

Analysis of Daily Behavioral Patterns of Purebred Cats Before and After Sterilization

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Abstract

Male domestic cats tend to exhibit different behaviors influenced by reproductive hormones, such as aggression, territorial instincts, and relatively high levels of exploratory activity. Sterilization (castration) has been shown to reduce the production of these hormones, which may consequently affect cats' daily behavioral patterns. This study aimed to examine changes in the daily behavior of domestic male cats before and after sterilization (castration). Observations were conducted on 15 cats (A–O), with variables including feeding frequency, sleeping patterns, grooming behavior, play activity, aggressive behavior, social interactions, and physical health. The method employed was direct observation of cat behavior before and after the sterilization procedure. The findings revealed significant behavioral changes following sterilization, including reduced aggression, decreased roaming activity, increased resting time, and more regular feeding patterns. In addition, social interactions with humans and other cats increased, while the cats' physical condition became more stable. The degree of behavioral change varied among individual cats and was influenced by factors such as breed, age, individual temperament, and the environment in which they were kept. Therefore, sterilization not only plays an important role in population control but also contributes to improved behavioral stability and overall welfare in domestic male cats.

Keywords: Sterilization; Male Cats; Behavior; Aggressiveness; Social Interaction.

INTRODUCTION

Cats (*Felis catus*) are among the most commonly kept companion animals and are well known for their ability to adapt to human environments. In addition, cats have a relatively high reproductive capacity compared with many other companion animals. Female cats experience recurrent estrous cycles throughout the year and are capable of producing multiple offspring in a single litter (Nielson et al., 2024). Meanwhile, intact male cats typically reach sexual maturity at an early age and exhibit reproductive behaviors influenced by hormones, including aggression, roaming tendencies, and territorial marking, which are largely regulated by testosterone (Lotfy, 2020). These characteristics can contribute to uncontrolled population growth when effective and sustainable reproductive management strategies are not implemented. Such population increases not only result in a greater number of cats but also create additional concerns, including the spread of infectious diseases caused by viruses, bacteria, and parasites, environmental disturbances, and reduced animal welfare. Effective reproductive control measures are necessary to maintain a balanced cat population and minimize potential negative impacts (Umiroh et al., 2023).

One of the most widely used methods for controlling cat populations is sterilization. Sterilization is a medical procedure involving surgery to permanently eliminate reproductive function through the removal of reproductive organs. In female cats, this procedure is known as ovariohysterectomy, whereas in male cats it is referred to as orchietomy or castration. These procedures lead to a reduction in the production of sex hormones, such as estrogen and testosterone, which play essential roles in both reproduction and behavior (Coe et al., 2021). The decline in hormone levels affects not only reproductive capacity but also the physical condition and metabolic balance of cats. Beyond population control, sterilization offers several health benefits, including a reduced risk of reproductive diseases, a lower likelihood of tumor development, and an overall improvement in quality of life. Sterilization is viewed not only as a population management strategy but also as an important component of responsible pet ownership and animal welfare practices (Corona, 2020).

In addition to its physical effects, sterilization can significantly influence feline behavior. Reproductive hormones play a crucial role in regulating various behavioral traits, including aggression, territoriality, and mating-related behaviors. In intact cats, behaviors such

as extensive roaming, aggression toward other cats, and urine marking are commonly observed as natural hormone-driven activities. Following sterilization, the reduction in circulating hormone levels may result in substantial behavioral changes, including decreased aggression, reduced territorial behavior, and a greater tendency toward calm and stable behavior (Rahmalisa et al., 2020). These findings are supported by previous studies indicating that castration contributes to a reduction in aggressive behavior and roaming activity among male cats (Azura et al., 2022). Furthermore, hormonal changes have been reported to affect activity levels and the ways in which cats interact with their environment. This evidence highlights the close relationship between physiological conditions, particularly hormonal status, and the behavioral patterns exhibited by cats in their daily lives (Utami et al., 2024).

