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# SHARK-BASED PET TREATS IN THAILAND

A HIDDEN THREAT TO SHARKS AND YOUR PET

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ช่วยสัตว์ป่า  
**WILDAID**



## ABOUT WILDAID

WildAid inspires change and empowers the world to protect wildlife and vital habitats from critical threats including illegal wildlife trafficking, climate change, and illegal fishing. WildAid delivers impact at scale in two distinct ways: (a) creating innovative communications campaigns that inspire millions of people in China, Southeast Asia, Africa, and the U.S. to protect endangered wildlife and reduce climate impacts, and (b) strengthening effective ocean enforcement of priority marine areas including marine protected areas, coastal fisheries, coral reefs, and blue carbon habitats with government, NGO, and community partners in 16 countries around the globe.

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## ABOUT OCEAN BLUE TREE

Ocean Blue Tree is a conservation organization dedicated to the protection and restoration of our oceans. Our mission is to provide actionable solutions to the challenges of ocean conservation by supporting marine exploration, advancing scientific research, and sharing critical knowledge with the public. Through these efforts, we aim to spark positive behavioral change, protecting and restoring ocean ecosystems for generations to come.

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*Whole dried sharks marketed as dental chews for dogs and cats are laid out at a laboratory at King Mongkut's Institute of Technology Ladkrabang (KMITL) for DNA species identification. WildAid's observations found that most such products lack labeling to identify the shark species or provide nutritional information.*

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# ABOUT THE REPORT

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This report is based on the research findings from “Unveiling the species in shark-based pet snack products with an overview of e-commerce trends.”

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# EXECUTIVE SUMMARY

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Shark-based pet snacks are an emerging and concerning trend in Thailand's rapidly growing pet industry. These items, ranging from shark cartilage to whole dried sharks, are often marketed as "premium" products, stimulating a new segment of demand. This increases pressure on already vulnerable shark populations and risks undermining ongoing conservation efforts to reduce shark exploitation.<sup>1</sup> Despite being promoted for their supposed health benefits, new research indicates these products may pose health risks to pets.

In 2024, WildAid, Ocean Blue Tree, and King Mongkut's Institute of Technology Ladkrabang (KMITL) conducted an investigation using tools like desktop research, market analysis, interviews and surveys, DNA barcoding, and toxicological and essential element analysis to fully comprehend this issue.

Between 2023 and 2025, WildAid and KMITL conducted an online market investigation of popular e-commerce platforms in Thailand, including Facebook, Lazada, LINE Shop, Shopee, and TikTok Shop. The surveys were carried out during three separate periods. Overall, the study identified more than 140 online vendors offering 10 different types of shark-derived treats for dogs and cats in Thailand. Shark cartilage products dominated the market, followed by whole dried sharks.

A survey of pet owners across Thailand's major cities found that while overall consumption of shark-based pet products remains relatively low, there is potential for future growth. Interviews with 50 pet product vendors revealed widespread unawareness regarding the ecological impacts of shark-derived items. This underscores the need for targeted education and awareness campaigns to shift consumer behavior. Vendors also lacked knowledge about species identity, sourcing, and production methods. None of the examined products displayed

species-specific labeling, and most sellers assumed they were byproducts from the seafood processing industry.

KMITL conducted DNA testing on 150 shark cartilage samples and 60 whole dried shark samples and found that the majority of samples belonged to species listed under the Convention on International Trade in Endangered Species (CITES) Appendix II and are therefore subject to international trade regulations. The widespread absence of species-specific labeling raises serious concerns about transparency, traceability, and sustainability, as consumers are left unaware of the species used in these products. In addition, toxicological and essential element analyses of 50 shark cartilage samples and 12 whole dried sharks identified potential long-term health risks to pets if consumed regularly.

Shark-based pet treats represent a quiet yet growing trend that should not be overlooked. As Thailand's pet market continues to expand,<sup>2</sup> the urgency to address this issue becomes even more pressing.

The presence of CITES-listed species in shark cartilage and whole dried shark products highlights the need for strengthened monitoring, clearer labeling requirements, stricter regulatory enforcement, and greater public awareness to ensure compliance with international trade obligations.

Without timely intervention, the continued growth of this market might place further pressure on vulnerable shark populations and undermine decades of conservation progress. This report provides key recommendations for government regulators, industry stakeholders, and consumers to counteract this concerning trend.

# BEYOND FINS

A pile of brownbanded bamboo sharks (*Chiloscyllium punctatum*) placed on ice at a port in Phuket Province, Thailand, after being landed by commercial fishing vessels operating in the Andaman Sea. The species is among the most frequently caught in both commercial and artisanal fisheries. © Pimpakarn Laongdee for WildAid



Whole dried sharks packaged in sealed bags and marketed as dental chews for dogs and cats. © Sirachai Arunrugstichai / WildAid / Ocean Blue Tree

Research shows that not only do shark finning ban regulations fail to decrease overall shark mortality, but may even increase it.<sup>3</sup> By prompting fishers to land whole sharks, these regulations created additional markets for shark meat, cartilage, and other products, contributing to an increase in global shark mortality to more than 80 million per year in 2017.<sup>3</sup>

The demand for shark and ray meat nearly doubled over a period of 20 years according to a 2024 report by IUCN. The global value of shark and ray meat trade is estimated to be 1.7 times the value of the fin trade.<sup>4</sup> In addition to these well-known products, lesser-known elasmobranch derivatives such as liver, skin, cartilage, jaws, and teeth also form part of a growing international trade in shark-based goods.<sup>4</sup> They are found in cosmetics, pharmaceuticals, and pet food.<sup>4</sup> This shift toward full utilization of sharks and rays presents new conservation challenges well beyond the historically focused shark fin trade.<sup>5</sup>

The IUCN report highlights the widespread use of elasmobranchs across many regions worldwide, often linked to cultural practices and traditions. In Thailand, ray and shark skins are crafted into shoes, wallets, belts, handbags, and purses.<sup>6</sup> In Indonesia, shark and ray skins are processed into chips. In the United States, skates are served as a seafood counterpart to buffalo wings, alongside mako and thresher sharks. Across Europe, stingray skin is turned into bags while shark meat is sold as “European conger.” In Belgium, savory ray cheeks are presented as a delicacy. In Oman, shark liver oil is used in traditional eyeliner. In Yemen, shark corneas are used for human transplants, while cartilage is marketed as a remedy

for a wide range of human ailments.<sup>6</sup>

Sharks play a vital role in maintaining healthy marine ecosystems. As apex and mesopredators, they help control prey populations, prevent trophic imbalances, and promote overall biodiversity. However, their slow growth, late sexual maturity, and low reproductive rates make them especially vulnerable to overexploitation.<sup>1</sup> According to the IUCN, overfishing and the demand for shark and ray products have driven one-third of all shark and ray species toward extinction globally.<sup>7</sup>

While the international community has made progress in regulating the trade of sharks and their products, such as listing all 54 species of the requiem shark family and all species from the hammerhead family under CITES Appendix II, challenges around enforcement, traceability, and species identification persist and may lead to increased underdetection.

