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The Effects of Human Feeding Activities on Animal Behaviors

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Abstract. Human interaction with animals, both domestic and wild, dates to millions of years ago, in ancient times when early humans formed symbiotic relationships with wildlife for survival, which eventually led to the domestication of certain species for food, labor and later companionship. This review essay will focus mainly on human feeding behaviors and their consequential influence on animal species. I would discuss different aspects of the influences with case studies from different research teams to evaluate both the positive and negative impacts and how can we utilize them to improve animal welfare and sustainability. After my review work, I found out that pros and cons come hand in hand in most situations. For example, human feeding behaviors can disrupt animal's natural behaviors and lead to ecological imbalances. On the other hand, proper feeding behaviors can sometimes reduce the stress levels of animals and improve both their physical and mental health. Going into greater depth with the application of the advantages of human feeding, there are still considerations about whether such an act is ethical since it alters animals' natural behaviors or if there would be any unknown long-term effect on the animal population. This review article aims to provide insight into how human feeding behaviors can affect animal behaviors so related workers and staff can have a clearer view of their behaviors and the potential consequences.

Keywords: Animals, Behavior, Feeding, Ecology.

1. Introduction

Human feeding behaviors have profound impacts on animal behavior, which has been proved by various studies that have investigated how human intervention affects animals in both wild and domestic settings. One important study by Federico Ossi and Nathan Ranc focused on roe deer and other ungulate species[1]. In the study, they examined how human supplemental feeding behaviors influenced roe deer's social and ecological behaviors. They used photo traps to observe these animals' behavior at feeding sites and found that the existence of feeding sites increased inter-individual tolerance among roe deer, meanwhile, the species is typically known for their solitary nature. This research demonstrates how human feeding practices can disrupt, or perhaps even encourage social dynamics that would be otherwise not seen among these species. Another significant study by Idrus Zulkifli delved into the impact of human feeding behaviors on livestock, specifically on how a stock person's behavior affects animal welfare and productivity[2]. His research revealed that the way stock persons interact with animals, in this case, through feeding, has a relationship with the animals' stress levels, which can in turn affect their productivity results. On the other hand, research by Laura Griffin explored another aspect of human-animal interactions—how human feeding practices can result in evolutionary changes in wild populations[3]. Her team studied wild fallow deer and found out that individuals exhibiting begging behaviors, often encouraged by human feeding, had higher reproductive success rates than non-beggars. They observed that individuals who consistently begged received more food and therefore better nutrition, which could enhance their reproductive outcomes and potentially lead to evolutionary changes within the species in time. Their study also raises concerns about the long-term genetic impacts of human intervention in animal feeding, because those behaviors that are not naturally occurring in the wild could become more prevalent due to human influence. Similarly, the research conducted by Margaret Wilson and April Ridlon examined the broader ecological consequences of human-induced behavior changes in animals[4]. Their study analyzed existing case studies on how human activities such as urbanization and hunting and especially feeding influence animal behaviors. Those influences are mainly related to movement and

reproduction. Their study highlighted the negative consequences of these behaviors, because animals often adapt their natural patterns to avoid human disturbances and these adaptations can lead to increased stress levels, reduced foraging efficiency, and diminished reproductive success, which can ultimately damage the resilience of species. The idea that human disturbances can act like predator risks was further [5]. The team investigated how non-lethal human activities, such as loud noises or sudden movements that come with feeding behaviors can affect animals in a way similar to predators. Their research, inspired by earlier studies on Thomson's gazelles, demonstrated that animals react to human disturbances in a similar way compared to how they respond to predator threats. This disruption can harm animals' overall health and reproductive results. However, not all human interventions are harmful. In a more strictly controlled environment, Barbara Toddes and Donna Ialeggio's research team at the Philadelphia Zoo introduced a human behavioral change model modifying animal diets to improve their health and behaviors. Their team worked with primates, implementing new feeding regimes based on behavioral science principles[6]. While this study presents the potential benefits of human intervention, it also raises ethical concerns about the extent to which humans should control and alter animal behaviors for their benefit. This review essay will categorize similar research and present them closely in a way for readers to understand the influence of feeding behaviors on animal behaviors and physiology.

