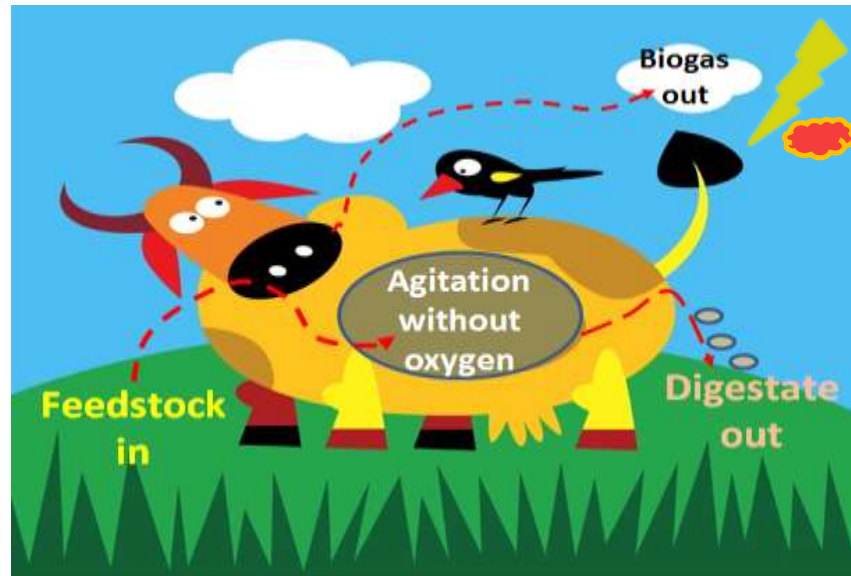


# Monitoring Feedstock & Keeping your bugs happy

**Avril Banks  
AD Network  
2017**



# Optimising the Process

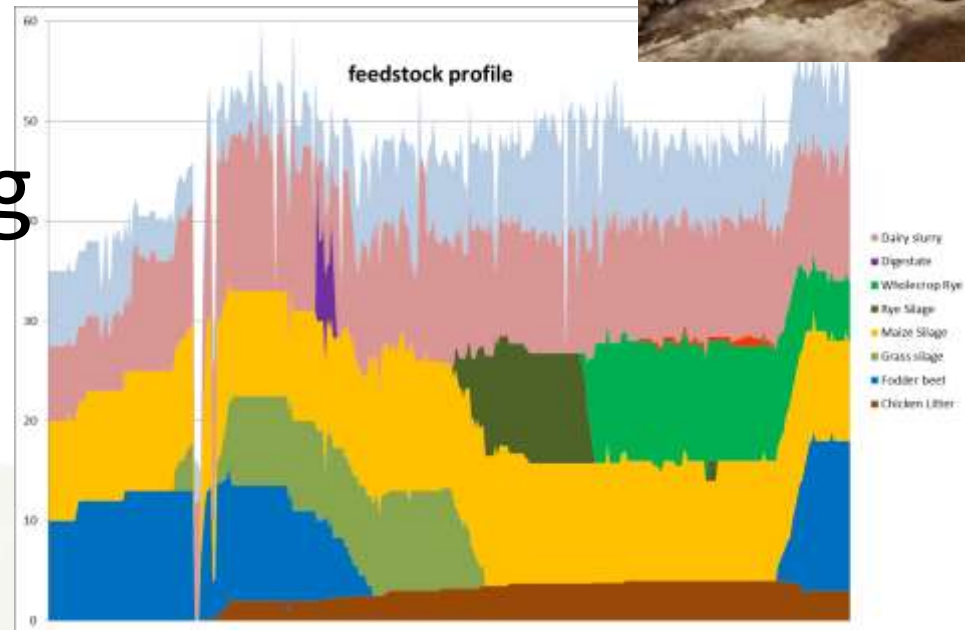
Choice of feedstock Waste / Crop

Feedstock preparation & storage

Microbial action

Agitation

Process monitoring



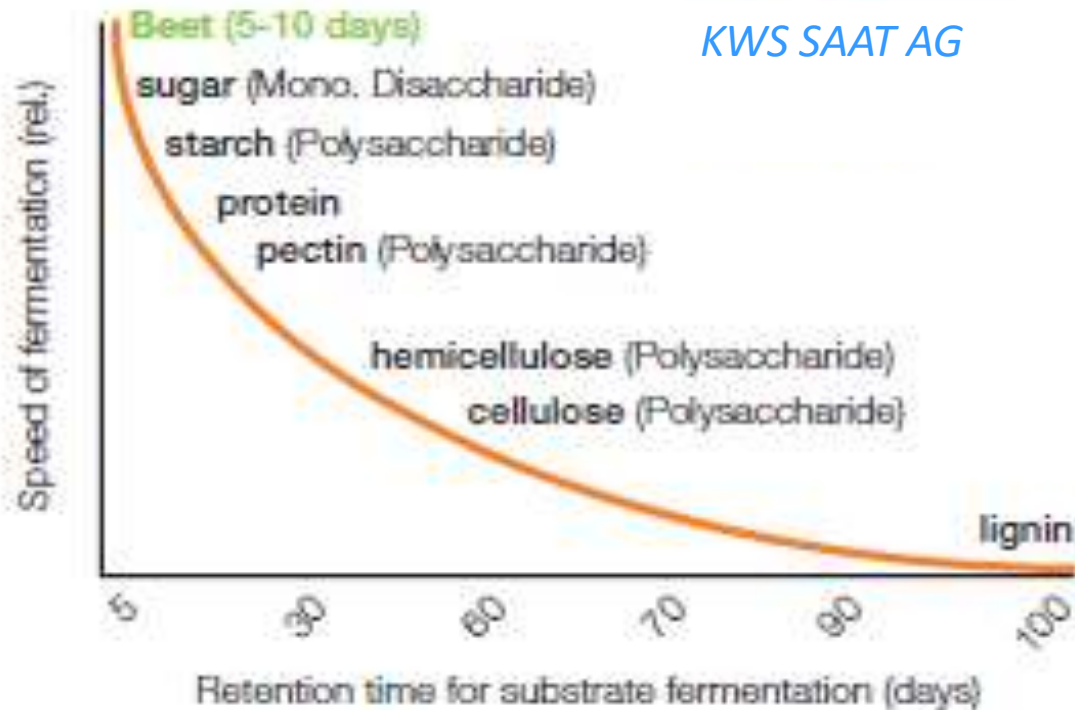
# Feedstock Variation

-  Seed variety
-  Harvest time
-  DM and oDM
-  Chop size
-  Silage additive
