

A Comprehensive Study of Processing Fish in Local Facilities for Local Food Systems

Theme B: Industry Development

Targeted Industry Development Area (TIDA) B-1: Marketing / Promotion / Merchandizing - Value-added products / Market identification including local foods

Chairperson: Kwamena Quagraine
Co-PI Pratik Banerjee
Industry Advisory Council Liaison(s): Jeni Blackburn
Extension Liaison: Kwamena Quagraine
Funding Request: \$201,834
Duration: 09/01/2021 – 08/31/23

Objectives

1. Conduct an in-depth study of the business models for shared-use commercial kitchens and butcher shop-type facilities.
2. Assess the feasibility for fish processing in shared-use commercial kitchens and butcher shop-type facilities and the supply of processed aquaculture products in the local food system.
3. Address food safety issues associated with implementing Objective #2 including product safety and safety of direct selling operations.
4. Develop economically viable business models and strategic pathways for fish farmers / aquaculture businesses to engage with local food actors.
5. Disseminate research results identifying optimal products, safety indicators for products and direct sales, business models, and strategic pathways for engaging local food systems.

Deliverables

- i. A comprehensive report on business models for fish processing infrastructure in select NCR states.
- ii. A comprehensive list of feasible fish processing facilities of shared-use commercial kitchens, butcher shop-type facilities and local food channels.
- iii. Food safety guidelines from federal, state and local governments governing processing of fish, product safety, and safety of direct selling operations.
- iv. Business models and strategic pathways / roadmap for fish farmers / aquaculture businesses interested in processing fish and for local food systems.
- v. A publication and outreach materials that outline the roadmap including operations and requirements of commercial kitchens and butcher shops.
- vi. 2 short videos on the outreach materials.

Proposed Budgets

Institution/Company	Principal Investigator(s)	Objective(s)	Year 1	Year 2	Total
Purdue University	Kwamena Quagraine & Amy Shambach	1, 2, 4 & 5	79,552	84,005	163,557
The Ocean's Friend Aquaculture, LLC	Ashtyn Chen	1, 2 & 4	(4,000) ¹	(4,000) ¹	(8,000)¹
University of Illinois	Pratik Banerjee	3 & 5	18,922	19,355	38,277
Total			98,474	103,360	201,834

¹ Budget for The Ocean's Friend Aquaculture, LLC is shown in the table only for information purposes and is included in Purdue University's budget as a contractor.

Project Summary

Fish farmers have long expressed interest in processing fish for local markets, but the marketplace situation created by the Covid-19 pandemic has intensified the need for processing to expand market opportunities. Therefore, this study explores processing fish and other aquaculture products in shared-use commercial kitchen and butcher shop-type facilities in local communities for the growing local food systems. Shared-use commercial kitchens are facilities in communities, which are rented out to food producers, local food entrepreneurs, and caterers to prepare and process their food products for consumer markets. The aquaculture industry in the North Central Region (NCR) like Illinois, Indiana, and Ohio have no processing infrastructure for aquaculture and have traditionally relied on live ethnic fish markets. However, the live market is very limited, and relying on a single market outlet in this low margin industry is risky. Utilizing these local facilities for processing fish and product development would diversify marketing opportunities and have an impact on farm profitability. A diversified market also reduces market risks for fish farmers. As NCR aquaculture looks ahead to grow, there is a need to develop strategic alliances with local food systems to enable forward linkages with local foods actors and niche markets. This will be feasible if the industry can supply freshly processed products. This project proposes to do a comprehensive study of utilizing shared-use commercial kitchens and butcher-type shops for the feasibility of processing aquaculture products by fish farmers. The research question is: ***“What would it take to process fish and other aquaculture products in shared-use commercial kitchen and butcher shop-type facilities to supply local clients?”*** The focus of this study is Illinois, Indiana and Ohio but the outline followed and results will be applicable to other NCR states. The study fills an important knowledge gap in the local food system through discovery of factors that would incentivize the NCR aquaculture industry to supply local fish.

Justification

The NCR aquaculture industry comprises of some major food fish such as hybrid striped bass, yellow perch, tilapia, trout, largemouth bass, walleye, barramundi, etc. Some food fish industry participants have traditionally relied on live ethnic fish markets. However, the live market is very limited, and relying on a single market outlet in this low margin industry is risky. Some NCR states like Illinois, Indiana, and Ohio have no processing infrastructure for aquaculture resulting in their exclusive reliance on ethnic live-fish market channels comprising supermarkets and restaurants in East Asian communities in major metropolitan cities throughout the NCR, cities in the east coast, and Toronto in Canada. The onset of the COVID-19 pandemic exacerbated the challenges with live markets as sales stalled. Ethnic restaurants, supermarkets, and grocers were not taking any live fish due to reduced customer visits and other stay-at-home restrictions. This resulted in fish producers carrying high inventory of fish on farms, which was increasing their cost of production and, at the same time, presenting cash flow challenges due to lack of sales.

van Senten et al. (2020) found that, because of market disruptions from the Covid-19 pandemic, fish producers have responded by adopting new marketing strategies during the second quarter of 2020. Specifically, the study reports that 34% of fish producers indicated they had implemented or attempted to implement a new marketing channel, and 45% indicated they had not implemented or attempted to implement a new marketing channel during the period. Of those respondents who had implemented or attempted to implement direct sales, 70% had used online sales, 59% curbside pickup, and 44% home delivery services. The study further reports that for catfish producers, 33% adopted curbside pickup, 33% online sales, and another 33% “other” direct sales that included farmers’ markets, cold shipping products to consumers, and partnering with other producers with a retail outlet. For salmon producers, 50% adopted home delivery and 50% online sales. For all other

food fish, 40% adopted online sales, while 20% of respondents adopted home delivery, 20% curbside pickup, and 20% “other” sales channels.

The marketplace situation presents opportunities for exploring locally processed fish to expand market channels to local restaurants and grocery stores, which are increasing their purchase of seafood. In a recent article in the New York Times, Wells (2020) reports that “... *people are cooking seafood as never before At supermarkets and other stores, seafood purchases have set records.*” This trend creates an opportunity for aquaculture producers in NCR to explore these important marketing outlets for their products. This can be achieved with processed fish products.

Consumers are also placing much emphasis on local food sources and systems for various social, economic, health, and environmental reasons. In response, the food industry and food retail industry are expanding their assortment of products, including fish and seafood, particularly locally grown fresh products. Results from the annual National Restaurant Association “What’s Hot” survey to chefs indicate that “Locally sourced meats and seafood” consistently ranked among the top five positions (National Restaurant Association, 2014 – 2017). Also, a 2017 national food hubs survey showed that, of the 12 different product categories handled by food hubs, fish and seafood ranked 11th with only 17% of food hubs carrying fish and seafood. The survey also showed that the percentage of food hubs sourcing only within the region increased from the 2015 to 2017 survey year in every product category except fish and seafood (Colasanti et al., 2018). This suggests that the NCR aquaculture industry may be missing an important marketing outlet for their products.

In the short term, small- to medium-scale fish producers could use existing butcher shops and shared-use commercial kitchens for primary processing to obtain fresh fish products such as whole-dressed fish, fish outlets/steaks, and fish fillets. State and county health departments inspect these facilities, which are required to comply with all federal, state, and county regulatory requirements for processing food. These facilities have seafood-handling capabilities and operate to meet consumer needs. Short-term investment in utilizing these facilities would help address cash flow challenges that fish producers experienced. A long-term strategy however, would be for producers to invest in processing infrastructures such as special processing rooms on the farm, specialized equipment, training, and labor.

Related Current and Previous Work

Marketing seafood via online, curbside, home delivery, farmers’ markets, local restaurants, and other channels provide niche market opportunities and requires some form of processing. Caporelli & Lazur (2014) reported that small-scale fish processing on farm involves a relatively low investment cost, and could provide marketing advantages for small fish farmers exploring niche markets. The authors stressed the need for fish producers intending to process fish to identify local and state regulations and permits that pertain to fish processing. Other considerations suggested are labor, time and delivery requirements and needs. Caporelli and Lazur (2016) focused on catfish and freshwater shrimp but this proposal will do a much more comprehensive study that encompasses major NCR-produced food fish species to identify all the necessary considerations for fish processing.

The Food and Drug Administration’s (FDA) "Procedures for the Safe and Sanitary Processing and Importing of Fish and Fishery Products" requires processors of fish and fishery products to develop and implement Hazard Analysis Critical Control Point (HACCP) systems for their operations. In addition, Knapp, Reeve, & Merrill (2008) point out that waste disposal is equally important and need planning because there may be fish waste discharge guidelines, cleaning and sanitation product(s) discharge guidelines, and permitting requirements. It means that, as much as

processors are required to develop HACCP plans to help them identify hazards that may be associated with their products and formulate control strategies for those hazards, there are additional state and county governments regulations relating to clean up procedures after processing fish, including disposal of wastes that must be followed.

