

## Cost of processing fish at a small scale

Catfish processing in Kentucky for commercial sales must be done in HACCP-approved and Kentucky Department of Public Health-inspected facilities. There are several small-scale fish processing facilities in Kentucky where most of the work is done by hand, without any mechanized help.

While building a processing facility is usually expensive, farmers have found less-costly alternatives such as converting an existing room into a

fish processing area. A processing room has specific requirements, which are outlined in this manual: [www.ksuaquaculture.org/Pubs.htm/Process & Market.pdf](http://www.ksuaquaculture.org/Pubs.htm/Process%20&%20Market.pdf). A schematic diagram of a fish processing area can be found in the following publication: <http://www.ksuaquaculture.org/Pubs.htm/AquaNews%20web%20W-07.pdf>.

Since processing operations are costly, they add to the cost of the final product, e. g. fish fillets. The following publication list the costs of processing catfish at \$0.71 per pound (Small-Scale, On-Farm Fish Processing, Southern Regional Aquaculture Center Publication No. 442).

This publication reported that the total fillet weight per fish (aka fillet dress-out) was 53% of the whole fish weight. If the cost of producing a food-sized catfish was \$1.20 per pound, the cost of producing the fillets was  $(\$1.20 \div 53\%) + \$0.71 = \$2.97$  per pound. Therefore, catfish fillets must be sold at prices higher than \$2.97 per pound for producers and processors to realize a profit.

## References

1. Catfish production manual: <http://www.ksuaquaculture.org/PDFs/Publications/Catfish.pdf>

2. Catfish fingerling production manual: Durborow, R.M. Channel Catfish Fingerling Production In Kentucky. Kentucky State University, Kentucky Department of Agriculture, and National Oceanic and Atmospheric Administration, 2001.

3. Fish processing manual: [www.ksuaquaculture.org/Pubs.htm/Process & Market.pdf](http://www.ksuaquaculture.org/Pubs.htm/Process%20&%20Market.pdf)

4. Economics fact sheet: Engle, C. R. and N Stone. Costs of Small-Scale Catfish Production for Direct Sales. <https://srac.tamu.edu/index.cfm/getFactSheet/whichfactsheet/150/>, 2014.

5. Low-density catfish farming publication: Wurts, W. A. Small-scale and Home Use Channel Catfish Farming in Kentucky. <http://www2.ca.uky.edu/wkrec/SmallScaleHomeUse.PDF>.

5. Catfish production report: Hanson, T. and D. Sites. 2014. 2013 U. S. catfish Database. [www.agecon.msstate.edu/whatwedo/budgets/docs/catfish/toc\\_2013\\_1.pdf](http://www.agecon.msstate.edu/whatwedo/budgets/docs/catfish/toc_2013_1.pdf)



*The Catfish Institute ([uscatfish.com](http://uscatfish.com)) has many recipes that will assist beginning farmers in the local marketing of catfish.*

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## Selling catfish in local markets

*Dr. Sid Dasgupta and Mr. Richard Bryant*

## Aquaculture and local foods

The aquaculture industry in the United States is relatively small when compared to other animal husbandry industries such as beef cattle, hogs, or poultry. U. S. aquaculture is primarily noted for large-scale production of rainbow trout and catfish. Smaller volumes of other freshwater fish such as hybrid striped bass, tilapia, largemouth bass, yellow perch, and walleye are also produced. Crustaceans such as marine shrimp, freshwater prawns, crayfish are produced in the United States, but at even lesser volumes.

Of various types of catfish available, channel catfish and hybrid catfish (the progeny of channel catfish females and blue catfish males) are typically cultured. The pond culture of catfish in Kentucky is relatively common and the Jackson Purchase Region of Kentucky has a small commercial catfish industry.

Of the various types of aquaculture options available to Kentucky's beginning farmers, catfish farming in ponds should be given serious consideration. This is because pond-based catfish production systems are very well-developed in the U. S. South. This means that scientists have worked out the details of how to stock, manage, and harvest ponds efficiently. There is much information and support related to production management, water quality requirements, disease management, and production economics for catfish.

