

### Introduction:

Several hundred chronic diseases and conditions exist in horses which can cause weight loss and poor appetite. In some cases, horses feel sick because of their condition and subsequently do not feel at all like eating, even when there is plenty of food available. Like, humans, horses have different behavioral traits that may be genetic or may evolve as they mature. These can include preferences related to type of food and consumption habits. On average, close to 24 horses per week in the United States die from food and medication rejection. Statistics like these encouraged me to find out if there is a way in which we can help horses to consistently want to eat their grain, which is critical for nutrition and weight gain, and is one of the most common ways to administer medication. This type of research can continue to save the lives of horses if we can determine a preference for feeding.

It is currently believed through scientific study that horses have dichromatic colour vision, meaning that their colour perception is limited to the green and blue portion of the spectrum. It is thought that their colour vision is somewhat like what is known commonly in people as red-green colour blindness (or more correctly called colour deficiency). This means that certain colours, especially red and related colours, appear greener.

Oats are generally considered to be well liked by horses, and were already established as a regular part of the diet for all horses in my sample group. By limiting the type of feed to only this grain, the possibility of feed rejection was minimized. A typical daily serving given to all the horses in my study group was 240mls of oats.

### Purpose:

The purpose of this experiment is to determine the effect of feed bucket size and colour on equine feeding preferences and rate. Improving our understanding of these feeding parameters could significantly enhance the predictability of feeding strategies to ensure proper nourishment in horses both in sickness and in health.

**Hypothesis:** If horses are given the choice to eat oats from a red, blue or yellow feeding bucket they will prefer yellow because it is the more vibrant colour. If horses are given the choice to eat oats from a small or large bucket, they will prefer the small bucket because the oats are more densely distributed.

If horses consume oats out of a small yellow bucket this will result in the shortest feeding time because there is less surface area for the horse to push the oats around with their nose.

### Materials:

- Small blue bucket
- Small red bucket
- Small yellow bucket
- Big blue bucket
- Big red bucket
- Big yellow bucket
- Timer (phone app)
- 240 ml measuring scoop
- 2 - 25 KG Masterfeeds Saddle Whole Oats





### Procedure:

Nineteen horses (Table 1) were used to investigate their preferences for various sizes and colours of feed buckets as determined by the length of time required to eat 240 ml of oats. All horses were fed at their usual time of day but were individually removed from the herd to reduce distraction. They were brought to the barn on a lead rope and guided to where the testing bowls had been placed in the aisle away from any other horses. Depending on the testing day, buckets of various sizes or colours had been placed side by side in an open area of the barn. Each of the buckets had a 240 mL measured amount of oats. All horses received the same amount of oats. The horses were allowed to choose which bucket they had preference for, and once they decided, the non-preferred bucket(s) was removed. Each horse was observed and timed for the exact amount of time, in minutes and seconds, they took to consume all of the food in the chosen bucket. Start time was defined as the mouth opening to initiate the first mouthful. Stop time was defined as the completion of the last visible swallow before the horse lost interest (rejected) or finished the grain. The horse was then brought back to their paddock to graze. The experiment was repeated for each individual horse every day during the testing period as follows:

- Day 1 and 2: the horses were offered a large and small blue bucket.
- Day 3 and 4: the horses were offered a large and small red bucket.
- Day 5 and 6: the horses were offered a large and small blue bucket.
- Day 7: the horses had a choice between a small red, blue or yellow bucket.
- Day 8: the horses had a choice between a large red, blue or yellow bucket.