Statement Regarding Duplication of Research

The project personnel at Purdue University is associated with NOAA Sea Grant's program, which is funding a rapid-response pilot project (6 months) for developing a producer factsheet on regulatory requirements, and producer training for processing fish in response to the Covid-19 pandemic. This proposal expands on the Sea Grant pilot project to do a much more comprehensive study of processing fish in local facilities for local food systems, accounting for processing infrastructure, business models, feasible processing opportunities, food safety guidelines, and strategic pathways/roadmap for fish farmers interested in pursuing processing fish.

Anticipated Benefits

- a. Better understanding of the local food system and their requirements, particularly utilizing available processing infrastructure.
- b. Small to medium-scale fish farmers interested in processing fish will develop, establish, and expand market opportunities and ultimately, expanded markets for the NCR industry.
- c. Development of new fish products, and improved diversity of local aquaculture products from the NCR.
- d. Increased sales of local aquaculture products for NCR fish producers.
- e. Increased awareness of supply and access to local aquaculture products from the NCR.
- f. Increased access to and consumption of local NCR aquaculture products.

Objectives

The research question is, "What would it take to process fish and other aquaculture products in shared-use commercial kitchen and butcher shop-type facilities to supply local clients?" The ultimate goal of this project is to provide expanded market opportunities through the local food system for fish farmers wanting to explore processing. The specific objective are:

1. Conduct an in-depth study of the business models for shared-use commercial kitchens and butcher shop-type facilities.
2. Assess the feasibility for fish processing in shared-use commercial kitchens and butcher shop-type facilities and the supply of processed aquaculture products to the local food system.
3. Address food safety issues associated with implementing Objective #2, including product safety and safety of direct selling operations.
4. Develop economically viable business models and strategic pathways for fish farmers/aquaculture businesses to engage with local food actors.
5. Disseminate research results identifying optimal products, safety indicators for products and direct sales, business models, and strategic pathways for engaging local food systems.

Project Deliverables

- i. A comprehensive report on business models for fish processing infrastructure in select NCR states.
- ii. A comprehensive list of feasible fish processing facilities of shared-use commercial kitchens, butcher shop-type facilities and local food channels.

- iii. Food safety guidelines from federal, state and local governments governing processing of fish, product safety, and safety of direct selling operations.
- iv. Business models that includes profitability analysis and benefit-cost analysis and strategic roadmap for fish farmers / aquaculture businesses interested in processing fish and for local food systems.
- v. A publication and outreach materials that outline the roadmap, including operations and requirements of commercial kitchens and butcher shops.
- vi. 2 short videos on the outreach materials.

Procedures

Shared-use commercial kitchen facilities are available across the region in communities and are ideal for new or expanding small food businesses that do not have the financial resources to invest in a processing facility. Start-up cost for an on-farm processing infrastructure involves high up-front capital outlay for special processing rooms on the farm, specialized equipment, training, labor, etc. In addition, there are federal, state, and county regulatory requirements for processing food that need to be followed, which can add to the cost, but shared-use commercial kitchens have already fulfilled these requirements. Potential opportunities for fish farmers include supplying processed fish products; stimulating new fish product development; improving the diversity of local aquaculture products; increasing sales of local aquaculture products; increasing awareness of supply, and access to local aquaculture products; and increasing access to and consumption of local aquaculture products. For example, a fish producer may want to utilize a commercial kitchen facility to develop a new fish product and/or enhance an existing product. Where a fish producer has identified its customers to supply a product, the facility can be used to prepare products specific for some clients or a general product for the consumer market. Some shared-use commercial kitchens have additional resources to help tenants, such as instructions and consulting services relating to business planning, product development, branding, etc. Thus, utilizing available commercial kitchen facilities will provide opportunities for new product development, distribution, branding, and marketing.

The study will focus on Illinois, Indiana, and Ohio, but the outline followed and results will be applicable to other NCR states. NCR fish farmers generally have small to medium size operations and have long indicated a strong interest in fish processing for sales through local restaurants, farmers' market, and seafood retailers.

Methods

Objectives 1 & 2.— This will involve a survey of select shared-use commercial kitchens and butcher shop facilities in Illinois, Indiana, and Ohio. We will compile a list of shared-use commercial kitchens and butcher shop-type facilities in the tri-state. Because these businesses are scattered around the region, we will emphasize on the quality of information derived and not the quantity. A “PEST” analysis approach will be adopted. “PEST” analysis is a concept in marketing research that companies use as a tool to track their operating environment or the environment they are planning to launch a new product or service. “PEST” stands for **P**olitical, **E**conomic, **S**ocial, and **T**echnological factors that need to be considered in market analysis.

The **Political** factors to be examined relate to state and local government policies on fish processing, local food systems, trading laws, employment policies, ordinances, taxes, health, funding, etc. The operations of a local food business might not be regulated at the industry level, but they must adhere to various environmental, food and health regulations. Anecdotal information suggests there may even be labeling requirements of stating, “*processed in the same facility as fish*” on labels if there is co-food products processing in the facility. These are some types of questions and considerations explored under this factor. The analysis explores how these regulations apply to fish/seafood.

Presumably, these regulations are mainly aimed at maintaining a high level of food quality and consumer protection.

The **Economic** factors will consider the economic condition prevailing in the area. These include disposable incomes, unemployment levels, taxation policies specific to food products/services, local economic situation and trends, etc. All these can affect the demand for seafood and can result in major changes in the business environment. We will also explore if owners/operators of commercial kitchens have additional resources to help tenants, such as instructions and consulting services relating to business planning, product development, and branding. Other things to examine include payment arrangements by tenants. Published reports indicate that some kitchens mainly have rental agreements. What factors affect rental rates? Are they fixed or do they vary with the frequency of usage, usage over a period of time, volume of activities, etc. How competitive are rents or charges in comparison to market rates, and how often do they change over time?

Social factors to be examined relate to aspects of culture, demographics, gender, ethnicity factors, ethical issues, consumer buying patterns, buying access, health, consumer opinions and attitudes, views of the media, education, social trends, etc. **Technological** consideration will be given to technological development, the use of information technology, consumer buying trends, communication, etc. This is very important given that some local food establishments have partnerships to assist producers in planning production, food safety, and post-harvest handling to enable producers to meet buyer requirements relating to quality, volume, consistency, packaging, liability, and food safety. The questions to be addressed under these two objectives include, how “PEST” factors affect processing and supplying fish and seafood products.

Objective 3.—Fish is a perishable food product, and with processing, it requires effective management of the path from the farm through processing to the end-user. This objective addresses product safety in processing fish including waste disposal / cleaning considerations and safety of direct selling operations. We will help fish producers to address the main requirements of food safety guidelines based on regulatory guidance, including seafood HACCP principles and the FDA Food Safety Modernization Act (FSMA) to ensure consumer safety and good manufacturing practice (GMP). These include identifying reasonable food safety hazards and developing plans for the control of those hazards. The technical assistance that we will provide include best practices to ensure the maintenance of an uninterrupted cold chain throughout the fish processing steps, maintaining information flow throughout all the steps (traceability of the products), and establishing indicators for fish quality measurements, e.g., the temperature of the fish product required to ensure product quality through the chain. Producers require robust procedures in each step of the fish supply chain while maintaining compliance with the federal, state, and local regulations. In addition, this project will assist the producers by providing timely food safety information that include several regulations under FSMA that allow exemptions related to the seafood HACCP and other seafood operational processes. We will communicate relevant information on food safety and quality codes through our Safe Quality Food (SQF) program recognized by the Global Food Safety Institute (GFSI) at no cost to the processors. Information on fish waste discharge guidelines, cleaning, and sanitation product(s) discharge guidelines, and permitting requirements will be provided to participants under this objective.

Objective 4.— The strategic pathways will be in the form of a roadmap for fish farmers interested in fish processing and product development for the local food system. Based on the information and data generated from Objectives 1 through 3, this objective will follow classic strategic management approaches: How to identify customers, what is the desired product and how it fits into the current local foods market, and how processing fish will help to achieve the farmer’s business goals. Recommended effective business development strategy involves four key components: Customers, Competitors, the Business, and the Macro environment (Caporale, 2015). The **Customers** component involves defining the customers/clients in the market and their needs. It requires a strong understanding of customers’ needs, especially relating to aquaculture products being offered and a continuous adjustment to the product based on feedback from customers. The **Competitors** element is about how to position the local product to local customers, given that there are other fish products on the market, such as imported and wild capture fish. The results from *Objective 3* becomes very relevant. The **Business** component ensures that going this route of processing and adding value would provide a return on the investment. This is where results from *Objective 2* become relevant in exploring a variety of different business models for fish farmers. The **Macro Environment** will utilize results from the “PEST” analyses to formulate approaches for effective marketing the product over the short and long-term. Some considerations will include emerging market trends in the local food system, emerging technologies that may be adopted, and any evolving seafood consumption patterns.