-  Clamp procedures
-  Feeding process



# Feedstock

Biogas: relative fermentation characteristics by crop



Water

Carbs

Protein

Fats

Minerals

 Physical contaminants & Chemical compounds



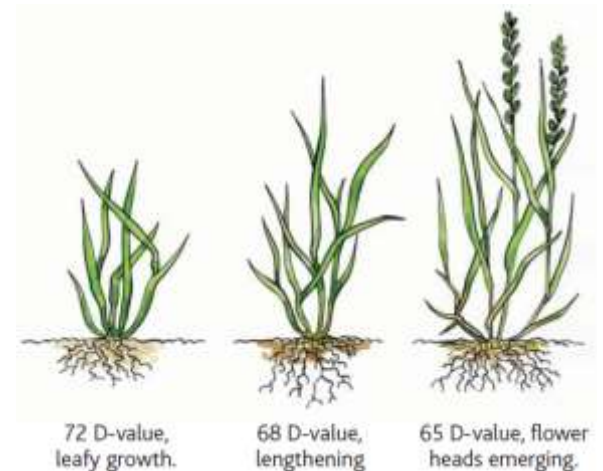
# No Right Answer

- 🌱 Silage analysis
- 🌱 Changes across the clamp
- 🌱 Amount of rainfall
- 🌱 Protein levels change
- 🌱 BMP indication of quality
  - ❖ Used to check performance of plant against expected input

