

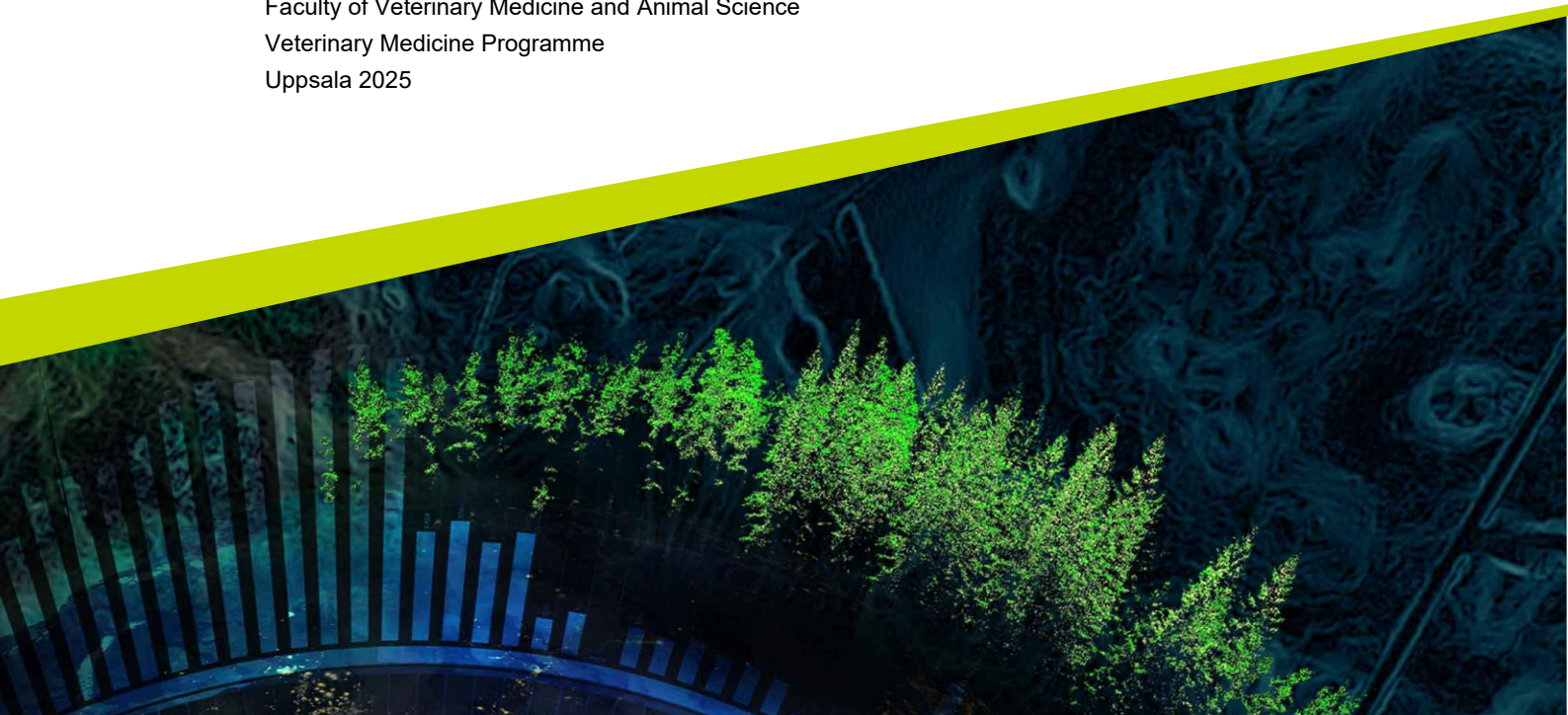


The health status of cats (*Felis catus*) in Mara Rianta, Kenya

and their bond to humans

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Swedish University of Agricultural Sciences, SLU
Faculty of Veterinary Medicine and Animal Science
Veterinary Medicine Programme
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Abstract

Domestic cats (*Felis catus*) have established a significant presence around the globe, adapting to various environments and forming complex relationships with humans. Today, people keep cats for numerous reasons, including their roles as vermin hunters, pets, and companions. Research indicates that domestic cats in Africa can carry a range of pathogens, both species-specific and zoonotic diseases, which may pose health risks to both humans and animals.

This study investigates the health and welfare of domestic cats in the Mara North Conservancy and their relationship with the local community. The research, conducted in Mara Rianta and surroundings, involved examining 48 cats and interviewing 100 households to evaluate cat health, care practices and the community's perceptions of these animals.

The findings indicate that domestic cats are integral to households, valued by 97% of respondents primarily for their pest control abilities. Most cats are allowed indoors, with 92% of households feeding them, often with milk, meat, or left-overs. However, the overall health of these cats is concerning as approximately 75% had a body condition score (BCS) below 4, suggesting malnutrition or low body fat. Dental problems, such as missing or fractured teeth, were widespread. Additionally, parasite infestations, including fleas, ticks, and lice, were common, affecting fur and skin conditions. None of the cats were neutered, and some queens were pregnant or lactating, which may contribute to health and population challenges.

The study highlights a gap in owner knowledge about cat health. Many respondents expressed uncertainty about how to care for sick cats, with the majority doing nothing and some resorting to home remedies. Issues such as malnutrition, parasitism, and inadequate healthcare may compromise cats' welfare.

Keywords: *Felis catus*, *Felis silvestris catus*, Maasai, domestic cat, Masai Mara, Kenya, feral cat, Mara North Conservancy

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1. Introduction

Domestic cats have established a substantial presence worldwide, adapting to various environments and forming complex relationships with humans. It is believed that the domestication of cats began in the Near East around 10,000 to 12,000 years ago, later spreading to Africa through human migration and trade routes (Driscoll *et al.* 2007). In Kenya, the genetic composition of domestic cats reflects a complex history of domestication and colonisation. Research indicates that the genetic makeup of cats in Kenya is closely related to Western European breeds, which were likely introduced during the colonial period which started in the 19th century (Lipinski *et al.* 2008; Nilson *et al.* 2022).

Today, people own cats for various reasons, including their roles as vermin hunters, pets and/or companions (Euromonitor International 2003 see Bernstein 2007). In the Thika District of Kenya, 44.9% of surveyed households reported owning cats as pets and/or for pest control (Ogendi *et al.* 2013). While cats offer numerous benefits to humans, research suggests they can also carry a variety of pathogens, raising concerns for both feline health and public health. A cross-country study across sub-Saharan Africa found a high diversity of ectoparasite infestations in domestic cats, with nearly 66% of the infested cats originating from Kenya and Tanzania (Madder *et al.* 2022). Furthermore, infections with *Cryptosporidium spp.*, *Toxoplasma gondii*, *Bartonella henselae*, *Mycoplasma haemofelis* and *Entamoeba spp.* have been detected in Kenyan domestic cats (Mutharia *et al.* 2017; Madder *et al.* 2022).

This study aims to investigate whether domestic cats inhabit the Mara Rianta area. If present, it examines their health status, interaction with local residents and potential implications for both feline and human well-being.

2. Literature review

2.1 Cat health

The evaluation of feline health involves assessing various physiological parameters using visual inspection, palpation, and utilizing specific tools. According to the "Cat Health Checklist: What Is Your Cat's Normal?" by the veterinary telemedicine company Vetster (2023), several parameters should be assessed to determine a cat's health status:

- Clear Eyes: Healthy cats should have bright, clear eyes, free from any discharge or redness.
- Clean Ears: The ears should be clean and free from wax buildup, parasites, and strong odours.
- Regular Bowel Habits: A healthy cat should have consistent bowel movements that are formed and of a moderate frequency.
- Mobility: A cat in good health should be able to move around easily and demonstrate normal gait without limping or signs of pain.
- Coat Condition: A cat's coat should be smooth and shiny, with no patches of baldness or signs of parasites such as fleas or ticks.
- Body Condition Score: The ribs should be easy to palpate but not protruding. This indicates a balanced weight—not underweight or overweight.
- Dental Health: Healthy cats possess clean and intact teeth and gums. Signs of dental disease could be bad breath, swollen gums, or excessive tartar build-up.

In addition to these signs, the average heart rate for a resting cat typically ranges from 140 to 200 beats per minute. Respiratory rates should be between 15 to 30 breaths per minute. The average body temperature of a healthy cat falls between 38.1 °C to 39.2 °C

2.1.1 Body condition score

Body condition scoring (BCS) is a method for evaluating the feline body fat accumulation. Studies have found correlation between BCS and various health

outcomes. Cats with a high BCS are at an increased risk for conditions such as diabetes, hypertension, and joint diseases (Bonecka *et al.* 2023; Vitor *et al.* 2024). In contrast, cats with a low BCS may indicate malnutrition or underlying health issues (Teng *et al.* 2018; Nielsen *et al.* 2023). The ideal BCS for cats is generally considered to range from 4 to 5 on a 9-point scale. Cats with BCS below 5 or above 8 tend to have shorter lifespans (Teng *et al.* 2018). Furthermore, the relationship between BCS and overall well-being is influenced by stress and environmental factors, which can affect a cat's appetite and, subsequently its body condition score (Tanaka *et al.* 2012).

2.1.2 Oral health

Cats have distinct dental characteristics typical of carnivores, including specific eruption times and occlusion patterns. According to Singh (2017), the dental formula for kitten deciduous teeth consists of three incisors, one canine, and three premolars in the upper jaw (3-1-3) and three incisors, one canine, and two premolars in the lower jaw (3-1-2). For adult cats, the dental formula changes to include three incisors, one canine, three premolars, and one molar in the upper jaw (3-1-3-1) and three incisors, one canine, two premolars, and one molar in the lower jaw (3-1-2-1). Generally, by six months of age, a cat's permanent teeth have emerged; however, this time frame may vary depending on factors such as cat health, genetics, and/or breed.

