

POTENTIAL MARKETING STRUCTURES FOR THE CATFISH INDUSTRY

Reporting Period

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PROJECT OBJECTIVES

1. Identify and characterize forms of market organization (including ownership and control of the processing/packing function) that have successfully resulted in higher farm-level prices and rank the forms of market organization that have the greatest likelihood of success for the U.S. farm-raised catfish industry.
2. Develop comprehensive economic analyses to evaluate likely impacts on the U.S. farm-raised catfish industry of implementing proposed structures identified under Objective 1. Results would measure effects on product price, product volume, product characteristics, size of the industry, and competitiveness with imports.

ANTICIPATED BENEFITS

Policy makers in the United States have given producers of agricultural and aquaculture products the opportunity to engage in horizontal integration and undertake collective action. The fundamental pieces of authorizing legislation at the federal level are the Capper-Volstead Act of 1922 and the Agricultural Marketing Agreement Act (AMAA) of 1937. Capper Volstead authorizes farmers to market their products collectively through cooperative organizations, while the AMAA allows industries to self regulate through marketing orders. Many states

have passed legislation authorizing farmers within a state to self regulate (Lee et al. 1996). Regulations permissible under marketing order statutes include forms of volume control, setting of grades and quality standards, and collection of funds to support research and promotion.

Arguably the need for producer collective action is even more acute today than it was at the time the authorizing legislation was implemented, in light of substantial and rising consolidation in the food

manufacturing and retailing sectors. The increasing consolidation in the food processing and retailing sector and the increasing power of dominant food retailers has been documented by a number of authors including Franklin and Cotterill (1993), Kaufman (2000), Rogers (2001), and Harris et al. (2002). Producers of perishable food products are perhaps most vulnerable to the power of buyers because their products are not storable and must be marketed quickly upon harvest (Sexton and Zhang 1996).

Despite the opportunities afforded by the aforementioned legislation, the track record of farmer collective action in the U.S. is mixed. As this discussion indicates, tools for horizontal integration and collective action available to farmers are quite varied and flexible, with the potential for complementarities among them. Thus, careful consideration of the appropriate options is required if these tools are going to achieve maximum effectiveness for southern aquaculture producers.

PROGRESS AND PRINCIPAL ACCOMPLISHMENTS

The industry advisory panel (including representatives from Alabama, Arkansas, and Mississippi)

organized for the project has met with and advised project participants throughout the life of the project.

Objective 1. *Identify and characterize forms of market organization (including ownership and control of the processing/packing function) that have successfully resulted in higher farm-level prices and rank the forms of market organization that have the greatest likelihood of success for the U.S. farm-raised catfish industry.*

University of Arkansas at Pine Bluff

Responsiveness of unbreaded frozen catfish products over season and across different geographical setting

Food consumption patterns generally do change over season and across geographical setting. Though the number of studies on seafood demand structure has increased considerably during the 1990's and the 2000's, little attention has been paid on the variability in consumers' responsiveness to changes in prices (product's own price and other product's price) and income/expenditure across species, season and across space (region/division). Hence, the University of Arkansas at Pine Bluff (UAPB) team has conducted an analysis focusing on the effects of season and geographical setting on the demand structure of unbreaded frozen catfish and its substitutes in supermarkets of the U.S.

The study used weekly market-level scanner data

acquired from A. C. Nielsen Inc. for 52 U.S. markets for the period of June 19, 2005 to June 12, 2010. We have extended a state-of-the-art market modeling tool (Almost Ideal Demand System model) by incorporating the seasonal and spatial dimensions, and have estimated the own price elasticity (percentage change in demand for a product due to one per cent change in price of the same product), cross-price elasticity (percentage change in demand for a product due to one percent change in price of another product), and expenditure elasticities (percentage change in demand due to one percent change in expenditure) of demand for 14 unbreaded frozen/chilled finfish products in the U.S. The finfish products considered in the study are salmon, tilapia, whiting, cod, flounder, pollock, catfish, halibut, orange roughy, mahi mahi, tuna, swordfish, perch, and other finfish. We divided the data into quarters to capture the effects of season on

demand: November to January, February to April, May to July, and August to October. We have considered U.S. census divisions to examine the spatial variations in the quantity demanded and the demand elasticities for different finfish products. The U.S. census divisions considered are: South Atlantic, East South Central, New England, East North Central, West South Central, Mountain, West North Central, Mid Atlantic, and Pacific.

The results show that own- and cross-price elasticities as well as expenditure elasticities of demand for different finfish products varied significantly across species and divisions. Seasonal variations are less important than spatial variations in the quantity demanded and the elasticities of demand for finfish products in the U.S. The cross-price elasticity estimates for different divisions show that one finfish product is substituting product for another finfish in one division and complementary to the same product in another division. The analysis further shows that not only the degree of competition among finfish products varies over the divisions, but also the competing products change. The analysis shows that demand for catfish varies considerably more across geographical areas than seasons. The spatial variations are considerably high for catfish. The highest demand for catfish is from West South Central division (145% higher), while the lowest in Mountain division compared to the Mid Atlantic division (base). The responsiveness of catfish demand to changes in its own and substitute products' prices vary over seasons and U.S. census divisions (Table 1). The demand for unbreaded frozen catfish products are own-price elastic (i.e., 1% change in catfish price will change catfish demand by more than 1%). Tilapia is a very strong substitute for catfish in all seasons, but not vice versa. However, their relationship varies across divisions between complementarity and substitutability. For example, tilapia is a substitute for catfish in the East North Central, New England, Pacific, while it is complementary for catfish in Mountain, West North Central and East South Central divisions. Overall,

important substitutes for catfish are perch, flounder, and cod in East South Central division, tilapia and whiting in New England division, salmon and tilapia in East North Central division, whiting in West North Central division, and tilapia in Pacific division.

