

FOOD SYSTEM RESEARCH AND PROJECT IDEAS FOR JHU STUDENTS

COMPILED BY THE JOHNS HOPKINS CENTER FOR A LIVABLE FUTURE FOR AY2021-2022

1. For Students of Johns Hopkins University

These research and project ideas for students were generated by staff from across the Johns Hopkins Center for a Livable Future (CLF). The projects tie in to current program areas at the Center, and they would be valuable contributions to the increasing body of knowledge in the field of food systems and public health. This list is not comprehensive, and variations of these projects may be viable. It is our hope these ideas will stimulate thinking, connect students with mentors from CLF, and address cross-cutting themes such as equity and climate change.

Many of these ideas could form the basis for capstones or practicum experiences. If you are interested in any of these ideas, please reach out to CLF's Education Program Specialist, Phil McNab, at pmcnab1@jhu.edu. JHU students will be given priority for consideration of mentorship. **Additional ideas not directly related to CLF's current work can be found on pages 6-9.**

1a. Food Animal Production

- 1a-1. Conduct a news media content analysis on food system resilience, including the threats to food animal production and slaughter capacity in the US due to supply chain disruptions caused by Covid-19, weather, ransomware, etc. The review could also explore the framing of solutions.
- 1a-2. Compare existing alternative food animal production methods, examining facilitators and barriers to producers transitioning to more sustainable methods.
- 1a-3. Examine occupational health and safety issues in industrial food animal production (IFAP), (food) waste management, sustainable agricultural production and/or in other parts of the food supply chain.
- 1a-4. Conduct a case study on the living and working conditions of animal agriculture workers on the Eastern Shore of Maryland.
- 1a-5. Perform an updated analysis of the usage of United States Department of Agriculture's (USDA) Environmental Quality Incentives Program (EQIP) conservation funds to support industrial food animal production.
- 1a-6. Perform a literature review or secondary data analysis on regenerative agriculture outcomes and how they compare with industrial agriculture in terms of health, environment, resilience, profitability, etc. Students might use aggregated data from many farms to evaluate outcomes, or dive deeply into case studies of farms that are experimenting with new methods.
- 1a-7. Examine attitudes about industrial and regenerative farming among farmers, consumers, or other demographic groups; barriers to entry into regenerative farming; barriers to adoption of regenerative methods among existing farmers; the history (or future) of public policy related to regenerative farming; or media framing of regenerative agriculture.

- 1a-8. Examine the current level of intersection between systems for manure management and for food waste.
- 1a-9. Examine the policies that food policy councils (FPCs) have passed or advocated for that support regenerative agriculture or oppose industrial food animal production.

1b. Healthy and Sustainable Diets, Food Access and Behavior Change

- 1b-1. Assess the impact of a [Meatless Monday campaign](#) on attitudes and food choices and/or purchases in a specific setting, such as school, college campus, hospital, restaurant, or workplace.
- 1b-2. Test specific messages regarding meat reduction and/or plant-based foods with different consumer groups. Message testing could be done at Meatless Monday food service sites or among other consumer groups. This may also involve focus groups and stakeholder interviews. The results will be used to develop initiatives and communication materials targeted at shifting consumers' animal and plant-based protein consumption.
- 1b-3. Evaluate meat consumption and availability of alternatives in lower-income communities; pathways to behavior change, such as education and training/skills-development (i.e., cooking classes); and ways to improve food environments (e.g., accessibility, affordability) of plant-based foods.
- 1b-4. Review approaches to studying online food shopping behaviors.
- 1b-5. Conduct a qualitative study interviewing individuals and organizations in selected countries in order to create a framework for implementing Meatless Monday in different regions and settings.

