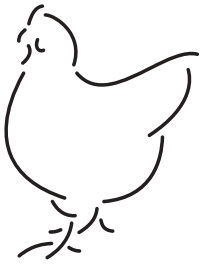
Chicken Processing Plant Geared Up for Business

A new, state-of-the-art, pilot processing facility has been constructed in Athens, Georgia, under the watchful eyes of food technologist Clyde E. Lyon and agricultural engineer J. Andra Dickens. The new facility allows researchers in the Poultry Processing and Meat Quality Research Unit at the Richard B. Russell Agricultural Research Center to design projects with protocols that cannot be tested in inspected, commercial facilities. It also allows researchers to process birds under conditions as close to commercial as possible, ensuring that food safety and food quality related research will be commercially feasible.

"The pilot plant, from conception to completion, took about 18 months, with construction modifications and equipment installation taking about a year," says Dickens. "The equipment was obtained from Simmons Engineering and Stork-Gamco, Inc., and other pieces were specially made."

The facility's evisceration line can be run at commercial speeds up to 180 birds per minute. Since September 2002, when the facility opened, the research group has completed two large-scale processing projects as well as several other projects that have used one or more pieces of the new equipment.



The facility was designed and constructed to allow installation of prototype imaging equipment and technology to detect fecal contamination on processed carcasses. As this technology is refined and readied for commercial testing, the pilot facility will give the researchers a good field test.

"There can be many differences between research testing and pilot plant testing. By being able to tweak new technology in a pilot situation, we can save a lot of time and money," explains Dickens. And they can demonstrate to industry members that the findings can be commercially applicable, where appropriate.

Food technologist Julie Northcutt is using the facility to test her research findings that may dramatically reduce the amount of water used in broiler processing plants. This would pose significant savings for the industry.—By **Sharon Durham,** ARS.

J. Andra Dickens and Clyde E. Lyon are in the USDA-ARS Poultry Processing and Meat Quality Research Unit, Richard B. Russell Agricultural Research Center, 950 College Station Road, Athens, GA 30605; phone (706) 546-3205 [Dickens], (706) 546-3418 [Lyon], fax (706) 546-3633, e-mail adickens@saa.ars.usda.gov, glyon@saa.ars.usda.gov. ★

Pedigreed Soybean Promises Healthier Soy Oil

In the future, a food oil pressed from a new line of soybeans could become a close runner up to olive oil in terms of its heart healthy levels of monounsaturated fat. Olive oil enjoys a fine reputation among nutritionists because of its relatively high levels of monounsaturated fat (nearly 75 percent of total fat).

The USDA-ARS National Soybean Germplasm Collection in Urbana, Illinois, recently received soybean genetic material, or germplasm, with higher monounsaturated fat concentrations than any other previously included in the collection. The NSGC preserves such plant material for use in developing improved cultivars.

The new germplasm, called N98-4445A, was developed through traditional breeding methods by scientists led by agronomist Joseph W. Burton, with the ARS Soybean and Nitrogen Fixation Research Laboratory in Raleigh, North Carolina. "The germplasm will be a useful genetic resource for breeding mid-oleic soybean varieties suitable for different growing regions," he says.

Oil from N98-4445A contains increased levels of oleic acid—a monounsaturated fat stable enough for use in salad dressings or frying oils without treatment by the hardening process called hydrogenation. Hardening is achieved by chemically adding hydrogen to a chain of oil molecules. While hydrogenation serves as a stabilizer to make oils suitable in solid products such as margarines, breakfast bars, and baked goods, it also creates trans isomers, which are known as less healthy trans fats. "The new oil would likely be as stable as hydrogenated oils, but without the trans isomers," says Richard F. Wilson, ARS's national program leader for Oilseeds and Bioscience. "Oils based on this new line would likely not oxidize as quickly as other soybean oils."

The germplasm line's increased oleic acid level also correlates to a decrease in polyunsaturated fatty acids (PUFAs). PUFAs are liquid fats (such as linoleic and linolenic acids) that are known to cause off-odors and break down when oxidized during aging or frying. While commercial soy oils are 7 percent linolenic acid, the new line has only 3 percent of that highly unstable PUFA. In comparison, even a 4-percent content might require some hydrogenation. Oils based on the new generation would fall below a critical cut-off point under which no hydrogenation is necessary.

By 2006, U.S. Food and Drug Administration plans would require food manufacturers to state the amount of trans fatty acids in processed foods. The processed-food industry uses tons of vegetable oils in myriad products annually. About half of all vegetable oil produced is from soybeans—the most used vegetable oil in the world.—By **Rosalie Marion Bliss,** ARS.

Joseph W. Burton is with the USDA-ARS Soybean and Nitrogen Fixation Research Laboratory, 3127 Ligon St., Raleigh, NC 27695; phone (919) 515-2734, fax (919) 856-4598, e-mail joe_burton@ncsu.edu. ★