The changes that occur following sterilization are not limited to reproductive behaviors but also extend to cats' overall daily behavioral patterns. Activities such as feeding, sleeping, playing, grooming, and social interactions with the surrounding environment may change after sterilization. These changes are associated with adjustments in metabolism and hormonal balance, which influence activity levels and daily habits. In some cases, sterilized cats tend to spend more time resting and engage in less roaming behavior compared with their pre-sterilization condition (Kreisler, 2021). Daily behavioral patterns may be reflected in changes in feeding frequency and social interactions as cats adapt to their altered physiological state. These findings suggest that sterilization affects not only a single aspect of behavior but also influences the overall daily activities of cats. Nevertheless, studies specifically examining comprehensive changes in daily behavioral patterns remain limited. Most previous research has focused on particular behavioral aspects, highlighting the need for more comprehensive investigations to better understand overall behavioral changes in cats (Coe et al., 2021).

A thorough understanding of behavioral changes in cats following sterilization is important not only for animal welfare but also for educational purposes. In biology education, particularly in topics related to the reproductive and endocrine systems, the use of concrete examples is essential for helping students understand concepts in a more relevant and practical manner (Amat et al., 2020). Behavioral changes in cats resulting from hormonal alterations can serve as an effective teaching tool for illustrating the relationship between the endocrine system and behavioral responses. Moreover, examples drawn from animals that are familiar to students can increase learning interest and facilitate comprehension of more abstract concepts. Research findings on animal behavior can therefore bridge the gap between theoretical knowledge taught in the classroom and real-world phenomena observed in everyday life (Rahmawati et al., 2022). Based on the available

information, a more detailed analysis of the effects of sterilization on daily behavioral changes in purebred cats is needed. According to Kreisler et al. (2021), many previous studies have focused primarily on specific aspects such as aggression and reproductive control, while investigations of overall daily behavioral changes remain scarce. Iwazaki et al. (2022) reported that hormonal and metabolic changes following sterilization may affect activity patterns, feeding habits, and resting behavior in cats. In addition, Tama et al. (2023) found that the physical condition and health status of cats can influence behavioral responses following medical procedures. These findings indicate that research on the daily behavior of sterilized cats still requires further investigation using more structured and comprehensive observational approaches.

Behavioral changes observed after sterilization do not always follow the same pattern among male cats. Some individuals may exhibit substantial reductions in aggression, roaming frequency, and urine-marking behavior, whereas others show only minor changes or virtually no noticeable behavioral shifts (Coe et al., 2021). Such variation may be influenced by numerous factors, including breed, age at the time of sterilization, health status, husbandry practices, and the environmental conditions in which the cats live and interact daily. Indoor cats, for example, may display behavioral responses that differ from those of cats with unrestricted outdoor access. Pre-sterilization hormonal status and previous social experiences may affect a cat's ability to adapt following surgery (Amat et al., 2020). Physical condition and housing environment are closely associated with changes in daily activity and behavioral responses after sterilization (Wazaki et al., 2023). This study aimed to analyze differences in the daily behavioral patterns of male cats before and after sterilization, thereby providing more comprehensive scientific information regarding the effects of sterilization on the behavior of companion cats.

MATERIALS AND METHODS

Study Area

The study was conducted at the Animal Husbandry and Animal Health Service Office of Palu City, located on R.A. Kartini Street, Palu, Indonesia. In addition to the main research site, the study involved 15 different observation locations distributed throughout Palu City (Figure 1). The Animal Husbandry and Animal Health Service Office served as the primary center for sterilization procedures and animal health examinations, while the remaining locations functioned as residences where the cats included in the study were cared for and observed. The main study site is situated in an urban area characterized by intensive veterinary healthcare activities. Available facilities include examination rooms,

medical treatment rooms, and other supporting areas that facilitate comprehensive animal care. These facilities enable various medical procedures, including sterilization, to be performed in accordance with established veterinary standards. Furthermore, the well-maintained environment and the support of qualified veterinary personnel make the facility an appropriate setting for research in animal health. The inclusion of multiple observation sites provides a more representative environmental context, thereby supporting a more comprehensive analysis of behavioral changes in cats (Yuliana et al., 2021).

