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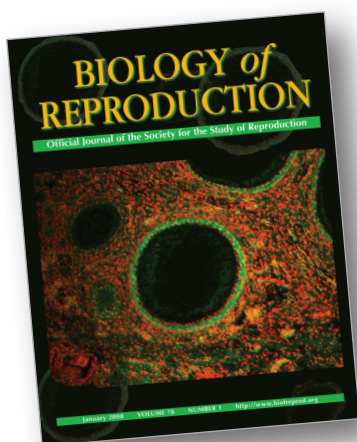
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Research, Education,  
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National Research Initiative (NRI)

## Scientists Examine Chicken Fertility

by Stacy Kish, CSREES

New research focused on poultry fertility may result in an economic boost of \$10 to \$15 million for the poultry industry. >>



Above: The research was featured on the cover of journal *Biology of Reproduction* volume 78, page 13-19.

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With funding from USDA's Cooperative State Research, Education, and Extension Service's (CSREES), a team of scientists at Cornell University identified new approaches to improve fertility in broiler hens without compromising growth efficiency. During embryo development in animals, the embryo can develop one of two reproductive duct systems. The mullerian system develops into the female reproductive tract and the wolffian system develops into the male reproductive tract.

Introduction of an anti-mullerian hormone (AMH) at this early stage inhibits the development of the female reproductive tract in males. Many studies have examined the effect of AMH in males, but few studies have examined the impact of this hormone on females.

Patricia A. Johnson and colleagues at Cornell University led one of the first studies to examine the effect of AMH on egg development in adult hens. The researchers examined how hen granulosa cells, specialized cells associated with the developing egg, produce AMH.

In all animals, oocytes, female germ cells that are enclosed in follicles, grow and develop into mature eggs. Follicle-stimulating hormones periodically initiate follicles to grow and develop.

The researchers found that the smallest follicles, less than one millimeter in diameter, contained the largest concentration of AMH. Anti-mullerian hormone concentration declines considerably when the follicle grows larger.

The research suggests that excessive AMH inhibits optimal follicle selection, preventing follicles from normal development.

The researchers noted that AMH expression is significantly higher in broiler breeder hens than in laying hens, which have better egg production. Furthermore, full-fed broilers had significantly greater AMH expression than restricted-fed hens. This was associated with excessive follicle development and poor egg production in the full-fed hens.

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Right: Ovary from a restricted-fed broiler breeder hen and (far right) from a full-fed broiler breeder hen. Note the organized hierarchy of follicles on the ovary of the restricted-fed broiler breeder hen.

Credit: Pat Johnson



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This study is a first step focused on understanding how AMH affects follicle development in hens. Results from this study will benefit poultry farmers in selecting broiler hens that naturally have a lower concentration of anti-mullerian hormone. With lower levels of this gonad-specific hormone, the hens may be less prone to excessive follicle development, but will not lose desirable traits, such as fast growth and size.

CSREES funded this research project through the National Research Initiative Animal Reproduction program. Through federal funding and leadership for research, education and extension programs, CSREES focuses on investing in science and solving critical issues impacting people's daily lives and the nation's future. For more information, visit [www.csrees.usda.gov](http://www.csrees.usda.gov). ■

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