Study Seeks to Decode Focal Duodenal Necrosis

It’s a worldwide intestinal affliction that’s one of the top five diseases affecting caged and cage-free table egg layers in this country. Yet despite occurring in at least 10 states since first being recognized in Pennsylvania in 1997, Focal Duodenal Necrosis (FDN) remains a mystery.

FDN is found in all varieties of flocks, although clear signs and symptoms are not always present, suggesting that the disease may be underdiagnosed. The economic repercussions of the disease are easier to detect than its symptoms; FDN results in decreased egg production (ranging from 1 percent to 10 percent) and lowered egg weights (as much as 2.5 g per egg or 2 lb. per case).

Franca’s research team designed a three-part study, beginning with questionnaires distributed among different U.S. layer operations to determine the epidemiological characteristics of flocks diagnosed with FDN. The survey also sought to develop a profile of affected flocks in terms of housing, rearing, management, nutrition, health status and methods used for disease prevention and control.

The second part of the study involved obtaining duodenal samples from FDN-affected hens to test for the presence of various bacterial strains, including *Clostridium perfringens*, which previous research has shown plays an important role in the development of FDN.

Lastly, the “challenge model” portion of the research project, which is now ongoing, seeks to reproduce FDN in replacement pullets and determine the role of *C. perfringens* in the development of FDN.

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“I have always been intrigued by this condition, and as an avian pathologist I really enjoy problem-solving,” Franca explains. “I have been very motivated to better understand FDN in order to help the egg industry control this disease. Intestinal disease pathogenesis is one of my favorite research topics, and my goal is to continue to conduct applied research on FDN and other poultry enteric diseases.”

This is Franca’s first Egg Industry Center grant and also the first grant she has received as principal investigator. “EIC support is very important and necessary for applied research to help solve the egg industry’s challenges,” she says. “I believe it would not be possible to advance the knowledge on Focal Duodenal Necrosis without EIC funding.”

With a grant from the Egg Industry Center, Dr. Monique S. Franca, assistant professor and Dr. Ana Maria Villegas, graduate student, in the Department of Population Health of the College of Veterinary Medicine at the University of Georgia, are pursuing a research project to more fully understand FDN’s pathogenesis. Their fellow researchers are Dr. Roy Berghaus, Dr. Charles L. Hofacre and Dr. Margie Lee of the University of Georgia Poultry Diagnostic and Research Center, and Dr. Guillermo Zavala of Avian Health International.

“Although FDN is about 20 years old, the predisposing factors of this disease are still not completely known,” Franca explains. “These research findings will provide much-needed information about possible factors and etiological agents that might be associated with FDN. A better understanding of this condition is needed to design control measures and intervention strategies to prevent FDN-associated egg production losses, and to improve the profitability of flocks affected with this disease.”