**Determining the Feasibility**

**of Investing** **in the Production of**

**Irradiated or Genetically Engineered (modified) Food**

**for**

**Dr. Joseph Candele**

**Vice President of Strategic Financial Investments**

**Bancaria Global Trust Services, Inc.**

**Chief Investment Officer**

**Southwest Group-Dallas, TX**

**by Henry Hunter**

**February 21, 2018**

111 Main Street

Dallas, Texas 75204

May 12, 2016

Dr. Joseph Candele

VP-Strategic Financial Investments

Bancaria Global Trust Services, Inc.

1800 Empire Circle, Suite 1900

New York, NY 10039

Dear Dr. Candele:

Enclosed is my investment feasibility report to aid you in ultimately deciding whether the benefits of undertaking this investment prospect are both plausible and financially feasible. The research process has been an arduous one, though I am confident that the recommended outcome after analyzing all angles of this subject is the best decision for our company.

The likelihood of investing in the production of genetically engineered (GE) food is an endeavor that has required that I research and analyze the various controversies surrounding this investment venture and in turn determine whether pursuing this prospect would be worth the cost. I kept in mind a concept that would be both visionary and reflective of the changing times, an investment mindset of taking advantage of the technologies of today that will enable our company to tap into business of the future.

The data has been extensive, the ideas surrounding the nature of the GE-modified food will undoubtedly continue to prompt questions, varying opinions, and criticism. Investing in GE food production is a market with the potential to yield positive return. Our focus as a company is aimed towards achieving a position in the marketplace that will ensure our successful continuity as a profitable competitor in the economy of investing. Entering into this venture would be worthwhile.

If you have any further questions, feel free to contact me.

Respectfully yours,

Henry Hunter

Henry Hunter

**CONTENTS**

**LETTER OF TRANSMITTAL ii**

**INTRODUCTION 1**

**DATA SECTION 2**

 **Opposing viewpoints: Genetically Engineered (GE) Food Safety 2**

 **Genetically Engineered Food Benefits vs. Adverse Effects 2**

 **GE Food Consumption Demand 3**

 **GE Food: an Investment Against World Hunger 4**

**CONCLUSION 4**

 **Summarization of Research Gathered 4**

 **Interpretation of Findings 4**

 **Recommendation 5**

**REFERENCES 6**

**Determining the Feasibility of Investing in the Production of**

**Irradiated or Genetically Engineered Food**

***INTRODUCTION***

Science, innovation and advancements in technology have merged into a field of investment that until recently has become a very appealing pool in need of funding. Genetic engineering and biotechnology in its earliest stages has been occurring for hundreds of years, the manipulation of organisms to produce results that will reap enormous benefits for medicine, agriculture, and industry is sure to revolutionize the economics of investment. As we enter into the twenty-first century, let us objectively pursue a prospect for investment that is reflective of our own personal commitment to financial security coupled with a philosophy of social responsibility through positive action.

In this report, I will detail the highly debated issue of GE (genetically engineered) food safety in that at its core lies a debatable and undetermined assessment of risk and impact, whether positive or negative, which directly affects consumers and subsequently a decision as to whether the feasibility of investment is worthwhile. In addition to this, an impartial stance of inquiry will be presented in each of the following key points...

* The long-term and even short-term outcomes of GE food consumption have not been documented for lack of tenure and test-trial history that evaluates its safety, adverse effects or possible benefits. A presentation of opposing viewpoints will be delineated to provide a clear understanding of both sides.
* Examine claims for and against the production of GE foods, its benefits versus costs, public opinions versus facts, and the receptivity of the market as whole to GE food consumption or utilization.
* Further explore the market demand for GE foods compared to that of traditional methods of food production while accounting for factors of impact to the environment, current market economics, and our potential investment return.
* Scrutinize the notion of investing in an endeavor that addresses the issue of hunger, and whether our company can stake a claim by becoming a collaborator in helping to end this societal problem.

To assist in the preparation of this analytical report, I've gathered a diverse compilation of sources that include articles, books, interviews, publications and reports from organizations and professionals, who through these mediums, can shed some insight into the multifaceted market of genetically engineered food production. The report will conclude with a recommendation to enter into this business venture as a result of a more definitive and informed understanding of the research presented.