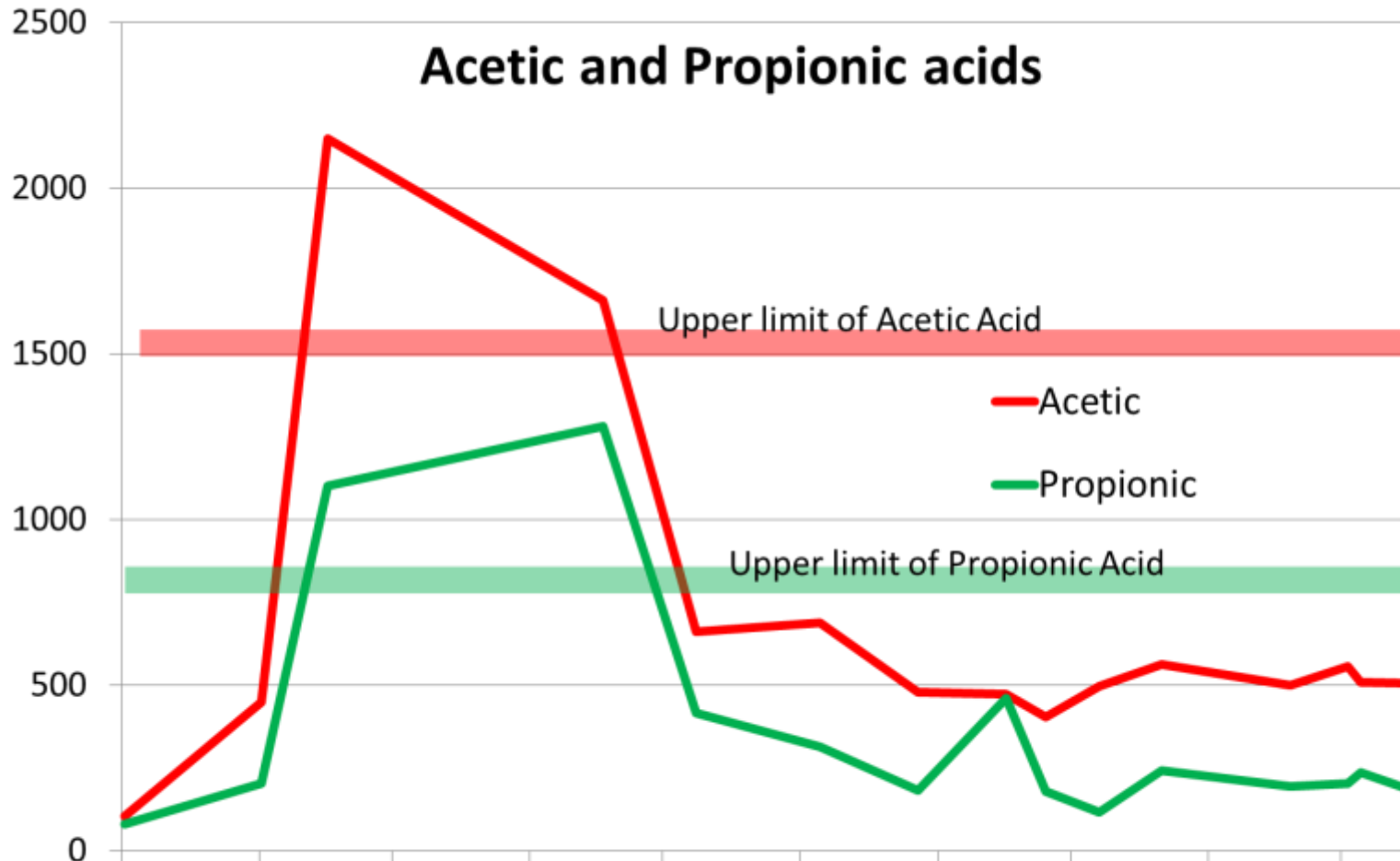


# They are all individuals


- Each feed is unique
- Climatic & soil conditions (Growth and nutrient uptake)
- Storage & preparation
- Perform differently in different digesters
- Microbes – populations change
- Digester operation, temperature, agitation, management





