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Tracing the wild meat pathway: Knowledge, practices, and human-animal contact in Indigenous communities of the Brazilian Amazon

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Abstract

Background: Subsistence hunting contributes to food security and sustains relationships among people, animals, and territory in the Brazilian Amazon. This study examined how Tikuna hunters interpret seasonal conditions and perceived changes in access to game, and how these observations shape decisions along the wild meat pathway, from hunting to consumption and disposal.

Methods: This ethnographically informed qualitative study was conducted in two predominantly Tikuna communities in the Upper Solimões. In-depth interviews with 19 hunters were integrated with field notes from participant observation on 15 hunting trips. A census of 55 households contextualized food access and living conditions. Thematic analysis used a socioecological framework to examine how individual knowledge, household relationships, community practices, and broader environmental and material conditions shaped decisions along the pathway.

Results: Hunters used river levels, fruiting patterns, animal movements, and tracks to decide when and where to hunt. Rising waters could concentrate game on higher ground, while low water restricted access to distant hunting grounds. Hunters reported longer journeys to encounter preferred large-bodied game, with implications for who could continue hunting and where carcasses were processed. When preferred species were difficult to find and other foods were scarce, some hunters broadened the range of species or carcass parts they used. Decisions to retain, share, or discard meat also

reflected judgments about animal condition, household needs, and access to transport and refrigeration. Processing and disposal brought people and domestic animals into contact with animal tissues and fluids, although pathogen exposure and transmission were not assessed.

Conclusions: Tikuna hunting knowledge links observations of seasonal and territorial conditions to decisions about food acquisition, processing, and sharing. Potential exposure interfaces emerged within interconnected livelihood practices shaped by influences extending beyond individual knowledge. One Health strategy should combine community-defined priorities and Indigenous expertise, enabling locally appropriate care practices while safeguarding food security and cultural continuity.

Keywords: Tikuna, Indigenous ecological knowledge, Subsistence hunting, Wild meat, Seasonality, Food security, Biocultural monitoring, One Health.

Introduction

Subsistence hunting has formed part of Amazonian food systems for millennia. Archaeological evidence shows that Early Holocene societies obtained food from hunted animals, forest plants, and aquatic resources [1,2]. Among contemporary Indigenous peoples, hunting supports food acquisition, collective life, territorial autonomy, and the transmission of knowledge across generations [3]. Its significance extends beyond animal protein: obtaining and sharing wild meat sustains social relationships and is embedded in spiritual and cosmological understandings of responsibilities toward animals and territory [4,5].

Hunting knowledge develops through sustained engagement with the territory. Hunters interpret tracks, feeding sites, seasonal movements, and changes in animal availability [6-8]. During carcass processing, observations of body condition, skin, organs, and visible parasites inform decisions about what to transport, share, store, prepare, consume, or discard [9,10]. These judgments are grounded in locally developed knowledge and in social and moral relationships with animals [4,5]. They also help explain why decisions about whether to keep an animal or parts of its carcass may differ between hunters and across stages of processing.

Wild meat contributes to food security in tropical regions [11,12], and hunting and carcass handling can create opportunities for pathogen exposure among people and domestic animals [13,14]. Ebola outbreaks in Africa illustrate the potential for spillover at the human-wildlife interface [15], which received greater attention during the COVID-19 pandemic [16]. Endemic foodborne infections also warrant attention, as risks associated with wild meat are less well characterized than those associated with domestic meat [17]. A systematic review found that studies assessing transmission risk at different stages of the wild meat supply chain were concentrated in Africa, Asia, and North America, whereas most surveillance studies related to consumption were conducted in Europe [18]. Evidence from Indigenous communities in the Amazon remains limited.

One Health recognizes the interdependence of human, animal, and environmental health. Applying this approach in Indigenous territories requires meaningful inclusion

of Indigenous knowledge and decision-making [19]. Amazonian hunting research has largely focused on wildlife use, sustainability, and regulation [6,20-22]. Less is known about how food security, human-animal interactions, and decisions about wild meat processing and consumption intersect within specific Indigenous territories. Understanding these relationships can support knowledge exchange and help shape public health strategies that address potential zoonotic risks while safeguarding livelihoods and respecting the nutritional, economic, and cultural significance of wild meat [23].

This qualitative study examined how practices, knowledge, and perceptions of disease risk shape wild meat acquisition, processing, distribution, and consumption in two predominantly Tikuna communities in the Brazilian Amazon. It identified human-animal interactions and points of potential pathogen exposure along this pathway to inform public health strategies grounded in community priorities.

Methods

Study setting

The study was conducted in São Sebastião and Nova Aparecida, two predominantly Tikuna villages in Tabatinga, in the western Brazilian Amazon near the borders with Colombia and Peru (Figure 1). São Sebastião lies approximately 6 km from urban Tabatinga and is accessible by an unpaved road. Nova Aparecida lies approximately 13 km from the city and is accessible only by river. Neither community had local healthcare services, waste collection, or landline or mobile phone coverage. Both had schools offering the first six years of basic education, electricity supplied through the public grid, and satellite internet access. Although federal law generally restricts hunting in Brazil [24], Indigenous subsistence hunting has a distinct legal context involving territorial rights and food security [25]. Researchers observed practices along the wild meat pathway without intervening in participants' decisions.

Study design

A household census preceded the qualitative fieldwork and characterized the communities' sociodemographic conditions, food access, and interactions with animals.

An ethnographically informed approach [26] combined in-depth interviews and participant observation to examine how hunting and wild meat practices were learned, carried out, and understood in everyday life. A socioecological framework [27] guided interpretation of how individual knowledge, interpersonal relationships, community norms, and broader structural and environmental conditions shaped practices and opportunities for animal contact along the wild meat pathway. These levels informed interpretation across the six analytical domains rather than serving as coding categories.

Community engagement and researcher positionality

Before data collection, three meetings with community leaders and local Indigenous health teams addressed study objectives, procedures, and field activities. A separate meeting introduced the study to community members and provided an opportunity for questions.

Indigenous team members APCS, NFS, and MCA contributed to study planning, fieldwork, reflexive discussions, analysis, and interpretation. Their backgrounds included qualitative and participatory research, biology and natural resource management, and Indigenous health nursing. Their familiarity with the regional context supported communication and interpretation, while differences in experience, position, and power between researchers and participants were acknowledged. The research team sought to understand practices within their local contexts and avoided judging them against external standards. Four researchers (FLGM, APCS, VAM, and WM) discussed the accounts, field interactions, and how interviewer positionality might have shaped the data. Hunters' terminology for animals, environmental conditions, and visible signs of animal health was retained where possible and interpreted collectively.

