Why is understanding animal nutrition important?

2 Volunteers...
Make a list on the board of 1 day’s worth of food that would represent a healthy diet.

Class Discussion
• Are the student’s choices healthy?
• Does the food sound appealing?
• Would you eat it?
• What are the benefits of eating healthy?
• What about the problems with eating unhealthily?
• If it is important for us to eat right, what about our animals?

Animal Nutrition & Feeding
A. List essential nutrients & their function
B. Identify factors effecting nutrition requirements in animals
C. Classify feed types and identify animal feeds
D. Compare & contrast common feeds according to species, age, and energy requirements
E. Interpret a feed label
F. Balance a ration

The Six Essential Nutrients

- Protein
- Carbohydrates
- Fats
- Minerals
- Vitamins
- Water

Why is understanding animal nutrition important?

Feeding will make or break an animal’s performance

Animal Nutrition & Feeding

Why is understanding animal nutrition important?

The Six Essential Nutrients

- Protein
  - Needed for growth and repair
  - Helps form MUSCLES, internal organs, skin, hair, wool, feathers, hoofs and horns
A. List essential nutrients & their function

The Six Essential Nutrients

**Carbohydrates**

- **ENERGY**
- The largest portion of the food supply
- Includes sugars, starch, and cellulose

**Fats**

- **STORED Energy**
- Insulation & Protection

**Vitamins**

- Organic substance
- CAN be broken down
- Needed in small quantities

Examples: Vitamin A, B, C, D, E, Folic Acid, etc

**Minerals**

- Naturally occurring
- Inorganic substance
- Can’t be broken down further
- Needed in small quantities
- Necessary for:
  - Building bones
  - Growth
  - Overall Health

Examples: Calcium, Magnesium, Iron, Manganese, Phosphorus, Potassium, etc

**Water**

- Animal’s body is made up of 70% water
- Necessary for proper organ function
- Vital to sustaining life

Where can you find Nutrient Contents of animal feed?

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Dry Matter (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protein</td>
<td>24.5</td>
</tr>
<tr>
<td>Fat</td>
<td>15.8</td>
</tr>
<tr>
<td>Carbohydrate (NFE)</td>
<td>52.8</td>
</tr>
<tr>
<td>Crude Fiber</td>
<td>3.8</td>
</tr>
<tr>
<td>Calcium</td>
<td>0.78</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>0.7</td>
</tr>
<tr>
<td>Sodium</td>
<td>0.30</td>
</tr>
<tr>
<td>Potassium</td>
<td>0.75</td>
</tr>
<tr>
<td>Magnesium</td>
<td>0.096</td>
</tr>
<tr>
<td>Taurine</td>
<td>0.13</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>291 mg/kg</td>
</tr>
<tr>
<td>Vitamin E</td>
<td>780 IU/kg</td>
</tr>
</tbody>
</table>
B. Identify factors effecting nutrition requirements in animals

Are all animal’s dietary requirements equal? ...... NO!

Factors effecting nutritional needs:

1- Maintenance
- Energy required to simply keep animal alive
  - Every second an animal is alive it takes energy
- No loss or gain of weight
- Known as Basal Maintenance Requirement
- 50% of animal’s diet is used for maintenance

Factors effecting nutritional needs:

2- Growth
- Young animals who are not fully grown
- Extra energy required to grow bones, support organ systems, develop muscle, etc.
- Need high levels of fats and carbohydrates

Factors effecting nutritional needs:

3- Work
- Animals used for heavy work, require more energy
  - For Example: hunting dogs, draft horses, race horses, etc.

Factors effecting nutritional needs:

4- Gestation & Lactation

- Nutrition deficiencies are the most common cause of reproductive failures
- Pregnancy requires higher levels of nutrition and energy intake
  - (Especially at the end of pregnancy when the fetus is growing rapidly)
- Milk production requires even more energy
  - (Especially calcium, phosphorus, protein)

Rank these animals from the HIGHEST energy (calorie) requirement to the lowest:

1. Breeding Stallion: 27,400 Cal/day
2. Lactating Brood Mare: 18,800 Cal/day
3. Pregnant Mare: 17,300 Cal/day
4. Weanling Colt: 15,100 Cal/day
5. Racing Performance Horse: 14,500 Cal/day
6. Full Grown Horse, minimum use: 11,300 Cal/day
Which would you choose?