At the same time, the shift toward full utilization of sharks sparks significant conservation concerns. The expanding shark product market may encourage targeted fishing or incentivize the retention of sharks caught as bycatch. Given the visual similarity among many shark species and the lack of distinguishable morphological features in processed products, there is a high risk that endangered or CITES-listed species are being unknowingly traded, processed, and consumed. This expanding market places additional pressure on vulnerable shark populations and underscores the urgent need for improved monitoring, traceability, and regulation throughout the global trade chain.

# OVERVIEW OF THAILAND'S BOOMING PET INDUSTRY



Thailand's pet industry experienced significant and consistent growth in recent years, driven by rising urbanization, shifting household dynamics, and an evolving cultural view of pets as family members. According to ttb analytics, Thailand's economic research and advisory center, the country's pet market has grown at an average annual rate of 18.9% from 2019 to 2025. The market is projected to reach 92 billion Baht (2.84 billion USD) in 2025, marking a 13.2% increase from the previous year.<sup>8</sup>

The growth is primarily driven by the pet food sector, which is valued at 62.4 billion Baht (1.94 billion USD). This expansion is fueled by the ongoing trend of pet humanization, which has led to increased demand for premium and functional pet products.<sup>8</sup> Other contributing sectors include pet accessories (21.3 billion Baht), health care (6.99 billion Baht), and pet care services (1.04 billion Baht).<sup>8</sup> As of late 2025, Thailand has become the world's second-largest exporter of pet food, and the United States its biggest buyer.

Pet ownership in Thailand is increasingly characterized by the trend of "pet parenting," where animals are treated as companions or family members. A 2023 survey by the College of Management, Mahidol University (CMMU) revealed that this mindset is driving lifestyle changes, including premium spending habits, travel with pets, and preferences for specialized pet nutrition and care.<sup>2</sup>

The shift reflects not only growing disposable income but also a deeper emotional investment in pet wellbeing. Consumers are increasingly seeking products that mimic human health supplements, favoring options perceived as natural, nutrient-rich, and free from artificial additives.

Veterinarians in Thailand increasingly recommend fish-based diets and treats as alternatives for dogs suspected of having food allergies, particularly to chicken, according to an in-depth interview with pet food retailers conducted by P.I.Y.A. Research. While true food allergies are estimated to affect only about 10–15% of dogs, chicken is one of the most frequently reported allergens, implicated in up to 15% of adverse food reactions.<sup>9</sup> As a result, fish-based pet snacks are gaining popularity among health-conscious pet owners seeking novel protein sources or hypoallergenic alternatives.



# SHARK-BASED PET SNACKS

MARKET DOMINANCE OF SHARK-DERIVED PET SNACK PRODUCTS:



65%

OF SHOPS SELL  
**SHARK CARTILAGE**  
PRODUCTS

35%

SELL  
WHOLE DRIED SHARK  
PRODUCTS

NOTE: BASED ON WILDAID-KMITL MARKET INVESTIGATION ON E-COMMERCE PLATFORMS IN THAILAND

Over the past few years, WildAid observed an emerging trend in Thailand for pet snacks advertised as “made from sharks.” Between 2023 and 2025, WildAid and KMITL conducted an online market investigation of popular e-commerce platforms in Thailand, including Facebook, Lazada, LINE Shop, Shopee, TikTok Shop. The study examined individual online stores identified through Google searches using keywords related to shark cartilage and whole dried sharks. The team compiled data from three separate surveys carried out between December 2023 to January 2024, May 2024, and November to December 2024. An additional survey, representing mid-2025, was conducted over approximately 15 days between June and July 2025.

Sellers advertised over 10 different types of dog and cat treats made from sharks, including dried shark cartilage, dried whole shark, dried shark fin, dried shark jerky, dried shark meat, and shark cartilage wrapped with chicken or salmon, etc. These products are often promoted for their purported high nutritional content, particularly the presence of protein, calcium, and other nutrients believed to support bone, teeth, and joint health in pets.<sup>10</sup>

Online shops offering shark cartilage products consistently outnumbered those selling whole dried shark products across all study periods. Shark cartilage products, which dominate the market segment, were present in around 65% of online shops selling shark-derived pet snacks, while whole dried shark products were sold by 35% of the shops.

The number of online sellers identified increased from 122 in the first survey to 149 in the mid-2025 survey, a ~22% increase in vendors. The figures include both vendors that remained continuously active and newly emerged vendors across the four survey periods.

Surveys also revealed a substantial increase in sales of shark-derived products over the study period. Shark cartilage products exhibited increased sales in 75% of shops that remained continuously active between the early-2024 and mid-2025 surveys, with sales volumes rising by 1.1 to 38.5 times (equivalent to an increase of 1 to 770 individual packages). Similarly, 96% of shops selling whole dried shark products recorded higher sales volumes between the two survey periods, ranging from 1.1 to 34.9 times, and in some cases increasing by as many as 2,400 to 6,000 individual sharks.

Interestingly, by mid-2024, many vendors were no longer advertising these products as ‘shark,’ but instead branding them as ‘fish’ cartilage or bone. This change in marketing strategy may reflect adaptation to a shift in public concern over products made from sharks in recent years. However, this new marketing trend creates additional safety and sustainability challenges because consumers might unknowingly purchase items made from sharks.

Unlike livestock-based ingredients, shark-derived materials often lack standardized sourcing or safety regulations. With Thailand now positioned as the world’s second-largest exporter of pet food products, the implications of mislabeling and lack of adequate regulatory measures are far reaching and global.

Despite health claims, there is limited scientific evidence supporting the efficacy of these supplements for pets. Moreover, as apex predators, sharks are known to accumulate heavy metals such as mercury, arsenic, and cadmium in their tissues.<sup>11</sup> This ecological vulnerability, combined with previous studies on toxin levels, raises serious concerns about the potential health risks to pets associated with long-term consumption and accumulation of contaminants.



A

B

Examples of shark-based pet treats available through e-commerce platforms in Thailand, illustrating the range of forms in which shark-derived products enter the pet supply chain. (A) Shark cartilage (B) Shark cartilage wrapped with meat (C) A whole dried shark (D) Specific parts of a shark © Patranan Suphangkalan for WildAid





# PET OWNER INSIGHTS & AWARENESS

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In 2024, WildAid, in collaboration with Thailand's Suan Dusit Poll, Suan Dusit University, conducted a quantitative survey through face-to-face interviews to understand pet owners' perceptions, behaviors, and motivations behind purchasing shark-based snacks as well as awareness and attitudes toward conservation issues related to sharks and their role in the ecosystem. The study analyzed data from 419 dog and cat owners from Bangkok and surrounding provinces, including Chonburi, Chiang Mai, Khon Kaen, and Songkhla.

