

Food for Thought:  
Assessing Visitor Comfort and Attitudes toward  
Carcass Feeding at the ABQ BioPark Zoo

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**Abstract**

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Enrichment is a cornerstone for keeping animals in zoos healthy and happy. For carnivores, the practice of feeding vertebrate animal carcasses, like those of goats or deer, or whole body prey animals like chickens or rabbits, can be an effective form of enrichment. While it is beneficial for animal care, carcass feeding can also be off-putting to some visitors, and zoos have hesitated to instate viewable carcass feeding programs. This research aims to address this concern and describe actual attitudes and comfort levels of visitors who view carcass feeding in three exhibits at the ABQ BioPark Zoo in Albuquerque, NM: spotted hyena, Tasmanian devil, and African painted dog. Results indicate that visitors stay at exhibits longer when a carcass is introduced and report feeling generally comfortable and at ease while viewing a carcass feeding. Findings also show that visitors exhibit positive attitudes toward animal care and welfare while viewing feedings.

*Keywords:* carcass feeding, whole prey feeding, zoo visitor comfort, zoo visitor attitude

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## CHAPTER 1: INTRODUCTION

Enrichment, or activities that encourage natural behaviors in captive animals, is a cornerstone for keeping animals in zoos healthy and happy (Carlstead & Shepherdson, 2000). Enrichment is used to combat stress, decrease instances of undesirable behaviors such as self-injury or stereotypies, and align wild-type behaviors with behaviors displayed by animals in captivity (Hosey, Melfi, & Pankhurst, 2013). The Association of Zoos & Aquariums (AZA) suggests several types of enrichment methods that can be effective depending on the physiology and natural history of the animal. Environmental enrichment devices that captive animals can manipulate such as car-wash roller brushes or large logs can be paired with habitat elements like tiers, crevices, or ladders to make exhibits more enriching. Sensory enrichment like blankets, perfumes, or sound recordings and food enrichment including freezing, hardening, or softening food items stimulate different senses. Social grouping enrichment can be used with animals of the same species or with mixed species. Finally, behavioral conditioning is often used to stimulate the mind of the animal through voluntary activity (Enrichment, n.d.).

Zoo visitors associate characteristics like “active,” “free,” and “wild” with captive animals in enriched, natural-looking exhibits, and zoos are encouraged to use enrichment to alter animal exhibits and behavior in ways that please the visitor while also working to decrease animal behaviors that are unappealing (Finlay, James, & Maple, 1988; Robinson, 1998). As Robinson (1998) explains, “Because public perceptions of the attractiveness of animal behaviour may not coincide with welfare realities, there can be a tension between the requirements of desirable exhibits and those of maximally promoting animal welfare” (p. 151). For carnivores, the practice of carcass feeding – which falls under food enrichment – can be engaging (NAG

Carcass Feeding Statement, n.d). In one of the first carcass feeding studies done in the United States, Bond and Lindberg (1990) discovered that there is more to carnivore feeding than a balanced diet. In addition to the proven hypothesis that their oral health would improve, vast psychological improvements such as increased appetite, ownership over the carcass, and more time spent feeding, were seen in the three cheetahs that participated in the carcass feeds (Bond & Lindberg, 1990).

Carcass feeding is even more crucial for social animals to replicate natural behaviors because it forces them to eat as a group instead of eating individual portions of ground meat. As Jason Goldman (2013) notes in an article for *Scientific American*, “the absence of competition over food sources combined with their reduced physical distance means that captive prides don’t precisely replicate the fission-fusion dynamics that characterize wild lion sociality” (para. 10). As social animals and as meat eaters, each of the species targeted in this study stands to gain from carcass feeding.

While it is clearly beneficial for animal care, carcass feeding can also be off-putting to some visitors and zoos have hesitated to instate viewable carcass feeding programs. In an article for *Slate* entitled “Let Them Eat Carcass,” Jason Goldman (2014) wrote that America’s squeamishness harms zoo animals. We appreciate psychological distance between ourselves and the processed food we consume, and that harmful attitude is carrying over to what we expect to see in the zoo (Goldman, 2014). This research aims to address this concern and describe actual attitudes and comfort levels of visitors who view carcass feeding in a zoo setting.

## **Purpose Statement**

The purpose of this research is to assess the attitudes and comfort of visitors who view carcass feedings in the spotted hyena, African painted dog, and Tasmanian devil exhibits at the ABQ BioPark Zoo in Albuquerque, New Mexico.

In addition to the purpose statement, three evaluative questions guide this study:

- To what extent are visitors comfortable when they are viewing carcass feeding?
- What are visitor's attitudes and reactions toward carcass feeding?
- Do visitor stay times change while there is a feeding?

The findings of this research will provide a starting place for understanding visitor perceptions toward this practice and help inform ABQ BioPark Zoo and other zoos as they grapple with decisions surrounding this enrichment strategy as it relates to visitors. The methodology can also be used as a framework for other institutions within the field interested in evaluating visitor attitudes toward their own carcass feeding programs.

## CHAPTER TWO: LITERATURE REVIEW

The modern zoo strives to embrace animal welfare as much as it does visitor experience. The AZA includes both public engagement and animal welfare in their mission as well as in their considerations for accreditation (AZA Strategic Plan 2015-2017, 2015). The missions of zoos and aquariums, collectively, are largely focused on conservation and education (Patrick et al, 2007). Zoo animals serve an important role as educators and ambassadors of their species, inspiring conservation through public engagement. Enrichment is key to these animals' welfare and has a positive effect on their behavior and activity levels (Carlstead & Shepherdson, 2000; Powell & Bullock, 2014). This literature review demonstrates first that carcass feeding is an effective form of enrichment for the species participating in the study. Second, it focuses on the visitor perspective by analyzing previously studied visitor responses toward zoo animals. The review is organized in this manner:

- **Enrichment and Animal Welfare**
  - What is the purpose of enrichment?
  - What is the role of carcass feeding as enrichment?
- **The Visitor Perspective**
  - How do visitors perceive zoo animals?
  - How do visitors perceive non-traditional feeding strategies?

This literature review was compiled to assist in framing the context of this study. The studies referenced demonstrate that visitor studies as a practice and enrichment as a designated form of animal care are still relatively new. While there are a few older studies that inform this research, most of the literature that directly informs this research is from the last 20 years. This study adds to the literature on visitor perspectives toward carcass feeding programs in the United States and

contributes to part of the larger conversation on visitor perspectives toward zoo animals.

## **ENRICHMENT and ANIMAL WELFARE**

### **What is the Purpose of Enrichment?**

The Behavior Scientific Advisory Group (BAG) (n.d.) within the AZA defines enrichment as, “a dynamic process for enhancing animal environments within the context of the animals’ behavioral biology and natural history” (para 1) and the incorporation of enrichment into husbandry planning is required for AZA accreditation. Enrichment takes many forms depending on the behavioral needs of the animal. For instance, studies suggest that carnivores may respond best to foraging while ungulates are better suited to environmental manipulations (Andrews, Fernandez, & Ha, 2011). The effectiveness of any particular technique hinges on drawing out “species-appropriate behaviors,” or behaviors that would be exhibited by the same species in a wild setting (Enrichment, n.d.). Many enrichment plans are undertaken to prevent or intervene in stereotypic behaviors exhibited by a zoo animal, to relieve stress, and to go beyond meeting basic needs by making the animal’s life richer (Carlstead & Shepherdson, 2000; Duncan & Olsson, 2001).

