

Fish Tales Newsletter

West Virginia's Aquaculture Newsletter is produced to help inform, educate, and update those interested in producing quality aquatic products, in a sustainable manner, for the recreational and food fish markets.

Farmer Profile: Paul Richards

It was 40 years ago that **Paul Richards, Sr.** bought a two-and-a-half acre parcel with a couple of ponds on it. Since then, Paul has been managing and expanding the acreage. Today, Paul has 160 acres and three ponds.

Two ponds are open to the public from February through November for fee fishing, in the form of **Pleasure Valley Trout Farm** in northern Randolph County (304-823-2228). One pond is spring-fed and has only trout. The other has many species of game fish and receives the water from the first pond. The third pond is for show and has koi and goldfish. Paul buys most of the trout for fee fishing from West Virginia trout producers.

Paul is a long time WVAA member, recently serving as vice president. He is proud to have a listing on the National Fish Strain Registry. Rainbows and golden trout have spawned regularly in the spring water that feeds his first pond. So, if you plan to be in the Philippi area, stop by and cast a line at Pleasure Valley Trout Farm and have a chat with Paul.



Paul Richards (left) stocking trout in pond

Effect of a Flaxseed Oil-Enhanced Diet on Product Quality of Farmed Brook Trout Fillets

By Kristen Matak, Courtney Simmons, and Ken Semmens

The first aquaculture experiment conducted at Reymann Memorial Farm investigated how flax oil influenced the level of omega 3 fatty acids in rainbow trout. Fish from that experiment had a good flavor, but no sensory analysis was done on the fish. Another set of experiments evaluated the potential for brook trout as a food fish for niche markets. Perhaps a native trout species, enhanced with omega 3 fatty acids, would have a different – maybe even a better – flavor that would appeal to consumers in local or regional markets. This article highlights work done by WVU researchers **Courtney Simmons, Kristen Matak, Jacek Jaczynski**, and others. The investigators examined the effect of flaxseed oil-enhanced feed on the fatty acid profile of brook trout and the consequent effects on shelf life.

Brook trout for the sensory evaluation were produced in the raceways at Reymann Memorial Farm. Two hundred pounds of fingerlings (9 inch TL, 1/3 lb each) were stocked into each of six raceways and fed two different diets during the 165-day experiment. Diets were made by Zeigler Bros. and were based on the Zeigler Gold product (42% protein, 16% fat). In the feed mill, oil is sprayed on the pellets to increase energy content of the feed. Menhaden oil is normally used to make commercial trout diets and was the oil source for the control diet. Flaxseed oil was used in the treatment diet. Fish in the raceways were fed daily and grew to about 1 pound each after 120 days.

Fatty acid profiles were conducted on boneless, skinless fillets. The fatty acid profile of the flaxseed (experimental) diet fillets showed an increase in total alpha linolenic acid (ALA, 18:3n3) and a decrease in eicosapentaenoic acid (EPA, 20:5n3) and docosahexaenoic acid (DHA, 22:6n3)

Fatty Acid Profile (% Fatty acid in total fatty acids)

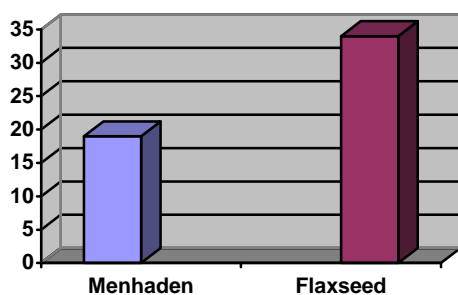
	ALA	EPA	DHA	Other Ω3	Total Ω3
Control	2.79	5.17	14.45	3.9	26.3
Flaxseed	13.58	3.83	11.09	4.3	32.8

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Shelf life of vacuum packed fillets was examined every other day over an 11-day period with refrigerated storage (39 degrees F). All shelf life analyses were performed in triplicate on raw fillets. Proximate composition (total fat, protein, moisture, ash) and fatty acid profile were determined on day 1 fillets. Refrigerated fillets were baked at 400 degrees for 12 minutes or until an internal temperature of at least 150 was reached. Samples were cut into 1-inch cubes, placed in 2-ounce plastic cups, assigned a random 3-digit code, and fitted with plastic lids. Samples were stored in a warming oven for no more than 45 minutes to maintain an internal temperature of 150 degrees until sampling by panelists.

Sensory evaluation included a triangle test for difference and a paired preference test for preference. The 53 sensory panelists were not able to choose the odd sample in two triangle tests; however, there was a significant preference for the experimental diet (flax) fillets based on taste only (Figure below).



Panelist Preference to Fillet Taste

(Vertical axis represents the number of panelists.)

The preference for flaxseed oil fillets by the panelists may have been due to the greater presence of fish odor and fish flavor found in the control (menhaden oil) diet fillets.