Common dental issues in cats include conditions such as periodontal disease, which involves inflammation and infection of the tissues surrounding the teeth, caudal stomatitis, an inflammatory condition with proliferation in the back of the mouth, and tooth resorption, where the body begins to break down the tooth structure (Gawor & Niemiec 2021). These conditions can cause significant pain, impacting the behaviour, eating habits and quality of life of cats (Palmeira *et al.* 2022). Treatment options may range from professional cleaning to tooth extraction, depending on the severity of the issue (Gawor & Niemiec 2021).

2.1.3 Feline diet

Domestic cats are classified as obligate carnivores, which means their dietary requirements are primarily met through the consumption of animal tissues. They require a higher intake of protein and have a limited capacity to synthesize specific nutrients such as taurine and vitamin A, and they need to ingest arachidonic acid through their diet (Verbrugghe & Bakovic 2013). Studies conducted by Platinga *et al.* (2011) and Hewson-Hughes *et al.* (2011) suggest that if domestic cats were given the choice, their diet would comprise approximately 52% protein, 36-46% fat, and 2-12% nitrogen-free extract. Feral cats can have a protein intake

of up to 52% from their diet (Plantinga *et al.* 2011). In contrast, omnivorous animals typically require about 4% protein in their diets to maintain optimal health (Bradshaw 2013). The diet of feral cats includes a diverse range of prey, such as mammals, reptiles, birds, and invertebrates (Lepczyk *et al.* 2023). Additionally, a cat's food preferences or inclination toward specific types of prey may be shaped by its mother during its early life stages, and these preferences can persist throughout its life (Wyrwicka 1978).

2.2 Domestic cats in Africa and Kenya

Domestic cats (*Felis silvestris catus*) originated from the African wildcat (*Felis silvestris lybica*) around 10,000 to 12,000 years ago in the Fertile Crescent (Driscoll *et al.* 2007; Faure & Kitchener 2009). This period coincided with the rise of agricultural societies. As these communities developed and began to store a surplus of grains, they inadvertently attracted rodents. The presence of these pests lured wild cats to human settlements (Nilson *et al.* 2022).

According to Faure & Kitchener (2009) the domestication process began as a mutually beneficial relationship between humans and cats, where cats hunted vermin and humans gave them food and shelter in return. The gradual domestication of cats likely occurred through natural selection, as there is no archaeological evidence of artificial selection until around 4000 years ago in ancient Egypt.

Domestic cats have been transported on ships to and from Europe for centuries, serving as pest control and companions for sailors (Faure & Kitchener 2009; Ottoni & Van Neer 2020). According to Nilsson *et al.* (2022), the presence of domestic cats on vessels contributed to their global distribution, allowing them to reach remote islands such as Madagascar and Hawaii. Today, the domestic cats in mainland Kenya exhibit genetic similarities to those in Western Europe, likely reflecting the impact of European colonization (Nilson *et al.* 2022).

2.3 Discovered pathogens in domestic cats in Africa

Domestic cats in Africa are associated with various pathogens, including species-specific and zoonotic infections. Among these pathogens, rabies poses a potential public health concern. Cats have been associated with the Mokola lyssavirus, an RNA virus related to rabies (Tsie *et al.* 2023), as well as rabies virus variants from canids and mongooses (Grobbelaar *et al.* 2020). This association increases the risk of spillover from sylvatic rabies cycles (Grobbelaar *et al.* 2020; Tsie *et al.* 2023).

In addition to being potential carriers of rabies, domestic cats can also be vectors for various ecto- and endoparasites. A multi-country study conducted in sub-

Saharan Africa found a high ectoparasite diversity in cats, where nearly 66% of the infested cats came from Kenya and Tanzania (Madder *et al.* 2022). In the Thika district of Kenya, Mutharia *et al.* (2017) documented a notable prevalence of gastrointestinal parasites in cats. These include *Cryptosporidium* spp., *Strongyloides stercoralis*, *Toxoplasma gondii*, *Toxocara cati*, *Ancylostoma* spp., *Dipylidium caninum*, and *Entamoeba* spp. Additionally, research by Ogendi *et al.* (2013) found that keeping domestic cats is a common practice in the Tika District of Kenya. This suggests that cats in this area can pose health risks to humans, cats, and other mammals.

2.4 Mara North Conservancy, Kenya

The Maasai Mara ecosystem is renowned for its rich wildlife and tourism potential. The Mara North Conservancy in Kenya is part of a network of wildlife conservancies in the Maasai Mara ecosystem, aiming to balance wildlife preservation with the livelihoods of local communities (Saoli 2020). These conservancies provide income to participating landowning households by providing compensation for land use. However, they also present challenges for livestock-based livelihoods due to restrictions on land use for grazing (Bedelian & Ogutu 2017).

Since the enactment of the 2013 Wildlife Conservation and Management Act in Kenya, conservancies like Mara North have expanded to cover millions of hectares. This expansion has facilitated private investment in conservation efforts while also addressing local community needs and wildlife protection (Cavanagh *et al.* 2020). Most residents living in the Mara North Conservancy identify as Maasai (Mara North Conservancy n.d.).

2.4.1 The Maasai

The Maasai are a semi-nomadic pastoral community primarily residing in Kenya and Tanzania, known for their distinctive clothing and a lifestyle centred around cattle herding (Salvadori & Fedders 1973). The social structure is patriarchal, with an emphasis on age-set systems, where individuals of similar ages should participate in communal activities and share responsibilities within the community (Berntsen 1979; Hodgson 1999).

Historically, the Maasai have relied on pastoralism as a crucial part of their livelihood. Throughout history, they have encountered challenges, such as land loss and forced relocations due to colonial policies (Berntsen 1979; Hughes 2003). Today, the Maasai face difficulties in preserving their migratory way of life while adapting to an ever-changing world (Phillips & Bhavnagri 2002; Nkedianye *et al.* 2020). These changes have contributed to a decline in the nomadic practices and a rise in farming and formal employment among some

communities (Bussmann *et al.* 2018). As some Maasai groups begin to shift towards a more settled lifestyle, alongside pastoral practices, the role of domestic animals may change (McCabe *et al.* 2010; Nkedianye *et al.* 2020).

2.4.2 The Maasai's relationship to animals

The Maasai have a complex relationship with both wildlife and domestic animals. Cattle are not merely livestock for the Maasai; they represent profound symbolic and economic significance. According to Quinlan *et al.* (2016), the value attributed to cattle can vary based on factors such as gender and marital status. Typically, men are seen as the primary cattle herders and owners, while women often handle household affairs and care for the livestock.

Historically, the Maasai have engaged in hunting large predators, such as lions, to assert their warrior status and demonstrating bravery. This practice also serves as a form of retaliation against these animals when they pose a threat to the Maasai's precious cattle. Though lions are perceived as threats, they are also revered within the Maasai community, embodying qualities such as strength, courage, and in more recent times, providing a source of income through tourism (Goldman *et al.* 2013; Ontiri *et al.* 2019). Thus, the Maasai's relationship with wildlife is complex; they can appreciate certain predators while simultaneously acknowledging the risks these animals pose to their livestock (Goldman *et al.* 2013).

According to Craft *et al.* (2017) domestic dogs, in addition to cattle, are valued for their role in protecting livestock. In Northern Tanzania, over 65% of households own a dog for security purposes. Furthermore, approximately 40% of households also keep domestic cats.



Figure 2: Manyatta in the Mara Rianta area. Photograph by Elin Kjellberg.



Figure 3: Manyatta and cat in the Mara Rianta area. Photograph by Elin Kjellberg.

3.2.1 The study population

The research primarily involved free-roaming cats from various households in the Mara Rianta area. Participation in the study required the consent of each cat's owner. The cats were brought to a central, empty dog clinic for examination and testing before being returned to their owners.

Feral cats were also part of the research. After consulting with the employees of the Karen Blixen Camp to gather information about the cat population, a trap was built (see figure 4), and places in areas where domestic feral cats had been observed. The cats were captured using regularly monitored traps, checked four to six times a day within the Karen Blixen Camp. Each captured cat was examined on-site before being released in the same location.



Figure 4: One of the feral cats caught in a trap.

3.2.2 Physical examination

An overall clinical examination was performed by veterinary students under the guidance of a senior veterinarian, following a predefined protocol (see Appendix 2). Cats that posed a safety risk were sedated with medetomidine under the veterinarian's supervision. Before administering a safe dosage (medetomidine 0.1mg/kg) of sedatives, the weight of each cat was recorded. Additionally, blood and hair samples were collected from each cat as part of the Mara Cat Project (Karen Blixen Camp Trust n.d.).

3.3 Literature search

Articles were sourced, and content was generated using Scite, Elicit, and Scispace. Additionally, Grammarly was used to improve the text. Relevant data for the literature review was gathered through searches in the “Primo” database.

4. Results

4.1 Health status of the cats

A total of 48 cats was examined for this study. Two were feral, while the remaining 46 were free-roaming domestic cats, consisting of 21 tomcats and 27 queens. Through oral and clinical assessments, including an evaluation of the dental formula, all cats except for one kitten, were estimated to be older than 6 months and younger than 5 years. Additionally, five cats were estimated to be under 3 years of age, and nine queens exhibited signs of pregnancy or lactation. None of the cats had been castrated. No abnormal variations in heart rate or respiration were observed during the examinations. The following table (see table 1) presents the complete results of the clinical examinations.

Table 1. Results from the clinical examinations. The findings marked with yellow represent abnormal values.

