

Domestic Animal Feeding Behavior

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Introduction

For this study, I observed three different species all doing the same behavior. I chose an herbivore, an omnivore, and a carnivore to study so that I could look at the differences in each species' movements and feeding patterns. The reason I chose to look at feeding behavior is because this is the most consistent behavior between the three species. I could have chosen play behavior, or sleep patterns, but I feel that the biggest difference would have been in feeding habits. My objectives for my research were as follows:

- Find out how long it takes each species to consume what is considered a full meal for that particular animal
- Determine the amount of time spent doing 3 behaviors most commonly viewed in all three species: biting, chewing, and swallowing
- Learn how each species uses their mouth for food consumption
- (and for fun) Learn of each animal's before or after-meal rituals

Methods

For this study, I chose three different species based on the type of diet they consumed. For herbivore, I chose a horse named Twister. For omnivore, I had access to a sugar glider named Luna. For carnivore, I used my own dog, an Australian Shepherd named PJ.

Animal	Age	Weight	Feed	Amount Fed	Time Spent Eating
Horse	8 years	1,127lbs	Mare & Foal Feed +	5.5lbs	9m 14s

			Complete Nutrition Horse Feed		
Sugar Glider	9 months	<1lb (78g)	Coconut Chips	2 Chips = 1.8oz	2m 26s
Dog	1yr 9mo	52.2lbs	Simply Nourish Chicken Flavor Dry Dog Food	<1lb (226.8g)	2m 34s

As you can see above, each animal had its own set of requirements. I observed each of them in how long they took to eat and the movements of their mouths during eating. I also observed the different behaviors displayed and defined them in the ethograms below.

I will display the percentages of time spent in the results section of this paper. Not all behaviors in ethogram were displayed in the specific video coded, but will be explained later.

Horse Ethogram:

<u>Behavior</u>	<u>Description</u>
Mastication	The act of chewing/grinding the food
Pacing	Movement back and forth
Biting	Gripping the food with teeth or lips
Swallowing	Guiding the food down the throat
Nipping	Using the front incisors to pinch down on something
Stomping	Beating one hoof on the ground

Dog Ethogram:

<u>Behavior</u>	<u>Description</u>
Mastication	The act of chewing the food
Biting	Grabbing the food with any part of the mouth
Swallowing	Guiding the food down the throat
Tail wagging	Movement of the tail back and forth
Jumping	At least two paws off the ground
Drinking	Using the tongue to guide water into the mouth and down the throat

Pacing	Movement around the room
Licking	Moving the tongue over an area

Sugar Glider Ethogram:

<u>Behavior</u>	<u>Description</u>
Mastication	The quick chewing of the food
Scooping	The use of bottom two incisors to hollow out fruits
Biting	Using the teeth to grab pieces of food
Swallowing	Guiding the food down the throat
Grabbing	Using the hands to grip/hold onto pieces of food
Licking	Flicking of the tongue outside of the mouth to taste certain foods
Turning	Moving the food with hands to access different sides

To record the behaviors of each of the animals, I used the camera on my phone to capture video footage that allotted the time of each event. The videos included in the PowerPoint presentation are only small clips of the footage I took. Initially, I had only one video that would have worked well for this study, so I did have to retake videos for the dog and the sugar glider.

Results

Displayed below are the percentages of time that each animal spent doing each behavior described in the ethogram. Note the time next to the title of each table is the total amount of time the animal spent feeding. Disclaimer: The percentages displayed below do not add up to 100%, due to the animal displaying multiple behaviors at the same time.

