes in the state of Missouri have significantly impacted the state of the Foodshed in terms of how its food production affects health. With the passage of Missouri Senate Bill 391 in 2019 and Missouri Supreme Court upholding its constitutionality in 2023, the Missouri General Assembly has prevented counties from passing regulations governing CAFOs that are more stringent than state rules. As a result, Missouri rural communities, particularly rural ones, cannot protect themselves from detrimental air and water pollution on the local level.

In order to promote the well-being of local farmers, grow a flourishing farm economy, and minimize the impact that CAFOs have on Foodshed residents, we need to prioritize competitive markets rather than allowing livestock production to be dominated by one or a few large companies. On an individual level, it is important to purchase animal products from local, environmentally responsible businesses such as those in the Known and Grown STL program.[36]

Figure 5-2 shows some environmental and human health impacts that may be caused by animal feeding operations. Missouri Coalition for the Environment is working to further analyze the impact CAFOs have on our Foodshed residents' health and the market for livestock production in order to advocate for healthier, more sustainable agriculture policies. Figure 5-3 shows a hog CAFO.

Figure 5-2 Potential Impacts of CAFO Pollutants[37]

Pollutant/Emission	Source	Health Risks/Environmental Impact
Water Pollution		
Nitrates	Land application of manure, leaching improperly spread manure, leaks or breaks in storage or containment units of manure	Blue baby syndrome; higher rates of stomach, esophageal, ovarian, and thyroid cancer; birth defects
Hormones		Alter reproductive habits of aquatic species and decreased fertility of fish
Fecal Bacteria, Pathogens		Fever, nausea, stomach cramps, typhoid fever, hepatitis, gastroenteritis, dysentery, and ear infections (contact through swimming)
Nitrogen/Phosphorus Runoff		Harmful algal blooms cause vomiting, diarrhea, confusion, seizures, permanent short term memory loss, or death
Air Pollution		
Ammonia	Microbes decompose undisgested organic nitrogen compounds in manure	Respiratory irritant, chemical burns to the respiratory tract, skin, and eyes, severe cough, chronic lung disease
Hydrogen Sulfide	Anaerobic bacterial decomposition of protein and other sulfur containing organic matter	Inflammation of the moist membranes of eye and respiratory tract, olfactory neuron loss, death
Methane	Microbial degradation of organic matter under anaerobic conditions	Greenhouse gas contributes to climate change
Particulate Matter	Feed, bedding materials, dry manure, unpaved soil surfaces, animal dander, poultry feathers	Chronic bronchitis and respiratory symptoms, decline in lung function, organic toxic dust syndrome

Figure 5-3 Hog CAFO

CATTLE RAISED IN THE FOODSHED

In our Foodshed, over 28,435,422 milk cows were in inventory in 2022.[38]

Over the past decade, the number of operations raising cattle in our Foodshed for milk has decreased, resulting in fewer local dairy options available to Foodshed residents. According to the USDA, the nation-wide average of annual milk production per cow was 24,117 lbs in 2023.[39] Using the specific Foodshed states' averages for annual milk production and multiplying each county's total reported inventory by its corresponding state's average, the estimated production in 2023 from Foodshed cows was 671 billion pounds of milk.

Foodshed farm operations produced over 813,803 beef cows in 2022.[40]

A large majority of beef cows in our Foodshed are raised in the Missouri counties. This can perhaps be attributed to specialization of farms—while Illinois farms have a lot of cropland to grow commodity and specialty crops, Missouri dedicates its land in farms to raising livestock.

Since cows are the most land-intensive source are the most land-intensive source of protein, it is important to critically analyze our Foodshed's consumption of these animals and their products and how this consumption affects the overall health of our Foodshed. Cattle not only require the most land, but they also have very inefficient feed to meat ratios. Researchers from Bard College, the Weizmann Institute of Science and Yale University calculated the feed costs for each class of animal in addition to data about land area, water, and fertilizer. They found that "beef requires 28 times more land, six times more fertilizer and 11 times more water" in comparison to pork, chicken, dairy, and eggs.[41]

In addition, cows contribute to climate change by producing large amounts of methane, a critical greenhouse gas, that ends up in the atmosphere. The result of this is not confined to the Foodshed; rather, its effect is far-reaching and impacts individuals around the globe. We will discuss more about the relationship between agriculture and climate change in Chapter 6.