The sample consisted of several purebred domestic cats (*Felis catus*) that underwent sterilization procedures at the research facility and originated from the 15 different observation locations. Sample selection was

conducted carefully based on specific criteria, including good health status, appropriate age, and suitability for sterilization with a low risk of complications. The selected cats were individuals that could be observed consistently both before and after the procedure, allowing for more accurate behavioral comparisons. This selection process was designed to ensure the collection of valid and reliable data capable of accurately reflecting behavioral changes associated with sterilization. In addition, these criteria helped minimize potential confounding variables that could affect the study outcomes. Consequently, the selected sample was expected to provide a representative overview of behavioral changes in cats following sterilization (Yuliana et al., 2021)

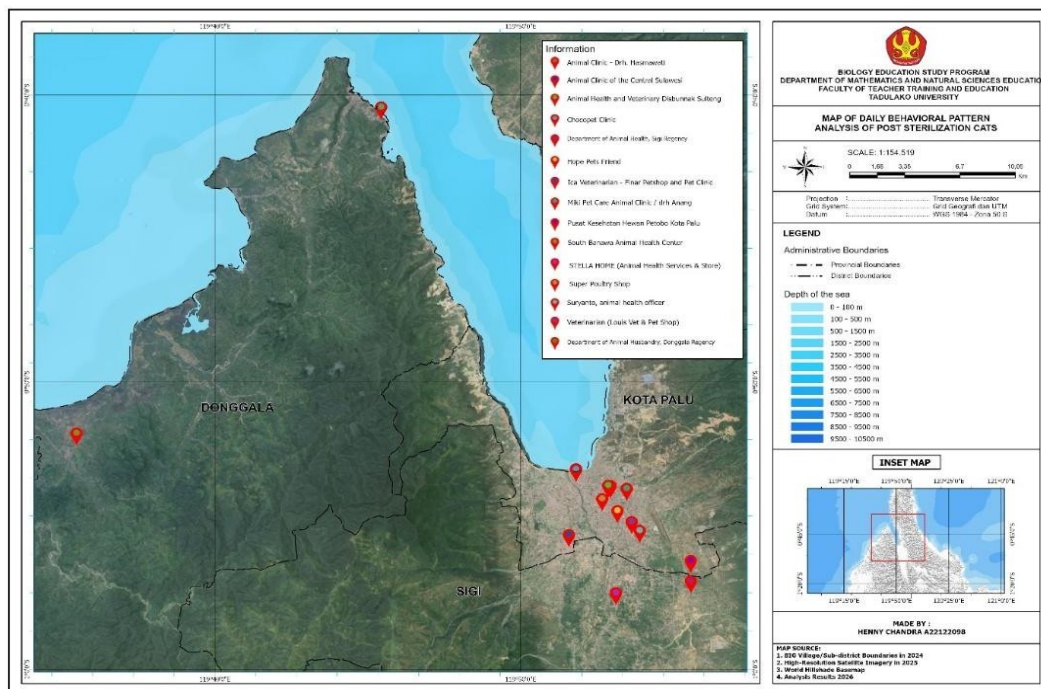


Figure 1. Map of the research location in Palu City, Central Sulawesi, Indonesia.

Procedures

Research Design

This study employed a qualitative descriptive research design to analyze changes in the daily behavioral patterns of purebred cats before and after sterilization. A qualitative approach was selected to facilitate an in-depth understanding of behavioral dynamics under natural conditions, particularly those influenced by hormonal changes following sterilization. The researcher served as the primary research instrument and was responsible for data collection, observation, interpretation, and validation. The study focused on identifying behavioral differences before and after sterilization, particularly in relation to feeding behavior, resting duration, social interactions, territorial tendencies (such as urine

spraying), exploratory activities, and aggressive behavior.

Research Subjects

Sterilization procedures were performed at veterinary clinics in Palu and at the Provincial Department of Plantation and Animal Husbandry of Central Sulawesi, Indonesia. Post-sterilization behavioral observations were conducted in the cats' home environments to ensure that the animals exhibited natural, stress-free daily behaviors. The primary subjects of this study were purebred male cats that had undergone sterilization. Subject selection was based on ownership accessibility and the cats' health suitability for the sterilization procedure. To enrich the data, additional informants were included, consisting of professional veterinarians and cat

owners with experience in caring for both sterilized and intact cats. Their perspectives provided supplementary information regarding behavioral characteristics and changes observed before and after sterilization.

