College of Agriculture and Life Sciences:

Transforming lives through learning,

by Lori Greiner

What do obesity, economic development, malaria, diabetes, bioprocessing, soybean rust, genomics, value-added beef production, and antioxidants have in common? More than most would think! These are just a few of the wide range of topics being investigated at the College of Agriculture and Life Sciences to help transform the lives of Virginians and people around the world.

The College of Agriculture and Life Sciences has come a long way since Virginia Tech's modest beginnings in 1872, when the Virginia Agricultural and Mechanical College first opened its doors as the commonwealth's land-grant institution. Initially, students were limited to a certificate in either agriculture or mechanics. Today, the college grants a two-year associates degree and bachelor's, master's, and doctoral degrees. Nearly 2,000 students are pursuing degrees in more than 41 options offered in the college's 12 departments.

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Through its land-grant mission of teaching, research, and Extension, the college has been instrumental in helping agriculture and other life science industries make significant strides in improving people's lives. For example, in the United States today, less than 2 percent of the population produces the food and fiber that is consumed by a large portion of the world.

These advancements have come with many challenges. It is no longer enough to be able to feed the world's population. Across the country, citizens, businesses, and government entities are focused on how to sustain and revitalize rural communities. Discussions in agriculture have turned from quantity to quality, and from productivity to sustainability and profitability.

These challenges are seen by the college as opportunities to capitalize on its strengths. "Our success will be attributed to our ability to adapt to society's expectations and needs," says Sharron Quisenberry, dean of the College of Agriculture and Life Sciences. "There is a strong need to improve human health and nutrition, enhance the quality of the environment, reduce the reliance on fossil fuels, and develop cures for devastating and debilitating diseases.

"We are positioned to assist the food and agriculture industries, local governments, and citizens address these issues through our strong infrastructure focused on applying research discoveries to educate and engage our citizens," she adds. "It is evident that we need to look beyond our traditional roots and build upon our strong foundation to develop solutions to problems. We need to focus on programs that revitalize agriculture to ensure long-term profitability."

To achieve this goal, the college is advancing its missions by pursuing research and education in biochemistry, genetics and genomics, bioengineering, molecular biology, biomaterials, biotechnology, nanotechnology, biomedical engineering, and proteomics.

Additional emphasis is being placed on human health and nutrition issues, including emerging and re-emerging infectious diseases, and obesity prevention and management. The college is proactively pursuing connections and collaborations with new institutes on campus (such as the Virginia Bioinformatics Institute, the Institute for Biomedical and Public Health Sciences, and the Institute for Critical Technologies and Applied Sciences) to enhance its capacity for responding to the diverse needs of the state.

All of these life science sub-disciplines allow the college to respond more fully to the needs of Virginia agriculture and, above all, to realize its most important mission—enhancing the quality of life for the people of Virginia.

The college is focusing its programs on six key areas: agricultural and environmental sustainability; food, nutrition, and health; biodesign and bioprocessing; the green industry; infectious diseases; and community viability. As part of this vision, the college will

- investigate how new knowledge and technologies can be tied to human health and nutrition to assist in the prevention of chronic diseases such as obesity, heart disease, and diabetes; build a better understanding of the relationship between food, nutrition, and health to address lifestyle and consumer behaviors for healthful living; and develop new and alternative food products to enhance the intake of micronutrients and antioxidants, as well as new strategies to improve understanding of the consequences of both healthy

Editor's note: This is the first in a series of articles about each of Virginia Tech's eight colleges.




discovery, and engagement

and unhealthy lifestyle choices;

• determine how Virginia's producers can add value to what they are already doing, whether through value-added endeavors, biobased products, bioprocessing, diversification into other crops, or through other avenues;

• develop high-value horticultural products, businesses, and systems; and provide the research and education that will assist the commonwealth in adjusting to the economic and environmental impact of growing urban environments and enhance rural ecosystems;

• study major infectious diseases, such as West Nile virus, malaria, and other vector-borne diseases that plague the United States and the world; and develop methods of attenuating the effects of diseases through state-of-the-art technologies;

• create a center of excellence in the area of local leadership, community development, and strategic responses to economic change; address ways that citizens can identify and respond to change through innovative opportunities that may take the form of exploiting market niches, improving management and marketing processes, developing new efficient products and processes, or shifting production toward higher-value activities; and provide local governments with educational opportunities that will guide change in areas such as making economic development decisions, changing zoning and land-use policy, and altering tax structure.

The foundation for these programs, in the long term, will be educational programs offered by the college and through Extension. Undergraduate and graduate programs in the College of Agriculture and Life Sciences will be focused on relevant societal needs. The curriculum not only has expanded over the years to include traditional production agriculture, but strives to continually adapt to meet the needs of society by offering students the opportunity to gain knowledge in biotechnology, human nutrition and health, business, the environment, and community development, to highlight just a few areas.

The college will transfer this knowledge and technology to citizens, businesses, and organizations through cutting-edge Extension programs. To be competitive and to facilitate these programs, the college will strengthen partnerships and build new alliances as the opportunities arise.

"This is an exciting time for the College of Agriculture and Life Sciences. By embracing a vision for the college that builds on its traditions and takes advantage of opportunities that foster interdisciplinary and external collaborations, we are poised to confront the challenges facing our citizens," says Quisenberry. "The college is dedicated to serving the needs of Virginia's citizens and to providing a level of excellence that is recognized across the nation."

Lori Greiner is college communications manager for the College of Agriculture and Life Sciences.

Fast facts about the College of Agriculture and Life Sciences

- One of the original divisions of Virginia Agricultural and Mechanical College
- Dean: Sharron Quisenberry
- Name changed from the College of Agriculture to the College of Agriculture and Life Sciences in 1971
- Number of undergraduate students: 1,633
- Number of graduate students: 243
- Number of faculty: 576 (teaching, research, and Extension faculty)
- Number of alumni: 15,481
- Twelve academic departments: Agricultural and Applied Economics; Agricultural and Extension Education; Animal and Poultry Sciences; Biochemistry; Biological Systems Engineering; Crop and Soil Environmental Sciences; Dairy Science; Entomology; Food Science and Technology; Horticulture; Human Nutrition, Foods and Exercise; and Plant Pathology, Physiology, and Weed Science
- With almost 700 undergraduate students, the department of Human Nutrition, Foods, and Exercise joined the college in 2003 and is currently the largest department.
- Offers a two-year agricultural technology program and 41 undergraduate degree options
- Spends more than $28 million in research expenditures
- Ranked 11th in the nation in agriculture research by The National Science Foundation.
- Biological systems engineering graduate program is ranked 11th in the nation by *U.S. News & World Report*.