Feeding Behavior of a Dog, Betta Fish, and Leopard Gecko

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Background

The feeding behavior for dogs is greatly influenced by the feeding habits of their wild ancestors. Most wild canines will display a feast-or-famine type of food intake. This is where the animal will gorge itself when food is available in order to sustain a diet where available food is not always a given. Eating as much as possible when it can will help the canine survive until its next meal, which may not be for several days (Beaver, 2009). Dogs today tend to retain this behavior, often eating more calories than needed when food is available (Beaver, 2009). Several breed of dogs are known to consume their meals very rapidly. This comes from their ancestors having to compete with other conspecifics for food, either from wolves or from scavenging during early domestication (Bradshaw, 2006). The quantity of food a dog eats may also vary by company. Slow eating dogs tend to eat faster when in the company of others. Again, this has ties to the ancestors of the dog, where the dominant pack leader would control most of the food (Geary, 1979).

Like most carnivores, the dog's taste buds respond mainly to amino acids. However, they can also respond to some of the "fruity-sweet" compounds found in plants. Dogs and other wild canines, such as coyotes, are known to eat plants when no other food is available (Bradshaw, 2006). Odor may play a role in food selection for canines. This is evidenced by dogs who lack the ability to smell showing less discrimination between different types of food (Bradshaw, 2006).

The teeth of the dog are mainly used for biting, grasping, and tearing. However, dogs do possess four molars, teeth typically used for grinding food, such as plant matter. Dogs are unable to grind their food, though, with their jaws only capable of moving up and down instead of side

to side (Spielman, 2015). When eating, dogs will not stop to chew or savor their food. With meat it will be torn into chunks that can be easily swallowed. The dry dog food fed by most owners tends to be swallowed whole (Geary, 1979).

Siamese fighting fish, or more commonly known as betta fish, are primarily carnivores (The Ultimate Betta Fish Food and Feeding Guide, 2016). In the wild, they feed mainly on insects (Sturgeon, 2001). Most commonly, they will eat mosquito larvae, brine shrimp, or bloodworms (The Ultimate Betta Fish Food and Feeding Guide, 2016). Betta fish possess an upturned mouth. This is because they catch most of their prey at the surface of the water. The upward angle helps the betta fish have easier access. Inside their mouths are tiny, sharp teeth the betta will use to break down their food before swallowing (Betta Fish Anatomy: External & Internal Explained, 2017). In captivity, betta fish are usually fed pellet or flakes in place of insects, as most owners do not have access to their natural food (The Ultimate Betta Fish Food and Feeding Guide, 2016).

Leopard geckos are hunters, which means they prefer to eat live food over dead food. A large portion of their diet is made up of crickets, but they can also eat spiders, worms, and a variety of small mammals (Delport, 2016). However, leopard geckos are also opportunistic feeders, meaning they will prefer not to go looking for their food. Instead, they will only stalk their prey once it is in their sight (Friends of the Rosamond Gifford Zoo Education Volunteers, 2006). In captivity, their food is typically dusted with calcium in order to balance the calcium phosphorus ratio in their diet. This is because the crickets they are fed are very high in phosphorus, and leopard geckos require are 2:1 ratio with calcium and phosphorus (Delport, 2016).

Methods

Three species of animals were observed: a female dog, a male betta fish, and a female leopard gecko. Videos were recorded an an iPhone, starting when food was given to the animal and ending when the animal has stopped eating.

The first recorded was a female Shetland sheepdog mix who is about five years old, named Rigel. Rigel is fed twice a day, with the same amount of wet and dry food each time. She is only given fish oil once a day. Rigel was recorded in the evening, where she was given $^{3}/_{4}$ cup of Iams Proactive Health dry dog food, 2 tablespoons of Abound Lamb and Brown Rice wet dog food, and 900 milligrams of fish oil. Rigel is given fish oil to prevent dry and sensitive skin. It took Rigel 5 minutes and 23 seconds to eat all of her food.

Next recorded was a male betta fish, about two years old. He gets fed twice a day, each time being fed a pinch of Aqueon Betta Food flakes. It took him 2 minutes and 45 seconds to finish eating.

The last animal recorded was a female leopard gecko named Godzilla. She gets fed once a day, in the evening. Each meal she is fed 4-5 crickets, dusted with calcium. It took her 2 minutes and 59 seconds to finish her food.