Sampling and data collection

The census was conducted from November 2024 to January 2025. All occupied households were approached, and none declined. One knowledgeable adult household provider or caregiver completed a structured questionnaire in person and reported information about other residents. The questionnaire, adapted from the Brazilian National Household Sample Survey [28], covered household composition, sociodemographic characteristics, housing, water sources and treatment, sanitation, waste disposal, food production and acquisition, domestic animals, hunting and fishing, and contact with wildlife and synanthropic animals. One item addressed household food shortage.

Adults aged 18 years or older who lived in either community and engaged in hunting were eligible for the qualitative component. Community leaders identified the first participants, and subsequent participants were recruited through snowball sampling. Recruitment ended when referrals yielded no additional eligible hunters in either community.

NFS conducted semistructured interviews in Portuguese in participants' communities between August and December 2025. After an introduction and explanation of the study, interviews lasted approximately 40 minutes and were audio-recorded with permission. Field notes documented the interview context, local terminology, hunting artifacts, and environmental and household features. The interview guide covered species hunted, seasonal variation, hunting methods, and carcass processing, preparation, consumption, sharing, and exchange. It also addressed preferences and restrictions concerning particular species and animal parts (Table 1).

From December 2025 to September 2026, HSSG and MCA accompanied hunters on 15 trips. Field notes and photographs documented practices from trip planning to meat storage and, in some cases, preparation and consumption. Observations covered species identified by local names, hunting techniques, killing, bleeding, skinning or plucking, evisceration, washing, storage, preparation, consumption, and disposal of unused parts [29]. Particular attention was paid to contact with animal tissues and secretions. Nonfood uses of animal parts, including medicinal applications, handicrafts, and ornaments, were also recorded.

Data analysis

Census data were recorded on paper forms and entered into Research Electronic Data Capture (REDCap) [30]. Categorical variables were summarized using counts and percentages.

Interview recordings were transcribed verbatim and de-identified before analysis. Methodological triangulation integrated interview accounts and field notes from participant observation, with convergences, complementary insights, and discrepancies informing interpretation. Thematic analysis used a predominantly deductive approach guided by six domains drawn from previous ethnographic studies [29,31-34]: (1) territory and conditions of food access; (2) knowledge, values, and selection criteria; (3) social organization of hunting and wild meat circulation; (4) practices and material conditions along the wild meat pathway; (5) perceptions of illness and local care practices; and (6) negotiation of choices and possibilities for change. These domains guided initial coding, while additional subcategories could emerge from interviews and observations. Drawing on McLeroy et al.'s socioecological perspective [27], individual, interpersonal, community, and structural (institutions and policies) influences were examined across the six domains. Qualitative analysis was completed in October 2026.

Results

Communities' characterization

The study area comprised 270 residents, including 165 (61.1%) in São Sebastião and 105 (38.9%) in Nova Aparecida. Most identified as Tikuna (94.8%). Males represented 53.7% of the population. Residents aged ≤20 years accounted for 48.9%, and those aged ≥60 years for 5.6%. Nova Aparecida had a younger population, with 58% aged ≤20 years, compared with 43% in São Sebastião (Table 2).

The census included 55 households, with a mean of 4.91 residents per household. Most dwellings were owner-occupied (98.2%), raised wooden houses (90.9%), and roofed with metal sheets (89.1%) (Fig 2, A and B). Rudimentary pits predominated for sewage disposal (80%), while burning alone accounted for 81.8% of waste disposal (Fig 2, C and D). Shallow or dug wells (78.2%) and river water or rainwater (61.8%) were the main reported water sources, and 89.1% received sodium hypochlorite for drinking-water treatment (Fig. 2, E-H). Monthly income was ≤1 minimum wage in 67.3% of households. Bitter cassava for flour preparation (Fig. 3, A-F) and fruit cultivation predominated, and 69.1% included someone who hunted or fished. Households also reported purchasing food in urban markets to complement their own production and extractive activities. Food shortages were reported by 23.6%, all in São Sebastião. Motorized land transport predominated in São Sebastião, whereas all households in Nova Aparecida used motorized river transport. Urgent or emergency care was reported by 18.2% of households during the preceding year (Table 3).

Animals were kept by 45 households (81.8%), of which 34 (75.6%) reported that companion animals entered the dwelling (Table 4). Dogs and cats were the most common companion animals (Figure 4), while chickens and ducks predominated among animals kept for production (Figure 5). Residents also reported bats, rats, opossums, and biting insects near their homes (Table 3).

Thematic synthesis of findings

Nineteen Indigenous hunters participated in the qualitative component. All were men, self-identified as Tikuna, and ranged in age from 32 to 64 years. Fourteen resided in São Sebastião and five in Nova Aparecida.

Across the six thematic domains, participants' accounts situated hunting within household food acquisition, collective organization, sharing practices, intergenerational learning, and ongoing relationships with animals and territory.

Territory and conditions of food access

Participants described hunting as part of a food system that also included fishing, small-scale agriculture, and food purchases. Hunting helped feed families when income and other food sources were limited: "*This is a basis for survival for me. If I don't go hunting, I won't feed my children; if I don't go fishing, my children won't eat*" (E06). The relationship also worked in the other direction: farming could provide the money needed to hunt. As one participant explained, "*Sometimes I make cassava flour, then I sell the flour to buy my cartridges*" (E05).

Participants reported encountering agoutis and pacas near the communities, whereas deer, peccaries, and tapirs often required longer journeys. One hunter contrasted past and present access to game: "*Back then, we did not walk very far. We killed animals nearby, and it was easier to bring them back. Now you have to walk almost the whole day to find game*" (E07). He attributed this change to both the displacement of animals as settlements expanded and a perceived decline in their numbers due to hunting: "*The animals are farther away because they are disappearing; people have already killed so many*" (E07). Longer journeys also affected who could continue hunting. An older participant described an increasing reliance on agriculture: "*The game animals are getting farther away [...] I'm getting old too, and now I'm working more in agriculture, making cassava flour and things like that*" (E12).

Seasonal changes in river levels and fruit availability shaped where hunters looked for animals and how they reached hunting grounds. Participants planned trips around fruiting trees and feeding sites and tracked movements between flooded areas and higher ground. One explained: "*When the river rises, it's easier to find them; they move to higher, unflooded ground*" (E12). Rain could facilitate tracking by making footprints more visible. In dry conditions, hunters described difficulties both in following tracks and in reaching more distant hunting grounds by water: "*You can't track them, and you can't go far along the streams or the river because it's dry*" (E10).

