OKLAHOMA’S AGRICULTURAL LABORATORY: PROVIDING A DIVERSE RANGE OF TESTING TO PROTECT CONSUMERS

by Emily Mumford, writer

LOCATION
Richly captured in the classic American musical, Oklahoma!, by Rodgers and Hammerstein, the state of Oklahoma is a microcosm of US complexity. Known for aviation technologies and oil and natural gas production, the state also has a healthy farm system that produces wheat, cattle, pecans, peanuts and peaches in notable quantities. The state’s economy has been booming in recent years. Oklahoma has also had a pivotal role in Native American history and today more than 39 tribes and nations are headquartered there.

The state’s agricultural laboratory, part of Oklahoma’s Department of Agriculture, Food and Forestry, is located in the heart of Oklahoma City, in the capitol complex. The laboratory is largely a regulatory agency, ensuring the safety and legitimacy of numerous agricultural products, including milk and dairy products, fertilizer, pesticides and seeds. Due to the diversity of its work, the lab works with numerous state and federal agencies, including USDA, FDA, EPA and state public health and animal diagnostic laboratories.

DIRECTOR
Laboratory Director Michael Talkington, DVM, grew up in Newcastle, OK, on a small farm. He married his high school sweetheart and they live in her childhood home. “I never went far from home,” he laughed. As Talkington grew up, small farms were disappearing into the big ones and ultimately, taking over the family’s farm was not a viable option for him. Becoming a veterinarian allowed Talkington to stay in the area he loved. After graduating—from Oklahoma State University, “not that other one”—he practiced veterinary medicine for nine years. Talkington began working for the state in the Animal Industry Services Division, working to eradicate Brucellosis in cattle and Pseudorabies in swine.

In 1999, Talkington came to the laboratory as acting director. In 2000, he was made director. “My training was very helpful in understanding the lab’s microbiology programs, and I counted on my excellent staff to catch me up on the chemistry side.”

Of the many challenges faced in this leadership role, perhaps the most recent has been overseeing the design and construction of a new laboratory facility. Staff began moving into the modern space in March 2009.

FACILITY
The new building is adjacent to its old space inside the department headquarters, juxtaposing the older granite building with a sleek, glass-encased design. “It makes the whole thing look better,” said Talkington. The three-story, 40,000 square foot lab incorporates as much glass inside as possible, helping staff give tours without passing through active lab space. Security measures have been modernized: the building is key-carded throughout, with individuals receiving entry permission where needed. The design also incorporates a first-ever BSL-3 lab which, Talkington says, will be in constant use—but ideally, never as a BSL-3 space. “We wanted to serve as a back-up to the state public health and animal diagnostic laboratories in case of an emergency and to increase the state’s surge capacity.” The state’s labs are working on agreements that will allow public health personnel to work at the agricultural lab’s facility, if necessary.

Talkington credits the Secretary of Agriculture, Terry Peach, with helping make the new lab a reality. “When he was elected, he came to us and asked what we needed.” After giving the secretary a tour, they asked for a new lab. Three years ago Peach helped pass a bond issue that funded the new building. “The timing worked perfectly for us,” said Talkington. As in other states, budgets are tight in Oklahoma today. Had the request come any later, “we might not have been so lucky,” said Talkington.

TESTING
Divided into seven focus areas, the laboratory focuses on animal health; feed, fertilizer and lime; food and dairy; pesticides; quality assurance; seeds; and water and inorganics.

The largest volume of testing occurs in the area of animal feed and fertilizer. The laboratory ensures label compliance, protecting consumers by regulating everything from bulk fertilizer and livestock feed to dog food.

Talkington notes that the lab’s pesticide program is also robust and that the technology there is transferable to the food safety program. “We are testing parts per billion in pesticides. By tweaking our methods, we’ve been able to help test for carcinogens in certain products imported from China,” he said. The lab recently tested seafood imported from China for pesticide content.

Food safety staff tests state-produced meat and dairy products, including cheese, milk and ice cream, for quality and safety. “We can also assist with foodborne outbreaks on a case-by-case basis,” said Talkington. The lab recently finished helping with the investigation of a large E. coli 0111 outbreak that sickened more than 340 people in Locust Grove, OK, in 2008.

The lab’s animal health section conducts serological and microbiological testing for disease diagnosis in large animals, searching for evidence of Brucellosis, Pseudorabies and Equine Infectious Anemia.
Other lab sections test ground and surface water to protect citizens from any contamination caused by agricultural industries, and regulate seeds according to federal and state laws.

DISTINGUISHING CHARACTERISTICS
“Our metrology lab is one of the best in the country,” said Talkington. “We have Swiss robotics that can perform small mass measurements down to 1/1 millionth of a pound—only one other lab in the US shares the technology.” While the measurement lab is not a high volume area, almost anything sold in Oklahoma is traceable back to the agricultural lab. Through its NVLAP accreditation process, the National Institute of Standards and Technology has recognized the metrology lab as meeting ISO 17025 standards.

The seed laboratory can identify the DNA of proprietary seeds. Talkington explained, “When someone comes up with something new, say, a roundup resistant soybean seed, they’re the only ones allowed to sell it.” The laboratory helps regulate a thriving seed industry.

Oklahoma’s agricultural lab has also been designated by EPA Region 6 as the state regulatory agency for pesticide testing under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). The busy pesticide lab concentrates on the entire range of pesticide issues, from label compliance to appropriate usage to the effects on human health, “all the way down to flea collars,” said Talkington.

SUCCESS STORY
“We report out a lot of things that don’t become public because they’re caught early,” said Talkington. The laboratory feels most successful when it’s able to keep a low profile. “We’re doing our best work when nobody knows what we’re doing.”

The lab also continues to add new technologies, despite financial limitations. Staff have been “proactive, seeking ways to add the right technology” at the right cost. The food safety lab can ribotype to identify bacteria sources. And they have just added PCR-DNA technology to support outbreak testing.

“We’re not a high-profile research lab, and aren’t funded that way, but I think our staff is using money wisely to accomplish goals and stay at the top of their practice,” said Talkington.

BIGGEST CHALLENGES
The big challenges all come back to money.

Increasing costs. “Everything costs more now,” said Talkington. “Reagents cost more. Waste disposal costs more. Our expenses are 30% higher than five years ago, but expectations remain the same.” Even with a lean budget, the state expects the usual expanding array of lab services but has not been able to make allowances for method development and training.

Staff retention and training. “We are a training ground for private industry,” said Talkington. “We hire young scientists out of college, train them for a couple of years and then say farewell as they leave for a job down the street that pays twice as much. We need to retain our best scientists and move them into leadership positions. Many of our supervisors are Boomers, like me, and we’re looking to retire in the next several years.”

GOALS
National accreditations. The lab plans to bring three sections—general chemistry, pesticides and inorganic—to A2LA or ISO 17025 standards. It will also maintain its FDA food accreditation and ISO 17025 standard in metrology.

Provide advanced training. A long-term goal, Talkington would like to help staff scientists earn advanced degrees through tuition reimbursements, but realizes that current budget cuts are pushing that goal further into the future.

The agricultural lab continues to forge ties with customers and partners to ensure it is on track to meet needs. A Commodity Group Panel convenes the agricultural community, including representatives of the lab, retail feed, cattleman, pork farmers and dairymen. The lab is also developing relationships with junior colleges to begin a steady internship program at the lab. And Talkington is very pleased with the growing relationship among the state laboratories and with APHL, saying “I think there are going to be a lot of positive changes in the lab community in the coming years.”