Human Response To Cholesterol: It's Up To The Individual

(Continued from Page C28) percent), or VTG.

Elkin said the chicken's liver produces VLDL and VTG to aid in the formation of the egg. The cholesterol is made in the hen's liver under the influence of estrogen and transported by the blood to the ovaries.

Several studies have attempted to reduce the amount of VLDL the hen produces using diet or drugs. One study has reported that copper in the diet can reduce cholesterol levels in eggs.

University of Georgia researchers have reported that using copper at the rate of 250 parts per million in hens' diet has worked to reduce cholesterol in the yolk. "But we don't understand the mechanism," Elkin said.

It should be noted that attempts using drugs like those used by humans to reduce plasma cholesterol work very well to reduce egg cholesterol in chickens, according to Elkin.

In the end, a "biotech" approach may be used, sometime in the future, to allow chickens to be "bioreactors." Perhaps something can be developed to compete with VLDL and replace it, said Elkin.

Some drugs used to lower cholesterol in hens have included the use of HMG-CoA reductase inhibitors, including Lovastatin, Simvastatin, and Atorvastatin. These "statins" are the same as those used in human medicine to decrease serum cholesterol.

In a 1999 study that Elkin directed, Atorvastatin was fed to laying hens. Eggs were weighed and cholesterol content was mea-

sured. The result: hens receiving no Atorvastatin had a total cholesterol of 198 milligrams per egg with an egg weight of 64.7 grams, and those receiving .06 percent of the statin measured 105 milligrams of cholesterol per egg with an egg weight of 57.8 grams.

Other attempts to use dietary fiber, which binds bile acids in the intestine, were unsuccessful. Chickens who eat cholesterol use most of it to produce the yolks — so coming up with a way to replace VLDL by using the chicken as a "bioreactor" may be the center of further research.

A typical large egg, noted the Penn State poultry science head, has about 213 of milligrams of cholesterol. The health benefits of eggs are already defined. But for a portion of the U.S. population, those that could be hypersensitive to cholesterol intake, more work needs to be done. And Elkin is on hand to dispel the worries of some consumers who remain "cholesterolphobic."

To mirror the statement of Donald J. McNamara, executive director of the Egg Nutrition Center, eggs are fine for "most people most of the time," Elkin said. "But there is a subset of people who will respond to a cholesterol challenge."

In one study to be reported in the Journal of the American Dietary Association, according to Elkin, two out of 25 people experienced a significant rise in LDL and total cholesterol in a clinical study. Two out of 25 amount to about eight percent of the people in the study—not so significant as some

would like to believe.

"Eggs are good for most people," said Elkin, "but there are data that shows eggs are not right for everybody."

Elkin also addressed changes in agriculture and how they are affecting universities. The Penn State poultry science professor said that the student population reflects changes to society. More urban and suburban students are involved in agricultural studies at college, they are more computer literate than in the past, and the female population at universities has increased substantially. Elkin said that two-thirds of the animal science undergraduates at Purdue, his former institution, are female.

Universities have had to deal with the results of increasing consolidation in the ag industry and the aftereffects of the Asian financial crisis. They have had to rely

more than ever before on help from private industry.

Those studying nutrition in universities used to concentrate on preparing animal feeds. These days the trend in nutrition research tends to be focused on how nutrients effect gene expression.

Elkin's focus, or vision, for his role in the university includes more emphasis on multidisciplinary and multi-institutional work, adopting new technologies, and recruiting and retaining instructors who maintain a "stakeholder"

view of their ties with industry.

Importantly, the work of the faculty won't concentrate so much at the molecular level that it will ignore the "real-world" implications of research.

"We hope to provide you, the industry, with excellent employees," Elkin told those attending the seminar. These employees, said the poultry science head, will be "well-educated, problem-solving, critical thinkers who can communicate."

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