Catfish is also a marketing success in the United States. Catfish is a tasty and popular food item with 2012 U. S. per capita consumption of 0.5 pounds (Hanson and Sites 2014). Its popularity gives catfish sales potential in direct markets. This fact sheet investigates marketing results obtained from investigating consumer perceptions and willingness-to-pay (WTP) for locally-grown catfish in Kentucky's mar-

## Basic catfish farming concepts

Catfish fingerlings are available from suppliers in Mississippi and Arkansas. Fingerlings are usually bought at sizes varying from 4 inches to 10 inches. A 4-inch catfish stocked in a pond might take over a year to reach 1.5-2.0 pounds, which is referred to as "food size" in the industry. Research in Kentucky has shown that fingerlings that are 9 inches or larger can reach food size in one year if stocked in Spring.

Catfish can be grown at a low density without artificial aeration of ponds. More commonly, the fish are grown at stocking densities of 5,000 to 6,000 fish/ water acre in ponds that are aerated.

## Catfish specialists near you

Beginning farmers would benefit from consulting with catfish specialists before starting production. Kentucky State University catfish specialists include Mr. F. Wynne (production), Dr. W. Wurts (production), Dr. R. Durborow (production, disease and water quality), and Dr. S. Dasgupta (economics and marketing); their contact information are at [www.ksuaquaculture.org](http://www.ksuaquaculture.org).

The Southern Regional Aquaculture Center, an USDA-funded organization, has a website with many fact sheets about catfish production at: <https://srac.tamu.edu/index.cfm/CategoryDetails/whichcategory/3/>

Mississippi, Arkansas, Kentucky & Alabama have Land Grant institutions with specialists who will assist beginning farmers



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## Acceptance of catfish fillets by farmers' market patrons

Farmers' markets are an obvious outlet for locally-grown fish. However, there are questions about how well catfish will be accepted in Kentucky's farmers' markets.

To address these issues, a Kentucky farmers' market survey was conducted in 2012 that obtained information about the perceptions of patrons towards fresh, locally-produced catfish fillets. The survey elicited data from 71 customers, who had the oppor-

tunity to taste the fillets and then respond to questions asked by an interviewer.

The data showed that the farmers' markets patrons were familiar with catfish fillets: more than half of the respondents cooked fish at home either weekly or twice monthly, 39 percent cooked catfish at home, and another 24 percent ate catfish in restaurants. The flavor of locally-grown catfish was well received: a total of 59 percent of respondents said that they liked the catfish.

The survey also obtained information about how much farmers' market patrons were willing to pay (WTP) for catfish fillets. Most respondents were willing to pay between \$6 and \$8 per pound; the average willingness to pay was \$7.14 per pound. Therefore, farmers' market patrons were willing to pay a modest premium over the retail price of fillets.

### Perceptions of catfish fillets by CSA patrons

CSAs (community-supported agriculture) are an increasingly common form of local food marketing where individuals can prepay for a supply of fresh produce during a growing season by a producer or a group of producers.

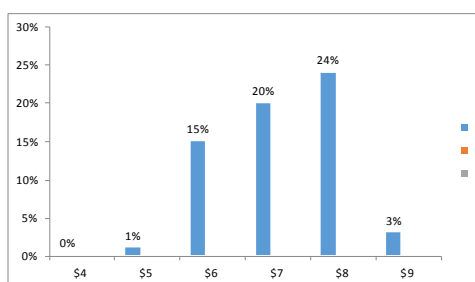
While most CSAs are known for fresh vegetables, many are diversifying into sales of animal protein such as eggs, poultry, beef, and sheep. Some CSA owners expressed a willingness to diversify into offering fish fillets to their

customers. This motivated a marketing study where we elicited CSA patrons' perceptions of locally-grown catfish fillets.

Four Kentucky-based CSAs participated in this project and their patrons were provided with a pound of fresh locally-grown catfish fillets, with an easy-to-follow recipe, for their convenience. These patrons were asked to cook and taste the fillets and answer a questionnaire that was also given to them. Useful data were obtained from 80 patrons.

The survey data showed that 93 percent of the respondents liked eating fresh-water fish. Seventy-three percent of respondents wanted catfish fillets to be a regular item at their CSA.