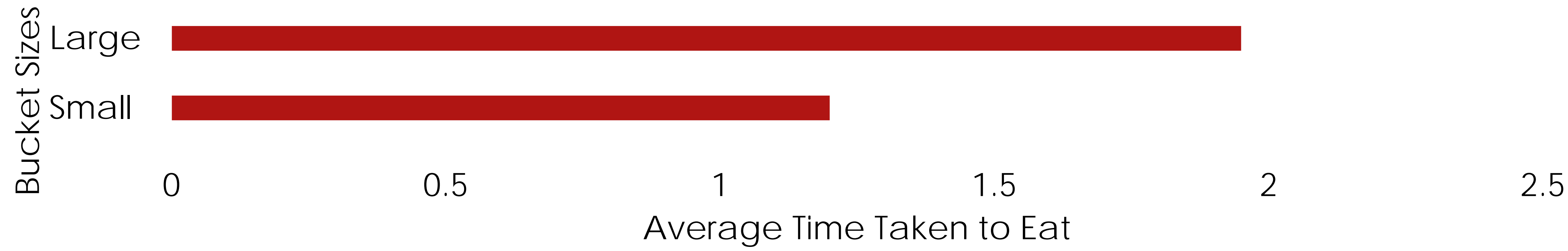
**Table 1: Gender & Age of horses**

Mares	Age	Geldings	Age	Stallion	Age
Ashira	11	Udaya	9	Promise	13
Winnie	11	Beato	10	Total	1
Welly	12	Beswick	10		
Angel	17	Rocky	11		
Stormy	17	Rene	12		
Felicia	20	Hunter	15		
Toffee	20	Des	17		
Total	7	Reuben	19		
Median age	15.42	JD	19		
Age range:	11 - 20	Jester	20		
		Scuttle	22		
		Total	11		
		Median age	14.9		
		Age range	9-22		

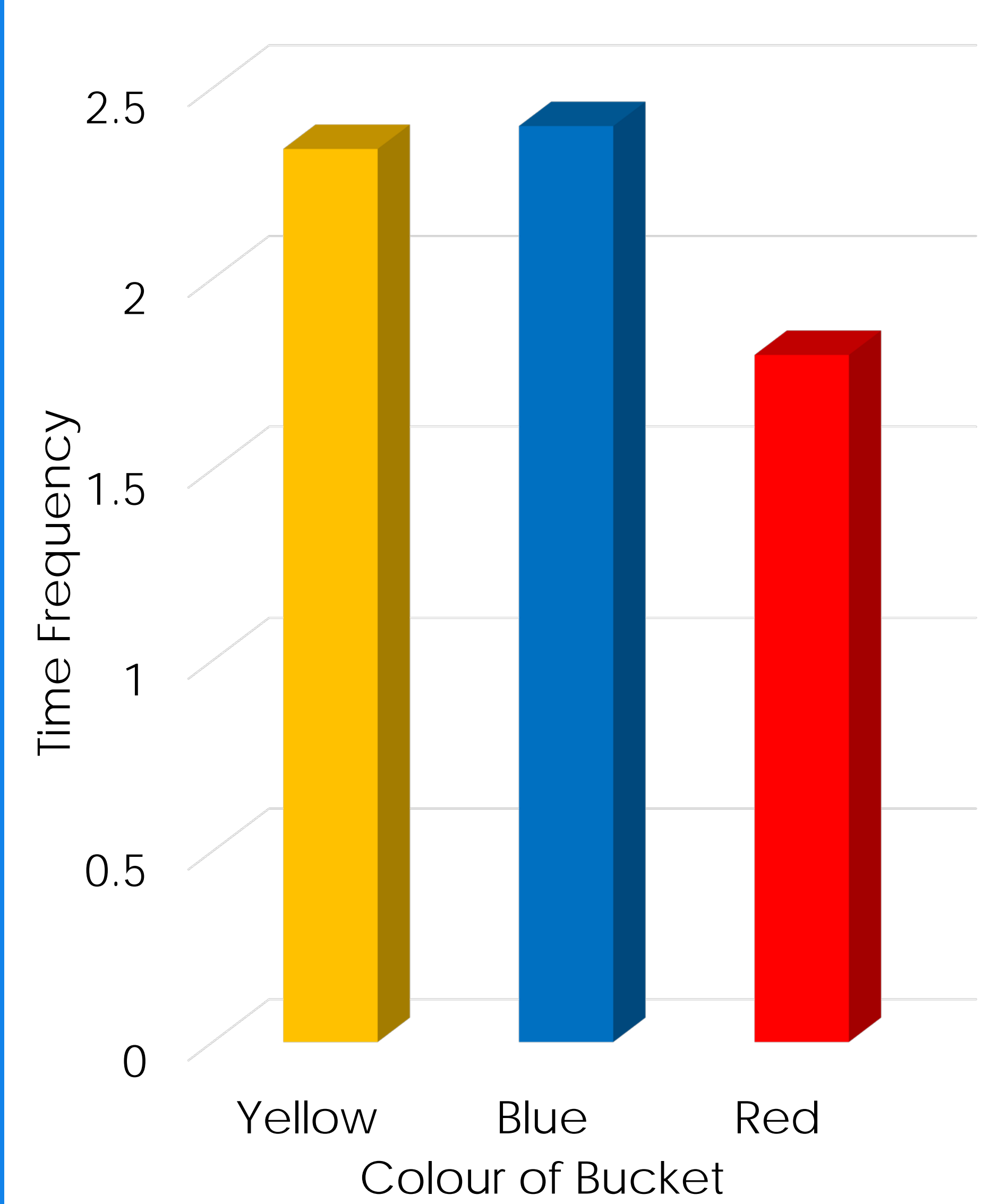
### Discussion:

I did not feel that the horses had a preference for placement of the bucket on the right or left hand side. It did appear that the horses all saw the large blue bucket first but then made their decision as to which bucket they would prefer to eat out of. The large bucket was deep and the horses ate a few bites, pushed the oats around with their noses and routinely lifted their head quickly like they were checking surroundings. I also did observe that the majority of the horses played around with the food in the large buckets which slowed down the feeding time. My small buckets were a little too small as a lot of the horses spilled a little of the food on the ground and then licked it up. They did tend to eat faster and continuously out of the small buckets as there was less space to move the oats around.

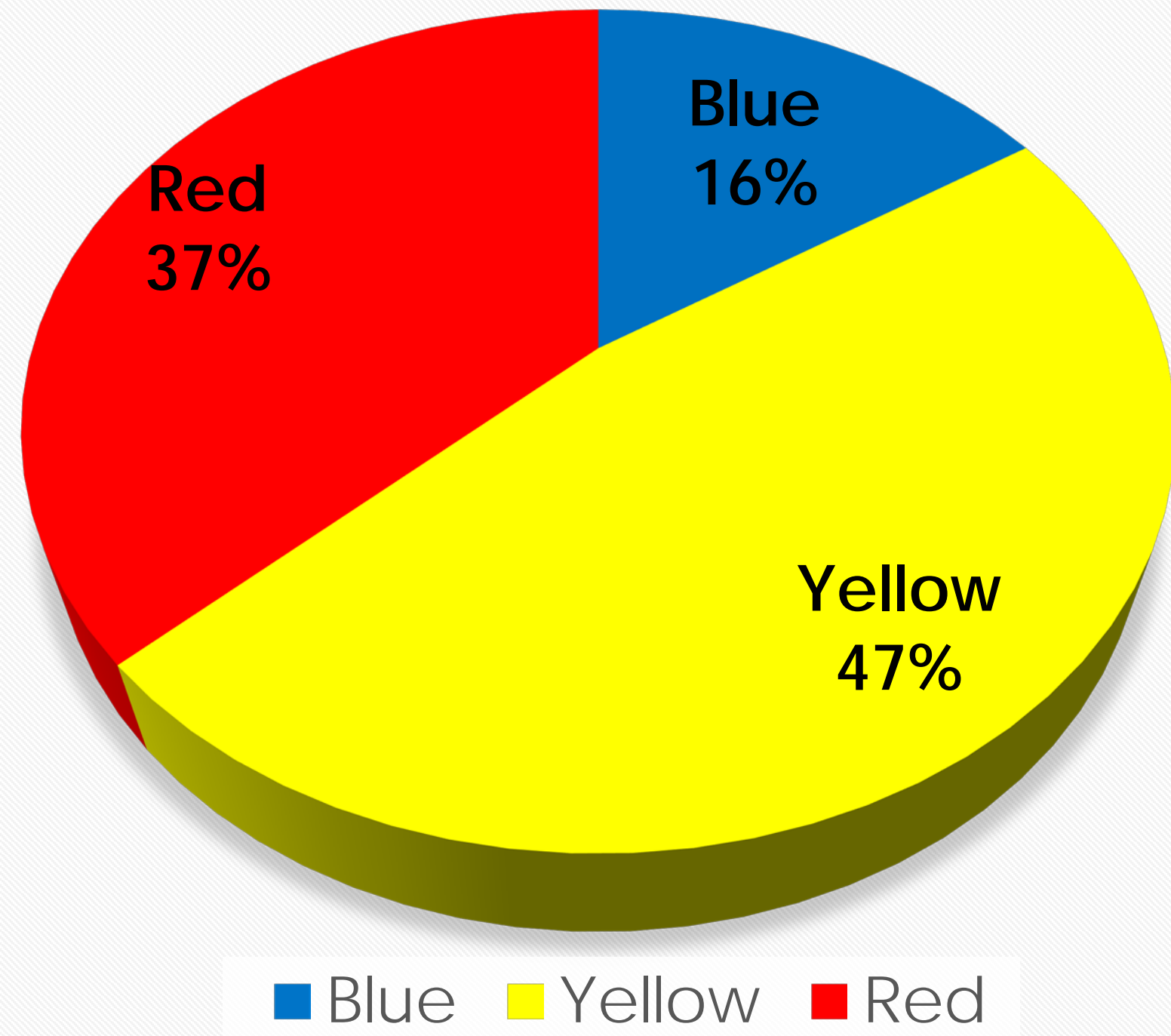
### Large vs. Small Time Comparison



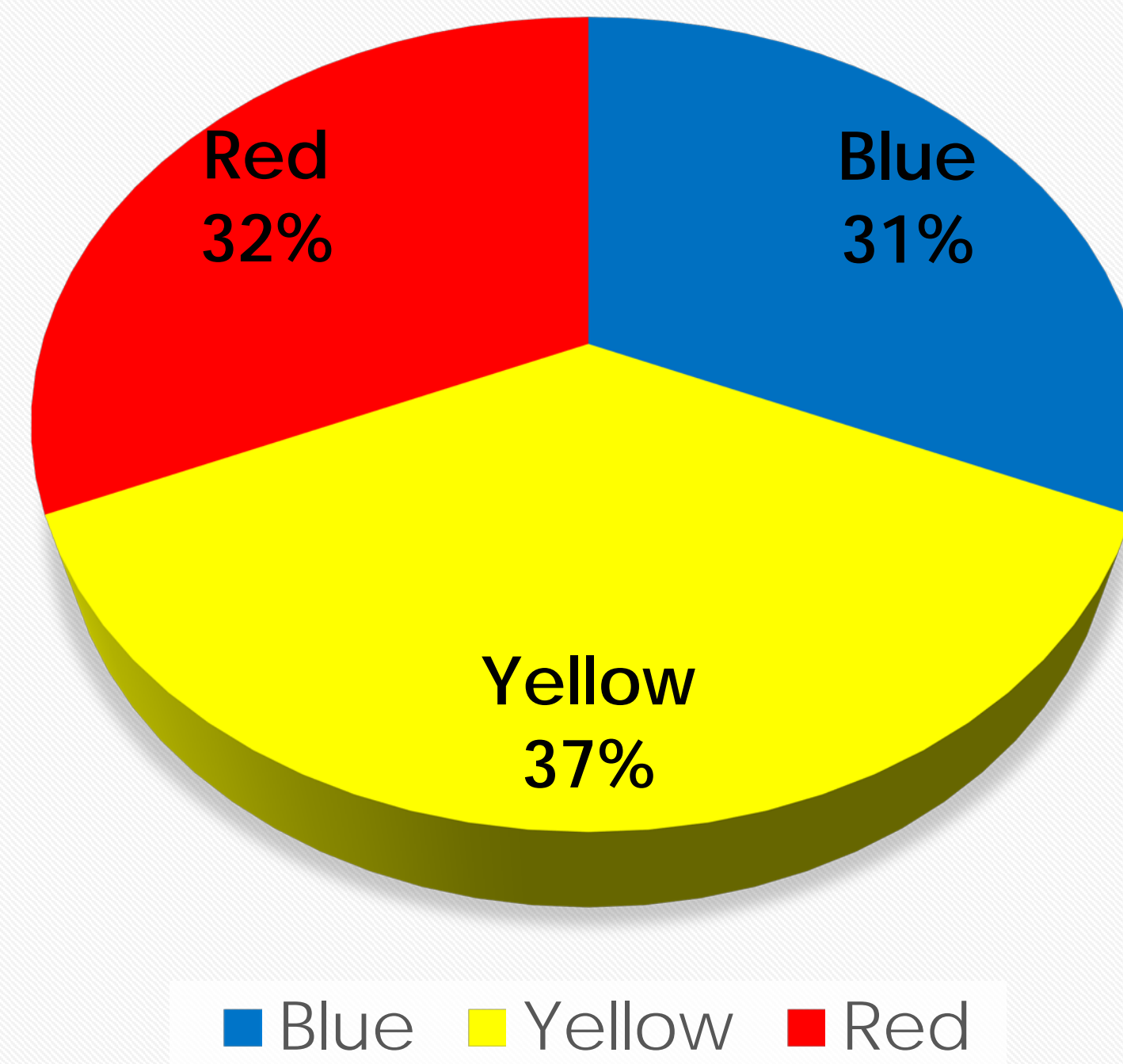
### Colour Time Comparison



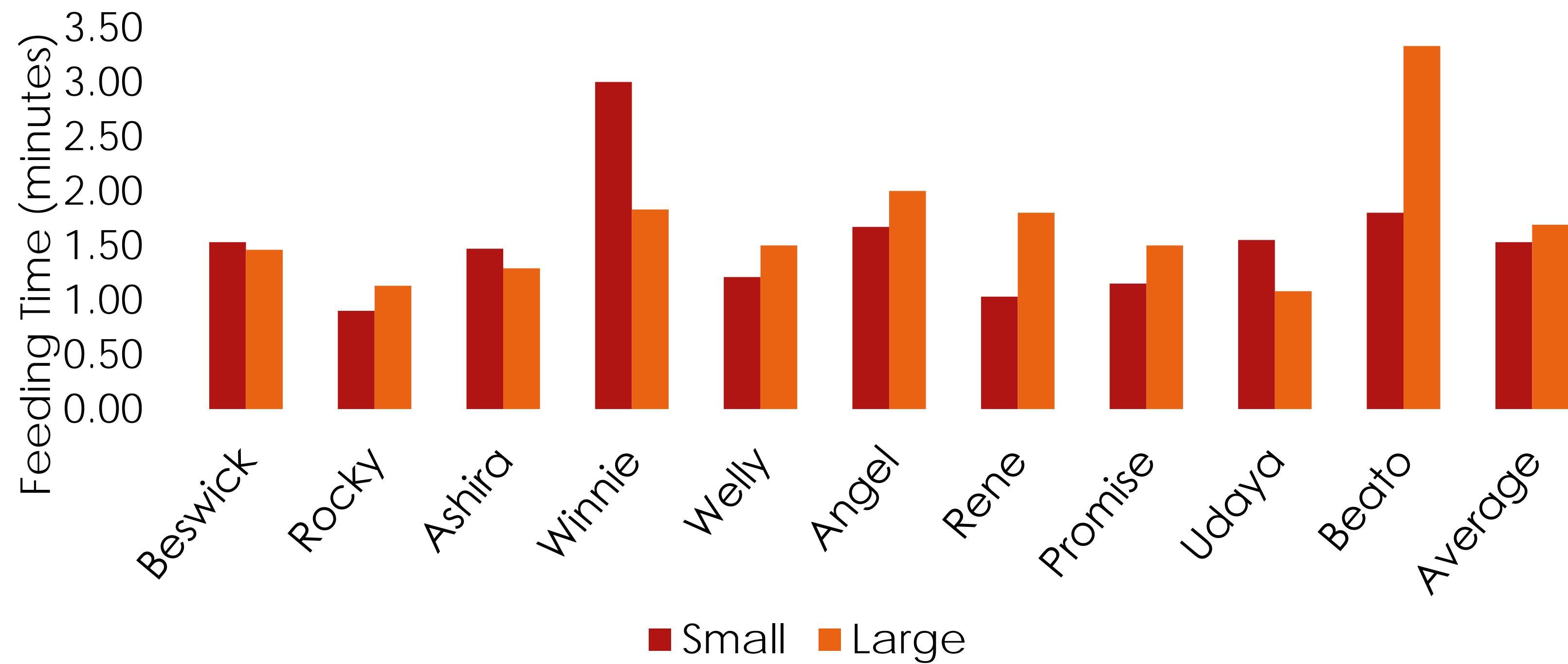
