Changing the Agricultural Paradigm:

Are we as an industry ready and able to become sustainable?

Topic 1: Addressing environmental threats to sustainability

Meeting the needs of tomorrow and the generations that will follow

The perceived problem

- Livestock production is 1 of the top 3 contributors to environmental problems
- Concerns:
  - Air quality
  - Global warming
  - Soil quality
  - Water quality
  - Biodiversity

Environmental impact of modern animal agriculture

- Drives public perceptions
- Puts the face on modern agriculture
- Drives many regulatory initiatives

The Situation

- Three mighty forces
  - Energy
  - Food
  - Environment

New Government Involvement

- Unprecedented in our time
- Involved in a broad range of non-traditional governmental areas
- Will recede eventually but very slowly

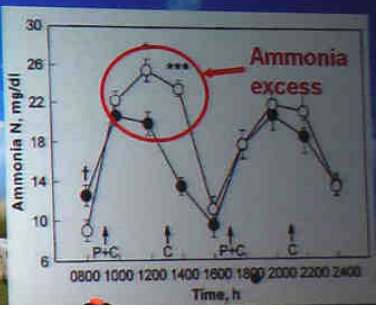
The technical advances: The Nitrogen Platform Concept as a tool for precision feeding

Redefine nitrogen metabolism to influence the efficiency of protein production and control wastes

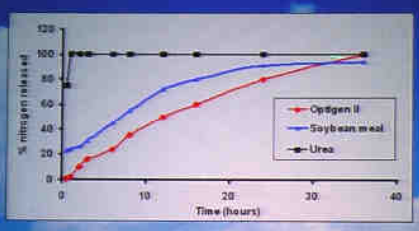
Controlled release nutrient products

A tool: Synchronization of N and carbohydrate metabolism

Balancing ruminal digestion and ammonia in cows

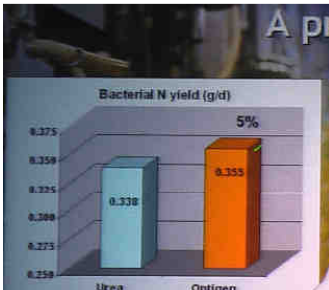


Change the form of a nutrient



Optigen II: Designing nitrogen release pattern for altering nutrient availability

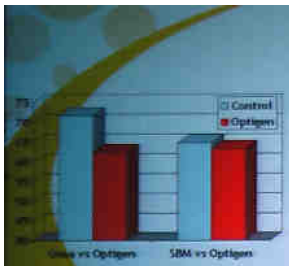
A proven concept:



Improved bacterial N yield and efficiency in the rumen

Improving nitrogen retention during digestion

Control nitrogen in waste of cattle



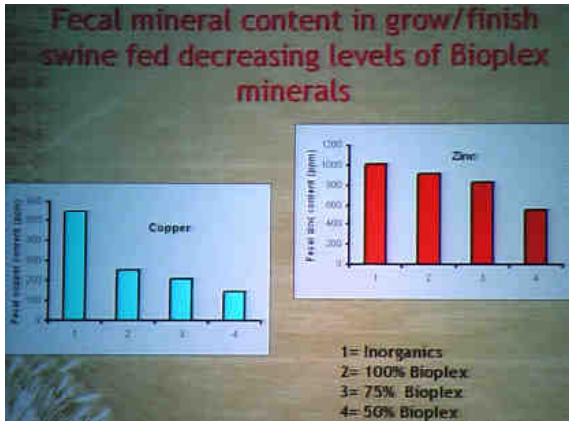
- Decreases nitrogen waste and could result in less N_2O
- Could result in a decrease of as much as 7 million T CO_2 eq in the US each year
- Projected worldwide, this could result in a 200 million T CO_2 eq (5% reduction in livestock associated greenhouse gases)

Organic minerals: Maximizing mineral availability-minimizing mineral excretion and environmental impact

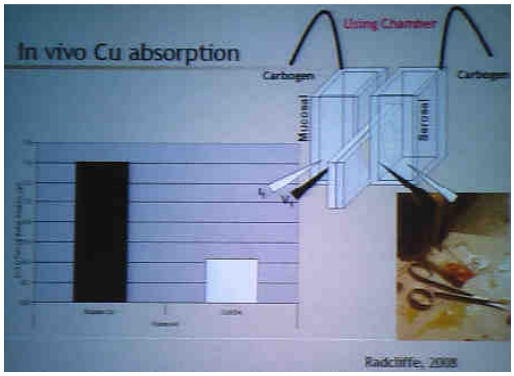
Accumulation of metals in the environment

- Only 5-15% of the copper and zinc in an animal's diet are retained by the animal
- Accumulation in soils affects food products and productivity of crops
- In the EU, copper and zinc (trace elements) in animal feeds have been restricted

Fecal mineral content in grow/finish swine fed decreasing levels of Bioplex minerals



In vivo Cu absorption

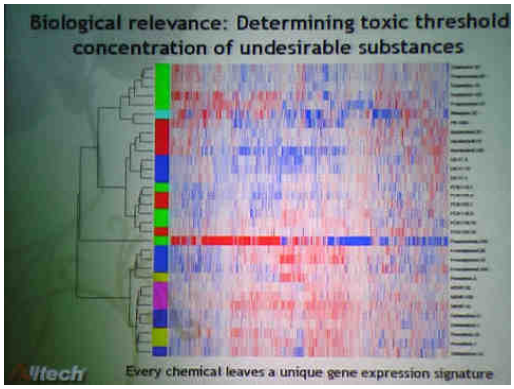


Topic 2: Quality issues that influence sustainability

Developing the quality control strategies and tools that will improve reputation and sustainability of the livestock industry

Potential problems: Detection of Monensin

- Some facts:
  - Current potential detection level - 0.03 ppm
  - Validated analytical testing levels in most labs approximately 1 ppm
  - Regulatory acceptance
    - EU 1.25 ppm
    - US zero
- "Zero tolerance" Detectable = Unallowable
- What is appropriate and biologically relevant?



Toxicogenomics approaches: Establishing new types of screening programs

- Science-based approach to risk management
- Establishing the true "biological risks" of feed contaminants
- Not based on perceived risk of individual contaminants
- Developing a herd (flock) health programs

Defining our future and building confidence:

Using technology to put traceability and quality into the industry

FDA

- Role of the USDA?
- Feed plants are audited through third party certifications
- Food plants are not
- Communication is critical
- Must be science based

Alltech Quality System

What is Q+™?

- Q+ (Quality Plus) is Alltech®'s mineral quality program unique to the Bioplex® range of organic trace minerals.
- Q+ is a positive release program where all batches of inorganic trace mineral sources and final Bioplex batches are tested for Dioxin, PCBs and Heavy Metals prior to sale.
- Q+ also integrates the Bioplex quality measures, guaranteeing total chelation and mineral content developed over the last 18 years.
- Q+ is developed by Alltech, and is an integral part of the Alltech Quality System (AQS).