JOHNS HOPKINS
CENTER *for* A LIVABLE FUTURE

FOOD SYSTEM RESEARCH AND PROJECT IDEAS FOR STUDENTS

COMPILED BY THE JOHNS HOPKINS CENTER FOR A LIVABLE FUTURE FOR AY2022-23

For Students of Johns Hopkins University

These research and project ideas tie into current work at the Center and would be valuable contributions to the increasing body of knowledge in the field of food systems and public health. Many of these projects could form the basis for MPH capstones, MHS essays, or practicum experiences. This list is not comprehensive, and variations of these projects may be viable. It is our hope these ideas will stimulate thinking and connect students with potential mentors from CLF.

Students interested in any of these project ideas should contact Phil McNab (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 5-7.

Food Production

1. Compare existing alternative food animal production methods, examining facilitators and barriers to producers transitioning to more sustainable methods.

2. Describe ways in which the food animal production system in the US is vulnerable to climate-fueled disasters, *and* ways that system's vulnerabilities may create follow-on threats to society and public health. This question can be addressed broadly with a literature review or more narrowly with a case study or data analysis. For example, students might examine how flooding affects meat and feed crop production, and potential follow-on risks for rural communities, low-income households, insurers and/or financial systems.

3. Examine environmental justice, occupational health, and safety issues in (food) waste management, production of meat analogues, and/or in other parts of the food supply chain.

4. Perform a literature review or secondary data analysis on regenerative or organic production outcomes and how they compare with industrial agriculture in terms of human health, environment, resilience, profitability, or other factors. Students might use aggregated farm data to evaluate outcomes, or dive deeply into case studies of farms that are experimenting with new methods.

5. Examine the framing of regenerative agriculture among media and/or advocacy groups.

6. Conduct a landscape assessment of meat labeling programs that address the environment and/or sustainability to assess how such programs are evaluated and monitored, as well as how results are verified and communicated.

7. Evaluate how policies related to food animal production drive consolidation in the industry and prevent new market entrants or expansion of smaller producers at the local and regional scales.

8. Examine the benefits and barriers related to the incorporation of trees on agricultural land.

9. Conduct a literature review of agriculture-related "green" energy (e.g., biogas, pyrolysis, biochar, anaerobic digestion) and its implications for communities, workers, and local ecosystems. Students could also investigate the USDA investment, funding, and technical support for the development and adoption of these "green" energy alternatives.

10. Food security is often overlooked as a component of national security. Student research in this area can focus on case studies (e.g., wheat crises stemming from conflicts) as examples of the complex relationships between food animal production, 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.

11. 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.

12. Examine how food animal production and food in general is covered in climate change media or in advocacy work. Compare with earlier analyses to explore the extent of change.

Seafood and Aquaculture

13. Seafood is the primary protein source for over one 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?

14. 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?

15. What are governments, international bodies, and organizations doing to combat human trafficking and forced labor in the fishing and seafood processing sectors? What is working, and what needs to be done?

16. 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?

17. 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 what should be replicated or further researched?

18. Aquatic food systems include plants, not just fish. Seaweed, algae, and other aquatic plants are getting more attention for their role in human nutrition, fighting climate change, and protecting ecosystems. With this evolving area of research on aquatic plants, what public health insights have already been drawn, and what gaps exist in the literature?

Food Systems Resilience

19. Examine how Covid-19 has changed the way people shop for food. Consider how the food environment has changed (e.g., stores closing/opening, online shopping, new store policies, limited stock), as well as perceptions and responses to these changes.

20. Analyze recent federal funding to strengthen the resilience of agriculture, infrastructure, and/or food systems generally. Compare funding priorities with potential for transforming food system versus those that maintain the status quo.

21. Examine how organizations have established processes and plans to deal with future disasters.

22. Perform a review of critical writings related to food system resilience and disaster response (such as those challenging the status quo, typical responses, or accepted ideas) from fields like sociology, geography, history, and anthropology. Summarize perspectives that public health professionals and advocates should consider.

23. 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.

Healthy and Sustainable Diets, and Behavior Change

24. How might consumer-focused interventions influence or be influenced by food animal production practices and policies? Develop a white paper framing a connection between different agricultural practices and healthy, sustainable consumption. If possible, estimate the impact of consumer-focused interventions on both production and consumption.

25. Conduct a literature review of published and grey literature on consumer behavior change interventions across different sectors and geographies related to reduced meat consumption and the protein shift. Incorporate findings into a report and user-friendly repository of findings and effective interventions (describing the outcome and projected impact).

26. Assess the impact of a **Meatless Monday campaign** or other meat reduction initiatives on attitudes, overall food choices, and/or purchases in a specific setting, such as a school, college campus, hospital, restaurant, or workplace. (This could be done at a JHU site.)

27. Test specific messages regarding meat reduction and/or plant-based foods with different consumer groups (e.g., based on age, income, gender, or market segments). Message testing could be done at food service sites or among other consumer groups. This could also involve focus groups and/or stakeholder interviews. The results will be used to develop initiatives and targeted communication materials designed to shift consumers' animal and plant-based protein consumption.

