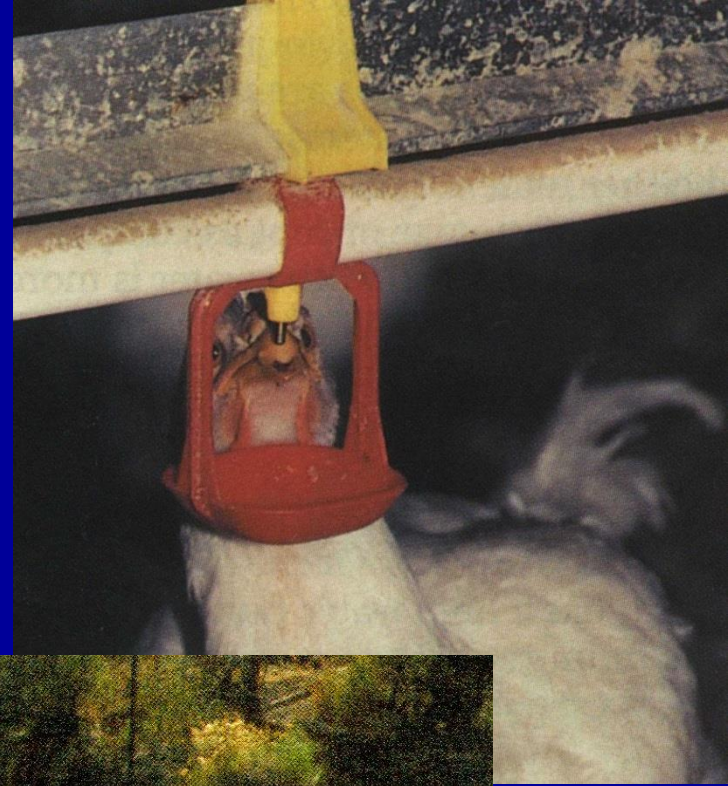


Livestock & Water



Past & current research

- **Water consumption & quality**
- **Predicting manure characteristics**
- **Handling, separation, storages**
- **Land application**
 - **Hydraulic**
 - **Nutrient**
- **Alternative systems**
 - **Vegetative, algae, aquaculture....treatment**

Possible research topics

- **Nutrient availability**
 - Placement
 - Timing
 - Distance from source
- **Plant nutrient uptake**



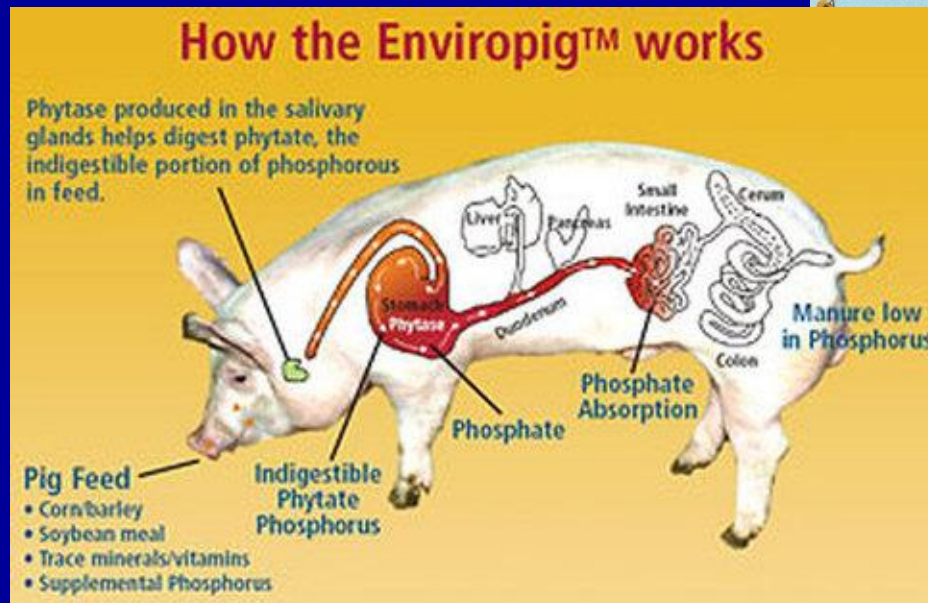
Possible research topics

- Buffer widths, manure application
 - Sediment
 - Nutrients
 - Pathogens



Possible research topics

- Increased nutrient retention
 - Decreased nutrient excreted
 - Via genetics and diet



Possible research topics

- Clustering of animals
 - Available land
 - Nutrient cycling
 - Air quality
 - Health



Educational needs

- Nutrient credit
- Land application techniques & methods
- By-product (food) recovery
- General public



Concerns

- **Regulations**
 - **Proper balance**
 - **“Carrot” & “stick”**
 - **Multiple agencies**
 - **State-of-the-art techniques & information**
 - **Economic compliance**

Concerns

- Regulations
 - Kudos to MPCA



Concerns

- **Sustainability**
 - Environmental issues
 - Economic
 - Quality of life



Concerns

- Disease transfer
 - Manure hauling, transfer, application





Going green



