EXTENSION NEWSLETTER

Andrew Rypel is the New Director for the School of Fisheries, Aquaculture & Aquatic Sciences at Auburn

Dr. Andrew L. Rypel was recently appointed as Director of the School of Fisheries, Aquaculture and Aquatic Sciences (SFAAS) at Auburn University. Dr. Rypel brings extensive experience with degrees from Saint Louis University, Auburn University, and University of Alabama and professional roles with the U.S. Forest Service, Wisconsin Department of Natural Resources, and private industry. For the past eight years, Dr. Rypel served as professor and Coldwater Fish Endowed Chair at University of California Davis. He was also the Director of the Center for Watershed Sciences (2019-2025), leading an $8 million/year interdisciplinary research enterprise towards practical water solutions for California. Dr. Rypel has extensive experience in fisheries management, agriculture, and sustainability. One of his signature projects in California was helping rice farmers develop an NRCS conservation incentive program for growing wild salmon on winter-flooded rice fields.

Andrew Rypel can be reached at 203 Swingle Hall, Auburn University, AL 36849 or rypel@auburn.edu.

Dr. Rypel's prior leadership focused on strategic planning, forging strong partnerships, conducting applied research, and encouraging the universities to face outward and help the public live better lives. He hopes to bring many of these hard-earned lessons to Alabama and the aquaculture industry. Dr. Rypel is excited to support and help grow the mission of the Alabama Fish Farming Center in particular. As such, he is eager to get to know local catfish producers in the region, and to hear about how Auburn's land grant mission can help local farms and industry meet their production and farming needs.

Aquaculture in Alabama: A Summary of USDA Census Data

Quinn LaFontaine and Taryn Garlock
SFAAS

The U.S. Department of Agriculture recently released the 2023 Census of Aquaculture, a survey that characterizes U.S. aquaculture and is conducted every five years. Total U.S. farmgate sales of aquaculture products were $1.9 billion in 2023, a nominal increase of 26% from 2018. There were 3,453 farms with sales in the U.S., an increase of 18% from 2018. Alabama had 102 farms, generating $131.9 million in sales, which ranks Alabama as the fifth largest aquaculture producer in the U.S., preceded only by Mississippi, Washington, Louisiana, and Florida. Although the number of farms in Alabama has declined since 2018 (down from 115), total farmgate sales have increased by 39%, which indicates that aquaculture is growing more quickly than in other U.S. states and Alabama is increasing its share of U.S. production. After adjusting for inflation, this represents a real increase of 68% in farmgate sales, which makes aquaculture the seventh-largest agricultural sector in Alabama and highlights its importance in the economy.

Catfish is the largest aquaculture industry in Alabama, accounting for $125.8 million, or 95% of the total farmgate sales. Other important aquaculture sectors in Alabama are oyster and sportfish production and, to a lesser extent, baitfish and crustacean production (Table 1). The number of farms with sales of oysters, tilapia and baitfish increased from 2018 to 2023, while the number of farms declined for all other sectors. However, farmgate sales for all sectors increased from 2018 to 2023, with the largest increases in oysters and baitfish.

Many aquaculture farms in Alabama are characterized as small-scale, family-owned farms. Fifty-five percent of Alabama's aquaculture farms are legally classified as family farms, and sixty percent are classified as small farms with less than $250,000 in farm gate sales. While small-scale farms are more prevalent, most of the sales value comes from large-scale farms. About one-fourth of farms in Alabama are more than 500 acres, and these farms contribute 72% of farmgate sales, whereas farms less than 500 acres make up three-fourths of farms and contribute 28% of sales.

Pond aquaculture is the most common production method used in Alabama, with 96 operations employing 1,818 ponds

	Number of Farms			Farmgate Sales (1000 USD)		
Product Type	**2018**	**2023**	**Percent Change**	**2018**	**2023**	**Nominal Percent Change**
Food Fish	104	84	-19%	92,965	126,863	36%
Catfish	96	78	-19%	92,139	125,849	37%
Tilapia	6	8	33%	172	354	106%
Carp	5	4	-20%	(D)	660	-
Sportfish	14	10	-29%	1,631	2,752	69%
Crustaceans	2	1	-50%	(D)	(D)	-
Oysters	3	9	200%	74	932	1159%
Ornamental	2	2	0%	(D)	(D)	-
Baitfish	3	4	33%	24	172	617%
Total	115	102	-11%	95,199	131,906	39%

Table 1. Number of aquaculture farms by product type in Alabama. (D) indicates data is not disclosed. Source: USDA Census of Aquaculture, 2018, 2023.