Cat	Sex	Weight (kg)	BCS (1-9)	Skin and fur	Lymphnodes	Eyes	Mouth and teeth	Circulation	Respiration	Outer genitalia	Other info
1	♀	1,8	2	Normal	Normal	Normal	Fracture 204 with visible pulp as a black dot. Missing teeth: 109, 106, 206, 209.109, 106, 206, 209	Normal	Normal	Normal	
2	♀	2,5	4	Normal	Left submandibular mildly enlarged.	Normal	Fracture 204, pulp not visible. Missing teeth 109, 106, 206, 209	Normal	Normal	Normal	Missing toe nr 3 on both frontlegs
3	♀	2,2	4	Normal	Normal	Discharge medial corner right eye.	Mildly gingivitis 104. Missing 109, 209	Normal	Normal	Normal	Dirty nose indicating nasal discharge
4	♀	2,2	3	Tick on right ear. Dull fur.	Normal	Normal	Fracture 104, pulp not visible.	Normal	Normal	Normal	
5	♂	2,2	4	Normal	Normal	Normal	Normal	Normal	Normal	Normal	
6	♀	2	3	3x3 mm round outgrowth on the neck, resembling a wart.	Normal	Mild hyperemia in conjunctiva of the right eye.	Fracture 104, Missing 109, 209	Normal	Normal	Normal	
7	♀	2,3	4	Normal	Normal	Normal	Missing 109 and 209	Normal	Normal	Normal	
8	♀	1,9	3	Fleas, dull fur, possible scar on right ear, and 6x9 cm alopecia inside left thigh.	Normal	Normal	Fracture on tooth 204, with 70% of the tooth missing and the pulp exposed.	Normal	Normal	Normal	
9	♀	1,27	2	Normal	Normal	Normal	Missing 109 and 209	Normal	Normal	Normal	Probably < 3 years old

10	♂	2,56	3	Normal	Normal	Normal	Fracture 404 with pulp showing, missing 109 and 209	Normal	Normal	Normal	
11	♀	2,2	2	Normal	Normal	Normal	Missing 106 and 206	Normal	Normal	Normal	
12	♀	2	2	Fleas, dull fur.	Normal	Normal	Fracture 104 & 204 with pulp showing. Missing 109, 209	Normal	Normal	Normal	Dirty around nose with signs of discharge
13	♂	2,56	4	Normal	Normal	Normal	Normal	Normal	Normal	Normal	
14	♂	2,81	3	Fleas.	Normal	Normal	Fracture on 104	Normal	Normal	Normal	
15	♀	2,2	2	Dirty around papilla mammae.	Normal	Normal	Gingivitis 104 & 204	Normal	Normal	Normal	Probably lactating
16	♂	n/a	3	Normal	Normal	Conjunctiva moderately pale bilaterally	104 & 204 deciduous teeth	Normal	Normal	Normal	
17	♂	3,6	4	Normal	Normal	Normal	Gingivitis 104	Normal	Normal	Normal	
18	♂	3	4	Fleas. Dull fur.	Normal	Normal	Missing 109 & 209	Normal	Normal	Normal	
19	♀	1,8	2	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Probably < 3 years old
20	♀	1,9	3	Normal	Normal	Normal	Fracture 207. Missing 109 & 209	Normal	Normal	Normal	Mild noseflow
21	♂	2,2	2	Scurf.	Normal	Normal	Missing 106, 108, 109, 206, 209 & 401.	Normal	Normal	Normal	
22	♀	2,3	3	Dull fur.	Normal	Normal	Normal	Normal	Normal	Normal	Possibly pregnant
23	♂	2,1	3	Normal	Sinister popliteal lnn mildly enlarged.	Normal	Missing 106, 109 and 209	Normal	Normal	Normal	
24	♀	2,2	2	Scurf.	Normal	Normal	Normal	Normal	Normal	Normal	
25	♀	2,02	3	Dull fur.	Normal	Normal	Missing 101,106,109, 201, 206 and 209	Normal	Normal	Normal	5 papilla mammae showing signs of lactating. Dirty ears, eyes, mouth and nose.
26	♀	2,1	3	Dull fur. Alopecia dexter ear with some scabs.	Normal	Normal	Missing 109 and 209	Normal	Normal	Normal	
27	♀	2,1	3	Flea faeces, but no fleas sighted.	Normal	Normal	Fracture on 204 with gingivitis, missing 109 and 209.	Normal	Normal	Normal	3 papilla mammae showing signs of lactating.
28	♂	3	5	Normal	Normal	Normal	Missing 309 and 409	Normal	Normal	Normal	
29	♂	1,66	1	Dull fur.	Normal	Normal	101, 201, 301 & 401 deciduous teeth still erupting. Missing 109 & 209	Normal	Normal	Normal	
30	♂	2,06	2	Alopecia chest, jaw and shorter hair on the root of the tail.	Normal	Normal	Missing 109 & 209	Normal	Normal	Normal	
31	♀	2,26	4	Severly black exudate is present bilaterally in both ears.	Normal	Normal	Fracture on 108 and 208 pulp not showing	Normal	Normal	Normal	
32	♂	2,1	2	Wound with scab outside sinister thigh, measuring 2 x 0,5 cm.	Normal	Normal	Missing 109 and 209	Normal	Normal	Normal	

33	♀	2,18	3	Dull fur and one tick.	Normal	Normal	Fracture + dead 104. Cremor dentis on 108. Missing 109 & 209	Normal	Normal	Normal	All papilla mammae lactating. Sinister ear moderately dirty
34	♂	2,9	4	Severely infested with fleas on the head. Wounds and scabs on right back paw.	Sinister popliteal lnn moderately enlarged.	Normal	Missing 106. Wounds from biting it self in palatinum next to 208 & 108	Normal	Normal	Normal	Wound medial RB tarsus 8 mm x 3 mm.
35	♂	1,96	1	Dull fur and fleas found.	Normal	Normal	Gingival hyperplasia 104. Missing 109	Normal	Normal	Dexter testicle smaller.	
36	♀	1,89	3	Dull fur.	Normal	Normal	Severe cremor dentis on 108 and 208. Missing 109 and 209	Normal	Normal	Normal	
37	♀	1,75	3	Dull fur.	Normal	Normal	n/a	Normal	Normal	Normal	Probably < 3 years old
38	♀	1,88	2	Normal	Normal	Normal	Fracture on 104 pulp not showing	Normal	Normal	Normal	Lactating.
39	♀	2,55	4	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Possibly stopped lactating recently. Probably < 3 years old
40	♀	2,08	2	Scabs on the ears, possibly caused by sun damage.	Normal	Normal	Missing 106 & 206	Normal	Normal	Normal	Possibly pregnant due to enlarged mamary glands. Probably < 3 years old
41	♂	2,44	3	Normal	Normal	Normal	Missing 209	Normal	Normal	Normal	
42	♀	2,64	3	Normal	Normal	Normal	Missing 109 & 209	Normal	Normal	Normal	Lactating
43	♂	2,76	5	Normal	Normal	Normal	301, 302, 401 & 402 smaller then usual	Normal	Normal	Normal	Difficult to decided age
44	♀	2,02	3	Shorter fur on the back.	Normal	Mildly clear discharge from the right eye	Fracture 104, pulp showing. Missing 109 & 209	Normal	Normal	Normal	Probably < 3 years old
45	♂	2,73	2	Normal	Normal	Normal	Fracture 204, 304 & 309. Missing 103 & 20	Normal	Normal	Normal	
46	♂	2,46	3	Normal	Normal	Normal	Fracture 204. Missing 109 and 209	Normal	Normal	Normal	
47	♂	3,7	3	Fleas. Wound on forehead, 3 x 1 cm.	Sinister popliteal enlarged.	Normal	Fracture 204, 404. Missing 106, 109, 206 and 302	Normal	Normal	Normal	Feral cat. Moderately secret dexter ear. Wounds on nose and cheek.
48	♂	n/a	2	One tick found.	Locally enlarged: sin axillar and dexter popliteal.	Normal	All deciduous teeth. Missing 106, 109, 206, and 209. 108, 208, 309, and 409 are on the way to erupt	Normal	Normal	Normal	Feral cat. 3 ticks on the forehead. Scratchwound on nose. Kitten.

4.1.1 Body condition score

An estimated 75% (36/48) of cats were found to have a body condition score lower than 4, indicating that most of these cats may be underweight or had a low proportion of body fat. No cats were overweight or obese.

4.1.2 Fur and skin

Around 52% (24/48) of the cats in the study showed signs of fur and skin complications. These issues ranged from dull fur to visible scars on their skin. Additionally, 21% (10/48) were infested with parasites, including fleas, lice, and ticks.

4.1.3 Eyes, nose and lymph nodes

In the observed group of cats, 12.5% (6/48) exhibited mild to moderately noticeable discharge from their eyes and/or noses, indicating potential respiratory or ocular issues. Additionally, 10% of the cats showed signs of mildly enlarged lymph nodes.

4.1.4 Oral status

Clinical examination revealed that 70.8% (34/48) of the cats were missing one or more teeth. Furthermore 33% (15/48) of the cats presented with one or more fractured teeth.

4.2 Survey

For a comprehensive overview of the interview results, refer to Appendix 3. Interviews were conducted with 100 households in the Mara Rianta area, predominantly involving women as participants. On average, each household had 1.08 cats. The following section will examine the questions that received a substantial majority of similar responses.

4.2.1 Question 6 – Allowed inside the house?

Of the respondents, 95% allowed their cats inside the house, mainly their own but also other cats.

4.2.2 Question 11 – Do you feed the cat?

Ninety-five percent of households feed their cats, although the types of food provided vary (see figure 5). The most commonly offered food was milk, followed closely by meat. Additionally, many households gave their cats leftovers or the same meals that the family consumed, which may include milk, meat, rice, vegetables, and ugali, depending on the day.

