

LESSON PLAN 11.1

COURSE TITLE: **Animal Science**

UNIT #: 11

Unit Title: Environmental Factors Effecting Animals

LESSON: Introduction to the environment of animals

PROBLEM STATEMENT:

What are the key factors in an animals behavior caused by the environment?

LEARNING OBJECTIVES:

Students will:

1. Define animal behavior
2. Describe the factors in animal behavior resulting from the environment.

SCIENCE CONCEPTS:

Behavior
Dominance
Adaptation

AGRICULTURAL SCIENCE PRACTICES:

Designing animal facilities
Controls for animal comfort
Providing proper lighting
Providing proper ventilation

REFERENCES, LEARNING RESOURCES, MATERIALS, EQUIPMENT:

Feeds and Nutrition; Ensminger, Oldfield, and Neinemann, 1990

Basic Animal Nutrition and Feeding; Pond, Church, and Pond, 1995

TEACHING PROCEDURE:

Activity: Have different types of feed stuffs on display.
 Show slides on different animal environment conditions and have the students
 choose the better environment and defend their position.

Leading Questions: Animals inherit certain genetic possibilities. How well these
 potentially develop depends upon the environment to which they are subjected.

LESSON SEQUENCE

PROBLEM SOLUTION

Layout of the plan...

Ask the class to list the following factors of special importance in animal environments:

- | | | |
|---------------|-----------|------------|
| 1. Feed | 2. Water | 3. Weather |
| 4. Facilities | 5. Health | 6. Stress |

KQ#1 What part of animal traits are heritable?

1. Most animal traits are only 30 to 50% heritable.
2. The expression of the rest depends on the quality of the components of the environment, which can be defined as all conditions, circumstances, and influences surrounding and affecting growth, development, and functions of animals.

KQ#2 What is needed for all vital processes of the body?

1. Water is used in all vital processes of the body, such as the digestion and absorption of food nutrients and the removal of waste from the body.
2. Water environmental conditions
 - a. Air temp
 - b. Frequency of watering
 - c. Quality of water
 - d. Species differences
 - e. Water excretion
 - f. Water sources
 - g. Water temperature

KQ#3 What are feed -- environmental interactions?

1. Animals may be affected by either:
 - a. too little or too much feed
 - b. rations that are too low in one or more nutrients
 - c. imbalance between certain months
 - d. objection to the physical form of rations (ground to fine)
2. What factors are pertinent?
 - a. appetite / intake
 - b. calving time affected by feeding
 - c. compensatory growth
 - d. competition
 - e. familiarity of feed
 - f. feed as a reward
 - g. frequency of feeding
 - h. flushing
 - i. nutrient deficiency
 - j. overfeeding / underfeeding
 - k. palatability
 - l. preconditioning

KQ#4 What weather factors affect animals?

1. Cold / hot weather -- comfort zones
2. Adaptation of a species / breed to the environment
3. Maintenance energy partition

KQ#5 What are facility / environmental interactions?

1. Space requirements
2. Shelter and shade
3. Social problems
4. Lighting
5. Modifications of facilities
 - a. fans
 - b. floors
 - c. lights
 - d. evaporation
 - e. ventilation

f. windbreaks

KQ#6 What should be considered for health and environmental interactions?

1. Altitude
2. Anti - body production
3. Disease defense
4. Colostrum defense
5. Pollution / dust / gases / odors
6. Muddy lots
7. Stray voltage

KQ#7 What adds stress to the environment that affects animals?

1. Bleeders
2. Manure
3. Gases / odors
4. Dust
5. Flies / insects / pests
6. Water pollution

PROBLEM CONCLUSION AND/OR SUMMARY:

An animal is the result of 2 forces ... heredity and the environment. Which is more important and why?

Discuss the impact of animal comfort in relation to producing livestock or having pets.

EVALUATION OF THE TEACHING / LEARNING PROCESS:

In this problem, we have practiced...

HIGHER ORDER THINKING LEVEL (Identify levels with the students)

Cognitive	Psychomotor	Affective
6. Evaluation	5. Naturalize	5. Characterize
5. Synthesis	4. Articulate	4. Organize
4. Analysis	3. Precision	3. Value
3. Application	2. Manipulate	2. Respond
2. Comprehension	1. Imitate	1. Receive
1. Knowledge		

LESSON PLAN 11.2

COURSE TITLE: **Animal Science**

UNIT #: 11

Unit Title: Essential Factors Affecting Animals

LESSON: Affect of air quality on animals.

PROBLEM STATEMENT:

How does air quality affect animal behavior, growth, and health?

LEARNING OBJECTIVES:

Students will:

1. Describe the factors that affect air quality in animal production.
2. Understand building designs necessary to ensure good air quality within facilities.