The responsiveness of demand to a change in expenditure (expenditure elasticity) is greater than one for catfish all seasons. Parallel to own- and cross-price elasticities, the spatial effects on expenditure elasticities of demand for catfish products are more prominent as compared to seasonal effects. South Atlantic and West South Central divisions have expenditure elasticity of demand for catfish near to one; other divisions have expenditure elasticity of demand for catfish greater than one except for the West South Central division where it is as low as 0.39.

The seasonally and spatially varying responsiveness of catfish demand due to the changes in prices and income, denote the necessity to understand the consumer demand behavior across seasons and different geographical settings at species level. For future market planning to increase sales in U.S. supermarkets, the catfish industry needs to consider a market-specific approach regarding substitute products of catfish by including other major white fish products relevant for that market.

Spatial price transmission and market integration among major markets for unbreaded catfish fillets of the U.S.

The efficiency of any marketing system depends, among other things, on the perfect market integration and full price transmission with an instantaneous adjustment of any price changes. The UAPB team has investigated the causal and horizontal price transmission relationship among the top seven strategically important retail markets of catfish in the U.S. The study used monthly average retail price data of catfish unbreaded fillets for the period of June 19, 2005 to June 12, 2010. The unique dataset was acquired from the A.C. Nielson Inc. The markets

Table 1: Responsiveness of unbreaded frozen catfish to changes in its own price and other products prices.

	Season					Division							
	Nov-Jan	Feb-April	May-July	Aug-Oct	Mid Atlantic	South Atlantic	East South Central	New England	East North Central	West South Central	Mountain	West North Central	Pacific
Catfish	-1.10	-1.13	-1.22	-1.23	-1.10	-0.70	-5.00	-1.10	-2.03	-1.46	-1.16	-1.07	-1.54
Catfish own-price elasticities													
Salmon	-0.11	-0.07	-0.14	-0.10	-0.11	-0.13	-4.61	-0.39	0.67	-0.97	0.36	0.04	0.24
Tilapia	1.71	1.49	1.46	1.33	1.71	0.19	-0.41	0.89	1.14	0.27	-0.41	-0.57	0.45
Whiting	-1.45	-1.34	-1.43	-1.34	-1.45	-1.10	0.23	0.82	-0.05	1.32	0.13	0.22	0.28
Cod	0.32	0.32	0.38	0.36	0.32	0.24	2.09	0.21	0.05	0.19	0.32	0.37	-0.20
Flounder	-0.74	-0.64	-0.63	-0.63	-0.74	-0.26	2.08	0.04	-0.15	0.22	-0.02	-0.10	0.17
Pollock	-0.07	-0.16	-0.12	-0.08	-0.07	0.09	0.12	-0.22	0.21	0.16	-0.13	0.51	-0.29
Halibut	0.12	0.16	0.11	0.13	0.12	-0.01	0.28	0.23	-0.20	0.08	0.25	0.02	0.20
Orange roughy	0.19	0.19	0.12	0.18	0.19	0.42	0.75	0.07	0.14	-0.14	0.09	0.44	0.27
Mahi mahi	0.07	-0.01	0.28	0.20	0.07	0.24	-0.05	0.11	-0.09	-0.19	0.06	-0.20	-0.03
Tuna	0.02	0.00	0.08	0.09	0.02	0.10	0.23	0.03	0.01	0.15	0.07	-0.04	0.09
Swordfish	0.04	0.04	0.06	0.08	0.04	0.16	-0.17	0.28	0.03	-0.23	0.10	-0.01	0.04
Perch	0.07	0.02	0.09	0.13	0.07	0.09	0.93	-0.01	-0.31	0.00	0.08	0.23	0.04

covered in the study are Memphis, Little Rock, New Orleans/Mobile, Chicago, Los Angeles, Sacramento, and San Francisco.

The analysis shows that New Orleans/Mobile retail price influences the Sacramento and Chicago retail price. A significant causal relationship also exists between the Memphis and San Francisco retail market price. High degrees of integration and price transmission relationships have been observed between those pairs of market. The integration analysis has shown that a significant long-run equilibrium existed between the New Orleans and Sacramento prices, with a price transmission elasticity of 1.23, implying that a one percent change in New Orleans retail price will result in a greater than proportional change of 1.23 percent in Sacramento. Similarly, long-run equilibrium prevailed between New Orleans and Chicago market pair with the price transmission elasticity of 1.09 (significant at the 5%

level of significance). An overreaction of price changes has been depicted between the New Orleans-Sacramento and New Orleans-Chicago market pairs. In both cases, price transmission elasticity has been observed to be more than one. The catfish fillet price of Memphis and San Francisco market has also been found to move closely with the existence of long-run price equilibrium of 0.60, implying that 60% of the price changes in Memphis get transmitted to San Francisco. This probably is a result of the bulk movement of catfish fillets between these markets. Fast exchange of price information between the markets could also be one of the contributing factors behind the observed market integration. In spite of being a large retail market of catfish fillet, Little Rock has not been found significantly integrated with any other domestic market studied. It could be possibly because of the large volume of sales within the state.