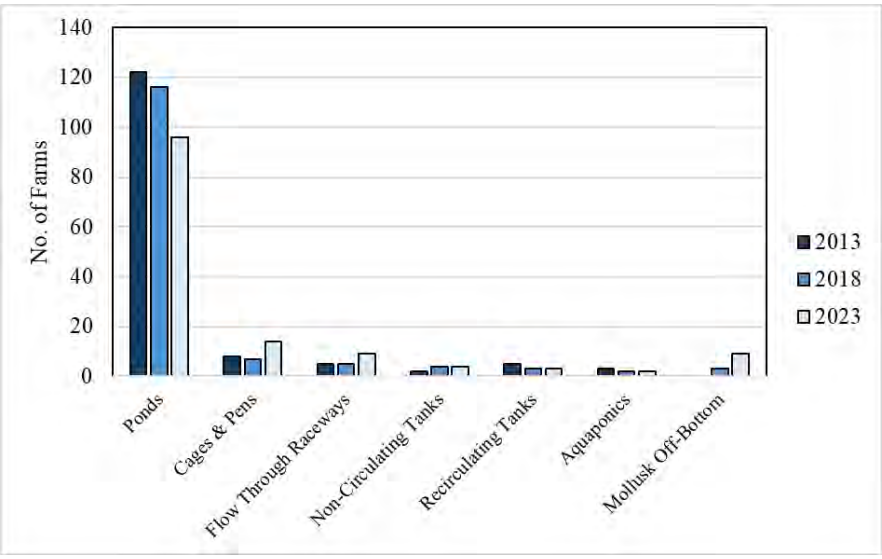

Figure 1. Number of farms by production method. Source: USDA Census of Aquaculture, 2013, 2018, 2023.

(Figure 1). Other technologies, such as cages and flow-through raceways, have become increasingly popular as the number of operations utilizing them doubled between 2018 and 2023 (Figure 1), highlighting a shift toward more advanced production technologies with a greater degree of control over production. Other production methods, such as non-circulating systems, recirculating systems, and aquaponics, are also used in Alabama to a lesser extent. Overall, the results show significant growth in Alabama's farmgate sales and a shift toward

Alabama Department of Public Health Releases 2025 Fish Consumption Advisories

Corey Courtwright, Aquatic Extension Agent
Alabama Cooperative Extension System

Alabama is blessed with many beautiful rivers and lakes that are a great source of recreation and food. However, some bodies of water in Alabama are subject to "consumption advisories." A consumption advisory is a special statement released by the Alabama Department of Public Health alerting anglers to the presence of chemicals at levels potentially harmful to human health in the fish of a particular body of water (Figure 1). The specificity of these advisories is limited by time and money for sampling. All the fish species in all the bodies of water cannot be sampled every year. Because of these limitations, advisories are meant to inform personal decisions about consuming fish from public waters. When there is a consumption advisory, the informed angler will consider fish species, chemical in question, level of contamination, and who will potentially be consuming the fish.

1. Fish species: In many cases an advisory may only be for one fish species in a particular body of water. This may be because agencies lack sample data on other fish species in that body of water. Anglers should consider species based on what the fish eat and how long they live. Most of the chemicals of concern in Alabama bioaccumulate (become concentrated in the body) in fish and increase in concentration the longer the fish eats contaminated prey. Prey higher on the food chain are more likely to have consumed prey that have also bioaccumulated chemical. Older fish also have had more years to eat prey that have higher levels of the chemical of concern. Therefore, if a consumption advisory is in place for a certain species, other similar species should be considered of concern. Also, any species that feeds higher on the food chain and/or is longer lived should be approached with caution. Furthermore, the movement of fish in the ecosystem should be considered. If one portion of a body of water has a consumption advisory there may or may not be data for other parts of the body of water. In this

case, the movement of the fish and water flow through the ecosystem should be taken into account when considering eating fish from other parts of the same body of water.

2. Chemical: Different chemicals work their way through the ecosystem and a fish's body in different ways. For example, if an angler consumes fish from an area with a consumption advisory where the chemical of concern is PCBs (polychlorinated biphenyls) the amount consumed can be limited by not eating the belly meat or other fatty parts of the fish and grilling the fish so that fats drip away from the meat since PCBs tend to build up in the fatty tissue. However, if the advisory is for mercury contamination, mercury builds up in the meat and how the fish is prepared makes little difference in the amount consumed.

3. The level of contamination should also be considered. Some water bodies consumption advisories are "do not consume any" (this can be for one or all species of fish in that water body). Others recommend not consuming more than a certain number of portions per month of fish from that body of water. These differences show different levels of contamination in the fish sampled.

4. Who potentially will be consuming the fish should also be considered as women who are pregnant or may become pregnant as well as children are more susceptible to adverse effects of chemical contamination of food than are other members of the population.