Knowledge, values, and selection criteria

Participants learned through practice with relatives and other hunters, acquiring knowledge of forest routes, animal behavior, feeding sites, and carcass processing. One hunter, who learned from an uncle, emphasized the time needed to develop expertise: *"Hunting is an art; you don't learn it overnight. It takes years and years of experience"* (E16). Another described learning from peers: *"At first, hunting was very difficult for me. After the other hunters taught me, it became easier"* (E05).

Hunters used environmental cues to decide when and where to look for particular species. One participant described how rainfall guided the timing of trips: *"When it*

rains one day, we go the next day, because then we can see the footprints" (E10). Another explained how fruiting trees helped locate pacas: *"When the fruit is ripe, they come to eat, and we do what we call waiting"* (E02).

Taste, fat content, odor, familiarity, and advice from elders shaped what participants chose to eat or avoid. One participant described how elders passed on food restrictions: *"The advice comes mostly from the elders. They never ate it either, so they pass that culture on to us"* (E06). Another associated eating tayra meat with harm to newborn relatives: *"Sometimes, when your daughter or your niece has just been born, it takes revenge on her"* (E05). Practices varied: one participant reported eating tayra (E02), while another did so when other food was unavailable (E06).

Religious teachings and encounters with animals also shaped decisions about what to hunt and how to handle it. One participant linked the avoidance of blood to biblical teachings and respect for animal life: *"Just like us, blood is the animal's life, so we have to respect that blood and bury it, not eat it"* (E01). Another recalled how an encounter with a wounded monkey led him to stop hunting monkeys: *"The animal defended itself just like a person. I felt so sorry for it that I never killed another monkey after that year"* (E10).

The social organization of hunting and wild meat circulation

Participants hunted alone or with relatives and other community members. Even when one hunter killed an animal, transporting a large carcass could require help: *"With a tapir, we need several people. I can't carry it alone"* (E17). Sharing meat acknowledged that contribution: *"We give a little to each person, a piece to each. It is like paying the person who helped us, by sharing that food with them too"* (E07).

Several accounts described women taking over carcass processing and meal preparation when hunters returned: *"When you arrive home, it is already with the women, no longer with the men. You hand it over to them, and they take care of everything"* (E10). Roles varied across households: one hunter said, *"I process all the animals myself"* (E11), while another participant recalled her grandmother hunting deer and peccaries (E14). Children also joined relatives on hunting trips or helped process carcasses: *"When he arrived home, we helped my grandmother process it"* (E14). Some participants recalled starting to hunt between ages 11 and 14 (E04, E07, E12, E16).

Gifts and shared meals extended access to wild meat beyond those who hunted or helped transport the carcass. As one participant put it, *"Game is not only for hunters. The neighbors have to taste it too"* (E11). Another described giving meat away: *"Here in the community, for my part, I don't sell it; I give it away"* (E08).

Other participants sold part of their catch to buy household staples such as sugar, salt, and rice. One explained: *"We keep one and sell the rest to buy provisions for the house"* (E13). Barter appeared in a retrospective account of itinerant trade: *"Trading those goods for produce, fish, meat, chickens, flour - whatever you could obtain"* (E07). This account described past exchanges but did not establish whether barter was still practiced in the study communities.

Practices and material conditions along the wild meat pathway

Participants generally preferred large-bodied animals, particularly white-lipped peccaries, deer, and tapirs, because they provided more meat. Pacas were valued for their taste and, like agoutis, were often encountered closer to households. Participants also reported hunting and eating several primate species and birds such as curassows, guans, and tinamous. When preferred game became harder to obtain, hunters described consuming a wider range of species and carcass parts. Figures 6–9 illustrate game animals and processing practices documented through participant observation during 15 hunting trips.

Hunting methods varied with species, animal behavior, and terrain. Participants commonly reported using shotguns. Some used firearm traps known locally as *bufetes*, particularly for armadillos and pacas. One hunter described checking a trap after several days: *"First I look for the trail, then I set my trap. I wait two or three days, and when I check, an armadillo has been caught"* (E19). Hunters also waited for pacas near fruiting trees or searched stream banks at night with flashlights. Peccaries were tracked individually or in groups, sometimes with several hunters surrounding a herd.

Participants described using additional shots or bleeding wounded animals with a knife. Caimans were shot, caught on baited hooks, or found entangled in fishing nets. Hunting could also occur near homes: *"It was catching my chicken. I grabbed it by the tail and killed it. The next day it was on the fire"* (E06), one participant recalled of an opossum. Pregnant females were among the animals documented during fieldwork (Figure 7). Hunters considered them easier to capture because they were heavier and moved more slowly. Maternal carcasses were retained for consumption. Fetuses were generally discarded, although participants also described instances in which they were eaten or buried.

Carcass size, distance, and transport effort determined where initial processing took place. Small animals, including agoutis, pacas, and armadillos, could be carried home whole in backpacks or fiber sacks. As one armadillo hunter explained, *"I bring it whole. Here is where I process it"* (E19). Larger animals were often eviscerated, skinned, or divided in the forest: *"We never bring it whole, because it is too heavy"* (E13). Some hunters removed heavy hides to lighten the load, whereas others left the skin on to protect the meat from dirt or contact with palm leaves. Participants carried meat in fiber sacks, woven baskets, or palm-leaf carriers secured with bark strips or vines. Large carcasses could require multiple trips or help from other people. In one account, a hunter returned with a motorized canoe to retrieve a tapir (E17).

Carcass processing varied by species (Figure 8). Agoutis and pacas were scalded or singed before the hair was scraped off, whereas deer were skinned. Armadillos were exposed to fire or hot water before their outer covering was scraped and the carcass opened. Participants also used fire or hot water to process monkeys and opossums. Birds were plucked dry or after immersion in hot water. Knives or machetes were used to open carcasses, and organs were removed by hand. The heart and liver were the organs most consistently retained for consumption. Other parts, including kidneys, heads, tongues, and tails, were used selectively. Stomachs and intestines were often discarded or given to animals, although some participants reported cleaning and cooking peccary intestines: *"The intestines we eat. We remove all the feces, then put them on to cook"* (E06). Visible abnormalities could lead to removal of the affected part

or rejection of the entire carcass. Participants avoided consuming blood; one also linked its disposal to religious teachings and respect for animal life (E01).