Results

A total of seven different behaviors were recorded during the observation of the dog. The most common behaviors were the act of eating followed by the licking of the lips. When recording, I was unable to get a decent angle to observe how the dog caste food into her mouth. I was also unable to clearly tell when she swallowed, and so I recorded prehension, mastication, and swallowing as one behavior: eating. The least observed behavior was the act of sitting, where he body was upright and she had both hind legs folded under her body and both front legs

extended, which was only done before the initial approach to the food. Periodically throughout eating, she would leave her food unattended to watch the front door of the house.

Table 1. *Ethogram of behaviors observed while dog was eating, with percentages.*

Behavior	Description	Percent Time
Approaching	The act of moving towards the food bowl with the intention to eat	7.36%
Eating	Prehension, chewing, and swallowing of the food	60.74%
Licking food	Using tongue to touch food without casting any into mouth	9.51%
Licking lips	Wiping tongue across lips	21.17%
Sitting	Upright with hind legs folded beneath body and forelegs extended. Not eating food	3.37%
Surveying	The act of looking at surroundings while standing at food dish	10.12%
Watching door	The act of leaving the food to look at the front door	11.35%

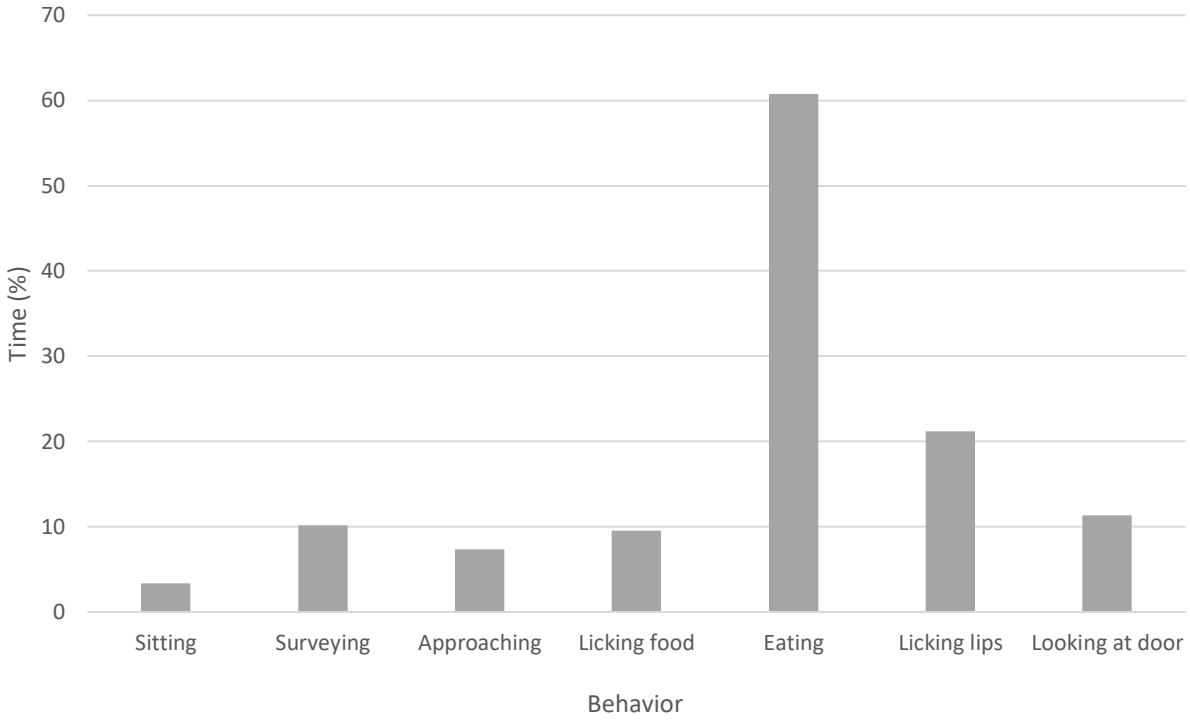

Figure 1. *Percentage of time dog spent doing each behavior as observed during feeding.*

A total of seven different behaviors were recorded during the observation of the betta fish. The most common behaviors displayed by the betta fish were the acts of heating and searching for food. Heating is the behavior that occurred when the betta fish floated next to the

heater of the tank. This behavior only occurred at the beginning, before the betta fish searched for food but after food was offered. Like with the dog, I was unable to tell the difference between chewing and swallowing for the betta fish, so the acts of prehension, mastication, and swallowing were all counted as the behavior, eating. Lunging, where the betta fish would surge forward to grab his food, was the least observed behavior.

