TRANSFORMING AGRICULTURE IN AFRICA
AGROECOLOGY and ORGANIC TRADE

Reducing Synthetic Pesticides and Fertilizers

Are GMOs safe to eat? What happens when you exceed current inadequate safety requirements?

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What happens when you exceed these inadequate methods?

Carman JA, Vlieger HR, Ver Steeg LJ, Sneller VE, Robinson GW, Clinch-Jones CA, Haynes JI, Edwards JW (2013).

A long-term toxicology study on pigs fed a combined genetically modified (GM) soy and GM maize diet.

Journal of Organic Systems 8 (1): 38-54. Open access full text: http://www.organic-systems.org/journal/81/8106.pdf

Why pigs?

Physiologically similar to humans, particularly digestive system

Howard Vlieger: pigs in commercial production fed GM crops often have problems:

- Reproductive
- Digestive:
    - Inflammation in stomach or small intestine
    - Thin intestinal wall → rupture

Pigs

Commercial Yorkshire cross

Just weaned

Males neutered 3 days age

84 pigs per group

Fed 23 weeks (commercial lifespan)

Equal numbers male, female

Individually ID by tattoo + ear tag

Monitored daily, recorded


PRIDE
FARMS


Pax

Feed

Mixed soy and corn diet – normal in US pig industry

Half of pigs fed a GM diet containing three GM genes (RR, MON863, MON 810) - commonly eaten in USA