1c. Covid-19 and Food Systems Resilience

- 1c-1. Examine how Covid-19 has changed the way people shop for food. Consider examining how the food environment has changed (stores closing/opening, online shopping, new store policies, limited stock, etc.), as well as peoples' perceptions and responses to these changes.
- 1c-2. Survey local governments about food system resilience pre- and post-COVID19
- 1c-3. Perform spatial analysis of Covid-19 and food system functioning outcomes by geography.
- 1c-4. Pilot a post-disaster food environment assessment tool.
- 1c-5. Review and examine how local and state governments are collecting, communicating (visuals, maps, dashboards), and using food systems data to guide recommendations and policies during Covid-19.
- 1c-6. The CLF and other collaborators are conducting national and Maryland surveys of food security and access since Covid-19 began. There may be opportunities to dig deeper on selected questions or to contribute to manuscripts.
- 1c-7. The CLF conducted a national survey of food system workers during Covid-19. There may be opportunities to dig deeper into selected questions or contribute to manuscripts.
- 1c-8. Explore potential effectiveness and tradeoffs of different strategies for supporting the safety, well-being and livelihoods of food workers during Covid-19 or other disasters.
- 1c-9. Analyze how threats to food system functioning (and thus the level of resilience) differ for each of a number of distinct types of disaster.
- 1c-10. Perform a review of critical writings (such as those challenging the status quo, typical responses, or accepted ideas) from sociology, geography, history, anthropology, etc. related to food system resilience and disaster response, summarize perspectives that public health professionals and advocates should consider.
- 1c-11. Explore the role of mainstream agriculture/land use projects including IFAP in mutual funds and other investments (e.g., university portfolios). To what extent are these promoted to potential

investors as relatively stable/safe investments? Are climate threats acknowledged? To what extent have disasters affected the value of these food investments?)`

- 1c-12. Analyze COVID-19 federal response funds allocated to agriculture and/or food systems; compare funding priorities with potential for transforming food system versus those that maintain the status quo. (A more in-depth analysis could also examine where the Biden Administration's infrastructure bill funding goes to support food systems.)

1d. Food Systems and Climate Change

- 1d-1. Examine awareness of virtual water content, land use, pesticide use, and greenhouse gas (GHG) footprint of different foods—and how knowledge of these might influence food choices.
- 1d-2. Assess the climate footprint and nutrition of meal kits, including packaging, transport, waste, etc.
- 1d-3. Review differences in climate change mitigation potential (e.g., reducing urban heat island effect, reducing storm water runoff) between urban farms/gardens and urban forests.
- 1d-4. Update 2009 media analysis to explore the dramatic shift in how food is covered in climate change media, with a special focus on food animal production.

1e. Seafood and Aquaculture

- 1e-1. Seafood is the primary protein source for over 1 billion people globally and a major income generator for many people. The largest production centers are in South East Asia. Climate change, water and land scarcity, and ecosystem decline are all threats to food and nutrition security. What programs are being deployed in SE Asia to make aquaculture more resilient? What food and nutrition security programs are worth replicating?
- 1e-2. Many large corporations have Corporate Social Responsibility (CSR) pledges related to sustainability. Assess the landscape of CSR for seafood at the producer, processor, and retail levels. What pledges exist, and to what extent is compliance with CSR being tracked?
- 1e-3. What are governments, international bodies, and organizations doing to combat human trafficking and forced labor in the fishing and seafood processing sectors? What's working, and what needs to be done?
- 1e-4. Traceability is becoming a major issue for fisheries and aquaculture. What are the options for tracing seafood to its source; what have been the experiences so far; and what are the opportunities?
- 1e-5. Regenerative aquaculture can be highly efficient and benefit ecosystems, coastal communities and public health. What forms is this taking in high, middle and low-income countries? What is working; what is not working; and and what should be replicated or further researched?

1f. Wasted Food and Food Rescue

We received new funds for multiple qualitative, quantitative and modeling projects related to food waste/food rescue. Below are examples of projects that would advance the effort in 2021-2022.

