

GMOS AND THE GUT



GMOs

- Organisms whose genetic material has been artificially manipulated in a laboratory through genetic engineering
- Foreign substances added on a DNA level
- Different from a hybrid which is a natural process that can be done for good and bad reason



GMOs

- Little testing has occurred – most of it has been “in the field”
- There are some animal studies that show issues such as cancerous tumors
- 70% of the GMO corn and soybeans are fed to animals



Animals

- The industry sites trillions animals have been fed this food and the damage has not show in the animals so far.
- Independent studies of farm animals show no difference
- Cows are not rats
- Are farm animals healthy?



Current GMO Crops

- **Alfalfa** (first planting 2011)
- **Canola** (approx. 90% of U.S. crop)
- **Corn** (approx. 88% of U.S. crop in 2011)
- **Cotton** (approx. 90% of U.S. crop in 2011)
- **Papaya** (most of Hawaiian crop; approximately 988 acres)



Current GMO Crops

- **Soy** (approx. 94% of U.S. crop in 2011)
- **Sugar Beets** (approx. 95% of U.S. crop in 2010)
- **Zucchini and Yellow Summer Squash** (approx. 25,000 acres)
- Approved but not available
- **Apples**
- **Potatoes**
- ****Wheat is not genetically modified****



Two types

- Herbicide-resistant and Pesticide-containing
- BT Corn, canola, cotton contain BT toxin
- Kills pests when they attack the plant
- Some evidence that the bugs build up a tolerance
- BT cotton shows decline in yields



Glyphosate

- Herbicide used to kill weeds (Round-Up)
- Round-Up ready crops are impervious to Round-Up
- This allows the farmers to spray round-up and only kill weeds.



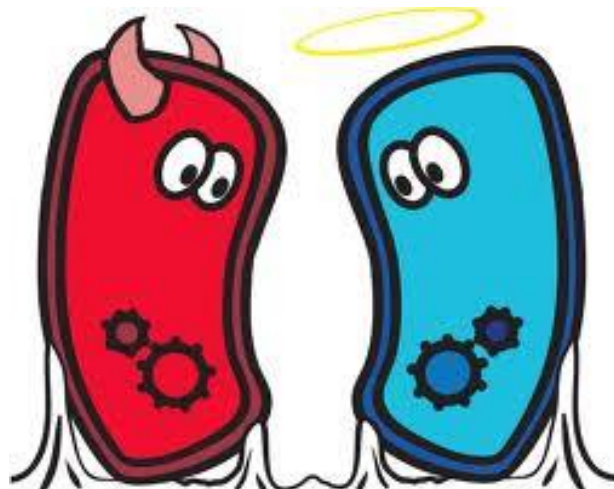
Glyphosate

- A non-selective herbicide
- Prevents plants from making specific amino acids needed for the growth of the plant
- It stops an enzyme pathway needed for this process
- This kills the plant



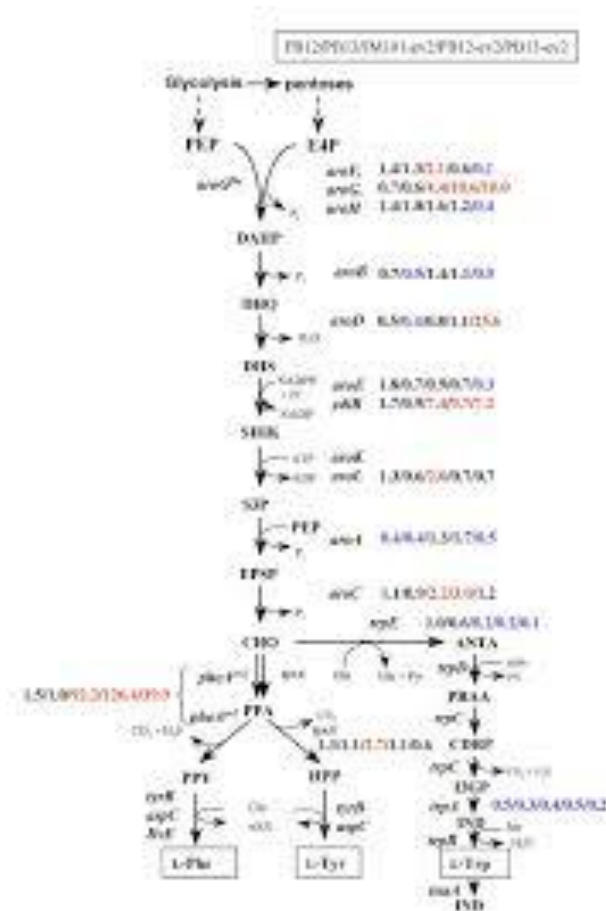
GMO's

- Glyphosate has been linked to lowering good bacteria at levels lower than recommended for commercial agriculture
- On study found that glyphosate affected 3 families - lactobacillus, bifidobacterium and bascillus bacteria but salmonella, and clostridium strains were resistant



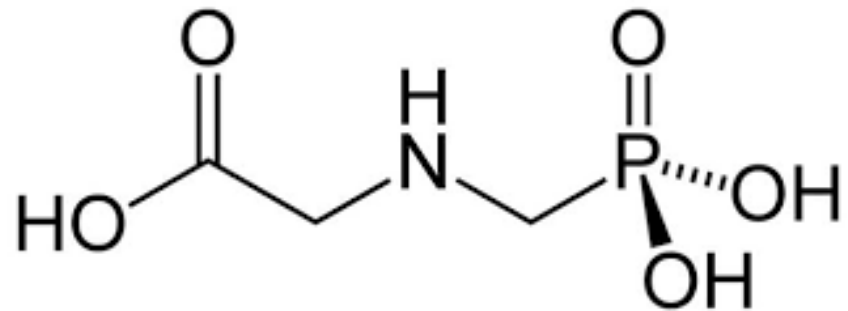
Shikimate Pathway

- It is a 7 step metabolic pathway that bacteria, fungi, and algae use to biosynthesize amino acids
- We do not have this pathway (so we must get amino acids from diet)
- Good bacteria does have a shikimate pathway



Glyphosate

- Some theories link this to health issues we may experience as a result of GMO
- Round Ready GMO seed prevents these plants from being killed by glyphosate
- Before farmers had to be careful not to hit the plant



- This allows the farmer to spray generously, the glyphosate residue is on our foods, something that was limited before
- This could be a factor in the increase of allergies but again it is due to the lack of good bacteria
- Desiccation is a process of spraying glyphosate on wheat and barley two weeks before harvest to essentially “kill” it so it can dry evenly



To Avoid

- Buy organic
- Look for non-GMO sticker on non organic product
- Buy heritage varieties
- Know your ingredients
- Read labels (many companies advertise that they do not use GMO ingredients)



- <http://www.nongmoproject.org/>
- <http://nongmoshoppingguide.com/>

What To Do

- Avoiding GMOs is ideal but we now have extra strategies to support gut health to help counter the damage
- Switching clients may help them avoid having to remove foods
- This may help with compliance for some clients

