

The genetics of hunger

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The Genetics of Hunger Shaleigh Johnson SCI 207 Dr. Christina Luecke
October 31, 2011 Genetically Modified Organisms (GMOs) alone cannot solve world hunger, or malnutrition, because malnutrition does not stem from a lack of food but what is contained in the food. Other issues to be considered would be agricultural sustainability, economics and politics. In order to solve world hunger, these issues must be fully addressed before GMOs or genetically engineered foods can be used as an aid in solving world hunger. GMOs were introduced somewhere in the 1990's and genetically engineered and tested with tobacco and tomatoes in the United States. The three producers of GMOs are Monsanto, Syngenta, and Dow Chemical Company. This is not to say that GMOs were not around before the early 90's. History tells us that several countries have done scientific work on GMOs for some years, and with great success in the United Kingdom. <http://iml.jou.ufl.edu/projects/spring01/denlinger/problems.html>) “ Europe has a surplus of food production. They have so much food that they are being subsidized. They do not know hunger. They do not know poverty. They are talking with their stomachs full. Wambugu, Nairobi based plant scientist (T GMOs supply the world with enough food to feed 8 billion people, but what are the qualitative assessments showing us? World hunger still exist. In the industrialized cities of the world , GMOs would seem to alleviate the problem of hunger in those regions alone. However, we still find hunger in almost every major city in the world, with the exception of the United Kingdom,. If there are enough seeds then why would we still be fighting hunger and malnutrition? “ Malnutrition is addressed by scientifically altering the original pure seed; the scientific community faces the consequences of the hybrid or

GMO not having the quality of protein and amino acid properties to sustain the human body requirements"(Coleman, 2005 P. 1). GMOs, or genetically altered seeds that produce an abundance of food, may or may not have the qualified nutrients to efficiently quail world hunger. Some nutritionists have clearly stated that the unknown mutant genes, which may be produced by bio technical engineering the original pure seed, could bring about a myriad of strange mutant genes that could cause viruses, allergies and diseases as yet unknown to the medical field, consequences that need to be addressed by further testing (Bailey, 2002) In cities all around the world we have family after family with malnutrition. Children's diets are being neglected in favor of the mutant genetic technology of the GMOs, the proof is in the pudding. We cannot solve world hunger through engineered (GMO) seeds, we must address the reason for the malnourishment and that lies in the ingredients which the GMOs apparently are unwilling to test, or at least they have not stepped forward to do the testing. When variant micro-nutrients are used in designing the GMOs, consideration must be given to the quality of the GMO. The GMO must not only be a seed, but must contain the nutrients relevant to normal growth genetics involved in the growth hormones of the children we are feeding, or plan to feed. Bailey, et al. (2002) In an ' Abstract', Mather's theory...contained the following: " The theory of correlated responses postulates that selection for a normally balanced, polygenically controlled character produces unusual recombinant s from crossing-over. Other changes occur, and variations in other characters thus released, owing to mingling of different poly-genes along the chromosomes. Animal and plant breeding selection experiments showing correlated responses are analyzed

in the light of this theory. Selection for (1) the hooded pattern in rats led to sterility; (2) high and low body weights in mice produced psychological, morphological and physiological differences; (3) resistance to tumor formation in mice, following methylcholanthrene injections, led to a kaleidoscope shift in types of induced tumors; (4) high and low abdominal bristle number in *Drosophila* produced changes in other bristles, in spermathecae pigmentation, and in mating behavior. There was gradual reduction in fertility as selection proceeded. Selection for: (1) high and low oil content in maize produced morphological and agronomic differences, and became hindered by decreased fertility; (2) earliness and cold tolerance in sweet corn led to pseudo-starchiness; (3) pleiocotyly in out breeding species produced correlated changes in vigor, morphology and disturbances in hormonal balance, and increased lethality. Inbreeding species so far, have shown no correlated responses. The transformation of pneumococcal types and changes in viruses during their passage through plants are also related to the theory. Some evolutionary aspects of correlated heredity are discussed. Extinction of some animal and plant species may have occurred by specialized selection bringing about correlated loss of fertility. An evaluation outlined of correlated responses in plant breeding, especially for pleiocotyly selection. Their disadvantages will not be felt providing lop-sided selection is not practiced to an extreme. " (1954), does this mean that lop-sided selection is practiced, just as long as it is not to an extreme? There must have been a reason this ' Abstract' was worded this way"(Bailey, 2002 p.) According to the Federal Drug Administration the GMOs currently on the market have never been tested and no GMOs have ever been recalled. There

are unknown dangers that persist within these mixtures of mutant genetics. The testing, according to the FDA has never taken place, at least not in the field. (<http://www.fda.gov/ohrms/dockets>) A good example would be the production of alfalfa for instance, bees pollinate the plants and can fly for 5 miles pollinating. While some of the farmers that have GMOs are feeding the bees and the bees cross over to another farmer's land that is growing organically and the bee pollinates the plants. The farmer will lose his certification to grow organically and his right to sell his product as such in the market place. This contamination continues into the soil and irrigation system of the land and may infest for years to come. These are all unknown factors which need to be assessed before the GMOs are placed on the market. These assessments are way overdue and must be done before the seeds are put on the market, they must be heavily regulated as they will produce the human element, the most important part of this equation. If we do not have healthy people, mentally sound and able bodied to carry on the work of the land, what will we do to survive? There has not been sufficient testing to know what happens after generations of ingesting these mutant genes into the human body, so this begs the question, what good are they if they cannot solve world hunger, they are mutilating the crops, mutilating good seeds, mutilating the land and the irrigation systems so that good seeds cannot be planted for years to come. The quantity of GMOs to feed 8 billion people is not the question, the quality of these GMOs is in question worldwide. (<http://www.farmaid.org/GMOs>) If scientist have the answers to the growing populations food demand then where is the food going? Partha Dasgupta discusses this issue in " Feeding a World Population of More than