2. Influence on Animal

2.1. Evidence of Influence

Human feeding behaviors can influence and alter animal behaviors and there are multiple researches that can prove this idea. Federico Ossi and Nathan Ranc's research is about how human supplementary feeding affects animal ecology and behavior. The research team set photo traps to capture pictures of roe deer and some other ungulate species at supplemental feeding sites set by humans. The results indicate that human feeding behavior can improve inter-individual tolerance among roe deer, which usually do not approach other deer, but this phenomenon has not been observed in human foraging sites. The roe deer seem to appear at their foraging sites at dawn and dusk, following their circadian rhythm. From this study, it can be concluded that human supplemental feeding behaviors can and already have influences on angulate species such as roe deer. Idrus Zulkifli's research team emphasizes animal productivity and welfare. This research mentions that the degree of animal fear and the quality of animal-human interaction are deeply affected and even determined by the behaviors of the stockpersons. And these two factors are the two most important resources of pressure that can result in poor productivity of livestock. Research suggests that the way humans interact with animals, including feeding and care, can have profound impacts on many aspects of animal physiology and behavior. Even though there is a lack of well-conducted and performed outside of laboratories, it remains clear that animal welfare is directly associated with the way humans interact with animals. More regular visual contact with animals is necessary to reduce their stress level when interacting with humans. In another study by Laura Griffin's team, it was mentioned that during the artificial selection stage of human feeding behaviors, wild populations can be affected when humans are trying to keep or remove certain traits of the animals. They conducted research on whether human feeding behaviors can lead to an artificial selection in the wild population of wild fallow deer. In more detail, the research team is trying to investigate if certain individuals with begging behaviors can have better reproductive outcomes. The research results indicate that consistent beggars do receive more food than others and thus can take in more nutrition. This could be one potential evolutionary change that is caused by human intervention and artificial selection during feeding behaviors. When individuals gain weight or larger sizes out of begging behaviors, it can potentially affect their reproductive processes and cause further genetic impact. However, it is still worth further discussing since begging behaviors in the wild fallow deer population also seem to their gender, age and herd size. Further research into the dynamics between human feeding behavior and its interaction with wild animals is emphasized in this article.

2.2. Negative Impacts

After introducing the concept that human intervention such as feeding can have impacts on animal physiology and behaviors, this article will discuss some of the potential downsides of this interaction between humans and animals. Firstly, the ecological impact of changes in animal behavior caused by humans. Margaret Wilson and April Ridlon's team conducted an analysis and study on the impact of human activities on animal behavior. The study mainly compared in detail how human activities such as urbanization, hunting, and entertainment affect animal behavior, such as feeding, exercise, and reproduction. The research findings indicate that human activities have a negative impact on animal behavior, emphasizing that urbanization and hunting disrupt the natural dynamics between predators and their prey. The natural dynamics between predators and their prey. For example, in order to avoid human, animals may change their feeding and habituating patterns, which can possibly result in increased stress levels and decreased animal foraging efficiency and reproductive activities. In the end, the resilience of different species could be decreased and such alterations in behavior can disrupt ecological functions and ultimately cause enduring adverse consequences for ecosystems. Another study focuses more on how human interference stimuli can serve as a predation risk. As mentioned in the research, more than 30 years ago, Walther conducted an experiment comparing Thomson's gazelles' responses to human disturbance with their responses to predators and found that the factors that influence their escape distances are similar in both situations. This study was inspired by earlier research on animals' responses to human disturbance. Subsequent research has supported the idea that human-induced disturbances act like predation risk, diverting animals' time and energy away from key activities such as feeding and mating. According to the research study, human behavior, even non-lethal ones, such as loud noises or sudden movements, can disrupt animals in the same way that predators do. By applying an economic model of anti-predator behavior to these disturbances, the study showed that animals would weigh the costs of avoiding these disturbances from humans against other important activities such as feeding and mating. This suggests that human disturbances disrupt these activities and can harm the animals' reproductive results and overall health. Therefore, human behavior can indeed have detrimental effects on animals, just like the threat of predators.

2.3. Positive Impacts

On the other hand, sometimes human feeding activities can be beneficial to animals rather than causing damage. Researchers working at the Philadelphia Zoo are studying how to use human behavior change models to alter animal diets, with a particular focus on primates. The model in detail is described as modifying animal diets based on principles from behavioral science and aims to alter both how humans practice the new model and how animals respond to it. This new human behavioral change model is practiced through a series of implementations of new feeding regimes, and five stages are mentioned in the passage while the last stage is still ongoing (maintenance). One example from the article is the modification of the diet of the Barbary macaques. In the beginning, their dietary structure is not ideal, because they cannot receive all the nutrition they need. The researchers then applied the human behavioral change model and changed the feeding regimes so that now they have a wider variety of food. As a result, the researchers later observed improvement in the macaques' health and behaviors. Another factor playing a vital role in this change is that training is given to the staff. Another example from the journal is the capuchin monkeys, where the research is focused on enhancing feeding enrichment. The staff utilized the human behavioral change model to encourage the monkeys to continue their foraging behaviors, which can be beneficial to the monkeys both physically and mentally. However, another question emerges as the animals in Philadelphia Zoo are getting new diets, is what they have done ethical? Can humans adjust the diet of other animals as they please? Related studies have discussed some potential, benefits, and ethical issues of changing wildlife behavior, first acknowledged the positive side and provided some successful examples, such as using aversive conditioning to prevent animals from raiding crops and altering migration patterns to protect species from climate change impacts. And there are also some potential ethical issues at the same time. In the process of modifying animal behavior, it is never possible to determine when or how human intervention can cause damage to animals especially if the action is not taken carefully.

