

MSU Research Gives Catfish Industry New Weapon Against Costly Disease

Persistence has paid off for a College of Veterinary Medicine researcher and for the catfish industry.

Dr. Pat Gaunt, a CVM veterinary toxicologist and interim director of the Aquatic Research and Diagnostic Laboratory in Stoneville, spent more than five years researching the use of the antibiotic florfenicol to treat enteric septicemia, or ESC, in catfish. ESC is one of the most costly diseases faced by the catfish industry.

The Food and Drug Administration approved the antibiotic for use with catfish in October 2005.

"It's being used in the Delta by catfish producers," Gaunt said. "It's been gratifying to see the research we did come to practical use by the farmers."

Her research began in observations about florfenicol's use with other animals when she was an intern with the Thad Cochran Warmwater Aquaculture Center at the Delta Research and Extension Center in Stoneville.

"I knew it was approved for use in beef cattle in the United States and in other countries for different types of fish," Gaunt said. "Because it was effective in other species, I thought it could also be used with catfish."

Working with scientists at the pharmaceutical company Schering-Plough Animal Health, Gaunt generated a mountain of data during more than five years of research with her colleagues. The effort, however, gave catfish producers a more effective tool for use against ESC.

"Before florfenicol was approved, there were only two other antibiotics for treating ESC in channel catfish," she said. "There were palatability problems with one, and the other is most often formulated in a sinking feed, which makes it difficult for producers to see if the fish are eating it or not. The new antibiotic is marketed in a floating feed, is very palatable to catfish and is very effective against ESC."



Tom Thompson

Dr. Pat Gaunt compiled volumes of data during her research with the antibiotic florfenicol to treat the costly catfish disease ESC.



Tom Thompson

New Technology Produces Affordable Premium Lean Beef

Consumer demand and the ability to add value to a Mississippi-grown item are important considerations when MSU food scientists begin development of a new product.

“Consumers vary in their preference of food product type, shape, size, packaging and composition,” said J. Byron Williams, a muscle foods specialist in MSU’s Department of Food Science, Nutrition and Health Promotions. “However, consumers are consistent in their demand for quality products that taste good and are convenient. At the same time, they are concerned with the nutrition, safety and wholesomeness of the foods they consume.”

A new beef product that has been developed at Mississippi State University meets those requirements.

“Because of health concerns, consumers are increasingly choosing leaner meats, even though they cost more,” Williams said. “MSU has developed the technology to produce a premium quality, 97 percent fat-free ground beef product that is also affordable.”

The product still must have the flavor and other characteristics consumers demand.

“Manufacturers and researchers alike have found that developing a lean, extra-lean or fat-free product, especially a ground product, it is not as simple as just removing the fat,” Williams said. “Maintaining the necessary flavor and texture characteristics is a very challenging process. It is very difficult to produce an acceptable product that is considerably lower in fat than typical lean products.”

Taste panels at the university’s Garrison Sensory Evaluation Laboratory revealed that this newly developed



J. Byron Williams is one of the MSU scientists working on new food products, including a 97 percent fat-free ground beef product. (Photos by Marco Nicovich)

product is as acceptable to consumers as conventional lean ground beef. The cost of materials and production, however, are similar to conventional items with only a small increase in final costs when compared with traditional ground beef products.

Based on current consumer demand for “healthier foods,” consumers are willing to pay more for these products provided they have the taste, texture, safety and convenience of the traditionally higher fat products, Williams added.

“The taste panels rated the low-fat ground beef high on taste, texture and other attributes, and the cooked yields of the product are higher than conventional ground beef,” he said “A plus for processors is that this product can be produced using existing equipment with just a marginal increase in overall production costs. Another attractive feature for retailers and consumers is that the product can be used in the same recipes, dishes and preparations as traditional or lean ground beef.”

MSU is currently seeking an industry partner to develop and commercialize the technology used to produce the product.

“Low-fat ground beef produced using this MSU-developed technology is expected to be marketed as a cooked product by food service and chain retailers and as a frozen product by grocery chains,” Williams said.



Plant Breeders Develop Mississippi-Friendly Varieties



Choosing the right variety to plant is one of the most important decisions row crop producers make each year.

Yields, disease and insect resistance, and suitability to Mississippi's climate are among the traits producers look for when selecting varieties. Those are also among the qualities plant breeders consider as they develop new varieties.

The world's first test of genetically engineered cotton took place at MSU in 1989 as part of the process of developing a pest-resistant cotton variety. Today, MSU cotton breeders Ted Wallace on the Starkville campus and Peggy Thaxton at the Delta Research and Extension Center are continuing work with the MSU-developed genetically modified, or transgenic, cotton line. Their work is in conjunction with Monsanto, a producer of genetically modified seed.

"Fiber quality is very important to me and the program for the future of the farmers," Thaxton said. "Hopefully we'll get some very high quality transgenic cotton lines developed so we can be competitive in the global market."

Conventional cotton, however, remains an important part of the MSU cotton-breeding program.

"The main objective of our breeding program is still to develop improved conventional breeding lines that will be released to private companies with better yields and fiber quality traits," Thaxton said.

During the past decade, Dwight Kanter, a rice breeder at the Delta Research and Extension Center, has released new rice varieties tailored to the needs of Mississippi producers. Litton and Priscilla were released in 1997 and 1998.

In 2000, Priscilla was planted on nearly 27 percent of Mississippi's rice acreage and still remains an excellent choice for rice producers.

Kanter has another new variety that will be the next to be released. The as-yet-unnamed rice variety, currently referred to as RU0404191, has averaged more grain yield than the popular Cocodrie variety in research trials.

MSU has also released soybean varieties jointly with U.S. Department of Agriculture plant breeders at Stoneville, and there have been releases of new varieties of various minor use crops during the past decade.

"In virtually every case, the main justification for release of any new variety is an increase in yield," said Randy Vaughan, operations manager of MSU's Foundation Seed Stocks Program. "In some cases, the variety also has disease resistance advantages or a more desirable grain type."

Foundation seed are the end result of the breeding process and are the first generation recognized under the state certification program. They are sold to seed companies to raise registered and certified seed.

"The process from choosing the original seed from the new variety through certification takes at least five years," Vaughn said. "Numerous standards and inspections, both in the field and in the lab, must be met to ensure the genetic purity of the new variety."



Rice breeder Dwight Kanter's work includes development of new varieties and answering grower questions about his research at field days and other events. (Photos by Marco Nicovich)