..Model United Nations of Hamburg 2015

Forum	Special Commission (Health)
Student Officer	Leon Usov
Issue	Discussing the Issue of Genetically Modified Organisms (GMO)

History:

Modified crops and foods have been present in our society ever since plants have been domesticated by farmers. Gatherers would find wild plants that were edible and would continue planting these so that they would serve as a food supply. When harvesting the crops, the farmers would select the plants with different but more desirable characteristics (Larger, better taste, etc.) and use the seeds of these mutations to produce the same edible plant with the more desirable characteristics, thus receiving crops which could feed more people. This is called natural selection, and is the first instance in human history of people modifying food and plants to their advantage. In the mid-1800s, Gregor Mendel, an Augustinian Friar, theorised domin-ant and recessive genes through the observation of different pea plants. With the help of Mendel's genetic theories, scientists were able to improve plant species in the 1900s through a method called classic selection.

In 1953, the discovery of DNA structure by James Watson and Francis Crick would revolutionise the possibilities of modifying various organisms to our advantage. Their discovery of the three-dimensional would enable scientists to eventually splice and combine different DNA of different organisms.

Twenty years later, in 1973, the scientists Herbert Boyer and Stanley Cohen joined their research and created the first recombinant DNA organism.

In 1987, the first genetically modified crops were tested in the USA, to see if they are fit for mass production and use. In 1997, Europe then ruled it mandatory to label GMOs as such, due to negative reaction from Greenpeace. Since the USA was and is exporting a part of their produced GMOs to Europe, the USA sees this regulation as a trade barrier, upon which the USA and Europe enrolled in a dispute which has been continued to this day.

In 2000, 130 countries approved the International Biosafety Protocol, which mandates the labelling of GM crops, yet the protocol still needs 50 ratifications to pass.

Due to initial instability of genetic structure within genetically modified plants, GMOs at first met large amounts of resistance from newly-formed anti-GMO organisations, as well as already present pro-nature organisations such as Green-peace. Because of this, the European Union has made the strictest rules in this regard, as all GM foods (as well as irradiated foods) are seen as new, and therefore possibly threatening, foods, which all undergo extensive and precise evaluation, so that there is no chance of danger. The checks are made by the European Food Safety Authority (EFSA), which then report the results back to the European Commission, which then decides whether or not the food will be authorised. Since September 2014, 49 GMOs have been authorised.

Nevertheless, since there have been advancements in the science and gene-splicing, most, if not all GMOs are genetically stable and can even be beneficial for poorer countries, since high-yield crops can be modified to contain more proteins, carbohydrates, vitamins etc. This would be a great step forward for less developed countries in areas with more arid or generally unyielding soil which is only able to grow one or two very specific crops with few needs. Modifying these so that the plant will deliver a certain vitamin (or something similar) that is especially rare in the region will certainly benefit the local population greatly. One such project is the Golden Rice Project.

The Golden Rice Project:

The Golden Rice Project is a scientific project which is centred on the modification of regular white rice. The normal rice is modified by changing the genetic structure so that it also contains beta-carotene, which will, when digested, give the body very necessary vitamin A, the lack of which causes around 670 000 child deaths per year in countries where vitamin A is a rarity. The Golden Rice Project, once fully tested and realised, will bring the much needed vitamin to countries such as India, China or Bangladesh (and others), countries in which rice is one of the main courses, since it is fairly easy to grow, as long as the area is swamp-like or contains a large amount of water. Since this project was set with a view to benefit poorer communities and states, the project is a non-profit one and has, due to its possible aid in the welfare of said states, been funded by numerous large charities, such as the Bill and Melinda Gates Foundation, etc.

The scientific details of the project were initially revealed in 2000, the result of an eight-year project of the scientists Ingo Potrykus and Peter Beyer, of the Swiss Federal Institute of Technology and the University of Freiburg respectively. At the time of publication,

golden rice was a significant breakthrough, since it represented the first complete biosynthetic pathway that had been engineered so far. Five years later, an even more advanced strain of golden rice, called *golden rice 2* was introduced. This strain could produce up to 23 times as much beta-carotene as the original golden rice.

Nevertheless, even though this biologically engineered product is completely stable and might aid in the saving of many lives, the Golden Rice Project still meets (for completely inexplicable (personal opinion) reasons) resistance from some sides (This link contains an "argument" against the project - http://www.i-sis.org.uk/rice.php).

GMO Controversy:

Some arguments frequently brought up are those of the GMOs being harmful to either the surroundings or the people digesting them. While these arguments may have been the case with the first GMOs in the mid-1990s, which were indeed harmful, the Gm crops which are planted now are far more developed and pose no threat at all. Even the original founder of the anti-GMO movement, Mark Lynas, has officially apologised for the movement against genetically modified foods. His statement is as follows:

"I apologize for having spent several years ripping up GM crops," he said. "I am also sorry that I helped to start the anti-GM movement back in the mid-1990s, and that I thereby assisted in demonizing an important technological option which can be used to benefit the environment."