- 1f-1. Contribute to planning/design of a novel food waste intervention developed in partnership with food system workers.
- 1f-2. Perform research focused on creating typologies of regional systems for use in studying food waste solutions.
- 1f-3. Generate initial estimates of potential impacts of selected food rescue interventions.
- 1f-4. Synthesize data and literature on occupational injury/illness related to food waste management.

1g. Food Systems Policy

- 1g-1. Develop a series of concise policy briefs on farmworker health issues, pulling from two recent reports: [Essential and In Crisis: A Review of Public Health Threats Facing Farmworkers in the U.S.](#) and [Essentially Unprotected: A Focus on Farmworker Health Laws and Policies Addressing Pesticide Exposure and Heat-Related Illness.](#)
- 1g-2. Conduct a landscape assessment of environmental labeling programs, corporate sustainability initiatives, and/or voluntary private sector programs such as nutrient trading or carbon markets to assess how such programs are evaluated and monitored, as well as how results are verified and communicated.
- 1g-3. Conduct case-study assessments to investigate how state policies that protect farmworkers were developed and implemented.
- 1g-4. Conduct a content analysis of news coverage on sustainable and regenerative agriculture programs in the United States.
- 1g-5. Food security is often overlooked as a component of national security. Student research in this area can focus on case studies (such as the Covid-19 pandemic and the role of the wheat crisis in Syria and Russia in the Syrian conflict) as examples of the complex relationship between food, agriculture, and national security. Additional research projects could include literature reviews and analyses of various elements of the food system and their influence on and relationship with national security.
- 1g-6. Review the evidence on the effectiveness and public health impact of food systems policy on issues such as the following: reduction of wasted food; expansion of access to land and other resources for urban farming and community gardening; restrictions on or taxation of unhealthy food; incentives for new food retailers in areas with poor food access; public procurement of regionally, sustainably, fairly, or humanely produced food; and increased access to land for sustainable agriculture.
- 1g-7. Examine the levels of support for food and agriculture industry businesses in “socially responsible” mutual funds. To what extent are these supporting relatively unsustainable or unhealthy production? Describe relevant shareholder initiatives. Make recommendations for socially responsible fund investment.
- 1g-8. Analyze the role of sustainable investing and the ability of these investment actions to influence agricultural policy. Include consideration of actions to limit the ability of sustainable investors to pressure public companies on issues ranging from climate change to animal welfare.
- 1g-9. Examine the membership of food policy councils (FPCs) to understand how councils address conflicting viewpoints or interests of members representing seemingly contrasting viewpoints—like restaurant owners and labor union representatives or large-scale, commodity agriculture and small-scale diversified producers. What are the tensions that exist across members of FPCs? How do FPCs encourage representation from diverse stakeholders? What systems or structures have FPCs established to help resolve issues among members with contrasting viewpoints? What strategies have FPCs used to reach consensus?
- 1g-10. Regional Food Policy Networks: More states and regions are creating networks of councils in order to foster collaboration. We are interested in understanding what is happening at these various levels. This will involve document review, as well as possible interviews and listserv inquiries. It might include reviewing the status of FPCs in other countries.
- 1g-11. Examine the impact of community engagement in FPCs on elected officials’ perceptions of FPCs.
- 1g-12. Research the network of FPC members and partners to map the relational capacity of FPCs and better understand how many people are part of the FPC movement. Explore differences in the network by regions and rural/urban areas.
- 1g-13. The CLF has compiled a rich dataset of 425 local urban agriculture policies from the 40 most populous US cities. Analyze these policies, with a focus on a topic such as water access.

1h. Food Systems Education

- 1h-1. Conduct a literature review and landscape assessment of youth education using aquaponics.
- 1h-2. Engage in activities related to the CLF's high school curriculum, FoodSpan. Examples include performing a literature review about food systems education for high school students, assessing what other people and organizations are doing, surveying teachers, developing activities for a specific lesson plan, or conducting outreach to raise awareness of FoodSpan. The activities could involve public health practice or be more research-oriented.