### Small Bucket Colour Choices



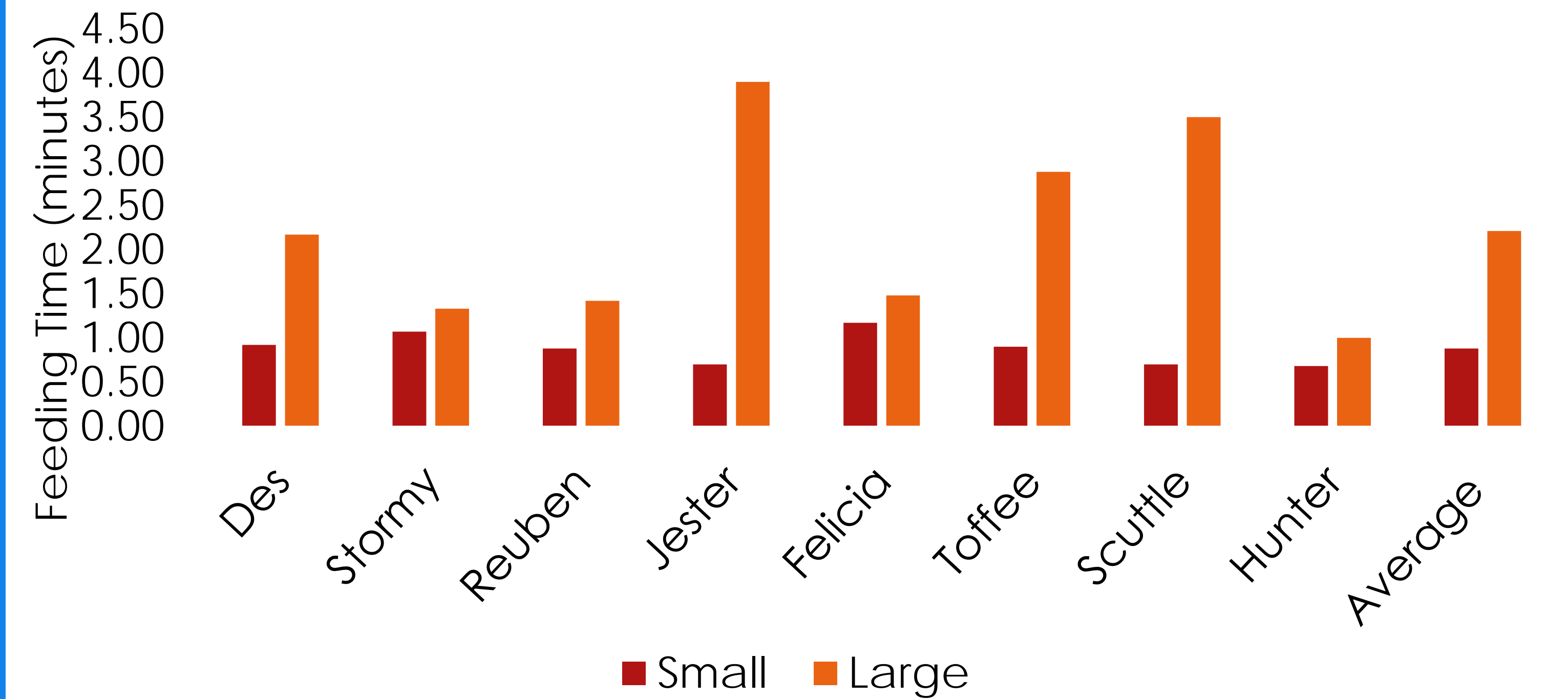
### Large Bucket Colour Choices



### Horses Age 9-13 Large vs. Small



### Horses Age 14-22 Large vs. Small





**Table 2: The bucket preferred by horses (n=19) to feed and the length of time(mins:secs) it took horses to consume 240ml of oats.**