CHICKENS RAISED IN THE FOODSHED

Chicken meat, or broiler, production has rapidly increased as an increasing number of consumers have substituted chicken meat for beef and pork nationwide.[42] **Our Foodshed raised more than 16.2 million chickens for broiler meat and more than 4.9 billion for egg laying in 2022.**[43]
Chicken meat is comparably more efficient to produce than producing beef and pork. Chickens require much less water and feed than the larger cattle and hogs, allowing farmers to raise a significantly higher number of the animals while also producing lower amounts of greenhouse gasses.

Although poultry and eggs are relatively more sustainable to produce than beef and pork, it is important to note that the poultry and egg industry is a major user of feed grains. This means that the poultry and egg industry, especially CAFOs, rely on food system crops such as corn to produce grains that feed the chickens. Therefore, if demand for poultry and eggs continues to grow, it is likely that this will increase demand for food system crops. This would prevent growers from being able to produce specialty crops such as fruits and vegetables, unless there is significant change in consumer demand for chicken products that are pasture-raised.

However, chickens for meat and eggs can be raised responsibly and humanely, especially in urban settings. Many farms throughout the Foodshed raise chickens in this way and you can connect with some of them through our partners at Known & Grown STL.[44]

HOGS RAISED IN THE FOODSHED

The St. Louis Regional Foodshed also raises hogs. The number of reported hogs in inventory decreased from 4,150,306 in 2017 to 3,824,493 in 2022.[45] A number of CAFOs produce pork in our Foodshed, contributing a significant amount to the hogs raised. The St. Louis Regional Foodshed plays a role in contributing to the global supply of pork— in 2022, Missouri was the tenth largest exporter of pork in the U.S. with $224.7 million of exports.[46]

[31] 2022 Census of Agriculture, Table 11. Cattle and Calves -- Inventory and Sales: 2022 and 2017.

[32] *Concentrated Animal Feeding Operations,* Missouri Coalition for the Environment, https://moenvironment.org/our-work/sustainable-food/concentrated-animal-feeding-operations/.

[33] U.S. Environmental Protection Agency, Office of Water, Concentrated Animal Feeding Operations (CAFOs) per County, US, 2013, March 31, 2016. https://catalog.data. gov/dataset/concentrated-animal-feeding-operationscafos-per-county-us-2013-us-epa11cea.

[34] Concentrated Animal Feeding Operations, Missouri Department of Natural Resources, https://catalog.data.gov/dataset/concentrated-animal-feeding-operations-cafos-per-county-downloadable-package-us-2013-us-epa4 (last visited September 24, 2024).

[35] Rep. Pocan, Mark. "H.R.2933 - 116th Congress (20192020): Food and Agribusiness Merger Moratorium and Antitrust Review Act of 2019." Congress.gov, 28 June 2019, www.congress.gov/bill/116th-congress/housebill/2933/text.

[36] *See* Known & Grown STL, www.knownandgrownstl.org.

[37] Hribar, Carrie, and Mark Schultz. Understanding Concentrated Animal Feeding Operations and Their Impact on Communities. National Association of Local Boards of Health (NALBOH), CDC. https://www.cdc.gov/ nceh/ehs/docs/understanding_cafos_nalboh.pdf. "Harmful Algal Blooms." National Institute of Environmental Health Sciences, https://www.niehs.nih.gov/health/ topics/agents/algal-blooms/index.cfm.

[38] 2022 Census of Agriculture, Table 11. Cattle and Calves -- Inventory and Sales: 2022 and 2017.

[39] *Dairy Data,* Economic Research Service, USDA, https://www.ers.usda.gov/data-products/dairy-data/ (download "Milk cows and production by State and region (Annual)" data set and view United States total for 2023 in "milk per cow" sheet).

[40] 2022 Census of Agriculture, Table 11. Cattle and Calves -- Inventory and Sales: 2022 and 2017.

[41] Nuwer, Rachel. "Raising Beef Uses Ten Times More Resources Than Poultry, Dairy, Eggs or Pork." Smithsonian.com, Smithsonian Institution, 21 July 2014, www.smithsonianmag.com/science-nature/beef-uses-tentimes-more-resources-poultry-dairy-eggs-pork-180952103/.

[42] *See* Poultry Sector at a Glance, Economic Research Service, U.S. Department of Agriculture, https://www.ers.usda.gov/topics/animal-products/poultry-eggs/sector-at-a-glance/.

[43] 2022 Census of Agriculture, Table 19. Poultry -- Inventory and Number Sold: 2022 and 2017.

[44] *See* Local Food Locator, Known & Grown STL, https://knownandgrownstl.org/local-food-locator.

[45] 2022 Census of Agriculture, Table 12. Hogs and Pigs -- Inventory and Sales: 2022 and 2017.