The survey was designed to achieve a target quota of 70% users of shark-based pet food products and 30% non-users who had at least been exposed to such products. To identify eligible participants, 1,705 pet owners completed initial screening questions. Among this broader group, only 16.5% reported having ever purchased shark-based pet products, indicating that although overall consumption remains relatively low among the general pet-owning population, there is potential for future growth. Based on the screening results, a quota-based sample of 419 respondents was selected for the main survey. Within this final sample, 282 respondents (67%) reported having previously purchased pet snacks or treats made from sharks.

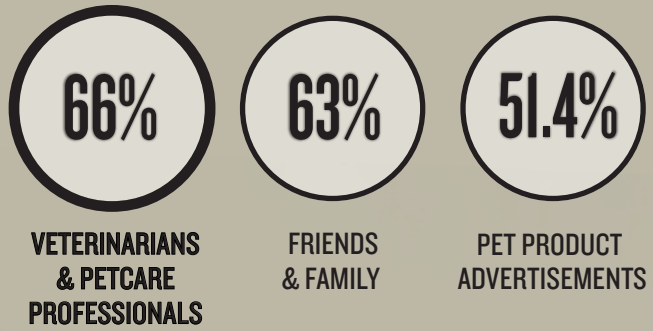
The survey revealed several trends among pet owners related to dental hygiene and pet nutrition, indicating that they typically prioritize product type, health benefits, and items that support their pets' overall well-being. Of the 419 respondents, 80% reported having heard of dental treats containing shark-derived ingredients, and 71% expressed interest in purchasing them. Interest was notably higher among respondents aged 20–39, with approximately 73% in both the 20–29 and 30–39 age groups. Interest remained relatively strong among those aged 40–49 (71%) but declined among respondents aged 50 and above.

Across the range of pet snack products, 67% of respondents reported having previously purchased shark cartilage or other shark-derived treats. A similar proportion, approximately 67%, had purchased mixed bone-and-meat snacks made from other protein sources, such as chicken, pork, bacon, or beef, followed by fish-based snacks made from salmon and tuna. This suggests that while shark-based treats are not the primary choice, they remain a common component of the pet treat market.

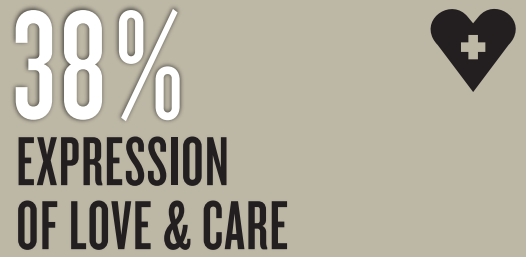
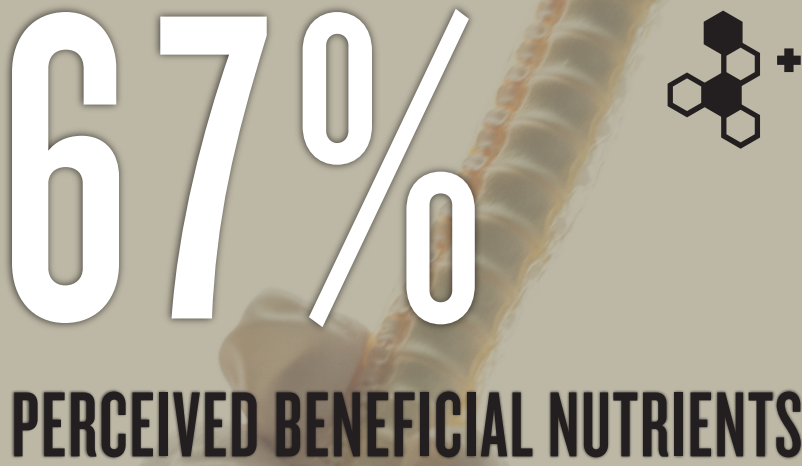
HOW PET OWNERS DISCOVER SHARK-BASED PET SNACKS:



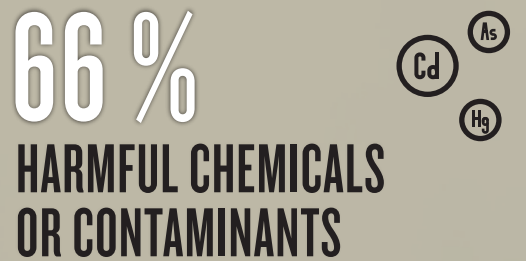
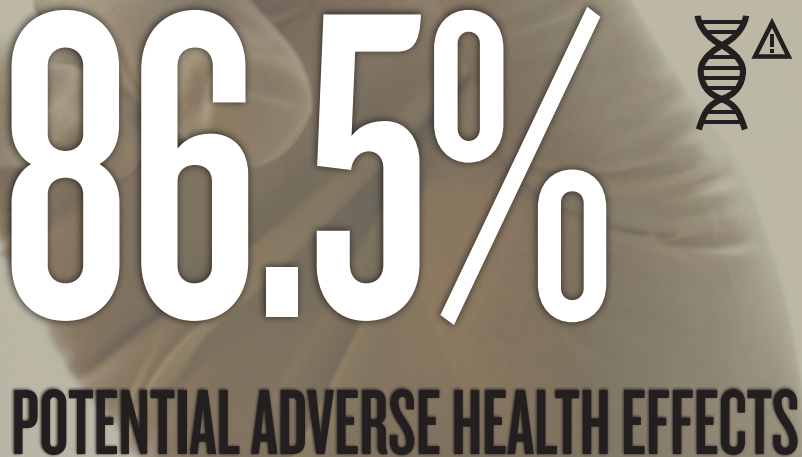
HOW PET OWNERS LEARN ABOUT PET NUTRITION:



WHY PET OWNERS BUY SHARK-BASED PET SNACKS:



WHY PET OWNERS MAY STOP BUYING THEM:



WHO WE ASKED:

**OF 419**  
**QUALIFIED RESPONDENTS**



**67%**



**HAVE PURCHASED**  
**SHARK-BASED PET TREATS**

**59%**



**HAVE SEEN DENTAL TREATS**  
**WITH SHARK-DERIVED INGREDIENTS**

**80%**



**HAVE HEARD**  
**OF SHARK-BASED PET TREATS**

**71%**



**ARE INTERESTED IN PURCHASING**



**20-39**  
**YEARS**



**40-49**  
**YEARS**



**ABOVE 50+**  
**YEARS**

**PURCHASING BEHAVIOR**

Of those who purchased pet treats or dental chew products containing shark ingredients, the majority (75%) gained awareness of these products through pet food stores, followed by friends and close acquaintances (57%), social media (34%), and online shopping platforms (34%). When seeking guidance on pet nutrition, veterinarians and pet care professionals were considered the most trusted sources (66%), followed by friends and family and close acquaintances (63%), pet product advertisements (51.4%) and online reviewers (29.7%).