For more information about any potential consumption advisories on your favorite Alabama fishing hole visit https://aldem.maps.arcgis.com/apps/MapSeries/index.html?appid=a363906f419b423b857bb8a4a04750dd

Figure 1. Many public fishing waters subject to consumption advisories do not have any signage at access points. In many cases it is the responsibility of the angler to investigate, though some signage has been installed especially by private groups.

Figure 2. Angler fishing in a public water source with a "Do not eat" advisory after stating that he was unaware of any contamination concerns.

Alabama

Catfish Conference '26

Thursday, January 8, 2026

Blackbelt Research & Extension Center

Marion Junction, Alabama

Imports Capture Demand Growth in Catfish

Taryn Garlock and Quinn LaFontaine
SFAAS

Demand for catfish has doubled over the last two decades, but imports have captured all the market growth, and then some. In the early 2000s, nearly all 650 million pounds of catfish (in live weight equivalents) supplying the U.S. market were sourced domestically (Figure 1). Over the next decade, the U.S. supply of catfish nearly doubled to 1.2 billion pounds, but this was filled by catfish imports as domestic production declined and imports of pangasius rapidly increased.

The Vietnamese pangasius industry has capitalized on U.S. demand for low-cost seafood. Their producers have benefited from subsidies provided by the Vietnamese government, which has helped them provide a product which is less than half the cost of U.S. catfish fillets. Industry efforts, such as the initiation of antidumping duties as well as the transition of regulatory oversight from FDA to USDA, have been ineffective at deterring imports over the long run. Over the last decade, about one-fourth of catfish consumed in the U.S. was produced domestically. This fits well with the broader situation within the U.S. where the governance and regulatory environment has poorly supported domestic aquaculture industries and has resulted in substantial sourcing of seafood from abroad. Tariffs are a temporary solution to the import problem. A tariff on imports from Vietnam could increase the price consumers pay for pangasius and result in a decline in imports. However, higher prices will also reduce consumer purchasing power, which could decrease overall demand.

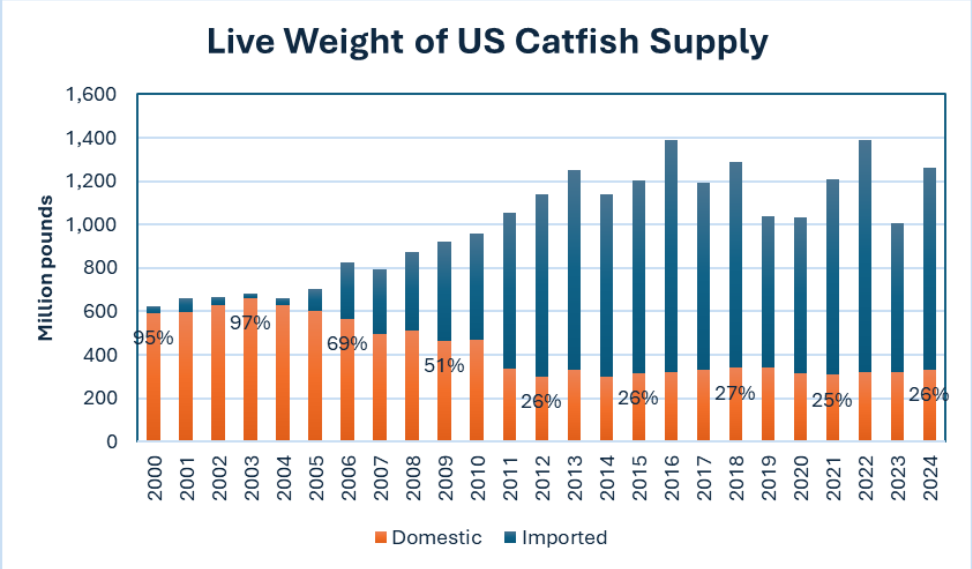

Figure 1. Live weight of the U.S. catfish supply. The U.S. catfish supply is predominately comprised of U.S. farm-raised catfish and imported pangasius. Live weight of U.S. farm-raised catfish was sourced from industry processing reports. Live weight of imported pangasius was estimated by applying a conversion factor of 3.55 to imported product weight (FAO).

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USDA-FSA Emergency Livestock Assistance Program Claims Checklist

1. **Meet with your County Office:** Very Important. If you have never worked with your county office, set up an appointment to discuss your operation, ELAP eligibility and what the county office requires to be eligible for an ELAP claim should a qualifying weather event occur.

2. **File an Acreage Report:** It is required to participate and must be done yearly

3. **Establish Inventory Record:** Figure out the best way to establish an inventory record that can be updated monthly. Work with the county office to determine what would be acceptable.