Table 2. *Ethogram of behaviors observed while betta fish was eating, with percentages.*

Behavior	Description	Percent Time
Approaching	The act of moving towards the food with the intention to eat	4.24%
Drifting	Floating, only movement is caused by water	7.88%
Eating	Prehension, chewing, and swallowing of the food	8.48%
Heating	Floating next to heater to get warm	46.67%
Lunging	A surge in movement in order to catch the food	1.82%
Searching	The act of looking for more food	29.09%
Waiting	Floating near the bottom of the tank after not initially finding food	6.67%

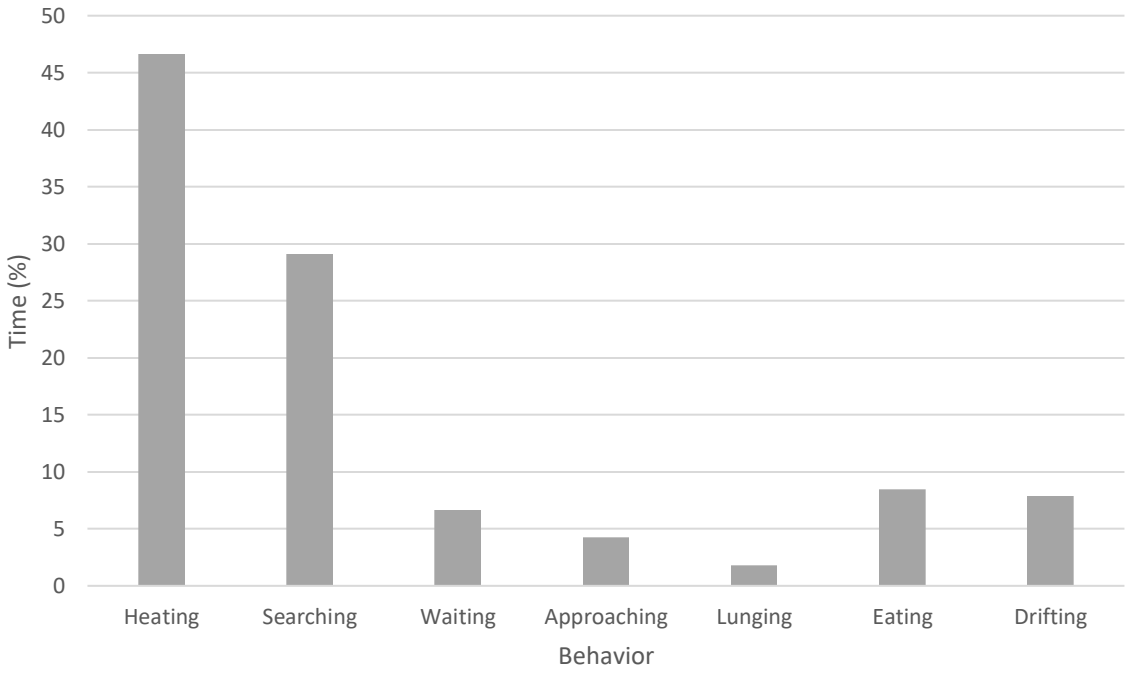

Figure 2. *Percentage of time betta fish spent doing each behavior as observed during feeding.*

Only three different behaviors were recorded during the observation of the leopard gecko. Eating and stalking were the most common behaviors displayed by the leopard gecko,

both happening much more frequently than stalking. Again, I was unable to tell when exactly the leopard gecko swallowed, so prehension, mastication, and swallowing were all counted as part of the behavior, eating.

Table 3. *Ethogram of behaviors observed while leopard gecko was eating, with percentages.*

Behavior	Description	Percent Time
Eating	Prehension, chewing, and swallowing of the food	62.01%
Lunging	A surge in movement in order to catch the food	2.23%
Stalking	The act of following or watching prey with the intent to catch it	35.75%

