CASE

Curriculum for Agricultural Science Education

Principles of Agricultural Science – Animal

Creature Comforts

Unit 3 – Lesson 3.3 Home Sweet Home

What are your basic needs?

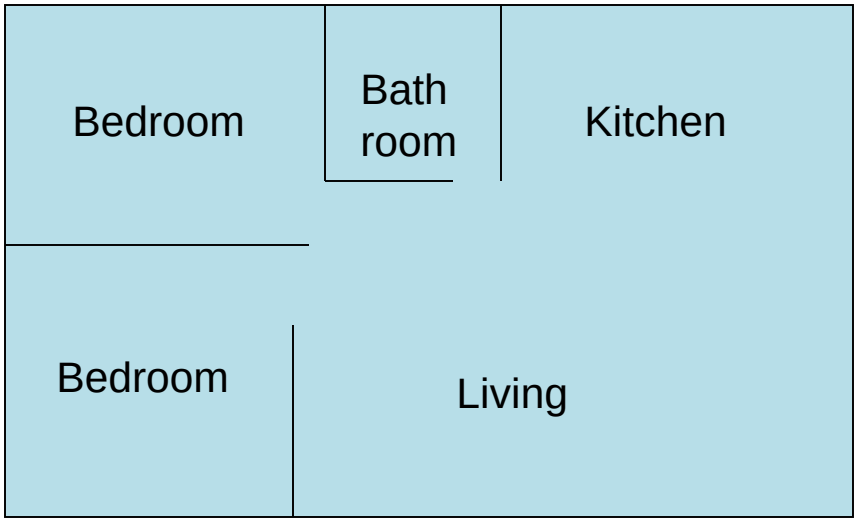
How are they different from the basic needs of animals?

Shelter

- Provides protection from environmental extremes.
  - Sun
  - Wind
  - Rain
  - Snow

Parts of a House

- Think of your house, what is the use of each room?
- How does the use relate to your needs?



Housing and Handling Facilities

- Design with production goals in mind.
- Considerations
  - Basic animal needs
  - Space requirements
  - Life stages
  - Handling
  - Providing health care
  - Transporting

Temperature

- Primary consideration when providing shelter.
- Warm-blooded animals rely on thermoregulation to maintain a constant body temperature.
- Outside of the optimal temperature range, animals must expend additional energy on maintaining homeostasis.

Comfort Zone

- Also called thermoneutral zone.
- A range of temperatures in which an animal is the most comfortable.
- This often correlates with production efficiency.
  - If an animal does not expend surplus energy maintaining body temperature that energy can be used for growth and production.

Heat Stress vs. Cold Stress

Heat

- Reduced feed intake ~ decreases heat from digestion
- Panting
- Sweating
- Blood vessels dilate
- Decreased growth rate

Cold

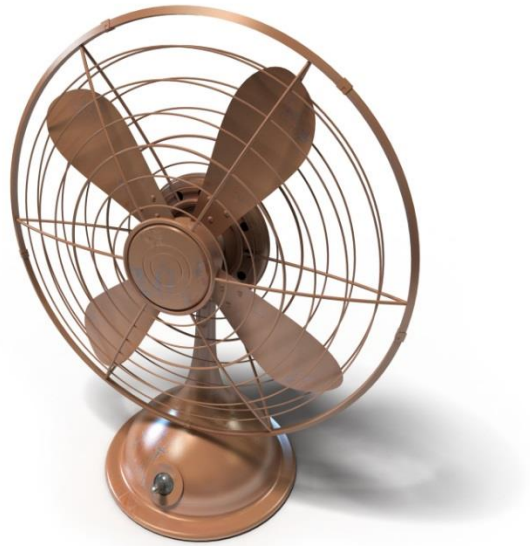
- Higher energy requirement to maintain body temp
- Bunching
- Hair provides air insulation
- Blood vessels constrict
- Reduces feed efficiency

Wet Conditions

- Evaporative cooling
  - Air evaporates water and in the process the air loses heat to the water.
- Beneficial in the summer
  - Misters and wallows can help moderate high temperatures.
- Harmful in the winter
  - Uses body heat for drying, magnifies cold temperatures and wind chill.

Ventilation

- Varies on style of shelter
- Provides:
  - Temperature control
  - Fresh air
  - Odor removal



Sanitation

- Manure management
  - How will stalls and barns be cleaned?
  - In confinement, how will manure be disposed of?
- Disease control
  - Cleaning pens between groups of animals.
  - Minimizing dust and airborne contagions.

Water

Major considerations

- Clean and fresh
- Constant and adequate supply
  - Automatic waterers
- Accessibility

Feed

Major Considerations

- Designating a feeding area
- Planning for feed equipment
- Bunk space requirements per head in group feeding arrangements

- Feeding on the ground is not efficient or sanitary.

Elephant Needs

Example Considerations	**Animal Requirements**
Indoor Area	400 ft^2
Outdoor Area	1800 ft^2
Optimal Temperature Range	55-80° F
Water Needs	18.5-52.8 gallons/day

References

Association of Zoos and Aquariums. (2003, May 5). *Standards for elephant management and care*. Retrieved from https://www.aza.org/uploadedFiles/Conservation/Commitments_and_Impacts/Elephant_Conservation/ElephantStandards.pdf

Brownson, R., & D. Ames. (2000). *Winter stress in beef cattle*. Cow-Calf Management Guide: Cattle Producer's Library. Moscow, ID: Ag Communications University of Idaho.

Feldkamp, S. (Ed.). (2002). *Modern biology*. Austin, TX: Holt, Rinehart, and Winston.

Gillespie, J.R., & Flanders, F.B. (2015). *Modern livestock and poultry production (9th ed.)*. Clifton Park, NY: Delmar.

Herren, R.V., & Donahue, R.L. (2000). *Delmar's agriscience dictionary with searchable CD-ROM*. Albany, NY: Delmar.