4. **Eligible Loss Event Occurs:** Excessive heat, freeze, floods, tornados, hurricanes. (Drought is NOT eligible).

5. **Required Information to be eligible for a loss:**
   a. Acreage report (Surface acres of water)
   b. Verifiable or reliable documentation of catfish
      i. Death Loss (photos, video, feed numbers)
      ii. Beginning Inventory (as close to loss event as possible)
      iii. Ending Inventory (not required immediately following the loss event)
      iv. Any other documentation required by the county office (eligibility requirements, AGI documentation, etc.)

6. **File Notice of Loss:** Make sure to file a NOL when the eligible event occurs. Check with your county office to determine the deadline to file a NOL for a given year!

7. **File an Application for Payment:** Once loss of fish is determined, file an application for payment.

Other Important Information:

1. **Normal Mortality:** This is a percentage established by the state FSA Office to reflect the non-weather-related losses that occur. In Mississippi, it is 15%. Normal mortality rate is applied to a claim only if the producer does not provide acceptable inventory numbers for the time period prior to the loss event.

2. **Lack of good inventory records:** You should still file a NOL. Even if your inventory numbers are not complete, you still have a claim. Normal mortality will be applied.

3. **Work with your County office before you have a claim:** You should make an appointment with your county office prior to making a claim. Work with them to determine what records they want to see to establish inventories. Develop a plan with your county office on the how/when to provide those records.

RESEARCH ROUNDUP

Success in Soy-Based Ingredients Towards Fishmeal Replacement in Cultured Largemouth Bass

Jamison L. Semla[1], Abdulmalik A. Oladipupo[1] Ian A.E. Butts[1], D. Allen Davis[1], Benjamin R. LaFrentz[2], and Timothy J. Bruce[1]
[1]SFAAS, [2]USDA-ARS Aquatic Animal Health Unit

The largemouth bass, native to the United States, is labeled a highly prized freshwater sportfish by many anglers. This species is widely accepted in aquaculture production due to its rapid growth rates, short rearing cycles, and overall hardiness, which enables it to tolerate a wide range of environments. Overall, largemouth bass production has grown exponentially over the past decade within the United States. The USDA-NASS census of 2023 has reported that the largemouth bass brings a high market value, with a state average of $7.53/lb. Recently, states have loosened regulations on the culture of largemouth bass. Previously, largemouth bass could only be produced for stocking waterways. Now, some states allow the production of this species as a food fish. Currently, the aquaculture industry is moving towards more sustainable directions by using renewable row crops, such as soybean meal (SBM), to alleviate overfishing of sources of fishmeal and reduce the associated costs of feed formulation. Success with soy-based protein formulations has been observed in many cultured species, such as trout, hybrid striped bass, tilapia, red drum, burbot, amberjack, catfish, and largemouth bass. The potential benefits of using soy-based diets in largemouth bass production are significant. These diets can reduce the industry's reliance on marine resources, lower production costs, and increase profit margins. Therefore, this research is crucial in promoting sustainable efforts by using soy-based diets in largemouth bass production.

Figure 1. Photo of largemouth bass fingerling.

A recent project investigated the growth and health status of largemouth bass fingerlings when cultured with formulated diets that used several soy-based ingredients to replace fishmeal (FM). Several investigators from Auburn University School of Fish-

eries, Aquaculture, and Aquatic Sciences approached this project holistically, and examined the performance, health status, and susceptibility to columnaris disease. Largemouth bass fingerlings (initial weight 14 lbs/1000 fish) were stocked in tanks within an indoor recirculating aquaculture system and fed a formulated diet with either a conventional SBM, enzyme-treated SBM, or a soy protein concentrate replacing FM (Figure 1). After a 14-week culture period, comparable data in growth metrics such as biomass (lbs), biomass gain (lbs), percent weight gain (%), feed conversion ratio, specific growth rate, and thermal growth coefficient were observed in largemouth bass fed the soy-based diets in comparison to the largemouth bass fed a basal diet. Additionally, there was no dietary influence on whole-body carcass composition for metrics such as moisture (%), dry matter (%), crude protein (%), crude fat (%), and ash (%) levels.

Furthermore, several objectives were set forth to investigate the overall health status of the largemouth bass following the culture period, which included an evaluation of the distal intestine. The results of the qualitative ranking evaluation of the distal gut demonstrated that the soy ingredients did not exhibit any morphological changes or the presence of gut inflammation (Figure 2).