Half fed substantially equivalent, non-GM crops grown from same area

No isogenic control possible for the GM corn

GM and non-GM crops processed on same equipment

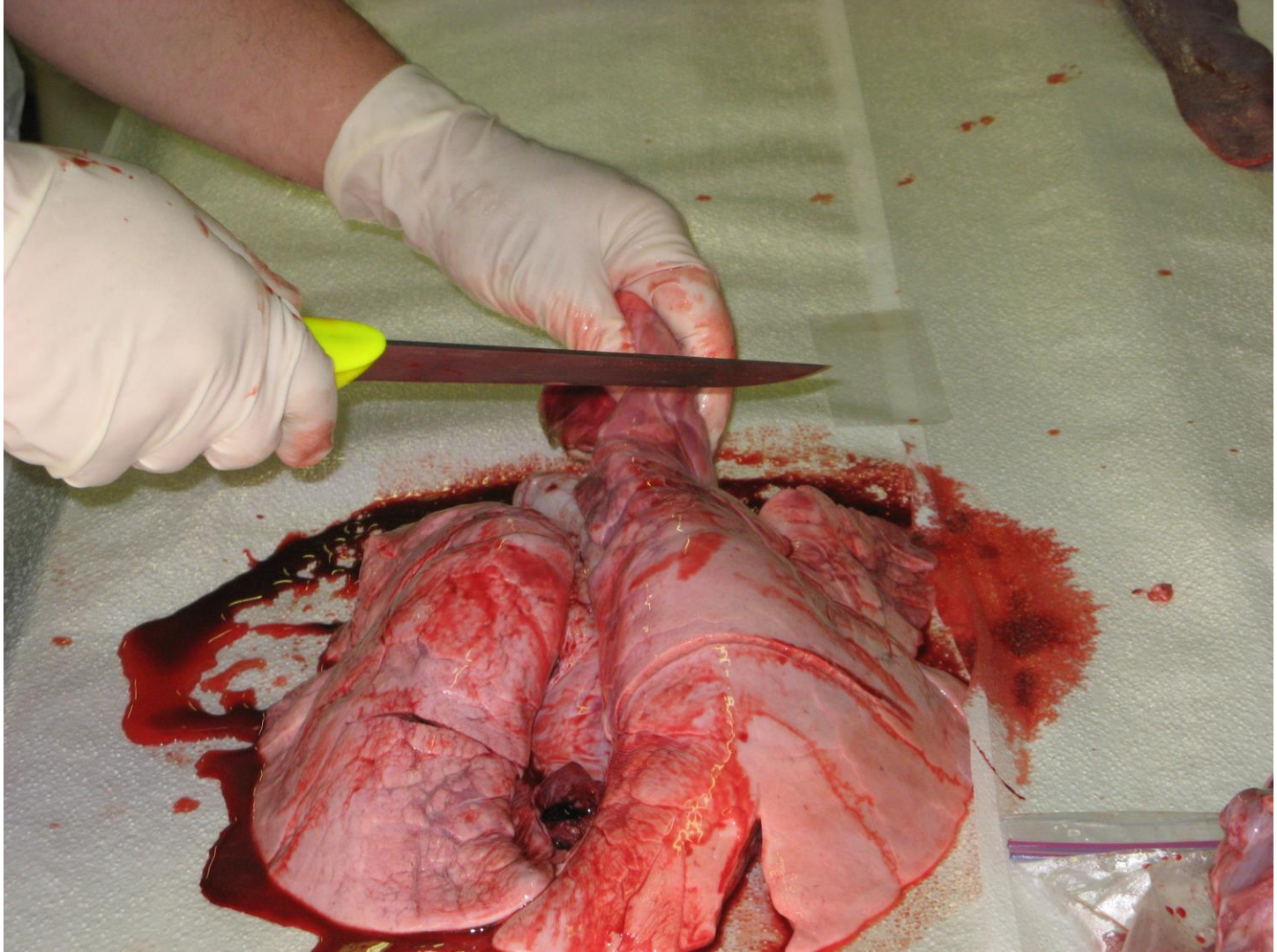
Autopsies

Killed in abattoir

Internal organs weighed

Examined internally: kidneys, hearts, lungs, stomach

Two blinded veterinarians



Uterus weights

25% higher in GM-fed pigs (p=0.025)

Males were neutered at 3 days old

Stomach inflammation

Measured as nil, mild, moderate, severe by blinded veterinarians

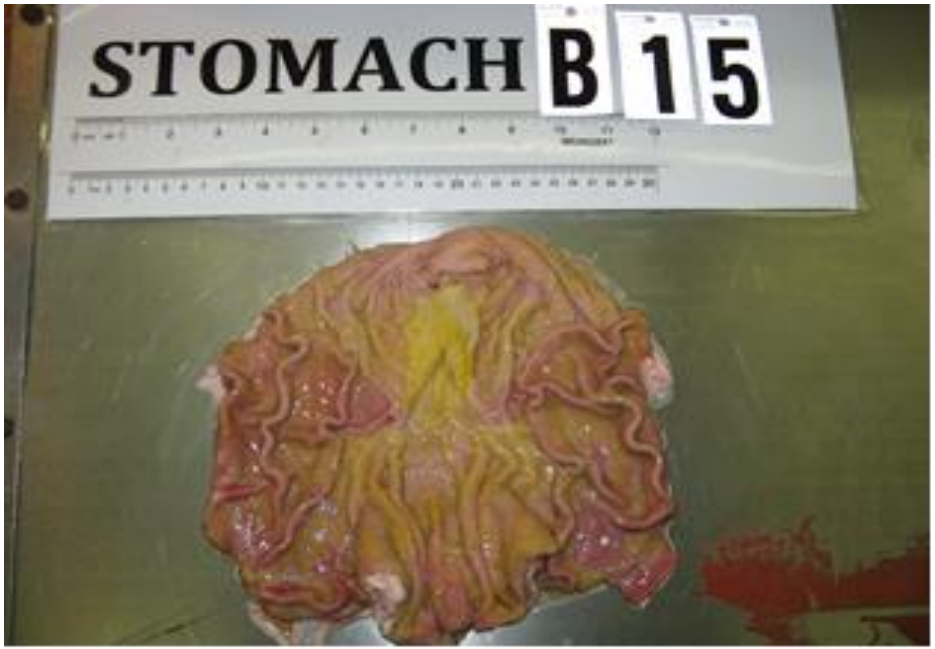

STOMACH B46

Nil inflammation

(fed non-GM feed)

Mild inflammation

(fed non-GM feed)



Moderate inflammation

(fed GM feed)

Severe inflammation

(fed GM feed)

Stomach inflammation results

The rate of severe stomach inflammation in GM-fed pigs compared to non-GM-fed pigs:

- Overall 2.6 times more likely, p=0.004
- In males – 4.0 times more likely, p=0.041
- In females – 2.2 times more likely, p=0.034

Cause?

Bt proteins are insecticides that rupture the gut of grubs

GM maize used contained two Bt proteins in the diet.

Act synergistically?

Blood biochemistry

Blood taken 2 days before autopsies

No difference between GM and non-GM-fed pigs

Standard biochemistry did not pick-up the stomach or uterus results

Pig study conclusions

A mixed GM soy and GM maize diet caused stomach and uterine pathologies in pigs.

Humans have a similar digestive tract to pigs.

Thanks!

ANY QUESTIONS?

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