Water availability shaped where carcasses were opened and washed and how hands and tools were cleaned. In the forest, hunters described working near streams and using broad leaves as surfaces: *"We put it on the leaves, remove the skin and process it there. It has to be near a stream because the meat has to be washed"* (E17). Washing and draining also helped when meat was carried against the body: *"We wash the meat and let the blood drain so that it does not drip down our backs while we carry it"* (E13). At home, participants used tables, boards, basins, and available household water. Some mentioned soap for cleaning hands and tools at home; forest accounts described washing in streams or using vegetation to remove residues.

Preservation depended on trip duration and access to electricity and cold storage. Participants described salting, drying, refrigeration, and *moqueamento*, which involved cooking and drying meat over a fire. Refrigeration could be combined with salting: one participant refrigerated what would fit and salted the rest (E08). On longer trips, salted meat could be drained and packed in leaf-lined baskets. Thick portions required prolonged heating during *moqueamento*: *"It has to spend almost a whole day roasting, until it is very dry and no longer dripping blood"* (E07). Some hunters processed carcasses immediately, while others kept them whole overnight. Two participants described temporarily submerging meat in streams before retrieval, explaining that this was intended to prevent spoilage or keep jaguars from reaching it. Anticipated storage also influenced capture decisions: one hunter reported killing caimans on the return journey because he preferred to consume the meat fresh (E10).

Households boiled, stewed, fried, or roasted meat and used it in soups or *mojica*, described by one participant as a preparation resembling banana porridge with meat. Preparation varied by species, cut, household preference, and available ingredients. Hearts and livers could be roasted and eaten during carcass preparation, while heads and other portions were used in soups. Some participants described washing the meat, rubbing it with lime, and scalding it before seasoning: *"First, she rubs at least one lime over it. She boils it, discards the water, and then adds the seasoning"* (E05). Lime and hot water were also used to reduce the characteristic odor of armadillo meat. When households could not afford seasonings, they sometimes cooked the meat with only water and salt (E12).

Unused viscera and other remains were buried, burned, left in the forest, discarded in streams, or fed to domestic animals. Participants described vultures and cats eating discarded viscera, ducks being fed remains, and fish consuming material thrown into streams. One hunter avoided discarding remains in streams because the water reached other communities (E11). Selected parts were retained for uses other than food: feathers were used to make fans and ornaments, hides to make drums or belts, and teeth to make necklaces. Participants also reported medicinal uses for selected parts, including paca bile for seizures and capybara claws for hernias.

Perceptions of illness and local care practices

Hunters assessed whether animals were suitable for consumption by observing their behavior and appearance and examining internal organs during processing. Fatness, an

intact coat, and the absence of visible abnormalities were taken as signs of good condition, whereas thinness, wounds, and unusual behavior raised concerns. One hunter explained: *"When an animal is sick, it isn't wary; it becomes tame. Then you kill it and see that it isn't fit to eat; it is thin"* (E07). Opening the carcass allowed hunters to reassess its condition. As another participant noted, *"The liver has no bubbles, it isn't yellow, there are no wounds. Then we think the animal is in good condition"* (E08).

Hunters linked perceived animal health to season, habitat, and behavior. Some reported seeing larvae or skin lesions in agoutis and monkeys during particular periods. Referring to larvae in agoutis, one participant explained: *"In winter, they have a lot of those things. That is why we avoid killing them during winter"* (E13). Another considered pacas less prone to illness because they sheltered in burrows and fed at night (E12). Participants reported finding ticks on tapirs, deer, and peccaries and described direct contact during transport: *"When we carry them, they come off and attach themselves to our backs"* (E12).

Visible abnormalities did not always lead to the same decision. One hunter described rejecting peccaries with whitish changes in the lungs and small lumps in the liver: *"That animal is no longer suitable for consumption and has to be abandoned"* (E10). Others discarded only the affected part. Referring to a paca with visible changes in its liver, one participant explained: *"We only discard the liver, but the animal is consumed"* (E17). The same participant reported eating meat from animals with intestinal worms, whereas other residents reportedly avoided it. Another hunter removed localized areas containing larvae if the rest of the animal appeared healthy (E07). Figure 9 illustrates selective disposal of an organ with visible abnormalities.

Participants described washing their hands, bathing or changing clothes before processing, cleaning utensils, and washing or scalding meat. These practices served overlapping purposes: removing residues and odors, limiting spoilage, and avoiding illness. One hunter explained why he used forest leaves to clean his hands and knife: *"Then you won't get an illness, a stomachache or a fever, because sometimes you don't know what the animal eats in the forest"* (E09). Another explicitly linked cleanliness to medical advice: *"The doctor always says, 'You have to be clean'"* (E11).

Concerns about illness also shaped decisions about blood, storage, cooking, and disposal. One participant linked avoidance of blood consumption to religious teachings and concerns about disease (E01). Another judged contact with blood according to the animal's apparent condition: *"If the animal is healthy, there is no problem; if it is sick, then you have to be afraid of catching something"* (E07). Participants also described covering stored meat to keep flies away and cooking it before consumption: *"We don't eat it raw"* (E19). Care could extend beyond the household. One hunter avoided discarding remains in streams because the water reached others: *"Not in the stream, because it can reach another community"* (E11).

Negotiation of choices and possibilities for change

Limited food alternatives shaped both which animals participants ate and how fully they used a carcass. One participant recalled eating tayra, an animal he rarely consumed, when he and his sister had no other food: *"We had nothing [...] It was the only option we had"* (E06). He also linked the difficulty of finding peccaries to a more lasting

change in what he retained: *"We used to throw that part away, but nowadays we are using everything. Especially now that peccaries are difficult to find"* (E06).

Changes in physical capacity and access to resources also shaped hunting and meat handling. One older hunter turned to agriculture as distant hunting grounds became harder to reach: *"I'm more tired now, and I can no longer manage those three hours of walking"* (E12). Fiber sacks and refrigeration expanded transport and storage options, while woven carriers, salting, and *moqueamento* remained useful on forest expeditions or when cold storage was limited. Hunters also adjusted the timing and quantity of captures to what they could process and preserve. One participant reported killing caimans on the return journey to shorten the time before preparation and explained: *"You should kill only what you need to eat or what you need for your livelihood"* (E10).

Personal encounters and information from outside the community also prompted some hunters to reconsider their choices. One stopped hunting monkeys after encountering a wounded animal: *"The animal defended itself just like a person [...] I never killed another monkey after that year"* (E10). Another linked his reduced consumption of monkey meat to news coverage and his understanding of hunting restrictions (E02). Others continued to hunt and eat monkeys, illustrating how responses differed across participants.

