

Emerging markets fuel the debate on GMO

When it comes to opposing views on gm-biotechnology the world is mainly divided into America and the EU

Emerging markets – particularly Asia and the Middle East – demand more food, especially meat and dairy away from traditional staples such as rice and vegetables.

By Henk W. Hoogenkamp

Health and food legislation should be based on objective analysis of the preponderance of scientific information, not of being rejected because of ideology. Hidden agenda's all too often hinder concise discussions to implement new technologies.

Contrary to the anticipated changes in emerging markets, consumption in developed countries is growing more slowly and in-line with population and economic prosperity. For emerging markets it is a rule of thumb that a 10% increase in household spending triggers an equal spending on meat consumption. This is in sharp contrast with developed countries where a 10% increase in household spending results in only 1% increased meat consumption. Knowing that the population will surge in emerging markets –especially China, India, Indonesia, Philippines- price spikes and supply uncertainties can trigger a global food crisis and as such food security will rapidly become much more than just an afterthought. Especially increased meat consumption will become a hotly debated issue: on one end of the equation it is the right of people in developing or emerging countries who have been deprived of eating meat, and on the other end the need to reduce cause and effect of global warming by greenhouse gases and food and feed security.

Long-term price volatility

For example: China's appetite for meat is skyrocketing. In just 20 years the world's most pop-

ulous nation consumed some 50 million t of pork, up from 25 million t in 1990. The rapid increase is a result of several factors: population growth, urbanisation, and general prosperity arising from the nation's economic boom.

To put these figures into a different perspective: in just 20 years some 250 million more pigs were harvested in 2010. Just imagine the phenomenal amount of feed needed to raise these animals. But it will not stop there; also Chinese beef consumption is expected to increase by some 30% by 2015, pushing resources to the limit. Calculated in grain, it takes about 9 kg of grain to produce 1 kg of beef. Of course, there are quite a few of feed/meat conversion rates floating around and often these figures are de- or overemphasised by special interest groups. But whatever figure is chosen, food production in general is rising sharply and it is not keeping pace with demand, and as such might provoke long-term price volatility.

The World Economic Forum cited increased demand for food, water and energy as a real risk facing the world. Both the greater prosperity and the sharp rising global population are putting unsustainable pressure on resources.

Probably the first commodity to suffer from food shortages

U.S. still tops the list

Tab. Biotech "mega-countries"		
	Country	GM-crops (million ha)
1	USA	66.8
2	Brazil	25.4
3	Argentina	22.9
4	India	8.9
5	Canada	8.7
6	China	4.1
7	Paraguay	2.8
8	South Africa	2.6
9	Uruguay	1.2
10	Bolivia	1.1

Source: HOGENKAMP
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China is emerging as the world's biggest investor in biotech crop research.

and rising food prices is beef. It is true that competitive pressure usually restricts the immediate pass-through of higher prices to consumers. This probably will not be the case for premium cuts of beef. Raising cattle requires prolonged outgrow and fattening using substantial quantities of feed and water. But it doesn't stop here. Food for fuel or fuel for food: a hotly debated issue, especially now that in 2011 one third of all corn harvested in the U.S. is used for biofuel ethanol. In essence, a question of feeding people or keeping cars on the road.

Many first generations biofuels actually had negative greenhouse gas balances. Food for fuel reduces further the arable land available for food production thereby accelerating the threat to food security.

Lucrative Government subsidies have the tendency to inflate farming commodities such as soy and corn. Both the EU and U.S. should take the initiative of cutting the billions of dollars in farm subsidies that distort food price mechanisms, encourage food for fuel, overfarming, and inflate the price of farm land.

Just think about it, by 2020 the world population will have increased 800 million to 7.6 billion, the equivalent of adding two-and-a-half of the current population of the USA. Yet, the world will have to produce more from

less land. Climate change is accelerating the shrinking of arable land. For instance, a 1 m rise in sea level would wipe out half of the rice fields in Bangladesh and destroy a substantial part of the Vietnam rice fields in the Mekong delta.

Biopiracy

In an effort to speed up the biotech approval process, the European Commission favours individual EU countries to embrace, restrict or ban cultivation of genetically modified crops. Member States need more flexibility to organise the coexistence of genetically modified crops. Currently the EU authorises GMO's on a case-by-case basis, but opposition by member countries can severally slow down or denial approvals.

There are more than 100 000 genetic rice varieties and for the future of the planet it is important to give rice seeds to farmers to allow genetic continuity as well as maintaining or improving biodiversity. It is important to prevent biopiracy in the sense that multinational food or ag-companies take sole ownership with the intention to control rice by patenting different rice varieties. Biopiracy usually occurs between countries rich in biodiversity but poor in resources against those with the technological

know-how. Or to put it differently; a tug-of-war between developed and developing nations for access and ownership of sovereign genetic material.

Green credentials of food companies increasingly focus on finding alternatives for commodities such as palm oil and soy oil. Algae oil is a possible replacement made by fermented single-cell organisms of switch grass, cornhusks, sugar cane, beets, and wood waste creating oil and its by-product animal feed.