Data Analysis

Semi-Structured Interviews

Semi-structured interviews were conducted with veterinarians involved in the sterilization procedures and cat owners who had experience caring for sterilized cats. The interviews aimed to gather both professional and practical perspectives regarding behavioral changes following sterilization, hormonal influences, recovery conditions, and overall health adaptation. An interview guide was prepared in advance; however, follow-up questions were allowed to explore emerging themes in greater depth. Interview data were documented through written notes and audio recordings when permission was granted by the participants.

Documentation

Documentation included photographs, clinical records (when accessible), observation sheets, and field notes. These materials were used to support observational findings and enhance the credibility and reliability of the collected data. The documentation also provided supplementary evidence for behavioral changes observed throughout the study period.

Direct Observation

The sterilization procedure for male cats was carried out through several stages, beginning with a health examination conducted by a veterinarian to ensure that each cat was physically healthy and suitable for surgery. Cats that were not in good health were excluded from the sterilization procedure; therefore, all subjects were required to be in good physical condition and exhibit a normal appetite prior to surgery. Sterilization was also recommended after vaccination to enhance immune function, thereby reducing the risk of infection and supporting postoperative recovery.







In addition, cats were required to undergo a period of fasting before the procedure to ensure that the stomach

was empty. This precaution was taken to prevent vomiting and minimize the risk of aspiration during anesthesia administration. During the sterilization procedure, general anesthesia was administered to induce unconsciousness, allowing the surgery to be performed safely and efficiently while minimizing pain and discomfort for the animal. Behavioral observations were conducted both before and after sterilization to identify potential changes in daily behavioral patterns. The observed variables included feeding behavior, sleeping duration, grooming activity, play behavior, social interactions, territorial behavior, exploratory activity, and aggression. Observations were recorded systematically using standardized observation sheets to ensure consistency and accuracy in data collection.

RESULTS AND DISCUSSION

The results of observations conducted on 15 domestic cats that underwent sterilization are presented in Table 1. The table illustrates a comparison of feline behavior before and after the sterilization procedure in the form of orchietomy (castration), covering several important variables, including feeding patterns, resting duration, grooming activity, aggression levels, social interactions, and physical activity levels. The data presented in the table indicate a relatively consistent trend in behavioral changes among the observed cats. Most cats exhibited increases in appetite, sleeping duration, grooming frequency, and social interaction following sterilization, whereas aggressive behavior and physical activity levels generally decreased. Furthermore, the table provides descriptions of the direction of change and interpretations for each behavioral variable, offering a clearer understanding of the behavioral dynamics of cats before and after the sterilization procedure. These findings suggest that sterilization may contribute to substantial modifications in daily behavioral patterns, particularly those associated with hormone-regulated activities, resulting in behavioral profiles that are generally calmer, more socially interactive, and more stable after the procedure.

Table 1. Comparison of behavioral characteristics of male domestic cats before and after sterilization.

Variable	Condition Before Sterilization	Condition After Sterilization	Direction of Change	Interpretation	Figure
Feeding behavior	Appetite was moderate and feeding patterns were irregular.	Appetite increased and feeding schedules became more regular.	Increased (↑)	An improvement in appetite and feeding regularity was observed.	
Sleeping behavior	Resting duration was relatively low.	Resting duration increased and sleep periods became longer.	Increased (↑)	Cats spent more time resting and sleeping after sterilization.	
Grooming behavior	Grooming activities were limited and performed less frequently.	Grooming frequency increased noticeably.	Increased (↑)	Self-maintenance behavior became more intensive and regular.	
Aggressive behavior	Aggressive behaviors were frequently observed.	Aggressive behaviors decreased significantly.	↓ Decreased	Cats became calmer and less reactive to environmental stimuli.	
Social interaction	Interaction with the environment was relatively limited.	Social interaction increased noticeably.	Increased (↑)	Cats became more responsive and adaptive to their surroundings.	
Physical Activity	Physical activity levels were high and cats were highly active.	Physical activity levels decreased.	↓ Decreased	Cats became less active and spent more time resting.	