Mares	Big/ small blue		big/ small red		big/ small yellow		Day 8: all big buckets			Day 9: all small buckets														
	Day 1	Time	Day 2	Time	Day 3	time	Day 4	time	Day 5	time	Day 6	time	Yellow	Blue	Red	Yellow	Blue	Red						
Ashira	big	2:28	big	1:29	big	1:08	big	1:41	big	2:09	big	0:59			0:35			1:13						
Winnie(pregnant)	small	4:04	big	2:33	small	2:01	big	2:17	big	1:04	big	2:34		2:29				3:01						
Welly	big	2:29	big	2:44	big	1:32	big	1:29	big	2:15	big	2:08	1:30					1:13						
Angel	big	2:36	big	3:05	big	1:25	big	1:14	big	0:45	big	1:21	2:02			1:40								
Stormy	big	3:19	big	2:15	big	2:08	big	1:10	big	1:31	small	1:50			1:20	1:06								
Felicia	small	2:01	big	2:23	big	1:51	small	1:22	big	1:20	big	3:06			1:23		1:07							
Toffee	big	4:53	small	1:20	big	2:18	big	3:00	big	5:17	big	3:15			2:53			0:55						
<b>Gelding</b>																								
Udaya	big	1:45	big	1:22	big	1:33	big	1:32	big	1:55	small	2:11		1:05		1:33								
Beato	big	3:08	big	2:14	big	2:10	big	1:52	big	2:06	big	3:11	3:20				1:48							
Beswick	big	2:35	big	2:38	big	1:10	big	1:55	big	2:09	big	1:50	1:28			1:33								
Rocky	big	2:05	big	2:27	big	1:58	big	0:30	big	1:25	big	2:19		1:08				0:54						
Rene	Big	4:07	big	3:29	big	2:17	big	0:44	big	2:39	big	2:14	1:50			1:02								
Hunter	big	3:07	big	1:47	big	2:11	big	2:00	big	2:21	big	1:55		1:03		0:41								
Des	small	1:05	small	1:04	big	1:07	big	1:31	big	2:17	big	1:24			0:35		1:16							
Reuben	small	1:28	big	3:39	big	2:32	big	1:39	big	0:40	small	1:25	1:25			0:53								
JD	small	1:51	small	1:51	big	2:22	big	1:41	big	1:50	big	1:48												
Jester	big	3:25	big	3:10	big	2:38	small	1:39	big	3:08	big	3:30			3:54	0:42								
Scuttle	big	5:26	big	2:57	big	3:33	small	2:23	big	3:50	big	2:58		3:31				2:12						
<b>Stallion</b>																								
Promise	big	1:40	big	1:48	big	1:17	big	1:29	big	1:27	big	1:31		1:31				1:09						
		5 small		3 small		1 small		3 small		0 small		3 small		7		6		6		9		3		7
		14 big		16 big		18 big		16 big		19 big		16 big												
Average feeding time		2.66		2.13		2.14		1.5		2:34		2:38		2:12		2:08		1.53		1:38		1:24		1:37

**Conclusion:**

The horses tested had a higher preference for the large feeding bucket when compared to the small. They had a higher preference of selecting the yellow bucket in both the large and small comparison testing. I think they were slower eating out of a large bucket because the food spread out more and the horses had to take several smaller bites and lick or tip the bucket on its edge to access the oats. My small feeding bucket was a limitation of my study as some of the horses did spill some oats on the ground while eating and also tipped the bowl over. In my future experimentation, I would increase the size of the small bowl.

horses were also led by halter and lead rope to the area where the bowls had been placed but I would also like to study how they would respond if they were allowed to roam freely and then make a bucket preference. Originally when deciding on this particular study, I thought it would be beneficial to record the differences between geldings, mares and stallion to determine if there were any behavioral differences in feeding, but throughout this study I now realize there is not.

Therefore, the next time I am treating a horse and there is hesitation or rejection I will try a large bright yellow bucket for feeding.

In the future, I would like to investigate how much communication between horses plays a role, or if distraction affects their feeding preferences, like adding music or gentle speaking. I could also test if exercise or increase in heart rate could affect their eating habits. Further studies would allow us to gain an even better understanding of optimal feeding strategies in equine veterinary medicine.

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