

SESSION I: INTERNATIONAL PERSPECTIVES

October 13, 2005 - 2:00 p.m. - 4:00 p.m.
Role of Agribusiness in Enhanced Nutrition

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Thank you, Dean. It's an honor to speak here to such a distinguished group. I'd like to also congratulate Dr. Gupta on a fantastic award.

What I'd like to do today is describe a few examples of how DuPont is working with partners across the food value chain to enhance nutrition. I know there are many examples across the industry that you've heard, so this is not just an exciting time for DuPont, but I think this is a very exciting time for all of us.

We're addressing both angles of the problem with our science, both the affordability, or the need for more food, especially for the developing world, and the need for better health, better nutrition for the developed world and for the developing world.

As you heard earlier, on the affordability side, we'll need to double food production over the next twenty years to meet the increasing population growth and the increasing affluence of the world population. In addition to that, we believe agriculture will play an increasing role in biofuels, sustainable route to biofuels, and to biomaterials. We also expect farmable acreage to increase very slowly. So, we've got to deliver substantially increased yields over time. Science is there to make that happen.

We're addressing the need for healthier food with technology to enhance grains and lead to healthier food ingredients that also taste great. We've learned the hard way that healthy foods that don't taste great may only get eaten once, if that much.

So how is DuPont helping address these challenges? Well, we're doing it through a number of businesses in the Agriculture and Nutrition Division of DuPont. This division has grown to sales of \$2 billion in 1997 to sales of \$6.6 billion this year. We see tremendous business growth opportunity in agriculture.

Our business model is a bit unique in that we play downstream, serving food companies. With some alliances we're actually in some consumer products, which gives us a clear understanding of what consumers and food companies are looking for. We build that into the technologies across our products, including our Pioneer seed business, our Crop Protection business, Solae, our Qualicon food safety, and liquid packaging businesses.

We deliver these products everywhere in the world. Although we're headquartered in Des Moines, more than 50 percent of our sales are outside of North America. We also have large and

fast-growing businesses in Eastern Europe, China, India, Brazil and Africa. We have more than a billion dollars in sales today to bottom of the pyramid markets.

We're investing heavily in science for these markets. This year, we'll spend more than \$600 million on Research and Development to help make food more affordable, healthier and safer.

Let's get back to the affordability of food and how we will address this growing demand with flat or low-growth acres. We're proud to be part of an industry that is increasing yields to make food more affordable. This chart shows how corn production since 1960 has grown. In fact, over the last 25 years, corn acreage has increased less than 5 percent, but corn production has increased 45 percent. Going forward, we see the demand drivers getting even stronger. Fortunately biotechnology and other science tools will provide the science capabilities to meet that increasing demand.

We see a number of areas where science can have important contribution to increasing this yield to meet the growing demand. The first is around adoption of hybrid seeds and the use of modern farming practices, such as no-till and increasing seed rates. This is already common practice in the developed world, but we're trying to extend it very aggressively into the developing world.

Secondly, we see accelerated breeding improvements through the use of modern tools enhanced by biotechnology, such as molecular markers and double haploids.

Thirdly, the tools of biotechnology currently provide better pest control. But, in our pipeline and in the pipelines of others, we are developing traits that will increase yield. You can see an example here with the soybean plant. This is not a soybean plant in a greenhouse; this is a soybean plant in fields in Iowa and other places in North America.

In addition to yield traits, we are also developing drought-tolerate traits. As all of you know, drought has the biggest impact on yield in all of agriculture in the world. We're also developing traits to increase the efficiency of the use of nitrogen in crops like corn, so less fertilizer will be required.

Finally, we believe there is a continued, important role for pesticides that are complementary to biotechnology. We're developing safer pesticides that require lower use rates to be effective and are complementary and enhance the protection of crops and add to the benefits of biotechnology.

We see multiple science approaches part of driving this yield improvement into the future.

We're also helping farmers around the world, like these farmers in Thailand, use modern farming techniques and technologies. Now, these smiling farmers are actually part of a school lunch program that DuPont/Pioneer sponsored because the school children in this village were undernourished. We saw an opportunity to work together with the village who donated public land. We trained the local farmers with modern farming techniques and donated the corn seed. They grew crops, sold other crops and donated the profits to the schools to enhance the nutrition of the children. At the same time, the farmers learned how to use modern agriculture techniques for their farms, and now they're profitable in their operations, and good customers for us. This is a good example of how science can be put to good use around the world.

