



Consumer Acceptance of Chesapeake Bay Wild Blue Catfish

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Blue catfish (*Ictalurus furcatus*) were introduced to Virginia’s waterways in the 1970s for recreational fishing, but they have since become an invasive species in the Chesapeake Bay (Robertson et al. 2024). These nonnative fish now threaten critical native species — including blue crabs, oysters, clams, shad, herring, and menhaden — with populations exceeding 1,300 fish per acre in some areas (Robertson et al. 2024; Virginia Marine Products Board 2024). Converting this invasive species into a marketable food product presents a unique opportunity to support both ecosystem management and Virginia’s seafood economy.

Recent research conducted by Virginia Tech evaluated consumer preferences for wild-caught Chesapeake Bay blue catfish. The findings provide valuable insights for processors, distributors, and marketers interested in developing and promoting blue catfish products in the marketplace.

Consumer Acceptance of Blue Catfish: Results from a Virginia Tech Study

Overall Acceptance

A total of 67 untrained consumers (ages 18-60+) participated in the sensory evaluation at Virginia Tech’s Sensory Evaluation Laboratory. Skinless blue catfish fillets without seasoning were cooked in vacuum-sealed bags immersed in boiling water to allow evaluation of

natural flavor attributes. Consumers rated Chesapeake Bay blue catfish favorably, with an average score near 6 (“like slightly”) on a 9-point hedonic scale (1 = “dislike extremely,” 5 = “neither like nor dislike,” 9 = “like extremely”), indicating moderate-to-good acceptance. This finding demonstrates that wild-caught blue catfish from Virginia waters have strong market potential when properly handled and prepared.

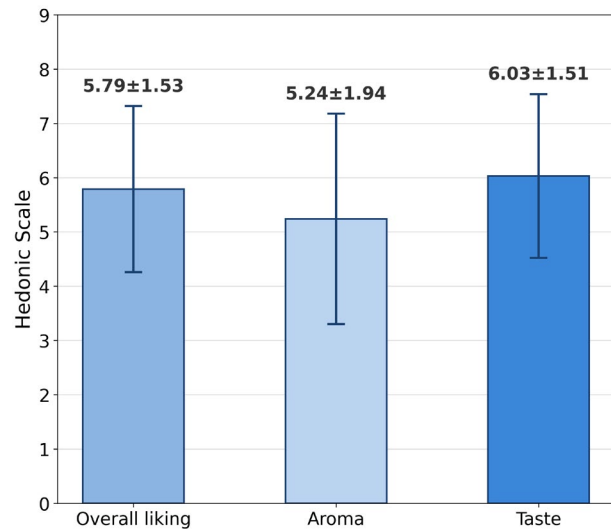


Figure 1. Average hedonic scores for Chesapeake Bay wild blue catfish sensory evaluation (N = 67).

Taste and Flavor Profile

Consumers tasted wild-caught Chesapeake Bay blue catfish samples prepared without any seasoning, which allowed them to assess the natural flavors dominant in this fish. Despite the lack of seasoning, wild-caught Chesapeake Bay blue catfish received positive taste-liking ratings from consumers, with an average score of 6 (“like slightly”). The fish’s natural diet of crustaceans, mollusks, and aquatic vegetation contributes to its unique flavor characteristics that distinguish it in the marketplace. This wild origin offers processors an opportunity to position blue catfish as a premium seafood product with authentic regional identity.

Preferred Sensory Attributes

In a sensory evaluation conducted in collaboration with the Department of Food Science and Technology at Virginia Tech, consumers who gave the highest overall liking scores for blue catfish described the fish using the following terms:

- Crisp texture.
- Creamy and buttery characteristics.
- Sweet flavor notes.
- Smooth texture.
- Tender and fresh.
- Moist.

These findings suggest that preparation methods emphasizing surface texture, such as breading or pan-frying, may enhance consumer satisfaction with blue catfish products. Chesapeake Bay blue catfish align well with these consumer preferences when proper handling and cooking techniques are employed.

Recommendations for Virginia’s Blue Catfish Industry

Handling and Processing Best Practices

To maximize consumer acceptance of Chesapeake Bay blue catfish:

- Minimize time between harvest and processing to maintain freshness.