This statement of Mr. Lynas was made due to his becoming aware of the fact that due to the advancements in technology, the arguments of the anti-GMO movements were becoming less and less valid. However, this realisation has struck few of the participants, which continue to believe their weakening arguments, and therefore struggle to keep a hold onto any power, resorting to destroying the harvests of farmers on the grounds that they are genetically modified. This is in fact a likely dangerous activity, since GM crops are likely cheaper due to low maintenance crops, and therefore a large source of food for the poorer people. Removing these foods from their list of comestibles would possibly endanger these people.

Furthermore, GMOs often are a step out of poverty for many local farmers in the poorer areas of less developed countries. Many of these farmers have only little plots on which they may grow their crops, and these crops are easily susceptible to harm from pests,

weeds or difficult weather conditions. Some GM foods have been modified in ways that can eliminate two of these threats by making the plant more durable and resistant to weeds and pests. This modification can boost harvests many times, helping the farmer keep himself and his family out of poverty. Moreover, due to the plant now not requiring any herbicides or pesticides, the crop remains toxin-free, which is a big advantage for rural areas, since pesticide poisoning are indeed a health problem in such places.

Still, these arguments fail to convince anti-GMO activists, since these crops are genetically modified and therefore a "poison". These activists also, due to a lack of proper evidence, make unfounded claims based on evidence taken from outdated sources or even completely irrelevant areas, such as publishing images of certain animals with tumours and claiming to have tested the GMOs on these animals, which subsequently showed signs of cancer.

Due to these protesters then, a large percentage of the human population remains malnourished, simply because of decades-old evidence that was once valid.

	Labeling scheme	% threshold for unintended GM material	Are some biotech foods and processes exempt?
Canada	Voluntary	5%[c]	N/A
United States	Voluntary	N/A	N/A
Argentina	Voluntary	N/A	N/A
Australia & New Zealand	Mandatory	1%	Yes
European Union	Mandatory	0.9%[a]	Yes
Japan	Mandatory	5%[b]	Yes
S. Korea	Mandatory	3%[b]	Yes
Indonesia	Mandatory	5%[c]	Yes

Sample of international guidelines for labelling GM foods.

Global Area of Genetically Engineered Crops, 1996 to 2006: By Country (Million Hectares)						
Country	USA	Argentina	Brazil	Canada	China	Paraguay
1996	1.5	0.1	--	0.1	--	--
1997	8.1	1.4	--	1.3	0.0	--
1998	20.5	4.3	--	2.8	<0.1	--
1999	28.7	65.7	1.4*	4.0	0.3	--
2000	30.3	10.0	3.6*	3.0	0.5	--
2001	35.7	11.8	5.7*	3.2	1.5	--
2002	39.0	13.5	6.3*	3.5	2.1	--
2003	42.8	13.9	3.0	4.4	2.8	--
2004	47.6	16.2	5.0	5.4	3.7	1.2
2005	49.8	17.1	9.0	5.8	3.3	1.8
2006	54.6	18.0	11.5	6.1	3.5	2.0

*illegal cultivation of GMOs: calculated area

Global Area of Genetically Engineered Crops, 1996 to 2006: By Country (Million Hectares)						
Country	India	South Africa	Uruguay	Australia	Mexico	Romania
1996	--	--	--	<0.1	<0.1	--
1997	--	--	--	0.1	<0.1	--
1998	--	<0.1	--	0.1	--	--
1999	--	0.1	--	0.1	<0.1	<0.1
2000	--	0.2	<0.1	0.2	<0.1	<0.1
2001	--	0.2	<0.1	0.2	<0.1	<0.1
2002	<0.1	0.3	<0.1	0.1	<0.1	<0.1
2003	0.1	0.4	0.1	0.1	<0.1	<0.1
2004	0.5	0.5.	0.3	0.2	0.1	0.1
2005	1.3	0.5	0.3	0.3	0.1	0.1
2006	3.8	1.4	0.4	0.2	0.1	0.1

Global Area of Genetically Engineered Crops, 1996 to 2006: By Country (Million Hectares)							
Country	Philippines	Honduras	Colombia	Iran	Spain	Portugal	Ger-many
1996	--	--	--	--	--	--	--
1997	--	--	--	--	--	--	--
1998	--	--	--	--	<0.1	--	--
1999	--	--	--	--	<0.1	<0.1	--
2000	--	--	--	--	<0.1	--	<0.1
2001	--	--	--	--	<0.1	--	<0.1
2002	--	<0.1	<0.1	<0.1	<0.1	--	<0.1
2003	<0.1	<0.1	<0.1	0.1	<0.1	--	<0.1
2004	0.1	<0.1	<0.1	0.5	0.1	--	<0.1
2005	0.1	<0.1	<0.1	1.3	0.1	<0.1	<0.1
2006	0.2	<0.1	<0.1	<0.1	0.1	<0.1	<0.1