2. Additional Food System Research and Project Ideas

The following research and project ideas could advance the science, policy, and practice of food systems and provide valuable learning opportunities for students. The Center for a Livable Future is not currently involved in these projects and is unlikely to provide mentorship for students pursuing them. Nevertheless, we would like to hear about your interest in these topics. Please email Phil McNab at pmcnab1@jhu.edu.

2a. Healthy and Sustainable Diets, Food Access and Behavior Change

- 2a-1. Assess the health, environmental, and labor implications of producing and consuming cell-cultured breastmilk (coming to market in 2021-2022) compared to other infant feeding options (e.g., dairy infant formula, soy infant formula, pumped breastmilk, exclusive breastfeeding).
- 2a-2. Research the undergirding philosophies of soup kitchens and food pantries to see how many of them are religiously motivated. For those that are, what theology underpins the actions of their organization?
- 2a-3. Discuss whether there are “obesogens” in the environment and/or food system that should be banned on a precautionary basis, based on existing evidence.
- 2a-4. Perform a literature review of articles specific to motivating environmentally sustainable food consumption and, especially, to maintaining motivation. Or, apply a relevant behavioral science theory to these questions.
- 2a-5. The “what you should eat” message in the context of climate change and environmental sustainability is complex. Identify one or more areas of complexity (e.g., meat or seafood consumption) and—in light of behavior change/communication theory or data gathered from interviews, focus groups, or surveys—discuss how this complexity should be communicated to consumers.
- 2a-6. Examine trust of the food system among different demographic groups.
- 2a-7. Assess the level of awareness among youth regarding food system issues—for example, industrial food animal production (IFAP); agricultural chemical use; links among public health, social justice and the environment; health implications of food processing; and inequitable access to healthy, culturally appropriate food.
- 2a-8. Research plant and animal sources of omega-3 in the food system and the latest science on metabolism of polyunsaturated fatty acids (PUFAs), including genetic variations in and across populations. Can some people better metabolize eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) from plant sources than others? What are the mechanisms? How could this impact dietary recommendations in terms of health and sustainability?

2b. Terrestrial Food Production

- 2b-1. Explore the narratives driving urban agriculture policy development and which types of operations they aim to support. For example, examine the paradoxes of indoor urban farms that require significant amounts of energy to operate.

- 2b-2. Survey farmers in a farmers market or elsewhere to gain insight into how many small, local-market farmers are using farming techniques that would be considered USDA-certified organic but have not gotten certified (and the reason why they have not done so). Additionally, ask about what types of pest control they DO use. This could also include exploring farm labor practices and treatment of local farmers—and it may require ethnography and other social science methodologies.
- 2b-3. Conduct a literature review on the impact of increasing wages on food insecurity, public health and diet, and, in particular, the quality of life of food chain workers. How does increasing wages impact the food supply chain?
- 2b-4. Examine facilitators and barriers for farmers transitioning to more sustainable methods.
- 2b-5. Develop a review paper on animal agriculture contributions to foodborne illness and discuss relevant policy or technical options.
- 2b-6. Review the literature on possible links between animal welfare and public health. For example, does the welfare of animals have any direct bearing on the healthfulness of animal products (e.g. does the release of stress hormones in hogs introduce chemicals into their meat)? Do industrial food animal production workers suffer psychological harms from slaughter and other forms of animal handling?
- 2b-7. Develop alternative scenarios for different agricultural systems in Maryland, and analyze the varied environmental and public health impacts associated with each scenario.
- 2b-8. Analyze agriculture on the Eastern Shore of Maryland. In particular, conduct an economic impact analysis of the poultry industry leaving the area.
- 2b-9. Perform a historical analysis of different forms of food production that have evolved on the Eastern Shore, such as vegetable production, seafood industries, forestry, and poultry.
- 2b-10. Many older adults and immigrants in Baltimore and other cities have experience with gardening and farming in their childhoods. Examine current interest among these populations in getting engaged in gardening activities or garden education.
- 2b-11. Many households have old containers of garden pesticides and herbicides stored in their garages. Review municipal or other guidelines for disposal and discuss how consumers might likely respond to them in the real world, considering safety for both consumers and the environment.
- 2b-12. Choose one processed food and research its ingredients in terms of one or more of the following: the food's sources, chemistry, water use, and pesticide use. Calculate the water or energy it took to produce the food item and get it to the store.
- 2b-13. Develop a case study looking at ethanol's implications for chemical use, land use, and food costs. What is the impact in Maryland and on the Chesapeake Bay?
- 2b-14. Conduct qualitative interviews with farmers to learn about their needs for compost from off-farm sources.