Let's move to some examples of what science is doing for health. We have also commercialized a healthy soybean oil. Ours is called Nutrium, and it's a lower linolenic soybean oil, addressing the transfatty acid opportunity. However lower linolenic soybean oil only is able to address this opportunity in a certain number of foods. We also have a high-oleic soybean oil, the next generation, that's more stable than the low linolenic. It will be introduced in a few years and will enable the removal of transfatty acids from additional food products.

We also have an approach to omega-3 fatty acids, using an algae gene. We're very excited about this as it can really make a difference in cardiovascular health. We are very excited about the progress of healthy oils.

We have a business called Solae, which is a soy food ingredients business. Solae takes soybeans, separates out the oils, and purifies the protein into a powder form that's used as a food ingredient with food companies. It's used in many applications, such as energy bars, health bars, soy milk and smoothies, yogurts, cereals, meat alternatives and other foods. They are not only heart healthy, but indications are that soy protein helps prevent certain types of cancers and increases satiety, which is a very important tool in the battle against obesity.

As our science further improves the taste and the functionality of soy protein, you'll see it used in more and more products that will help consumers get the health benefits of soy in many different forms throughout the day. Our soy protein business today is over a billion dollars in sales, which represents more than a million acres of soybeans. And all of this soy is going to consumers that are getting the health benefits of soy protein.

This chart just shows you an example of how our technology and our science can improve the taste of soy protein. We developed a sweeter soybean seed called "high sucrose soybean," or the "sweet bean," that was targeted for soy beverages. We commercialized this in a joint venture with General Mills with a product called 8th Continent soy milk. As you can see, we matched the taste of low-fat milk and exceeded the taste of the soy milks that were on the market at the time. This product has been out for four years now, and this year consumers in the United States, the only country that we're commercial in today, will buy more than \$85 million of 8th Continent soy milk. We see tremendous growth opportunities because of the taste and the health benefits.

DuPont is bringing our science to the market to help make foods safer. For example, food companies and governments expressed the need for better diagnostic tools to understand if bacterial pathogens were in food, specifically e-coli, salmonella and lysteria. We took some of our biotechnology capacity, focused it on this challenge, and developed leading-edge diagnostic tools and created a business called Qualicon. Qualicon is now about a 50-million-dollar business, growing rapidly and profitable. It enables food companies to check food samples by analyzing the DNA, which can tell with virtually a hundred percent certainty whether a pathogen is present or not. It also identifies sources of pathogens.

We bring our chemistry to leading clean and disinfect products to help keep food manufacturing, especially meat production, clean. We make leading-edge packaging systems, both filling machines and aseptic packaging, also designed to keep food free from foodborne pathogens. Each year in the U.S. alone, there's an estimated 76 million cases of food poisoning, leading to about 350,000 hospitalizations and about 5,000 deaths. You can only imagine what that number is worldwide. Our technologies are helping food companies address that challenge head-on.

Finally, I want to tell you about a very exciting collaboration where our scientists, working with Africa Harvest and the Gates Foundation, are combining the science capabilities that can drive both affordability and nutrition and health into a major opportunity to help hundreds of millions of people around the world.

Sorghum is a dry-land crop that is grown mostly for animal feed because humans have difficulty digesting sorghum. It has very low nutrient value. However, because it's grown in areas that other crops today will not grow in, sorghum is the dietary staple for nearly 500 million people, and roughly 300 million of those are in Africa.

Well, DuPont has donated biotechnology traits, and our scientists are working alongside African scientists that are applying these traits to sorghum. The first product will contain elevated levels of lysine, an essential amino acid, and then the next generation will not only have high lysine, it'll have other essential amino acids. It will have a gene that will enable better digestibility, so people will get more calories per unit of sorghum, and we'll have increased levels of critically important vitamins and minerals.

We're very excited about this example and the other examples of how science is helping drive both the supply of food to a growing world and the nutrition and health of that food. This is a great time to be in agriculture, and we see great opportunities to help people around the world and have a good business from that.

Thank you very much.