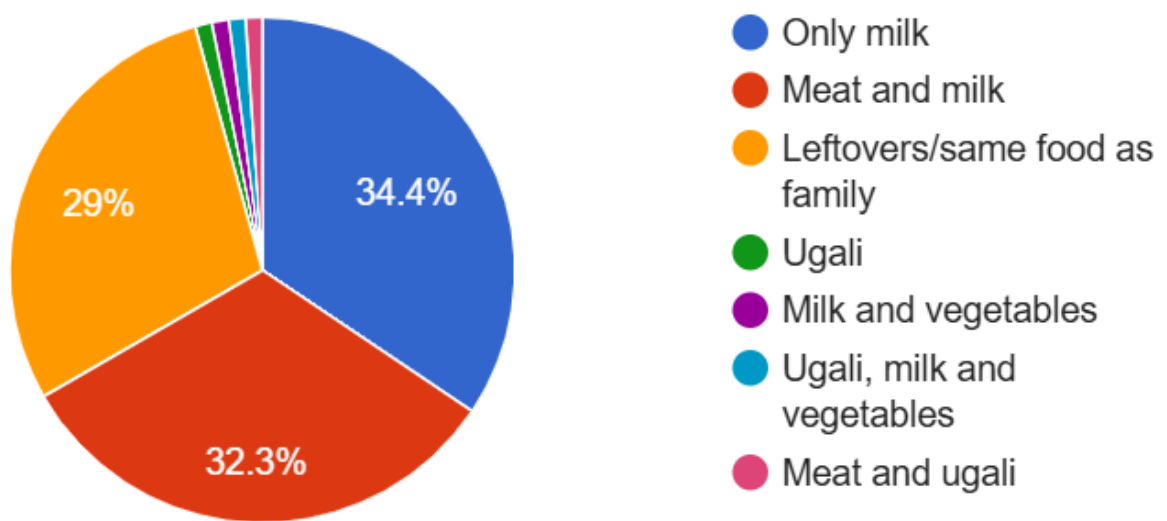


Figure 5. Types of food given to the cats in Mara Rianta.

4.2.3 Question 15 – What do you do with a sick cat?

The survey revealed that 59% of participants do not take any action when their cat is sick, primarily due to a lack of access to medication or uncertainty about how to care for an sick cat. Additionally, 6% of respondents indicated they would administer antibiotics meant for cows, which are available over the counter. Meanwhile, 4% mentioned they would resort to traditional remedies, such as herbs, salt, or a mixture of chili and water.

4.2.4 Question 16 – What do you do with a dead cat?

The survey revealed that 90% of respondents would throw away the cat, usually to the bush.

4.2.5 Question 17 – Do you like cats?

Most respondents (97%) stated that they like cats, usually because the cats help keep small animals, such as rodents and snakes, away from their homes.

5. Discussion

5.1 Health status

5.1.1 Body condition score

An estimated 75% of cats had a body condition (BCS) score lower than 4, indicating that most of these cats may be underweight or have an unhealthy low proportion of body fat. The low BCS could be due to many different factors, including malnutrition or underlying health issues, which were observed among feral cats in Denmark (Nielsen *et al.* 2023).

Furthermore, even though endoparasites was not included in this study, the presence of endoparasites may also contribute to a low BCS. For instance, the prevalence rate of 73.2% for intestinal parasites has been reported in the Thikka region of Kenya (Mutharia *et al.* 2017). The high incidence of intestinal parasites may be linked to a lack of veterinary care and inadequate deworming practices. Our interviews covered what owners do with a sick cat. Many respondents indicated that they do not have any medication for their cats and wait for them to either get better or pass away. This implies that the cats are likely not being dewormed. It is important to note that while increased deworming practices can be beneficial in reducing parasite loads in affected populations, further research is necessary to fully understand the long-term implications of such measures. Specifically, there is a concern that frequent treatment combined with underdosing, genetics of the parasite, and targeting and timing of mass deworming could lead to the development of resistance among parasites, potentially compromising the effectiveness of these treatments in the future (Fissiha & Kinde 2021)

Further research is also needed on the impact of diet on a low body condition score. Studies (Platinga *et al.* 2011; Hewson-Hughes *et al.* 2011) have shown if domestic cats were given the choice, their diet would comprise approximately 52% protein, 36-46% fat, and 2-12% nitrogen-free extract. The food provided to the cats in Mara Rianta, such as milk and ugali, may affect their body condition scores. If cats are fed an inappropriate diet, it may adversely affect their body condition score and overall lifespan. While studies show that feral cats can adjust their diets accordingly, our findings indicate that these cats possibly do not receive enough nutrients to maintain a healthy body condition score.

Additionally, neutering cats has been shown to increase lifespan and improve their body condition scores (Nielsen *et al.* 2023). Neutering may help increase the BCS of the cats in Mara Rianta and prolong their life.

5.1.2 Oral status

As discussed above, many factors, may impact a cat's BCS, including poor oral health.

Examination of the cats in this study revealed that 81% of the cats appeared to have been missing teeth. It remains unclear whether these missing teeth are due to genetics, tooth resorption, health issues, breed characteristics, or other factors, highlighting the need for further research.

Additionally, 33% of the cats exhibited one or more fractured teeth, which could be attributed to trauma, health issues or dental disease. More research is needed to understand this issue fully.

According to Gawor & Niemiec (2021), a common dental issue in cats is periodontal disease, observed in only 4 (8.3%) cats in this study. This may be because of the diet, but it is also worth considering that the gingiva may appear pale when a cat is sedated, potentially leading to misinterpretations of their dental health (Gawor & Niemiec 2021)

Dental health in cats is a relatively new research field, but it is worth noting that all the above-mentioned issues may cause cats pain (Palmeira *et al.* 2022) and negatively impact their welfare.

5.1.3 Eyes, nose and lymph nodes

This study identified that 12.5% of the cats displayed mild to moderate discharge from their eyes and/or nose, which may suggest potential respiratory or ocular issues. While this clinical sign is not directly associated with the pathogens discussed in prior studies (Mutharia *et al.* 2017; Madder *et al.* 2022), it could indicate the presence of infections, possibly of viral, parasitic or bacterial origin.

Furthermore, 10% of the cats in the study had mildly enlarged lymph nodes, which may reflect an immune response to infections, whether parasitic, viral or bacterial.

5.1.4 Fur and skin

50% of the cats experienced fur or skin complications, including dull fur, scars, and ectoparasites such as fleas, lice, and ticks. These issues may be linked to a lack of grooming or constant re-exposure to parasites. Insufficient grooming could result from malnutrition or some internal health issues. Additionally, it is likely that many cats in Mara Rianta do not receive treatment for parasites because their owners are unsure about how to care for a sick cat or do not have access to do so.

Additionally, many of these cats were infested with parasites, including fleas, lice, and ticks, which can lead to further discomfort and health problems.

5.2 Human relationship to domestic cats

The interviews were conducted by veterinary students who lacked prior training in interviewing techniques and the field of sociology. This lack of experience may introduce biases such as social desirability bias, acquiescence bias, and question order bias, among others. Therefore, the following discussion will examine the trends identified in the questionnaire results; however, further research is necessary, ideally conducted by individuals with backgrounds in sociology or related disciplines.

With 97% of respondents answering that they like cats and 92% feeding them, it can probably be concluded that cats play an important role in households. A majority of the respondents answered that they own cats because they keep small animals like rodents and snakes away. In contrast, the research performed in the Thika district of Kenya (Ogendi *et al.* 2013) indicated that most of the interviewees kept domestic cats as pets.

It is worth noting that although many of the respondents expressed their fondness for domestic cats, they were unsure of how to care for a sick cat. Some reported that they had never seen a sick cat; this might be attributed to the tendency of domestic cats to hide when they are unwell.

Information provided by the translator indicated that women in the community predominantly take on the responsibility for the cats. While informal inquiries were made to men regarding domestic cats, the response from male respondents was notably less comprehensive. Therefore, it is likely that the responsibility for taking care of the cat lies mostly with women. Previous research showed that women in the Masai community typically handle household duties (Quinlan *et al.* 2016) and cats can be considered a part of the household as they often sleep inside and are fed inside the dwelling. This explains the higher proportion of female respondents in the study, who were able to provide information regarding care and living conditions of domestic cats.

5.3 Conclusion

The objective of this study was to examine the population of domestic cats within the Mara North Conservancy and evaluate their health status. Additionally, the research aimed to explore the relationship between humans and domestic cats in the region. The findings indicated that domestic cats are indeed present in the Mara Rianta area of the Mara North Conservancy, but their overall health status was found to be inadequate. However, the local community values these cats for their role in controlling vermin around the homesteads. Further research is necessary to identify the factors contributing to the poor health condition of these cats.

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Popular science summary

Domestic cats have established a worldwide presence. These animals have formed intricate relationships with humans, evolving from their wild ancestors to become cherished members in many households. In contemporary society, the roles of domestic cats extend beyond their effectiveness as vermin hunters, they are often also valued for their companionship. Research suggests that domestic cats in Africa can carry a diverse array of diseases, which pose potential health risks to both human populations and other animals.

This study delves into the health and welfare of domestic cats residing in the Mara North Conservancy, Kenya, and examines their relationship with the local human community. The research was conducted in the area of Mara Rianta and its surroundings, where 48 cats were physically examined. One hundred households were interviewed to gather insights on cat health, care practices, and human perceptions toward these animals.

The findings from the study reveal that domestic cats hold a vital place within these households, with 97% of respondents asserting that they value cats primarily for their exceptional pest control abilities. A significant number of these cats are allowed indoors. Approximately 92% of the households reported feeding their cats, with common food sources including milk, meat, or leftovers from meals. This high percentage of households feeding cats reflect a close bond between the animals and their human caretakers.

Despite being integral to daily life, the overall health of these domestic cats raises serious concerns. The assessment found that roughly 75% of the cats had a body condition score (BCS) below 4 on a 9-pointscale, suggesting issues such as malnutrition or insufficient body fat reserves. Moreover, dental health appeared to be a widespread concern, with many cats exhibiting missing or fractured teeth. Additionally, there was a high prevalence of parasite infestations, including fleas, ticks, and lice, that greatly affected their fur and skin conditions.

The research underscores a significant gap in the knowledge possessed by cat owners regarding appropriate care and management of their pets' health. Many respondents expressed uncertainty when it came to handling sick cats, with some resorting to home remedies or, in some cases, choosing to do nothing at all when faced with health issues. This lack of awareness about proper healthcare, along with ongoing issues of malnutrition and parasitism, are likely to compromise the welfare of these cats.

