

Science supporting abundant, nourishing food for a growing civilization

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The diets of people in North America shed almost 1.5 billion pounds of unhealthy saturated and trans fat over the last six years thanks to a new phase in an ongoing agricultural revolution, an expert said here today.

In an interview before his keynote address at the 246th National Meeting & Exposition of the American Chemical Society (ACS), Daniel Kittle, Ph.D., cited the development of healthier foods as one part of the role science has played in supporting the growth of civilization through advances in agricultural technology.

Kittle, vice president for research and development at Dow AgroSciences, explained that the mission of agricultural science is to supply abundant and nourishing food for a global population that is rising from 7 billion today to a projected 9 billion by 2050. In addition, that food must be grown sustainably to meet the expectations of millions of people in developing countries who are moving into the middle class, he said.

"We are making progress on those goals, including some major advances that may not be widely known," Kittle said. "For example, we've used advanced breeding to produce canola, soybean and sunflower plants that are lower in saturated fats, the bad fats linked to heart disease, and high in the healthier monounsaturated fats. These plants do not have trans fats, so oils made from them, such as our Omega-9 Oils, are trans-fat free. Through this technology and the sale of these oils to restaurants and food manufacturers, we have removed more than a billion and a half

pounds of those bad fats from the North American diet since 2006. Reduced saturated fats, increased amounts of healthful omega-9 fats and the elimination of trans fats should translate to lower cholesterol levels and a reduced risk of developing heart disease and diabetes, which already affect millions of Americans."

Another challenge involves meeting the expectations of consumers in countries like the People's Republic of China, who are becoming more prosperous and entering the middle class, Kittle said. Millions of people are doing so, and it has profound implications for agriculture in the 21st century.

"One of the expectations from a growing middle class is a [diet](#) that includes more protein," Kittle explained. "It takes about 15 pounds of feed to make 1 pound of beef, 6 pounds for a pound of pork, and 5 pounds of feed for 1 pound of chicken. It means that grain production will have to increase significantly. In addition, a larger middle class typically means migration to the cities, with fewer people in rural areas left to grow crops, and less land to do it on as more land is converted to urban and industrial uses."

Other factors, such as climate change and soil erosion, may reduce the amount of prime land available for food production. Insects, weeds and diseases are evolving to resist traditional ways of keeping them in check.

Kittle expressed confidence, however, that scientists and farmers working together will meet those challenges in the years ahead, as they have in the past. He cited, for instance, progress in developing crops with higher yields and greater resistance to pests and drought.

He pointed out that industry-wide efforts have increased crop productivity by 20 to 50 percent, which keeps food costs down and provides jobs. In addition, integrated pest management programs help

decrease energy consumption and environmental impact by using the right products at the right times to reduce pest populations and minimize the impact on other insects and animals.

"Scholars have predicted for centuries that the earth will reach a tipping point where population growth will outstrip our ability to sustain ourselves. But far from a story of doom and gloom, the agricultural story is one of innovation, adaptation and determination," Kittle said. "We have a huge challenge ahead of us, and our scientists are prepared to meet it."

More information: Abstract

From lab bench to table top: Science serving the needs of a growing world

For centuries, many thought leaders have predicted disastrous results when the Earth's growing population and dwindling resources together reach critical mass. As early as 1798, British scholar Thomas Malthus based *An Essay on the Principle of Population* on the simple premise that the planet has a finite capability to support the human race, and the inevitable outcome will be the demise of human society, broad famine, and war that "with one mighty blow levels the population with the food of the world." Just 45 years ago, Paul Ehrlich's bestselling book *The Population Bomb* stated that the limits of the planet's resources had finally been reached and "the battle to feed all of humanity is over," warning that mass starvation and famine were imminent. In 2013, more than 200 years since Malthus' proclamation, the global population has grown exponentially from approximately 1 billion to 7 billion, but we've averted the prognostications of widespread shortages of meat, vegetables, and grains by undergoing a massive transformation in agricultural technologies that has increased both the quantity and quality of food production. Over the next few decades, the challenges to the

agricultural industry will multiply, as we now must target dramatic new breakthroughs to provide nutritious and plentiful food for 9 billion people on fewer arable acres, using less available water, and leaving a smaller environmental footprint. This talk will explore the progress, impact, and future needs of agrichemical innovation as we continue to stave off the Malthusian hypothesis through sustainable long-term solutions.

Provided by American Chemical Society

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