Early reports on the effectiveness of enrichment in zoos came in the late 70s from Hal Markowitz who is widely regarded as the father of zoo enrichment (Maple, 2013). In one of his early experiments, Markowitz (1978) introduced a discrimination apparatus into a mandrill exhibit. Changes such as increased spatial usage and general activity levels paired with the reduction of stereotypic behaviors demonstrated success in adding environmental enrichment (Yanofsky & Markowitz, 1978). He used these early experiments to write *Behavioral*

*Enrichment in the Zoo* (Markowitz, 1982), which advocates for empowering animals through enrichment activities.

In a subsequent carnivore enrichment study, Markowitz et al. (1995) used an “acoustic prey device” to alter melancholic behaviors of an African leopard. The computer-controlled device would emit bird sounds, and if the animal pursued the sounds, was rewarded with whole pieces of bird (Markowitz, Aday, & Gavazzi, 1995). This activity simulated a natural behavior and decreased the melancholic, stereotypic behaviors of the animal (Markowitz, Aday, & Gavazzi, 1995).

Since those early investigations, countless studies have been conducted on the effectiveness of enrichment in animal welfare. Andrews, Fernandez and Ha (2011) show through meta-analysis of over 132 studies conducted in zoos that over half focused on food-based enrichment suggesting that this is a common form of enrichment, particularly with carnivores. Out of the 132 studies, 65% targeted carnivores, which may be because of their likelihood to exhibit stereotypic behaviors (Andrews, Fernandez, & Ha, 2011).

Today, animal care experts rely on studies and expertise of all of these animal behavior researchers. Markowitz’s last book, *Enriching Animal Lives* (2011), provides a comprehensive approach for designing modern enrichment programs for a variety of animals, including captive carnivores. Keepers working with carnivores can use it for examples of naturalistic feeding practices including carcass feeding.

### **What is the Role of Carcass Feeding as Enrichment?**

With food-based enrichment established as a well-documented form of enrichment for carnivores, carcass feeding is an important type of enrichment to explore further. Of the few

studies conducted on animal responses to carcass feeding, each has found success with carnivorous mammals (Altman, Gross, & Lowry, 2005; Bond & Lindburg, 1990; Cloutier & Packard, 2014; Mcphee, 2002).

One of the earliest studies to address carcass feeding as a beneficial form of enrichment was conducted by Bond and Lindburg (1990) at the San Diego Wild Animal Park (San Diego Zoo Safari Park) with a select group of cheetahs. The study was conducted to assess both the physiological and psychological needs of captive carnivores. In terms of physical needs, carnivores can experience tooth decay and muscle atrophy in their jaws from the convenience of prepared diets. The three cheetahs that received carcasses spent more time masticating, slicing and using their molars, which lead the researchers to conclude that the texture of the food could have significant impact on their oral health, particularly in the health of their molars, which go unused while consuming a commercial diet. In a psychological sense, the animals that were fed carcass were more possessive of their food and spent more time smelling and eating it. There was also a noted change in social dynamic presented during the feed. One of the cheetahs was fed alone in a pen and rarely left her carcass. The other four participating cheetahs were housed together in one pen with one carcass and would often pause to assess the position of their relative pen mates (Bond & Lindberg, 1990).

The benefits presented for cheetahs are clear, yet a recent study of cheetah diets across the globe conducted by Whitehouse-Ted, Lefebvre, and Janssens (2015) demonstrated that a significant portion of captive cheetahs do not receive carcass as a part of their diet. In 172 cheetahs representing zoos in Africa, Asia, North America, Australia, and Europe 37% ate raw meat, 20% are commercially prepared food, 8% ate carcasses and 35% receive a combination of two or all three of those options. Diet type varied significantly by region showing that not only

are prepared diets the most common option in North American facilities, but they are also exclusive to these cheetahs. In contrast, carcasses were only fed in European or African facilities (Whitehouse-Ted, Lefebvre, & Janssens, 2015).

Looking toward other captive felids, McPhee (2002) assessed how carcass feeds affected behavior with felids at the Toledo Zoo, Potawatomi Zoo, and Binder Park Zoo. McPhee (2002) examined stereotypic, natural, active and inactive behaviors in 9 animals that were fed calf carcasses both on- and off-exhibit. When a carcass was introduced to cats on-exhibit, there was a significant increase in natural behaviors with no notable change in stereotypic behavior – although the cats were considered largely behaviorally healthy with few stereotypes to begin with. Similarly, carcass feedings had a positive effect on behavior off-exhibit, with 52% of the 2-hour observation time consumed with feeding (McPhee, 2002).

A number of carcass feeding studies have been conducted with large felids like lions and cheetahs, and one study looked at carcass feeding in African painted dogs. While looking across a wide variety of enrichment strategies employed with this species, Cloutier and Packard (2014) were the first to confirm the “perceived success and diversity of options in the food enrichment category” (Discussion, para 1), including the use of carcass feeding. Wild painted dogs could be seen hunting together as often as twice per day and live in very tight-knit packs (Creel & Creel, 1995). Therefore, the benefits of food enrichment could revolve around its ability to engage the dogs socially (Cloutier & Packard, 2014).

The ABQ BioPark Zoo makes a conscious effort to engage their captive carnivores in as many enrichment techniques as are beneficial. Shelly Dicks, Mammal Department Supervisor at the ABQ BioPark Zoo commented,

“I believe carcass feeding is an important component of captive carnivore management. It stimulates and allows expression of natural feeding behaviors,

physically engages the animals in feeding for a longer period of time, provides novelty in their environment, and provides opportunity for important social interactions between animals and within groups” (S. Dicks, personal communication, April 16, 2015).

Through carcass feeding, the ABQ BioPark Zoo caretakers are able to enhance the lives of their social carnivores with nutritive and non-nutritive benefits.

## **THE VISITOR PERSPECTIVE**

### **How do visitors perceive zoo animals?**

Every year, hundreds of millions of visitors across the United States go to zoos and aquariums to see live animals (Education, n.d.). Aside from goals in animal care and conservation, zoos serve to inspire action through education. In a meta-analysis of zoo mission statements, Patrick et al. (2007) found that out of 136 AZA accredited institutions, 131 of their mission statements mention education in some form. John Falk (1999) makes the claim that people learn most of what they know outside of their formal education. He noted after a study at the *Think Tank* exhibit in the National Zoo, that visiting a zoo exhibit leads to learning and also impacts visitor behavior. Half of the 150 visitors that participated in follow up interviews 3 months after their visit reported changes in behavior such as watching nature shows, reading books about animals or talking about the exhibit with friends or family (Falk, 1999). Half of the respondents also noted that they recommended the exhibit to someone else, indicating a positive experience with these animals and this exhibit (Falk, 1999). Zoos animals have a key role to play in the education of visitors and learning increases from zoo experiences (Falk, 1999; Packer & Ballantyne, 2010).

