

A matter of taste

Sensory science lab tests consumer products

When you pick up a box of frozen chicken, and the package claims the meat is “crispy on the outside, tender and juicy on the inside,” that statement is probably based on science.

Food companies put forth a great deal of effort in the development of products before they end up on supermarket shelves. The Sensory Science Laboratory on the University of Arkansas campus is one resource for helping companies put products to the test – the taste test, that is.

The lab conducts, on average, two taste tests per week on behalf of national companies that employ the lab to test new products. The lab is operated through the food science department in the Dale Bumpers College of Agricultural, Food and Life Sciences, under the direction of interim department head and professor of food science, Jean-François Meullenet.

“We test all sorts of products,” said Caroline Sullivan, a lab assistant and 2007 food science master’s graduate. Without revealing specific companies or products, Sullivan said they’ve tested food items such as potato chips, fruit juice, pizza, rabbit, chicken, diet shakes and yogurt.

The lab manages a database where volunteers – members of the campus community and the public – complete a profile. If a company

is looking to test a product in a certain demographic, then a volunteer may be selected to participate in a test.

“We are currently doing testing of a microwavable pizza product and the company is seeking men under the age of 35 – their target market – to test a new product,” Sullivan said.

Companies want to know what consumers think about flavor, texture, smell, visual appeal and even tenderness of certain products and food ingredients that may go into food products.

Volunteers typically come to the lab to taste and then rate products according to a pre-defined set of questions that the lab manager, Tonya Tokar, and the supervising professor, Meullenet, pose to test whether or not consumers like the product. The taste testers are compensated, most often with a \$20 gift card for a test session lasting 20 minutes. Tokar, who happens to be a 2001 food science graduate, walks the volunteers through the process, step-by-step, to help them answer questions in a subjective way. Most tests use around 75 people, Tokar said.

Clients pay for the lab’s expertise and related testing materials, but the cost is much less than they’d face using a commercial laboratory – even though the University of Arkansas facility is as well equipped technologically. ■

Grant helps researchers store energy in concrete

Engineering researchers at the University of Arkansas will receive a \$770,000 award from the U.S. Department of Energy to develop a novel method of storing thermal energy in concrete. The award and research project are part of the federal government’s initiative to develop technology for low-cost energy storage of solar power.

“Solar holds great promise as an alternative source of energy,” said Panneer Selvam, professor of civil engineering and director of the university’s Computational Mechanics Lab. “The government recognizes this and knows that we must move in this direction. The problem is that scientists and engineers have not yet developed technology that will allow producers to harness solar power efficiently. So, one area of emphasis is to reduce costs is something called thermal energy storage, which is nothing more than developing effective and cost-efficient methods of transferring heat from collectors and holding it before sending it to generators. That is what we are trying to do.”

Storage of solar power in concrete starts with the collection of heat in solar panels. The heat is then transferred through steel pipes into concrete, which absorbs the heat and stores it until it can be transferred to a generator. In short, Selvam and Hale’s team will investigate better ways to transfer heat from the pipes into concrete.

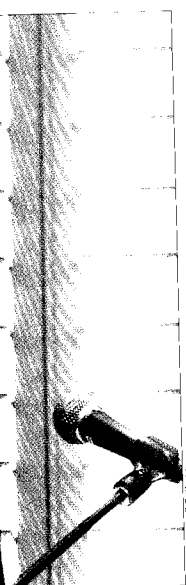
It’s about the economy

A panel of nationally recognized economists gave their predictions about the business landscape of our country Jan. 23 during the 15th annual Sam M. Walton College Business Forecast Luncheon, held at the John Q. Hammons Convention Center in Rogers.

Thomas F. “Mack” McLarty III, president, McLarty Associates, Washington, DC., provided an international outlook for the coming year, suggesting that foreign currencies would fluctuate and that the Russian ruble should be watched.

Ross C. DeVol, director, regional

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economics and the Center for Health Economics, Milken Institute, Santa Monica, Calif., presented the national outlook. He said exports would decrease for the coming quarters but mentioned a number of countries where demand for U.S. products should continue to grow.

Katherine A.

Deck, director, Center for Business and Economic Research, Sam M. Walton College of Business, gave



photo by Russell Cothran

her perspective about local and state prospects for the coming year.

"The turmoil in the financial markets has wide-reaching implications for businesses, consumers and local governments," Deck said. "But, even in a 'crisis' there is an opportunity for strategic behavior for well-informed decision-makers. At last year's Business Forecast luncheon, our speakers told the attendees that we were already in a recession, so local leaders had valuable insights ahead of the general public."

Dave Rader, executive vice president and CFO of Frito Lay, Plano, Texas, served as moderator.

Technology brings unseen artifacts to public eye

You can now visit museums or conduct archeological research in your pajamas, thanks to researchers at the Center for Advanced Spatial Technologies.

The scientists have used a short-range scanner to create hundreds of three-dimensional representations from a collection found at the Hampson Archeological State Park in Wilson, Ark. The result is the Virtual Hampson Museum.

CAST is based in the J. William Fulbright College of Arts and Sciences. Please visit <http://researchfrontiers.uark.edu/14094.php> to see a video on the virtual museum.

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Shake, rattle and roll

The ground rumbled late last year as small earthquakes shook central Arkansas. According to the United States Geological Service, Arkansas experienced five earthquakes ranging in magnitude from 2.2 to 2.7 in central Arkansas in November, 2008.

Earthquakes of magnitude 2.5 to 3 are the smallest that can be felt by people. Typically, earthquakes in Arkansas originate in the northeast corner of the state around the New Madrid fault line. Though the November quakes were mild in intensity, they still were a reminder that even central Arkansas is not immune from tremors.

Brady Cox, an assistant professor of civil engineering, conducts research related to earthquakes using a Vibroseis shaker truck that he affectionately has named "Hogzilla." Cox's truck shakes the ground beneath it to mimic seismic stress waves that would travel below the surface during a real earthquake. This allows Cox to learn more about how various soils react under earthquake conditions. The data he gathers will help engineers to improve bridge, road and building designs to protect property and lives in earthquake zones here and around the world.

Soil liquefaction is one of Arkansas' greatest risks if the New Madrid fault line experiences

a major quake, Cox said. Liquefaction, which occurs when soils rapidly change from solid ground to a liquefied state, causes bridges to fail and roads and buildings to sink into the earthquake-softened ground. Any poorly built structure that is on top of the soil may sink into the ground if the soil it is founded on liquefies as the earthquake happens. This can result in homes that are sunken two to three feet into the ground, power poles that are tipped over, and bridges that fail as their foundations settle into the shifting soil.

How does this happen? Take a bottle with sand packed loosely into the bottom. It seems firm enough, but if you saturate the sand by pouring in some water, and then shake the bottle you will see the sand unpack as the particles settle loosely through the water. The harder you shake the bottle, the looser the sand becomes. The once firm soil is now a thick, watery mixture with little of the strength it had before shaking. This is the problem that confronts the New Madrid area. The loose sand deposits that surround the Mississippi River, when shaken by a quake, will liquefy just like the sand in the bottle.

Liquefaction isn't a big killer, but the damage to utilities and roads can be expensive, Cox said. ■

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