Feeding Behavior

Feeding is one of the most important daily activities of male domestic cats and reflects their nutritional requirements and physiological condition. The cats consumed food approximately three to four times per day, with a total feeding duration of around 20–30 minutes daily. The feline sense of taste plays a significant role in food selection and in meeting nutritional requirements (Julianti et al., 2020). Cats are classified as obligate carnivores, and their feeding behavior, body structure, and digestive system have evolved to efficiently process animal-based diets. Naturally, cats tend to consume small meals at frequent intervals throughout the day. The feeding process in cats consists of two stages: the appetitive stage and the consummatory stage. During the appetitive stage, cats display behaviors such as vocalizing to request food, stalking, hunting, capturing, and killing prey. In contrast, the consummatory stage involves chewing and swallowing food. Furthermore, when cats are fed by their owners, they may perceive the owner as a parental figure, reflecting the emotional bond that develops between cats and humans. This behavior is referred to as et-epimeletic

behavior. Appetite tends to decrease when cats enter the reproductive or mating phase. This reduction is associated with elevated levels of reproductive hormones, including estrogen in female cats and testosterone in male cats. During mating activities, cats frequently produce loud vocalizations. These sounds are related to the presence of penile spines in male cats, which stimulate ovulation in females by triggering the release of Luteinizing Hormone (LH) (Ngitung, 2021).

Maladaptive Behavior

Maladaptive patterns in cats may include excessive play, fighting, and aggressive actions. These responses originate from the species' natural predatory instincts. Cats possess an innate drive to hunt prey, and these instincts may occasionally manifest in domestic environments. If not properly managed, such instincts can lead to undesirable behavioral outcomes (Ngitung, 2021). Behavioral patterns observed in cats can be influenced by a variety of factors, including both biotic and abiotic components. From a biotic perspective, illness or physical abnormalities may result in noticeable behavioral changes. Cats experiencing health problems

may adopt a hunched posture, fail to hold their heads normally, tilt their heads, or move their tails in unusual ways. They may also exhibit reduced appetite and water intake for several days, fever, dehydration, lethargy, vomiting, and pale gingival mucosa. These signs often indicate compromised health and may significantly affect normal behavior. Abiotic factors can also influence feline behavior. Cats are capable of learning through observation and imitation, allowing them to mimic behaviors demonstrated or encouraged by humans. Through repeated interactions and environmental conditioning, cats can imitate certain human actions and respond to requested behaviors, demonstrating their capacity for behavioral adaptation and learning (Tama et al., 2023).

Grooming Behavior

Grooming represents an important component of the daily behavioral repertoire of male domestic cats and is performed regularly as part of routine self-maintenance activities. Grooming is a natural behavior in which cats lick their bodies with their tongues to remove dust, dirt, and loose hair. This activity may occur several times throughout the day, with varying durations depending on environmental conditions, stress levels, and the cat's physical activity. In addition to maintaining body cleanliness, grooming helps regulate body temperature and provides a calming effect, allowing cats to feel more comfortable and relaxed (Ellis et al., 2021). In certain circumstances, the frequency of grooming can serve as an indicator of an animal's health and welfare, as changes in this behavior are often associated with stress, discomfort, or specific physiological conditions. Grooming behavior also plays an important role in maintaining physiological balance and supporting the emotional well-being of cats (Baquero et al., 2020). Therefore, observations of grooming behavior can be used as one of the indicators for evaluating daily behavioral patterns and the welfare status of companion cats (Amat et al., 2020).