The distal gut was examined using four inflammatory genes (*il1b*, *il8*, *il10*, and *tgfb*), and the soy ingredients did not appear to induce inflammation within the distal gut of the largemouth bass. This study provided evidence that largemouth bass were less sensitive to soy products than other species. Furthermore, when the gut microbiome was examined (the bacteria, fungi, and viruses that naturally occur in the gut), results showed that the soy-based protein sources did not affect overall species richness or diversity of the microbial community. However, the fluctuation in the abundance of specific gut bacterium species was influenced by the type of soy ingredient used.

This project demonstrated success in FM replacement with soy-based ingredients towards the culture production of largemouth bass. This will lead to a more sustainable industry that relies more on renewable resources and reduces the cost of feed production, resulting in higher profit margins in the market. The implications of these findings are significant for the aquaculture industry, as they provide a viable and sustainable protein source to FM, reducing the industry's reliance on marine resources and potentially lowering production costs.

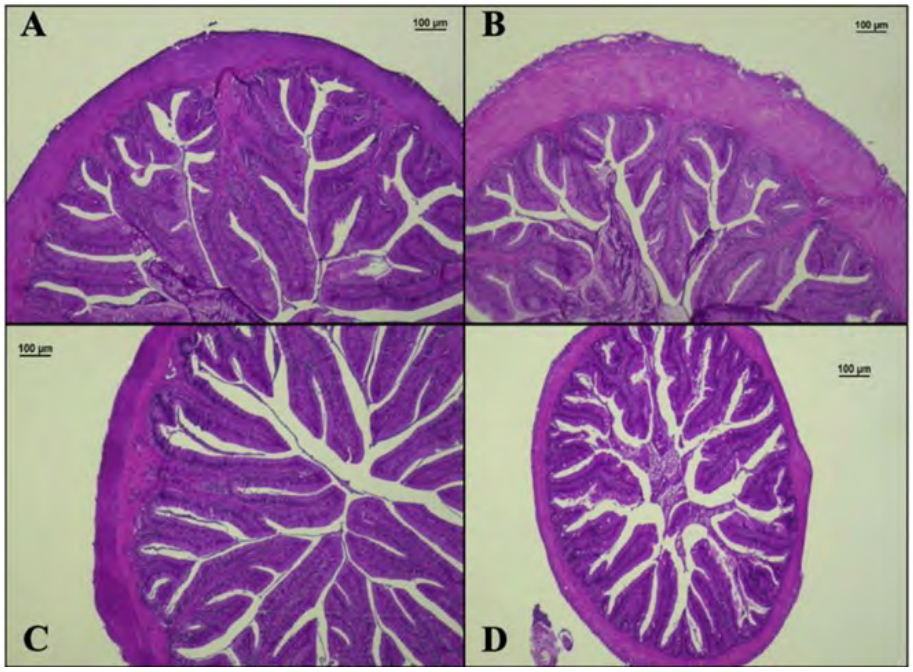

Figure 2. Cross-section of the distal gut for (A) Basal, (B) SBM, (C) ESBM, and (D) SPC following the 14-week culture period.

Black Soldier Fly Frass: A Promising Eco-friendly Ingredient for Catfish Feed

Magida Tabbara[1], Abigeal Adeyemi[1], Tim Bruce[1], Luke Roy[1,2], Jesse James[1,2], Sunni Dahl[1,2], D. Allen Davis[1], Daniel Adams[3], and Anita Kelly[1,2]

[1]SFAAS, [2]AFFC, [3]EnviroFlight Inc.

Catfish farmers still face challenges despite the steady production of catfish over the last ten years. One is increased production expenses compared to the revenue generated. Feed accounts for more than 60% of production expenses, due to the increased price of protein sources used in feed. To help reduce production costs, catfish farmers started using more cost-effective diets. Expensive fishmeal as a protein source in catfish diets was replaced with plant protein sources. Soybean meal is the most used plant protein source. Although soybean meal is a good protein source, relatively affordable, and available, the increased demand for soybean meal for human consumption and upward price fluctuations mean that some other ingredients can be even cheaper. Accordingly, other ingredients can help decrease feed costs even further if used as a partial replacement for soybean meal. However, when deciding on a new ingredient, it is essential to consider its nutritional profile, environmental impact, and potential to stimulate fish health.

Figure 1. Black Soldier fly on flower. Photo by EnviroFlight, Inc.

Figure 2. EnviroFlight products EnviroBug (L), EnviroFrass, EnviroMeal. Photo by EnviroFlight Inc.

The black soldier fly is an insect gaining attention as an aquaculture feed ingredient (Figure 1). The insect can be produced sustainably and convert organic waste into feed-grade nutrients. Most research has evaluated using black soldier fly larvae or meal as a feed ingredient. However, little research has been done on using black soldier fly frass (BSFF) in fish feed. BSFF is a co-product of rearing black soldier flies and consists of leftover feed, insect exoskeletons, and waste produced by the larvae. Despite being a waste product, BSFF has a protein content of around 24% and is easily digested (Figure 2).