The majority (57%) purchased these products fewer than six times over the past 12 months, while 34% bought them 6-12 times annually. Infrequent purchasing was mainly attributed to package sizes that last several weeks, non-daily feeding habits, limited product availability, and high prices.

**FACTORS INFLUENCING PURCHASE DECISIONS**

The primary motivations for purchasing these treats are the perceived beneficial nutrients that promote pet health (67%), recommendations from individuals including veterinarians, friends or pet shops (48%), and as an expression of love and care for pets (38%).

Key attributes that drive subsequent purchases are the alleged claim that these products contain high calcium content, which supports bone and joint health, aids in teeth cleaning, prevents tartar buildup, freshens breath, and offers nutritional value from the ocean, including omega-3 fatty acids.

Insights from the survey of pet food vendors conducted by P.I.Y.A. Research confirmed similar factors drive sales of shark-based treats. Vendors report that the majority of customers (82%) purchase these products believing they support their pets' oral and joint health. Additionally, 66% of consumers turn to these treats as allergy-friendly alternatives to chicken, while more than half (52%) associate the products with a high calcium content.

Typically, buyers of these products are affluent pet owners caring for large breed dogs. Their purchasing habits vary, ranging from weekly visits to once every two months, with an average purchase of nearly two bags per trip.

Despite these perceived benefits, concerns about product safety and sustainability could influence future purchasing decisions. Consumers indicated that potential adverse health effects (86.5%), harmful chemicals or contaminants (66%), and lack of clear benefits (60%) could deter them from buying shark-based products.

🗨️ PET OWNERS ATTITUDES TOWARD SHARK-BASED PET SNACKS:

75%



**AGREE SHARK  
USE IN PET FOOD  
HAS INCREASED  
COMMERCIALIZATION & EXPLOITATION,  
WHICH THREATENS  
SHARK POPULATIONS & MARINE ECOSYSTEMS**

40%



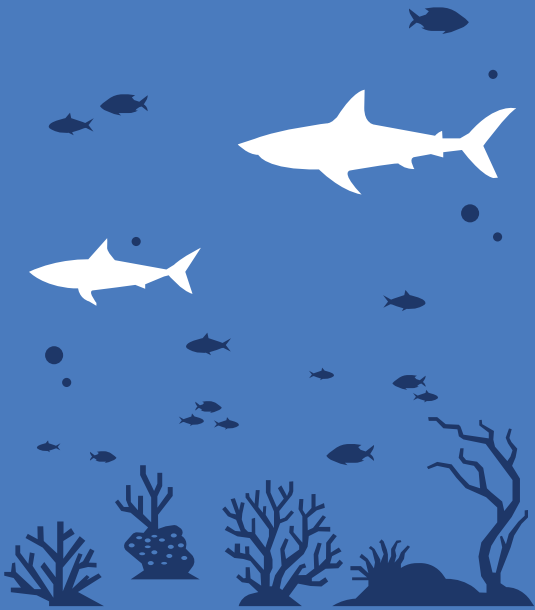
**BELIEVE SHARK-BASED PET SNACKS ARE IMPORTED  
AND DO NOT THREATEN THAI MARINE ECOSYSTEMS**

## ☞ PET OWNERS' PERCEPTIONS OF SHARKS IN MARINE ECOSYSTEMS:

# 82%



## AGREE SHARKS PLAY A CRUCIAL ROLE IN MAINTAINING BALANCE OF MARINE ECOSYSTEMS



## CONSERVATION AWARENESS AND CONSUMER ATTITUDES

The pet owner survey's findings highlight a growing awareness of sharks' ecological importance. A majority of respondents (82%) agreed that sharks play a crucial role in maintaining the balance of marine ecosystems. Most also agreed that shark populations are declining and should not be used in pet food products.

Respondents' attitudes toward shark-based pet snacks reflect an awareness of the link between their use and the potential risks to shark populations. A majority (75%) agreed that using sharks in pet food has led to increased commercialization and exploitation that threaten shark populations and the overall marine ecosystem.

Two-thirds of respondents believe that if shark-based pet snacks are sourced from farmed sharks, it is less likely to impact wild shark populations and marine ecosystems. This highlights the need to educate consumers about shark farming. Shark farming is not a viable option due to biological characteristics of most shark species that make them difficult and costly to raise in captivity.<sup>12</sup> The survey also revealed that, while pet owners are generally aware of the increasing commercial exploitation of sharks for pet products, 40% of the respondents believed that shark-based dental products originate from overseas suppliers and did not threaten Thai marine ecosystems.

Meanwhile, pet owners who were more informed about the ecological impact of shark exploitation were less likely to purchase such products. The majority of respondents expressed a preference for products with transparent sourcing and production criteria. The majority stated that they would avoid purchasing shark-based treats if they originated from sharks intentionally caught for manufacturing purposes in either Thai or international waters.

# MARKET & VENDOR ANALYSIS

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To better understand how shark-based pet snacks are marketed and sold in Thailand and to further understand consumer behavior and conservation implications, WildAid commissioned P.I.Y.A. Research, a local research firm, to conduct a study. The study included in-depth interviews with key retailers and distributors to explore sourcing practices, product perceptions, and customer demand, which then informed a structured, face-to-face survey of 50 pet store owners across Greater Bangkok and selected upcountry provinces. Respondents were selected based on their direct purchasing roles, regular sales of shark-based products, and frequent customer engagement.

The survey collected quantitative data on product availability, sales trends, and awareness of legal and environmental issues. Results indicate that demand for shark-based pet treats remains steady, with potential for growth. Most vendors believe pet owners are increasingly seeking alternative foods and treats that promote pets' health and wellness, while avoiding ingredients that may trigger allergic reactions. As a result, shark-based snacks have been introduced as a healthy alternative, marketed for their perceived health benefits and absence of common allergens.

## MARKET SHARE AND PRODUCT FORMATS

Shark-based pet chews are not a brand-new market category, with about half of surveyed retailers having sold them for over three years. Notably, the majority (90%) of vendors reported first learning about these products and ordering them through sales representatives rather than through their own product research or sourcing efforts. These products account for an average of 5.8% of monthly revenue among participating stores. The most popular formats are shark cartilage wrapped with fish or chicken. On average, stores sell 9.3 bags per week, and 88% of retailers indicated that they do not actively promote or recommend these products to customers.

## MISCONCEPTIONS & LIMITED AWARENESS ON SOURCING AND REGULATIONS

Half of the vendors surveyed were unsure of the origins of the sharks used in pet snacks, and 38% believed the parts were leftover from sharks used for fin production. A notable portion mistakenly assumed that the shark-based products came from farmed sharks, revealing a fundamental misunderstanding of product sourcing.