1 Snickers bar (266 calories)
OR
9 cups of broccoli (270 calories)

Which one would TASTE better?

Classify feed types and identify animal feeds

3 Types of Feed:
- Roughage
- Concentrates
- Supplements

Roughage
- Contains MORE than 18% Crude Fiber
- Fed in HIGH quantities
- Contains MINIMAL energy per pound of feed

Examples...
- Dry Hay
- Corn Silage
- Haylage
Grass & Pasture

Concentrates

- Contain LESS than 18% Crude Fiber
- Feed in SMALL quantities
- Contains HIGH amounts of energy per pound of feed

Examples...

Roughage

Corn

Examples...

Concentrates

Oats

Barley

Examples...

Concentrates

Cotton Seed
FYI: “Grain” is a general term for a mixture of specific grains such as corn, oats, barley, etc.

Supplements

- Nutritional Boost to a ration:
  - Usually vitamins, minerals, or protein in form of:
    - Powders
    - Lick blocks

Examples...

Concentrates

- Salt or mineral block

Examples...

Supplements

- Protein Licks

Comparing Feeds

How do you choose?

What body system has a HUGE impact on what type of feed an animal can digest??

Avian

Ruminant

Modified Monogastric

Monogastric
Comparing Feeds

Things to consider...

1- Species

• Premixed feeds are formulated specifically for the nutrient requirements of each species
• Type of digestive system determines which feeds an animal can digest
  • Ruminants can digest roughages
  • Monogastrics cannot break down roughage

2- Age

• Young, Adult, Senior?

3- Energy Requirement

• Lactating/Gestation
• Heavy Work

Comparing Dog & Cat Foods

Feed Labels

• Guaranteed analysis
  o Lists nutrients contained in feed
  o Lists minimum % of each nutrient

• Ingredients listed
• Usually have some feeding instructions
Feed Label Shuffle

*Directions:* Each student should have 1 feed label. As a class we will establish a pattern of rotating the feed labels. With each pass you will record the name of the feed, crude fiber, protein content, type of feed, and list the first 3 ingredients. Note that the labels are color coded according to species.

If the feed is MEDICATED, put a star by the name of the feed.

How to Balance a Ration

• Ration = Daily Intake of food

• Successful ration must:
  1. Fill them up
  2. Taste Good
  3. Provide required nutrients/energy
  4. Be cost effective

How to Balance a Ration

• A few hints:
  • Rations vary by species and energy requirement
  • Some rations mix roughage, concentrates, and supplements
  • Some rations meet all dietary requirements with 1 feed

Example Ration

Full grown, 6 year old horse, minimum use:

Ration #1:
• Free choice grass pasture
• Salt/mineral block

Ration #2:
• 11 lbs hay
• 2.75 lbs Purina Strategy
  *This ration mixes a roughage (hay) and concentrate (Strategy) to meet all dietary requirements

Ration #3:
• 11.25 lbs Purina Equine Adult
  *This is a “Complete” feed which means it has roughages and concentrate mixed together. It meets all dietary requirements in 1 food

Example Ration

Laying Hens

Ration #1:
• Free choice Lay Mash or Pellets
  *This is a complete feed, premixed to exact nutrition requirements

Example Ration

5 Month old Market Lamb

Ration #1:
• Show Lamb Grain Mix
• Hay
How is protein content calculated when mixing feeds?

Bell Quiz
Objective A & B
1. What are 3 reasons it’s important to have a good understanding of animal nutrition & feeding?
2. Which essential nutrient builds and repairs muscle?
3. Name the 6 essential nutrients
4. List 4 factors that effect an animal’s nutrition requirement.
5. Which essential nutrients are needed in the smallest amounts?

Bell Quiz
Objective C & D
1. What is the difference between a roughage and a concentrate?
2. Give 2 examples of a roughage.
3. When comparing animal feeds, what 3 things should you consider when choosing a feed?
4. Which body system has a huge effect on what types of feed an animal can digest?
5. Give an example of an animal supplement.

Bell Quiz
Objective E & F
1. What is a guaranteed analysis?
2. List 3 things that can be found on a feed label.
3. What is a ration?
4. Sam wants to make 1 ton of a 16% protein ration using alfalfa hay (18.7%) and oats (13.3%). How much of each will she have to mix together?
5. If you should feed 1½ lbs of hay per 100 lbs of your horse’s body weight, how much should you feed a 1200 lb horse?