Conclusions:

1. Dietary modification with flaxseed-oil on farmed brook trout (*Salvelinus fontinalis*) resulted in an overall greater percentage of omega 3 fatty acids than traditionally fed trout.
2. Sensory evaluations confirm that panelists preferred the taste of the “flax” fillets to the control fillets.
3. Despite the difference in fatty acid profiles between the control and the flaxseed oil fillets, diet had no effect on the rate of oxidation over the 11-day storage period.

It can be concluded that a flax-enhanced diet would have favorable effects on the product quality of farmed brook trout, and it may appeal to the health-conscious consumer as a value-added food product.

Organic Seafood Progress?

by Daniel Miller

This is a brief update on the progress of the USDA’s certification of organic seafood. Consumers have been waiting for the final details, and like patrons in a fine restaurant are told, good results take time – lots of time.

In March 2007, the **National Organic Standards Board (NOSB)** Livestock Committee recommended certification for noncarnivorous species in closed systems (tilapia and catfish). That has still not been accomplished in part because there are so many issues and stakeholders to deal with. One difficult area still being debated is the issue of using fish meal and fish oil in the feed.

In November 2008, the NOSB recommended to the **National Organic Program** that the feeding of fish meal and fish oil from wild caught fish be allowed, provided it was produced from environmentally responsible food grade wild caught fisheries.

Consumers can be confused because certified organic aquaculture products are found in retail stores now. Those products originate from other countries and are **not USDA certified organic**. Without a single authority (i.e., USDA) to control certification of organic seafood, the value of organically produced seafood is often lost for the consumer. If you are interested in learning more about this slow-moving process, you can find information at: http://www.ams.usda.gov/AMSV1.0/ams.fetchTemplateData.do?template=TemplateN&navID=NationalOrganicProgram&leftNav=NationalOrganicProgram&page=NO_SBFinalRecommendations&description=NOSB%20Final%20Recommendations

We will try to keep you updated as significant progress is made toward this difficult goal. In the meantime, enjoy lots of fresh farm-raised fish and shellfish.

Fish Waste Bill Passes

by Daniel Miller

Soon fish farmers will be able to land-apply fish manure just as other farmers are able to land-apply manure from other animals as fertilizer. House Bill 2474 passed the legislature and was signed by the governor on April 11, 2009. The bill exempts land-based aquaculture facilities from certain sludge management requirements and provides the commissioner of agriculture with the authority to promulgate rules concerning the disposal or application of waste produced from an aquaculture facility.

To view the bill and its history, visit:

www.legis.state.wv.us/Bill_Status/Bills_history.cfm?input=2474&year=2009&sessiontype=RS&btype=bill

This change effectively prevents fish manure from being regulated as industrial waste. New rules will allow commercial fish farms to use the nutrient value of the fish manure for land application without the expensive analysis and restrictions currently required for industrial waste. The Department of Agriculture has begun to develop a rule. It is expected to recommend use of Best Management Practices used with other animal manures. Essentially, fish manure will be treated like other animal manures.

To put this in perspective, commercial fish production in West Virginia is approximately 2.5 million pounds annually. This translates into approximately 450 tons of manure (dry weight) on an annual basis. Manure from trout farms is expected to have about 2.8% nitrogen (N) on a dry weight basis. Therefore, the W.Va. aquaculture industry would produce 25,200 pounds of nitrogen annually. The poultry industry in a five-county area of east central West Virginia produces manure containing more than 7 million pounds of nitrogen annually.

The rule-making process will take time. A copy of the filing is expected by the mid-June. Readers should contact the Secretary of State's Office for a copy. Written comments will be taken through July 13. A draft of the rule must be sent to the legislature by July 30. The new guidelines are expected to be effective in July 2010.

The Northeast Regional Aquaculture Center and WVU's Extension Service are holding a **Biosecurity Workshop for Fish Farmers on July 29 at the South Branch Inn in Moorefield, W.Va.** It will begin at 9 a.m. and end by 3:30 p.m.

If you are interested, please call Becky Casteel before July 22 at 304-293-6131, ext. 4231 to register. There is no charge for the event, and all pre-registered people will get lunch at no cost.

West Virginia Aquaculture Association

On May 7, the spring board meeting for the West Virginia Aquaculture Association took place in Sutton, for the purpose of electing the 2009 officers. Present at the meeting were **Jonathan Browning, Ken Semmens, Rob Nichols, Mike Nardella, and Tom Ort.** **Jody Ours** and **Jake Musick** were present via teleconference.

The 2009 officers are **President: Tom Ort; Vice president: Mike Nardella; Treasurer: Ken Semmens; and Secretary: Rob Nichols.**

July 29 was mentioned as a time for the next board meeting. This will coincide with the Bio-Security Workshop at Reymann Farm in Wardensville.