Objective .5 — This objective involves packaging the information, data, and knowledge gained from Objectives 1 through 4, which include identified potential aquaculture products, food safety indicators, various business models in the local food system, requirements for the different local foods actors, compliance and regulations issues, licensing, certifications, etc, into outreach materials - factsheets / bulletins / short videos. Additional data will be collected from participating farmers on processing cost, facility rental cost, travel cost, product & materials cost, labor cost, and fish yield as well as prices. These data items will be used to assess costs, profitability, and cost/benefit for engaging in processing. At University of Illinois, Co-PI Banerjee is developing a dedicated online outreach platform, Virtual Food Safety Outreach Platform at Illinois (VFSOPI), which will be utilized to host and deliver educational content for this project. These materials will help inform decisions by fish producers relating to processing, direct sales, business models, and engagement with local food systems. As alluded earlier, a fish producer may have identified customers such as local restaurants and caterers to supply fish, and could use the materials developed under this objective to expand operations and markets.

Evaluation and Outreach (Logic Model included)

The publication and outreach materials will be available online with examples of business models that inform decisions about the development of economically viable marketing strategies for engaging the local food system. The materials will be appropriately disseminated via Purdue University and University of Illinois Cooperative Extension Service (CES) online outlets, including extension web pages, virtual programming, and extension social media platforms. We will be very active in the two universities’ online presence with snippets of study results published as part of the two universities’ CES’s local foods outreach programs.

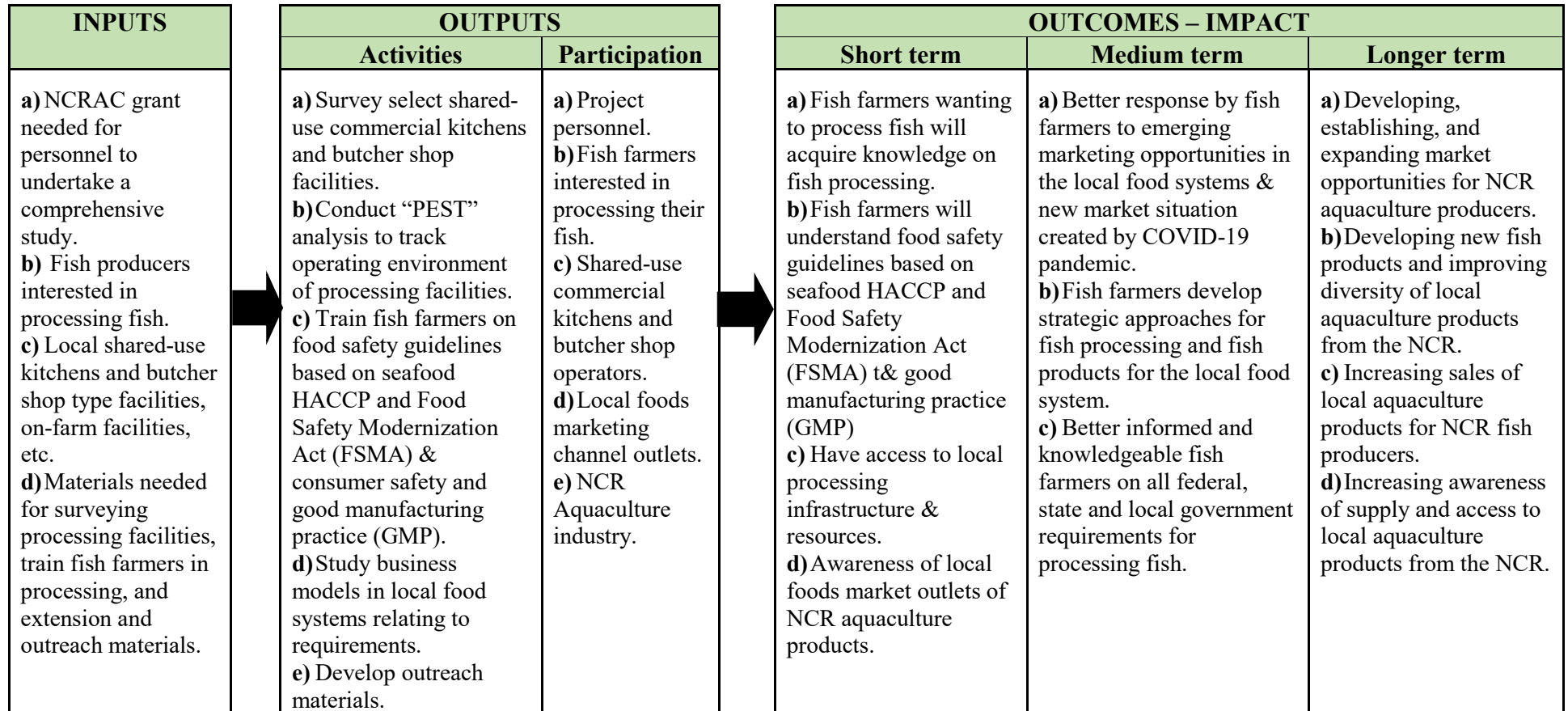
We will also participate in both in-person and virtual conferences and meetings relating to aquaculture and local food systems to present results. We will present results at state, regional, and national aquaculture meetings. In particular, we will organize a special panel session / discussion during state Aquaculture Association meetings and NCRAC regional meetings on utilizing kitchens

and butcher shops for fish processing, and highlight food safety issues. This will help promote the marketing opportunities from processing to the aquaculture industry.

Evaluation plans include using post-study and activity measures that assess the usefulness of the information we provided at both online and in-person / virtual meetings and conferences. Some measures to use are the number of views for the short videos, the number of hits to the web pages containing information from the study, post-activity surveys, the number of fish farmers who intend to utilize shared-use commercial kitchens and butcher shops, fish farmers who actually use the kitchens and butcher shops, and those who engage local food actors.

LOGIC MODEL

Situation: Fish farmers have long expressed interest in processing fish for local markets, but the marketplace situation created by COVID-19 pandemic has intensified the need for processing to expand market opportunities to niche markets. A recent article in the New York Times, Wells (2020), and a report by van Senten et al (2020), suggest opportunities for aquaculture producers in the NCR to explore processing to service emerging markets. Unfortunately, processing infrastructure is limited in the NCR; therefore, this study explores processing fish and other aquaculture products in shared-use commercial kitchen and butcher shop-type facilities in local communities to supply the local food systems.



ASSUMPTIONS

- 1) Interest expressed by several NCR fish farmers
- 2) Identified commercial shared use kitchens / butcher shop facilities
- 3) Adapt to in-person and virtual activities / programming when necessary.

EXTERNAL FACTORS

- 1) Utilize trainers in HACCP, FSMA, & GMP
- 2) Federal, state and local government factors

Facilities

Purdue University:

There are facilities and equipment, office space, computer software and hardware, internet access, network support, clerical and administrative support and other miscellaneous office supplies readily available at Purdue University for our use with this project. Dr. Quagraine and Amy Shambach are involved in Purdue's aquaculture program, which entails quality research, teaching and committed outreach activities by nationally and internationally recognized faculty and extension professionals.

University of Illinois:

The Department of Food Science and Human Nutrition at University of Illinois has excellent state-of-the-art research facilities, including fully equipped chemistry, microbiology, biochemistry, nutrition, and molecular biology laboratories; food-processing pilot plant complex; bioprocessing / fermentation pilot plant; metabolic kitchen; and sensory science lab.

References

- Caporale, B. (2015). Creative strategy generation: using passion and creativity to compose business strategies that inspire action and growth. McGraw Hill Professional.
- Caporelli, A., & Lazur, M. (2014). Small-Scale, On-Farm Fish Processing. Southern Regional Aquaculture Center (SRAC) Publication No. 442, June 2014. Retrieved from <https://fisheries.tamu.edu/files/2019/01/SRAC-0442.pdf>. Viewed October 6, 2020
- Colasanti, K., Hardy, J., Farbman, J., Pirog, R., Fisk, J., & Hamm, M.W. (2018). Findings of the 2017 National Food Hub Survey. East Lansing, MI: Michigan State University Center for Regional Food Systems & The Wallace Center at Winrock International. Retrieved from <https://www.canr.msu.edu/resources/2017-food-hub-survey>
- Knapp, G., Reeve, T., & Merrill, C. (2008). A Village Fish Processing Plant: Yes or No? A Planning Handbook. Institute of Social and Economic Research, University of Alaska – Anchorage. Retrieved from <https://seagrant.uaf.edu/map/pubs/village/villagefishplant.pdf>. Viewed October 6, 2020
- National Restaurant Association. (2014 – 2017). What’s Hot Culinary Forecast. Annual Surveys. Retrieved from: <http://www.restaurant.org/News-Research/Research/What-s-Hot>
- van Senten, J., Smith, M.A., Engle, C.R., Clark, C., Fluharty, S., and Schwarz, M.H. (2020). Impacts of COVID-19 on U.S. Aquaculture, Aquaponics, and Allied Businesses: Quarter 2 Results April 10, 2020 to June 29, 2020 survey. Virginia Cooperative Extension publication 2020 AAEC-228NP, VSG-20-10. Retrieved from https://www.pubs.ext.vt.edu/content/dam/pubs_ext_vt_edu/AAEC/aaec-228/AAEC-228.pdf. Viewed October 6, 2020
- Wells, P. (2020). A Quarantine Surprise: Americans Are Cooking More Seafood. Retrieved from https://www.nytimes.com/2020/05/05/dining/seafood-fish-coronavirus.html?auth=link-dismiss-google1tap&campaign_id=58&emc=edit_ck_20200506&instance_id=18240&nl=cooking®i_id=117378642&segment_id=26716&te=1&user_id=0039953cb16cab1a36dd80467d437aa0. Viewed October 6, 2020