In addition to Falk's (1999) study, researchers have also asked what traits zoo visitors assign to animals held in captivity. Fraser, Bicknell, and Sickler (2006) used semantic differentials to assess how visitors perceive several animals in zoos and aquaria including African painted dogs. Descriptors included "valuable/unimportant," "cute/unappealing," "passive/aggressive," "strong/weak," among others, and once data was analyzed, the strong descriptors were assigned as traits to that animal. There are largely very positive sets of traits assigned to common zoo animals such as cheetahs and zebras with visitors describing them as "interesting," "good," and "cute," among others. Respondents also had a very strong connection with dolphins, strongly associating with 7 out of the 9 positive traits. The only species to emerge with negative perceptions were sharks as respondents considered them to be "dangerous", but also "valuable" and "interesting". African painted dogs elicited a neutral response with only one trait – "interesting" – emerging as a strong descriptor (Fraser, Bicknell, & Sickler, 2006).

Activity level seems to play a role in visitor's perceptions of the animal. Active animals that engage with visitors seem to provide a stronger emotional connection and inspire conservation mindedness (Powell & Bullock, 2014). These links between positive emotional responses and enrichment activities have been found specifically in spotted hyenas and African painted dogs. Powell and Bullock (2014) found that visitors exhibited a stronger emotional response toward the animals when environmental enrichment was present. Enrichment affected the animals' behavioral diversity and allowed for up-close encounters and periods of eye contact. The study concluded that visitors who have these positive emotional responses report stronger conservation mindedness (Powell & Bullock, 2014). Studies that have surveyed and timed visitors also confirm that visitor stay time is longer and visitors are more engaged when animals

are active versus inactive or out of sight (Godinez, Fernandez, & Morrissey, 2013; Clayton, Fraser, & Saunders, 2009).

It also seems that visitors have a positive perception of animals exhibiting natural behaviors and that have naturalistic enclosures (Rhoads & Goldsworthy, 2009; Finlay, James, & Maple, 1988). Finlay et al. (1988) asked participants to view clips of animals in traditional zoo enclosures – with visible fences and bars, naturalistic exhibit settings, and animals in the wild and then rate their perceptions of 11 different semantic differentials including traits like free-restricted, tame-wild, active-passive, and energetic-lazy. Participants perceived naturalistic enclosures largely in the same manner as they did animals in the wild, showing that naturalistic enclosures are key in providing a positive perception of zoo animals (Finlay, James, & Maple, 1988).

Researchers Reade and Waran (1996) sought out perceptions of zoos and zoo animals from visitors in the Edinburgh Zoo and also from the general public. Looking at a sample of 261 respondents, they found that those who did not go to the zoo had negative perceptions of the animals kept there (Reade & Waran, 1996). In the first phase of the study, respondents from the general public reported perceiving zoo animals as “sad” and “bored.” The second phase of the study showed that visitors to the zoo were more positive in their perceptions but also had a better understanding of the value of enrichment (Reade & Waran, 1996). Respondents who had the opportunity to see enrichment in place and saw naturalistic enclosures felt that animals were better taken care of and also developed a greater sense of empathy and conservation mindedness (Reade & Waran, 1996).

This analysis shows that positive perceptions of zoo animals are often associated with animals exhibiting natural behaviors in naturalistic environments. This connection further

emphasizes the importance of providing enrichment to enhance the care and welfare of zoo animals, such as carcass feeding for carnivores.

### **How do visitors perceive non-traditional feeding strategies?**

While studies have been conducted to address visitor perceptions of zoo animals and enrichment techniques, limited work has been done to address zoo visitor reactions and comfort levels during carcass feedings. Visitors connect with animals that are active and behaving naturally (Godinez, Fernandez, & Morrissey, 2013; Powell & Bullock, 2014), and carcass feeding has been linked to increased activity and exhibitions of natural behavior (Bond & Lindberg, 1990; McPhee, 2002; Cloutier & Packard, 2014). Strictly based on the scholarship, we can predict that visitors would be content and engaged with carcass feeding because of its effect on the animals. However, the fact that the enrichment is another vertebrate mammal instead of an old tire or a tree branch seems to present an interesting dilemma. Although few carcass feeding studies have been done, some unpublished work and conference proceedings, as well as popular opinion captured by media sources help to frame the context of this study.

In 2007, the popular public radio show, Radiolab hosted a show on zoos called “Dead or Alive.” For the duration of the broadcast, hosts Jad Abumrad and Robert Kulwich (2007) explored the idea of what zoo animals – particularly large carnivores – really eat. One of the places this research took them was to the Toledo Zoo for their annual event called “The Big Feed” where carcasses and whole prey items are tossed to large carnivores. Nell Boyce, who reported on the feed for the broadcast recalls going behind the scenes, opening a box which contained a small calf carcass and thinking, “It was like a little baby. Little eyelashes...little ears...it’s a baby cow, you know? I thought like ‘Aww, baby cow’ and then I thought ‘Oh my

god. Tomorrow little children are going to be watching this baby cow be ripped apart by a giant wild cat” (Boyce, 2007). Boyce clearly showed some apprehension about whether or not carcass feeding was something that would be perceived as positive by the public. After an interpretive discussion led by zookeepers, tigers started their feeding and Boyce noted that no one seemed particularly disturbed, in fact, people were moving in for a closer look (Boyce, 2007). Boyce also interviewed zoo representative Beth Stark who mentioned that in an internal survey conducted by Toledo Zoo, 98% of people were comfortable viewing the feedings and wanted to see more of it as long as rabbits were not fed on Easter (Boyce, 2007).

There are also academic postulations that indicate that carcass feeding is an unethical practice that should not be carried out in front of visitors, and it is commonly thought by zoo professionals that the public will have a negative reaction to carcass feeding (Veniga & Lemon, 2001; McPhee, 2002; Young, 1997). However, the few studies that have been conducted with actual zoo visitors seem to indicate the contrary (Veniga & Lemon, 2001; Pratt, 2009). At the Western Plains Zoo in Dubbo, New South Wales, 44 zoo visitors were surveyed during a study that targeted carcass feeding as an enrichment practice for African painted dogs (Veniga & Lemon, 2001). The results indicated that 69.5% of visitors approved of the practice and 95.4% of visitors were not offended by it. Additionally, nearly all visitors also found it to be of educational value and around 30% of visitors thought of it as a necessity for the animals (Veniga & Lemon, 2001). Pratt’s (2009) study yielded similar responses. In a sample of 89 visitors that viewed a carcass feeding at the Monarto Zoo in southern Australia, 85% of respondents were comfortable with the practice (Pratt, 2009). A recent hypothetical study by Gaengler and Clum (2015) also suggests that around 40% of zoo visitors in New York, New Jersey, Connecticut, and Massachusetts would approve of viewing a deer carcass feeding in an Andean condor exhibit.

Another 40-45% of visitors would approve of the feeding, but weren't sure if they would want to view it (Gaengler & Clum, 2015). The majority of visitors also approved of viewing a fish, chicken, rat, or rabbit carcass feeding with the same species (Gaengler & Clum, 2015).

