



# **Edible Antibiotics**

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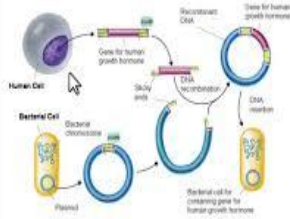
# Case Highlights



- Phytopharmaceuticals (GMOs or natural) drugs derived from plants
- Scientists want to modify corn to contain high levels of penicillin
- Penicillin is used as an antibiotic used to fight infections
- Costs 10% of the current penicillin cost
- Would provide a reliable source of antibiotics/ medicine for developing countries
- Can be taken orally so it eliminates the danger of needles
- The U.S. has mostly not allowed GM food, but have approved the modification of this organism

# Explanation of DNA technology questioned

- ❑ Agrobacterium Tumefaciens Method
  - ❑ Bacterium carries the desired trait into the plant cell
  - ❑ As the plant grows the bacterium grows with it and the DNA mixes
- ❑ Particle Gun Method
  - ❑ Metal particles are encoded with the DNA and placed into the plant
  - ❑ The DNA from the metal particles combines with the DNA in the plant
- ❑ Recombinant DNA Method
  - ❑ DNA from one or two or more sources are combined
    - ❑ Desired DNA segments are cut from the chromosomes using restriction enzymes
      - ❑ Restriction enzymes: enzyme able to cleave DNA based on certain base sequences
    - ❑ These segments of DNA are then inserted in a different chromosome using ligase enzymes
      - ❑ Ligase Enzymes: enzyme that catalyzes the joining of two molecules



# Identification of issues

## ❑ Biodiversity

- ❑ Contamination of organic crops occurs when GMO pollen spreads by wind, insects, and other natural factors, decreasing biodiversity

## ❑ Economic

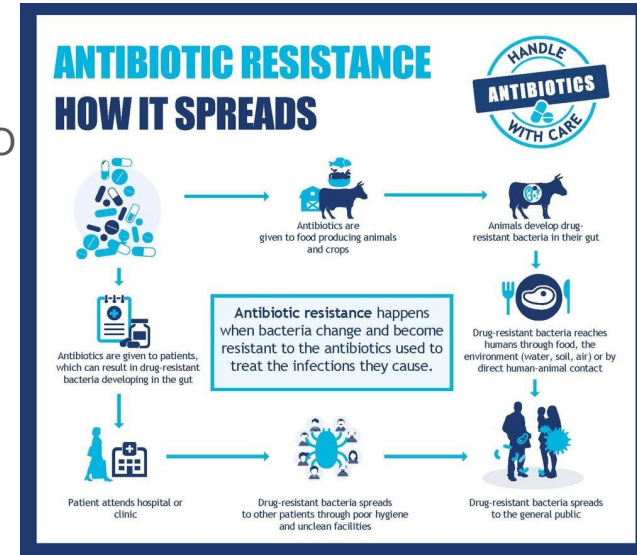
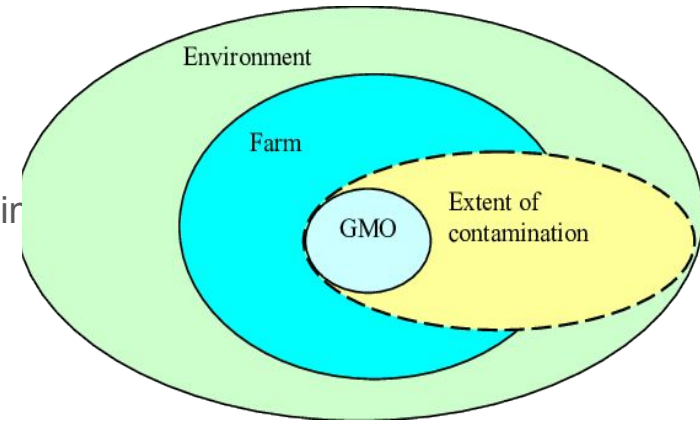
- ❑ Contamination can ruin the crops of organic farmers
- ❑ Big businesses are able to mass produce GMOs at low costs, making it easier to buy out smaller farmers