Cats are widely recognized for their strong emphasis on cleanliness, making self-grooming one of the most prominent activities in their daily behavioral repertoire. Their rough tongues enable them to clean their fur efficiently while maintaining its condition and appearance. Furthermore, grooming frequency is closely associated with the cat's emotional state, as cats experiencing comfort and well-being generally engage in grooming more actively. Conversely, alterations in grooming frequency may indicate stress, illness, or other health-related concerns. Animal behavior has been shown to be strongly influenced by environmental conditions and individual welfare, which may be reflected in variations in grooming activity (Mikkola et al., 2023). Grooming behavior may also change as a result of physiological conditions, particularly following sterilization. Based on the observations conducted in this

study, cats exhibited an increase in grooming frequency after the sterilization procedure, suggesting improved physical stability and a reduction in the influence of reproductive hormones. Sterilized cats tended to display calmer temperaments, making self-grooming behavior more frequently observable. These findings indicate that sterilization affects not only the reproductive system but also broader aspects of daily behavioral patterns. Physiological changes in animals have been reported to influence behavioral stability and everyday activities, supporting the observed relationship between sterilization and increased grooming behavior (Horakova, 2020). Overall, the increase in grooming frequency observed after sterilization suggests improved behavioral balance, enhanced welfare, and greater adaptation to post-sterilization physiological conditions (Amalia et al., 2024).

Sleeping Behavior

Resting and sleeping were among the most frequently observed activities in the daily behavioral repertoire of male domestic cats. Cats are known to spend more time sleeping than many other companion animals, with sleep occurring in multiple periods throughout both the day and night. Generally, cats sleep in several sessions of varying duration, depending on factors such as age, environmental conditions, activity level, and physiological status. In addition to providing rest, sleep plays a vital role in energy restoration, metabolic regulation, and the maintenance of physiological balance (Ramos et al., 2021). Cats typically prefer quiet, warm, and secure locations for sleeping, as these environments provide comfort and minimize potential disturbances. The selection of resting sites represents an adaptive behavioral strategy that enhances safety and comfort (Horakova, 2020). Furthermore, sleeping patterns are influenced by health status, stress levels, and social interactions with humans and other animals in the surrounding environment (Ellis et al., 2021).

Sleeping habits are also strongly influenced by a cat's activity level and emotional condition. More active cats tend to exhibit shorter but more frequent sleep periods, whereas less active individuals generally spend longer durations sleeping. Environmental factors such as temperature, noise levels, and human presence may also affect sleep quality. Consequently, alterations in sleeping patterns can indicate stress, discomfort, or underlying health problems. The daily activity patterns of companion animals are strongly influenced by environmental conditions and physiological factors (Robertson et al., 2018). Following sterilization, noticeable changes in sleeping behavior were observed. The results indicated an increase in resting duration after the procedure, reflected by both a higher frequency of sleep and longer periods of rest. These findings suggest a reduction in overall activity levels associated with hormonal changes occurring after sterilization. Sterilized

cats generally appeared calmer and less inclined to explore their surroundings compared with their pre-sterilization condition. This observation indicates that sterilization affects not only the reproductive system but also broader aspects of daily behavior, particularly resting activities. Physiological changes resulting from sterilization may influence overall activity patterns and sleep duration, contributing to greater behavioral stability. Similar findings have shown that physiological alterations in animals can significantly affect activity patterns and sleeping behavior (Alexander et al., 2024).

Social Interaction Behavior

Social interaction was identified as one of the key behavioral indicators reflecting how male domestic cats respond to their surrounding environment. Prior to sterilization, cats generally exhibited limited social interactions with both humans and other animals. They tended to maintain distance, interact selectively, and engage socially only under specific circumstances. This behavior was closely associated with territorial tendencies and dominance-related traits that remained strongly influenced by reproductive hormones. Low levels of social interaction were also evident from the cats' minimal responses to external stimuli, such as human calls or physical approaches. These observations suggest that, before sterilization, cats displayed relatively low social openness and were more focused on individual and self-directed behaviors (Coe et al., 2021).