Two studies in Europe also look at visitor responses to hypothetical live feedings. Cottle, Tamir, Hyseni, Bühler, and Lindemann-Matthies (2010) surveyed 400 visitors at the zoo in Zurich, Switzerland to ascertain visitor attitudes toward the live feeding of different species of animals. Starting with insects fed to lizards and fish fed to otters, the survey finally asked whether or not visitors would be comfortable with watching a tiger eat a live rabbit (Cottle et al., 2010). The results indicate that visitors are very supportive of live feeding in every situation except for the live feeding of the rabbit to the tiger (Cottle et al., 2010). Eighty-two percent of visitors agreed with otters eating live fish on-exhibit and 87% agreed with lizards eating live insects on-exhibit, but those numbers drop drastically to 48% of visitors who agree with the idea of live feeding rabbits on-exhibit (Cottle et al., 2010). The percentage increases a bit to 68% when the idea of live feeding rabbits off-exhibit is presented (Cottle et al., 2010). Based on the results the researchers hypothesize that, "Attractive mammals being killed and eaten by other attractive mammals might not be people's idea of an enjoyable family excursion, especially if the prey resembles their children's beloved pet animals" (Cottle et al., 2010, p. 349).

An older study which took place in the United Kingdom looked at live insects fed to lizards, live fish fed to penguins, and live rabbits fed to cheetahs. Ings, Waran, and Young (1997) similarly found that most visitors agreed with live feeding insects to lizards with all visitors agreeing to it done off-exhibit and 96% agreeing with on-exhibit feedings (Ings, Waran, & Young, 1997). Live fish feedings were found to be similarly acceptable with 72% of visitors agreeing to on-exhibit feedings and 84% off-exhibit (Ings, Waran, & Young, 1997). Just as it

was with the zoo in Zurich, there was a sharp decline in the percentage of visitors who agree with live rabbit feeding on-exhibit (Ings, Waran, & Young, 1997). Only 32% of visitors agreed with feeding live rabbits to cheetahs on-exhibit, and the percentage only goes up to about 62% off-exhibit (Ings, Waran, & Young, 1997). When asked why visitors opposed the live rabbit feeding, they often answered that they thought it would be disturbing for their children (Ings, Waran, & Young, 1997). With more than a decade between the two studies, there is not a significant change in the findings.

Media sources and studies on visitor responses to non-traditional feeding strategies conducted in other countries most directly inform this research. This study contributes to the scholarship on visitor reactions to carcass feeding and is one of the first to address visitor reactions to carcass feedings in North America.

## CHAPTER THREE: METHODS

### SITE

The ABQ BioPark Zoo in Albuquerque, New Mexico is part of a larger complex including an aquarium, a botanic garden, and Tingley Beach – a series of fishing ponds – that all operate within the City of Albuquerque’s Cultural Services Department (ABQ BioPark, n.d.). The ABQ BioPark serves to create “fun, educational experiences and encourage environmental awareness and stewardship” (ABQ BioPark, n.d.). The 64-acre zoo opened its doors in 1927 and hosts a large, diverse collection (Zoo, n.d.). They are currently accredited by the AZA through September 2015 (List of Accredited Zoos and Aquariums, n.d.).

The ABQ BioPark Zoo was identified as suitable site for this research because it is one of the only zoos found in my search that uses carcass feeding as a regimented part of animal care. They consistently carry out feedings in public view with no prescribed prompting or interpretation (A. Harrell, personal communication, July 31, 2014). The study occurred with three species identified by zoo staff as receiving carcasses as part of an enrichment plan or under general husbandry (A. Harrell, personal communication, July 31, 2014). Fortunately, I was able to conduct the study with African painted dogs, which was important because of the previous studies done with visitor reactions to painted dogs in Australia (Pratt, 2009; Veniga & Lemon, 2001). Finding out more about visitor reactions to carcass feeding with painted dogs in the United States will add to the scholarship on this topic. The study was additionally conducted with Tasmanian devils and spotted hyenas, with which there have been no visitor reactions to carcass feeding studies performed to my knowledge.

## INSTRUMENTS

Two instruments were used in this study: a questionnaire that was administered to visitors and a datasheet that I used to record conditions, exhibit, group size, group composition, and stay time. Copies of each of these can be found in Appendix A. The questionnaire was designed using best practices and standards from the field of audience research. At the top of the sheet, there was a clear explanation of what was expected from the participant as well as a definition of carcass feeding in case they did not associate the prey animals in the exhibit with the term carcass feeding on the questionnaire (Diamond, Luke, & Uttal, 2009). There was also a phrase reminding them that participation was completely optional, and they could stop their participation at any point (Diamond, Luke, & Uttal, 2009). When writing the questions, phrasing them in an understandable and non-technical way was essential. In the words of Miles et al. (1998) “The fundamental precept in writing the questionnaire is to imagine the people who are going to be asked to answer, and develop questions that are understandable and appropriate for them” (p 161). Content questions were written to assess visitor emotions, attitudes and comfort levels. The questionnaire collected basic demographic information such as gender, zip code, group size and group composition in addition to the content based questions.

Once written, questions were informally pilot-tested on colleagues and reviewed by zoo staff to ensure content validity. During this pilot-testing period, I also recorded how long it took for the questionnaire to be completed, making sure it was reasonable (Diamond, Luke, & Uttal, 2009). The questionnaire usually took less than two minutes to complete. After pilot-testing, the questionnaire was edited and was then formally approved by my thesis committee and the ABQ BioPark Zoo.

## **PARTICIPANTS**

The goal of this research was to assess visitor reactions and comfort levels while viewing a carcass feed. The protocol targeted visitors who were viewing a carcass feed and were 18 years of age or older. Based on the limitations of having only one data collector and the need to perform two methods during each feed – timing and administering a questionnaire – a convenience sampling strategy was implemented. Convenience sampling is a non-probability technique, common for research within informal learning settings like zoos, that allows the researcher to sample the visitor that is easiest to access (Convenience Sampling, n.d.).

As visitors approached the exhibits, I observed whether or not they noticed the feeding happening through gestures or comments. If they noticed the feeding, I approached one person in the party and asked them to complete the questionnaire. If the visitor agreed to take the questionnaire, then I would hand them a clipboard and let them fill out the questionnaire on their own. Most visitors took less than 5 minutes to fill out the questionnaire. Concurrently, I selected groups to time and recorded their group size and composition. Groups that were timed were not approached to fill out a questionnaire, as it would have impacted their total stay time. The feed was determined to be over when I deemed the carcass to be no longer recognizable. Hours later when the carcass had been totally removed – or hidden in the case of the two larger carnivores – or before the carcass had been introduced, I recorded visitor stay time without the feed. This served as a control for stay time. I always recorded visitor stay time with and without the feed on the same day to ensure conditions would be similar.

In total 95 questionnaires were collected at the Tasmanian devil exhibit, 81 at the African painted dog exhibit, and 66 at the spotted hyena exhibit for a total of 242 visitors surveyed. During carcass feeds, I timed 45 groups at the Tasmanian devil exhibit, 14 at the African painted

dog exhibit, and 23 at the spotted hyena exhibit for a total of 82 groups timed with a carcass feed occurring. I then timed the same amount of visitor groups without a feeding present for a total of 164 groups timed.

The data was collected over 12 non-consecutive days during 3 trips from February 21 through March 22, 2015. On each of the three trips, the large carnivores would receive one carcass – usually goat – that usually lasted for a minimum of a few hours. The Tasmanian devils received a whole prey items such as quail, large rats, chickens or rabbits for all except one of the research days.

## **ANALYSIS**

As surveys were collected, they were numbered, dated, and entered into a Google spreadsheet. This web-based application was chosen to ensure that data would not be lost in the event of a computer error and for its convenient sharing capabilities. This application is password protected, so the data could not be accessed in any way by outside parties and anyone who received a link to the spreadsheet was not given editorial access, which protected the integrity of the data.