University of California at Davis

One of the fundamental purposes of this project is to study and recommend forms of producer collective action to the U.S. farm-raised catfish industry. If producers are able to act effectively together they will be better able to countervail market power exercised by processors, combat ills caused by international competitors, and build demand for their product. Enhanced demand in turn will enable U.S. farm-raised catfish farmers to receive higher prices and earn higher incomes.

Federal legislation in the U.S. affords producers of agricultural and aquaculture products the ability to act collectively to market their production. The Capper-Volstead Act of 1922 authorizes farmers to jointly market through cooperatives, while the Agricultural Marketing Agreement Act of 1937 allows producers of a specific commodity in a given geographic region of the country to establish and maintain a federal marketing order. Cooperatives

and marketing orders are not mutually exclusive; they can be used in concert to serve producers' marketing objectives.

The present focus of University of California at Davis is on federal marketing orders including (i) analyzing the tools and strategies available under marketing orders, (ii) evaluating the results of using marketing orders in other U.S. agricultural industries, (iii) assessing how establishing a marketing order may benefit the U.S. farm-raised catfish industry and (iv) determining what specific marketing-order provisions should be considered by the industry.

Under the auspices of federal marketing order regulation, producers have a variety of provisions at their disposal including, but not limited to: volume/supply control, generic promotion and advertising, and minimum quality standards. Our research to

date suggests that the minimum quality standard and generic promotion provisions offer the most potential to U.S. farm-raised catfish producers, especially given the increased international competition faced by the industry from China and Vietnam.¹

These importers are supplying the U.S. market with catfish raised in suboptimal conditions that can directly affect the taste and quality of the fish marketed. Consumers' inability to distinguish quality of catfish *ex ante* constitutes an adverse selection problem wherein poor quality can drive good quality from the market and reduce consumer demand. Imposing minimum quality standards through a federal marketing order represents one option for U.S. farm-raised catfish farmers to address problems caused by inferior imported products. Under U.S. law, imports must meet the same standards that a domestic agricultural industry imposes upon itself.

Generic commodity promotion programs have an extensive history within U.S. agriculture, and numerous studies have documented their overall effectiveness. Economic evaluation of such programs reveals that they are most effective when commodity

markets involve relatively undifferentiated products that, in the absence of a mandatory industry program, would be under-promoted due to free riding. Such conditions are present in the U.S. farm-raised catfish industry. Two small promotion programs are in place presently for promoting U.S. farm-raised catfish. Both operate at the state level and one of them is voluntary, so free riding and under-promotion is a genuine concern under the present structure, creating the potential in our view to achieve producer benefits through a federal program encompassing all major U.S. producing areas and possibly also involving contributions from international competitors.

Appendix A to this Objective Report details the history and current use of marketing orders and reviews relevant literature with specific focus upon the minimum quality standard and generic promotion provisions. Table 2, Federal Marketing Orders and Quality Standards, shows that each extant federal marketing order contains provisions for generic commodity promotions and indicates the orders that utilize minimum quality standards and the types of provisions that are utilized.

University of Missouri

Project activities of the University of Missouri to date include:

- Review of conceptual models of alternative marketing cooperatives utilized by agricultural and aquacultural producers before attending the initial August 16, 2011 meeting.
- Identification of several models and correlations with institutional environments where highest probability of success might emerge.
- Attendance at initial research meeting in Pine Bluff, Arkansas, August 16, 2011.
- Presentation at the initial meeting of a Life Cycle Approach to examining the intra-firm challenges to developing collective action among and within the U.S. catfish industry.
- Engaged in discussions with team researchers and industry participants regarding the advantages disadvantages of alternative marketing options which included: state

¹ Section 8e of the Agricultural Marketing Agreement Act of 1937 (amended in 1954) requires that importers comply with the same minimum quality standards, adopted by the marketing order, that domestic producers face.

Table 2. Federal Marketing Orders and Quality Standards

<u>Commodity</u>	<u>Promotion</u>	<u>Grade</u>	<u>Size</u>	<u>Quality</u>	<u>Section 8e</u>
Florida Citrus Fruit	X	E	E		X
Texas Oranges and Grapefruit	X	E	E		X
Florida Avocados	X	E	E		X
California Nectarines	X	E	E		
California Pears and Peaches	X	E	E		
California Kiwifruit	X	E	E		
Washington Apricots	X	E	E		
Washington Cherries	X	E	E		
Washington-Oregon Fresh Prunes	X	A	A		
California Desert Grapes	X	E	E		
Oregon-Washington Pears	X			X	
Cranberries-10 states	X	E*	E*		
Tart Cherries-7 states	X	A			
California Olives	X	E	E		
Idaho-East Oregon Potatoes	X	E	E		X
Washington Potatoes	X	E	E		X
Colorado Potatoes	X	E	E		X
Virginia-North Carolina Potatoes	X	E	E		X
Georgia Vidalia Onions	X				X
Walla Walla Onions	X	A	A		X
Idaho-Oregon Onions	X	E	E		X
South Texas Onions	X	E	E		X
Florida Tomatoes	X	E	E		X
California Almonds	X			X	
Oregon Hazelnuts	X	E	E		X
California Pistachios	X		E	X	
California Walnuts	X	E	A		X
Far West Spearmint Oil	X				
California Dates	X	E	E		X
California Raisins	X	E	E		X
California Dried Prunes	X	A	A		
Oregon and California Potatoes	X				

Source: USDA, 2007. E=In effect, A=Authorized but not in effect, E*=In effect to withheld or reserve product.

marketing orders, federal marketing orders, marketing boards, traditional cooperatives, new generation cooperatives and Limited Liability Companies.