28. Evaluate meat consumption attitudes and behaviors and the availability and acceptability of alternatives among BIPOC and lower-income U.S. communities. Propose pathways to behavior change, such as education and training/skills development (e.g., cooking classes) and ways to improve food environments (e.g., accessibility, affordability) of healthy plant-based foods.

29. Investigate how participation in meal kits may change eating and discard patterns, including meals and meal kits available via supermarkets and those ordered from delivery services.

Food and Agriculture Policy Solutions

30. Review the evidence on the effectiveness and public health impact of policies to reduce wasted food; increase public procurement of regionally, fairly, or humanely produced food; or increase access to land for diversified/regenerative/agro-ecological farming systems.

31. In light of the upcoming 2023 Farm Bill, 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.

32. Examine potential impacts of reforms to commodity policy (Title I in the Farm Bill) on industrial food animal production.

33. Examine the public health impacts of the debt relief program in the 2021 American Rescue Plan for Black and other socially disadvantaged farmers.

34. 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.

35. Examine the policies that food policy councils (FPCs) have passed or advocated for that pertain to food production methods such as industrial food animal production.

36. Examine the membership of FPCs to see how food production is represented on councils and how this representation influences the work of the council. Who are the members that represent food production? Are they urban growers, small to mid-scale producers, fruit and vegetable producers, and/or ranchers? Do they represent agricultural associations or commissions? What production-related policies or programs do the councils with producer representation work on? Does the type of food production that the members are engaged in influence the policies/programs of a council? Are there any councils with members representing seemingly contrasting viewpoints, such as large-scale, commodity agriculture and small-scale diversified producers? How do these councils address potentially conflicting viewpoints of these members?

37. What is the relationship between FPCs and environmental justice organizations, particularly environmental justice organizations engaged with industrial animal food production and labor issues? How do environmental justice organizations perceive FPCs? How do the policy agendas of FPCs and environmental justice organization align, or how could they be better aligned?

Wasted Food and Food Rescue

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

Food Systems Education

42. 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.

Additional Food System Research and Project Ideas for Students

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 likely to provide mentorship for students pursuing these projects. Even if CLF is unable to provide mentorship, we want to hear about your completed project. Please share it with CLF by contacting Phil McNab at **pmcnab1@jhu.edu**.

Food Production

- 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 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 farmworkers—and it may require ethnography and other social science methodologies.

- Conduct a literature review on the impact of increasing wages (and inflation) on food insecurity, public health, diet, and, in particular, the quality of life of food chain workers. How does increasing wages impact the food supply chain?

- Develop a review paper on animal agriculture contributions to foodborne illness and discuss relevant policy or technical options.

- 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?

- Develop alternative scenarios for different agricultural systems in Maryland and analyze the varied environmental and public health impacts associated with each scenario.

- Analyze agriculture on the Eastern Shore of Maryland. In particular, conduct an economic impact analysis of the poultry industry leaving the area.

- 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.

- 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.

- 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?

- Conduct qualitative interviews with farmers to learn about their needs for compost from off-farm sources.

Seafood and Aquaculture

- 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.

- Is there a relationship among aquaculture production methods, increased sustainability, and reduced threats to environmental/occupational public health?

- 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)?

- 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?

- 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?

- What policy changes (at any level) are needed to increase use of sustainable fishing and aquaculture methods? What barriers need to be addressed?

- How do food safety risks differ between various seafood sourcing, fisheries aquaculture production methods, and species consumed?

- 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? Also, what labeling schemes, interventions, or messages work best to help consumers make these changes?

- Are messages comparing the nutritional value, sustainability, and food safety associated with different terrestrial and aquatic animals effective in changing dietary choices?

- How do different production methods affect food security and employment in surrounding communities and regions (e.g., the Chesapeake Bay watershed)? How many jobs are created using different aquaculture production methods?

- What is the status of vaccine development for aquaculture species? Are there any relevant policies and regulations that are pending?

- Assess newly implemented oyster aquaculture regulations in Maryland. Are policies modifying production and harvest practices?

Healthy and Sustainable Diets, and Behavior Change

- Assess the health, environmental, and labor implications of producing and consuming cell-cultured breastmilk compared to other infant feeding options (e.g., dairy infant formula, soy infant formula, pumped breastmilk, exclusive breastfeeding).

- 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?

- Discuss whether there are "obesogens" in the environment and/or food system that should be banned on a precautionary basis, based on existing evidence.

- 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.

- 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; and inequitable access to healthy, culturally appropriate food.

- Review approaches to studying online food shopping behaviors.

- Research plant and animal sources of omega-3 in the food system and the latest science on metabolism of polyunsaturated unfatty 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?

Food Systems Policy

- Analyze the growth of marijuana legalization and how that is influencing urban agriculture policies.

- 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 assess the potential impacts on food security in affected areas. Review available information on mutual fund investment in this process.

- Develop case studies of successful policies or covenants between competing users of freshwater—for instance, between agriculture and municipalities.

- Create a map of the "political terrain" of Chesapeake Bay Watershed regulation, legislation, and advocacy.

- 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.

- 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?

- 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.

- 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.

- Survey local governments about food system resilience outcomes.

- Explore potential effectiveness and tradeoffs of different policies and programs for supporting the safety, well-being, and livelihoods of food workers during disasters.

For more information, please contact

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