Eight Billion People: A Challenge to Science". He states that " by 2020 the population will reach 8 billion plus and that a large part of the world will go hungry despite affluence. Hunger would primarily affect women, children, and the elderly". Dasgupta argues that " world hunger is not a distribution failure, nor a production failure", and the idea of such is misleading (Waterlow, et al. p. 20). The food supply is more than enough to sustain the population. If distribution is not a factor and neither is production, this begs the question: Why is the world hungry? With so much food production, why are people malnourished? A large majority of the hungry people in the world reside in third world countries. These countries lack the infrastructure and this directly affects people living below the poverty level from rising to the point of stability, financially and economically. Simple ideas, i. e., roads, schools and agricultural development can suspend poverty indefinitely. Toads to provide access in traveling to and from areas that have food supplies, schools provide knowledge so that one can learn how to take care of oneself, as well as lessons in basic agriculture. Basic sanitation, something taken for granted in affluent countries, can make a difference, because without proper sanitation and sewage systems, communities die from disease. Farm Aid also states that according to the National Research Council (2002)... "GE [genetically engineered] crops pose additional environment risks, such as unintentional harm to other insects and animals in the ecosystem. The sheer prevalence of GE crops also threatens biodiversity in our seed supply, making us more vulnerable to pest outbreaks. The US Department of Agriculture conducts no monitoring to see if any GE crop has harmed the environment once it's released" (<http://www.farmaid.org/site/c>.

qII5lhNVJsE/b. 2723717/k. 5146/Genetic_Engineering_GMOs. htm#8) The Cost The technology involved in producing GMOs has to be costly, the testing, the science and then the production. Monsanto was one of the first companies to step into the arena regarding GMOs. To establish themselves in the marketplace as the leader of GMOs, they began buying up smaller seed companies, which would allow them to acquire a larger customer base and also force the GMO seeds to their customer. This attributed to the high-cost of producing GMOs. The cost to the small farmers is also relevant in that they must buy new seeds every year so as to not water down the GMOs and to keep the new GMO seeds coming. In third-world countries, the smaller farmers cannot afford the seeds every year and this presents a new problem with the watered down GMO seeds. What genetic imbalances could or could not be reproduced in using watered-down seeds? The cost to the public is inherent in that if the people cannot afford to feed themselves, they will have to forage for food, or steal and this leads us to societal injuries not addressed by those who are trying to sell their wares at a high price to the tune of ' feed the world'. The cost relevant to producing a higher yield must be taken into consideration. According to Waterlow (1998), " the maize hybrids in the USA has reduced the height by only . 08% but the yield potential was only increased by 1%". How then will Monsanto, Syngenta or Dow Chemical feed the world's hungry with that small of an increase in yield? The cost in producing higher yields would have to be passed onto the customer or the farmer, thus creating other problems in securing the seeds necessary to grow their own food. Testing The Food and Drug Administration (FDA), United States Drug Administration (USDA) and the Environmental

Protection Agency (EPA), are responsible for regulating the SMOs. There is minimal testing because it is presumed by these regulators that transgenic food products are safe, the question of safety lies with those who would question GMOs to show the risk involved in ingesting these GMOs. Bailey (2002) There must be a higher standard whereby the GMOs must meet a higher standard in producing the GMOs because of the risk to human life involved. The regulators, neither the producers nor the general public have any idea about the rDNA technology in GMOs. Bailey clearly states this in ..."The use of rDNA technology in food production may deserve more oversight because it is newer and less rigorously tested than are other methods of crop modifications that have been in place for much longer periods" (Bailey et. al p.). The FDA went on to state that if the manufacturers of these foods would like to voluntarily label their products, that would be okay. Is it Moral? Does the manufacturer have a moral obligation to present the facts properly to the consumer? Do they not have an obligation to explain to the consumer the process by which these GMOs are engineered and the hazards they may or may not present in the future?. The Luddites and the public at large should be made aware of the process by which these GMOs found their way to the marketplace. For the last 15 years or so, the producers of genetically engineered organisms have been promising better yields. They claim that their scientifically engineered seeds can and will feed the world and rid us of world hunger. However, according to Doug Gurian-Sherman..." That promise has proven to be empty" despite the commercialization, advertising genetically engineered crops have failed to yield any substantial amounts. (2009) (p77) Recently the Luddites, the anti=

GM lobby, and environmentalist have taken issue with the failure of the GMOs to abolish malnutrition and or world hunger. They feel that approaching the malnutrition and world hunger is a matter which involves the proven technologies, i. e. aggro-ecology. There are many groups who have formed small entities of people to put to better use the land management, which involves anti erosion measures, better water systems, trickle irrigation, recycling manure and increasing the soil's organic content and integrating perennials into the crops. They believe that this will increase the yields by a minimum of 60 percent and that improvements in plant technology, such as assisted breeding are producing better crops at better yield rates without resorting to biotechnology and the genetically altered crops with their unknown properties or unknown results. Conclusion There is no conclusion, while there is evidence of malnutrition and world hunger prevalent in the world today the issue is how do we deal with the feeding of millions of starving people and do it in the right way. Feeding the starving people of the world is a costly endeavor that nobody really seems to want to do it except Monsanto, Syngenta, and Dow Chemical. Some would argue that these producers of GMOs can produce the seeds for the crops, however there is substantial reason to believe that they may or may not be nutritionally beneficial to the recipients, thus continuing the malnutrition that is a worldwide problem. Genetically Modified Organisms (GMOs) alone cannot solve world hunger it is not a matter of quantity but quality of the end product that seems to be the issue and one that must be addressed soon.

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