Despite the various challenges highlighted in the findings, it is clear that domestic cats are valued members of the community. They are not only cherished for their companionship but also regarded as essential agents of pest control. This resonates with the evolving lifestyle of the Maasai, who are increasingly adopting more settled ways of life.

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Appendix 1

Questionnaire

1. Do you or someone in your household have a cat?

- Yes
- No
- Do not know

2. How many cats do you have?

_____ Number of cats

3. What gender is the cat or cats living in or close to your house?

- Male
- Female
- Both females and males
- Do not know

4. Do you know how many of them are female and how many are males?

_____ Number of females

_____ Number of males

5. Do you prefer one gender over the other?

- Yes
- No

5.1. If yes: Which gender, do you prefer?

- Female
- Male

5.2. Why do you prefer that gender?

6. Are the cats allowed inside your house?

- Yes
- No
- Do not know

7. Do you or someone in your household pet the cats?

- Yes
- No

8. Do children play and pet the cats?

- Yes
- No
- Do not know

9. Can you catch the cats and hold them?

- Yes
- No
- Some of them

10. When the cats are outside, where do they go? e.g. around the village, with the children or far away.

11. Do you feed the cats in your household?

- Yes
- No
- Do not know

11.1. If yes: What do you give them?

11.2. If yes: Who gives them food?

11.3. If no: Do you know what the cats are eating?

12. Have you seen a cat hunt or eat small animals?

- Yes
- No

12.1. If yes: What animals have you seen the cat eat or hunt?

13. Have you seen a cat being hunted or eaten by other animals?

- Yes
- No

13.1. If yes: Do you know which animal it was?

14. Have you seen a cat interact with other wild cats? For example leopard, servals, african wild cat, lions etc.

- Yes
- No
- Do not know

14.1. If yes: which wild felids have you seen interact with the cats?

15. If a cat that lives around your house gets sick, what happens to the cat?

16. If you find a dead cat, what do you do with it?

17. Do you like cats?

18. In some countries, black cats are considered unlucky, do you have something similar?

19. Do you do something with the cat's feces if they defecate near the house? For example, bury it in the ground or take it away from the house.

- Yes
- No
- Do not know

19.1. If yes: What do you do with it?

19.2. If yes: How do you do it? for example using hands, a shovel or a bag

20. Do you think that cats can transmit disease to humans?

- Yes
- No
- Do not know

20.1. If yes: Which disease do you think can be transmitted from a cat to a human?

21. Has there been a case where you think a person has caught a disease from a cat?

- Yes
- No

21.1. If yes: Can you tell me about that case?

22. Can we use your cat for research and neuter it?

- Yes, both
- Yes, only neuter
- Yes, only research
- No

Appendix 2

Examination protocol for cats in Mara Rianda

Sex:

Fur colour:

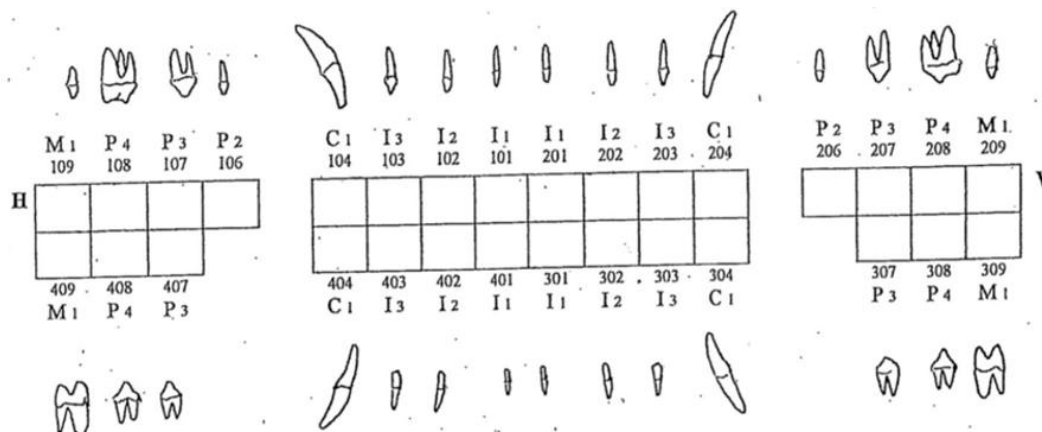
1. BCS	2. Skin/fur	3. Lymph nodes	4. Eyes
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9	☐ Rash ☐ Scurf ☐ Parasites ☐ Signs of itching* ☐ Not examined ☐ Other ☐ No remarks	☐ Generally enlarged ☐ Locally enlarged ☐ Not examined ☐ Other ☐ No remarks	☐ Conjunctivitis ☐ Entropion ☐ Ectropion ☐ Corneal ulcer** ☐ Not examined ☐ Other ☐ No remarks
5. Oral cavity & teeth's	6. Circulation	7. Respiration	8. Genitalia
☐ <u>Cremor dentis</u> ☐ Tooth fracture ☐ Gingivitis ☐ Bite error ☐ Not examined ☐ Other ☐ No remarks	☐ Murmurs ☐ Not examined ☐ Other ☐ No remarks	☐ Nasal discharge ☐ Dissonance over lungs ☐ Not examined ☐ Other ☐ No remarks	☐ Cryptorchid ☐ Uneven testicles ☐ Secretion ☐ Mammary tumour ☐ Not examined ☐ Other ☐ No remarks

* Signs of itching are determined by examination of the base of the ear, groin, paws or tail root that does not have apparent traumas.

** Visible ulcer without fluorescein

Body temperature:

Other remarks:



Appendix 3

Household nr.	Gender and number of the interviewed.	Question 1&2 Number of cats	Question 4. Owns a queen	Question 4. Owns a tomcat	Question 5.1 Likes female cats?	Question 5.2 Likes male cats?	Question 6. Allowed inside the house?	Question 7. Pets the cat?	Question 8. Does the children play with cats?	Question 9. Can hold the cat?	Question 10. Do you know were the cat go?	Question 11. Do you feed it?	Question 12. Does the cat hunt?	Question 13 & 14. Have you seen the cat interacted with wild animals?	Question 15. What do you do with a sick cat?	Question 16. What do you do with a dead cat?	Question 17. Do you like cats?	Question 18. Superstition about cats?	Question 19. Do something with faeces?	Question 20 & 21. Do you think cats can transmit diseases?	Question 22. Want to castrate?
1	1 ♀	2	1	Unknown (kitten)	-	-	Yes	Yes	Yes	Yes, one of the cats.	No	Yes, milk, leftover meat	Rats and snakes	No	Nothing. Maybe it gets better or it dies	Throws it away or waits for it to be eaten.	Yes, because they kill snakes and rats	Black cats are more wild	No, the cat buries their faeces	Yes, rabies	Yes
2	3 ♀	4	2	2	-	-	Yes	Yes, only children	-	Yes, children	No, maybe out and hunt	Left over meat, milk, rice	Rats and snakes	Yes, owl.	Nothing. Been vaccinated against rabies.	Throw it away	Yes	No	No, cat hides it	No	Yes
3	1 ♀	5	3	2	-	-	Yes	Yes	Yes	Yes	No	Milk and meat, maybe some left overs.	Rats	No	Nothing. Have no medicine.	Throw away	Yes	No	No, cat hides it	Yes, rabies	Yes
4	1 ♀	3	2	1	-	-	Yes	Yes	Yes	Yes	In the bushes	Mostly leftover milk, bread and other food	Lizards, snakes rats and birds	No	Maybe inject antibiotic for cows	Throw away	Yes, because keep away rats and snakes from house	No	Young cats defecate in house. Adult cats go outside. Sweeps away with broom	Have not seen any	Yes
5	1 ♀	2	Unknown	1	-	-	Yes	Yes	Yes	Yes	Near the village	Milk and meat	Snakes, rats and birds	No	Nothing. Don't know what to do.	Throw away	Yes, because keep away rats and snakes from house	No	No, cat hides it outside	No	Yes
6	1 ♀	1	1	-	-	-	Yes	No	Yes	Only children	Around the compound	Milk and leftovers.	Rats, snakes and birds	Think the cats get eaten by leopard at night	Sometimes they cough and don't give medicine, don't have medicine for cats. One time the mzungu came and gave injection to cat	Throw away outside and maybe hyena or leopard eats them at night.	Yes, because they catch rats	Don't like black cats, chase them away.	Yes, takes a spade and put it in toilet.	Yes, tuberculosis	Maybe
7	1 ♀	4	2	Unknown (kittens)	-	-	Yes	Yes	Yes	Yes	Everywhere	Milk and leftovers.	Lizards, rats, snakes and bats.	No	Nothing. Waits for the cat to be okay or die.	Throw away.	Yes, because they hunt snakes.	No	No, cat hides it outside.	No.	Yes
8	1 ♀	1	1	-	Yes, because they give birth	-	Yes	Yes	Yes	Yes	Goes to the bushes.	Milk	Rats, snakes, lizards, bats.	No	Nothing.	Throw away	Yes, kill rats and snakes.	No	Yes, put away from house.	No.	Yes
9	1 ♀	4	4	-	-	-	Yes	No	Yes	Yes, children.	No	Milk	Rats, lizards	No	Nothing.	Throw away	Yes, because they "clean" ie eats rats, snakes and lizards.	Accepts all cats	Yes, sweeps away with broom to outside the house.	Don't know.	Yes
10	1 ♀	1	-	1	Yes, Give birth and can give kitten to a neighbour.	No, runs off from home.	Yes	No	Not allowed	Children can, but not allowed.	To the bushes	Milk and meat	Snakes, birds and rats	No	Nothing. Have no medicine.	Throw away or bury it.	Yes, because keep snakes and rats away.	No	Yes, sweep away with broom.	Yes, maybe rabies	Yes
11	1 ♀	4	2	2	-	Yes, don't give birth.	Yes	Yes	Yes	Yes	To the bushes	Milk and leftovers	Rats, snakes lizards	No	Nothing	Throw away	Yes, keeps rats and snakes outside the house	No, owns a black cat.	Yes, sweep away with a broom	No.	Yes
12	1 ♀	0 (wants one)	-	-	Yes, because they reproduce.	-	Yes	No	-	-	-	Milk	Snakes, lizards, rats.	No	Nothing	Throw away	Yes, because they hunt	Likes all cats	Yes, brush away and wash.	Yes, can spread poison from poisonous snake	-
13	1 ♀	1	-	1	-	-	Yes	Yes	-	No, but kids can.	Kills something and bring it back.	Milk and leftovers.	Rats, lizards and snakes.	No	Wait, see if they get well or die	Throw away	Yes, because they hunt	Black cats not good because they run away to the bushes.	No, poops outside somewhere.	Don't know.	-
14	1 ♀	0 (does not want one)	-	-	-	-	No, chase away	-	-	-	-	-	Rats and snakes	No	Nothing.	Throw away	No, is afraid of them.	-	No, cat hides it	-	0
15	1 ♀	4	3	1	Yes, gives birth and likes to play	-	Yes, prefer them inside	Yes	Yes	Some of them.	Go around the village, keeps security.	Milk, meat, liver and stomach. So the cats stays.	Rats, snakes, frogs, small birds.	No, Wild felids don't come close to village.	Gives it a mix of chili and water or traditional medicine for cows.	Throw away	Yes, keeps dangerous animals away	don't like wild cats	Wrap in paper and carry it outside.	Yes, tetanus	Maybe
16	1 ♀	2	2	-	Yes, they reproduce.	No, goes away when they get older.	Yes	No	Yes	Children can.	Goes to the bushes.	Milk, left over meat	Frogs, snakes and rats	No, those animals don't come near the village.	Don't know what to do.	Throw away	Yes	If you see a black cat you will be unlucky. Accept the way they were born. The black cat can stay but most often go away when they grow up.	No, cat poops outside.	No, maybe children can get sick.	No
17	1 ♀	1	-	1	Yes, can have kittens.	Yes, can have kittens.	Yes	Yes	Yes	Yes	Near the house	Milk and meat	Rats, snakes and lizards	No	Gives it traditional medicine.	Throw away in the bushes.	Yes, because they kill rats.	No	No, cat hides it outside.	No	No