Once data collection was complete, analysis and visualization was carried out using Microsoft Excel and IBM SPSS. SPSS was used for data analysis and then results were transferred to Excel to create data visualizations. Descriptive statistics such as median visitor stay time were run in addition to inferential statistics, which evaluated relationships between groups, specifically visitor stay time. Skewness and Kurtosis values run on species and condition of presence or absence of carcass were used to determine whether the data met normality assumptions. Skewness and Kurtosis values were normal; however, variances did not meet the

homoscedasticity assumption for independent t-tests. Therefore, the most appropriate test was determined to be independent t-tests for unequal variances. These t-tests were performed to ascertain whether or not there was a statistically significant difference in stay time depending on the presence or absence of a carcass within each exhibit.

The questionnaire was also analyzed using IBM SPSS and Microsoft Excel, including frequency distribution of words chosen by the visitor, and frequency of response to the six Likert-type agreement statements. In addition, reliability analysis was run on the Likert scale items, generating a Cronbach's Alpha noting consistency across the items, as well as inter-item correlations to gauge relationships between the scale items.

## **LIMITATIONS**

There are some limitations to the methodology of this study. In the case of convenience sampling, there is the disadvantage of inherently including some researcher bias, as there is no protocol that mandates who the researcher approaches, which could affect generalizability (Convenience Sampling, n.d.). I attempted to mitigate this bias by approaching every person that recognized the carcass feed was occurring. Some visitors did not elect to participate in the study, but the refusals were not related to the carcass feed. The reason most often sighted was "I have no time" or "I don't take surveys." Overall, the refusal rate for the study was negligible – less than 2%.

Many factors aside from refusals affected total sample size, including weather conditions and regularity of feedings. I was able to collect more data at the Tasmanian devil exhibit because they were fed a whole carcass on nearly every research day. Weather conditions also impacted the collection of data. On one of the African painted dog feeding days, the weather was very cold

so there were only three surveys collected, and I was not able to time any groups. This impacted the overall amount of timing data for the African painted dog exhibit.

A final limitation is that the study was conducted at one zoo. The sample was found to be largely local to the Albuquerque metro area, which hinders the generalizability of this study. Identifying comparisons to other similar studies could help alleviate the locality of this study.

## CHAPTER FOUR: RESULTS

The results of this study are reported according to the three research questions that guided this study along with a presentation of demographic information:

- Description of Sample
- To what extent are visitors comfortable when they are viewing carcass feeding?
- What are visitors' attitudes and reactions toward carcass feeding?
- Do visitor stay times change while there is a feeding?

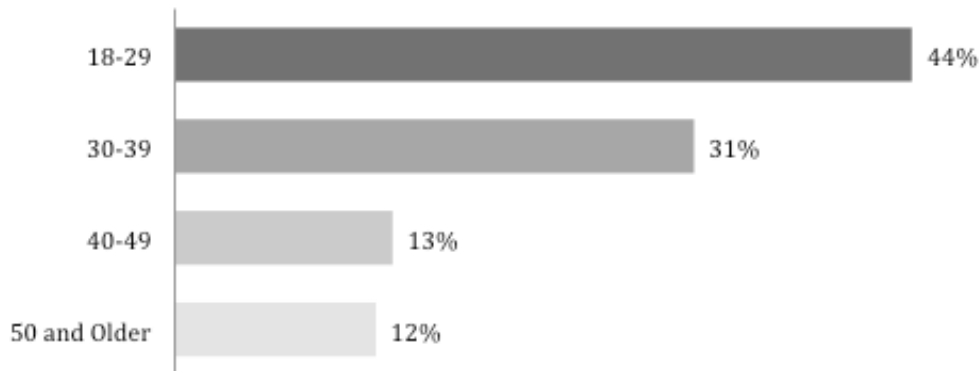
As a point of reference, a sample questionnaire can be found in Appendix A and an example of the timing datasheet can be found in Appendix B.

### **Description of the Sample**

The questionnaire distributed to visitors was designed to collect basic demographic information including gender, group composition, age, and zip code. Visitors were also asked how often they visit the zoo and whether or not they had seen a carcass feeding before. This question was asked to assess whether or not visitors who had seen carcass feeding in the past had a different reaction than those who were viewing it for the first time.

The sample of respondents skewed towards women. Of the 240 respondents who listed their gender, 58% were women. An analysis of group composition showed that 65% of respondents were in groups with both adults and children under the age of 18, while 33% of respondents were in groups of adults. Only 2% of respondents were visiting the ABQ BioPark Zoo alone.

Most visitors were between the ages of **18 and 39** years of age. n=234

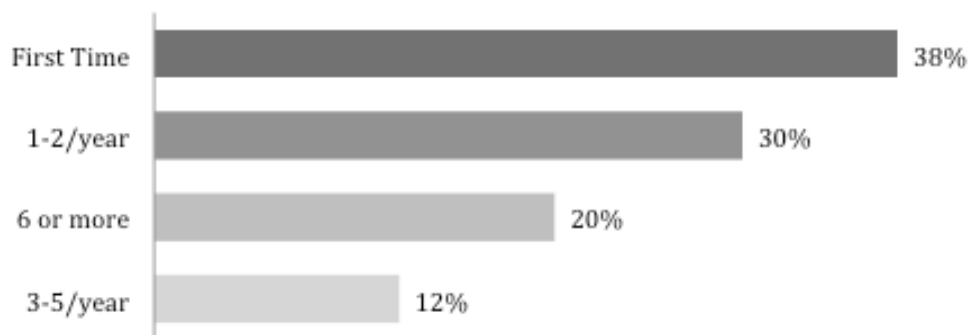


**Figure 1: Respondent Age**

Seventy-five percent of respondents were between the ages of 18 and 39. Of those who gave their zip code, 67% of them were from New Mexico and 39% were from Albuquerque.

The other two demographic questions relate to visitation and experience. Visitors were first asked how often they visit the ABQ BioPark Zoo.

38% of visitors had **never been** to the ABQ BioPark Zoo. n=242



**Figure 2: How often do respondents visit the ABQ BioPark Zoo?**

The majority of respondents had been to the zoo before and 62% of visitors come at least once per year. The zoo frequently engages in carcass feeding, particularly with the Tasmanian devils, which eat whole body prey items several times per week. However, only 9% of visitors had seen a carcass feeding at the ABQ BioPark Zoo. Another 9% of respondents had seen a

carcass feeding at another site, but of the 242 visitors who completed the questionnaire, 82% of respondents had never seen a carcass feeding.

**To What Extent Are Visitors Comfortable When They Are Viewing Carcass Feeding?**

This question was addressed using the questionnaire. In a series of Likert-type scaled statements, visitors were asked to respond to the following statement: “I feel comfortable and at ease while viewing a carcass feeding,” on a scale of “Strongly disagree” to “Strongly agree.” As shown in Figure 4, 92% of the 242 visitors surveyed “Agree” or “Strongly Agree” that they feel comfortable watching a carcass feeding.

Only 1% of visitors reported that they “Disagreed” with this statement and there was one visitor, making up >1% of the sample who “Strongly Disagreed” that they were comfortable while watching a feeding. There were no instances of “Disagree” or “Strongly Disagree” in the spotted hyena feedings. All three instances of “Disagree” occurred in the Tasmanian devil exhibit and the one “Strongly Disagree” in the African painted dog exhibit. No differences were found between male and female responses to the feedings or between groups of adults only and groups with adults and children. Similarly, there was no change in comfort level between those who had seen a carcass feeding before and those who had not.