SCIENCE CONCEPTS:

Growth
Nutrition
Quality
Vaporization

AGRICULTURAL SCIENCE PRACTICES:

Control for animal comfort
Designing animal facilities
Providing proper ventilation
Selecting filtration systems
Testing air quality

REFERENCES, LEARNING RESOURCES, MATERIALS, EQUIPMENT:

Feeds & Nutrition, Enaminger, et al., 2nd ed, 1990, Enaminger Publishing, 209-299-2263

TEACHING PROCEDURE:

Activity: Student breathing activity. (see below)

Leading Questions: Have the students breathe into a plastic tube that is cooled in a water trough to collect moisture from the students' breath. Breathe for a given period of time. Make sure you sterilize the tube each time. Measure this and estimate a month's worth of moisture for that many animals.

LESSON SEQUENCE

PROBLEM SOLUTION

Layout of the plan...

KQ#1. What gases affect air quality for animals and why?

1. Ammonia build up -- released from fresh manure.
 - a. eyes burn at 25 - 30 ppm
 - b. chicken eyes inflame at 50 ppm
 - c. at 200 ppm, loss of appetite, salivate, sneezing
 - d. at 5000 ppm, dangerous to humans
2. Carbon Dioxide build up -- increases with animal respiration and manure decomposition -- causes a lack of oxygen.

3. Hydrogen Sulfide
 - a. most toxic gas in liquid manure
 - b. at 20 ppm, develops fear of lights, nervousness, and loss of appetite.
 - c. rotten egg odor
4. Methane -- released from manure decomposition and high concentration results in asphyxiation.

KQ#2 What does parts per million mean?

Student Activity 11.2.1

KQ#3 Why is temperature an air quality concern?

1. All animals have a comfort zone
2. Too hot reduces feed intake
3. Too cold increases feed intake

KQ#4 How does humidity affect air quality?

1. Water droplets carry diseases (shipping fever, flu, respiratory infection)
2. Excess humidity is an indicator of poor ventilation.

KQ#5 How does dust affect air quality?

1. Dust is a mixture of small particles of different size dry matter.
2. Contributes to respiratory diseases and can carry microbes, gases, and vapors.

PROBLEM CONCLUSION AND/OR SUMMARY:

Review Key Questions

EVALUATION OF THE TEACHING / LEARNING PROCESS:

In this problem, we have practiced...

HIGHER ORDER THINKING LEVEL (Identify levels with the students)

Cognitive	Psychomotor	Affective
6. Evaluation	5. Naturalize	5. Characterize
5. Synthesis	4. Articulate	4. Organize
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Student Activity 11.2.1

STUDENT EXERCISES / EXPERIMENTS / ACTIVITIES

TITLE: Parts Per Million Demonstration

FOCUS QUESTION: What does one part per million mean?

OBJECTIVES:

You will....

1. Describe, through illustration, the concentration of one part per million.

STUDENT PREDICTION:

You will predict

What will the color of this crop be when it is distributed between these bottles?

INTRODUCTION:

Ask what one part per million means to them.

SCIENCE CONCEPT(S):

Measurement

Density

Condensation

Vaporization

MATERIALS NEEDED:

Three 1 liter pop bottles, clear (double the recipe for two liter pop bottles)

Red food coloring to represent a toxic substance

1 ml eye droppers

LEARNING ACTIVITIES / PROCEDURE(S):

1. Use 3 - one liter clear pop bottles filled with clear water.
2. Add one ml of food coloring to 1 bottle. This is one part per thousand (ppt)
3. Take one ml from the first bottle and add it to the second bottle. This is one part per million (ppm)
4. Take one ml from the second bottle and add it to the third bottle. This is one part per billion. (ppb)

Name: _____

STUDENT OBSERVATIONS / EVIDENCE / ANALYSIS:

Record your observations for

Bottle One:

Bottle Two:

Bottle Three:

STUDENT SUMMARY / CONCLUSIONS / RECOMMENDATIONS / REFLECTIONS

At what levels do you feel that substances are safe in water?

Does it take much to reach hazardous levels at one ppb or one ppm?

Summarize what you have learned from this lab.....

Student Activity 11.2.2

STUDENT EXERCISES / EXPERIMENTS / ACTIVITIES

TITLE: Tissue Comparisons from Different Environments

FOCUS QUESTION: How does air quality affect an animal?

OBJECTIVES:

You will...

1. Understand animal air quality and relate how it affects the animal.

STUDENT PREDICTION:

You will predict what a good lung looks like and how that can affect the function of the animal.

INTRODUCTION:

You will compare good lung tissue and bad lung tissue with the naked eye, binocular scopes, and microscope.