Project Leaders

State	Names / Institution	Area of Specialization
Indiana	Kwamena Quagraine, Purdue University	Aquaculture economics & marketing
Indiana	Amy Shambach, Purdue University	Aquaculture production, extension / outreach
Illinois	Pratik Banerjee, University of Illinois at Urbana-Champaign	Food processing, food safety
Ohio	Ashtyn Chen, The Ocean's Friend Aquaculture, LLC	Fish production, processing

BUDGET: Purdue University – Year 1

ORGANIZATION AND ADDRESS Purdue University Sponsored Program Services 615 W. State St., West Lafayette, IN 47907-2053			USDA AWARD NO. Year 1: Objectives 1 & 2			
			Duration Proposed Months: <u>12</u> Funds Requested by Proposer	Duration Proposed Months: _____ Funds Approved by CSREES (If different)	Non-Federal Proposed Cost-Sharing/Matching Funds (If required)	Non-federal Cost-Sharing/Matching Funds Approved by CSREES (If Different)
PROJECT DIRECTOR(S) Kwamena Quagrainie						
A. Salaries and Wages 1. No. of Senior Personnel			CSREES FUNDED WORK MONTHS			
			Calendar	Academic	Summer	
a. ___ (Co)-PD(s)						
b. ___ Senior Associates						
2. No. of Other Personnel (Non-Faculty)						
a. ___ Research Associates-Postdoctorates ...						
b. 1 Other Professionals				X		39,668
c. Paraprofessionals						
d. ___ Graduate Students						11,274
e. Prebaccalaureate Students						
f. Secretarial-Clerical						
g. Technical, Shop and Other						
Total Salaries and Wages →						50,942
B. Fringe Benefits (If charged as Direct Costs)						14,060
C. Total Salaries, Wages, and Fringe Benefits (A plus B) →						65,002
D. Nonexpendable Equipment (Attach supporting data. List items and dollar amounts for each item.)						
E. Materials and Supplies						
F. Travel						4,550
G. Publication Costs/Page Charges						
H. Computer (ADPE) Costs						
I. Student Assistance/Support (Scholarships/fellowships, stipends/tuition, cost of education, etc. Attach list of items and dollar amounts for each item.)						
J. All Other Direct Costs (In budget narrative, list items and dollar amounts and provide supporting data for each item.)						10,000
K. Total Direct Costs (C through I) →						69,552
L. F&A/Indirect Costs. (If applicable, specify rate(s) and base(s) for on/off campus activity. Where both are involved, identify itemized costs in on/off campus bases.)						0.00
M. Total Direct and F&A/Indirect Costs (J plus K) . →						79,552
N. Other →						
O. Total Amount of This Request →						79,552
P. Carryover -- (If Applicable) Federal Funds: \$79,552 Non-Federal funds: \$ Total \$79,552						
Q. Cost Sharing/Matching (Breakdown of total amounts shown in line O)						
Cash (both Applicant and Third Party) →						
Non-Cash Contributions (both Applicant and Third Party) →						
NAME AND TITLE (Type or print)		SIGNATURE (required for revised budget only)			DATE	
Project Director						
Authorized Organizational Representative						
Signature (for optional use)						

BUDGET: Purdue University – Year 2

ORGANIZATION AND ADDRESS Purdue University Sponsored Program Services 615 W. State St., West Lafayette, IN 47907-2053			USDA AWARD NO. Year 2: Objectives 4 & 5			
			Duration Proposed Months: <u>12</u> Funds Requested by Proposer	Duration Proposed Months: _____ Funds Approved by CSREES (If different)	Non-Federal Proposed Cost-Sharing/Matching Funds (If required)	Non-federal Cost-Sharing/Matching Funds Approved by CSREES (If Different)
PROJECT DIRECTOR(S) Kwamena Quagrainie						
A. Salaries and Wages 1. No. of Senior Personnel			CSREES FUNDED WORK MONTHS			
			Calendar	Academic	Summer	
a. ___ (Co)-PD(s)						
b. ___ Senior Associates						
2. No. of Other Personnel (Non-Faculty)						
a. ___ Research Associates-Postdoctorates ...						
b. 1 Other Professionals				X		40,660
c. Paraprofessionals						
d. ___ Graduate Students						11,499
e. Prebaccalaureate Students						
f. Secretarial-Clerical						
g. Technical, Shop and Other						
Total Salaries and Wages →						52,159
B. Fringe Benefits (If charged as Direct Costs)						14,406
C. Total Salaries, Wages, and Fringe Benefits (A plus B) →						66,565
D. Nonexpendable Equipment (Attach supporting data. List items and dollar amounts for each item.)						
E. Materials and Supplies						
F. Travel						3,440
G. Publication Costs/Page Charges						
H. Computer (ADPE) Costs						
I. Student Assistance/Support (Scholarships/fellowships, stipends/tuition, cost of education, etc. Attach list of items and dollar amounts for each item.)						
J. All Other Direct Costs (In budget narrative, list items and dollar amounts and provide supporting data for each item.)						14,000
K.....Total Direct Costs (C through I) →						70,005
L. F&A/Indirect Costs. (If applicable, specify rate(s) and base(s) for on/off campus activity. Where both are involved, identify itemized costs in on/off campus bases.)						0.00
M..... Total Direct and F&A/Indirect Costs (J plus K) . →						84,005
N.....Other →						
O.....Total Amount of This Request →						84,005
P. Carryover -- (If Applicable) Federal Funds: \$84,005 Non-Federal funds: \$ Total \$84,005						
Q. Cost Sharing/Matching (Breakdown of total amounts shown in line O)						
Cash (both Applicant and Third Party) →						
Non-Cash Contributions (both Applicant and Third Party) →						
NAME AND TITLE (Type or print)		SIGNATURE (required for revised budget only)			DATE	
Project Director						
Authorized Organizational Representative						
Signature (for optional use)						

BUDGET: Purdue University – Total (Yrs 1 & 2)

ORGANIZATION AND ADDRESS Purdue University Sponsored Program Services 615 W. State St., West Lafayette, IN 47907-2053			USDA AWARD NO. Year 1 & 2: Objectives 1, 2, 4 & 5			
			Duration Proposed Months: <u>24</u> Funds Requested by Proposer	Duration Proposed Months: _____ Funds Approved by CSREES (If different)	Non-Federal Proposed Cost-Sharing/Matching Funds (If required)	Non-federal Cost-Sharing/Matching Funds Approved by CSREES (If Different)
PROJECT DIRECTOR(S) Kwamena Quagrainie						
A. Salaries and Wages 1. No. of Senior Personnel			CSREES FUNDED WORK MONTHS			
			Calendar	Academic	Summer	
a. ___ (Co)-PD(s)						
b. ___ Senior Associates						
2. No. of Other Personnel (Non-Faculty)						
a. ___ Research Associates-Postdoctorates ...						
b. 1 Other Professionals				X		80,328
c. Paraprofessionals						
d. ___ Graduate Students						22,773
e. Prebaccalaureate Students						
f. Secretarial-Clerical						
g. Technical, Shop and Other						
Total Salaries and Wages →						103,101
B. Fringe Benefits (If charged as Direct Costs)						28,466
C. Total Salaries, Wages, and Fringe Benefits (A plus B) →						131,567
D. Nonexpendable Equipment (Attach supporting data. List items and dollar amounts for each item.)						
E. Materials and Supplies						
F. Travel						7,990
G. Publication Costs/Page Charges						
H. Computer (ADPE) Costs						
I. Student Assistance/Support (Scholarships/fellowships, stipends/tuition, cost of education, etc. Attach list of items and dollar amounts for each item.)						
J. All Other Direct Costs (In budget narrative, list items and dollar amounts and provide supporting data for each item.)						24,000
K.....Total Direct Costs (C through I) →						139,557
L. F&A/Indirect Costs. (If applicable, specify rate(s) and base(s) for on/off campus activity. Where both are involved, identify itemized costs in on/off campus bases.)						0.00
M..... Total Direct and F&A/Indirect Costs (J plus K) . →						163,557
N.....Other →						
O.....Total Amount of This Request →						163,557
P. Carryover -- (If Applicable) Federal Funds: \$163,557			Non-Federal funds: \$		Total \$163,557	
Q. Cost Sharing/Matching (Breakdown of total amounts shown in line O)						
Cash (both Applicant and Third Party) →						
Non-Cash Contributions (both Applicant and Third Party) →						
NAME AND TITLE (Type or print)			SIGNATURE (required for revised budget only)			DATE
Project Director						
Authorized Organizational Representative						
Signature (for optional use)						

Budget Explanation (Purdue University)

Personnel

Amy Shambach will be supported on this project for 80%FTE each year serving as both Research and Extension Associate (Year 1 support is \$39,668; Year 2 support is \$40,660). Her position is grant-funded with the main responsibility for all the leg-work establishing a list of kitchens and butcher shops, collecting information from fish producers, kitchen and butcher shop operators, and relevant state and county officials. She will coordinate with State Aquaculture associations to identify fish producers and relevant authorities and do in-person interviews where necessary. Together with Dr. Quagraine, they will develop all the outreach materials and do the extension activities. Amy Shambach and Professor Quagraine will be responsible for Objectives 1, 2, 4 & 5.