- Researched the history and evolution of bargaining associations in the U.S.
- Presented to the group overview of bargaining

Auburn University

Attended project meetings and participated in the discussion of the implications of the Capper-Volstead Act of 1922 and the Agricultural Marketing Agreement Act of 1937 on agricultural producers and potentially for aquaculture producers. Auburn University's role in the discussion was primarily to

Kentucky State University

A survey was conducted at several community supported agriculture (CSA) operations in Kentucky (N=60). Each CSA consumer was given two fresh catfish fillets, along with a simple recipe. The consumers were asked to eat the fish, and then answer a set of questions. A payment-card approach was used to determine their willingness to pay for fresh catfish fillets.

Demographics of the respondents were: 1) 97% of CSA consumers were Caucasian, only 1 consumer was Asian; 2) Education (proxy of income): 60% had either graduate degrees or professional degrees; 3) 53% of respondents were female; 4) 53% of respondents lived in a suburban area; 5) 60% of respondents were 50 years old or older; and 6) average household size = 2.68.

Preferences for fish and catfish identified included: 1) 93% indicated that they like to eat freshwater fish; 2) 13% ate catfish once per month; 3) 45% ate

associations, including the role of bargaining associations, the different types, potential benefits and challenges as well as specific issues for consideration for the catfish producers.

- Initiated search for and gathering of materials to prepare case study on aquatic and catfish cooperatives.

provide University of California at Davis (Richard Sexton) and University of Missouri (Michael Cook) information about the U.S. farm-raised catfish industry, current and historical and understand better agricultural cooperative option and their potential in the U.S. farm-raised catfish industry.

catfish a few times a year; and 4) 425 ate catfish less often than "a few times a year".

With respect to the sample of fresh fillets they received: 1) Taste: 92% either "loved it" or "liked it"; 2) Texture: 82% either "loved it" or "liked it"; 3) freshness: 97% either "loved it" or "liked it"; 4) 67% consider regular or year-round availability of a product is important; and 5) 75% want their CSA to offer fresh, locally-grown catfish fillets as a future protein.

Demand for fresh catfish fillets: 72% of CSA consumers indicated that they will be willing to buy 1 to 10 pounds of fillets per month, 17% of respondents said that they will not buy any catfish fillets, and 3% of respondents will buy more than 10 pounds of catfish fillets per month. Figure 1 shows the distribution of the willingness to pay responses for fresh catfish fillets.

Objective 2. *Develop comprehensive economic analyses to evaluate likely impacts on the U.S. farm-raised catfish industry of implementing proposed structures identified under Objective 1. Results would measure effects on product price, product volume, product characteristics, size of the industry, and competitiveness with imports.*

The UAPB team has expanded “The U.S.-Catfish model”, recently developed as part of the SRAC Economic Forecasting project, to assess the impact of various marketing strategies and structure. The team has analyzed the likely effects of the impact of government procurement of processed U.S. farm-raised catfish on the pond bank price of U.S. farm-raised catfish. The results indicate that, if the U.S. government and/or other institutional buyers (such as U.S. military, hospital) purchase about 3 million pounds of processed catfish, pond bank

price of catfish would be increased by about 10% (Figure 2). This result has direct implications for the likely impacts of federal marketing orders on catfish. If provisions of federal marketing orders, such as commodity promotion and minimum quality standards, succeed in raising consumer demand for U.S. farm raised catfish by about 20%, we would expect similar impact (10% increase) on the pond-bank price of U.S. farm raised catfish.

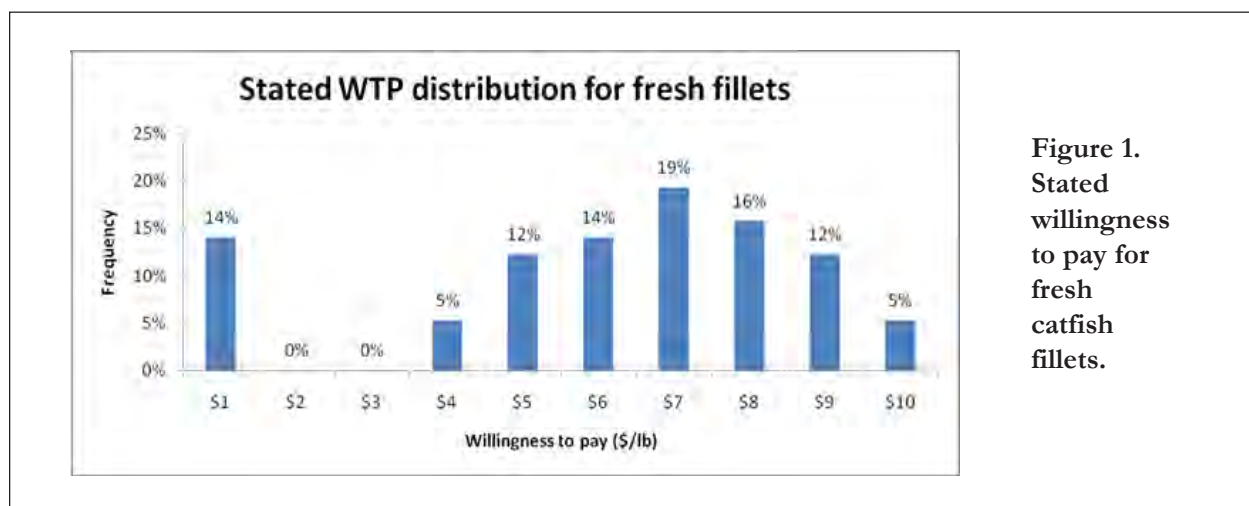


Figure 1. Stated willingness to pay for fresh catfish fillets.

