Researchers studying nitrites in bacon and other meats

May 2 2012

As with many concerned consumers, a team of University of Oklahoma researchers wondered if the green color sometimes seen in bacon is, in fact, harmful to human health. Recently, these OU scientists took an important first step in answering this question by determining the structure of the green pigment responsible for this 'nitrite burn.'

The research team led by George Richter-Addo and Jun Yi, Department of Chemistry and Biochemistry in the OU College of Arts and Sciences, discovered that the green pigment seen in nitrite-cured bacon and other meats is due to an unusual chemical reaction of nitrites with the meat protein myoglobin. But more research is needed on the effects of 'nitrite burn,' particularly on the physiological function of myoglobin and other proteins.

"No one really knows if 'nitrite burn' is bad for you or not because there is so little information about the physiological effects on humans," remarks Richter-Addo. "But, we have discovered that a simple chemical process, which inhibits the flow of oxygen in the blood and degrades the blood protein hemoglobin, causes the blood to turn from red to green. Identifying the degraded blood components allowed us to characterize the related green pigment seen in bacon and other meats."

For centuries, nitrites have been used as a preservative to keep meats fresh, but very little is known about the harmful effects of nitrites on the body. While nitrites give meat its fresh color, add flavor and kill toxic bacteria, when used improperly, nitrites create cancer-causing chemicals.

Naturally, consumers are concerned with the discoloration seen in bacon—a concern OU researchers share, says Richter-Addo.

He and his team will continue to look for answers through research to determine if the discoloration of bacon and other meats, such as chicken, beef and pork, is an indication of a cancer-causing component. In the future, the OU research group will collaborate with agencies, such as the U.S. Department of Agriculture, to study nitrites in plants and vegetables.

"This is not research we would have pursued if we were any other place," states Richter-Addo. "The OU academic research environment encourages creative activity, so our research faculty and students can look at a problem from a fresh perspective. In this case, the chemistry point-of-view—a very different approach from that taken by researchers in the field of agriculture—led to an important step in solving this problem."

Provided by University of Oklahoma