In addition to asking visitors to rate their comfort level, I asked them to say a few words about why they rated their comfort level that way. 41% of visitors who rated their comfort level elected to write in a response.

**Table 1: Visitors say a few words on why they rated their comfort level they way they did.**

<b>Visitor Comments</b>	<b>Percent of Cases</b>	<b>Examples</b>
<b>Hard to Watch</b>	2%	"Sick to my stomach" "Hard to view"
<b>Educational Experience</b>	4%	"Educational for adults & children"

<b>Negative emotional response/Positive response toward animal care</b>	9%	"Great learning opportunity for my kids" "It's sad to see a rabbit being eaten but I'm not sure if the [Tasmanian] devils need it to survive." "Sad for the goats, happy for hyenas"
<b>Positive emotional response/Positive response toward animal care</b>	13%	"We know that these are wild animals, and it's not only beneficial for the animals, it's interesting for us to watch and learn." "We expect the ABQBioPark to do what is best for the animals."
<b>Interesting/Exciting Experience</b>	14%	"Because the study of animals is interesting and informative" "Thought it was pretty cool to see"
<b>Natural Behavior</b>	58%	"It's part of the circle of life" "It's just natural to eat for them that way" "This is natural and we wouldn't get to experience this otherwise"

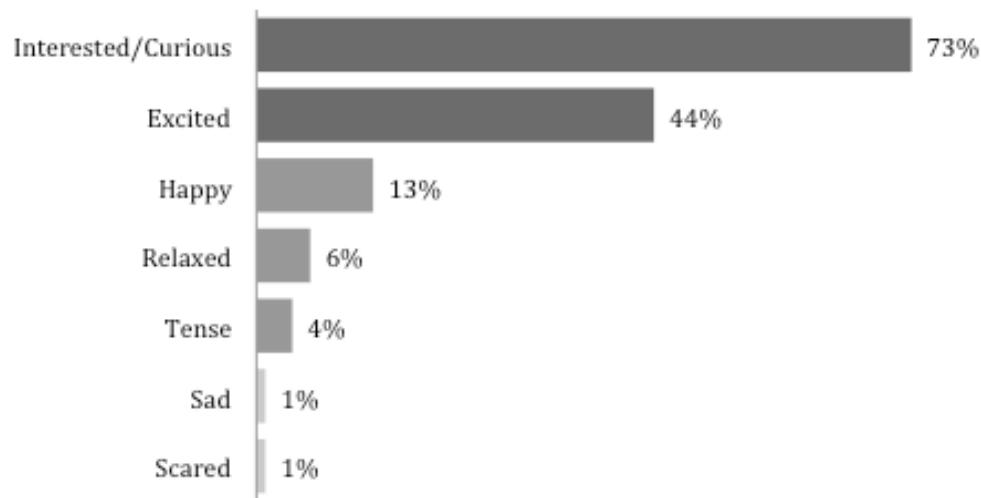
Visitors expressed in this section that even those who felt comfortable still found that the feedings could be physically unnerving. When asked if they felt comfortable, a few visitors who chose “Agree” wrote in comments like, “It was interesting, but seeing the actual [goat] legs/feet was nasty” and “I felt tense when I saw the quail intestines.” Overall, visitors wrote in positive comments that supported their comfort level.

### **What Are Visitors’ Attitudes And Reactions Toward Carcass Feeding?**

Five statements in the Likert scale series and a question that asked visitors to circle what feelings they most identified with out of a list of eight emotions were used to answer this question.

The question that asked visitors to circle an emotion offered eight options, four positive and four negative. The question was also phrased in a fill-in-the-blank manner, so 17 respondents elected to write in their own answers.

Most visitors report feeling *Interested/Curious* and/or *Excited*. n=242



**Figure 3: Survey item asked visitors:**  
“Watching an animal at the zoo consume a carcass makes me feel \_\_\_\_\_”.<sup>1</sup>

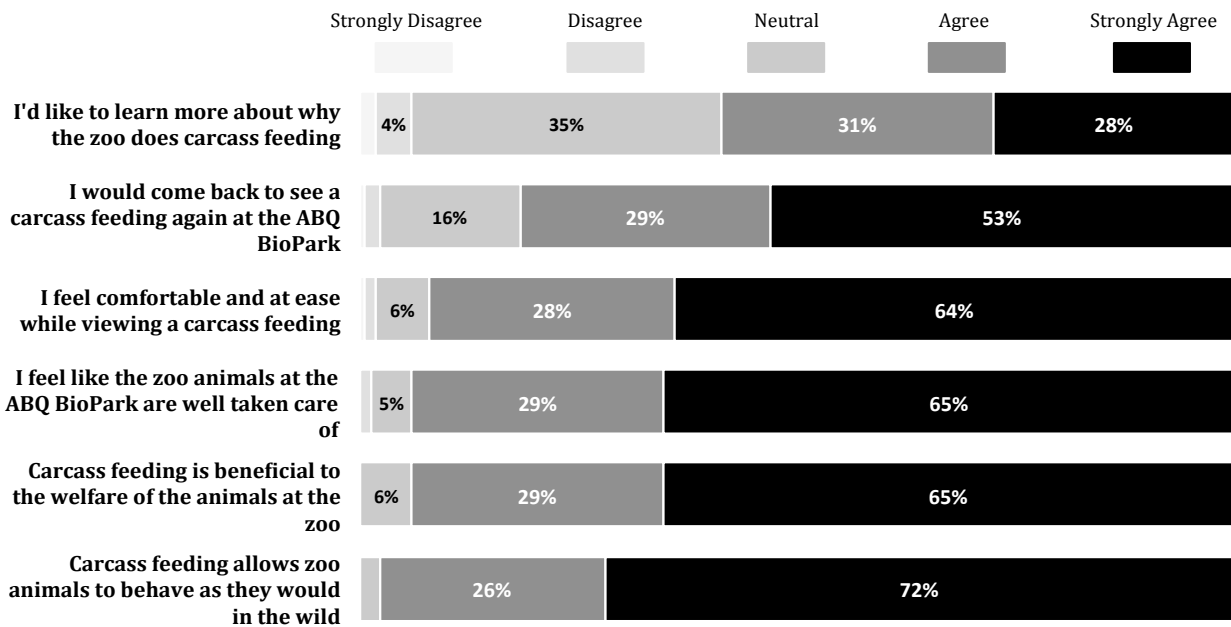
Visitors generally circled positive emotions on the list and many visitors circled more than one emotion. The most commonly selected emotions were all of the positive choices available, accounting for 136% out of 142% of words circled by visitors. The most common items circled together were “Interested/Curious” and “Excited.” Only one emotion – “Bored” – garnered >1% of cases and is not accounted for in this graph. One person selected “Bored” while viewing a feeding at the Tasmanian devil exhibit, however that visitor also agreed that they were comfortable viewing the feeding. The 1% of cases for both “Sad” and “Scared” were made up by three and two respondents respectively. Both visitors that reported feeling “Scared” viewed a feeding at the spotted hyena exhibit, and one of those visitors also selected “Sad.” The other two visitors that reported feeling “Sad” were at the spotted hyena exhibit and the Tasmanian devil exhibit.