Discussion

The Tikuna are the most populous Indigenous people recorded in Brazil's 2022 Census, with 74,061 individuals, many living along the Solimões River in the western Brazilian Amazon [35]. In this region, households combine fishing, small-scale agriculture, hunting, forest resource use, and food purchases [20,21]. These activities draw on different forms of knowledge, labor, and social relationships, and their relative contributions vary with seasonal conditions and household resources [6,22]. Research in Tikuna communities has shown that food practices sustain social relationships, while river dynamics influence mobility, cultivation, and access to resources [36,37]. Hunting is thus best understood within the broader Indigenous food system.

Decisions about hunting, processing, sharing, and disposal reflected interactions across socioecological levels (Figure 10). Individual knowledge, physical capacity, and preferences interacted with intergenerational learning, household responsibilities, and cooperation. Shared knowledge of the territory guided hunting, while social networks helped hunters transport large carcasses and distribute meat. Access to water, electricity, refrigeration, and transport shaped where and how meat was processed and preserved. Similar interactions among environmental resources, household labor, knowledge, and social support have been described in other Indigenous Amazonian communities [31]. Research among the Waiwai in Guyana and in sub-Saharan Africa has likewise shown that cultural responsibilities and material conditions shape contact with animals and their tissues at different stages of the wild meat pathway [32-34].

Seasonality influenced where hunters could travel, which animals they encountered, and how much effort was required. Participants used rainfall, river levels, fruiting, and animal movements to decide when and where to hunt. Previous studies have linked seasonal flooding to changes in food consumption and rainfall and fruiting to game reproduction and hunting patterns [7,8]. Tikuna accounts from the Upper Solimões also

describe how extreme floods and droughts disrupt mobility, cultivation, and access to biological resources [37]. The present findings show how hunters used this knowledge to adjust routes, timing, and target species.

At the societal level, the governance of subsistence hunting involves Indigenous territorial rights, wildlife conservation, and food and health policies. Tensions persist around the legal recognition and regulation of hunting within traditionally occupied territories [4,25]. Territorial recognition alone may offer limited protection for Indigenous food systems where habitat integrity and landscape connectivity are compromised [38,39]. Territorial and habitat protection should therefore be considered alongside Indigenous knowledge and community approaches to wildlife management.

Hunters reported traveling farther and encountering preferred large animals less often. These accounts are consistent with evidence linking lower wild meat availability to deforestation, population pressure, and proximity to urban areas [5]. Preferential hunting and slow population recovery may make some large species particularly vulnerable, although responses vary by species and may also reflect habitat degradation and altered flood regimes [40-42]. The study did not measure wildlife abundance, hunting pressure, or environmental change. The accounts therefore indicate perceived changes in encounters and hunting effort; they do not establish wildlife depletion or its causes. Community-governed ecological monitoring could help assess these changes while linking wildlife conservation to territorial rights and food security [43,44].

River networks connect Upper Solimões communities to urban markets, expanding access to purchased foods and contributing to shifts from locally obtained fish and wild meat toward domesticated animal products [45-47]. Wild meat also reaches urban households through informal markets and social networks [48]. Participants in the study communities described keeping most wild meat for local consumption and sharing. This differs from findings in another Amazonian Indigenous community, where market value strongly influenced how harvested animals were allocated [10]. If longer hunting trips become less productive or more costly, households may rely more on purchased foods, although changes in consumption over time were not assessed.

Participants preferred large-bodied game, particularly peccaries, deer, and tapirs, for the amount of meat provided, while pacas were valued for their taste. Similar preferences have been documented in Central Amazonia [48]. Previous studies show that prey choice reflects body size, palatability, accessibility, hunting effort, and culturally shaped food avoidances [29,40,49-51]. Large carcasses also provide more meat for sharing, connecting hunting to food provision and reciprocal relationships [10,32,52]. Actual harvests depend on local availability and species' reproductive characteristics, and hunters may take a wider range of animals as preferred game becomes harder to find [53-55]. In this study, choices varied with seasonal conditions, transport demands, household needs, and animal condition. The reported use of a wider range of animals and carcass parts illustrates how households adjust to limited food options [31]. Such changes may alter which animals and tissues people handle, but their implications for pathogen exposure remain unknown.

Selection continued after capture. The heart and liver were commonly retained, whereas other parts were used selectively according to species, household practices, and food availability [10,29]. Practices differed across settings: Waiwai participants variably

avoided entrails, while hunters in the Democratic Republic of the Congo commonly consumed the heart, liver, and lungs at hunting camps [32,33]. In the present study, stomachs and intestines were often discarded or given to animals, although some participants cleaned and ate them, particularly from peccaries. One account linked difficulty finding peccaries to more extensive use of the carcass, illustrating a possible response to scarcity [31,51]. Participants consistently avoided consuming blood, but their explanations included religious, cultural, and illness-related concerns. Amazonian ethnographies describe spiritual and transformative meanings associated with blood and its odor [56,57]. These meanings varied among participants, and the study did not evaluate whether draining blood affected zoonotic risk.

When hunters noticed abnormalities in meat or organs, some rejected the entire carcass, while others discarded only the affected tissue. Selective disposal, including giving abnormal organs to domestic animals, has also been reported in Guyana and Cameroon [32,58]. In the study communities, more than 80% of households kept animals, and discarded viscera were sometimes fed to dogs, cats, or ducks or left accessible to scavengers. Dogs in Waiwai communities have likewise been observed consuming wildlife tissues while maintaining close contact with people [59]. In the Brazilian Amazon, feeding raw viscera from hunted rodents to dogs has been implicated in the transmission cycle of *Echinococcus vogeli* [60]. This example illustrates why the destination of discarded tissues matters for One Health. In the present study, the documented contacts identified possible interfaces among wildlife, domestic animals, people, and household environments [33]. Few studies have examined such practices alongside evidence of pathogen presence or transmission [16].

Potential exposure interfaces occurred throughout the wild meat pathway. During killing, evisceration, and processing, hunters handled tissues and fluids, and cuts or scratches could provide additional routes of exposure. Washing and butchering brought carcasses into contact with water, utensils, and shared surfaces, while transport and storage without refrigeration created conditions relevant to food safety. Disposal extended contact beyond the household to domestic animals, scavengers, and the surrounding environment. Without laboratory, veterinary, or clinical investigations, the study could not determine whether pathogens were present, whether transmission occurred, or whether particular practices increased or reduced risk. These findings can guide discussions with communities about where improvements in water access, meat preservation, and waste management would be useful and feasible. They can also help prioritize future surveillance in settings with limited access to diagnostic services.