A **Graduate student** will be supported at 25%FTE each year (Year 1 support is \$ 11,274; Year 2 support is \$11,499). The student will assist in the collection of information and data. Under the supervision of Dr. Quagraine, he/she will do both qualitative and quantitative analysis, which will form the basis of their MS thesis. The student will assist in achieving all 5 objectives.

Fringe Benefits

Fringe benefits are budgeted in accordance with university policy as follows:

Research Associate (Amy Shambach) 33.05% - Year 1 = \$13,111; Year 2 = \$13,438

Graduate student 8.42% - Year 1 = \$949; Year 2= \$968

Travel

Year 1: \$4,550 - Travel for project personnel is domestic for data collection, and includes a cumulative mileage of 1,000 miles @ \$0.55 (\$550), and cumulative 20 days overnight stays @ \$100 for 2 project personnel (\$4,000).

Year 2: \$3,440 - Travel for project personnel for extension and outreach activities, and includes a cumulative mileage of 800 miles @ \$0.55 (\$440), and cumulative 10 days overnight stays @ \$150 for 2 project personnel (\$3,000).

Other Direct Costs

- Survey costs: \$2,500
The budgeted amount includes incentives for some in-person surveys and pilot use of facility @ \$50 per facility x 50 commercial shared-use kitchens respondents and butcher-shop type facilities.
- HACCP participation costs: \$1,500
To support costs for fish producers interested in HACCP training - registration charges and training materials.
- Software for analysis: \$1,500
Charges relating to the updating the analytical software to analyze the data collected.
- Factsheets & Bulletins: \$1,500
- Outreach / Extension-oriented activities: \$5,500

Expense associated with online and social media activities; organizing special session / panel discussion at state and regional aquaculture conferences; and collaborating with the local foods industry.

- Video production: \$2,500
Transcription (\$800) and freelance video production (\$1,700), as part of the deliverables and highlighted online / social media.
- Publications: \$1,000
Publication costs for a peer-reviewed article at \$1,000 to cover associated page fees
- Contract to The Ocean's Friend Aquaculture, LLC: \$8,000. Ashtyn Chen, who already is involved in processing fish produced on his farm will assist in making industry connections and networking with potential processing facilities and the foodservice industry, i.e., restaurants, food caterers, etc. He is budgeted for his time consulting on the project for 2 years. Ashtyn will assist in achieving Objectives # 1, 2 & 4.

BUDGET: University of Illinois at Urbana-Champaign – Year 1

ORGANIZATION AND ADDRESS University of Illinois at Urbana-Champaign Office Of Sponsored Programs Z-Building, 1901 S 1st St a, Champaign, IL 61820			USDA AWARD NO. Year 1: Objective 3			
			Duration Proposed Months: <u>12</u> Funds Requested by Proposer	Duration Proposed Months: _____ Funds Approved by CSREES (If different)	Non-Federal Proposed Cost-Sharing/Matching Funds (If required)	Non-federal Cost-Sharing/Matching Funds Approved by CSREES (If Different)
PROJECT DIRECTOR(S) Pratik Banerjee						
A. Salaries and Wages 1. No. of Senior Personnel			CSREES FUNDED WORK MONTHS			
			Calendar	Academic	Summer	
a. <u>1</u> (Co)-PD(s)					X	9,000
b. _____ Senior Associates						
2. No. of Other Personnel (Non-Faculty)						
a. _____ Research Associates-Postdoctorates ...						
b. _____ Other Professionals						
c. Paraprofessionals						
d. Graduate Students						
e. Prebaccalaureate Students						
f. Secretarial-Clerical						
g. Technical, Shop and Other						
Total Salaries and Wages →						9,000
B. Fringe Benefits (If charged as Direct Costs)						4,222
C. Total Salaries, Wages, and Fringe Benefits (A plus B) →						13,222
D. Nonexpendable Equipment (Attach supporting data. List items and dollar amounts for each item.)						
E. Materials and Supplies						3,000
F. Travel						2,700
G. Publication Costs/Page Charges						
H. Computer (ADPE) Costs						
I. Student Assistance/Support (Scholarships/fellowships, stipends/tuition, cost of education, etc. Attach list of items and dollar amounts for each item.)						
J. All Other Direct Costs (In budget narrative, list items and dollar amounts and provide supporting data for each item.)						
K.....Total Direct Costs (C through J) →						18,922
L. F&A/Indirect Costs. (If applicable, specify rate(s) and base(s) for on/off campus activity. Where both are involved, identify itemized costs in on/off campus bases.)						0.00
M..... Total Direct and F&A/Indirect Costs (J plus K) . →						18,922
N.....Other →						
O.....Total Amount of This Request →						18,922
P. Carryover -- (If Applicable) Federal Funds: \$18,922			Non-Federal funds: \$		Total \$18,922	
Q. Cost Sharing/Matching (Breakdown of total amounts shown in line O)						
Cash (both Applicant and Third Party) →						
Non-Cash Contributions (both Applicant and Third Party) →						
NAME AND TITLE (Type or print)			SIGNATURE (required for revised budget only)			DATE
Project Director						
Authorized Organizational Representative						
Signature (for optional use)						

BUDGET: University of Illinois at Urbana-Champaign – Year 2

ORGANIZATION AND ADDRESS University of Illinois at Urbana-Champaign Office Of Sponsored Programs Z-Building, 1901 S 1st St a, Champaign, IL 61820			USDA AWARD NO. Year 2: Objective 5			
PROJECT DIRECTOR(S) Pratik Banerjee			Duration Proposed Months: <u>12</u> Funds Requested by Proposer	Duration Proposed Months: _____ Funds Approved by CSREES (If different)	Non-Federal Proposed Cost-Sharing/Matching Funds (If required)	Non-federal Cost-Sharing/Matching Funds Approved by CSREES (If Different)
A. Salaries and Wages						
1. No. of Senior Personnel			CSREES FUNDED WORK MONTHS			
			Calendar	Academic	Summer	
a. <u>1</u> (Co)-PD(s)					X	
b. _____ Senior Associates						
2. No. of Other Personnel (Non-Faculty)						
a. _____ Research Associates-Postdoctorates . . .						
b. _____ Other Professionals						
c. Paraprofessionals						
d. Graduate Students						
e. Prebaccalaureate Students						
f. Secretarial-Clerical						
g. Technical, Shop and Other						
Total Salaries and Wages					9,270	
B. Fringe Benefits (If charged as Direct Costs)					4,349	
C. Total Salaries, Wages, and Fringe Benefits (A plus B) →					13,619	
D. Nonexpendable Equipment (Attach supporting data. List items and dollar amounts for each item.)						
E. Materials and Supplies					2,928	
F. Travel					2,808	
G. Publication Costs/Page Charges						
H. Computer (ADPE) Costs						
I. Student Assistance/Support (Scholarships/fellowships, stipends/tuition, cost of education, etc. Attach list of items and dollar amounts for each item.)						
J. All Other Direct Costs (In budget narrative, list items and dollar amounts and provide supporting data for each item.)						
K.....Total Direct Costs (C through J) →					19,355	
L. F&A/Indirect Costs. (If applicable, specify rate(s) and base(s) for on/off campus activity. Where both are involved, identify itemized costs in on/off campus bases.)					0.00	
M..... Total Direct and F&A/Indirect Costs (J plus K) . →					19,355	
N.....Other →						
O.....Total Amount of This Request →					19,355	
P. Carryover -- (If Applicable) Federal Funds: \$19,355			Non-Federal funds: \$		Total \$19,355	
Q. Cost Sharing/Matching (Breakdown of total amounts shown in line O)						
Cash (both Applicant and Third Party)						
Non-Cash Contributions (both Applicant and Third Party) →						
NAME AND TITLE (Type or print)	SIGNATURE (required for revised budget only)					DATE
Project Director						
Authorized Organizational Representative						
Signature (for optional use)						