<sup>1</sup> Many visitors chose multiple words so totals add to more than 100%.

“Tense” was the most commonly reported negative emotion. Seven respondents making up 4% of cases responded that they were feeling tense, however five of those respondents also circled “Excited” and “Interested/Curious” and five of the seven agreed or strongly agreed that they were comfortable with watching the feeding. All three exhibits had at least one visitor who felt tense during the feeding.

The Likert-type scale agreement statements also echoed positive attitudes toward carcass feeding. Aside from comfort level, the statements addressed visitor attitudes toward animal welfare and behaviors, if they would like to learn more about the feedings, and if they would return to see another feeding.

Visitors exhibit *positive attitudes* toward animal care and welfare while viewing feedings. =242



**Figure 4: Visitor attitudes toward carcass feeding.** Visitors are least interested in *learning more* about why the zoo does carcass feeding.

The statements that most visitors agreed or strongly agreed with relate to animal care. Ninety-eight percent of respondents agree or strongly agree that carcass feeding encourages

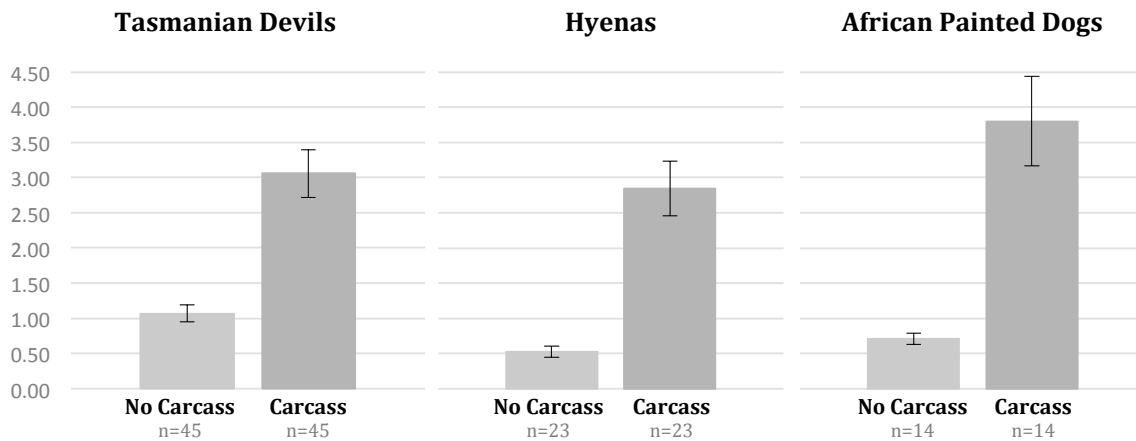
natural behaviors and 93% of visitors agree or strongly agree that the feedings are beneficial for the animals. Visitors also agreed with a general statement that animals are well taken care of at the BioPark with 94% of visitors selecting “Agree” or “Strongly Agree.” Respondents were also likely to come back to see another feeding with 83% of respondents selecting that they “Agree” or “Strongly Agree” that they would come back to see another feeding. The statement that most visitors disagreed and the only statement that gathered a “Strongly Disagree” response was related to learning more about why the zoo does carcass feeding. Six percent of visitors either selected “Disagree” or “Strongly Disagree” with this statement.

Reliability testing was run on the Likert-type scale statements to determine inter-item correlation. The statements were found to be reliable with a Cronbach’s Alpha score of .797. The least reliable of the statements was found to be the statement that also had the greatest variation in responses: whether or not visitors would be interested in learning more about why the zoo does carcass feeding. If this question were removed, the score would increase to .82, which would indicate the statements are highly reliable.

### **Do Visitor Stay Times Change While There Is A Feeding?**

The final research question addressed by this study was whether or not visitor stay times changed during a carcass feeding. To answer this question, 164 groups were timed – 82 while there was a carcass present and 82 while there was not. Mean visitor stay time was assessed using SPSS.

Visitors spent *more time* at the exhibits when there was a carcass present. (n=164)



**Figure 5: Mean visitor stay-time (min) during and in the absence of a carcass feeding. Displayed with standard error bars.**

Visitors stay times increased by 1:45 at the Tasmanian devil exhibit, 1:59 at the spotted hyena exhibit, and 2:51 at the African painted dog exhibit. Combining all three cases, overall mean stay time with a carcass present was 2:44 with a standard deviation of 1:11. Comparatively, the overall median stay time without a carcass present was 0:41 with a standard deviation of 0:41.

This data was also analyzed using independent t-tests for unequal variance to determine if there were statistically significant differences in stay times between visitors who viewed the exhibits in the absence and presence of carcass.

**Table 2: Independent T-Test for Unequal Variance results**

Exhibit	Coefficient
Tasmanian Devil	(t=-5.486, p<.001)*
Spotted Hyena	(t=-5.840, p<.001)*
African Painted Dog	(t=-4.840, p,.001)*

\*statistically significant difference, p<.001

The results of the independent t-tests for unequal variance show that there is a statistically significant difference in visitor stay times at the three exhibits with and without a carcass present.

## **DISCUSSION**

Analysis of these results will be discussed through the lens of these three main ideas, which address the research questions set forth at the beginning of this study:

- The majority of visitors are comfortable watching carcass feeding.
- Visitors responded with positive attitudes toward carcass feeding.
- Visitor stay time increased with the presence of carcass feeding.

### **Visitors are Comfortable Watching Carcass Feeding**

The first research question presented was answered in a positive manner: Visitors report being very comfortable while viewing a carcass feeding. Researchers and media spokespeople have suggested that visitors would be affronted or scared by carcass feeding (Boyce, 2007; Veniga & Lemon, 2001; McPhee, 2002; Young, 1997), but in the case of this study, those suggestions appear to be unsubstantiated. The results of this study – with 92% of visitors agreeing or strongly agreeing that they are comfortable while viewing a carcass feeding – are similar to those of the internal evaluation at the Toledo Zoo where 98% of visitors were comfortable viewing carcass feeding (Boyce, 2007). Visitors responded better to carcass feeding in this case compared to the Veniga & Lemon (2001) study, where 69.5% of visitors agreed with the practice, and the Pratt (2009) study, where 85% of respondents were found to agree with the practice.

Another suggestion that females would be more sensitive than men to the feeding because they show a greater emotional response toward animals (Pratt, 2009; Cottle et al., 2009; Ings et al., 1997) was also found to be false during this study. The gender ratio of this study was

imbalanced toward females with only 42% of respondents identifying as male. Despite the large number of female respondents, results show that out of 221 visitors who agreed or strongly agreed with the feeding, 56% were female.

Out of the 156 respondents that reported being in a group with adults and children, 93% of respondents were comfortable with watching the feeding. Only two respondents in a group with children disagreed or strongly disagreed that they felt comfortable. Parents did not seem to feel Boyce's (2007) concern over children watching a feeding. These results would indicate that groups with children were not deterred by the feedings. This is affirmed by some of the visitor comments as well. When asked to say a few words about why visitors rated their comfort level the way they did, some visitors answered that it was an educational experience for themselves and their children.