Limitations

The household census, interviews, and field observations provided complementary evidence, and Indigenous researchers strengthened contextual interpretation and helped preserve local terminology. The study involved two predominantly Tikuna communities, limiting transferability to other settings. Interviews with male hunters alone limited insights into women's roles, household food preparation, and non-hunters' perspectives. The 15 hunting trips observed may not capture the full range of practices and species across seasons and households. Without dietary, laboratory, or veterinary assessments, the study could not quantify wild meat's nutritional contribution, diagnose animal health conditions, or assess pathogen exposure or transmission.

Conclusion

In the two predominantly Tikuna communities studied, food needs, local knowledge, social relationships, and access to resources shaped wild meat practices from hunting to consumption and disposal. Contact with animal tissues and fluids occurred at several stages, but pathogen exposure and transmission were not assessed. These contacts should be understood in the context of low household incomes, food shortages, inadequate sanitation, and limited access to healthcare. The findings support community-governed One Health surveillance that builds on local observations and links them to laboratory investigation and timely public health responses.

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FLGM and WM conceived the study, secured funding, supervised all phases of the research, and wrote the manuscript.
LMFG, TCAR, JRNV, and AB contributed to the genral study design.
APCS, NFS, and VAM contributed to the design, conduct, and analysis of the in-depth interviews.
TLG and ICS transcribed the interviews and checked the quality of the transcripts.
HAPD contributed to fieldwork planning and provided logistical support.
JS and ESC contributed to the ethics approval process.
NMR, PCMN, and RND contributed to the household census.
HSSG and MCA conducted the ethnographic fieldwork.
TN prepared the figures.
VCPRS performed the taxonomic identification of the animals.
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BPD, FRS, GST, HLF, RALR, and VSS contributed to the interpretation of the findings and critically reviewed and edited the manuscript. All authors read and approved the final manuscript.

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Data availability

Due to privacy and/or ethical restrictions, the datasets generated and/or analysed during the current study are not publicly available but are available from the corresponding author on reasonable request and subject to approval.

Declarations

Ethical approval

The study was authorized by community leaders, the coordinator of the Alto Solimões Special Indigenous Health District, and the Alto Solimões District Council for Indigenous Health. Favorable opinions were issued by the Health Research Program Coordination of the Brazilian National Council for Scientific and Technological Development (COSAU/CNPq; 01300.010949/2023-09) and the National Foundation for Indigenous Peoples (FUNAI; 08620.001036/2024-09). The Brazilian Research Ethics Committee/National Research Ethics Commission system approved the study (CAAE 77721524.6.0000.5016). Written informed consent was obtained from the adult respondent in each household and from hunters participating in the qualitative component. Participation was voluntary, and participants were informed of their right to withdraw at any time.

Hunters authorized audio recording and photographs. Participants were assigned alphanumeric codes, and identifying information was removed from transcripts and analytical files. Documentation of associated Indigenous traditional knowledge was registered in the Brazilian National System for the Management of Genetic Heritage and Associated Traditional Knowledge (A5E1C8A). Findings were periodically shared and discussed with community members.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Attempting to fill out or update fields: author information, data availability statement and author contribution statement.

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Tables' List

Table 1. Hunting and feeding habit interview's script.

Number	Question
1	Rapport/Opening questions: • Could you tell me a little about yourself and your everyday life in the community? • How did hunting become part of your life? • Could you tell me about how you learned to hunt and who you learned from? • What does hunting mean to you and your family?
2	Could you tell me about the animals you hunt in and around your community?

3	Do your hunting activities change between the rainy and dry seasons?
4	Could you describe how you hunt these animals, from planning the hunting trip to capturing or killing them?
5	Could you walk me through what happens to an animal from the moment it is captured or killed until the meat is ready to be prepared?
6	Could you describe how hunted animals are prepared and eaten in your household?
7	Which types of wild animal meat do you prefer?
8	Are there animals or animal parts that you choose not to eat?
9	Is meat or are other parts of hunted animals shared or exchanged with other households?

Table 2. Demographic characteristics of residents in the study area.

Variable	São Sebastião	Nova Aparecida	Total
Number of residentes	165 (61.1%)	105 (38.9%)	270 (100%)
Ethnicity			
Tikuna	151 (91.5%)	105 (100%)	256 (94.8%)
Kokama	13 (7.9%)	0 (0%)	13 (4.8%)
Mayruna	1 (0.6%)	0 (0%)	1 (0.4%)
Gender			
Male	86 (52%)	59 (56%)	145 (53.7%)
Age group			
≤20	71 (43%)	61 (58%)	132 (48.9%)
21-59	80 (48.5%)	43 (41%)	123 (45.5%)
≥60	14 (8.5%)	1 (1%)	15 (5.6%)

Table 3. Housing and socioeconomic characteristics of households in the study communities.

Variable	São Sebastião	Nova Aparecida	Total
Housing characteristics			
Number of households	35 (63.6%)	20 (36.4%)	55 (100%)
Mean number of residents per household	4.71	5.25	4.91
Housing tenure			
Owner-occupied	34 (97.1%)	20 (100%)	54 (98.2%)
Occupied with permission, without rent	1 (2.9%)	0 (0%)	1 (1.8%)
Number of rooms			
1	7 (20%)	6 (30%)	13 (23.6%)
2	11 (31.5%)	14 (70%)	25 (45.5%)
3	6 (17.1%)	0 (0%)	6 (10.9%)
≥4	11 (31.4%)	0 (0%)	11 (20%)
Housing structure			
Wooden house raised above ground	30 (85.7%)	20 (100%)	50 (90.9%)
Wooden house at ground level	3 (8.6%)	0 (0%)	3 (5.5%)
Mixed construction	2 (5.7%)	0 (0%)	2 (3.6%)
Roofing material			
Metal sheets only (zinc/aluminum)	32 (91.4%)	17 (85%)	49 (89.1%)
Plant materials and wood only	1 (2.9%)	1 (5%)	2 (3.6%)
Metal sheets and plant materials/wood	2 (5.7%)	2 (10%)	4 (7.3%)
Interior ceiling lining			
Yes	1 (2.9%)	0 (0%)	1 (1.8%)
Flooring material			
Cement	4 (11.4%)	0 (0%)	4 (7.3%)
Wood	31 (88.6%)	20 (100%)	51 (92.7%)
Water and sanitation			
Household water sources			