Horse feeding time: 9m 14s

Behavior	% Time Spent
Mastication	89
Pacing	4.5
Biting	87
Swallowing	20

Nipping	2
Stomping	1.7

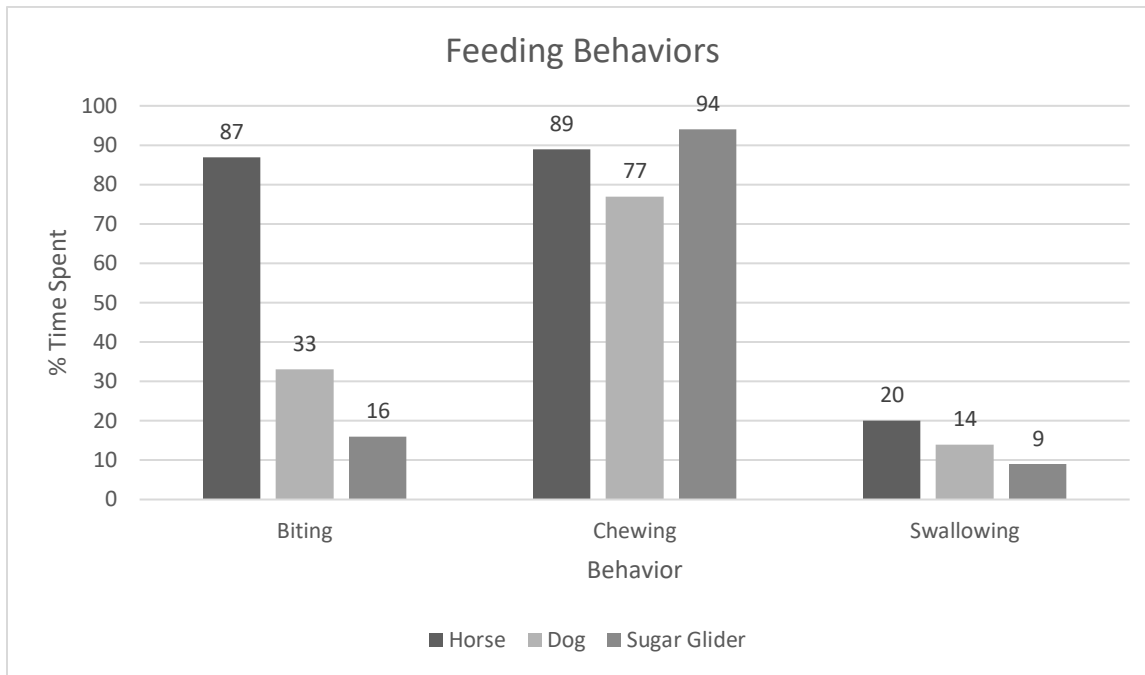
Dog feeding time: 2m 34s

Behavior	% Time Spent
Mastication	77
Biting	33
Swallowing	14
Tail wagging	1.2
Jumping	0.6
Drinking	3.8
Pacing	5.5
Licking	18

Sugar Glider feeding time: 2m 26s

Behavior	% Time Spent
Mastication	94
Scooping	0.0
Biting	16
Swallowing	9
Grabbing	98.6
Licking	14
Turning	80

After observing the feeding behavior in all three species, I compared the three most common behaviors: biting, chewing, and swallowing. The following figure is a chart comparing these results.



(Fig 1. Three most common feeding behaviors recorded (% of the recorded time) in horse, dog, and sugar glider.)

Discussion

Because I chose three different species that eat completely different foods, the process of eating the food was different in each. These next sections will explain the individual process, literature, and limitations of each animal.

Horse:

Twister

The herbivore I studied is Twister the horse. Twister spent a lot of time both biting and chewing. She was constantly grabbing more food with her lip as she was still chewing food from previous bites. Before she was fed, she did see us approaching with the bag of food, so she

would pace back and forth and stomp in what I only assume was anticipation. During the feeding she didn't take a single drink and she did not take a drink within the 5 minutes after feeding that I observed her. Also during the feeding, other mares in the pen tried to approach her, so she turned around and nipped at them to warn them away. After she was done, there were no other specific behaviors recorded, as she just walked away from us.

