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Meat-Based Diets Mean More Demand for GM Crops

This week's **Biotech in Focus** came from a paper written by Kristen Jamieson, a University of Hawaii at Manoa student who recently enrolled in TPSS 416 (Introduction to Social, Ethical, and Political Issues Associated with Biotechnology). Designed for non-majors, this class is offered by the Department of Tropical Plant and Soil Sciences in UH Manoa's College of Tropical Agriculture and Human Resources.



When discussing how we will feed a growing population in the future, we need to consider how our diets influence the agricultural landscape and the demand for genetically modified (GM) crops. Beef cattle are fed a diet of primarily soy and corn once they reach the feedlot: at least 45% of U.S.-grown corn and 40% of the U.S. soybean crop is converted to animal feed. Almost all of this feed is GM, since 92% of corn and 94% of soy grown in the United States is genetically engineered.



The livestock industry is heavily reliant on GM grains to feed animals produced for human consumption. In the European Union, livestock producers warn that slow approval of GM crops could threaten the entire industry there. Half of the E.U.'s soy imports are used for animal feed. Without these feed imports, the E.U. would have to consume fewer animals or increase importation of animal products.

Worldwide, meat consumption is on the rise. The U.S. Department of Agriculture reports that U.S. meat consumption nearly doubled in the past century, and currently averages 132 pounds per person per year. U.S. livestock and poultry producers raise 9 billion animals annually for slaughter. Increased meat consumption is also occurring in emerging developing countries as they become more affluent increasing both the demand for and availability of meat. Between 1970 and the mid-1990s, meat consumption in developing countries grew by three times the amount observed in industrialized nations.



Ania Wiczorek, PhD

Professor
Department of Tropical Plant and Soil Sciences
College of Tropical Agriculture and Human Resources
University of Hawai'i at Manoa
Honolulu, HI 96822
ania@hawaii.edu

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Developing countries are expected to account for more than 80% of the growth in global meat demand during the current decade. This trend is especially worrisome because the largest population increases are predicted in the developing world, and producing animal-based protein in those countries will require careful management of resources.



Sustaining A Growing Population

As world population and the demand for animal products continues to rise, we must feed not only more people, but also more animals. This demand means more land, water, and agricultural inputs will be required for grain crops used in livestock production. World population is projected to reach 9 billion by 2050. In 2010, we produced more than 5000 kilocalories per year of food for each person on Earth. Despite this production level, 805 million people remain undernourished worldwide with a decline in world hunger.

We already produce enough grain to feed the world, so further yield increases do not offer a simple solution to hunger. Instead, improved distribution of food and reduced meat consumption can contribute more significantly towards sustaining a growing population.



Use of Resources

Livestock are fed 6 kilograms of plant protein to generate one kilogram of animal protein. Beef production requires significant amounts of water, consistently more than vegetable crops. The exact estimates of beef water requirements vary widely. Water use can include irrigated pastures for grass-fed beef, or irrigated grain for the feed if the animal is feedlot finished, and other water needs that the animals have to meet their physiological requirements



Availability of Crops



GM crops might offer the potential to grow crops in perennially drought-stricken areas, and thus increase availability of crops in those regions; but using those crops for animal production is probably not the best use of the new resources.

Addressing Hunger

Food insecurity is a multifaceted problem, and simply producing more grain is not the only solution. Improved food distribution and the adoption of a more plant-based diet can address the issue of world hunger more efficiently than increasing yields alone. The question is how best to manage increasing demand for animal-based protein diets. Perhaps we need to look towards alternative sources, such as insects!