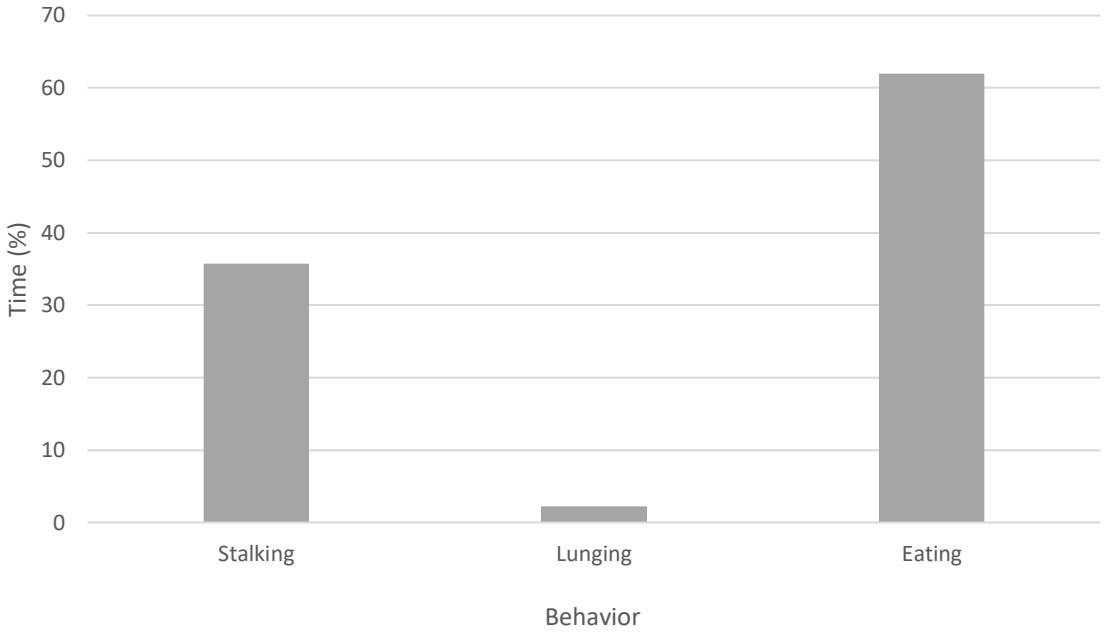

Figure 3. *Percentage of time leopard gecko spent doing each behavior as observed during feeding.*

All together, the three animals did not share many behaviors. Approaching was counted with stalking in the comparison because both involve moving towards the food source. Between the three animals, the dog and the leopard gecko spent similar percentages of their time eating while the betta fish spent significantly less. The leopard gecko spent the highest percentage of the three stalking her food. The dog never lunged for her food, but the betta fish and leopard

gecko spent a similar percentage lunging.

