

Getting to the Heart of Chicken Ailments

Humans aren't the only ones who are susceptible to congestive heart failure—the heart's inability to maintain adequate blood flow to tissues. Chickens, particularly broilers, fall prey to a similar condition called ascites.

In chickens, the right ventricle of the heart enlarges and can't pump blood efficiently to the lungs. Blood pressure then builds in the liver,

and a yellow serumlike fluid leaks from the liver into the body cavity, eventually leading to death.

The problem has been around for about 20 years in birds grown at high altitudes. But in the last decade, it has become a problem everywhere.

"Birds are genetically selected for fast growth. It now takes less than 6 weeks for birds to get to market," says poultry physiologist Janice M. Balog. "Their hearts and lungs have to work harder to keep up with the rapid rate of growth, and they just can't do it."

"Many factors, such as ammonia, dust, or respiratory diseases—combined with accelerated growth rates—have led to a growing problem among poultry producers," she says.

Balog, who is in the ARS Poultry Production and Products Safety Research Unit in Fayetteville,

Arkansas, has made recent strides to prevent this fatal condition in poultry.

In an 8- by 12-foot room that holds 480 chickens, Balog's birds are taking a trip to higher elevations. This room, called a hypobaric chamber, simulates conditions found at higher altitudes. At a simulated 9,500 feet above sea level, 80 to 90 percent of commercial broilers will develop ascites.

Using the hypobaric chamber allows Balog to identify and selectively breed resistant birds and to test for possible remedies. In the fourth year of her study, Balog and University of Arkansas poultry geneticist Nicholas Anthony, have selected over four generations of broilers that have escaped this disease. One population exhibits no more than 20 percent ascites at simulated high altitudes.

"Once we are satisfied with the selected populations, we will attempt to determine what's different physiologically between the two lines," says Balog. "Ultimately, we hope to eliminate the disease."

Ascites research is particularly important because some birds die as early as 3 weeks old, and more die before making it to processing—after the producer has wasted a lot of money on feed costs that are passed on to the consumer. Finding new ways to prevent this disease will reduce the amount of money spent on birds that never make it to market.

Aside from genetic selection, Balog has found other ways poultry producers can reduce the incidence of ascites, including increasing ventilation in poultry houses and maintaining stable temperatures. Currently, producers restrict the amount of feed—a process that slows growth and reduces mortality—but birds on restricted diets take longer to reach market weight and can have less white meat—the most valuable part of the chicken.

"We're looking at restricting feed during certain time periods. This seems to help the problem," says Balog.—By **Tara Weaver-Missick, ARS.**

This research is part of Animal Health, an ARS National Program (#103) described on the World Wide Web at <http://www.nps.ars.usda.gov/programs/appvs.htm>.

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Baby chicks are being bred for resistance to ascites, a fatal disease resulting in heart failure in chickens.