

Treating poultry diseases without antibiotics

May 30 2012, By Sandra Avant



ARS scientists are finding proteins in chickens that can act as alternatives to antibiotics to control infectious diseases such as coccidiosis and *Clostridium* in poultry. Credit: Keith Weller

Identifying antimicrobial proteins in chickens that kill pathogens is one method being used by U.S. Department of Agriculture (USDA) scientists to find alternatives to the use of antibiotics to control infectious poultry diseases.

Each year, poultry diseases such as coccidiosis cause losses of more than \$600 million in the United States and \$3.2 billion worldwide.

[Molecular biologist](#) Hyun Lillehoj, at the Agricultural Research Service (ARS) Henry A. Wallace Beltsville Agricultural Research Center (BARC) in Beltsville, Md., has dedicated her career to discovering how to produce poultry without using drugs. Her research includes enhancing innate immunity through genetics, and examining molecules produced by birds in response to enteric or intestinal pathogens.

ARS is USDA's chief intramural scientific research agency, and this research supports USDA's priority of promoting international food security.

Some molecules are host antimicrobial proteins that can kill pathogens, improve immune responses and promote the growth of beneficial gut bacterial populations in poultry, according to Lillehoj, who works in the ARS Animal [Parasitic Diseases](#) Laboratory at BARC. She and her colleagues have identified one such immune molecule, called NK lysin.

Lillehoj and her colleagues demonstrated for the first time that NK lysin kills chicken coccidia. They also showed that this antimicrobial protein or host defense molecule is effective against other parasites such as Neospora and Cryptosporidia, which infect livestock and humans, respectively. One commercial company is looking at the possibility of developing NK lysin into a product that can be used to kill chicken [intestinal parasites](#).

Lillehoj also is studying enteric bacterial infections caused by Clostridium, a pathogen associated with [necrotic enteritis](#) in poultry. She is using a similar [molecular technology](#) to develop alternatives to treat this disease.

Working with industry, international partners and other scientists, Lillehoj has discovered other options to antibiotic use in poultry. Phytochemicals derived from peppers, plums, safflower, green tea and

other plants have been shown to be effective in enhancing the immune system of chickens. Also, the beneficial effects of probiotics, which are live, nonpathogenic bacteria that promote health and balance of the intestinal tract microbiota, have been demonstrated in past research.

More information: [Read more](#) about this research in the May/June 2012 issue of Agricultural Research magazine.

Provided by Agricultural Research Service

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