Uncertainty also extends to production origins. Half of the vendors believed the products were manufactured overseas and imported into Thailand, while 46% thought the shark parts were imported but processed locally. Around one-third of respondents had no idea where the treats were produced at all.

When asked about the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), an international agreement regulating trade in wildlife species, including over 90 shark and ray species listed under Appendix II that require permits to ensure legality and sustainability, half of the vendors had never heard of it. Another 40% had heard of CITES but did not understand its purpose, and only 10% demonstrated a clear understanding of its implications.

This widespread lack of awareness contributes to the ongoing distribution of potentially illegal or unsustainable products, undermining both national and international conservation efforts.

**AWARENESS OF SHARK SOURCING:**



**50%**  
DON'T KNOW

**50%**  
BELIEVE THEY KNOW  
THE SOURCE

<b>1<sup>ST</sup></b>	<b>PARTS LEFTOVER FROM SHARKS USED FOR SHARK FIN PRODUCTION</b>	<b>38%</b>
<b>2<sup>ND</sup></b>	FARMED SHARKS	30%
<b>3<sup>RD</sup></b>	BYCATCH	20%
<b>4<sup>TH</sup></b>	TARGETED CATCH (SHARK FISHING, SPECIFICALLY TARGETED FOR SHARKS)	4%

\*MULTIPLE ANSWERS ALLOWED

**AWARENESS OF SHARK-BASED PET CHEWS PRODUCTION ORIGIN:**



**30%**  
DON'T KNOW

**70%**  
BELIEVE THEY KNOW  
THE PRODUCTION ORIGIN

<b>1<sup>ST</sup></b>	<b>IMPORTED</b>	<b>50%</b>
<b>2<sup>ND</sup></b>	THE SHARK PARTS ARE IMPORTED, BUT THE MEAT WRAPPING IS SOURCED LOCALLY	46%
<b>3<sup>RD</sup></b>	MADE DOMESTICALLY	20%

\*MULTIPLE ANSWERS ALLOWED

**AWARENESS OF CITES AGREEMENT:**



50%

40%

10%

<b>1<sup>ST</sup></b>	<b>HAD NEVER HEARD OF CITES</b>	<b>50%</b>
<b>2<sup>ND</sup></b>	HAD HEARD OF IT, BUT DON'T UNDERSTAND ITS PURPOSE	40%
<b>3<sup>RD</sup></b>	UNDERSTAND WHAT CITES REGULATES	10%



# UNVEILING SPECIES IN SHARK-BASED PET SNACKS

In 2024, a research team from Thailand's King Mongkut's Institute of Technology Ladkrabang (KMITL), in collaboration with WildAid and Ocean Blue Tree, conducted DNA-based species identification of shark cartilage and whole dried shark products sold as pet snacks. The study aimed to uncover the species composition of these products to understand the occurrence of nationally vulnerable and internationally regulated shark species in pet snack products to better inform conservation efforts and promote responsible consumer behavior within the pet food industry.

The study examined shark cartilage and whole dried shark as these are among the most commonly marketed shark-based pet snacks in Thailand. Researchers randomly collected a total of 150 shark cartilage samples and 60 whole dried shark samples from 27 out of 123 online marketplaces and physical retail stores in May 2024 and analyzed them using DNA barcoding techniques.

## PRESENCE OF CITES APPENDIX II SPECIES: SHARK CARTILAGE

Ninety-one percent of the cartilage samples could be identified at the species level, revealing eight distinct shark species. The most commonly identified species in the cartilage products were the brownbanded bamboo shark (*Chiloscyllium punctatum*) and the Australian blackspot shark (*Carcharhinus coatesi*), accounting for 63.2% of the samples. The spottail shark (*Carcharhinus sorrah*) made up 27.2% and the remaining identified species included the spinner shark (*Carcharhinus brevipinna*), hardnose shark (*Carcharhinus macroti*), milk shark (*Rhizoprionodon acutus*), Australian sharpnose shark (*Rhizoprionodon taylori*), and Hasselt's bamboo shark (*Chiloscyllium hasseltii*).

The majority of identified species (61.8%) are classified as Near Threatened (NT) on the IUCN Red List, with the other third (32.3%) categorized as Least Concern (LC). A smaller proportion, 5.2% are listed as Vulnerable (VU), and 0.7% are listed as Endangered (EN). Of the eight identified species, five are classified as Vulnerable (VU) under Thailand Red Data.

Moreover, according to the updated CITES listings valid from 25 May 2024,<sup>13</sup> 67.7% of the products were derived from species included in CITES Appendix II, meaning they are subject to international trade regulations.

## WHOLE DRIED SHARK

All whole dried shark samples were identified as Pacific spadenose shark (*Scoliodon macrorhynchos*). The species is listed as Near Threatened (NT) under the IUCN Red List and Vulnerable (VU) under Thailand Red Data. The species is also listed in CITES Appendix II. The samples were determined to be from mature individuals, based on the size range of mature individuals.



A majority (67.7%) of the species identified in shark cartilage products were from species listed under CITES Appendix II, indicating that international trade in these products is subject to regulatory controls. © Sirachai Arunrugstichai / WildAid / Ocean Blue Tree



A researcher from KMITL collects a tissue sample from a whole dried shark specimen for DNA extraction. © Sirachai Arunrugstichai / WildAid / Ocean Blue Tree

**TABLE 1: PROPORTION OF IDENTIFIED SPECIES FROM SHARK CARTILAGE SAMPLES, THEIR CORRESPONDING IUCN RED LIST STATUS, THAILAND RED DATA, AND CITES LISTING**

NO.	SCIENTIFIC NAME	COMMON NAME	PORTION IN IDENTIFIABLE SPECIES (%)	IUCN RED LIST	THAILAND RED DATA (2021)	CITES LISTING
1	<i>Carcharhinus coatesi</i>	Australian blackspot shark	31.6	LC (2018)	-	Appendix II
2	<i>Chiloscyllium punctatum</i>	Brownbanded bamboo shark	31.6	NT (2023)	VU	-
3	<i>Carcharhinus sorrah</i>	Spot-tail shark	27.2	NT (2020)	VU	Appendix II
4	<i>Carcharhinus macloti</i>	Hardnose shark	3.0	NT (2020)	VU	Appendix II
5	<i>Rhizoprionodon acutus</i>	Milk shark	3.0	VU (2020)	NT	Appendix II
6	<i>Carcharhinus brevipinna</i>	Spinner shark	2.2	VU (2020)	VU	Appendix II
7	<i>Chiloscyllium hasseltii</i>	Hasselt's bamboo shark	0.7	EN (2020)	VU	-
8	<i>Rhizoprionodon taylori</i>	Australian sharpnose shark	0.7	LC (2018)	-	Appendix II