Preparation for Resolutions:

Since this is not a world-wide problem, and only a controversy, the UN has not dealt with this matter extensively, or they are simply just difficult to find. Nevertheless, some resolutions have been passed on this topic, and there will be links below:

http://mmun.nse.cn/sites/mmun.nse.cn/files/resources/2012/FAO2012.pdf

One apologises for the inconvenience, but there was only one link to a complete UN resolution on the subject. While it is not strictly speaking a resolution of the UN, one may look up the Cartagena Protocol on Biosafety:

https://en.wikipedia.org/wiki/Cartagena_Protocol_on_Biosafety

For further amendments on GMOs in various other resolutions, which have no direct correlation to our issue, go to www.un.org and search GMO. There are a few amendments there.

As a delegate, it would be recommended that you firstly state and represent your country's opinion on the matter. Furthermore, depending on whether your country is for or against the use of GMOs, you should argue why they should or should not be used more often.

A History of Genetic Engineering

Before genetic engineering:

Prehistoric times to 1900
Gatherers find food from plants they find in nature, and farmers plant seeds saved from domesticated crops. Foods are manipulated through the use of yeast and fermentation. Some naturalists and farmers begin to recognize "hybrids," plants produced through natural breeding between related varieties of plants.

1900
European plant scientists begin using Gregor Mendel's genetic theory to manipulate and improve plant species. This is called "classic selection." A plant of one variety is crossed with a related plant to produce desired characteristics.

Modern genetic engineering

1953
James Watson and Francis Crick publish their discovery of the three-dimensional double helix structure of DNA. This discovery will eventually lead to the ability of scientists to identify and "splice" genes from one kind of organism into the DNA of another.

1973
Herbert Boyer and Stanley Cohen combine their research to create the first successful recombinant DNA organism.

1980
The U.S. Supreme Court in *Diamond v. Chakrabarty* rules that genetically altered life forms can be patented. The decision allows the Exxon Oil Company to patent an oil-eating microorganism.

1982
The U.S. Food and Drug Administration approves the first genetically engineered drug, Genentech's Humulin, a form of human insulin produced by bacteria. This is the first consumer product developed through modern bioengineering.

1986
The first field tests of genetically engineered plants (tobacco) are conducted in Belgium.

1987
The first field tests of genetically engineered crops (tobacco and tomato) are conducted in the United States.

1992
Calgene's Favr Savr tomato, engineered to remain firm for a longer period of time, is approved for commercial production by the US Department of Agriculture.

1992
The FDA (**F**ood and **D**rug **A**dministration) declares that genetically engineered foods are "not inherently dangerous" and do not require special regulation.

1994
The European Union's first genetically engineered crop, tobacco, is approved in France.

2000
International Biosafety Protocol is approved by 130 countries at the Convention on Biological Diversity in Montréal, Canada. The protocol agrees upon labelling of genetically engineered crops, but still needs to be ratified by 50 nations before it goes into effect.

Bibliography:

http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.413.6479

http://www.sciencedirect.com/science/article/pii/S0278691504000444

https://en.wikipedia.org/wiki/Regulation_of_genetically_modified_organisms_in_the_European_Union

http://americanradioworks.publicradio.org/features/gmos_india/history.html

http://gmo-awareness.com/all-about-gmos/gmo-timeline-a-history-of-genetically-modified-foods/

http://www.princeton.edu/~ota/disk1/1991/9110/911015.PDF

http://www.choicesmagazine.org/2003-2/2003-2-01.htm

http://www.npr.org/sections/thesalt/2014/01/24/265687251/soil-weedkillers-and-gmos-when-numbers-don-t-tell-the-whole-story?ft=1&f=1007&utm_source=twitterfeed&utm_medium=twitter&utm_campaign=nprscience

http://www.gmo-compass.org/eng/agri_biotechnology/gmo_planting/142.countries_growing_gmos.html

https://en.wikipedia.org/wiki/Golden_rice

http://www.goldenrice.org/

http://www.biotech-now.org/food-and-agriculture/2015/04/why-the-founder-of-the-anti-gmo-movement-converted-to-the-side-of-science

http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.413.6479

http://www.un.org/apps/news/story.asp?NewsID=9909#.VY8m7vmqqkr

In case of any questions, send them to this e-mail address: specialcom@munoh.com

In case of you not being able to contact that address, send your question to this one: leon.antonowitsch.usov@outlook.com