The average WTP was \$6/pound, with 55 percent wanting to pay between \$6-\$8 per pound. This showed that the average WTP was comparable to the retail price of catfish fillets. Only 15 percent of respondents did not want to buy catfish.



*Distribution of willingness to pay (in \$ per pound) for fresh, locally-grown, catfish fillets in Kentucky's farmers' markets. The sum of percentages is less than 100% because not all survey respondents answered the willingness to pay question.*

## Selling whole catfish to Hispanic consumers in Kentucky

The Hispanic population in Kentucky has been expanding rapidly. In 2000 it was 59,939 (1.39% of Kentucky population); in 2013 the estimated Hispanic population was 145,044 (3.30% of Kentucky population) (U. S. Census Bureau). If Hispanic consumers are willing to buy food directly from farms, they could be an important direct marketing resource for Kentucky's producers.

Anecdotal evidence from poultry and small ruminant farmers suggested that Hispanic consumers purchase live animals for home consumption. This inspired a project that investigated their willingness to buy whole (i. e., unprocessed) catfish on ice.

Hispanic grocery stores in Lexington and Shelbyville, Kentucky, were recruited to feature the sale of unprocessed, locally-sourced catfish on ice. These two cities were selected due to their large Hispanic population proportion. At each store, Hispanic customers were engaged in a simple bidding process to elicit their willingness to pay for the fish. If they bid "high enough", they were allowed to buy catfish. These bids were recorded and the customers were surveyed to investigate their perception of catfish.

The survey of Hispanic consumer resulted in a useful sample size of 73. Of these respondents 42 percent were female, 77 percent were less than 40 years old, 52 percent had agricultural or factory work as livelihood, 25 percent were from Mexico and 39 percent were from Peru.

## Perception of fresh, whole catfish among Hispanic consumers

The survey data revealed that Hispanic consumers cooked fish frequently at home. The survey revealed that 75 percent of respondents either cooked fish weekly or twice monthly.

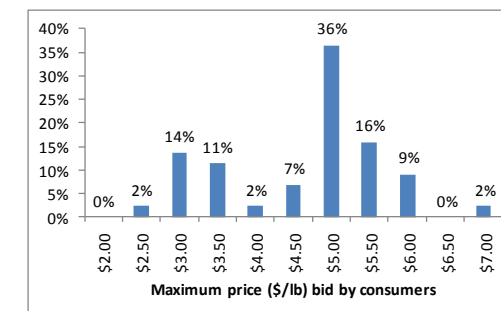
The survey indicated that 81 percent of respondents preferred whole catfish, 53 percent preferred fresh gutted catfish, and an additional 25 percent wanted live catfish. Only 22% of the respondents preferred fillets.

The catfish price bidding data provided measures of the value that Hispanic consumer placed on the whole fish. Most Hispanic consumers were willing to pay between \$2 and \$7 per pound. Their average WTP was \$4.63 per pound. The most frequent price that they were willing to pay was \$5 per pound.

### Catfish sales to Hispanic grocers in Kentucky

The results of the Hispanic consumer survey encouraged several Hispanic grocers to feature fresh, unprocessed locally-grown catfish at their seafood counter. Kentucky State University supplied catfish to the grocers every Friday, in order to record their sales over time.

Two Hispanic grocers in Lexington, two in Shelbyville, and one in Louisville sold whole catfish. The Shelbyville grocers were unable to sell catfish for more than



*Distribution of the willingness to pay for whole catfish by Hispanic consumers in Kentucky.*

### Characteristics of CSA patrons

- Total number of respondents = 80
- 59% of respondents were female
- 96% of respondents were Caucasian
- 89% of respondents had either a 4-year college degree, graduate degree, or professional degree
- 54% of respondents lived in a suburban area
- 67% of respondents were between 30 and 50 years old
- The average household size was 2.78; the most commonly-reported household size was 2

two weeks. The remaining grocers continued to purchase fish at prices ranging from \$.125 to \$1.75 per pound. They wanted fish between 1.5 and 2.0 pounds. Average weekly demand per store varied from 30 pounds to 60 pounds. Grocers equipped with meat processing facilities (i. e., carneceria) were able to process the whole catfish and sell gutted fish.