Also, there is a debate over whether it is appropriate for humans to interfere with the natural behaviors of animals as many people argue that such acts would disturb the order in nature and ecosystems. Some people are concerned that altering wild animals' behaviors can cause uncertain consequences in the long term. Researchers in the field are calling for more research and emphasizing the need for further analysis in evaluating the effectiveness and ethical implications of behavioral interventions [7]. It advocates for a cautious approach, ensuring that interventions are scientifically sound and ethically justified.

To summarize the influence of human feeding behaviors on animal behaviors, D. Fraser, professor at the University of British Columbia, wrote in his article, Four Types of Activities that Affect Animals: Implications for Animal Welfare Science and Animal Ethics Philosophy, that among all the animals fed by human, captive wildlife exists at almost 0.1 billion [8]. According to the author, in many situations when humans are keeping animals, whether in the wild or domestically, actions that benefit animals can in some ways be beneficial to humans as well. For example, when laboratory animals are treated in better condition, it can reduce the stress level of the animals and may result in better experiments. Humans have the opportunity to provide wild animal with nutrition vital to their lives but can normally be found nowhere in nature. The way how people keep animals may result in various scientific, practical, and ethical challenges. He mentions in his article that one major scientific and practical challenge is to find better animal-care practices that also benefit stockpersons. Another ongoing challenge is to identify and eliminate economic and other constraints that stand in the way of better animal care as an obstacle [8].

3. Suggestions

As some of the potential negative impacts discussed in previous section, it's now clear that it's important to improve human feeding behaviors to reduce their negative impact on wildlife and the ecosystem. One way to achieve this is through minimizing direct feeding and focusing on scientifically informed strategies that prioritizes animal welfare and the overall health of the ecosystem. Direct feeding can cause a major influence on animal's habituating behaviors and dietary structures. In a case study of moor macaques, too much direct feeding changed their social structure because the artificial food as an unnatural food source disrupted their original social network[9]. Learning from the case study, human should actively seek for more diverse and indirect feeding methods that would not leave long-term effect on animal populations, such as diversionary feeding, which aims to attract animals from their sensitive areas without disrupting their natural behaviors. However, such approach requires a well-structured decision-making process, including setting objectives and evaluating outcomes[10].

4. Conclusion

Human feeding behaviors have a mixed impact on animal's physiological and behavioral patterns, influencing their behaviors, health and the way they interact with the environment. As mentioned in many cases, supplemental feeding behaviors can modify animal behaviors as the roe deer grow inter-individual. And animal's productive activities and welfare could be affected directly by the behavior of the stock person. One other research highlights how human behavior can bring evolutional advantages to certain species, where fallow deer individuals who actively beg for food have a higher reproductive success rate. On one hand, as expected, human feeding behaviors can cause negative ecological and behavioral consequences, ranging from an increase in animal stress levels and disturbance in predator-prey dynamics. However, some positive influences are observed in several studies. For example, the use of human behavioral change models, like those implemented at the Philadelphia Zoo, has improved the health and well-being of primates by enhancing their diets and encouraging natural behaviors. Other behavioral methods, including the use of aversive techniques, have contributed to solving conservation conflicts. As promising as these methods may be, they are ethically problematic in view of the damage that stockpersons can do to the balance between nature

and animals, and what long-term, unpredictable consequences may occur. This research is significance in highlighting the dual effects of human feeding behaviors on animal populations, showing both the positive and negative consequences. The importance of developing feeding strategies that promote animal welfare while reducing ecological disturbances is underscored. While these findings provide valuable insights, the existing research still faces limitations, especially concerning the unknown long-term effects of human feeding on wild populations. Most of the research studies do not offer much data beyond the controlled experimental conditions, which may complicate the evaluation when it comes to the wider ecological impacts. Future investigations should aim to address these deficiencies by implementing long-term field studies that assess the long-term consequences of human actions on animal behavior, genetics, and interactions with the ecosystem. Another limitation in the current research is the lack of understanding of species-specific responses to human feeding behaviors. While certain studies have focused on specific animals like roe deer, wild fallow deer, or primates, the effects of human feeding on a broader range of species remain unknown. Different species may respond differently to supplemental feeding, with some benefiting from the intervention and others may suffer from unintended consequences. Researchers in the future can work to investigate how various species across different ecosystems react differently to human feeding to provide a more comprehensive understanding of the broader ecological impacts. Furthermore, it is essential to delve deeper into the ethical implications of human behavior's influence on animal behaviors, ensuring that future human-animal interventions are both scientifically valid and ethically sound. By harmonizing human interests with animal welfare and ecosystem integrity, a more sustainable strategy for feeding wild animals can be developed..

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