Golden Rice:
The Need, the Science, and Public Reception of GMO’s
GMO?

Genetically Modified Organism

How is a GM crop made?

- Specific trait is determined
- Gene that denotes that trait is isolated (DNA hybridization)
- Gene combined with promoter and terminator
- Gene inserted into desired plant cell
- Plant tested for efficacy of trait
Vitamin A<sub>2</sub>

- **Fat soluble vitamin**

- **Foods**
  - Dark leafy greens
  - Red/dark orange vegetables
  - Liver
  - Eggs
  - Fortified foods

- **Linked to immune and epithelial cell health**
Vitamin A_{2,3}

- Retinal
  - Pigment in rod cells
  - Needed for photoreception
- Rhodopsin
  - Night vision
- Epithelial growth and differentiation
Vitamin A Deficiency (VAD) ²

- Not clearly defined
- Decreased Immune System
  - Low amount of goblet cells
  - Decrease immune secretions
- Night blindness
  - Not enough rhodopsin being produced
  - Cannot see in dim light or dark
- Bitot’s Spots
  - Build up of keratinized epithelial cells on eye
VAD Prevalence

WHO 1995 survey of Pre-school aged children

- Southeast Asia (49.9%)
- Africa (44.4%)
- Eastern Mediterranean (20.4%)
- Europe (19.7%)
- America’s (15.6%)
- West Pacific (12.9%)
Ways to Combat VAD

- Supplement programs
  - 60,000 retinol equivalents/ four months
  - 30% decrease in childhood mortality
- Increase Access to Vitamin A rich foods
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GM crop with increased amount of beta-carotene

How made?
- Corn gene - phytoene synthase
- Bacterium gene - phytoene desaturase
- Convert carotenoid compounds to beta-carotene
Public Interviews 9, 10

Well educated individuals
- PhD, RD
- BS in Economics and Marketing

Diverse responses
- Should be investigated more
- Should be used in developing countries
- Food allergies

Sources: Friends, online articles, journals
Conclusion

Vitamin A deficiency
- Effects eyesight and immune system
- Prevalent in Southeast Asia and Africa

Supplementation programs alone are not completely effective

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Public is not well educated on GM crops and the uses around the world
Resources


