Biosecurity Unit Lesson #1

**Title Of Lesson: *Beef Production***

**Subject/Course/Grade: Ag Science**

 Learning objectives:

* Students will understand the use of genetic selection in beef cattle.
* Students will be able to reason their choices of selections of beef cattle in scenarios.
* Students will be able to recall aspects of beef production as it applies to them.
* Students will gain insight on what being a large animal veterinarian can look like.

Main Concept:

* Students will learn about the beef production industry and learn about genetic selection.

Students will understand/know…

* **Vocabulary**
	+ rumen – first stomach on a ruminant animal, receives food and partially digests it with the help of bacteria, then passes contents to the rumen.
	+ fermentation – chemical breakdown of a product by using bacteria, yeast, or other microorganisms.
	+ monogastric – animal with only a one compartment stomach such as humans.
	+ microbes – a microorganism such as a bacteria or virus
	+ genetics – characteristics that are passed down to generations such as hair color.
	+ marbling – streaks of fat found in meat.
	+ traits – a genetically determined characteristic
	+ offspring – an animal young, in this case called a calf.
	+ Calving – process of a cow giving birth.
	+ Large operation – cattle farmers who will make a living out of cattle, has a large herd
	+ Parasites – microorganisms that can live in cattle intestinal tract and cause issues such as anemia and other diseases that will make them produce less.

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| * + Calving season – farmers will try and have all calves in one part of the year, usually in the springtime, this allows for more uniform herds and is easier to take care of multiple calves.
	+ breed – animals with the same defining appearance and been developed deliberately.
	+ crossbred – product of a mating between two different breeds.
	+ heterosis – tendency of crossbred animals to show qualities that are better than their parents
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| Show video “Beef Production.”**Background:****“**Understanding cattle breeds is important for production systems. By know what breeds do better in what environment we can maximize production wherever we are. As we saw in the video we can also combine some of these traits so that their offspring to maximize their efficiency, this process is called **heterosis**.”“We also can select for qualities that we want to see from our herd, such as good mothering quality, calving ease, and docility, just to name a few. These help us to have herds that are fit to our production type, so if you have a smaller herd, we might look more at docility to make sure that we are able to handle the animals better. But that trait wouldn’t matter as much on a larger farm with a lot more land, since we wouldn’t have to handle cows as much. Knowing what you want on your farm is a good first step in picking what breed you should have.”“Lastly some qualities that we can select for is meat quality. Some qualities that breeds can show is growth rate and marbling. These qualities are important for meat production so that we can select for cows that will grow faster and more efficient so we aren’t putting as much money into the cow and we can still get more out.”“As a veterinarian you may be asked some questions about what breed a client should get. So today that is what we are going to do. Each group will get a different scenario and different breeds with their characteristics. In this lesson you will have to find the best fit of breeds for each scenario.”**Activity**Materials Needed\_\_ Beef cattle scenarios\_\_ Beef breed cardsBefore students arrive: Set out scenarios and breed cards throughout the classroom to have groups of approximately 2-5.ActivityAfter students watch the beef production video, have them get into groups together around the scenario and breed cards. These groups can already be preassigned or assigned right before the activity. Once students are in the groups, they can read their scenario together. These scenarios will describe farm type, weather, what kind of production they will be used for. Students will discuss in groups what breed they would recommend to the farmer. Once each group has picked their breed or breeds for their farm, you can go around the room and have each group read their scenario out loud to the class and then what breeds they chose and why.  |

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| **Following Through**After each group has presented students can talk about other groups choices for breeds and see if any of their opinions differ. After ask groups if there were any breeds that they thought would also make a good choice but was not the best fit for their scenario. You can also have a discussion with students to see if any of the other breeds they heard from other groups, that may have fit will for their scenario. This shows that there are a lot of different breeds that we can use for a certain scenario, but since we were only given a few to pick from our options were limited. You can also relate this to other species and ask students if they think other production animals can work in this same way.  |
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| Monitoring and Feedback:* Students will understand selection importance for the beef industry.
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| Learning Activities:Beef Production video (2:35 minutes)Introduce vocabulary, give background (10 minutes)Beef activity (15 minutes)Post activity discussion and questions (20 minutes) |

# RESOURCES

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| * https://extension.umn.edu/dairy-nutrition/ruminant-digestive-system#stomach-compartments-1000460
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| * https://www.beefitswhatsfordinner.com/raising-beef/animal-care
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| * https://www.westtexaslivestockgrowers.com/the-truth-about-what-roughages-does-for-cattle/
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| * https://www.vicsmeatmarket.com.au/post/what-is-marbling#:~:text=Marbling%20is%20the%20fine%20flecks,%2C%20rib%20eye%2C%20and%20blade.
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| * https://afs.ca.uky.edu/livestock/beef/breeds/scottish-highland
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| * https://extension.okstate.edu/fact-sheets/crossbreeding-beef-cattle-i.html#:~:text=Crossbreeding%20is%20a%20system%20of,cure%2Dall%20for%20unproductive%20cattle.
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