18	1 ♀	0 (wants one)	-	-	Yes, gives kittens	Yes, gives kittens	Yes, but the other peoples cats don't come inside.	Yes	-	-	-	Yes other peoples cats.	Small snakes and rats.	No	-	Sometimes call veterinarians, but otherwise throw away	Yes and pets them	No	No, cat hides it	No	No
19	1 ♀	0 (wants one, but they die)	-	-	Yes, because they give birth.	-	Yes, other peoples cats.	Yes	Yes	Yes	-	Leftovers	Rats and lizards	No	-	Throw away	Yes, because they clean the environment	No	Sweeps away with a broom	No	-
20	1 ♀	0 (wants one)	-	-	Yes, because they give birth.	-	Yes, other peoples cats.	Yes	-	-	-	Milk	Rats and snakes.	No	Nothing.	Throw away	Yes, because they kill rats	Yes, chase away black cats.	Sweeps away with a broom.	No	-
21	1 ♀	0 (does not want one)	-	-	Yes, Gives birth and can give kitten to a neighbour.	-	Yes	Yes	Yes	Yes	-	Milk	Rats	No	Nothing.	Bury it in the ground	Yes, but don't want to own a cat	Yes, chase away black cats.	Sweeps away with a broom	No	-
22	2 ♀	2	2	-	Yes, because they give birth.	-	Yes	Yes	Yes	Yes	No, think they go to the bushes.	Milk and leftovers such as potatoes, rice and meat.	Snakes, lizards, rats.	No	Does not have medicine. Waits	Throw away	Yes, cause they clear the house from animals	No	No, cat hides it outside.	Don't know.	Yes
23	1 ♀	1	1	-	Yes, because they give birth.	-	Yes	Yes	Yes	Yes	No	Milk	Rats and snakes.	No	Wait	Nothing	Yes, scare the rats away	No	No, cat poops outside.	No	Yes.
24	2 ♀	1	1	-	-	-	Yes	Yes	Yes	Yes	Sometimes see it go to the bushes	Milk, meat and they can steal food while eating	Rats and snakes	Yes, seen it fighting with feral/wild cats	Wait	Throw away	Yes, because they protect from animals	Believes black cats were used in evil things, are devils, have evil spirits. sometimes chase it away. can still keep a black cat. Depends on the person, but she doesn't like them because of beliefs	No, cat pops outside If it poops inside she sweeps away with a broom	Yes, but not so much.	Maybe
25	1 ♀	1	-	1	-	Yes, because she got one male	Yes	Yes	Not allowed	No	No	Milk only	Birds, snakes and rats	No	Never seen a sick cat.	Throw away	Yes, Because it takes snakes and rats	don't like black cats for no particular reason	Sweeps it away	Maybe, because the poop smells really bad.	Yes
26	1 ♀	1 (had kittens but other cat came in and killed them)	1	-	Yes, because they give birth.	-	Yes	Yes	Yes	Yes	Goes around the village and sometimes follows her as a dog.	Milk and leftovers.	Birds, lizards, snakes and rats	No	Never seen a sick cat. Don't know what to do.	Throw away, can not eat it.	Likes her own cat	The mother of her cat was black so she doesn't care about colors. But long time ago she thought that the purring was bad and didn't touch the cat	No, cat don't poop inside.	No	Yes
27	1 ♀	1	-	1	-	Yes, because they don't give birth.	Yes	Yes	Yes	Yes	No, but it stays inside at night.	Anything the cat can eat.	Never seen.	No	Nothing. If a vet comes by maybe they can help but don't know what medicine to give.	Throw away	Like, can't stay without the cat. Don't chase away other cats	Don't like the color but doesn't believe they are unlucky	Sweeps away with a broom.	No.	Yes
28	1 ♀ + 1 ♂	1	-	1	♂ says yes	♀ because she don't like the cubs.	Yes	Yes	Yes	Yes	Near the house, not far.	The same food they eat.	Snakes and rats	No	Don't know what to do. They don't have a veterinary clinic for cats.	Throw away	Likes their own cat	Don't like black cats. Not any specific reason, just the color is not good.	Sweeps away with a broom.	Don't know.	No
29	1 ♂	2	-	2	-	Yes, don't like to have too many. Male don't give birth.	Yes	Yes	Yes	Yes	No. They go and hunt.	Milk, meat and sometimes leftovers.	Snakes and rats	No	Have to find a treatment, one time they gave the cat antibiotics, the cat was weak and slept more than usual, with rough fur. The cat got better.	Throw away in the bushes.	Yes, but not if it kills chicken.	Yes, black cats are considered devils/spirits. He can try to kill the cats or chase them away.	Sweeps away with a broom, put in a dust bin.	Yes, maybe the same as the dogs.	No
30	1 ♀	4	1	Unknown, kittens	Yes, because they give birth.	-	Yes	Yes	Yes, the kittens.	Kids can hold.	No. They go and hunt.	Milk, ugali, greens.	Rats, snakes and lizards.	Yes cat killed by snake	Don't know what to do.	Throw away in the bushes.	Likes their own, don't like other peoples cats..	Don't like black cats because of the color but don't think they are bad luck.	Sweep away with a broom.	No	No
31	1 ♀	1	-	1	Yes, because they reproduce.	-	Yes	Yes	Not allowed	No	Around the compound.	Milk and meat.	Rats and snakes.	No	Can't do anything. Has no treatment.	Throw away outside in the forest.	Yes, keeps her company and keeps rats and snakes away.	Believes black cats are unlucky.	Sweeps away with a broom.	No	Yes
32	1 ♀ + 1 ♂	1	-	-	Yes, because they reproduce.	-	Yes	No	Yes	No	Don't know	Milk	Snakes and rats.	No	Gives it penicillin.	Throw away	Yes, protects the house from small animals.	Believes black cats have bad spirits and kills them if they come to the house.	Sweep away outside the house with a broom	Yes, but don't know which disease	No
33	1 ♀	1	2	-	-	-	Yes	Yes, but only grandmother	Yes, but very rare.	No	Around the compound.	Milk and meat.	Rats and snakes.	No	Don't know what to do.	Throw away	Yes, because the cat chase away small animals that can eat their food or clothes.	Yes, chase away black cats.	Sweeps away outside.	Yes, maybe diarrhea.	Yes

