2003, freshwater prawn technical support position

Aquaculture Abounds at Kentucky State University

Students at Kentucky State University's aquaculture facility were busy on a Thursday morning checking fish feed, working in the library on research papers, watching demonstrations for new fish processing methods, showing off their freshwater prawn and catching squirmy paddlefish out of large tanks to attach satellite tracking devices.

It's all a day in the life at the Frankfort school that is world-renowned for its aquaculture research.

What began as just one or two Ph.D.-level researchers in the 1980s has become a graduate-level program with about 12 students per year and approximately one in five students continuing on to a doctorate-level education every year.

Dr. James Tidwell, chair of the Division of Agriculture at KSU and a past president of the World Aquaculture Society, said the program has matured quickly and includes Extension specialists who partner with the University of Kentucky as well as an emerging undergraduate program.

"Undergraduate involvement is more limited, but we just now spun out a new agricultural college here at KSU that really starts with new course offerings in the fall, and part of that is an aquaculture option," he said.

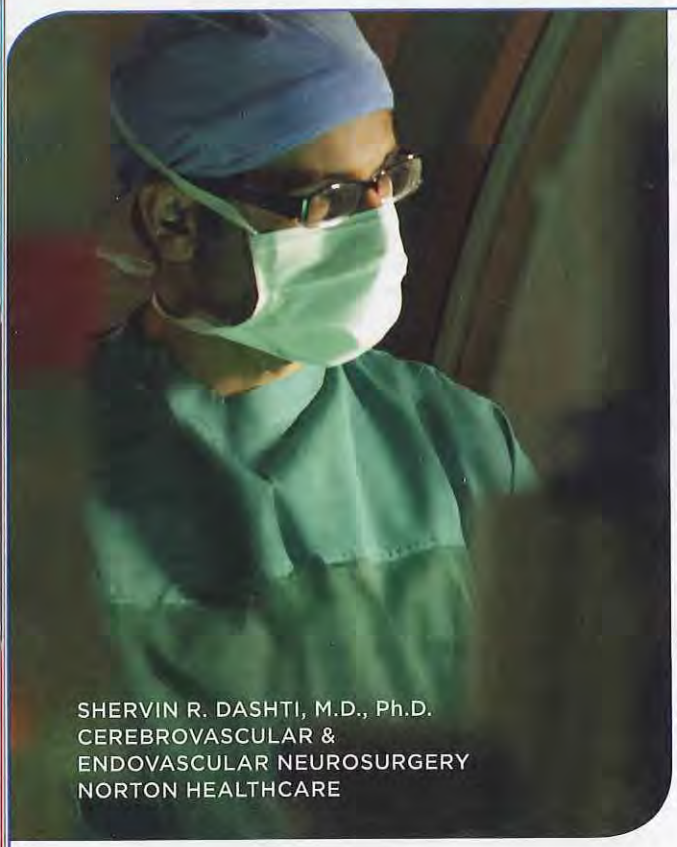
KSU, which has 33 research ponds, a hatchery and many facilities, also offers extensive online courses that are taken by people all over the nation and around the world.

"The bottom line for us is we're trying to develop alternative crops for Kentucky farmers, especially starting a few years ago as tobacco went from our far-and-away cash crop to No. 3—a really seismic change in the agricultural economy in the state," he said.

Making aquaculture viable is where **Dr. Carl Webster** comes in as the department's principal investigator of aquaculture nutrition. The university is doing groundbreaking research economizing fish feed.

Traditionally, farmed fish are fed with fish meal, a substance made mostly of fish harvested in the millions of pounds. Webster smirked at the word "sustainability" in fish feed, pointing out that it is a hot-button word now but something that KSU has been working on for 20 years as it searches for alternative proteins for fish meal replacement.

"A lot of the environmental groups have a problem with aquaculture and feeding fish to fish where you could use the fish meal to feed people," he said. "But the fish that are used for fish meal are not fish you would want to eat."



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Webster noted that about 60 percent of protein consumed by humans around the world comes from fish, so sooner or later oceans will be depleted, and finding ways to feed fish with cheaper, easier-to-grow commodities like soy or canola will be crucial.

"The problem is fish like to eat fish," he said, adding that human consumers are not affected nutritionally if fish remain healthy regardless of their diet.

KSU is working with Kentucky distilleries to develop feed from distillers' grains, a byproduct of ethanol production—another process Tidwell said the university has researched for years.

"We've done groundbreaking research here," Webster said. "Shrimp still have to have fish meal in the diet. But compared to, say, 20 years ago, they were putting 50 or 60 percent fish meal in. Now it's 15 to 25 percent."

Dr. Steve Mims, principal investigator of paddlefish and sturgeon, said KSU also is studying reuse technology by using decommissioned, reclaimed water plants and their reclaimed water for aquaculture to cut capital construction costs. "These old facilities are scattered throughout Kentucky and have opportunities for people in rural communities to participate in aquaculture," he said.

Mims and his team also study paddlefish, one of the recent choices to move from research and development into commercial production since the boneless white meat has characteristics desirable to United States consumers.

Dr. Boris Gomelsky, who studies fish genetics, reproduction and spawning techniques, said another aspect of KSU's research is genetic modification, though aquaculture has stricter standards than traditional agriculture.

Webster said, "Aquaculture kind of takes pride—we don't do transgenic fish, and we also don't put growth hormones and antibiotics in feed. And that's why a lot of the foreign fish is under scrutiny, because some of the places aren't as diligent as others."

Students working at KSU typically stay within the state, working with state government agencies, such as the Department of Fish & Wildlife Resources. Some go on to become entrepreneurs in fish farming, and some international students head back to their home countries.

"We are optimistic that Kentucky and other regional states will use technologies developed through our aquaculture program to increase the number of farmers and farms to supply the increasing demand for fish and other seafood in the U.S.," Mims said.

— Abby Laub

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