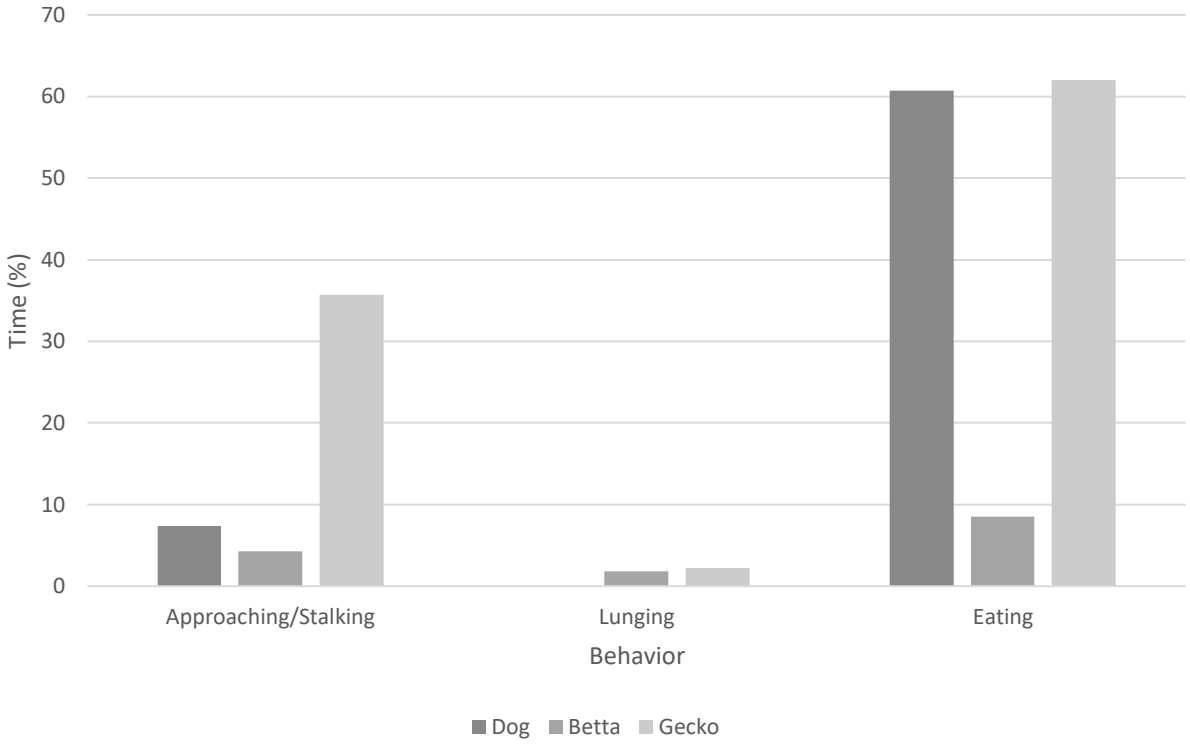

Figure 4. *Comparison of the percentage of time the dog, betta fish, and leopard gecko spent performing three behaviors.*

Discussion

According to the literature, most dogs tend to eat quickly and consume as much as possible. Rigel did not align with what the literature said. Of the three animals, she took the longest to eat. She walked away from her food, leaving it completely unattended, several times. This could be because I got her as an 8-week old puppy, and so she never had to compete for her food. She could also not care for the specific food she was given. Whenever she left her food, she would go somewhere where she could watch the door for a few seconds. During the time she was fed, one of her owners was out of the house. Watching the door is a behavior she typically displays when she is anticipating their return. Whenever she stopped eating, she would lick her

lips. This could be because the dry food increased a desire for water. However, she never drank water before, during, or after eating so there is no way that could be proven. She ate her wet food first, which indicates a preference for that food. Combined with the lack of interest displayed when repeatedly walking away from her dry food, I would say that conclusion is possible.

There was not enough in the literature to really compare the betta fish to. After first being given food, he did not immediately move from his spot by the heater. By time he started searching for his food, much of it had already floated to the bottom of the tank. His refusal to eat it, and instead wait for more food to be given, does coincide with what the literature said about betta fish preferring to eat their food from the water's surface. On the day the betta fish was recorded, the room his tank is kept in was cold. This would explain why he spent a large portion of his time floating by the heater even after being given food. Overall, he did not spend much time actually eating. Perhaps had he been given more food, he may have spent more time eating.

Again, there was not enough in the literature to really compare the leopard gecko to. The literature said leopard geckos are opportunistic feeders, and prefer to not go looking for their food. This was observed in the leopard gecko's behavior. She only seemed to stalk her food after it passed near her, and she did not seem to seek it out when there was none in sight. Of the 4 or 5 crickets she was given, she only ate three of them. However, it is possible she ate the other two sometime after she was no longer being recorded.

References

Beaver, B. V. (2009). *Canine Behavior: Insights and Answers* (2nd Edition ed.). St. Louis, Missouri, USA: Saunders.

Betta Fish Anatomy: External & Internal Explained. (2017). Retrieved from Betta Fish: https://bettafish.org/betta-fish-anatomy/

Bradshaw, J. W. (2006). The Evolutionary Basis for the Feeding Behavior of Domestic Dogs (Canis familiaris) and Cats (Felis catus). *The Journal of Nutrition , 136* (7), 1927S-1931S.

Delport, R. (2016, October 22). *Leopard gecko eating behaviour*. Retrieved from Leopard geckos 101: http://www.leopardgeckos.co.za/leopard-gecko-eating-behaviour/

Friends of the Rosamond Gifford Zoo Education Volunteers. (2006, January 25). *Leopard Gecko*. Retrieved from Rosamon Gifford Zoo: http://www.rosamondgiffordzoo.org/assets/uploads/animals/pdf/LeopardGecko.pdf

Geary, M. (1979). *Rand McNally pictorial encyclopedia of dogs.* Chicago: Rand McNally.

Spielman, B. (2015, August 3). *Structure and function of the tongue, teeth and mouth in dogs*. Retrieved from PetPlace: https://www.petplace.com/article/dogs/pet-health/structure-and-function-of-the-tongue-teeth-and-mouth-in-dogs/2/

Sturgeon, D. (2001). *Betta splendens: Siamese Fighting Fish*. Retrieved from Animal Diversity Web: http://animaldiversity.org/accounts/Betta_splendens/

The Ultimate Betta Fish Food and Feeding Guide. (2016). Retrieved from Betta Fish: https://bettafish.org/care/food-feeding/