34	1 ♀	1	-	1	-	-	Yes	Children can pet the cat	Yes	Maybe the children.	Around the compound.	Milk	No.	No	Nothing.	Throw away	Yes, because the give company and chase away small animals.	Considered unlucky	Sweeps away with a broom.	No	No
35	1 ♀	3	1	2	-	-	Yes	Only children.	Yes	Only children can	Around the compound.	Milk and meat	Snakes and rats	No	Never been sick.	Throw away	Yes, give company and keep small animal from the house	Black cats are considered unlucky and chase them away	Sweeps away with a broom.	No	Yes.
36	1 ♀	1	1	-	Yes, because the reproduce.	-	Yes	Yes, the children.	Yes	Maybe the children.	Around the compound.	Milk	Rats.	Yes, seen it fighting with feral/wild cats	There is nothing to do.	Throw away	Yes, keeps he company and keeps rats and clean house from rats.	Yes, kills or chase away black cats.	Sweeps outside with a broom.	No	No
37	1 ♀	1	-	1	-	-	Yes	Yes	Yes	Only the children	Maybe it goes around the compound.	Milk and meat	Snakes.	Seen a cat close to a wild/feral cat.	Nothing. Just wait and see	Throw away	Yes, keeps he company and keeps rats and clean house from rats.	She hates black cats and kills them if she sees them. She kills black kittens if her cat has them. But don't believe that they are unlucky, just hate them	Yes, sweeps away with a broom.	No	Yes
38	1 ♀	0 (wants one)	-	-	Yes, because male leaves home when older.	-	Yes	-	-	-	-	Milk	Snakes	No	-	Throw away	Yes, because it is the most beneficial animal that keep animals away like snakes and rats.	Didn't see a black cat when growing up. Black cats started appear after that, but more wild and don't stay at home.	-	No	-
39	1 ♀	0 (wants one)	-	-	Yes, because they give birth.	-	Yes, other peoples cats come at night	-	-	-	-	Milk and meat	Rats and lizards	No	Yes, don't know which disease	Throw away	Yes, keeps snakes and rats away.	Don't belive in anything like that.	-	Yes, the cat scratch or bites you, you need to go to the hospital for an injection	-
40	2 ♀	2	unknown	1	-	-	Yes	Yes, the children.	Yes	Yes	No	Milk	Snakes, frogs, lizards and rats.	Yes, seen it fighting with feral/wild cats and hyenas chasing cats.	Doesn't get sick.	Throw away	Yes, prevent small animals from entering the house	Black cats are usually wild. don't know if they are unlucky.	No, cat hides it	No	No
41	1 ♀	1	1	-	Yes	Yes	Yes	Yes	Yes	Yes	No	Milk	No.	No	Never seen a sick cat	Never found a dead cat.	Yes, protect the house from animals	Don't know	Yes, sweeps away with a broom.	Don't know. But have heard that if the cat scratches you should visit a doctor	maybe
42	1 ♀	0 (shares 3 cats with neighbour)	-	-	Yes, because they stay at home.	-	Yes	No	Yes	Yes	No	Milk and meat.	Snakes, rats and frogs.	No	Don't know. Don't have medication.	Throw away	Yes, keeps animals away	Have a black cat haven't seen any bad luck	Yes, sweeps away with a broom, but usually the cat poops outside.	Don't know.	-
43	1 ♀	1	1	-	Yes, because they give birth.	-	Yes	Yes	Yes	Yes	Around the compound.	Milk	Snakes and lizards	No	Never seen a sick cat.	Throw away	Yes, keep rats and snakes away	Don't belive in anything like that	Sweeps away with a broom	No	No
44	1 ♀	1	1	-	Yes, because they give birth.	-	Yes	Yes	Yes	Yes	No	Milk and leftovers.	Rats and snakes.	Yes, seen with feral/wild cats	Nothing.	Throw away	Yes, keeps the household safe	Don't belive in anything like that	Sweeps away with a broom.	Yes, but don't know wich disease	No
45	1 ♀	0 (wants one)	-	-	-	Yes, because don't give birth.	Yes, other peoples cats.	-	-	-	-	Milk	Rats, snakes and lizards.	No	-	Nothing	Yes, keeps snakes and rats away.	Naturally scared of black cats for no reason. not because they are unlucky	-	No	-
46	1 ♀	3	1	2	-	Yes, because don't give birth.	Yes	Yes	Yes	Yes	No	Milk	Rats	No	Don't know	Don't know	Yes, because they eat rats	Don't belive in that	Yes, sweeps away with a broom.	Don't know.	maybe
47	1 ♀	1		1 kitten	Yes, because they give birth.	-	Yes	Only the kittens.	Yes	Yes	Around the compound.	Milk and meat	No.	No	Don't know what to do.	Throw away	Yes, keeps animals away	No	Yes, sweeps away whit a broom.	No	maybe
48	1 ♀	0 (wants one)	-	-	Yes, because they give birth.	-	No	-	-	-	-	No, don't come to her house.	No	No	-	Throw away	Yes, give her company.	Don't know	-	Don't know.	-

49	1 ♀	0 (wants one)	-	-	Yes, because they give birth.	-	Yes	-	-	-	-	No	Lizards	No	-	Can't do anything.	Yes, protect the house from rats and snakes	Don't think black cats are unlucky but doesn't like them so chase them away if close to the house.	-	-	-
50	1 ♀	0 (wants one)	-	-	-	Yes, because they walk around.	Yes, neighbours cat comes inside during the night.	-	-	-	-	No	Snakes	No	-	Throw away	Yes, protects the house from animals.	No	-	No	0
51	1 ♀	2	1	1	Yes, because they give birth.	-	Yes	Only the children.	Yes	Children can.	Around the compound.	Milk	Lizards and snakes.	No	Don't know what to do.	Throw away	Yes, keep company and protect the house	No	Yes, sweeps away with a broom.	No	No
52	1 ♀	2	-	2	Yes, because they give birth.	-	Yes	Yes	No	Yes	Just around the compound.	Milk	Rat	No	Gives penicillin	Throw away	Yes, protects the house	No	Yes, sweeps away with a broom.	Yes, she thinks that when the cats purr they can transmit disease.	No
53	1 ♀	0 (wants one)	-	-	-	Yes, just likes male more.	Yes	-	-	-	-	Milk and meat	Snakes and rat	No	-	Throw away	Yes, protects the house from bad animals.	Yes think black cats are unlucky, chase them away if close to the house	No, cat hides it	Don't know.	-
54	1 ♀ + 1 ♂	1	1	-	-	-	Yes	No	No	No	No	Milk, ugali, meat.	No, but brings home dead rats.	No	Never been sick.	Sometimes bury it.	Yes, keep animals away from the house	No	Yes, sweeps away with a broom.	Don't know.	Yes
55	1 ♀	1	unknown	unknown	Yes, because they give birth.	-	Yes	No	No	No	No	Milk, meat vegetables.	Rat	No	Nothing.	Throw away to the forest.	Yes, protects the house from rats and snakes	Don't like black cats, not unlucky just dislikes them. If close to the house either chase away or kill.	Yes, sweeps away with a broom.	Yes, but don't know which disease	No
56	1 ♀	1	-	1	-	-	Yes	No	No	No	Around the compound.	Milk and meat.	Rats	No	Nothing.	Throw away	Yes, clean the house	Don't know	Yes sweeps away with a broom.	No	No
57	1 ♀	1	-	1	-	Yes, because don't give birth.	Yes	Only children.	Yes	Only children.	No	Milk and meat.	Rats and snakes.	No	Nothing.	Throw away	Yes, protects the house	No	Yes sweeps away with a broom.	Yes, but don't know which disease.	Yes
58	1 ♀	3	1	2	-	Yes, because they are bigger and take better care of the house.	Yes	Yes	Yes	No	In to the bushes.	Milk, rice and meat.	Snakes, lizards, rats and birds.	No	Give antibiotics for cows.	Throw away	Yes, cat because it secures the house, the cat takes care of the house	No. Have a black cat	Yes sweeps away with a broom., but only kittens poop inside the house.	Don't know.	No
59	1 ♀	2	1	1 kitten	Yes, stays inside more and don't run away.	-	Yes	Yes	Yes	Only children.	No	Milk, ugali and meat.	Snakes, rats and lizards.	Yes, feral cats that come inside the house and eats the kittens.	Nothing.	Throw away	Yes, kills small animals in the house	Don't like the black cats because of the color, but I don't believe in superstitions.	Yes sweeps away with a broom.	Yes, rabies.	Yes
60	2 ♀	2	-	2	Yes, because they give birth.	-	Yes	Yes	Yes	No	No	Milk and leftovers.	Birds, snakes and rats.	No	Nothing.	Throw away	Yes, kill wild animals that can come inside	Do not like the color, but does not think they bring bad luck. If a black cat comes they chase them away.	Yes sweeps away with a broom.	Don't know.	Yes
61	1 ♀	0 (shares 1 cat with neighbour)	-	-	-	Yes, because they don't give birth.	Yes	-	-	-	-	Rice and ugali.	Rats and lizards.	No	-	Throw away	Yes, because they kill rats, snakes and lizards.	not believe that they are unlucky but do not like the color.	Yes sweeps away with a broom.	Don't know.	-
62	1 ♀	0	-	-	Yes, stays in the house, males run away.	-	Yes	-	-	-	-	Milk, meat and leftovers.	Snakes and rats.	No	Nothing.	Throw away	Yes, because they kill rats and snakes	do not think they are unlucky but they do not like the color	-	Yes, poison from poisonous snake	-
63	1 ♀	1	-	1	-	Yes, because they don't give birth.	Yes, but not during the night.	Yes	Yes	Only the kids.	Around the house.	Milk and meat.	Rats	Yes, cheetah.	It is rare that it becomes sick, but if sick talks to the veterinary technician.	Tells the veterinary technician then throw away	Yes, protects the house from small animals.	No	Yes sweeps away with a broom.	No	Yes
64	1 ♀	1	1	-	Yes, because they stay at home.	-	Yes	Yes	Yes	Only the kids.	Not really, but think it stays around the compound.	Milk, rice, vegetable, ugali and meat.	Lizards and snakes.	No	Nothing.	Throw away to the bushes.	Yes, keeps away snakes and rats	No, has a black cat.	Yes sweeps away with a broom and use washing powder.	Don't know.	Yes
65	1 ♀	2	1	1	-	Yes, because they don't give birth.	Yes	No	Yes	Only the children.	No, but thinks it close to the house.	Milk and leftovers	No	No	Nothing.	Throw away	Yes, clean the house	No, but don't like black cats.	Yes sweeps away with a broom.	No	No

