

Scientists study excess fat in chickens

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Obesity is a problem for many American consumers—and now even chickens are getting fat. As a result, scientists have been looking for ways to help growers efficiently produce chickens of optimal weight while minimizing excess fat.

Penn State researcher Ramesh Ramachandran, assistant professor of molecular endocrinology in the College of Agricultural Sciences, is part of a team at the U.S. Agricultural Research Service's Animal Biosciences and Biotechnology Laboratory that recently identified and sequenced genes responsible for regulating both energy use by individual cells and the food intake of birds. They also showed that the genes function in different tissues throughout the body of the broiler chicken.

This important biochemical pathway, previously discovered in other animals, maintains energy balance in the bird's body. A key component of the pathway is an enzyme called AMP-activated protein kinase, or AMPK, according to the January 2008 issue of Agricultural Research magazine.

In all animals, obesity results from an imbalance that occurs when more food energy (calories) is consumed than the body actually needs. The excess energy is stored mostly as fat. Over the years, in response to a growing worldwide consumer demand, poultry breeders have bred chickens that grow faster and produce more meat. But modern broiler/breeder chickens don't adequately balance their feed consumption to match their energy requirements. When these birds are given unrestricted access to feed, they will overeat and become obese.

AMPK plays a central role in sensing cellular energy levels. It begins a series of events that affect food intake and metabolism of fat, carbohydrate and protein. According to Proszkowiec-Weglarz, AMPK is really a “molecular fuel gauge” and a master metabolic regulator in cells. It responds to fluctuations in the levels of cellular energy and of specific nutrients and hormones outside the cells.

The team includes animal scientists Monika Proszkowiec-Weglarz and Mark Richards, along with research leader John McMurtry and Ramachandran. ARS is the U.S. Department of Agriculture's chief scientific research agency.

Source: Penn State

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