BUDGET: University of Illinois at Urbana-Champaign – Total (Yrs 1 & 2)

ORGANIZATION AND ADDRESS University of Illinois at Urbana-Champaign Office Of Sponsored Programs Z-Building, 1901 S 1st St a, Champaign, IL 61820				USDA AWARD NO. Year 1 & 2: Objectives 3 & 5							
				Duration Proposed Months: <u>24</u> Funds Requested by Proposer	Duration Proposed Months: _____ Funds Approved by CSREES (If different)	Non-Federal Proposed Cost-Sharing/Matching Funds (If required)	Non-federal Cost-Sharing/Matching Funds Approved by CSREES (If Different)				
PROJECT DIRECTOR(S) Pratik Banerjee											
A. Salaries and Wages 1. No. of Senior Personnel		CSREES FUNDED WORK MONTHS		18,270							
		Calendar	Academic							Summer	
a. <u>1</u> (Co)-PD(s)				X							
b. ___ Senior Associates											
2. No. of Other Personnel (Non-Faculty)											
a. ___ Research Associates-Postdoctorates ...											
b. Other Professionals											
c. Paraprofessionals											
d. Graduate Students											
e. Prebaccalaureate Students											
f. Secretarial-Clerical											
g. Technical, Shop and Other											
Total Salaries and Wages →				18,270							
B. Fringe Benefits (If charged as Direct Costs)				8,571							
C. Total Salaries, Wages, and Fringe Benefits (A plus B) →				26,841							
D. Nonexpendable Equipment (Attach supporting data. List items and dollar amounts for each item.)											
E. Materials and Supplies				5,928							
F. Travel				5,508							
G. Publication Costs/Page Charges											
H. Computer (ADPE) Costs											
I. Student Assistance/Support (Scholarships/fellowships, stipends/tuition, cost of education, etc. Attach list of items and dollar amounts for each item.)											
J. All Other Direct Costs (In budget narrative, list items and dollar amounts and provide supporting data for each item.)											
K.....Total Direct Costs (C through I) →				38,277							
L. F&A/Indirect Costs. (If applicable, specify rate(s) and base(s) for on/off campus activity. Where both are involved, identify itemized costs in on/off campus bases.)				0.00							
M..... Total Direct and F&A/Indirect Costs (J plus K) . →				38,277							
N.....Other →											
O.....Total Amount of This Request →				38,277							
P. Carryover -- (If Applicable) Federal Funds: \$38,277				Non-Federal funds: \$		Total \$38,277					
Q. Cost Sharing/Matching (Breakdown of total amounts shown in line O)											
Cash (both Applicant and Third Party) →											
Non-Cash Contributions (both Applicant and Third Party) →											
NAME AND TITLE (Type or print)		SIGNATURE (required for revised budget only)						DATE			
Project Director											
Authorized Organizational Representative											
Signature (for optional use)											

University of Illinois at Urbana-Champaign

A. Salaries and Wages

Pratik Banerjee, PhD, will serve as a Project Director/Principal Investigator (one-month summer effort, Yrs 1-2). Dr. Banerjee is an Associate Professor of Food Science and Human Nutrition at the University of Illinois is the Co-PI of the project; he will be responsible for overseeing and managing all aspects of the project with the PD at Purdue University. Specifically, he will direct the content development of food safety educational modules. Dr. Banerjee will coordinate with the University of Illinois Extension and organize the onsite HACCP, and Better Process Control workshops and face to face interaction with the stakeholders. Dr. Banerjee will be responsible for communicating the project outcomes and will work with regional centers. To support Dr. Banerjee's efforts, summer salary supports in the amount of \$9,000 (plus \$4,222 in benefits) and \$9,270 (plus \$4,349 in benefits) are requested in years 1 and 2, respectively.

B. Fringe Benefits (If charged as Direct Costs)

Benefits for faculty are calculated at 46.91% as per university policy and inflated at 3% per year.

C. Total Salaries, Wages, and Fringe Benefits: \$26,841

E. Materials and Supplies:

The requested budget includes \$3,000 in year one and \$2,928 for year 2. This fund will be used to purchase outreach materials delivery materials, e.g., imaging materials including hard drives and cloud storage (\$1,600); Training participation costs, e.g., course registrations, room rentals, supplies (\$2,800); Course materials with postage (\$528); Outreach through online and social media activities (\$1,000).

F. Travel: \$5,508

Funds are requested each year for the co-PD to travel to venues of fish processors and conferences as appropriate and other related meetings as mandated by the grant. Travel locations include Illinois, Indiana, Ohio and other NCR states as necessary.

Year1 \$2,700: Cumulative mileage of 1,000 miles @ \$0.50 (\$500), and cumulative 20 days overnight stays @ \$110 (\$2,200).

Year 2: \$2,808: Travel to regional meetings, participate in extension and outreach activities, and provide trainings – conference registration (\$208); cumulative mileage of 800 miles @ \$0.50 (\$400), and cumulative 20 days overnight stays @ \$110 (\$2,200).

K. Total Direct Costs: \$38,277

L. Indirect Costs: \$0

As per the sponsor's requirement, no indirect cost was charged.

I. Total Amount of This Request: \$38,277.

Budget Summary

Year 1

	Purdue University PI: Kwamena Quagraine	University of Illinois PI: Pratik Banerjee	The Ocean's Friend Aquaculture, LLC
Salaries	50,942	9,000	0
Benefits	14,060	4,222	0
Supplies		3,000	0
Travel	4,550	2,700	
Other	10,000	0	4,000 ¹
TOTAL	79,552	18,922	4,000¹

¹ Budget for The Ocean's Friend Aquaculture, LLC is shown in the table only for information purposes and is included in Purdue University's budget as a contractor.

Year 2

	Purdue University PI: Kwamena Quagraine	University of Illinois PI: Pratik Banerjee	The Ocean's Friend Aquaculture, LLC
Salaries	52,159	9,270	0
Benefits	14,406	4,349	0
Supplies		2,928	0
Travel	3,440	2,808	
Other	14,000	0	4,000 ¹
TOTAL	84,005	19,355	4,000¹

¹ Budget for The Ocean's Friend Aquaculture, LLC is shown in the table only for information purposes and is included in Purdue University's budget as a contractor.

Schedule for Completion of Objectives

Start date: 09/01/2021
 Completion date: 08/31/2023

Objectives & Tasks	Year 1						Year 2					
	S O	N O	J F	M A	M J	J A	S O	N O	J F	M A	M J	J A
Objective 1:												
Task 1: - Review relevant literature & develop questionnaires for shared-use kitchens and butcher shop facilities.	█	█										
Task 2: Identify, compile, and contact (pretest questions) subjects to select shared-use kitchens and butcher shop facilities.		█	█									
Task 3: Survey selected shared-use commercial kitchens and butcher shop facilities.			█	█								
Task 4: Collate survey data & information and conduct “PEST” analysis to track operating environment of processing facilities.				█	█							
Objective 2:												
Task: - Synthesize information & analytical results for feasible fish processing in the facilities.				█	█							
Objective 3:												
Task 1: - Compile federal, state, & local food, health, & environmental regulations on seafood operational processes.		█	█	█	█							
Task 2: - Assemble materials relating to HACCP, FSMA, GMP, wastes & other food safety protocols for training fish producers.		█	█	█	█							
Task 3: - Identify fish producers for training & conduct training in HACCP, FSMA, GMP, wastes, & other food safety protocols.					█	█						
Objective 4:												
Task 1: - Network with select fish producers & local food outlets on the supply of processed aquaculture products.						█	█					
Task 2: - Collect information on business operations in local food systems relating to requirements.						█	█					
Task 3: - Develop economically viable business models & potential pathways for fish farmers to engage local food actors.							█	█				
Objective 5:												
Task: - Develop outreach materials – manuscript, factsheet, bulletin, short videos, & results briefs on PEST analysis, safety indicators for products and direct sales, business models, & strategic pathways for engaging local food systems.								█	█	█		
Delivery												
Task 1: - Publish outreach materials via appropriate channels including a professional journal, Extension online outlets, & social media platforms.										█	█	█
Task 2: - Present results at state, regional & national meetings.									█	█	█	
Task 3: - Prepare and submit final report to NCRAC.											█	█

Data Management Plan

Expected Data Type

Describe the type of data (e.g., digital, non-digital), how it will be generated, and whether the data are primary or metadata. Research examples include: lab work, field work and surveys; Education examples include: number of students enrolled/participated, degrees granted, curriculum, and training products; Extension examples include: outreach materials, number of stakeholders reached, number of activities, and assessment questionnaires

Data type will be survey results from select shared-use commercial kitchens and butcher shop facilities in Illinois, Indiana, and Ohio. Data collected will include state and local government policies on fish processing; trading laws; employment policies; ordinances; taxes; disposable incomes; unemployment levels; taxation policies; available resources to help kitchen tenants; demographics; consumer buying patterns; social trends; and use of technology. This data will be both qualitative and quantitative to be use for the “PEST” analysis.