Additionally, BSFF is rich in components that stimulate the immune system and peptides that pro-

tect against bacteria. These can help catfish fight bacterial diseases if provided in the feed. Accordingly, the possible effects of BSFF on catfish welfare were evaluated in the present study.

An experiment was performed in in-pond raceways on a commercial farm in Gallion, Alabama (Figure 3). The experiment was conducted in two adjacent ponds with four in-pond raceways. Each raceway was stocked with an equal number of hybrid catfish (mean initial weight of 0.6 ± 0.2 lbs). Additionally, 50 catfish were euthanized, and the distal intestine collected for initial histological analysis. Catfish were fed a standard commercial feed (28% crude protein) formulated with or without BSFF (South Fresh Feeds, Demopolis, AL) for 129 days. Afterward, catfish from each raceway were sampled, and individual weights and lengths of three fish per raceway were recorded to calculate Fulton's condition index. Then, the same fish were sedated before blood collection.

Analyzing blood lets us assess the lysozyme activity and blood biochemistry. Lysozyme is an antimicrobial enzyme that acts as a first line of defense for the immune system. Blood biochemical parameters assessed were liver and kidney health indicators. After blood collection, the same fish were euthanized and dissected. Then, the spleen and a section of the distal gut were collected for gene expression analysis and histological assessment of the gut. The results suggested that including BSFF in hybrid catfish diets does not negatively affect fish welfare. Catfish offered either diet exhibited similar individual weights, lengths, condition index, lysozyme activity, and serum biochemistry.

Additionally, the use of BSFF in the feed did not exhibit any drastic effects on gut histology, as the gut tissue of fish offered either feed was similar and did not show noticeable signs of inflammation in the intestine. However, the immune genes extracted from the spleen of catfish fed BSFF in the feed were upregulated. *il-1β, il-8,* and *tnf-α* are pro-inflammatory genes that, when upregulated, help strengthen the immune system by making it more prepared to fight infections. Conversely, *tgf-β* is an anti-inflammatory gene that, when upregulated, prevents over-inflammation. Accordingly, using BSFF in catfish feed could potentially help fish fight off disease and infections.

Figure 3. Harvested catfish fed frass diets.

The results of this study open our eyes to a recycled co-product that can be an ingredient in catfish diets. BSFF positively influenced hybrid catfish welfare by enhancing the immune system and helping fish withstand disease infections commonly seen on farms. Incorporating BSFF in catfish diets could help decrease feed costs for the farmers and potentially decrease mortalities by boosting the fish's immune system. More studies are in progress to evaluate the effectiveness of BSFF in helping fish fight off columnaris, enteric septicemia of catfish, and motile *Aeromonas* septicemia.

Using a new LAMP Assay to Rapidly Detect Aeromonas and Other Bacterial Pathogens in Catfish

James Tuttle[1], Anita Kelly[1], Mark Liles[2], Yogesh Chander[3], and Alyssa Hassinger[3]
[1]AFFC, [2]Auburn University College of Sciences and Mathematics, [3]Varizymes

Figure 1. Current thermocycling machine for Phase 2 of the LAMP assay project.

Bacterial infections, such as hole-in-the-head (ESC), Columnaris disease, and *Aeromonas* diseases, remain a problem year-round. Virulent *Aeromonas hydrophila* (vAh) has been diagnosed by the Alabama Fish Farming Center (AFFC) personnel almost every month of the year. Traditional methods of identifying pathogens in sick fish can take days to confirm. However, new diagnostic technology has made it possible for us to determine the bacterial pathogen in as little as 30 minutes in a portable thermo-cycling PCR machine (Figure 1). Because this machine is portable, it will be possible to conduct loop-mediated isothermal amplification (LAMP) assay tests for bacterial pathogens on-site.

A new LAMP assay developed by Dr. Mark Liles at Auburn's College of Sciences and Mathematics and Dr. Yogesh Chander from the biotechnology company Varizymes is being evaluated at the AFFC with promising results. LAMP allows us to detect specific bacterial pathogens by testing their DNA. Instead of requiring a multiple day process involving cutting open a fish, swabbing the internal organs, waiting 24 to 48 hours for the bacterial colonies to grow, extracting the bacterial DNA, then conducting a 2 to 4 hour DNA confirmation test (PCR) to verify the identity of a bacteria, a LAMP assay can accomplish all those steps in a fraction of the time. The procedure for this LAMP assay involves swabbing the external mucus or internal organs of a sick fish, placing the used cotton swab in a solution that breaks down the bacterial cells, transferring a tiny amount of the sample solution into a small reaction tube containing the LAMP assay mixture, placing that tube into a PCR machine that runs a 30-minute detecting procedure.