SCIENCE CONCEPT(S):

Growth

Nutrition

Quality

MATERIALS NEEDED:

Good lung tissue

Poor lung tissue

Knives

Binocular scopes

Microscopes

LEARNING ACTIVITIES / PROCEDURE(S):

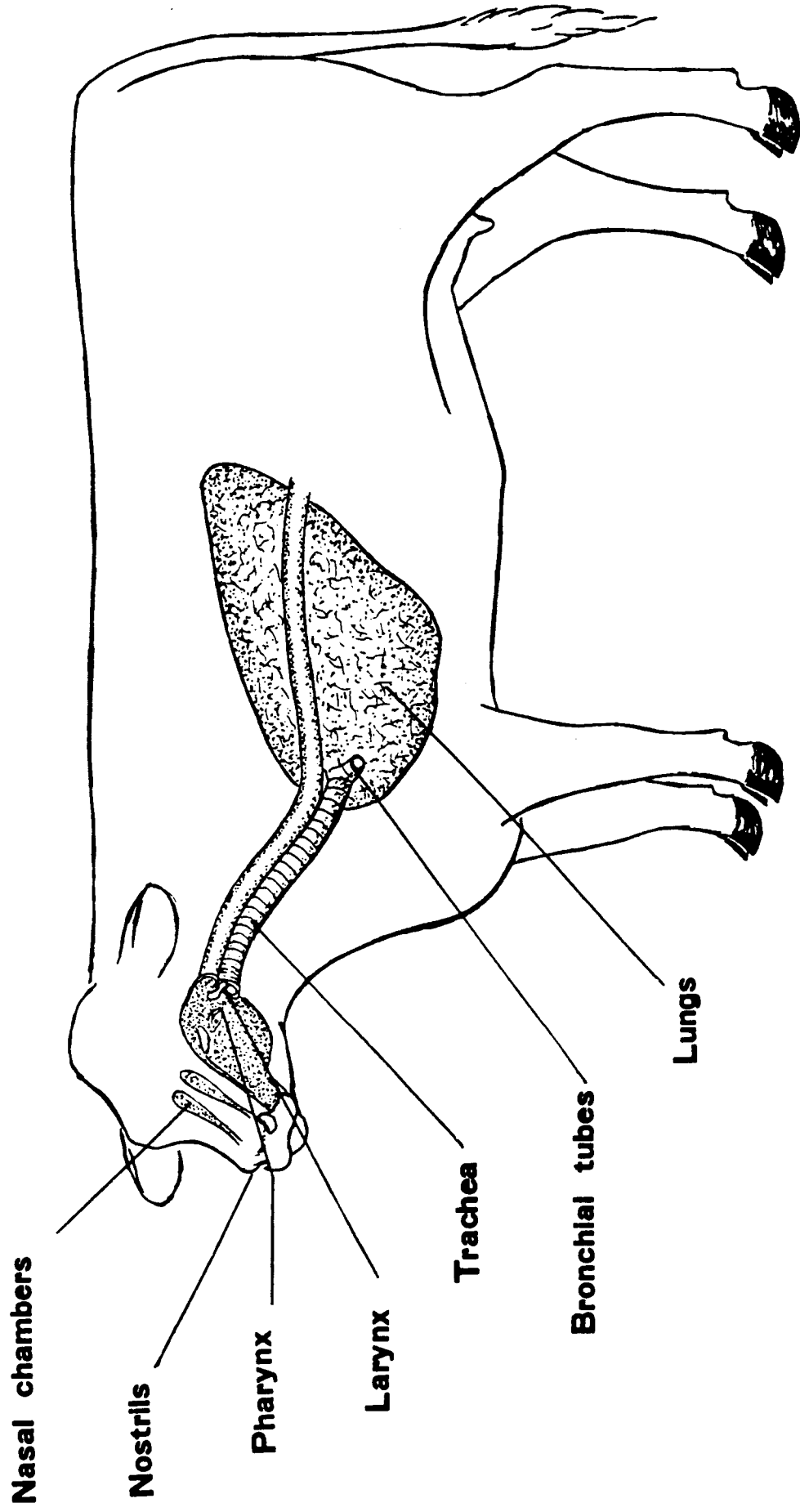
1. Compare the lung tissue with the naked eye.
2. Compare the lung tissue using the binocular scope
3. Compare lung tissue with a microscope (add additional light for observation)

STUDENT SUMMARY / CONCLUSIONS / RECOMMENDATIONS / REFLECTIONS

How did the lung tissue differ from the poor lung to the good lung?

What effect does the air quality have on an animal? What are the advantages to having a good, quality environment in which the animal can live?

RESPIRATORY SYSTEM OF THE COW



RESPIRATORY SYSTEM OF THE CHICKEN