Additional data to be collected is from participating farmers on processing cost, facility rental cost, travel cost, product & materials cost, labor cost, and fish yield as well as prices. These data items will be used to assess costs, profitability, and cost/benefit for engaging in processing.

Data format

For scientific data to be readily accessible and usable it is critical to use appropriate community-recognized standard and machine readable formats when they exist. If the data will be managed in domain-specific workspaces or submitted to public databases, indicate that their required formats will be followed. Regardless of the format used, the data set must contain enough information to allow independent use (understanding, validation, and analysis) of the data

The data will be both qualitative and quantitative in Microsoft Word and Excel format.

Data storage and preservation

Data must be stored in a safe environment with adequate measures taken for its long-term preservation. Applicants must describe plans for storing and preserving their data during and after the project and specify the data repositories, if they exist. Databases or data repositories for long-term preservation may be the same that are used to provide Data Sharing and Public Access. Estimate how much data will be preserved and state the planned retention period. Include any strategies, tools, and contingency plans that will be used to avoid data loss, degradation, or damage

All the data collected will be stored at Purdue University Research Repository. Since this study involves a selected processing facilities and fish farmers, the data will not be very large. Data access will be provided to the public through Purdue University’s repository. The data will be in the repository for 10 years.

Data sharing, protection, and public access

Describe your data access and sharing procedures during and after the grant. Name specific repositories and catalogs as appropriate. Include a statement, when applicable, of plans to protect confidentiality, personal privacy, proprietary interests, business confidential information, and intellectual property rights. Outline any restrictions such as copyright, confidentiality, patent, appropriate credit, disclaimers, or conditions for use of the data by other parties.

All the data collected will be stored at Purdue University Research Repository. Data will be aggregated to protect individual privacy and confidentiality. Both qualitative and quantitative will

be available through Purdue University's repository. There will be no restrictions to access the data derived from the project. Data will be aggregated.

Roles and responsibilities

Who will ensure DMP implementation? This is particularly important for multi-investigator and multi-institutional projects. Provide a contingency plan in case key personnel leave the project. Also, what resources will be needed for the DMP? If funds are needed, have they been added to the budget request and budget narrative? Projects must budget sufficient resources to develop and implement the proposed DMP.

Lead PI, Kwamena Quagrainie will ensure the implementation of the DMP.

VITA

Kwamena K. Quagraine

Professor, Aquaculture Economics & Marketing / Extension Specialist Phone: 765-494-4200
Department of Agricultural Economics / Illinois-Indiana Sea Grant Email: kquagrai@purdue.edu
Purdue University, 403 West State Street, West Lafayette, IN 47907

Education

Ph.D. (University of Alberta, Canada, 2000, Agricultural Economics)
M.S. (University of Alberta, Canada, 1995, Agricultural Economics)
B.S. (University of Science and Technology, Ghana, 1982, Agriculture)

Positions

2005 – Present: Director / Assistant Professor / Associate Professor / Professor, Aquaculture Economics & Marketing / Extension Specialist Purdue University / Illinois-Indiana Sea Grant
2001 – 2005: Assistant Professor, University of Arkansas at Pine Bluff, Pine Bluff, AR

Selected Publications

- Flores, R. M. V., Widmar, N. O., Quagraine, K., Preckel, P. V., and Pedroza Filho, M. X. 2021. Establishing Linkages Between Consumer Fish Knowledge and Demand for Fillet Attributes in Brazilian Supermarkets. *Journal of International Food & Agribusiness Marketing*, 1-21.
- Akuffo, A.S., and Quagraine, K.K. 2019. Assessment of Household Food Security in Fish Farming Communities in Ghana. *Sustainability*. 11(10); 2807.
- Amankwah, A., and Quagraine, K.K. 2019. Aquaculture Feed Technology Adoption and Smallholder Household Welfare in Ghana. *Journal of the World Aquaculture Society*. 50 (4):827-841.
- Quagraine, K.K. 2019. Consumer Willingness to Pay for a Saline Fish Species Grown in the US Midwest: The Case of Striped Bass, *Morone saxatilis*. *Journal of the World Aquaculture Society*. 50(1); 163-171.
- Quagraine, K.K., and Chu, J. 2019. Determinants of Catch Sales in Ghanaian Artisanal Fisheries. *Sustainability*. 11(2); 298.
- Quagraine, K.K., Flores, R.M.V., Kim, Hye-Ji, and McClain, V. 2018. Economic Analysis of Aquaponics and Hydroponics Production in the U.S. Midwest, *Journal of Applied Aquaculture*. 30(1); 1-14.
- Amankwah, A., Quagraine, K.K., and Preckel, P.V. 2018. Impact of Aquaculture Feed Technology on Fish Income and Poverty in Kenya. *Aquaculture Economics & Management*. 22(4); 410-430.
- Engle, C.R., Quagraine, K.K. and Dey, M.M. 2017. *Seafood and Aquaculture Marketing Handbook*. 2nd Edition, Wiley-Blackwell Publishing, West Sussex, UK.
- Cai, J., Quagraine, K.K., and Hishamunda, N. 2017. Social and Economic Performance of Tilapia Farming in Africa. *FAO Fisheries and Aquaculture Circular* N0. 1132, FIAA/C1132. Rome, Italy.
- Amankwah, A., Quagraine, K.K., and Preckel, P.V. 2016. Demand for Improved Fish Feed in the Presence of a Subsidy: A Double Hurdle Application in Kenya. *Agricultural Economics*. 47(6); 633-643.
- Darko, F.A., Quagraine, K.K., and Chenyambuga, S. 2016. Consumer Preferences for Farmed Tilapia in Tanzania: A Choice Experiment Analysis. *Journal of Applied Aquaculture*. 28(3); 131-143.
- Quagraine, K.K. 2015. Profitability of Indoor Production of Pacific White Shrimp (*Litopenaeus vannamei*): A Case Study of the Indiana Industry. Purdue University Extension Publication# EC-797-W / Illinois-Indiana Sea Grant Publication #15-005, May 2015.
- Quagraine, K.K. 2015. Profitability of Hybrid Striped Bass Cage Aquaculture in the Midwest. Purdue University Extension Publication# EC-798-W / Illinois-Indiana Sea Grant Publication #15-004.

VITA

Pratik Banerjee

Associate Professor of Food Safety and Extension Specialist
Department of Food Science and Human Nutrition
University of Illinois at Urbana-Champaign, Urbana, IL 61801

Phone: 217-300-0260
E-mail: pratik@illinois.edu

EDUCATION

B.Tech. (West Bengal University of Animal & Fishery Sciences, India, 1997, Dairy Technology)
M.Tech. (Jadavpur University, India, 2000, Biotechnology)
Ph.D. (Purdue University, 2008, Food Science)

POSITIONS

Associate Professor, Department of Food Science and Human Nutrition University of Illinois at Urbana-Champaign, IL	2020- present
Associate Professor, School of Public Health, University of Memphis, Memphis, TN	2018- 2020
Assistant Professor, School of Public Health, University of Memphis, Memphis, TN	2012- 2018
Assistant Professor, Food Science, Alabama A&M University, Huntsville, AL	2009-2012
Principal Scientist. LacPro Industries, LLC, Fort Wayne, IN	2008-2009

SCIENTIFIC AND PROFESSIONAL ORGANIZATIONS

American Society for Microbiology
Institute of Food Technologists
International Association for Food Protection