To develop and validate this LAMP assay, we are using catfish samples from west Alabama, but the assay has come a long way. The first phase of this project involved successfully using a LAMP as-

say mixture to detect vAh and non-vAh (nAh) bacteria (Figure 2). After determining that the best way to test fish was from swabs of skin or internal organs, the LAMP assay produced consistent results in Phase 1. Those results were promising enough to expand the project to Phase 2, which has led to the development of assay mixtures that can now detect the bacteria responsible for Columnaris disease and ESC, as well as different species of *Aeromonas* aside from vAh. The new machine and LAMP assay mixture can detect multiple bacterial types within the sample. This technology will allow us to identify when co-infections are present in our diagnostic cases and when available commercially, we expect that this assay can enable the AFFC to quickly and accurately identify fish diseases for our west Alabama farmers.

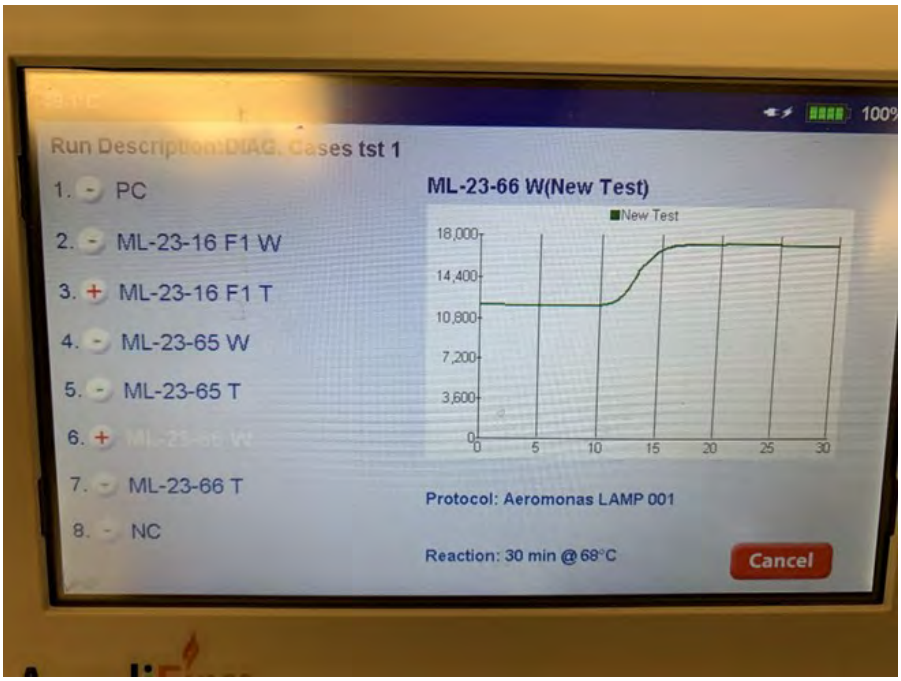

Figure 2. Example of a positive result from the thermocycling machine used during Phase 1 of the LAMP project. The increasing line indicates the presence of vAh in a single disease case sample.

Could My Hydrated Lime Actually Be Calcium Carbonate?

Peyton P. Johnson, Matthew F. Gladfelter, Anna C. Mollica, Russell A. Wright, and Alan E. Wilson
SFAAS

Hydrated lime, or calcium hydroxide, is sometimes used in aquaculture and recreational fish pond management to increase hardness by adding calcium and increase alkalinity via hydroxide. Hydrated lime dissolves quickly, raising pH and causing fast but often temporary effects in ponds. But could you accidentally be adding calcium carbonate, or agricultural lime, to your pond instead and not realize it?

During a recent experiment at the E.W. Shell Fisheries Center at Auburn University, hydrated lime was applied to experimental plastic enclosures in a pond. These big plastic enclosures were opened at the top and bottom to include the entire water column from the surface to the sediment of the pond. Each enclosure held roughly 300 gallons of water, and the experiment ran for almost two months.

