

FEEDING THE ECONOMY THROUGH AQUACULTURE: DR. REBECCA LOCHMANN, UAPB

Arkansas is widely known for its rice and soybean production. But did you know that Arkansas ranks second in the nation for aquaculture? Or that the Natural State ranks fourth nationally in catfish production and first in production of cultured baitfish?

Arkansas Research Alliance Academy member Rebecca Lochmann, Director of the Aquaculture & Fisheries Center of Excellence at the University of Arkansas at Pine Bluff, has focused her research on protecting this nearly \$68 million-per-year industry.

Among her latest projects: improving fish performance and production by discovering a comprehensive approach to assessing dietary iron utilization in channel catfish-fed, plant-based diets.

AMP: Aquaculture is an unsung but immensely vital element to Arkansas' economy. How did you become interested in this field?

Lochmann: I grew up in Louisiana, where I spent my childhood in ditches catching crawfish, tadpoles and minnows. While pursuing my PhD at Texas A&M, I focused my research on fatty acid requirements of red drum. Later, I applied for the position of assistant professor of nutrition in the Department of Aquaculture and Fisheries at UAPB. I've been here ever since, researching nutrition issues for catfish, baitfish, bass and other species.

AMP: Worldwide, aquaculture is a highly competitive industry. Explain why it's so important that the United States improve the ingredients for channel catfish food?

Lochmann: Feeds comprise about 50 percent of the operating costs of a catfish farm. An ideal feed is readily accepted by the fish, provides all required nutrients in a highly digestible form, produces a



fish with white flesh and a mild flavor, and is priced so that the farmer can make a profit relative to the cost of producing the fish. Meeting all of these objectives simultaneously is challenging with increases in ingredient costs, labor costs and regulatory costs for U.S. producers relative to farmers in other countries who produce the same or similar species. Nevertheless, catfish is still the top food-fish produced in the United States, due to its consistent quality, safety and familiarity to consumers.

AMP: Reducing the cost of feed would be a big benefit to U.S. catfish growers. Plant-based feed may be the answer, specifically using soybeans. What are the challenges to soy-based feeds?

Lochmann: Soybeans are a good plant source of protein, but they contain some anti-nutritional factors and lack some essential amino acids that limit their use in fish diets. Some methods used to improve the nutritional value of soybeans are selective breeding, heat treatment, water or alcohol extraction and fermentation. These processes generally reduce anti-nutritional factors and improve the protein amount or quality in soybeans. However, the cost of the enhanced product is usually higher.

AMP: The Aquaculture/Fisheries (AQFI) Center at UAPB is among the best aquaculture programs in the nation. Why is the program so important to Arkansas?

Lochmann: UAPB has the designated Center of Excellence in Aquaculture and Fisheries for the state of Arkansas. This means we have statewide responsibility for addressing research and extension issues of importance to stakeholders including Arkansas fish farmers and the Arkansas Game and Fish Commission. We also have three academic programs — BS, MS and PhD. We endeavor to involve all of our students in research to enhance their competitiveness for graduate school and rewarding careers.

AMP: How can research increase knowledge and understanding and lead to bigger breakthroughs?

Lochmann: Research often results in modest, sequential discoveries that are not earth-shattering or transformative by themselves but collectively advance the field. This is how most science progresses. Substantial resources and a collective sense of urgency — developing a coronavirus vaccine, for instance — can certainly expedite big breakthroughs. However, we can increase knowledge, understanding and appreciation of research through emphasizing the relevance of discoveries — even modest ones — to different audiences.

AMP: Big picture, what impact does your work have on the everyday lives of Arkansans?

Lochmann: Aquatic animal nutrition research can improve lives by providing greater access to safe and healthy seafood, supporting businesses in rural areas and promoting responsible animal production in the context of environmental sustainability. **A**

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