## ❑ Human Health

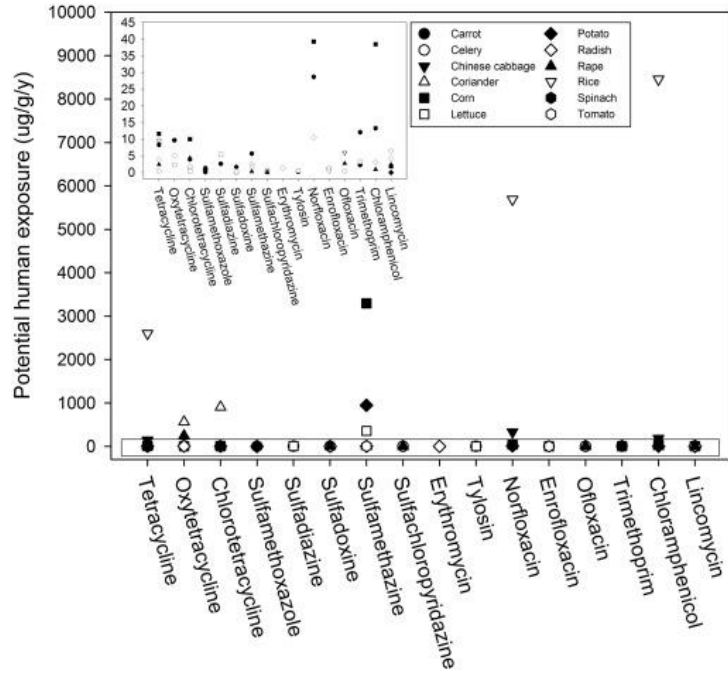
- ❑ Some people have allergies to certain compounds within GMO crops. Pollen drift, storage contamination, and contamination of supplies further exacerbate this risk
- ❑ Some argue there has not been enough research concerning the health effects of GMO consumption

## ❑ Resistant Bacteria (“Superbugs”)

- ❑ Bacteria can evolve to become resistant to the antibiotics within GMOs, making it even more difficult to kill them

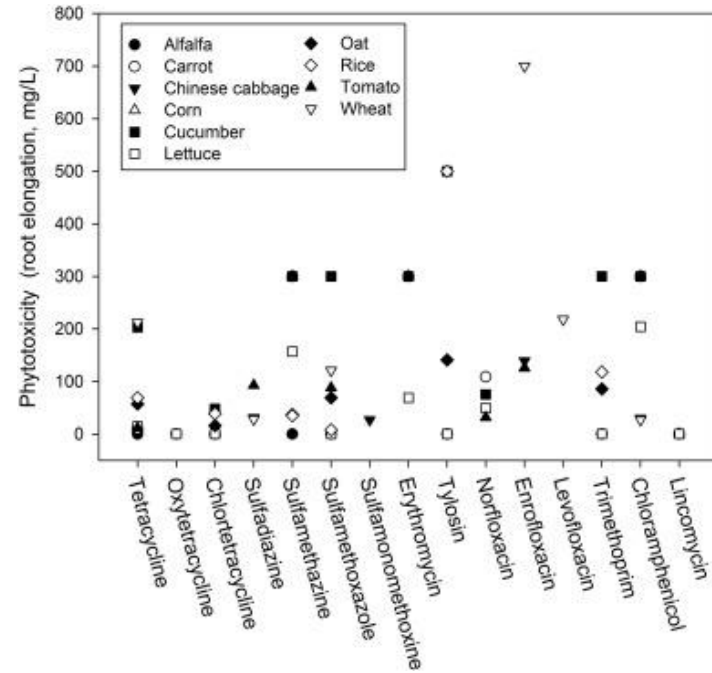


# Will your grocer become your pharmacist?



- Human exposure can reach 6000ug
- Wind pollination can contaminate other crops and affect those with allergies

**Edible antibiotics in food crops should NOT be encouraged**



- Phytotoxicity (plant injury) can occur with levels of 700 mg/L
- Threat of cross contamination with neighboring fields

# References

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