After adding hydrated lime, the expectation was a rapid increase in hardness. However, that was not the case. After adding 1 lb. of hydrated lime to the

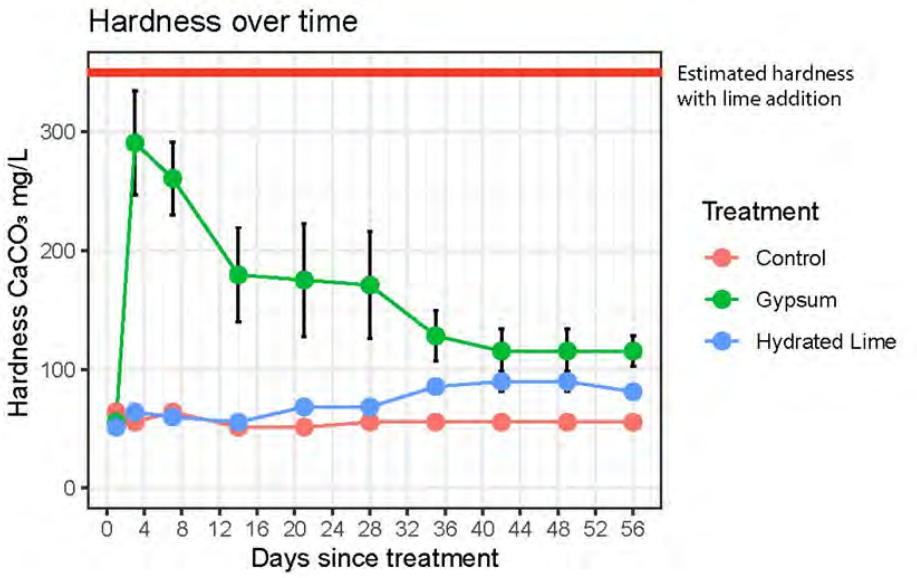

Figure 1. Hardness changes during the experiment showed no increase after hydrated lime was added. The hydrated lime had converted into agricultural lime, which was not detected until after the experiment.

enclosure, there was no significant increase in hardness (Figure 1). We did not realize then that the bag of hydrated lime was improperly stored and past its shelf life. The hydrated lime went through a reaction known as carbonation, where atmospheric carbon dioxide reacts with hydrated lime to form calcium carbonate, or agricultural lime. As you know, agricultural lime will increase alkalinity and hardness, but it is a much slower process as it dissolves very slowly and will not raise pH beyond about 8.5. One must use hydrated lime to achieve a rapid response or when pH needs to be raised beyond 11-12, which is required for sterilization. While most producers buy hydrated lime in bulk rather than in bags, the storage issue is important to remember. Hydrated lime left on the ground will also change to agricultural lime. Therefore, we recommend buying hydrated lime just before you use it and applying it as quickly as possible.

There is a way to test hydrated lime to determine if it is good or has converted to agricultural lime. Household white vinegar will tell you which form of lime you have. If in hydrated lime form, you will not see any bubbles once you add drops of vinegar. If it has converted to the agricultural lime form, the vinegar will cause carbon dioxide bubbles to form (Figure 2).

Warning:

If you use hydrated lime, please take precautions when handling it. Protective clothing, such as gloves, a mask, a long-sleeved shirt, and pants, should always be worn when handling hydrated lime. Hydrated lime can be applied in two forms, powder or slurry. The slurry is safer to use as powder has the risk of blowing back into the person applying the lime.

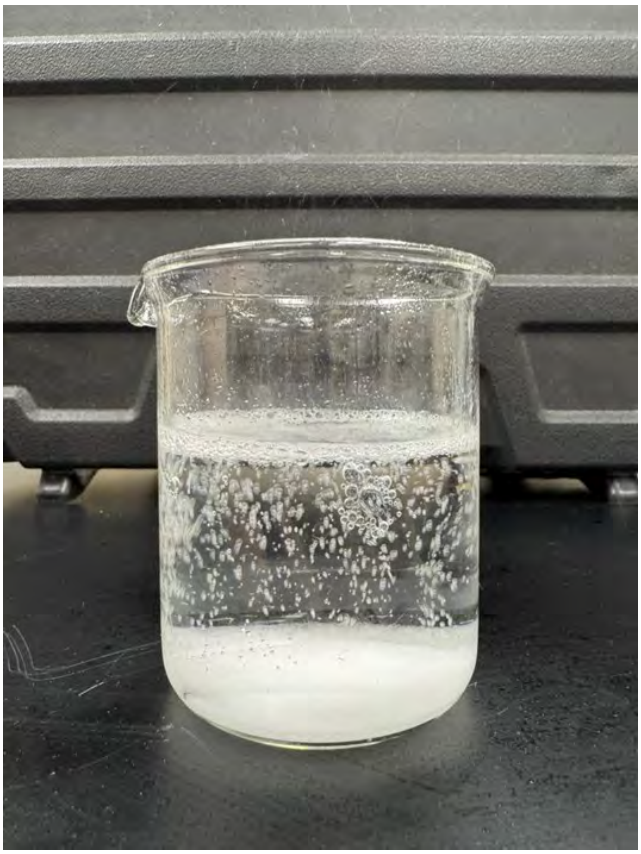

Figure 2. White household vinegar is added to a mixture of water and calcium carbonate to show expected bubbling.

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