Anatomy/Literature

Horses' cannot move their jaws in an up and down motion, therefore they have to grind their food. They do this using their back molars and premolars, commonly called "cheek teeth". From the start of eating, they use the upper lip to grab hold or take a "bite" (as I defined it) of their food. Then they use the tongue to guide the food into their mouths and hold the food against their cheek teeth for chewing. It takes several minutes for the food to be soft enough to swallow. (Arnott 2018)

Limitations

For this study, I should have found another horse to use. Twister is not eating her normal diet in this study due to the fact that she lost quite a bit of weight in the month before filming. She had come down with heaves, so the owners are feeding her mare and foal feed in order to fatten her back up to normal weight.

Dog:

PJ

The carnivore used was my own dog, PJ. Before eating, when he saw me coming with the food he got excited and started jumping around a bit and wagging his tail. Normally before every

meal I say two little words to let him know he is about to be fed, so in order to make this study accurate, I also said those two words as if it were a normal feeding. When I approach with the cup of food I say in a high pitched voice “you hungries?” During feeding he had a tendency to turn away from his bowl or walk around with food still in his mouth. Normally when he eats, he will walk away and drop food on the floor to eat, but for this study, he didn’t do that. He only stopped to drink water once for 6 seconds, but did not drink for the rest of the meal or after eating. He spent quite a bit of time licking his muzzle, assumedly to clean any food off of it from having his whole muzzle in the bowl. He ate quickly and although the results say he chewed a large percentage of the time, this also only took a little over 2 and a half minutes. After eating, the only thing he did was walk to the door to go outside.

Anatomy/Literature

Dogs are complete opposite of horses when it comes to chewing, as their mastication is up and down. They cannot physically move their jaws side to side. Their digestive system was made for them to swallow food whole, which is why PJ is fine with eating so fast. Many dogs tend to speed eat. This may come from their wolf ancestors who had to eat quickly before another predator came to steal their food. Their front teeth are made for ripping at meat, so technically there is no correct diet for humans to feed their dogs unless it is raw meat. (Bolz 2009)

Limitations

For this study, I did use my own dog, who happens to be afraid of anything and everything. When I approached him with my phone to record him, he hesitated to even start

eating. If I were to do this study in a real research experiment, I would stand further back so as not to risk changing the normal behavior of the dog.

Sugar Glider:

Luna

For the omnivore in my study, I used my friend's sugar glider, Luna. She was very stubborn to actually record because she is still considered a baby. The only video she actually cooperated in was pretty blurry, so it was hard to tell a lot of the behaviors. She had just woken up for the night and her owner gives her 2 coconut chips for breakfast, plus whatever fruit they have in the bowl for that night. Luna got very excited over the food, so when the owner handed her the coconut chip, she immediately started eating it. She didn't stop to sniff it or inspect it at all. She would nibble at the coconut chip until one side was deteriorated and then she would use her little hands to turn the food and nibble from the other side. She spent a majority of the time chewing, as stated in the chart.

Anatomy/Literature

Sugar gliders are nocturnal, so they sleep the majority of the day and become active at night. They are what are called "diprodonts", which means they have a set of two smaller incisors on the top of their mouths and two very large incisors on the bottom. The two bottom incisors are meant for scooping fruit. I did not observe this action firsthand, but it is included in the ethogram for educational purposes. They can survive solely on sugar, hence the name "sugar" glider. Luna has apple juice in her cage which she licks at whenever she wants because although they are omnivores, they must have sugar in their diets. They have very long tongues used to lick sugar. This was also included in the ethogram. (Pocket Pets 2018)

Limitations

I should have gotten better videos of the sugar glider, and slowed it down so I could see the specific swallowing and chewing patterns. The swallowing percentage may not be accurate due to the fact that it is difficult to tell when a sugar glider is swallowing their food.

Conclusion

Overall, the study was very informational. I definitely could have gotten more than one video for each and tested the consistency of each animal's feeding behavior. I learned a lot in my research about the differences in herbivores, omnivores, and carnivores. I also learned the differences in different animals of each feeding group (i.e. pigs are also omnivores, but have very few similarities to sugar gliders). This was an interesting experiment and I look forward to learning more by watching my dog, cat, and my 5 new fish here at home.

References

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