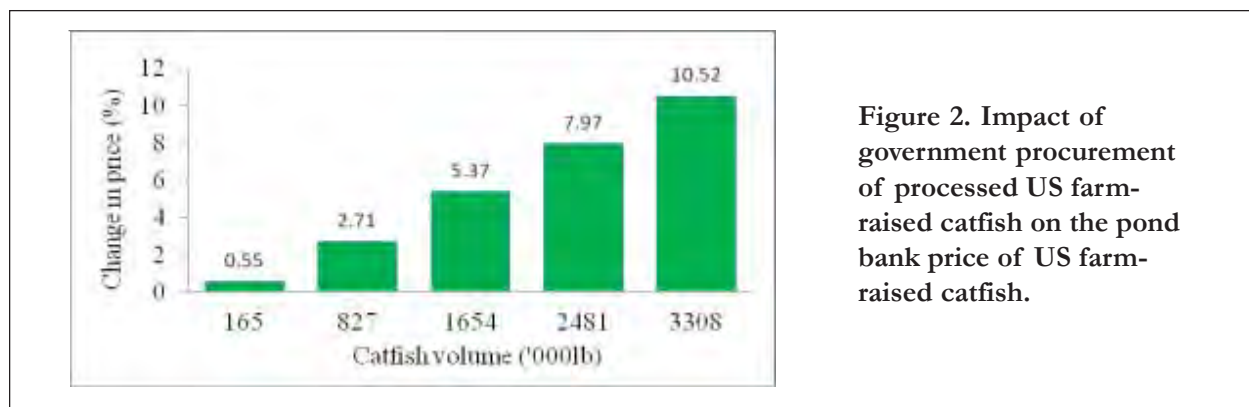


Figure 2. Impact of government procurement of processed US farm-raised catfish on the pond bank price of US farm-raised catfish.

Kentucky State University

A survey was conducted in two cities in Kentucky with high Hispanic population concentrations, Lexington and Shelbyville (N=73). The Hispanic Consumer Survey focused on fresh, whole-gutted catfish (2011-2012). The demographics of the consumers surveyed were: Male respondents 58%; average household size = 4; Origin (Mexico 52%; Peru 39%); Age (77% <40 years old); Occupation (32% in “factory work” and 20% in agriculture).

Fish eating habits included: 1) 56% cook fish at home weekly; 2) 71% prefer freshwater fish; 3) 68%

like eating catfish “A Lot” + 20% like eating catfish but not “A lot”. Catfish preferences measured were: 1) live fish preferred by 25%; 2) fresh gutted fish preferred by 53%; 3) fresh fillets preferred by 15%; 4) they do not like frozen catfish (nor frozen fillets); and 5) “will you buy fresh gutted catfish?” YES (84% of respondents); NO (3%). Figure 3 shows the distribution of the willingness-to-pay responses for fresh unprocessed catfish on ice. The average weekly demand per store was 30 pounds (Fig. 4). Stores will pay \$1.50 to \$1.70/pound for unprocessed catfish on ice. Preferred size = 1.5 to 2 pound fish.

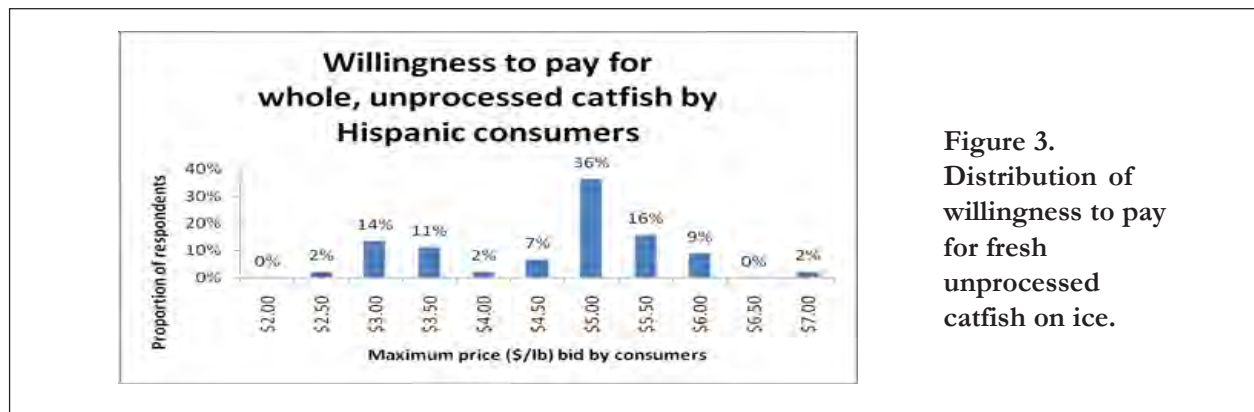


Figure 3. Distribution of willingness to pay for fresh unprocessed catfish on ice.