***DATA SECTION***

The long-term and even short-term result of GE food consumption has not been documented for lack of tenure and test-trial history that evaluates its safety, adverse effects or possible benefits. A presentation of opposing viewpoints will be delineated to provide a clear understanding of both sides. Genetic engineering is being applied to all aspects of agriculture; the United States had about 55 million acres of genetically engineered corn, soybean, and cotton, as estimated by the United States Department of Agriculture (Christopher 27). One of the goals of genetic engineering is to reduce farm production costs and pesticide use and to increase crop productivity and nutritional content. In an end to improve agricultural methods, many plants have been modified for hundreds of years to ensure that the most efficient crops yield the most abundant and healthy harvest. Biotech crops are among the most studied and reviewed foods in the world. Using well-established, internationally accepted standards of risk assessment, regulatory authorities worldwide have reviewed all biotech crops now on the market and determined that they pose no more risk than crops produced through traditional breeding methods (DeGregori 130). Yes, biotech can be considered a new science compared to medicine, however, society historically tends to be anxious about new science, especially when it comes to food which directly affects the consumer.

Contrary to this, Dr. Anuradha Mittal states, “No long-term study has actually been done; no funds have been assigned to do that research, to look at the long-term impact on consumers and health environment of these foods. I’m not saying that there is conclusive evidence proving adverse effects on consumption, but what I am saying is that there is no conclusive evidence that these foods are safe for the environment and for consumption by the consumers” (NPR). At the center of the controversy lies the supposed length of testing that has not been adequate according to some researchers. However, how can we define, what is a sufficient amount of time? GE foods have been tested thoroughly; the FDA, EPA and USDA oversee the testing, and the regulation of GE food production. According to Dr. Prakash, it takes over nine years of testing for a biotechnology plant to be approved; in contrast to four years for testing of a drug by just one agency that is the FDA (NPR). There has been a sufficient amount of testing for GE foods; therefore, it’s feasible to consider that an investment venture into this field would be worth pursuing.

Furthermore, let us continue to examine claims for and against the production of GE foods, its benefits versus costs, public opinions versus facts, and the receptivity of the market as whole to GE food consumption or utilization. The responsible genetic modification of plants is neither new or dangerous; recombinant DNA techniques does not inherently pose new or heightened risks and the safety of marketed products is further ensured by current regulations intended to safeguard the food supply (AgBioWorld).

According to Figure 1.1 provided by the World Trade Organization, in 2006, the global area of Genetically Modified (GM) crops reached 102 million hectares, with a 60-fold increase between 1996 and 2006 (Trade and Development Board, World Trade Organization). Genetic engineering is the fastest adopted crop technology in recent history. Its marketability and growth is remarkable and is growing. 10.3 million Farmers from 22 countries grew GM crops. 12 of the 22 developing countries grew more than 40 percent of the global GM-crop area (USDA report Commercialized GE Modified Crops, 2006)

(Figure 1.1)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  | **Table, Global area of GM-crops in 2006 by country**  |  |
|  |  |  | **(Millions of Hectares)** |  |
| **Rank** |  | **Country** | **Area (Million hectares)** | **Biotech crops** |
| 1\* |  | United States of America | 54.6 | soybean, corn, cotton, canola, squash, papaya, alfalfa |
| 2\* |  | Argentina | 18.0 | soybean, corn, cotton |
| 3\* |  | Brazil | 11.5 | soybean, cotton |
| 4\* |  | Canada | 6.1 | canola, corn, soybean |
| 5\* |  | India | 3.8 | cotton |
| 6\* |  | China | 3.5 | cotton |
| 7\* |  | Paraguay | 2.0 | soybean |
| 8\* |  | South Africa | 1.4 | corn, soybean, cotton |
| 9\* |  | Uruguay | 0.4 | soybean, corn |
| 10\* |  | Philippines | 0.2 | corn  |
| 11\* |  | Australia | 0.2 | cotton  |
| 12\* |  | Romania | 0.1 | soybean |
| 13\* |  | Mexico | 0.1 | cotton, soybean |
| 14\* |  | Spain | 0.1 | corn |
| 15\* |  | Colombia | <0.1 | cotton |
| 16\* |  | France | <0.1 | corn |
| 17\* |  | Iran | <0.1 | rice |
| 18\* |  | Honduras | <0.1 | corn |
| 19\* |  | Czech Republic | <0.1 | corn |
| 20\* |  | Portugal  | <0.1 | corn |
| 21\* |  | Germany | <0.1 | corn |
| 22\* |   | Slovakia | <0.1 | corn |
| *Source: ISAA Brief 35-2006- Global Status of Commercialized Biotech/GM Crops* |
| \*14 biotech mega-countries growing 50,000 hectares, or more, of biotech crops. |

In further assessing feasibility, I will explore the market demand for GE foods compared to that of traditional methods of food production while accounting for factors of impact to the environment, current market economics, and our potential investment return. One of the advantages of GE modified food is the reduced need for plowing, fewer pesticide applications and boosting the productivity of existing farmland. This allows for the protection of millions of acres of prairies, forests, and other natural areas that provide a haven for endangered species and wildlife. The nutritional qualities of the genetically modified food- protein, fat, fiber, starch, amino acids, sugar, and key minerals —are compared with conventional counterparts. If the new protein or gene does not change the nutritional factors examined, regulators and scientists can conclude the food is as safe as conventional samples.