[46] State Agricultural Trade Data, *Economic Research Service,* U.S. Department of Agriculture, https://www.ers.usda.gov/data-products/state-agricultural-trade-data/state-agricultural-trade-data/#CashR (download "U.S. agricultural exports, State detail by commodity: calendar years 2000-2022" dataset).

6 CLIMATE CHANGE & AGRICULTURE

Climate change remains a crucial issue when evaluating environmental quality, farming practices, and the health of our Foodshed.

As of 2022, agricultural production occupies about 53% of the total land area in the United States.[47] Poor soil management practices—such as leaving soil bare, excessive use of chemical fertilizers, and overplowing—contribute significantly to agricultural greenhouse gas emissions. These practices reduce soil microbial biodiversity and organic matter and increase erosion and nutrient runoff into waterways.[48]

Effective soil management practices include agroforestry techniques like alley cropping, agroforestry,[49] riparian buffers,[50] silvopasture, and windbreaks.[51] For more details on these practices, refer to resources from the Savanna Institute.[52]

Consolidated corporate agriculture also impacts land and water use. As the global demand for meat grows, deforestation in the Amazon rainforest continues. JBS S.A., a major Brazilian meat processing company, is linked to significant deforestation, contributing to approximately 18% of the deforested land in the Brazilian Amazon. JBS also owns American operations, with U.S. taxpayer dollars supporting their losses from trade conflicts. This indirectly supports deforestation efforts in critical ecological areas.

Livestock agriculture is notably water-intensive. For instance, an average beef cow requires around 816,000 gallons of water throughout its lifespan, with the majority allocated to growing feed. Field crops generally use more water than fruits and vegetables, but animal products have a larger water footprint per pound.

Commercial agriculture, particularly livestock farming, is also water-intensive. Livestock require water for drinking, feed, barn cleaning, and waste management. A beef cow uses an average of 816,000 gallons of water in its lifetime: 6,300 gallons for drinking, 808,400 gallons for feed and pasture, and 1,900 gallons for cleaning. This results in a significant water footprint for animal products. Field crops generally require more water than fruits and vegetables; however, all foodstuffs have noticeably lower water footprints per pound than animal products. See the 2014 St. Louis Regional Food Study for information on the water footprint of individual agricultural products.[53]

Agriculture accounts for approximately 80% of consumptive water use in the U.S., rising to 90% in Western states with less rainfall.[54] Efficient water irrigation systems are essential for managing agricultural water use. In arid regions, over-reliance on irrigation can deplete groundwater[55] and exacerbate drought conditions, while in wetter climates, improper drainage can increase pollution from runoff.[56]

Climate change further impacts agriculture by worsening extreme weather events such as intense rainfall, flooding, drought, and wind. Rising global temperatures lead to melting ice caps and rising sea levels, which erode coastal lands. The effects of climate change on agriculture not only pose economic challenges but also threaten food security.

[47] Land Use, Land Value, and Tenure." *Economic Research Service,* U.S. Department of Agriculture, 15 May 2024, www.ers.usda.gov/topics/farm-economy/land-use-land-value-tenure/.

[48] "Climate Change and Agriculture." Union of Concerned Scientists, 20 Mar. 2019, https://www.ucsusa.org/resources/climate-change-and-agriculture.

[49] *The cultivation of specialty crops under existing forest canopies. "Understanding Agroforestry" Infographics, Savanna Institute, 2019, https://www.extension.iastate.edu/smallfarms/agroforestry-fact-sheets.*

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CONCLUSION

To build a localized, equitable, and sustainable foodshed, we must take actionable steps that support both our environment and our communities. Begin by purchasing directly from local, environmentally responsible farmers. This ensures that your food is fresh and sustainably produced while also strengthening local economies and reducing environmental impact.

When shopping at stores, choose stock products that come from your local farms and encourage them to increase their offerings from local producers. Clear labeling that identifies the farms and their locations within the foodshed can help consumers make informed choices and foster transparency in the food supply chain.

Additionally, get involved with organizations like MCE to advocate for policies that enhance soil health, build climate resilience, and support local farm economies at both the state and federal levels. Advocate for reforms to federal commodity and crop insurance policies to ensure that the federal safety net is accessible to small-scale farms, beginning and socially disadvantaged farmers, and those growing specialty crops.

By supporting these initiatives, you contribute to solving the agricultural component of the climate change puzzle. Sustainable farming practices, improved soil health, and localized food systems are crucial for reducing greenhouse gas emissions and enhancing resilience to climate impacts. Together, these efforts not only mitigate climate change but also promote a more equitable and sustainable food system for everyone.