

Egg yolk loaded with antibodies boosts poultry's immunity

July 10 2012, By Sandra Avant



Chicks can be fed antibodies extracted from hyperimmune egg yolks from pathogen-free hens as an antibiotic-free way to protect them from coccidiosis while potentially helping to fight the development of drug-resistant strains. Credit: Photo courtesy of APHIS-USDA

Hyperimmune egg yolk antibodies can be used to help control intestinal diseases in poultry, according to U.S. Department of Agriculture (USDA) scientists.

The antibiotic-free technology involves extracting antibodies from egg yolks from pathogen-free hens or female [chickens](#) that have been hyperimmunized—injected with a vaccine that contains inactivated

pathogenic organisms. Hyperimmunized birds have a greater-than-normal immunity and produce a large amount of antibodies.

Avian immunologist Hyun Lillehoj at the Agricultural Research Service (ARS) Animal Parasitic Diseases Laboratory in Beltsville, Md., partnered with ARS colleagues, university scientists and collaborators from the Mexican company IASA (Investigación Aplicada, S.A.) on the studies. ARS is USDA's chief intramural scientific research agency, and this research supports the USDA priority of promoting international food security.

The group demonstrated the effectiveness of inducing passive immunity in young birds, which have no immune protection right after hatching, against coccidiosis, a devastating poultry disease.

Birds affected by coccidiosis are unable to absorb feed or gain weight. The disease costs the poultry industry more than \$600 million in the United States and about \$3 billion worldwide each year.

Treatments used to reduce the spread of disease include good management practices and live vaccinations. However, antibiotic-free alternatives are important to help fight drug-resistant strains and for organic poultry farmers, according to Lillehoj.

In the study, one-day-old chickens were given feed mixed with spray-dried egg yolk powder prepared from hens hyperimmunized with multiple species of the parasite *Eimeria*, which causes coccidiosis. The chickens were then exposed to live coccidia parasites. Chickens that had received the hyperimmune egg yolk antibodies gained more weight and shed significantly fewer *Eimeria* in their feces. The treated birds also had less gut lesions than chickens that did not receive the treatment.

A commercial product that helps control coccidiosis has been developed

by a private company based on results of this research. In the future, similar methods may be used to help prevent other harmful [poultry](#) diseases.

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

Provided by Agricultural Research Service

Citation: Egg yolk loaded with antibodies boosts poultry's immunity (2012, July 10) retrieved 25 June 2024 from <https://phys.org/news/2012-07-egg-yolk-antibodies-boosts-poultry.html>

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