# Process monitoring




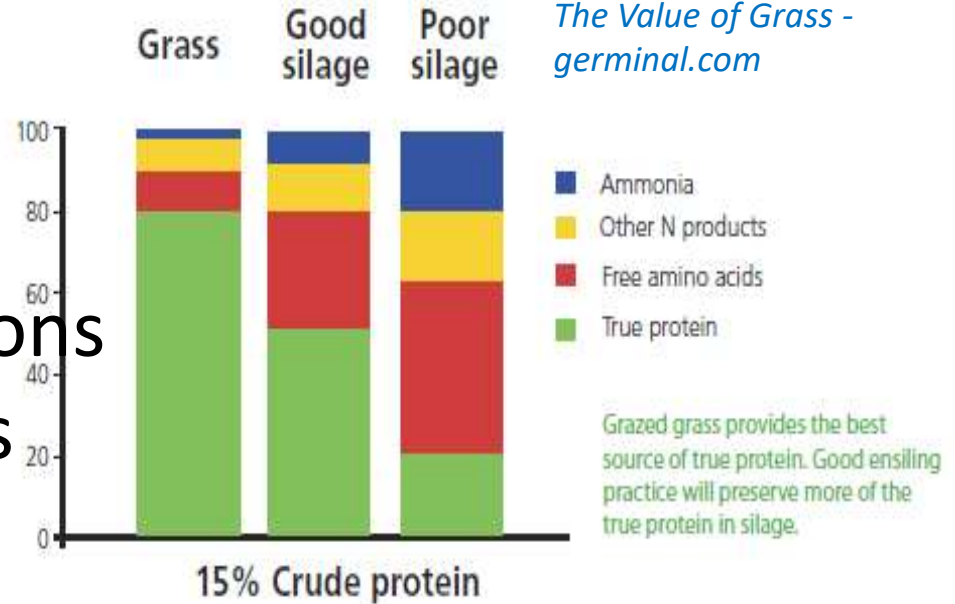
# Nitrogen

 High Protein levels -  
converted to Nitrogen

 Crop - climatic conditions  
& soil interaction levels

 Can cause build up of  
ammonia -inhibition

 Also affects the form &  
availability of nitrogen  
digestate



AHDB RB209





# Sulphur

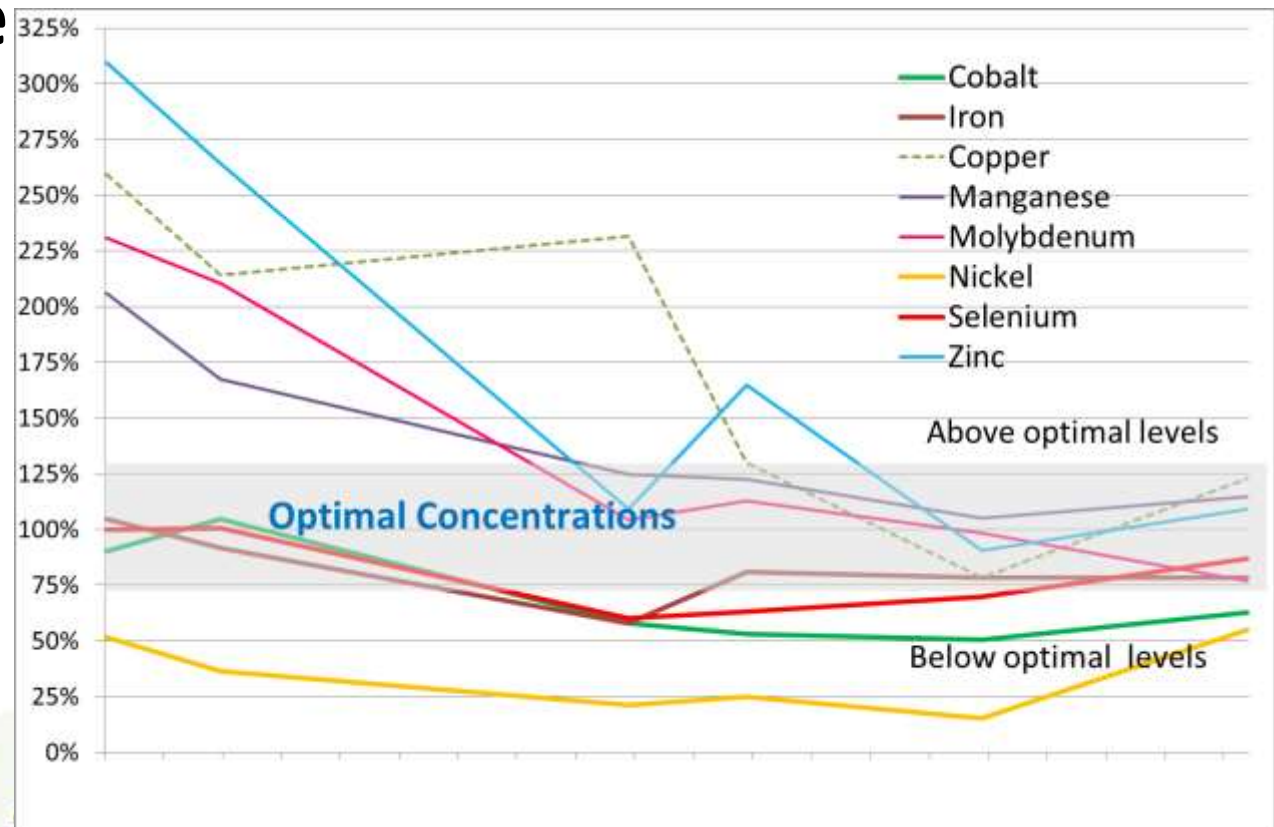
- 🌱 Sulphur – converts to High H<sub>2</sub>S in biogas
- 🌱 OSR & other high S feeds in animal ration
- 🌱 Silage with sulphate based fert application
- 🌱 H<sub>2</sub>S reduction - Fe addition
- 🌱 Both Sulphur and ferric additions to the end digestate



