

LESSON 1.7

Facility Plans & Management Project

Student Name _____ Date _____

DIRECTIONS

You will design a facility for each of the types of cattle enterprises listed below. Draw out your designs in the space provided. Include all necessary pieces of equipment based on the lesson and rubric requirements.

Cow-Calf Operation

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Backgrounding

Feedlot Operation

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Facility Design Rubric

Criteria	3 - Exemplary	2 - Satisfactory	1 - Needs Improvement
Shelter and Housing	Design includes adequate shelter that protects from elements, with proper ventilation and space for all cattle.	Design provides basic shelter but lacks some protection or ventilation.	Shelter is inadequate or poorly designed for animal comfort.
Feeding and Water Facilities	Facilities are easily accessible, clean, and provide access to nutrition and hydration for all cattle.	Facilities are accessible but may be slightly dirty or lack access to nutrition and hydration for all cattle.	Facilities are difficult to access or do not meet basic feeding and watering needs.
Handling and Working Facilities	Design includes safe and efficient handling areas that minimize stress for animals during management tasks.	Handling areas exist but may not effectively reduce stress or improve safety.	Handling areas are poorly designed, posing risks to animals and handlers.
Breeding and Calving Facilities	Facilities are designed for safe and comfortable breeding and calving, with necessary equipment and space (in production systems where applicable).	Facilities are present but lack some comfort or equipment for effective breeding and calving.	Breeding and calving facilities are inadequate or poorly planned.
Quarantine and Isolation Areas	Design includes proper isolation areas that are easily accessible and maintain animal health.	Isolation areas are present but may not fully ensure health safety or ease of access.	No clear quarantine or isolation areas are included in the design.
Pasture and Grazing	Pasture is well planned, providing ample grazing space and rotation options for optimal health.	Pasture is present but may not be adequately planned for optimal grazing.	Pasture design is inadequate and does not support cow health.
Operation Needs	Each design has items that are relevant to the type of production being done.	There are a few design flaws based on production type.	There are a lot of errors made for the types of products needed.
Neatness and Creativity	Design is hand-drawn with exceptional neatness and showcases high levels of creativity and originality.	Design is hand-drawn with some neatness and shows moderate creativity.	Design is messy or lacks creativity and originality.

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REFLECTION QUESTIONS:

1. What decisions on design differed based on the type of production you were designing?
2. Which design do you think is most costly? Why?
3. Are there parts you included in your design that you think you could go without? Why?

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Financial Demands of Cattle Enterprises

Student Name _____. Date _____

DIRECTIONS

Starting a beef enterprise requires several key pieces of equipment to ensure the efficient and humane handling, feeding, and care of cattle. On page 2 of this sheet, there is a list of basic equipment needed. Find and research the cost of these items and compile an expenses list to see what your total for start-up would be with all of these supplies. Make sure you consider the quantity of the supplies you need (for example, one automatic waterer may not be applicable in a production facility with 15 pastures being used for rotational grazing). Your goal is to spend the LEAST amount of money while making sure you have what you NEED.

Assume your start-up production set-up for pasture is as shown in the picture below, which you can use for reference in the amount of supplies you need. Each box is a different paddock for rotational grazing, so it represents where fencing would need to go. Your herd size is 100 head of cattle.

Each paddock = 30 acres or 1,306,800 square feet. Each paddock's dimensions are 1,306.8'x1,000'

			Area for other equipment and facilities

Your research needs to include the following:

- Either a slideshow or a document to put your research in
- On each slide or page, put:
 - The item you are getting, be specific (i.e., “electric fence” instead of just “fencing”)
 - The estimated cost
 - Picture or link for the specific product
- At the end, add up the cost of everything and share the total

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Basic Equipment Needs

Fencing and Gates

- Fencing- sturdy perimeter fencing (barbed wire, electric, woven wire, permanent vs. portable)
- Gates for access to different pasture paddocks and corral systems

Cattle Handling Facilities

- Corral
- Holding pens for corral
- Chutes and alleys
- Headgate or squeeze chute
- Loading ramp or dock