Deep or artesian well	4 (11.4%)	0 (0%)	4 (7.3%)
Shallow or dug well	25 (71.4%)	18 (90%)	43 (78.2%)
River water or rainwater	15 (42.9%)	19 (95%)	34 (61.8%)
SALTA-Z system **[a]**	6 (17.1%)	17 (85%)	23 (41.8%)
Received sodium hypochlorite use for drinking-water treatment [b]			
Yes	29 (82.9%)	20 (100%)	49 (89.1%)
Household with a bathroom			
Yes	28 (80%)	20 (100%)	48 (87.3%)
Sewage disposal			
Septic tank	4 (11.4%)	0 (0%)	4 (7.3%)
Rudimentary pit	24 (68.6%)	20 (100%)	44 (80%)
Discharge into the environment (ditch, vegetation, or river)	7 (20%)	0 (0%)	7 (12.7%)
Household waste disposal			
Burned only	28 (80%)	17 (85%)	45 (81.8%)
Buried on the property only	1 (2.9%)	0 (0%)	1 (1.8%)
Burned on the property and dumped on vacant land	4 (11.4%)	3 (15%)	7 (12.8%)
Burned and buried on the property	2 (5.7%)	0 (0%)	2 (3.6%)
Household income and livelihoods			
Number of household income contributors [c]			
1	13 (41.9%)	7 (35%)	20 (39.2%)
2	10 (32.3%)	10 (50%)	20 (39.2%)
≥3	8 (25.8%)	3 (15%)	11 (21.6%)
Total household income in multiples of the minimum wage [d]			
≤0.5	2 (5.7%)	2 (10%)	4 (7.3%)
>0.5–1	20 (57.1%)	13 (65%)	33 (60%)
>1–2	10 (28.6%)	5 (25%)	15 (27.3%)
>2	3 (8.6%)	0 (0%)	3 (5.5%)
Main household income contributor			
Wife, mother, or female head of household	8 (22.9%)	14 (70%)	22 (40%)
Husband, father, or stepfather	5 (14.3%)	1 (5%)	6 (10.9%)
Shared contribution	13 (37.1%)	4 (20%)	17 (30.9%)
Person or relationship unspecified	9 (25.7%)	1 (5%)	10 (18.2%)
Household income sources			
Agricultural and livestock production and extractive activities	24 (39.3%)	17 (94.4%)	41 (51.9%)
Trade in handicraft products	11 (18%)	1 (5.6%)	12 (15.2%)
Wage employment and services	9 (14.8%)	0 (0%)	9 (11.4%)
Social assistance and pension benefits	17 (27.9%)	0 (0%)	17 (21.5%)
Food production and food security			
Crops grown on household plots			
Fruit crops only	1 (2.9%)	0 (0%)	1 (1.8%)
Cassava; fruit crops	27 (77%)	18 (90%)	45 (81.8%)
Fruit crops; vegetables	1 (2.9%)	0 (0%)	1 (1.8%)
Cassava; fruit crops; vegetables	5 (14.3%)	2 (10%)	7 (12.8%)
No cultivated plot	1 (2.9%)	0 (0%)	1 (1.8%)
Any household member hunts or fishes			
Yes	22 (62.9%)	16 (80%)	38 (69.1%)
Household experienced food shortage in the previous 3 months			
Yes	13 (37.1%)	0 (0%)	13 (23.6%)
Transport and healthcare utilization			
Travel to town or other communities			

Walking or cycling only	6 (17.2%)	0 (0%)	6 (10.9%)
Motorized land transport only	25 (71.4%)	0 (0%)	25 (45.5%)
Motorized river transport only	2 (5.7%)	20 (100%)	22 (40%)
Walking or cycling and motorized land transport	2 (5.7%)	0 (0%)	2 (3.6%)
Urgent or emergency care received in the previous 12 months			
Yes	10 (28.6%)	0 (0%)	10 (18.2%)
Reported reason for urgent or emergency care [e]			
Pregnancy, childbirth, or postpartum care	2 (20%)	0 (0%)	2 (20%)
Fever, diarrhea, or reported infection	4 (40%)	0 (0%)	4 (40%)
Injury or musculoskeletal complaint	2 (20%)	0 (0%)	2 (20%)
Others	2 (20%)	0 (0%)	2 (20%)
Pregnant household member			
Yes	4 (11.4%)	0 (0%)	4 (7.3%)
Prenatal care among pregnant household members [f]			
Yes	3 (75%)	—	3 (75%)

[a] SALTA-z (*Solução Alternativa Coletiva Simplificada de Tratamento de Água com Zeólita*; Simplified Alternative Community Water Treatment System Using Zeolite) is a simplified community water treatment technology using zeolite, developed by the Brazilian National Health Foundation to supply drinking water to small, isolated, riverine, Indigenous, and rural communities.
[b] Sodium hypochlorite is supplied through coordinated efforts between the Amazonas State Health Surveillance Foundation and the Secretariat of Indigenous Health, through the Special Indigenous Health Districts.
[c] Income contributors: 31 and 20 responses, respectively (total, 51).
[d] At the time of the census, the Brazilian monthly minimum wage was BRL 1,518, equivalent to approximately USD 253 at an exchange rate of BRL 6.00 per USD 1.00.

Table 4. Animals kept by households and reported animal presence near homes in the study communities.

Variable	São Sebastião	Nova Aparecida	Total
Number of animals	396 (61.4%)	249 (38.6%)	645 (100%)
Households keeping animals for companionship or production			
Yes	28 (80%)	17 (85%)	45 (81.8%)
Animals recorded by group			
Mammals	71 (17.9%)	60 (24.1%)	131 (20.3%)
Birds	288 (72.7%)	189 (75.9%)	477 (74%)
Reptiles	33 (8.3%)	0 (0%)	33 (5.1%)
Fish	4 (1%)	0 (0%)	4 (0.6%)
Companion animals by type			
Cats	16 (4%)	23 (9.2%)	39 (6%)
Dogs	48 (12.1%)	36 (14.5%)	84 (13%)
Parrots	7 (1.8%)	2 (0.8%)	9 (1.4%)
Sloths	2 (0.5%)	0 (0%)	2 (0.3%)
Monkeys	5 (1.3%)	1 (0.4%)	6 (0.9%)
Parakeets	1 (0.3%)	0 (0%)	1 (0.2%)
Livestock by type			
Turtles	33 (8.3%)	0 (0%)	33 (5.1%)
Chickens	190 (47.9%)	142 (57%)	332 (51.5%)
Ducks	91 (23%)	45 (18.1%)	136 (21.1%)

Variable	São Sebastião	Nova Aparecida	Total
Fish	3 (0.8%)	0 (0%)	3 (0.5%)
Companion animals enter the home [a]			
Yes	21 (75%)	13 (76.5%)	34 (75.6%)
Wild animals observed near the home			
Bats	32 (91.4%)	20 (100%)	52 (94.5%)
Opossums	27 (77.1%)	8 (40.0%)	35 (63.6%)
Rats	31 (88.6%)	13 (65.0%)	44 (80%)
Mosquitoes, biting midges, or horseflies observed near the home			
Yes	34 (97.1%)	20 (100%)	54 (98.2%)

[a] Percentages are based on households reporting that they kept animals: 28 in São Sebastião and 17 in Nova Aparecida (total, 45).