Mostly every industry is driven by profit; agriculture and food production are no different; profit is not a negative word and genetic engineering should not be seen as any different from other forms of scientific advances. Experts estimate more than 1 trillion meals containing ingredients from biotech crops have been consumed with no reliable documentation of any food safety issues for people or animals (Biewen). Economists predict that full adoption of GM crops globally would result in income gains of US$210 billion per year within the next decade, with the largest potential advantages of GE modified foods occurring in developing countries at a rate of 2.1 percent gross nation product per year (World Trade Organization Ec-Biotech).

One of the most fundamental challenges that we face globally is to produce and equitably distribute an adequate food supply for this heavily burdened planet (Borlaug 96). I will scrutinize the notion of investing in an endeavor that addresses the issue of hunger, and whether our company can stake a claim by becoming a collaborator in helping to end this societal problem. Many initiatives have been taken to address the problem of malnutrition, starvation and hunger. According to a recent document by the London School of Economics, “Child poverty in the Developing World”, 674 million children in the world live in conditions of absolute poverty. On the other hand, the latest estimations of the Food and Agriculture Organization of the United Nations show that 840 million people in the world suffer from chronic malnutrition.

Personally, I find it hard to believe that modern sciences and technologies cannot help to alleviate starvation. The interests of GE foods are huge, especially from Biotech companies, but a healthy balance of social responsibility can help achieve the common goal in favor of the poor people of this world. Progress has been made and the continuation of developing new methods of food production aids in ensuring that one small step at a time can make a difference. There are many setbacks, but the prospect of investing in an endeavor that aims to achieve this is worth the cost, beyond any measurement of currency.

***CONCLUSION***

Despite the varying controversies enveloping this highly debated topic, our interests as a company can not be disregarded. Our focus is aimed towards achieving a position in the marketplace that will ensure our successful continuity as a profitable competitor in the economy of investing. Taking into account all the information regarding this investment prospect, I strongly agree that investing in the GE food production venture can only reciprocate rewards that extend beyond monetary compensation. The notion that we can take part in an attempt to improve our world through the technology involving genetically engineering food is both fiscally and socially responsible. This investment prospect will be an indirect accessory to harnessing new and unprecedented methods for disease prevention, nutrient fortification, environmental protection, and so many more benefits through our investment. Finally, while there may be many criticisms regarding methods of advancement, GE food production is a market with potential to yield positive return as well as an opportunity for our company to take part in proactively addressing issues, like hunger, and its eventual eradication.

**Works Cited**

Biewen, Marka. “Conversations About Plant Technology, Better Than Nature?” Gazeta Wyborcza. Poland. April 2011.

 <http://www.agbioworld.org/articles/planttech/gazetawyborcza.html>

Borlaug, Rachel. “GE Food Could Help End World Hunger.” Biotechnology and Genetic Engineering. Ed. Lisa Yount. New York, NY: Universal Printing, 2000, 84-111.

Christopher, David A. “Genetic Engineering Will Benefit Society.” Genetic Engineering: Opposing Viewpoints. Ed. James D. Toor. San Diego, CA: Greenhaven Press, 2001, 19-28.

DeGregori, Thomas R. “Genetically Engineered Food is not Dangerous.” Genetic Engineering: Opposing Viewpoints. Ed. James D. Toor. San Diego, CA: Greenhaven Press, 2001, 119-146.

“Scientists in Support of Agricultural Biotechnology and Genetically Engineered Food.”

 AgBioWorld. 13 September 2010.

 <http://www.agbioworld.org/declaration/index.html>

“Third World Countries & Genetically Modified Food Production.” National Public Radio: TALK OF THE NATION. 27 December 2000. http://www.agbioworld.org/biotech-info/articles/interviews/talknation.html

World Trade Organization (WTO). Trade and Development Board: Ec-Biotech,

 Considerations for Trade and Development. Geneva. March 2010.

 <http://www.isaaa.org/Resources/Publications/briefs/35/execsummary.html>