Following sterilization, significant changes were observed in the social interaction behavior of the cats. The animals demonstrated greater responsiveness to the presence of both humans and other animals and appeared to adapt more readily to their surrounding environment. The cats became friendlier, exhibited fewer defensive reactions, and engaged more frequently in social behaviors such as approaching people, following individuals, and responding positively to physical contact. This increase in social engagement indicates a more balanced psychological condition resulting from the reduced influence of reproductive hormones. Furthermore, enhanced social interaction may reflect a greater sense of security and comfort within the housing environment. Physiological condition and environmental factors have been shown to play important roles in shaping social interaction patterns in domestic animals (Kennedy et al., 2020). The observed changes in social behavior further suggest that sterilization influences not only reproductive functions but also broader aspects of feline social behavior. Sterilized cats generally exhibited lower levels of aggression, making them more willing and able to interact with their surroundings. Moreover, increased social interaction can be interpreted as an indicator of improved animal welfare. Behavioral modifications following medical procedures may contribute to enhanced quality of life through greater behavioral stability and reduced stress-related responses. Therefore, social interaction represents an important

behavioral parameter for assessing changes in cats before and after sterilization (Crawford et al., 2023).

Discussion

The results revealed consistent changes across all behavioral variables analyzed. Prior to sterilization, the cats generally exhibited relatively high levels of activity, characterized by intense movement, frequent play behavior, and aggressive responses when interacting with their surroundings. Feeding patterns during this period were considered normal but were not entirely regular, while resting durations were shorter compared with those observed after the procedure. Grooming activities were relatively infrequent and irregular, and social interactions tended to be limited and selective. However, following sterilization, substantial behavioral changes were observed, including increases in feeding behavior, sleeping duration, grooming frequency, and social interaction, accompanied by decreases in aggression and overall physical activity (Bian et al., 2023). Feeding behavior showed a notable increase after sterilization, with cats displaying more regular feeding schedules and improved appetite compared with their pre-sterilization condition. Before the procedure, feeding patterns tended to be inconsistent in terms of both feeding frequency and the quantity of food consumed, suggesting instability in energy intake. Following sterilization, cats became more responsive to food offered by their owners and consumed their meals more consistently. This pattern suggests alterations in metabolic regulation associated with reduced levels of reproductive hormones, resulting in a physiological tendency to conserve and store energy more efficiently than before (Heitzmann, 2022).

The observed improvements in feeding behavior may also be related to the reduction of reproductive and territorial motivations that previously competed with feeding activities. Prior to sterilization, male cats often allocate substantial time and energy to seeking mates, defending territories, and exploring their surroundings. After sterilization, the decline in reproductive hormone levels reduces the expression of these behaviors, allowing more energy to be directed toward routine activities such as feeding and resting. Consequently, cats tend to establish more predictable daily routines and exhibit greater consistency in food consumption patterns. These findings support the view that sterilization contributes not only to reproductive control but also to significant modifications in daily behavioral regulation and physiological balance (Heitzmann, 2022; Amalia et al., 2024). Sleeping or resting behavior also exhibited marked changes following sterilization. Prior to the procedure, cats generally spent less time resting due to their relatively high levels of daily activity, including playing, active movement, environmental exploration, and territorial behaviors. After sterilization, the duration of sleep increased noticeably, and resting patterns became more regular compared with the pre-sterilization period. The cats spent more time lying down or sleeping

and gradually reduced the exploratory activities that had previously been common. These changes indicate a decline in physical activity levels associated with hormonal adjustments occurring within the body (Ramos et al., 2021). The increase in resting time may reflect a more balanced physiological condition and the body's adaptation to changes in energy metabolism following sterilization. Sterilized cats tend to sleep for longer periods due to a reduction in hormone-driven motivations for activity, particularly those related to reproductive behaviors and environmental exploration. These findings suggest that sterilization affects not only reproductive functions but also broader aspects of daily activity patterns and resting behavior in male cats (Ellis et al., 2021; Utami et al., 2024).