SELECTED PUBLICATIONS

- Syed, I., P. Banerjee, and P. Sarkar. 2020. Oil-in-water emulsions of geraniol and carvacrol improve the antibacterial activity of these compounds on raw goat meat surface during extended storage at 4 °C. *Food Control*, 107, 106757.
- Mukherjee, N., V.G. Nolan, J.R. Dunn, and P. Banerjee. 2020. Exposures Associated with Non-Typhoidal Salmonella Infections Caused by Newport, Javiana, and Mississippi Serotypes in Tennessee, 2013-2015: A Case-Case Analysis. *Pathogens*, 9, 78.
- Higgins, D., N. Mukherjee, C. Pal, I.M. Sulaiman, Y. Jiang, S. Hanna, J.R. Dunn, W. Karmaus, and P. Banerjee. 2020. Association of Virulence and Antibiotic Resistance in Salmonella-Statistical and Computational Insights into a Selected Set of Clinical Isolates. *Microorganisms*, 8, 1465.
- Mukherjee, N., V.G. Nolan, J.R. Dunn, and P. Banerjee. 2019. Sources of human infection by Salmonella enterica serotype Javiana: A systematic review. *PLoS One*, 14, e0222108-e0222108.
- Sulaiman, I.M., P. Banerjee, Y.H. Hsieh, N. Miranda, S. Simpson, and K. Kerdahi. 2018. Rapid Detection of Staphylococcus aureus and Related Species Isolated from Food, Environment, Cosmetics, a Medical Device, and Clinical Samples Using the VITEK MS Microbial Identification System. *Journal of AOAC International*, 101, 1135-1143.
- Higgins, D., C. Pal, I. M. Sulaiman, C. Jia, T. Zerwekh, S.E. Dowd, and P. Banerjee. 2018 Application of high-throughput pyrosequencing in the analysis of microbiota of food commodities procured from small and large retail outlets in a U.S. metropolitan area – A pilot study. *Food Research International*, 105, 29-40.
- Miranda, N., P. Banerjee, S. Simpson, K. Kerdahi, and I.M Sulaiman. 2017. Molecular Surveillance of Cronobacter spp. Isolated from a Wide Variety of Foods from 44 Different Countries by Sequence Typing of 16S rRNA, rpoB and O-Antigen Genes. *Foods*, 6, 36.
- Banerjee, P., I.M. Sulaiman, G. Schneider, and U. Ray. 2017. Jagadeesan, B., Novel Microbial Diagnostic Methods for Clinical, Environmental, and Food Samples. *Biomed Res Int*, 3942801-3942801.
- Adhikari, A., S. Kurella, P. Banerjee, and A. Mitra. 2017. Aerosolized bacteria and microbial activity in dental clinics during cleaning procedures. *Journal of Aerosol Science*, 114, 209-218.
- Mukherjee, N., L.M. Sulaiman, and P. Banerjee. 2016. Characterization of methicillin-resistant Staphylococcus aureus isolates from fitness centers in the Memphis metropolitan area, Tennessee. *American Journal of Infection Control*, 44, 1681-1683.
- Mukherjee, N., D. Bartelli, C. Patra, B.V Chauhan, S.E. Dowd, and P. Banerjee, 2016. Microbial Diversity of Source and Point-of-Use Water in Rural Haiti - A Pyrosequencing-Based Metagenomic Survey. *PLoS One*, 11, e0167353-e0167353.

VITA

Amy Shambach (F.K.A Amy Stinton)
Illinois-Indiana Sea Grant, Purdue University
195 Marsteller Street, West Lafayette, IN 47907

Phone: 765-496-4085
Email: ashambac@purdue.edu

EDUCATION

A.A., A.S. (College of the Redwoods, 2002, Science and Mathematics, Marine Science Technology)
B.S. (Ball State University, 2010, Biology)

POSITIONS

2019 – present	Aquaculture Marketing Outreach Association / Illinois-Indiana Sea Grant, Purdue University, Indiana
Oct. 2014 – 2019	Aquaculture Lab Technician, RDM Aquaculture LLC, Indiana
Aug. 2014 – Oct. 2014	Consultant, Aqua International Corporation, Costa Rica
Jan. 2014 - Aug. 2014	Compliance and Certification Coordinator, Bell Aquaculture, Indiana
2012 – 2013	Farm Manager, Bell Aquaculture, Indiana
2010 - 2012	Analytical Research Coordinator, Bell Aquaculture, Indiana
2010	Undergraduate Intern, Oregon State University, Oregon
2007	Farm Worker 1, University of Hawaii, Hawaii
2001 – 2005	Fisheries Technician, Pacific States Marine Fisheries Commission, California
2003	Environmental Health Technician, Mendocino County Environmental Health Department, California
2002 – 2003	Naturalist, Hendy Woods State Park, California

PROFESSIONAL AFFILIATION

Indiana Aquaculture Association Inc.

SELECTED PUBLICATIONS

Carlton, J.S., Foley, C. Shambach, A., 2020. Walleye Aquaculture Working Group Workshop: Identifying Walleye Marketing and Production Barriers. Accessible: <https://iiseagrant.org/publications/walleye-aquaculture-working-group-workshop-identifying-walleye-marketing-and-production-barriers/>

Stinton, A., Ciannelli, L, Reese, D., and Wakefield, W., 2014. Using In Situ Video Analysis to Assess Juvenile Flatfish Behavior Along the Oregon Central Coast, CalCOFI Rep., Vol.55, 2014

VITA

ASHTYN REED CHEN

3662 Hazelton-Etna Rd. SW
Pataskala, Ohio 43062

Phone: 740.564.0900

Email: ashtynchen@gmail.com

Education

BS. (The University of Southern California, Viterbi School of Engineering, Los Angeles, CA,
2015, Chemical Engineering with Biochemical Emphasis)

Positions

BriskHeat Corporation Columbus, OH Feb 2020 – Present

Team Leader, Technique (Europe)

- Promoted to a second lead role with managerial responsibilities over additional 8-10 Engineers
- Lead large projects (>\$100K) with major customers while delegating other work to the rest of the Engineering Team.
- Focus on European customers, but responsible for leading all international projects from design to delivery
- Responsible for revamping and redesigning our controller and composite curing products (Vacuum Tables, Multi-Zone Controllers, ACR System)
- Accustomed to international travel spanning 2+ weeks where I visit multiple sites in one go

BriskHeat Corporation Columbus, OH Aug 2018 – Present

Lead Applications Engineer, Industrial

- Promoted to a lead role with managerial responsibilities over 2-3 Engineers
- Lead large projects (>\$50K) with major customers while delegating other work to the rest of the Engineering Team.
- Focus on industrial applications, which account for \$21M of company gross revenue and growing tremendously (Gross Sales Growth >40% for the last 3 years)

The Ocean's Friend Aquaculture, LLC Pataskala, OH June 2015 – Present

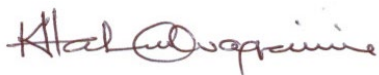
CEO & Biochemical Engineer

- Designed and set up Ohio's 1st indoor aquaculture facility to cultivate organic white-leg shrimp for sale
- Studied the mutual symbiosis of bacteria and shrimp to create this bio-floc RAS system
- Experimented to find and maintain the optimal temperature, dissolved oxygen levels, salinity, and pH to sustain the fragile 4-month shrimp maturation process
- Currently produce ~ 1900 lbs. per month and sell to consumers directly, restaurants, and institutions
- Family-Owned and Operated with slightly over 23,000 SF of production space in Cambridge, Gratiot (Zanesville) and Pataskala
- Also involved and hold positions in the OAA, OHAC, NCRAC, Ohio Sea Grant, and more.

Checklist for Submission of Full Proposals

- ✓ Follow guidelines with the exception of the budget sheets.
- ✓ Format manuscripts for 22 x 28 cm (8½ x 11 inch).
- ✓ Number *all* pages sequentially.
- ✓ Use 10-12 font; Times New Roman. Do not justify right margins.
- ✓ Format headings appropriately.
- ✓ Leave at least a 2.5-cm (1-inch) margin on all sides.
- ✓ Use metric units of measurement with English units in parenthesis, e.g., 2.54 cm (1 inch).
- ✓ Define all abbreviations the first time they are used.
- ✓ Express ratios by using a slant line (e.g., mg/L).
- ✓ Scientific names should accompany common names in the title and when they are first mentioned in the abstract and in the text. Authority for scientific names need not accompany the genus and species unless needed for clarity.
- ✓ Spell out one to ten unless followed by a unit of measurement (e.g., four fish, 4 kg, 14 fish). Do not begin a sentence with a numeral. Use 1,000 instead of 1000; 0.13 instead of .13; and % instead of percent.
- ✓ Use the 24-hour clock for dial time: 0830, not 8:30 a.m. Calendar date should be day month year (7 August 1990).
- ✓ Include signed Letters of Intent for identified Extension and Industry Liaisons.
- ✓ Signed Authorized Organization Representative (AOR) form from each funded PI's institution are welcomed but not required at this time.
- ✓ Include the required three (3) Letters of Support from Industry members who are not directly involved in the proposed project.
- ✓ Assemble the full proposal in this order: Title Page, Project Summary, Justification, Related Current and Previous Work, Statement Regarding Duplication of Research, Anticipated Benefits, Objective(s), Deliverables, Procedures, Evaluation and Outreach (Logic Model included), Facilities, References, Project Leaders, Budget, Budget Explanation per Institution, Budget Summary, Schedule for Completion of Objectives, Participating Institutions and Principal Investigators, Curriculum Vitae for Principal Investigators (PIs).
- ✓ Provide names of three possible reviewers who will not have Conflict of Interest..
- ✓ All identified co- PIs have been provided a final draft of the full proposal.
- ✓ Submit full proposal (including all required documentation) in a single MS Word document.

If the NCRAC Administrative Office cannot verify inclusion of any element, the Full Proposal will not be accepted.



October 23, 2020

Principal Investigator Signature

Date