The ultimate goal is to create super algae that are highly efficient at converting sunlight and carbon dioxide into lipids and oils that can be sent to a refinery and made into fuel and foods. The main attraction of algae is their ability to potentially produce 10 or more times more fuel than corn used to make ethanol or soybeans used to make biodiesel. Moreover, algae can be cultivated at wasteland or water and subsequently no direct competition with food production.

Sustainable green and excessive world population growth are on a collision course. Population stabilisation cannot any longer be seen merely as an afterthought; it needs to be brought into the lime light of attention.

Cities cover only 1% of the planet's surface, but consume 75% of the energy. This translates to an emission of about 80% of all harmful greenhouse gases. By 2050, roughly 70% of the world population will reside in urban areas, which will force cities to massively invest in infrastructures based on sustainable and eco-friendly solutions.

Europe vs. USA

For almost 20 years, opposing views of genetically modified or engineered crops have debated the pros and cons of world's food supply. The genetic modification of certain crops such as soy, corn, rice, wheat and fruits, allow farmers to spray weed killer without hurting the crop and fight off insects. The technology also protects the environment

by decreasing pesticide use and using soil that is not plowed, which increases water retention and thus decreases erosion.

Opposing views mainly divide America and the EU, currently resulting in a standoff. However, there are clear signs that the standoff may be shifting in favour of biotech supporters now that China has approved GM (Genetically Modified) rice and corn varieties. China, not the U.S, will shift the balance away from Europe's movement to stop the introduction of GM crops. Although India rejected in early 2010 the introduction of a genetically modified eggplant to produce its own insecticide, both Africa and Asia are still undecided whether or not to embrace biotech. Europe's opposition may be waning now that China is emerging as world's biggest investor in biotech crop research.

Together with Brazil, Indonesia boasts one of the world's largest rain forests, which functions as global "lungs" that transform carbon dioxide into oxygen. Deforestation, especially on the islands Sumatra and Borneo and Brazil's Amazon, are rightfully on the radar screen of environmental protection groups. According to Greenpeace, forest covering the equivalent of 300 football fields is eradicated every hour in Indonesia. There is great logic in the demands that conversion of the forests and the peat land into soy and palm "plantations" need to be halted, and if possible, reversed. GM biotechnology can play a role in this process by virtue of crop yield increases at the same or less arable land mass.

Biotech "mega countries"

According to New York (USA) based ISAAA (International Service for the Acquisition of Agri-biotech Application), a mega-country is one that plants biotech or GM-crops in 50000 ha or more. Dr. Norman Borlaug, 1970 Nobel Peace Laureate, is considered to be the "Father of the Green Revolution" and credited for having imple-

mented a vision for a biotechnology regulatory system for transgenic crops.

In 2010 the global agricultural GM-harvest was planted on 148 million ha or approximately 10% of the world's cropland. The U.S. still tops the list of biotech "mega-countries". In 2010 it planted 66.8 million ha of biotech corn, soy, cotton, canola, sugar beet, alfalfa, papaya and squash. Both corn and soybeans are responsible for a large part of this vast amount of farmland.

To put these figures into perspective: Second to the U.S. is Brazil that planted 25.4 million ha of soy, corn and cotton, while Argentina follows as a close third with 22.9 million ha. Latin America and Asia will generate most increases in GM-agriculture. It is expected that by 2015 about 40 nations will harvest GM-crops using some 200 million ha.

Emerging markets

Arable land has become a hot commodity again, though in the U.S. the farmland acreage has been declining steadily for more than 50 years, according to the USDA. Yet, U.S. farms are well positioned to continue their world agricultural leadership role as they produce much more than are needed for their domestic or home market consumption. This is especially true for corn, soy and cotton.

Fast growing nations will need to import more food commodities to satisfy increasing prosperous populations such as Asia, boosting income for U.S. farms. That is why increasingly investors and investment funds plough money in farmland acquisitions, not just domestically but also seeding funds to far away places on several continents in order to hedge future food security.

Not only in-kind crop competition driven by farmers deciding whether to increase acreage for soybeans over corn or sugar beets, also out-kind acreage competition such as cotton could cause significant supply constraints. The latter is espe-

cially true now that cotton prices continue to dramatically increase. It should also be taken into consideration that other farm-input constraints such as weed-blockers, fertilisers and labour costs can drive up commodity prices.

Looking into the crystal ball, another major variable can play havoc: if oil or energy prices continue to increase this not only will drive up everything in the agricultural cycle, but also entice farmers to shift food for fuel or in other words use food for ethanol or soy diesel production.

The recent food shortages in 2007 and 2008 have proven that governments get increasingly nervous and sensitive to food inflation and food supply shortages and restrictions. These variables cloud the picture even further and its impact should not be underestimated.

To top it off; if at all possible, a confrontation must be avoided between farmers who want to grow bioengineered crops, and organic farmers without litigation that potentially could stifle food production.

While discussing a rapid growing world population, the expected demand for agricultural products will double in the years leading up to 2050. That also will be the case for meat consumption. This being the case, it will become of paramount importance to preserve what is already harvested. Therefore more farm and harvest management will be necessary to increase the efficiency of arable land, water, energy and crop selection criteria.

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