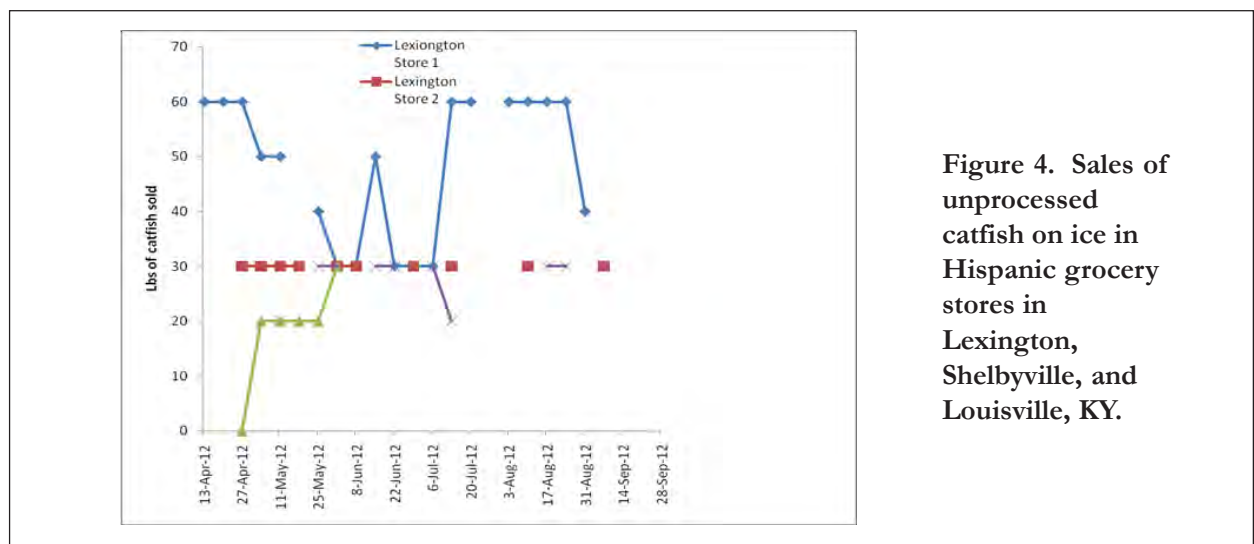


Figure 4. Sales of unprocessed catfish on ice in Hispanic grocery stores in Lexington, Shelbyville, and Louisville, KY.

Results at a glance...

A summary table of federal marketing orders and quality standards for various segments of U.S. agriculture has been developed as well as a narrative summary of the use of federal marketing orders in U.S. agriculture. Main highlights for catfish industry are:

- *Not only does the degree of competition among finfish products vary considerably across markets, but substituting products change.*
- *Understanding of consumer demand behavior across seasons and different geographical settings at species level is essential.*
- *Many of the key markets for catfish fillet are highly integrated with other markets.*
- *New Orleans retail market of catfish fillet is highly integrated with Sacramento and Chicago retail markets, and is causing price changes of these markets.*
- *A significant causal relationship and integration also exists between the Memphis and San Francisco retail market price*
- *In spite of being a large retail market of catfish fillet, Little Rock has not been found significantly integrated with any other domestic market studied.*
- *If the U.S. government and/or other institutional buyers (such as U.S. military, hospitals) purchase about 3 million pound of processed catfish, pond bank price of catfish would be increased by about 10%. If provisions of federal marketing orders, such as commodity promotion and minimum quality standards, succeed in raising consumer demand for U.S. farm raised catfish by about 20%, we would expect a similar impact (10% increase) on the pond-bank price of U.S. farm raised catfish.*

IMPACTS

The Project has identified alternative marketing structures with potential to provide economic benefits to the U.S. catfish industry. The interactive process between the researchers and industry leaders has led to a consensus that a marketing structure with significant potential to benefit the industry is a federal marketing order organized under statutory authority of the Agricultural Marketing Agreement Act, as amended. Similarly, a complementary cooperative structure can help catfish farmers to

improve their bargaining power.

We have communicated the results of this project to the catfish industry. The industry leaders (including catfish farmers, processors) are seriously considering our recommendation for market specific catfish marketing strategy. The catfish industry has constituted a technical committee to implement the recommendations of the project.

PUBLICATIONS, MANUSCRIPTS OR PAPERS PRESENTED

Singh K., M. M. Dey, and P. Surathkal. 2012. Seasonal and spatial variations in demand for and elasticities of fish products in the United States: An analysis based on market-level scanner data. Under review in *Canadian Journal of Agriculture Economics*.

Singh K., M. M. Dey, and P. Surathkal. 2012. Seasonal and spatial variations in demand for frozen and chilled finfish products in the United States: An analysis of fourteen unbreaded products based on market-level scanner data. Poster presented at the Field Day organized by the Aquaculture/Fisheries Center, University of Arkansas at Pine Bluff, October 4, 2012.

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APPENDIX A

Marketing Orders: Commodity Promotion and Quality Regulations

Federal marketing orders are authorized under the Agricultural Marketing and Agreement Act (AMAA) passed by Congress in 1937 (7 U.S.C. § 601 *et seq.*). The AMAA and subsequent amendments provide for five general types of regulatory actions: *i*) restrictions on the quantity of a commodity that can be sold, either through marketing allotments or reserve pools, *ii*) limits on the grade, size, or quality of the commodity, *iii*) regulation of packaging and container sizes, *iv*) generic promotion and advertising, and *v*) production and health-related research.

The AMAA was amended by Congress in 1954 to include “marketing development projects” and in the 1996 farm bill (P.L. 104-127) wherein Congress granted to the U.S. Department of Agriculture (USDA) the ability to create promotion programs for any commodity if the producers wished to have such programs. This amendment stipulated that advertising conducted under a federal marketing order must be generic in nature and not a benefit to some producers and not others. Promotion programs created under this legislation thus “stand alone” and do not operate under the auspices of a federal marketing order.