Self-maintenance behavior, or grooming, also showed a significant increase after sterilization. This change was reflected in the increased frequency with which cats licked their bodies, groomed their fur, and maintained personal hygiene. Before sterilization, grooming activity was generally observed at a relatively low frequency, indicating that attention to body maintenance was less pronounced (Amat et al., 2020). Following the procedure, a clear increase in grooming frequency was observed, suggesting improved physical and psychological stability. The cats appeared calmer, more comfortable, and benefited from more regular resting periods, allowing them to engage more frequently in self-grooming behavior. The increase in grooming activity may also indicate reduced stress levels and a decline in aggression and anxiety previously influenced by reproductive hormones. Grooming behavior is closely associated with emotional state, comfort, and animal welfare, as the activity itself provides a relaxing effect for cats (Baquero et al., 2020). The increase in grooming behavior observed after sterilization suggests that the procedure has a positive impact on behavioral balance and overall welfare in male cats. Moreover, these behavioral changes may serve as indicators of improved adaptation to environmental conditions and post-sterilization physiological adjustments (Amalia et al., 2024).

Social interaction behavior also demonstrated a considerable increase following sterilization. Prior to the procedure, cats generally exhibited low levels of social interaction with both humans and other animals and tended to be highly selective in their engagement with their surroundings. After sterilization, the cats appeared friendlier, more responsive, and better able to adapt to both individuals and environmental conditions around them. These behavioral changes suggest improved psychological stability, accompanied by a reduction in defensive tendencies and excessive vigilance (Heitzmann, 2022). The increase in social interaction indicates that the cats experienced a greater sense of comfort and security within their environment. Sterilized cats were more likely to approach humans, respond

positively to attention and physical contact, and engage in interactions with other animals without displaying excessive territorial or defensive behavior. Such changes may be attributed to the reduction in reproductive hormone levels, which decreases motivations related to territorial defense and social competition, thereby facilitating more positive social behaviors. Azura et al. (2023) supports these findings, indicating that hormonal factors and environmental conditions play important roles in determining the level of social interaction in cats, particularly following sterilization. As hormonal influences become less pronounced, cats may become more receptive to social stimuli and more capable of adapting to their social environment. This enhanced sociability can contribute to improved relationships with owners and other animals, promoting a more harmonious living environment. Sterilization may contribute significantly to improving the quality of social relationships and overall behavioral comfort in domestic cats. Beyond its reproductive and physiological effects, the procedure appears to promote positive social behaviors, greater emotional stability, and enhanced welfare, making social interaction an important indicator of behavioral adaptation following sterilization (Coe et al., 2021).

Aggressive behavior showed a substantial decline following sterilization. Prior to the procedure, many cats displayed aggressive behaviors such as hissing, attacking, chasing, and exhibiting defensive reactions toward other cats as well as their surrounding environment. These behaviors are commonly associated with reproductive hormones, particularly those involved in territorial defense and the establishment of social dominance over other cats. Following sterilization, a clear reduction in aggression was observed, characterized by calmer behavior, reduced susceptibility to provocation, and more stable responses to environmental stimuli (Amat et al., 2020). The decrease in aggressive behavior suggests that sterilization contributes to reducing the influence of testosterone on dominant and territorial behaviors. As testosterone levels decline after castration, the motivation to compete for territory and reproductive opportunities is diminished, resulting in less confrontational and more predictable behavioral responses (Ellis et al., 2021). Sterilized cats are generally less likely to engage in conflict with other animals and tend to exhibit a more relaxed disposition in their daily interactions. Reduced aggression may also facilitate improved relationships with humans and other animals, thereby contributing to a more harmonious living environment. Furthermore, lower levels of aggressive behavior are often associated with reduced stress and improved emotional stability, both of which are important indicators of animal welfare. Sterilization can be regarded as an effective method for managing aggressive behavior in male cats. Beyond its role in reproductive control, the procedure offers behavioral

benefits by decreasing territorial and dominance-related aggression, promoting calmer behavior, and enhancing the overall welfare and adaptability of domestic cats (Ellis et al., 2021).

CONCLUSIONS

Sterilization significantly affected the daily behavior of male domestic cats. After sterilization, cats showed increased feeding behavior, sleeping duration, grooming frequency, and social interaction, while aggression and physical activity decreased. These changes indicate improved behavioral stability, reduced influence of reproductive hormones, and better adaptation to their environment. Sterilization not only serves as an effective method of population control but also contributes to enhancing the welfare and quality of life of male domestic cats.

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