Ready-to-eat meat products contain few cancerous compounds: study

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(PhysOrg.com) -- If given the choice between eating a hot dog or enjoying some rotisserie chicken, consider the hot dog.

That's because hot dogs, as well as pepperoni and deli meats, are relatively free of carcinogenic compounds, according to Kansas State University research. But it's a not-so-happy ending for bacon and rotisserie chicken -- especially chicken skin -- because both have higher levels of cancerous material.

J. Scott Smith, professor of food chemistry, and a K-State research team have been looking at such ready-to-eat meat products to determine their levels of heterocyclic amines, or HCAs. These are carcinogenic compounds found in meat that is fried, grilled or cooked at high temperatures. Studies have shown that humans who consume large amounts of HCAs in meat products have increased risk of stomach, colon and breast cancers.

Ready-to-eat meat products are meat or poultry products that come in edible forms and don't need additional preparation or cooking. Smith has already researched HCA levels in cooked meat and found that adding certain spices and marinades before cooking can reduce HCA content in the meat.

The ready-to-eat product project was a collaboration with several other K-State researchers, including Terry Houser, assistant professor of meat science; Melvin Hunt, professor of animal sciences and industry;

Kanithaporn Puangsombat, December 2010 doctoral graduate in food science, Bangkok, Thailand; and Priyadarshini Gadgil, a K-State graduate who now works as a research scientist at the U.S. Department of Agriculture Center for Grain and Animal Health Research in Manhattan. Their research appears in a recent issue of *Meat Science*, the journal of the American Meat Science Association.

The study focuses on eight types of ready-to-eat meat products: beef hot dogs, beef-pork-turkey hot dogs, deli roast beef, deli ham, deli turkey, fully cooked bacon, pepperoni and rotisserie chicken.

"These are the most common types of ready-to-eat products, and their use has increased in recent years because of convenience," Smith said. "For this research, we took each of these products and prepared them as a consumer would."

The researchers heated up the hot dogs and bacon in a microwave, cooked the pepperoni on a pizza either in the oven or a microwave and used the chicken and deli meat as obtained. After doing so, they studied the meat to determine whether it contained five different types of HCAs according to nanograms per gram, ng/g.

Pepperoni had the least HCA content, 0.05 ng/g, followed by hot dogs and deli meat, 0.5 ng/g). Such amounts are low, and the researchers concluded that consuming such ready-to-eat meat products contributes very little to HCA intake.

Fully cooked bacon, with 1.1 ng/g, and rotisserie chicken meat, with 1.9 ng/g, contained all five types of HCAs tested. Rotisserie chicken skin had significantly higher HCA levels, with 16.3 ng/g. This is because chicken skin contains more fat and protein and less moisture, and HCA levels tend to increase as moisture decreases, Smith said.

"Based on this research, HCA consumption can be reduced by not eating chicken skin," he said.

The reasons for lower HCA content in some of the other ready-to-eat products may be because of the higher water content in the ready-to-eat products. More moisture prevents many HCAs from forming. Ready-to-eat products are often enhanced products, meaning they have a water solution with flavoring added to them.

"Hot dogs and deli meat may have low HCA levels because they are manufactured at low temperatures," Smith said. "The low HCA levels may also be from ingredients that are added to the meat and prevent HCAs from forming while the meat is cooking."

Provided by Kansas State University