Federal marketing order programs must be for specific commodities and in as small a region as possible to further the objectives of the order. The process to create a federal marketing order begins with a producer initiative to the USDA. The USDA will conduct hearings on the proposal and if the industry’s rationale seems consistent with the AMAA and subsequent amendments, the proposal is put to an industry referendum. If two-thirds of the producers in an industry (or producers representing two-thirds of the value of production) vote in favor of the regulation, it is set in place and its provisions are legally binding upon all who operate under the order’s auspices (a detailed overview of the establishment process is provided at the USDA Agricultural Marketing Service Website by linking to the subject “Marketing Orders and Agreements”). A vote by a simple majority vote by the producers can abolish an extant order.

Federal marketing orders operate under the control of an elected producer board whose appointments are approved by the Secretary of Agriculture. However, ultimate decision authority lies with the Secretary, who must approve board recommendations. An equivalent standard of government approval exists for marketing programs that have state authorization. In these cases approval of board decisions must come from the head of the state’s department of agriculture. Programs are funded by assessments on producers and sometimes on handlers of the commodity.

Among the possible functions that can be performed under federal marketing orders, we have focused to date upon two—commodity promotion and minimum quality standards—that seem especially relevant to the U.S. catfish industry. For example, in 1999 the Arkansas Catfish Promotion Board was created to promote growth and development of the state’s industry through research and promotion. The Board’s funding is collected by an assessment of one dollar per ton on all catfish feed purchased by commercial Arkansas catfish producers. A state-level program with multistate production of catfish and relative product homogeneity across states means that producers from other states benefit as free riders on benefits generated from Arkansas promotions. Volume control programs, although important at the inception of the AMAA (Sexton and Alston 2009), are utilized

actively today in only a few industries, and it is generally understood that the USDA will not approve new volume-control programs.

Commodity Promotion Programs

The main justification for generic commodity programs is that agricultural products are, essentially, homogeneous (undifferentiated), and, because benefits of advertising by one firm inure to all firms, free-rider problems create little incentive for unilateral promotion. Opponents of commodity promotion programs have challenged this characterization, arguing that their products were differentiated from those of competitors. Thus, even if total demand increased with generic advertising, the effects would not be consistent among growers. Specifically, opponents have argued that generic promotion reduced the differentiation among products and, therefore harmed producers who had worked to establish a brand identity. These arguments, notably, would appear at present to have little resonance in the U.S. catfish industry where product differentiation seems unimportant. Agricultural industries in the United States spend about \$1 billion dollars annually on producer-funded, generic marketing programs. Ninety percent of all U.S. farmers pay assessments to support at least one commodity promotion program (Congressional Research Service 2005, p. 52).

The marketing programs that allow generic advertising and promotion exist under various state and federal statutes in addition to the AMAA, although the goals of the various programs are similar. So-called “stand-alone programs” are authorized by separate legislation or farm bill legislation, and are generally significantly larger in the amount of funding involved than those under marketing orders. Currently 51 agricultural industries are covered by federal programs and many others are promoted under state programs. However, only the federal programs can encompass inter-state industries. A list of federally authorized commodity marketing programs is provided in Table 1 of this annual report.

Nearly 250 research studies including 124 peer-reviewed journal articles and chapters in 14 books have examined the effectiveness of commodity promotion programs. The overwhelming majority of these studies have shown that the benefits outweigh the costs (Alston, Crespi, Kaiser and Sexton 2007). Most studies report a benefit-cost ratio wherein the producer benefit (additional profit) generated from the program is divided by the share of program costs borne by producers. Even if producers pay 100 percent of an assessment, the incidence upon producers will normally be less than 100 percent due to tax shifting. In nearly every study this benefit-cost ratio is higher (and often substantially higher) than one, meaning that the commodity program not only worked but worked very well because a dollar spent on it earned the industry greater than a dollar’s worth of revenue. See, for example, the summary of various studies provided in Alston, Crespi, Kaiser, and Sexton, 2007.

Given the general consensus on the overall effectiveness of commodity advertising programs, more recent research has focused on distributional issues. Is it true that the rising tide caused by a successful advertising program raises all boats? Scant research has addressed the claim that generic advertising can frustrate firms’ attempts to create product differentiation through their own advertising. This concern is of paramount importance given the growth in number of product varieties and amount of branded advertising in modern agricultural markets. One exception is Chakravarti and Janiszewski (2004) who in a lab experiment showed that generic advertisements could reduce consumers’ responsiveness to branded advertisements, thus making a firm’s own advertising less successful than if the generic program did not exist, just as program opponents have argued.

Another key trend in U.S. agricultural markets that impacts promotion effectiveness is consolidation and increased market concentration in food manufacturing, and retailing. Market power of retailers and food manufacturers, both as buyers from farmers and sellers to consumers, is a legitimate concern in many markets. Only a few commodity-promotion studies have taken these considerations into account when investigating the benefits of generic marketing programs. Norman, Pepall and Richards (2008) showed that when industry concentration is low, generic programs are welfare improving but when concentration is high, there may not be a good reason to have generic advertising. Suzuki and Kaiser (1997), Kawaguchi, Suzuki and Kaiser (1997), Chung and Kaiser (2000), and Wohlgenant and Piggott (2003) looked at the effect of generic advertising by size of firm and/or in imperfectly competitive markets and in markets with differing farm supply elasticities, finding various differential effects among producers.