### **Visitors Responded with Positive Attitudes toward Carcass Feeding**

When asked to circle an emotion that described how visitors felt while viewing a carcass feeding, the most common selections were "Interested/Curious" and "Excited." Together the two of those responses totaled 113% of 142% of words chosen. In addition, all of the positive emotion choices – "Interested/Curious," "Excited," "Happy," and "Relaxed" – totaled 136% of cases. This shows an overwhelmingly positive result when discussing the attitudes of visitors toward carcass feeding.

The Likert-type scale statements pertaining to this question also demonstrated a positive response. First, visitors agree that carcass feeding allows animals to simulate wild-type behaviors, with 98% of visitors agreeing or strongly agreeing with the statement. While viewing the feedings, visitors also agreed that carcass feeding is beneficial for animals and that the

animals at the ABQ BioPark Zoo are well taken care of with about 93% of people agreeing or strongly agreeing to each statement. Another notable result was the disparate results on the statement about whether or not visitors would like to learn more about why the zoo does carcass feeding. Only 59% of visitors selected “Agree” or “Strongly Agree” when asked if they would like to learn more.

One hypothesis for this result lies in the visitor comments relating to comfort. The majority of visitors – 58% – described being comfortable because carcass feeding is natural. Many visitors wrote in responses saying, “It is a natural part of these animal’s lives,” and “This is how they eat.” Visitors who agreed that they were comfortable wrote in statements relating to animal care, like, “It’s better for the animals,” and visitors that were uncomfortable even expressed some benefits for animals: “It makes me a little queasy, but animals seem happy.” Visitor comments suggest that they feel that they already know why the zoo does carcass feeding: that it’s natural for animals and that it benefits them.

### **Visitor Stay Time Increased with the Presence of a Carcass**

Overall, visitor stay time significantly increased by about two minutes at the Tasmanian devil and spotted hyena exhibits and nearly three minutes at the African painted dog exhibit. The literature shows that visitors stay longer at exhibits with active animals (Godinez, Fernandez, & Morrissey, 2013; Clayton, Fraser, & Saunders, 2009) The introduction of the carcass made the animals at each exhibit more active. The animals would often attempt to run around with the carcasses before consuming them and if they weren’t eaten right away, they would guard them from each other. This led to a lot of activity for a prolonged period of time in each exhibit, which supports more effective engagements of visitors.

## **Areas for Further Research**

There are many avenues for further research presented by these findings. With the advantage of understanding the demographics and attitudes of the visitors in the area, one area of further research could involve implanting carcass feeding in other exhibits. This research could give insight to visitors' perception of carcass feeding with a broad range of carnivorous zoo animals. Another area that could be explored is live feeding. Anecdotally, the most common question asked by visitors during the study was whether or not the prey animal was alive when it went into the exhibit. There are hypothetical studies that examine this issue such as those implemented by Cottle et al. (2010) and Ings, Waran, & Young (1997) that could be relied on as models to determine visitor's comfort levels.

There is also the opportunity to explore carcass feeding outside the parameters of one institution. In this instance, zoos from other parts of the country already engaging in carcass feeding or starting a carcass feeding program could implement a carcass feeding study. Zoos considering starting their own carcass feeding program could benefit from a network of visitor responses – either positive or negative – that would help them make informed decisions about what their visitors might be comfortable with.

Further research could also examine how the public views carcass feeding in relation to other forms of enrichment. This could be a beneficial study from both the animal behavior and visitor perspectives. It would be interesting to compare other types of environmental enrichment to carcass feeding to see if there was anything that was more engaging and therefore better for visitor engagement.

## CHAPTER FIVE: CONCLUSION

Enrichment is a cornerstone for keeping animals in zoos healthy and happy. For carnivores, the practice of feeding vertebrate animal carcasses, like those of goats or deer, or whole body prey animals like chickens or rabbits, can be an effective form of enrichment. While it is beneficial for animal care, carcass feeding is also considered off-putting to some visitors and zoos have hesitated to instate viewable carcass feeding programs. This research aimed to address this concern and described actual attitudes and comfort levels of visitors who viewed carcass feeding in three exhibits at the ABQ BioPark Zoo in Albuquerque, NM: spotted hyena, Tasmanian devil and African painted dog.

This study shows that visitors watch animals in exhibits longer when a carcass is introduced and are generally comfortable with viewing carcass feeding. Most visitors explained that the practice of carcass feeding seemed natural to them or that they believe it was a positive thing for the animals even if they were uncomfortable with it.

The findings of this research will help inform the ABQ BioPark Zoo and other zoos as they grapple with decisions surrounding this feeding and enrichment strategy as it relates to the comfort of their visitors. The overwhelmingly positive response can be considered an aid to zoos that are thinking about taking steps toward implementing carcass feeding programs and to the ABQ BioPark Zoo if they choose to expand their carcass feeding program to be a more regular form of enrichment with the three animals in the study and other carnivores kept at the zoo.

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# APPENDIX A: QUESTIONNAIRE

## Visitor Responses to Carcass Feeding with African Painted Dogs at the ABQ BioPark

Researcher: Ellen Roth // Email: rothe@uw.edu

Thesis Advisor: Nick Visscher, Museology Graduate Program Faculty // Phone: 206-221-0763 // Email: vissche2@uw.edu

I am asking you to complete a questionnaire that is a part of my Master's Thesis work at the University of Washington. The purpose of this research is to address visitor responses to carcass feeding at the ABQ BioPark. Your participation is voluntary, refusal to participate will involve no penalty or loss of benefits, and you may discontinue participation at any time. If you have any questions now or in the future, you may contact me through the numbers on this form.

**Thank you for agreeing to answer a few questions about the feeding you just saw. As a point of reference, carcass feeding is the practice of feeding animal carcasses like those of goats or deer, or whole body prey animals like chickens or rabbits, to meat eaters in zoos.**

**How often do you visit the ABQ BioPark?**

This is my first time  1-2 times a year  3-5 times a year  6 times or more a year

**Is this the first time you have seen a carcass feeding in a zoo?**

Yes, this is the first time  No, I've seen it before at the ABQ BioPark  No, I've seen it at a different zoo

**Watching an animal at the zoo consume a carcass makes me feel \_\_\_\_\_.** (please circle all that apply)

Excited      Bored      Relaxed      Happy  
Scared      Interested/ Curious      Tense      Sad

On a scale from **strongly disagree** to **strongly agree**, to what extent do you agree with these statements?

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Carcass feeding is beneficial to the welfare of the animals at the zoo	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Carcass feeding allows zoo animals to behave as they would in the wild.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I feel like the zoo animals at the ABQ BioPark are well taken care of.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I'd like to learn more about why the zoo does carcass feeding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I would come back to see a carcass feeding again at the ABQ BioPark.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>I feel comfortable and at ease while viewing a carcass feeding.</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please say a few words about why you rated your **comfort level** this way:

**What is your age?**

18-29  30-39  40-49  50-59  60-69  70 or older  I'd prefer not to say

**My group is made up of:**

Only me  Adults Only  Adults and Children

**What is your gender?**

Male  Female  I'd prefer not to say

**What is your Zip Code?** \_\_\_\_\_

**Do you have any other thoughts or questions about this feeding that you'd like share?** (write on back of sheet if necessary)

**APPENDIX B: TIMING DATASHEET**

Date:

Carcass:

Enclosure & Conditions:

Time:

<b>Group Size</b>	<b>Group Comp</b>	<b>Time</b>