Kansas State, Wichita State Researchers Link Wheat Bran Antioxidants with Cancer Prevention

MANHATTAN, Kan. – Preliminary findings of collaborative research being conducted at Kansas State University and Wichita State University suggest that the antioxidant components of wheat may be helpful in preventing colorectal cancer tumors.

Colorectal cancer is the third most common cancer in men and women, according to the Centers for Disease Control and Prevention. The American Cancer Society estimated 105,500 new cases of colon cancer and 42,000 new cases of rectal cancer in 2003.

The current research focuses on an antioxidant class of orthophenolics found in wheat bran that appear to block the formation of mutagenic compounds. The orthophenolics are capable of scavenging free radicals and chelating metals, said Ron Madl, researcher at Kansas State. This effect is in addition to the benefits realized from consuming higher fiber content from the bran. The initial study showed that diets containing the same level of wheat bran, but different levels of antioxidants exhibited dramatically different capacity to suppress tumor development.

In separate studies, researchers found that intestinal and colon tumors can be prevented in mice when fed diets supplemented with plant-derived, purified orthophenolics.

“Just think, eating a couple of slices of whole wheat toast each day or adding some wheat bran when shaping a hamburger may be all that it takes to lessen the risks of colorectal cancer,” said Madl, who also directs Kansas State’s Bioprocessing and Industrial Value-Added Center.

“Findings in the study are encouraging, and researchers are now continuing the studies using other animal model systems to test whether these components of wheat can suppress mammary and prostate cancer development,” Madl said.

Lead researchers on the project are Drs. Delores Takemoto, of the Department of Biochemistry at Kansas State (in Manhattan, Kan.) and John Carter, in the Department of Physical Therapy at Wichita State University in Wichita, Kan. The prostate study will be carried out by Dr. Dennis Lubahn in the Department of Food Science at the University of Missouri. The research is partially funded by the Kansas Wheat Commission.

A complementary research project led by Dr. George Wang being conducted in the College of Human Ecology at Kansas State is focusing on the anti-tumor capabilities associated with the lignan in wheat bran and is observing similar effects, higher antioxidant activity, higher lignan content, and more cancer suppression.

“While we have known that whole wheat-based foods are an important part of a balanced diet, this research suggests that the bran antioxidants may play an even more important role in protecting consumers from cancer,” Madl said. “More work is needed to understand why some wheat varieties are more effective than others, thereby enabling wheat breeders to enhance this attribute for future variety releases.”

“This work shows the importance of maintaining a balanced diet, including foods from wheat and other cereals that impact the digestive system and protect it against cancer,” said Dr. Virgil Smail, new Grain Science and Industry Department Head at K-State. “Current restrictive diets may prevent consumers from realizing these health benefits.”