These studies suggest that outside of the idealized market setting where goods truly are homogeneous and firms are unable to differentiate their products, the market structure of the industry is immensely important to understanding the potential of generic promotions to boost farmers' incomes. Further, while most studies examine what is happening at the production sector, Zhang and Sexton (2002) examined the entirety of the supply chain and showed that at least half of the benefits from an advertising program will not get to the farmers if either the processing or retailing sectors are imperfectly competitive, and will instead be captured by the players holding market power.

What if promotions succeed in raising consumer demand, but downstream sellers such as retailers and food-service establishments capture that demand shift in the form of higher prices? No more farm product is sold in such a case, and, thus, farmers derive no benefit from a program that "worked" in the sense of raising consumer demand. Little research has been conducted into such possibilities. One exception is work by Carman, Li, and Sexton (2009), which used retail-level scanner data to examine both price and quantity impacts of promotions conducted by the Hass Avocado Board. They found no evidence that retailers raised prices in response to avocado promotions.

Relevant directly to the U.S. catfish industry is the comparison of voluntary commodity promotion programs to mandatory programs. The Alabama Catfish Producers Association administers a voluntary catfish commercial feed assessment of 50 cents per ton of feed manufactured, bought, and sold in Alabama to fund the research and promotion activities of Alabama catfish producers. Whereas mandatory programs must have federal or state mandates and supervision, voluntary programs can operate entirely under industry auspices. Messer, Kaiser, and Schulze (2008) examined voluntary programs, noting that many of today's mandatory programs began as voluntary programs. They report that free riding on voluntary programs tends to increase over time, often causing producers to seek to establish mandatory programs. These authors conducted experiments with voluntary promotion programs that tended to replicate the progressive incidence of free riding in successive iterations of the experiment. However, the introduction of a "provision point mechanism", which is a threshold participation rate (70% in their base case), substantially reduced free riding. If participation falls below the provision point, all contributions are refunded and no expenditures take place, limiting the opportunity to free ride.

Minimum Quality Standards

Federal marketing orders enable producers to self-regulate the quality of their production with approval by the Secretary of Agriculture by choosing whether or not to impose minimum quality standards (MQS) and what

standards to set. Through amendments to the AMAA enacted in 1954 (section 8e) imports can be made subject to the same quality standards, regulations, and other provisions as are imposed upon domestic production by a marketing order. Thus federal marketing orders allow industries to influence international competition and protect the domestic market from being downgraded by the receipt of poorer quality product from abroad. Article III of the General Agreement on Tariffs and Trade (GATT) requires that imports not be held to higher standards than domestic production, therefore section 8e requirements can only be effect when domestic production is being produced, regulated, and shipped (USDA, 2007). Yet, since catfish are grown, processed, and sold on a year-round basis, section 8e requirements would apply to imports on a continuous basis.

MQS imposed through federal marketing orders are relatively common for fruit and vegetable commodities in the United States. Currently, 16 of the 31 commodities regulated under federal marketing order statutes are subject to section 8e requirements of the AMAA. A summary of these commodities and the specific product attributes regulated is provided in Table 1 *Federal Marketing Orders and Quality Standards*. Of the 31 marketing orders currently operating under the federal statutes, 29 have some combination of grade, size, quality, or maturity provisions authorized or in effect (USDA, 2007). Twenty-five of the federal marketing orders have minimum grade standards in place, 25 have size regulations in authorized or in effect, and 3 have general “quality” regulations in effect.

Increasing international competition faced by domestic farm-raised catfish producers and growing concerns of U.S. consumers surrounding the safety and quality of fish make the establishment of MQS worthy of U.S. catfish producers’ consideration. Since 2003 U.S. farm-raised catfish producers have faced increased international competition, primarily from Vietnam and China. From May 2010 to May 2011, the U.S. has seen a 64 percent increase in the amount of Siluriforme catfish imported (USDA 2011).

Catfish produced in Asian countries are typically raised in floating cages on rivers and ponds while being fed a diet of agricultural by-products consisting of rice bran, soy, and fish by-products (Orban et al. 2008). In addition to being subject to chemical contamination from high anthropic pollution, fish raised in these fresh-water, caged environments also often test positive for organochlorine pesticides and polychlorinated biphenyls (PCBs), which have been banned in the U.S. due to human health concerns (Orban et al. 2008).

Processed catfish cuts and fillets are relatively indistinguishable in terms of their origin. As such, without mandatory country-of-origin labeling and/or safety and quality standards in place, imported fish with inferior quality or taste may compromise domestic demand. The problem as described originally by Leland (1979) is one of adverse selection or Gresham’s law. When both high-quality and low-quality products are available on the market and are indistinguishable ex ante to consumers Gresham’s law states that the bad product will drive the good product out of the market. One potential solution to this problem is for individual farmers to attempt to voluntarily certify the quality of their production. Such certification is, of course, costly and often ineffective because consumers are generally skeptical as to the reliability, stringency, and credibility of voluntary certification. Thus, certification of quality at the industry level is often necessary to surmount the adverse selection problem. MQS maintain and/or enhance market demand for commodities by ensuring that the poorest quality product doesn’t reach consumers (Carmen and Alston, 2005) and, thus, deter them from making future purchases. MQS in this setting can at once mitigate imports, improve overall product quality, and stabilize or increase consumer demand. International shipments that do not meet the MQS may be (i) reconditioned for re-inspection, (ii) re-exported, or (iii) sent to an exempt (normally, nonhuman) use.

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