# Trace Elements in Digestate

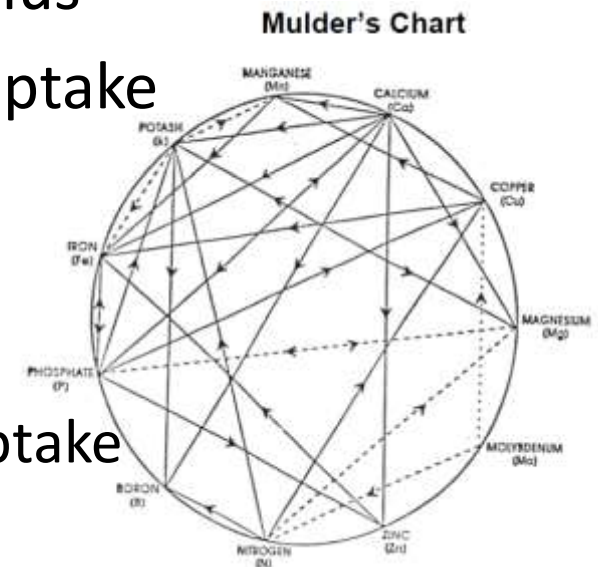
 Important to understand levels in digestate and identify where high levels are coming from

 **Can provide valuable levels of expensive trace elements**



# Effect of Trace Elements

- Assess soils ability to utilise these before spread **DIGESTER AND SOILS**
- Analyse regularly – seasonal/ lock up and crop changes
  - Molybdenum – copper lock up – Cu bolus
  - Copper - affect phosphate, Zn and Fe uptake & reduces beneficial fungi
  - Sodium chloride wilting plants / scorch
    - the sodium affects cation uptake potassium & chloride inhibits nitrate uptake




# Digestate

 **Valuable source of nutrient & trace elements**

 **Analyse & Understand your soils**

- ❖ pH
- ❖ Mineral capacity
- ❖ Crop plan/ land usage
- ❖ Application rate and times



 **Always be aware that what you put in affects what you put out**



# Bug - Livestock Farming

- 🌱 Look after your bugs - Peace Keeper
- 🌱 Feed quality
- 🌱 Trace elements
- 🌱 Housing
- 🌱 Reduce stress
- 🌱 Consistency
- 🌱 Good yield



**Avril Banks**

**Ab-En Ltd**

**[Avril.banks@ab-en.co.uk](mailto:Avril.banks@ab-en.co.uk)**

**07980 692727**

 **@ab\_en\_uk**