66	1 ♀	1	1	-	Yes, because they give birth.	-	Yes	No	Yes	Don't think so.	To the forest.	Milk	No	No	Nothing.	Throw away	Yes, protects the house from small animals.	Yes, they are considered unlucky. Chases away if they come near.	Yes sweeps away with a broom.	Don't know.	No
67	1 ♀	0 (wants one)	-	-	Yes, because they stay at the house.	-	Yes	-	-	-	-	Milk	No	No	-	Throw away	Yes, protects from snakes and give company.	Yes, they are considered unlucky. Chases away if they come near.	-	No	-
68	1 ♀	0 (wants one)	-	-	Yes, because they give birth.	-	Yes	-	-	-	-	Milk	Rats and snakes.	No	-	Throw away to the forest.	Yes, protects the house from rats.	Black cats are unlucky, because don't stay home. she fears them and chase it away	-	Don't know.	-
69	1 ♀	1	-	1	-	Yes, don't like the kittens.	Yes	No	No	No	No	Milk and meat.	Rats.	No	Nothing.	Throw away	Yes, protects the house from rats and snakes	No	Yes, sweeps away with a broom.	No	Yes
70	1 ♀ + 1 ♂	0	-	-	Yes, because they give birth.	-	Yes	-	-	-	-	Milk	Rats and snakes.	No	-	Throw away	Yes, protects the house.	Don't know	-	Don't know.	-
71	1 ♀	0	-	-	Yes, because they give birth.	-	-	-	-	-	-	Meat and milk.	Snakes and rats.	No	Nothing.	Throw away	Yes, because they chase away rats	Believe black cats are unlucky. chase away them or kill them	-	No	-
72	1 ♂	1	-	1	-	Yes, don't want many kittens.	Yes	No	Yes	Yes	Stays around the house.	Milk meat and leftovers.	Mice.	No	Can not help. Just waits.	Throw away	Yes, chase away small animals like mice.	Have heard about it but don't believe it	No, cat poops outside	No	No
73	1 ♀	1	-	1	-	Yes, because they go away.	Yes	No	Yes	Yes, the children.	Around the house.	Milk, meat and ugali.	Snakes and rats.	No	Nothing.	Throw away	Yes, protects the house from snake rats	Don't know	Yes, sweeps away with a shovel.	No	Yes
74	1 ♀	1	1	-	Yes, because they give birth.	-	Yes	No	Yes	No	No	Milk and meat.	Snakes.	No	Chase away.	Throw away	Yes, protects	yes	Yes, sweeps away with a broom.	No	Yes
75	1 ♀	0 (wants one)	-	-	Yes, but don't have any reason.	-	Yes	-	-	-	-	Milk.	No	No	-	Throw away	Yes, catch animals like rats.	Likes the black cat	-	No	-
76	1 ♀	0 (does not want one)	-	-	-	-	Yes	-	-	-	-	Milk and meat.	No.	No	-	Throw away	Yes, eats rats and snakes.	No	-	No	-
77	1 ♀	0 (does not want one)	-	-	-	-	Yes	-	-	-	-	Milk.	No	No	-	Throw away	Yes, because kill rats.	No	-	No	-
78	1 ♀	1	-	1	-	Yes, don't give birth.	Yes	Only children.	Yes	Only children.	No	Milk, sometimes meat.	Snakes and rats.	No	Nothing.	Throw away	Yes, The house is safe when cats are inside. protect from small animals	-	Yes, sweeps away with a broom.	Don't know.	Yes
79	1 ♀	0 (does not want one)	-	-	-	-	No	-	-	-	-	No	Rats and lizards.	No	-	Throw away	No, don't like them.	Don't know.	-	Yes, if it scratches someone.	-
80	1 ♀	0	-	-	Yes, because they give birth.	-	Yes	-	-	-	-	Milk.	Snakes and rats.	No	-	Throw away	Yes, keeps away wild animals.	not good, people use it as witchcraft to make the more wealthy. Chase away black cats	-	Yes, when someone get scratch.	-
81	1 ♀	1	1	-	Yes, because they give birth.	-	Yes	Yes	Yes	Yes	Around the compound, sometimes to the bush.	Milk and meat.	Rats and lizards.	No	Nothing.	Throw away	Yes, Keeps snakes and rats away	don't like them, scared of them, not because they are unlucky. Screams and chases away when she sees black cats	Yes, sweeps away with a broom.	Yes, if vaccinated can't transmit	-
82	1 ♀	0 (wants one)	-	-	-	Yes, don't give birth.	Yes	-	-	-	-	Milk.	Rats, snakes and lizards.	Yes, was attacked by wild/freal cat.	-	Throw away	Yes, chase away rats and snakes.	doesn't like black cats, don't know why	-	Yes, but don't know wich disease.	-
83	1 ♀	1	1	-	Yes, because they give birth.	-	Yes	Only children.	Yes	Only children.	No	Milk and meat.	Snakes and rats.	No	Don't know.	Throw away	Yes, keeps rats and snakes away	Don't know	Yes, sweeps away.	No	Yes
84	1 ♀	1	-	1	-	Yes, does not go inside so much. Don't multiply.	Yes	Yes	Yes	Yes	Just roams around the house.	Meat, milk, ugali and rice.	Birds, snakes and rats.	No	Never seen a sick cat.	Throw away	Yes, Keep away, rats, snakes and lizards	No	Yes, sweeps away with a broom.	No	No
85	1 ♀	2	1	1	-	-	Yes	Yes	No	No	No	Leftovers.	Rats and snakes.	No	Nothing.	Throw away	Yes, keep away rats, snakes and lizard so the rats don't destroy clothes	No, has a black cat.	Yes, pick up with a spade and throws it outside.	No	No
86	3 ♀	1	-	1	-	Yes, don't give birth.	Yes	Yes	Sometimes	Yes	No	Milk and meat.	Snakes, rats and lizards.	No	Give salty water.	Throw away	Yes, Keeps her company and chase way rats and snakes	Don't know	Removes it and cleans the house.	No	Yes

87	1 ♀	0 (does not want one)	-	-	-	-	No	-	-	-	-	-	Frogs and snakes.	No	-	Nothing.	No, for no specific reason.	don't care about the colour	-	Yes, but don't know which disease.	-
88	1 ♀	1	1	-	Yes, for no reason.	-	Yes	Yes	No	Yes	No	Milk and ugali.	Snakes and rats.	No	Nothing.	Throw away	Yes, just likes them	No	Yes, sweeps away with a broom.	No	Yes
89	1 ♀	1	-	1	-	Yes, don't give birth.	Yes	No	No	No	No	Milk.	Rats	No	Nothing.	Throw away	Yes	Yes. If a black cat comes near the house I would kill it.	Yes, sweeps away with a broom.	No	No
90	1 ♀	0	-	-	Yes, because they give birth.	-	Yes	-	-	-	-	Milk, meat and ugali.	Snakes and lizards.	No	-	Leave it.	Yes, protects the house from rodents.	No, I do not believe they are unlucky. But I do not like the colour and would chase away a black cat if it came near the house.	-	No	-
91	1 ♀	1	unknown	unknown	Yes, because they give birth.	-	Yes	No	No	No	To the forest.	Milk.	Rats	No	Don't know.	Throw away	Yes, protects the house	Do not know	Yes, sweeps away with a broom.	No	Yes
92	1 ♀	1	unknown	unknown	-	-	Yes	No	Yes	Yes	No	Milk, meat and rice	No	No	Nothing.	Throw away	Yes, eat rats and snake	No	Yes, sweeps away with a broom.	Yes, but don't know which disease.	No
93	1 ♀	1	-	1	-	Yes, don't give birth.	Yes	Yes	Yes	Yes	Around the compound	Milk.	Snakes and rats.	No	Give it penicillin.	Throw away	Yes, protects the house and gives company	Yes, I don't like the black cats, but do not believe in unluck. Chases them away if they come near the house.	Yes, sweeps away with a broom.	Don't know.	Yes
94	1 ♀	0	-	-	Yes, because they give birth.	-	Yes	-	-	-	-	Milk and meat.	Rats	No	-	Leaves it.	Yes	No	-	No	-
95	1 ♀	1	-	1	-	Yes, don't reproduce.	Yes	Yes	Yes	Yes	Goes around the compound.	Milk, cabbage, kale, rice and potatoes.	Snakes, frogs, rats, and grasshoppers	No	Gives it herbs mixed with water.	Throw away	Yes, They are good pets and they protect the house from snakes and dangerous animals	No	Yes, sweeps away with a broom and then cover it with soil.	Yes, because they eat poisonous snakes.	Maybe
96	1 ♀	0	-	-	Yes, because they give birth.	-	Yes	-	-	-	-	-	No	Yes, was eaten by a leopard.	-	Throw away	Yes, no reason why, just do.	No	-	No	-
97	1 ♀	1	1	-	-	-	Yes	Yes	Yes	Yes	Around the compound	Milk, meat and ugali.	Rats and insects.	No	Never been sick.	Leave it.	Yes, keeps rodents away like rats, so they don't destroy clothes or food.	Don't like black cats, think they are evil. If near the house she chase them away	Has never pooped inside.	Maybe, diseases from ticks might transmit to humans.	No
98	1 ♀	0	-	-	Yes, because they give birth. So when the older cat dies you still have cats left.	-	Yes	-	-	-	-	No	Rats and lizards	No	-	Throw away	Yes, takes away rats and snakes. Rats can't destroy clothes.	No	-	Yes, but don't know which disease.	-
99	1 ♀	1	-	1	Yes, because they give birth.	-	Yes	Yes	Yes	Yes	Around the house.	Milk, rice meat.	Snakes and chameleons	No	Don't know.	Throw away	Yes, security around the house, snakes can't enter	No	Yes, sweeps away and then cleans with soap	No	Yes
100	1 ♀	1	-	1	-	Yes, don't give birth.	Yes	No	Yes	Yes	No	Milk.	Snakes, rats and frogs.	No	Nothing.	Throw away	Yes, snakes don't get in the house if cats are near.	Don't know.	Yes, sweeps away with a broom.	No	Yes
Total	112 individuals	108 cats	50	48	51	28	95	44	55	35	-	92	86	7	-	90 (throw away)	97 (yes)	-	47 (yes)	26	34
Summary	106 ♀ + 6 ♂	108 cat/household	46.00%	44%	45%	25%	95%	44%	55%	35%	-	92%	86%	7%	-	90%	97% likes cats	-	47%	26%	34% positive to castrate

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