2c. Seafood and Aquaculture

- 2c-1. How do aquaculture production systems, ranging from open-ocean to closed system aquaculture, compare regarding public health risks to communities and employees? Topic examples include water quality, veterinary drug use, and pollution generated.
- 2c-2. Is there a relationship among aquaculture production methods, increased sustainability, and reduced threats to environmental/occupational public health?
- 2c-3. Do the environmental public health risks from industrial aquaculture and fisheries affect communities of color or groups with few resources differently than others (i.e., environmental justice)?
- 2c-4. What are the impacts of climate change on production of (and demand for) fisheries and aquaculture? Are the impacts differential by fishing and aquaculture methods?

- 2c-5. What aquaculture production trends are occurring globally, in the US, and/or regionally (e.g., in the Chesapeake Bay watershed)? Are sustainable methods gaining ground?
- 2c-6. What policy changes (at any level) are needed to increase use of sustainable fishing and aquaculture methods? What barriers need to be addressed?
- 2c-7. How do food safety risks differ between various seafood sourcing, fisheries aquaculture production methods, and species consumed?
- 2c-8. What do consumers understand about food safety risks, sustainability, and nutritional value of different types of seafood and different sourcing/production methods? What messages work best to convey important information about these topics?
- 2c-9. How do different labeling schemes and/or communication materials impact consumers' seafood choices?
- 2c-10. Are messages comparing consumption of land animals and sea animals regarding nutritional value, sustainability, and food safety effective in changing dietary choices?
- 2c-11. How do different production methods affect food security and employment in surrounding communities and regions (i.e. the Chesapeake Bay watershed)? How many jobs are created using different aquaculture production methods?
- 2c-12. What is the status of vaccine development for aquaculture species. Are there any relevant policies and regulations that are pending?
- 2c-13. Assess newly implemented oyster aquaculture regulations in Maryland. Are policies modifying production and harvest practices?

2d. Food Systems Policy

- 2d-1. Analyze the growth of marijuana legalization and how that is influencing urban agriculture policies.
- 2d-2. Describe “land grabs” in which some governments, multi-national companies, or even wealthy individuals purchase land in developing countries for their own agricultural production, and the potential impacts on food security in affected areas. Review available information on mutual fund investment in this process.
- 2d-3. Develop case studies of successful policies or covenants between competing users of freshwater—for instance, between agriculture and municipalities.
- 2d-4. Create a map of the “political terrain” of Chesapeake Bay Watershed regulation, legislation, and advocacy. Questions to answer include, who are the key players, what are their roles, and how are the two related?
- 2d-5. Examine the USDA Agricultural Marketing Service’s Commodity Procurement Program, which purchases farm products for school lunches and other food assistance programs, and has the dual aim of stabilizing commodity prices. Discuss what foods are purchased, their healthfulness, and the potential economic and environmental impacts of these purchases.
- 2d-6. Examine perceptions of local and state food systems policy and food policy councils among a variety of groups representing different demographics and regions—particularly youth, communities in the South, people in rural areas, and elected officials—to understand appropriate messages for food policy councils to engage the surrounding community and key stakeholders in their efforts.

For more information, please contact:

Phil McNab, PhD, Education Program Specialist, (pmcnab1@jhu.edu)