

Prospecting for Health Protectants in Soy

The soybean, long known in the Orient as a “yellow jewel,” has been processed in the United States for vegetable oil and protein since the mid-1920s. Now it’s clear this plant gem may hold even more valuable health treasures.

Agricultural Research Service scientists and their University of Illinois colleagues are prospecting for components that might help cancer-free animals and humans stay that way.

“While some natural and synthetic chemicals disrupt DNA and sometimes result in malignancies, other compounds in our food supply help protect against irreversible DNA damage,” says Mark A. Berhow. He is an ARS chemist at the National Center for Agricultural Utilization Research in Peoria, Illinois.

The idea is to provide DNA-friendly dietary compounds—termed chemoprotectants—to counter unfriendly ones in food or the environment.

In search of the extra treasure, the scientists are examining some leftovers from soybean oil and protein extraction. The leftovers make up a gooey molasses called phytochemical concentrate (PCC). Until now, PCC has been processed into a light-brown powder for livestock feed. But compounds isolated from the leftovers may become more valuable than the main processed soy products.

Someday, soybeans may be bred or genetically transformed to contain greater amounts of chemoprotectants. The current search for these substances, supported in part by the United Soybean Board, may serve as a model for research on other foods.

Geneticist Michael Plewa of the University of Illinois at Urbana-Champaign and his colleagues expose cell cultures of Chinese hamster lungs and ovaries to PCC components prepared by Berhow and ARS plant physiologist Steven F. Vaughn. Plewa’s team then challenges these cells with a chemical known to induce tumors. PCC and some of its components prevent DNA damage.

The university researchers assess DNA breakage in the cells. Once the scientists associate a particular PCC portion with minimal cell breakage, they further purify it for experiments designed to precisely identify the protective components.

In preliminary studies, mice fed certain PCC components for 2 weeks were protected from cell damage.—By **Ben Hardin**, ARS.

Mark A. Berhow and Steven F. Vaughn are in the USDA-ARS Bioactive Agents Research Unit, National Center for Agricultural Utilization Research, 1815 N. University St., Peoria, IL 61604; phone (309) 681-6595, fax (309) 681-6693, e-mail berhowma@mail.ncaur.usda.gov vaughnsf@mail.ncaur.usda.gov. ◆