Tom Ort is urging members to develop specific goals for the WVAA. He posed this question: "What is it that you would like the aquaculture association to accomplish?" Please consider sharing your ideas with another board member, attending a meeting yourself, e-mailing your ideas to the address below, or calling him at 304-683-5006.

tom.mountaineertrout@gmail.com.



WVAA currently has 22 dues-paying members. You may check the minutes of the meeting on the WVAA Web site (<http://wvaquaculture.com/>). Participation by W.Va. fish producers is needed.

DNR gets permit for land application of fish manure

By Ken Semmens

On January 23, the W.Va. Division of Natural Resources (DNR) obtained a permit from W.Va. Division of Environmental Protection (DEP) to land-apply waste collected from the **Spring Run Fish Hatchery** near Petersburg. This is a modification of the NPDES permit under which current regulations consider fish manure to be industrial waste. The information below describes what this entails and illustrates why the change in rules described on the previous page (Fish Waste Bill Passes) is good news.

The permit requires testing for 19 parameters: pH, Nitrogen – Kjeldahl Total, Arsenic, Cadmium, Chromium, Lead, Mercury, Molybdenum, Nickel, Selenium, Zinc, Nitrogen – Organic Total, Calcium, Solids – Total Sludge (%), Potassium, Phosphorus, Nitrogen – Ammonia, and Nitrogen – Sludge Total Dry Wt.

A composite sample of the fish manure is taken every six months and sent to a certified laboratory for analysis. Even though laboratory analyses may reveal that concentrations of parameters are consistently less than maximum allowable concentrations, the monitoring frequency must be maintained.

The soil at each plot where the manure is land-applied must be sampled annually.

There are numerous restrictions on when, where and how the fish manure can be land-applied. Some restrictions are similar to Best Management Practices for land application of other animal manures. Others are more cumbersome. For example, cattle are not permitted to graze on a pasture within 30 days of manure application. Hay cannot be harvested within 30 days of land application. If the soil pH is below 6.2, land application of fish manure is not permitted at all.

The maximum annual loading rate for selected plots is 2.7 dry tons/acre, or about 41,000 gallons of fish waste and water. The five-year cumulative loading rate is about 4 times the annual loading rate. No lifetime loading rate is described.

Monthly Industrial Sludge Management Reports must be generated. They describe the quantity and quality of sludge produced. Fortunately, reports are not required for months during which sludge materials are not land-applied. The monthly reports must be submitted to DEP in Charleston and Fairmont, as well as to the county or regional solid waste authority in which the facility of land application site (s) is located.

All of this makes land application of fish manure from Spring Run Hatchery challenging to manage and expensive to maintain.

Did YOU KNOW?

If you have fish that are showing signs of poor health, are you taking the correct steps to improve the health of the fish? Did you know that the West Virginia Department of Agriculture (WVDA) is helping fish farmers identify diseases so proper treatment can be implemented?

Any West Virginia fish farmer can send a sample of sick fish to the lab for bacterial or parasitic diagnosis for free. This is the type of cooperation that will help fish farmers become better managers.

Well-managed fish farms follow a protocol for dealing with fish diseases. The first step is to develop a **written biosecurity plan** to reduce the chances of getting fish diseases in the first place. Each biosecurity plan should be specific for the individual farm, based on the traffic flow of water and people at the facility. This plan should also minimize the chances of contaminating other areas if a pathogen becomes established on the farm. The plan should also address ways to reduce stress on the fish to lower the susceptibility to disease.

If signs of disease are present, review the biosecurity plan and follow the recommended ways to reduce stress in the affected population. Then choose a few fish showing signs of disease and send them via courier to the WVDA Guthrie Animal Health Lab at 4720 Brenda Lane, Bldg. 12, Charleston WV 25312. **Be sure to call Brenda Keavey (304-558-2214) before sending any samples.**

Fish should be packed individually in zipper-lock bags and sent overnight express via courier in a cooler with ice. Brenda can determine what antibiotic will be most effective if it is a bacterial disease. Take advantage of this opportunity next time you have sick or dying fish on your farm.

Trout Farm Facility for Sale – Pocahontas Co.

The facilities consist of two 800-gal. hatching tanks; the remaining tanks are round fiberglass production tanks: 1 x 10,000 gallon; 12 x 1500 gallon; 6 x 500 gallon tanks. In addition, a feed shed and a trailer are within the 8' high 3-strand barb wire fence. Land and water is leased at \$100/mo. McNeil Spring is the water source.

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Fred Hays 304-548-7117, <http://wvfish.tripod.com/>

A W.Va. Farmer

We encourage contributions to Fish Tales newsletter by W.Va. residents. If you are interested in contributing, or would like to be put on the mailing list, please contact Dan Miller at dmille31@wvu.edu or call 304-293-4832, ext. 4465. The deadline for contributions to the next issue of Fish Tales is Aug. 1, 2009.

This publication is available, in a printable format, on the Web at:

www.wvu.edu/~agexten/aquaculture/newsletter.htm

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