- Implement rapid chilling immediately after catch, such as icing the fish to reduce internal temperature to 40 F (4.4 C) or below within one hour of harvest and maintaining cold chain throughout transport and processing.
- Develop consistent quality control protocols that account for variations in season, fish size, and location.
- Focus on preparation methods that enhance crisp texture by breading, pan-frying, or using other techniques that consumers prefer.

Environmental Influences

The Chesapeake Bay’s brackish water environment contributes to the sensory characteristics of blue catfish. While some consumers noted subtle astringent or pungent notes in samples collected from brackish water, these characteristics varied and can be managed through targeted harvest and post-harvest handling practices, such as immediate icing to maintain freshness, and minimizing the time between harvest and processing. Processors seeking detailed handling guidance should contact the Virginia Seafood Agricultural Research and Extension Center. Understanding the relationship between harvest location and flavor profiles helps processors optimize their operations.

Market Development Strategies

Based on the consumer preference data from this sensory evaluation, processors and marketers may consider emphasizing:

- Wild-caught status as a premium quality indicator.
- Regional authenticity and connection to the Chesapeake Bay.
- Sustainable harvesting that supports ecosystem management.
- The fish’s natural diet and unique flavor profile.
- Proper handling and freshness as key quality factors.

Consumer Education

Raising awareness and informing consumers about blue catfish present a range of valuable opportunities to increase market acceptance:

- Highlight the environmental benefits of consuming this invasive species.

- Explain the unique flavor characteristics derived from the fish’s natural diet.
- Demonstrate proper cooking techniques that maximize texture and taste.
- Share the story of how harvesting blue catfish supports Chesapeake Bay restoration efforts.
- Developing post-harvest handling protocols specific to Chesapeake Bay conditions.
- Creating consumer education materials that highlight quality and environmental benefits.
- Exploring value-added product development opportunities.

Market Positioning

The positive consumer acceptance scores and favorable sensory attributes identified in this study for Chesapeake Bay blue catfish provide a compelling foundation for niche market differentiation. Key product attributes include:

- Authentic regional seafood with a compelling story.
- Premium wild-caught positioning.
- Environmental stewardship through invasive species control.
- A unique flavor profile shaped by the Chesapeake Bay ecosystem: Consumers described favorable attributes including sweet, firm, oceanlike, and umami characteristics derived from the fish’s natural diet of crustaceans, mollusks, and aquatic vegetation in brackish waters.

Processors can leverage these attributes to develop a distinctive brand identity that resonates with consumers seeking both quality seafood and products with positive environmental impact.

Looking Forward

Overall, the consumer sensory evaluation study demonstrates that wild-caught Chesapeake Bay blue catfish achieves good consumer acceptability when properly handled and prepared. As Virginia continues to develop its blue catfish fishery as both an invasive-species management tool and an economic development opportunity, understanding these quality factors becomes essential for market success. Suggested future research and industry priorities include:

- Optimizing harvest timing and location for best flavor profiles.

- Investigating the relationship between seasonal variations and sensory characteristics.

The success of Virginia’s blue catfish industry depends on consistent quality, effective marketing, and consumer education that positions this product as both a premium seafood choice and an environmentally responsible purchase.

For More Information

Contact the Virginia Seafood Agricultural Research and Extension Center (Yimingfeng@vt.edu or 757-727-4861) for technical assistance with blue catfish processing, handling, and marketing strategies. Additional resources on invasive species management and seafood quality are available through Virginia Cooperative Extension.

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References

- Robertson, Ellen, Jenn Malpass, Christopher Ottinger, John Griffin, Christine Densmore, and Kenneth Hyer. 2024. “Invasive Blue Catfish in the Chesapeake Bay: A Risk to Realizing Bay Restoration Investments.” Fact Sheet 2024-3033. U.S. Geological Survey. <https://pubs.usgs.gov/fs/2024/3033/fs20243033.pdf>.
- Virginia Marine Products Board. 2024. “Virginia/ Chesapeake Bay Wild Caught Blue Catfish.” https://www.potomacriver.org/wp-content/uploads/2024/10/Hutt_Blue-Catfish-Samuels-3-2.pdf.