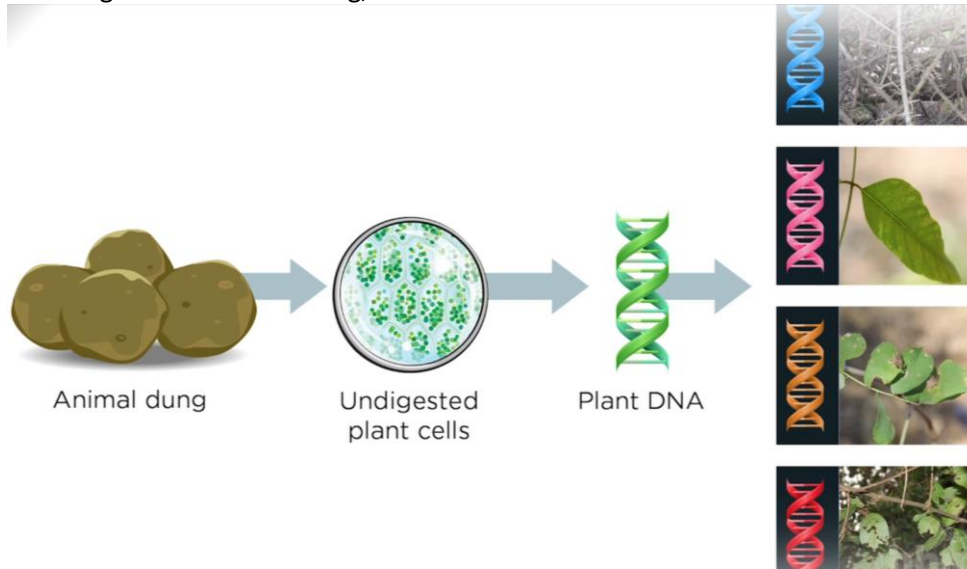


6. Dr. Pringle is using DNA metabarcoding, summarized here:



- a. Provide two reasons why it is important to isolate **undigested** plant cells.

- b. In order to use this DNA technique, the research team first collected DNA from 400 plant species that grow on the African savanna and entered the sequence data into a database. Explain why this was a necessary first step.

7. Toward the end of the film, the narrator says, “The Pringle lab’s work reminds us that ecological communities are profoundly interconnected.” Using sentences, describe three specific examples of the interconnectedness of the organisms found in Gorongosa National Park.

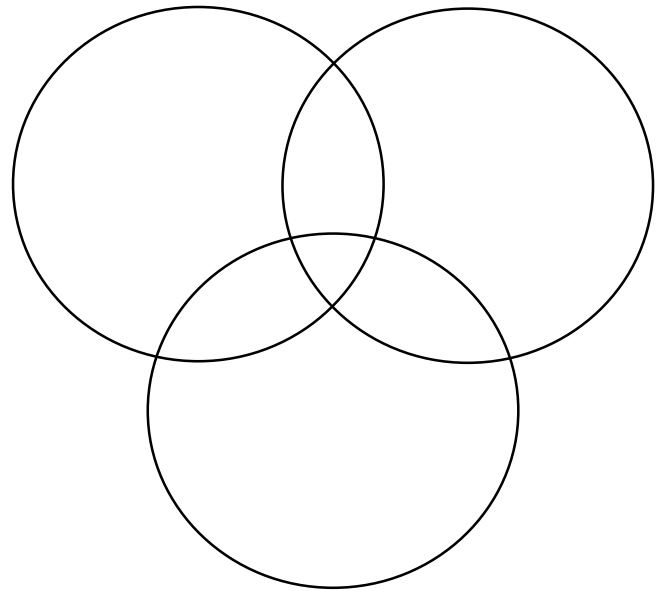
8. Conservation biologists in other areas of the world think that knowing more about what wildlife eat will help them make better decisions to protect threatened and endangered species. Explain two ways conservationists could use DNA metabarcoding data to help make these decisions.

Niche Partitioning and Species Coexistence

	Plant Taxa	Buffalo	Cattle	Impala
1	<i>Hirpicium diffusum</i>	Yes	Yes	Yes
2	<i>Gutenbergia (genus)</i>	Yes	Yes	Yes
3	<i>Emilia discifolia</i>	Yes	Yes	Yes
4	<i>Osteospermum vaillantii</i>	No	Yes	Yes
5	<i>Helichrysum glumaceum</i>	No	Yes	Yes
6	Asteraceae (family)	No	No	Yes
7	<i>Eragrostis sp.</i>	Yes	Yes	No
8	<i>Digitaria (genus)</i>	No	Yes	Yes
9	<i>Tragus berteronianus</i>	No	Yes	Yes
10	<i>Setaria sphacelata</i>	Yes	No	No
11	<i>Eragrostis papposa</i>	No	Yes	No
12	<i>Urochloa brachyura</i>	Yes	No	Yes
13	<i>Echinochloa pyramidalis</i>	Yes	No	No
14	<i>Harpachne schimperi</i>	Yes	Yes	Yes
15	<i>Panicum maximum</i>	Yes	Yes	Yes
16	<i>Garnotia (genus)</i>	Yes	No	No
17	<i>Brachiaria eruciformis</i>	Yes	No	No
18	<i>Sporobolus agrostoides</i>	Yes	No	No
19	<i>Dinebra retroflexa</i>	No	Yes	No
20	<i>Pennisetum hohenackeri</i>	Yes	No	No

Data from Kartzinel, et al. (2015). PNAS 112(26), 8019–8024.

The table to the left is from another metabarcoding study by Dr. Pringle. Use the table to complete a Venn diagram illustrating the different plants eaten by three different animals. Label a circle for each of the animals and then **place a dot** in the appropriate area of the graph for each plant taxa.



- Which two animals have the most overlap in their diets? Justify your response.
- Cattle and buffalo share a similar fundamental niche, the entire set of conditions under which a population can survive and reproduce. A realized niche is the set of conditions actually used by a given population. Explain what the data in the Venn diagram suggest about the realized niches of the cattle and buffalo and their ability to coexist. Use evidence to support your explanation.
- If plant species #10, 13, 16, 17, 18, and 20 were no longer available to the buffalo, predict three consequences to the stability of the biological communities and ecosystem.