*LC = Least Concern, NT = Near Threatened, VU = Vulnerable, EN = Endangered*

*Thailand Red Data is a status assessment of threatened species in Thailand by Thailand's Office of Natural Resources and Environmental Policy and Planning (ONEP) using the IUCN Red List Categories as a guiding document.*

*\*Thailand has requested a reservation on the inclusion of requiem sharks (Carcharhinidae) valid for a period of six years or until November 2028.*



A researcher from KMITL collects a tissue sample from a shark cartilage for DNA extraction.  
© Sirachai Arunrugstichai / WildAid / Ocean Blue Tree

# HEAVY METAL ACCUMULATION AND ESSENTIAL ELEMENT LEVELS

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As apex predators, sharks are particularly vulnerable to bioaccumulation, a process in which toxic substances, including heavy metals and persistent organic pollutants (POPs), concentrate in their tissues over time. These contaminants enter the food chain through plankton and small fish, building up at progressively higher concentrations at each trophic level.<sup>14-18</sup> Because of their long lifespans and predatory feeding habits, sharks tend to retain hazardous levels of toxic substances including arsenic, cadmium, and mercury. The consumption of shark products poses health risks to humans<sup>19-20</sup> and other animals.<sup>21-23</sup>

Despite extensive research conducted on heavy metal accumulation and essential element levels in shark meat, seafood products, and cosmetics and supplements for human consumption, studies on their presence in pet snacks, such as shark cartilage and whole dried shark products, remain limited.

Shark-based pet snacks for dogs and cats are often marketed for their perceived health benefits. Many believe these snacks offer pets a good source of calcium, glucosamine, and chondroitin, which support strong bones, teeth, and joint health in pets, particularly when they are growing or experiencing bone and joint concerns. However, there is a lack of scientific evidence to support these claimed benefits.

This study sought to examine the concentrations of heavy metals and essential elements in shark-based pet snacks and compare them with international safety standards to assess potential health risks to pets associated with consumption.

## HEAVY METAL ACCUMULATION

WildAid, in collaboration with researchers from KMITL, tested 50 of the shark cartilage and 12 whole dried shark samples used in the DNA study for heavy metal and essential element analysis, along with two fish bone samples, Nile tilapia (*Oreochromis niloticus*) and giant sea perch (*Lates calcarifer*), as positive controls.

The KMITL research team analyzed the samples for presence of arsenic (As), cadmium (Cd), and mercury (Hg) and documented the percentage of product samples exceeding the Maximum Tolerated Level (MTL), defined as the highest concentration of specific heavy metals considered safe or acceptable (figure 1). The MTL threshold evaluates product safety and minimizes potential health risks to consumers or animals exposed to contaminants. The study followed the United States Food and Drug Administration (FDA, 2011) guidelines for arsenic levels, the Association of American Feed Control Officials (AAFCO, 2019) for cadmium levels, and the National Research Council (NRC, 2005) for mercury levels.

## WHOLE DRIED SHARKS

Researchers detected arsenic and mercury in all whole dried shark samples, with arsenic concentrations exceeding the Maximum Tolerable Level (MTL) in 50% of cases. Cadmium was found in 41.7% of the samples, though levels remained below safety thresholds.

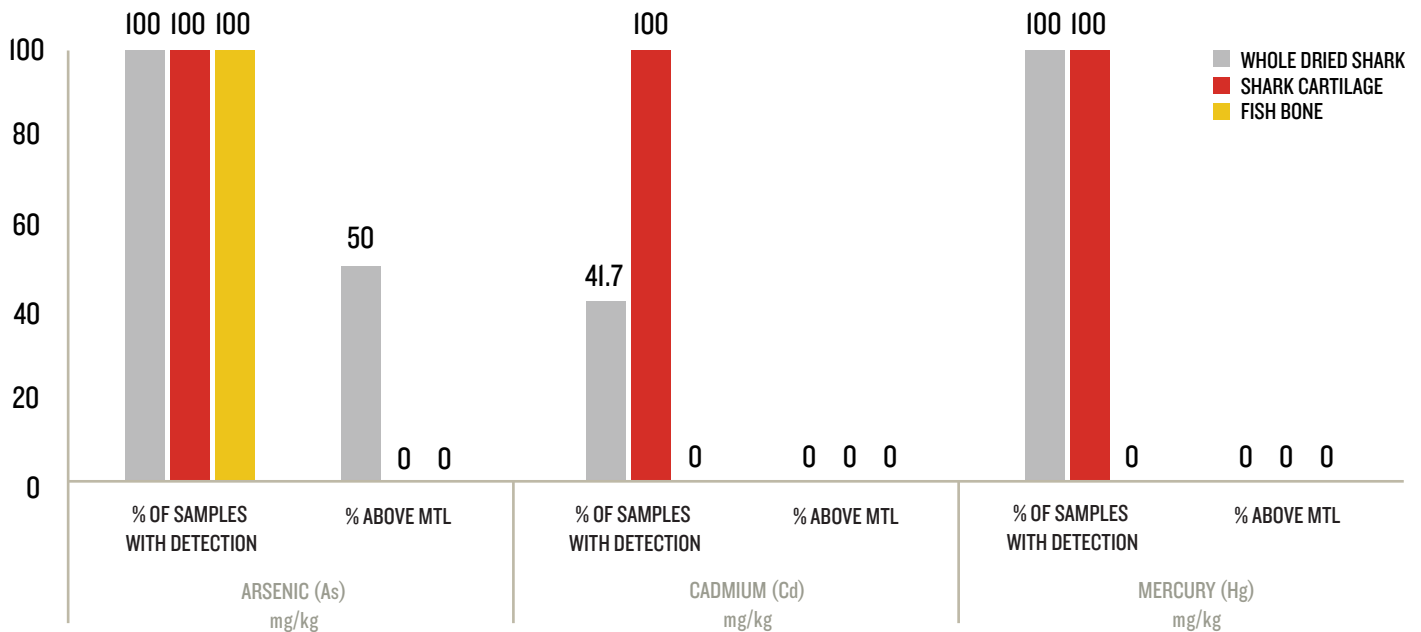
## SHARK CARTILAGE

All shark cartilage samples contained arsenic, cadmium, and mercury, but no single sample exceeded regulatory MTL limits.

## FISH BONE

Fish bone samples from the positive controls, Nile tilapia and giant sea perch, contained lower arsenic levels and no detectable mercury or cadmium, suggesting that alternative calcium sources appear comparatively safer for pet consumption.

