**REQUEST FOR PRE-PROPOSALS**

*Please Copy and Distribute to All Interested Parties*

The USDA-NIFA Southern Regional Aquaculture Center solicits response from qualified multi-state teams interested in participating in the regional project:

# INVESTIGATING THE EPIDEMIOLOGY OF *EDWARDSIELLA PISCICIDA* - SEPTICEMIA IN CATFISH AND OTHER COMMERCIALLY IMPORTANT FISH SPECIES IN THE SOUTHERN UNITED STATES

SRAC's Board of Directors has authorized up to $375,000 for a three-year project on investigating the epidemiology of *Edwardsiella piscicida* - septicemia in hybrid catfish and other commercially important fish species in the Southern United States. This project will be developed using the "competitive proposal method" where a team of multi-state scientists having demonstrated records of expertise in the subject complete a single preproposal that addresses all project objectives. One proposal will be selected for funding based on review by a committee of scientists not involved in any of the proposals that are submitted.

## Background

Bacterial septicemia associated with *Edwardsiella piscicida*, previously identified as *E. tarda*, is an emerging disease in the US catfish industry. Increased incidence and prevalence within the industry has led to laboratory investigations and experimental infectivity trials, demonstrating increased susceptibility of hybrid catfish to *E. piscicida* infection as compared to channel catfish. Phylogenomic studies have identified *E. piscicida*. Moreover, *E. piscicida* is increasingly recognized as a virulent pathogen with a wide host range affecting more than 20 economically important fish species. The economic losses on hybrid catfish farms are substantial as outbreaks primarily affect market-size fish during the grow-out phase of production, where significant investments have been incurred. Anecdotal reports suggest fish immunized with *E. ictaluri* are less susceptible to *E. piscicida* infection and vice versa, suggesting vaccine candidates already developed against *E. ictaluri* could have utility as an effective *E. piscicida* vaccine. Understanding the similarities and differences between these *Edwardsiella* spp. will help to shape effective pathogen-specific management measures. A complete study of the epidemiology of *E. piscicida*-septicemia is warranted to determine the gravity of this emerging disease. Comprehending the pathobiology and pathogenesis of infection is critical in developing effective pathogen-specific control strategies, and provide aquaculturists efficient tools to combat this emerging disease.

## Objectives

The goal of this project is to develop efficient disease management strategies against *E. piscicida* and increase productivity and economic viability of fish farms. Specific objectives include:

1) Disease surveillance of *E. piscicida* in the Southeastern United States to: a) investigate the magnitude and intensity of *E. piscicida*-septicemia on commercial farms and evaluate its pathogenicity in multiple commercially important fish species; b) investigate environmental and water quality stressors or conditions that may trigger outbreaks.
2) Phenotypic, serological and molecular differentiation of *E. piscicida* with *E. ictaluri* in order to: a) determine the antigenic-cross reactivity between *E. piscicida* and *E. ictaluri*; b) evaluate the cross-

protective potential of existing ESC vaccines against *E. piscicida* septicemia in catfish and other commercially relevant fish species; c) optimization of vaccine design and administration.

3) Explore the economic losses associated with Edwardsiellosis in catfish fingerling and foodfish production phases. Project should address economic losses associated with both ESC and *E. piscicida* septicemia. Specific losses associated with disease severity, cost of medicated feed usage, lost feeding days and other foregone opportunities should be accounted.

## Experimental Approach

This study involves disease surveillance, study of complete etiology of the pathogen, degree of severity of disease, and the derivation of practical and economically feasible management strategies against curbing the disease. Comprehensive experimental approach should provide accurate representation of disease prevalence, severity, and associated economic loss. Emphasis will be given to approaches that include thorough, rigorous evaluation under commercial and laboratory conditions for various stages of this project. Proposals leveraging existing resources and infrastructure will be looked upon favorably. Priority will be given to proposals that include research on multiple species. Adequately replicated experiments simulating commercial production with appropriate statistical design and analysis will be required. End users of the disease-management strategies developed from this project may include fish producers, fish health managers, aquarium operators, and researchers. Data regarding effectiveness of management approaches for reduction of *E. piscicida* disease incidence should be compiled, analyzed and shared by local Extension specialist and agents within the industry. Proposals will be evaluated on the basis of the project team's research experience, productivity, complementary expertise, as well as the availability of appropriate facilities and other resources required to implement the research.

## How to Respond

Pre-proposals must address all three objectives and demonstrate a strong link with industry. To meet the criterion for a regional project, the pre-proposal must include collaboration from scientists in two or more states or territories in the Southern Region (Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, Puerto Rico, South Carolina, Tennessee, Texas, U.S. Virgin Islands, and Virginia). Preference will be given to pre-proposals that show a high degree of collaboration and coordination among participants.

The pre-proposal must include a one-page vita for each participant and a proposed budget for each participating institution or organization. Pre-proposals, vitae, and budgets that are not in the proper format will not be considered. (See "Format for Pre-Proposals" file attached or contact Kristen Thompson with the SRAC office at 662-686-3269.)

Send an electronic copy of the pre-proposal in Word format to Jimmy Avery, SRAC Director as an email attachment (jimmy.avery@msstate.edu) by **September 30, 2018**. Proposals received after that date will not be considered.