



# GMO Cricket

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# Hunger

## Overview

- Over 795 million people in the world are suffering from chronic hunger
- 98% live in developing (third) world countries
- Prices for necessities like food are rising and is a direct link to the rise in chronic hunger in the world

## Reasons for Hunger

- Poverty - lack of resources or poor income distribution in the world
- 3rd world countries can't buy these resources - why they suffer the most

# Drought

Drought- a prolonged period of abnormally low rainfall in a specific area

## Overview

- Developing (third) world countries are disproportionately affected by rainfall
- Drought is a naturally occurring weather pattern in the world, but it is more likely to occur in areas where there isn't a lot of rain
- Third world countries climates are typically drier which means with the rising temperature occurrences like drought will become more often
- This makes it harder to grow crops and keep these countries population's alive
- 1.8 billion by 2025

# Why do these problems need to be solved?

- These 3rd world countries already have low funds and if their populations keep suffering because of the malnourishment caused by the rising climate change, they will continue to suffer at an exponential rate

If not solved

- Whole continents will die out
- Important trade ports in these countries will cease to exist
- People in the world will continue to suffer

# Our Solution

How we plan on solving these detrimental problems that are negatively affecting our environment will be to genetically modify crickets that will provide the same nutritional benefits as a cow, but only need to take only 1.5 teaspoons of water to survive and reproduce. This will lower the amount of hunger in the world because there is now a constant supply of food to these developing countries. The bugs don't need much water to survive, which means that third world countries can use the limited clean water they have for themselves and not have to put it towards agriculture.

# How GMO works

We will use substitution to insert the WETA cricket size regulatory gene in the genes of the North American Cricket.

The GMO process is a game of chance so we will never truly know what the offspring will look like until it is done. By inserting the gene at different stages of the crickets youth we will be able to tell when the best time to insert the gene in the development stages to have the best results.

# Costs

The initial cost of this entire project would be about \$ 300,000

Lab: \$ 150,000 (in pacific northwest area)

WETA gene: \$50,000

Flights: \$ 50,000

Crickets: \$ 30,000

FDA Preservation Steps: \$ 20,000

# Plan of action

Our solution will be inserting the weta cricket size regulator into the genes of a North American cricket. This will allow the North American cricket to grow to about 2.5 oz and be full of protein and more nutrients than any meat product of the same size. The crickets will also need less water than pork, chicken, and beef.

## FDA regulated 5 step process for food preservation

1. Prevent contaminating food with pathogens spreading from people, pets, and pests.
2. Separate raw and cooked foods to prevent contaminating the cooked foods.
3. Cook foods for the appropriate length of time and at the appropriate temperature to kill pathogens.
4. Store food at the proper temperature.
5. Do use safe water and safe raw materials.



# Implement

We have two options on how we would implement these crickets into third world countries.

1. Ship the eggs of the North American cricket with the WETA genes already inserted to the countries and once they begin to grow and the tribes are able to be sustain themselves we will no longer need to continue shipping them.
2. We can use crickets that are already indigenous to the country so we would not need to ship the egg, but still need to ship the WETA gene out to the country and insert the gene there.



# Cook

## Steps to cooking the crickets

1. Kill crickets once they are fully grown and at their peak of nutrients
2. Boil crickets for about 15 minutes
3. Leave them out to dry for a couple hours
4. Sprinkle on some spices such as salt to add flavor
5. Enjoy!

# Reproduce

A female North American Cricket can lay anywhere from 100-200 eggs, and it takes about 2-3 months for the baby crickets to grow to a size that would hold enough nutrients. This means after a couple of slow months the reliability of the crickets will exponentially increase and a constant fulfilling food source would be achieved.

# Conclusion

By inserting the WETA gene into the North American Cricket we will be able to not only greatly increase its size, but its nutritional value as well. This will provide a steady food source for tribes and indigenous areas throughout Africa and solve a problem such as hunger there. Due to the lack of water needed to grow the crickets in mass quantities, these areas in Africa who have a limited supply of water already do not have to use it for agricultural purposes. This will solve the drought problem in these areas.