**FIGURE 1: PROPORTION OF SAMPLES CONTAINING HEAVY METALS AND THE PERCENTAGE EXCEEDING THE MAXIMUM TOLERABLE LEVEL (MTL)**

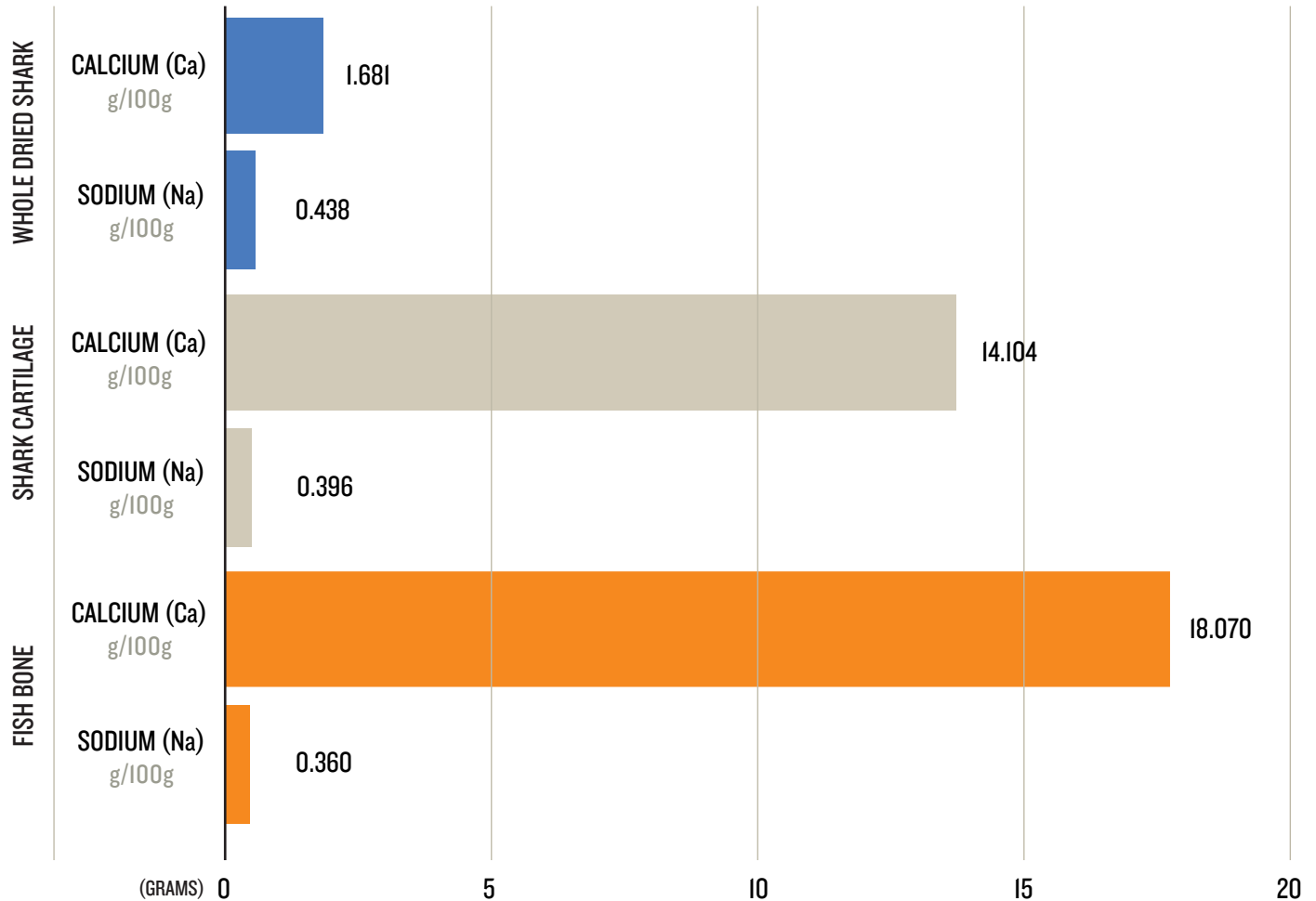


Previous research linked arsenic exposure to the development of several diseases in dogs, including myocarditis, dermatitis, and kidney and liver damage.<sup>24-26</sup> Even though concentrations of cadmium and mercury detected in both shark cartilage and

whole dried shark products remained within the MTL, prior research cautioned that long-term exposure to such metals could lead to adverse health effects, such as kidney damage or neurological impairment.<sup>21,23</sup>

## ESSENTIAL ELEMENTS LEVELS

FIGURE 2: CALCIUM AND SODIUM CONCENTRATIONS IN SHARK CARTILAGE, WHOLE DRIED SHARK, AND FISH BONE.



KMITL researchers also assessed calcium and sodium levels to evaluate nutritional claims and understand potential risks associated with excessive intake (figure 2). Calcium concentrations in shark cartilage and fish bone exceeded the nutritional maximum limit for dry dog food, while whole dried shark products exceeded the minimum recommended levels set by the European Pet Food Industry Federation (FEDIAF). While high short-term calcium intake is not harmful to dogs, it does not provide any additional health benefits, since excess calcium is effectively regulated and excreted by the body.<sup>27</sup> However, excessive calcium intake, particularly when not balanced with other essential elements such as phosphorus, can negatively affect pet health.<sup>28-29</sup> In cats, an imbalance of high

calcium and low phosphorus can cause hemolytic anemia, difficulty walking, and metabolic acidosis.<sup>29</sup>

Additionally, the sodium concentration in the samples was approximately four times higher than the minimum recommended level for both dry dog and cat food, which may lead to long-term health issues, particularly in those with pre-existing conditions such as kidney disease, hypertension, or cardiac disorders, if consumed regularly.<sup>30-32</sup>

Given these findings, fish bone appears to be a safer option, as it carries a lower risk of bioaccumulation and has significantly lower levels of heavy metals compared to shark-based products.



A brownbanded bamboo shark (*Chiloscyllium punctatum*) rests on the seafloor. Despite their critical role in maintaining marine ecosystem balance and overall ocean health, cartilage from this species was identified in 36% of sampled shark-based pet snack products sold on e-commerce platforms in Thailand.



# CONCLUSION

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The emergence of shark-based pet snacks in Thailand represents a troubling new frontier in shark exploitation, one that threatens to reverse decades of progress in shark conservation. What was once a trade centered primarily on fins has evolved into the full utilization of sharks, potentially creating new sources of demand and further increasing or maintaining the vulnerability of these species to overexploitation.<sup>33</sup>

At a time when one-third of all shark and ray species face extinction due to overfishing to satisfy demand for human and pet consumption, full utilization should not be mistaken for sustainable use.

Our extensive research reveals a consistent pattern of low transparency, potential health concerns, and conservation risk. Products such as shark cartilage and whole dried sharks are now widely promoted as premium pet treats, often marketed with unverified health claims that are neither scientifically supported nor without risk. This emerging trend not only fuels new demand but also undermines efforts to reduce shark bycatch and protect vulnerable species.

Consumer and vendor insights reveal that many pet owners are drawn to these products for perceived benefits to pets, yet most remain unaware of the conservation implications or potential health risks associated with these snacks. The findings suggest that once consumers are informed about these issues, their willingness to purchase shark-derived treats declines. This presents a clear opportunity for targeted education campaigns and policy interventions aimed at promoting more informed and responsible consumer choices.