Figures' List

Figure 1. Location of the study communities. Geographic location of São Sebastião and Nova Aparecida in the Évare I Indigenous Territory, municipality of Tabatinga, western Brazilian Amazon, near the borders with Colombia and Peru.

Figure 2. Housing structures, sanitation, and household water sources and storage in the study area. A) Raised wooden houses, the predominant housing type in the study communities, situated along the forest edge. An open central area of grass and bare ground serves as a shared space for everyday movement, social gatherings, and recreational activities. Animals, particularly dogs, frequently roam this communal space. **B)** Shaded space beneath a raised house, with persistently damp soil. In many households, wastewater from sinks and bathrooms drains into these spaces, which also provide shelter for domestic animals, particularly dogs, chickens, and ducks, as well as synanthropic wildlife such as rodents and opossums. **C)** Typical community latrine, consisting of a simple enclosure with a hole in the ground, the predominant form of household sanitation in the study communities. **D)** Site used to burn household waste and branches and leaves collected from yards, showing an accumulation of ash. **E)** Covered water storage tank at a household with piped water. **F)** Stream near the community used for bathing and water collection. **G)** Uncovered household tank used to store rainwater or water collected from the river. **H)** Plastic bottles containing visibly turbid water collected from nearby rivers, used for bathing and, when necessary, drinking after treatment with sodium hypochlorite.

Figure 3. Cassava varieties and traditional production of cassava-based foods in the study area. A, B) Two varieties of bitter cassava, with green and purple leaves, cultivated locally to produce *farinha de tapioca* (puffed cassava starch granules) and *farinha de mesa* (toasted cassava meal), major carbohydrate sources in the study area. **C)** An Indigenous woman peeling freshly harvested cassava roots for processing. **D)** Cassava-processing facility where roots are grated, pressed, and toasted. **E)** *Farinha de tapioca*, consisting of light, crisp, rounded granules produced from cassava starch, eaten alone or with fish, açaí, or other foods. **F)** *Farinha de mesa*, a granular product obtained by grating, pressing, and toasting cassava roots, showing its characteristic yellow coloration.

Figure 4. Diversity of animals kept for companionship in the study areas. A, B) Domestic dogs (*Canis lupus familiaris*), including individuals with visible skin lesions. **C)** An adult cat (*Felis catus*) with an extensive neck lesion. **D)** A litter of three kittens in one of the households visited. **E-G)** Saddleback tamarins (*Leontocebus fuscicollis*). **H)** Large-headed capuchin (*Sapajus macrocephalus*). **I, J)** Hoffmann's two-toed sloths (*Choloepus hoffmanni*). **K)** Parakeet. **L)** River turtles (*Podocnemis expansa*).

Figure 5. Household poultry keeping and animal-source foods in Indigenous communities in the Brazilian Amazon. A) Chickens roaming in a cassava-processing area. **B)** Container holding eggs laid by household chickens for household consumption. **C, D)** Ducks and ducklings roaming around households. **E)** Freshly caught fish on a household kitchen sink. **F)** Fried fish observed at lunchtime during a household visit.

Figure 6. Game animals documented during participant observation in the study area. Panels **A-D** show game animals that participants identified as preferred: **A)** collared peccary (*Pecari tajacu*), **B)** deer (*Mazama nemorivaga*), **C)** *Caiman crocodilus* and lowland pacas (*Cuniculus paca*), and **D)** agouti (*Dasyprocta fuliginosa*). Other animals documented included **(E)** a nine-banded armadillo (*Dasypus novemcinctus*), **F)** a long-nosed armadillo (*Cabassous unicinctus*), **G)** a coppery titi monkey (*Plecturocebus cupreus*), **H)** a woolly monkey (*Lagothrix lagothricha*), **I)** a coati (*Nasua nasua*), **J)** two kinkajous (*Potos flavus*), **K)** a crab-eating raccoon (*Procyon cancrivorus*), and **L)** a heron (*Ardea cocoi*).

Figure 7. Pregnant wild mammals and fetuses documented during carcass processing in the study communities. A) deer (*Mazama nemorivaga*). **B)** kinkajou (*Potos flavus*). **C)** lowland paca (*Cuniculus paca*). Main photographs show maternal carcasses, and insets show the corresponding fetuses removed during processing.

Figure 8. **Household processing and preservation of wild meat in the study area.** Carcass opening, evisceration, and singeing over a wood fire: **A-C)** Squirrel monkey (*Saimiri* sp.). **D-F)** Kinkajou (*Potos flavus*). **G-I)** Agouti (*Dasyprocta fuliginosa*). **J)** Women washing a collared peccary (*Pecari tajacu*) carcass with river water. **(K)** Frozen opossum (*Didelphis* sp.) carcass observed in a participant's home. **L)** Children handling processed carcasses of woolly monkey (*Lagothrix lagothricha*) and of a greater long-nosed armadillo (*Dasypus kappleri*), illustrating their participation in the wild meat pathway.

Figure 9. Selective disposal of visibly abnormal lung tissue during processing of a nine-banded armadillo (*Dasypus novemcinctus*). A) Armadillo carcass before processing. **B)** Lung showing visible lesions, which was rejected for human consumption and discarded for dogs to eat. The remainder of the carcass was consumed by household members.

Figure 10. Socioecological framework of the wild meat pathway. Practices from hunting to consumption and disposal are shaped by interacting individual, interpersonal, community, and societal or legal influences. The levels are interdependent rather than hierarchical, and their effects vary across stages of the pathway and according to species, seasonality, household needs, territorial conditions, and available material resources.

Supplementary Files

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