Feeding Equipment

- Feed bunks or troughs
- Hay feeders or racks
- Grain storage bins or silos
- Water troughs or automatic waterers

Housing and Shelter

- Barn or shed for protection from harsh weather
- Windbreaks or natural shelter areas in pasture

Health and Veterinary Supplies

- Vaccination equipment: syringes, needles
- Dewormers and other medications
- Livestock scales for monitoring weight

Pasture Management

- Pasture harrow
- Portable electric fences (if went that route for paddocks)

Breeding and Calving Equipment

- Artificial Insemination equipment
- Calving pens or maternity pens

General Farm Equipment:

- Tractor
- Tractor attachments:
 - Front-end loader
 - Hay forks
- ATV or UTV
- Manure spreader

Record Keeping

- Software or log books

Miscellaneous

- Cattle prods
- Cattle sorting sticks
- Ear tags and tag applicators
- Branding equipment

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Reflection Questions:

1. Compare your total with the totals of other students in class. Was yours higher or lower?
2. What was a major cost you were surprised by?
3. This expense list includes costs associated with cattle production but does not include the cost of the land or cattle themselves. Do the math for those costs by researching the average price for a head of beef cattle and the average price for an acre of pasture in Missouri. How does that compare to the price of all the equipment and facility needs?

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Waste Management Plan

Student Name _____. Date _____

DIRECTIONS

Answer the questions below using one of the cattle facilities you designed.

Assessment and Planning	
Site Assessment: Choose one of the cattle facilities you designed earlier in this lesson. Where is your farm located? Soil type based on location: Water source:	Manure Production Estimation: Assume your herd size is 100 head, and you feed them a balanced ration for the herd. How much waste do you estimate they produce? Make sure you put per year, per week, per month, etc. for the information you found.
Manure Handling and Storage	
Manure Collection: Answer according to facilities and areas in your designs. How often will you remove manure from: Barns? Feedlots? Pens? Other areas?	Manure Storage: What kind of manure storage will your facility have? Describe it below.

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Manure Utilization	
<u>Nutrient Management Planning:</u> What nutrients are in cattle manure that plants need? List one crop that is ideal for cattle manure fertilization.	<u>Composting:</u> How long does it take beef cattle manure to compost?
Land Application	
<u>Application Timing and Methods:</u> When should you apply manure to crop fields to fertilize the crop you selected above? What is the best method of application for fertilizing your crop with cattle manure?	<u>Buffer Zones:</u> What are buffer zones and how can you use them when applying manure to land?
Runoff and Erosion Control	
<u>Vegetative Buffers:</u> What are vegetative buffers?	<u>Cover Crops:</u> What benefits do cover crops have?
Water Quality Protection	
<u>Runoff Management:</u> List two things you can add to your facility to manage runoff.	<u>Water Monitoring:</u> How can you monitor water?

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Air Quality Management	
<u>Odor Control:</u> What is one way you can reduce odor from manure?	<u>Dust Control:</u> What is one way to help control dust on a beef cattle operation?
Regulatory Compliance	
<u>Permits and Regulations:</u> What are two permits or regulations that exist for waste management where your operation is located?	<u>Record Keeping and Reporting:</u> What reports should be submitted to regulatory agencies regarding waste?

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Cleaning and Sanitation Plan

Student Name _____ Date _____

DIRECTIONS

Use the space below to make a Cleaning and Sanitation Plan by creating daily, weekly, and monthly checklists for you to follow for maintaining cattle facilities.

Daily	Weekly	Monthly

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Assessment

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DIRECTIONS

Partner up with a classmate who has a facility design that is different from yours. Share your plans and designs with each other. Answer the following questions about their designs or compare the two.

1. Would you say that their design is low-stress? List three items included in their design that support your answer.

2. Comparing your design to your classmates, which is the most low stress? Explain your answer.

3. Which design cost the most to startup- your or your classmates? What parts of design and planning made the difference?

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4. Describe the environmental management practices your classmate uses in their plan. What problems are there related to what we discussed in class?
5. What differences were there in the Waste Management plans based on facility designs?
6. Are there any cleaning and sanitation differences between the two based on facility type and design?