Feed Ingredient Utility

Mika Alewynse
Division of Animal Feeds
Center for Veterinary Medicine
FDA
AAFCO Definition Process

- Proposed definition
- Description/ purpose of the ingredient
  - Rationale for request
- Use limitations
- Literature information
- Feeding trials/ controlled observations
What Does the Substance Do?

- Information sources
  - Other uses
- Scientific literature
  - Books
  - Internet databases (AGRI COLA)
  - Libraries
- Traditional research studies
- Behavior of related substances
What Do You Want to Say About Substance X?

- Technical effect on feed
  - Preservative
  - Emulsifier
  - Pelleting aid
- Source of something for the animal
Types of Substances Intended for the Animal

- **Nutrient**
  - Essential nutrients (amino acids, fatty acids, vitamins, minerals, water, and in some cases, fiber)

- **Flavor** (taste)

- **Aroma** (smell)

- **Coloring** - regulated process

- **New substance**
  - Feed components have effects beyond supplying essential nutrients
    - enzyme
Caveats about What You Say

- DSHEA does not apply to animal feed
  - Federal Register 61:17706
- Substance could be both a food and a drug, based on claims made for product
  - CVM Program Policy and Procedures Manual - Guide 1240.3605
  - Some structure/ function claims could be acceptable if related to “food” properties
How to Show Substance X Works (Utility)

- Prior approval or acceptance?
  - Substance listed in CFR
    - approved Food Additives for feed - 21 CFR 573
    - partial List of Generally Recognized as Safe (GRAS) Substances - 21 CFR 582
  - Feed ingredient definition published in Official Publication of AAFCO

- If approved or listed for the intended use, no problem

- Remember intended use includes target species, may need to address this issue
Showing Substance X Works (cont.)

- Recognized by an authoritative organization
  - National Research Council
    - taurine for cats
  - Flavor & Extract Manufacturers Assn (FEMA)
    - Is the intended use the same?

- Demonstrate that Substance X has “food” properties
  - Therapeutic effect = animal drug
What You Need to Show

- Dependent on identity and properties of Substance X
- What is the possible mode of action?
  - Scientific literature
  - Non-therapeutic physiological effect
  - Effects of related compounds
- Number of needed studies varies
Substance X is Nutrient

- Look in the literature first
- Use the appropriate animal model
  - Avoid chicks if intended use is cattle
- Lots of different traditional study designs
  - Deficiency/supplementation studies
- Use a known comparator
- Account for bioavailability
Substance X is Flavor/ Aroma

- Primarily pet food, but young animals, too
- Use the appropriate animal model
  - Cats and dogs are very different
- Be sure to use sufficient animals and choices
  - Subjects need multiple bowls/ feeders
- If using older subjects, be aware of
  - Prior exposure
  - Predispositions/ conditioning
- Consult with experts as palatability/ food choice studies are tricky
New Substance

What is the intended use?
- Many of these substances fall in a gray area
- See CVM Program Policy and Procedures Manual - Guide 1240.3605
  - Improved productivity = drug
  - Disease prevention/ treatment/ mitigation = drug

Use appropriate measures for feed ingredient
Designing the Study

- You need statistics!
- Foreign locations can be used if conditions are like those in US
- Sound study design
  - Use sufficient experimental numbers (power of test)
  - Focus on effect of Substance X
  - studies often include too many additional factors
Study Design (cont)

- Mimic proposed conditions of use
  - Target species
    - cattle versus chickens
    - “animal class”
      - Purpose statement in AAFCO Reg. 3
  - Test proposed use rate!
    - if test down to 500 mg/ lb, label use rate cannot be 250 mg/ lb
    - if test up to 4000 ppm, label use cannot be for 5000 ppm
Study Design (cont)

- Pelleted versus mash diets
- Free choice versus limit feeding

- **Data must support claim**
  - Measuring fecal Ca levels does not support claims for improved bone density
  - Animal production or disease prevention/treatment data can mean Substance X is an animal drug!
**Study Conduct**

- **Analyze feed for Substance X**
  - Do not assume it is there
  - Clearly explain how activity relates to amount added to feed

- **Account for:**
  - Bioavailability
  - Storage/ dietary stability

- **When study protocol is not followed, explain the changes**
  - Don’t make us guess
Study Results

- Appropriate statistical analysis
  - Use the CORRECT experimental unit
    - often the pen, not individual animal
  - Make sure you can compare treatments
    - lowest level which shows statistical improvement over negative control
    - contrast of control vs. all levels of substance X unlikely to be beneficial
General Points

- **Submit complete study reports**
  - Raw data (sometimes)
  - Statistical printouts
- **Be sure submitted data support claim**
  - Substance X had a significant effect as expected
  - Data can be pooled over studies if appropriate
- **Submit all information and explain any conflicting studies**
  - Not good when we find conflicting studies that are not mentioned