DNA analysis reveals that the majority of shark species identified in sampled pet snacks are considered Near Threatened by the IUCN Red List and classified as Vulnerable (VU) under Thailand Red Data. Most of the species found are also listed under CITES Appendix II, meaning international trade is regulated and specimens must be accompanied by export permits.

Toxicological testing highlights significant risks to pet health. Arsenic levels exceeded safe limits in 50% of the whole dried shark samples, while traces of other heavy metals, such as cadmium and mercury, were detected in both shark cartilage and whole dried shark products. Although their concentrations in this sample set remained within the maximum tolerable levels (MTL), long-term and regular exposure to such heavy metals could lead to negative health complications for pets.

Meanwhile, calcium concentrations in shark cartilage exceeded the maximum nutritional limit set for dry dog food. While high short-term calcium intake is not considered harmful to dogs, it does not provide any additional health benefits. Sodium concentrations, however, were approximately four times higher than the minimum recommended levels for both dry dog and cat food. Elevated sodium levels should be carefully monitored to prevent potential health risks associated with excessive sodium intake in pets.

Insights from pet snack traders revealed a widespread lack of awareness regarding the species used, their origin, and production processes. There were minimal manufacturer and product details on the snacks, as many were packaged in small plastic bags with cartoon labels. The absence of clear product information prevents consumers from making informed choices and raises concerns about traceability, legal compliance, and conservation efforts, particularly for species at risk of overexploitation or those regulated under CITES.

Without traceability across the supply chain, it is impossible to verify whether these shark-derived products are sourced legally, ethically, or sustainably. Therefore, the most responsible choice for consumers is to avoid shark-based products altogether.

# RECOMMENDATIONS

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As Thailand's pet industry continues to grow, conservation measures, especially those aimed at improving the monitoring of shark product trade, must keep pace. This comprehensive report provides the first empirical evidence of such exploitation in the pet food trade. The detection of CITES-listed species in shark cartilage and whole dried sharks highlights the urgent need for enhanced monitoring, stricter regulatory enforcement, and improved product labeling to ensure compliance with international trade laws. The presence of Near Threatened and predominantly Vulnerable species listed in the Thailand Red Data undermines the goal of the National Plan of Action for the Conservation and Management of Sharks (NPOA-Sharks, Thailand) Plan 1: 2020–2024 and undermines the country's biodiversity commitments. Without urgent regulatory oversight, improved labeling standards, and greater public awareness, the emerging demand for shark-based pet snacks may further threaten vulnerable species and undermine decades of conservation progress.

This report calls on consumers, retailers, policymakers, and the broader pet industry to acknowledge the hidden costs behind shark-based products and the by-product trade, recognize them as a priority threat that needs to be integrated into shark fisheries management measures and take collective action to safeguard shark populations for future generations.

## REGULATORY & LEGAL MEASURES:

### IMPROVE TRACEABILITY FOR SHARKS USED IN PET FOOD

Shark-based pet snack products require stricter customs and border inspections with careful attention to species-specific documentation and import-export requirements to ensure compliance with CITES trade regulations. A national framework for monitoring the shark trade should be developed to track fisheries and supply chains, and efforts should be made to prevent shark bycatch, particularly species listed as Near Threatened or Vulnerable, from entering the pet food market.

Species-specific labeling should be mandatory for all shark cartilage, whole dried shark, and other marine-based pet products. In addition, an online registry system should be introduced, requiring businesses to report the shark species used, the origin of the catch, and product distribution details.

### IMPROVE HS CODE CLASSIFICATION AND BORDER CONTROLS

Thailand's Department of Foreign Trade and the Customs Department should adopt new eight to 10-digit sub-codes for shark cartilage, dried shark products, and other shark-based pet snacks to ensure that imports and exports are subject to CITES permit verification. The Harmonized System or HS Code is used to identify and classify goods in international trade, which helps authorities assess duties, collect statistics, and enforce relevant regulations.

### ESTABLISH STANDARDS FOR HEAVY METALS AND NUTRIENT LIMITS

Thailand's Department of Livestock and the Food and Drug Administration should establish standard limits for heavy metal accumulations such as arsenic, cadmium, mercury, as well as essential nutrients like sodium in pet snacks. Additionally, they should mandate pre-market testing and annual re-certification for marine-based treats.

### STOCK AND TRADE MONITORING OF DOMINANT SPECIES

Although most shark species identified in this study are listed as Near Threatened, and some as Least Concern, on the IUCN Red List, the assessment is still cause for conservation concern. Five of the eight species found in cartilage products, along with the Pacific spadenose shark from whole dried products, are listed as Vulnerable in Thailand's Red Data list. This highlights the importance of regional assessments, which better reflect local threats and fishing pressures.

Although there is no confirmed information on the origin of these products, there is a significant threat for local shark populations if the sharks used were sourced from Thailand. In Thailand, the brownbanded bamboo shark is classified as Vulnerable under the Thailand Red Data,<sup>34</sup> indicating that their populations are at risk, and further exploitation could exacerbate the decline of the species in the region.

## INCORPORATE PET SNACK TRADE INTO NPOA-SHARKS REVISION

Production of pet snacks containing shark species threatened from fishing pressure could potentially undermine the goals of Thailand’s National Plan of Action for Sharks (NPOA-Sharks, 2020–2024), which prioritizes managing the impacts of fisheries on threatened species. The Department of Fisheries should add “shark byproduct trade for pet food” as a priority threat that includes indicators for monitoring trade volume and species composition.

## ACTIONS FOR INDUSTRY AND VETERINARY SECTOR:

### DEVELOP A VOLUNTARY “SHARK-FREE PET TREATS” STANDARD

Both online and offline pet product vendors and manufacturers of shark-based pet snacks have a critical role in improving transparency and traceability within the supply chain. These companies should be subject to regular audits to ensure products do not contain protected or undocumented species. Mislabeling should be treated as a false/deceptive trade practice under the Consumer Protection Act.

In addition to strengthening transparency and traceability measures, the industry can lead by establishing a certification that requires shark-free ingredients and clear documentation of product origin. Modern trade retailers should be encouraged to pledge to comply with a “Shark-Free Pet Food” commitment. Collaboration with NGOs and regulatory agencies can further enhance industry standards and help reduce the circulation of high-risk or potentially illegal products.

### VETERINARY ADVISORIES

Thailand’s Veterinary Medical Association along with other relevant professional bodies should issue guidance discouraging the use of shark cartilage in pet products and promote safer, scientifically supported alternatives such as fish bone or plant-based chews.

### DIGITAL PLATFORMS & E-COMMERCE RULES

Facebook, Lazada, LINE Shop, Shopee and TikTok shop should be required to strengthen platform-level enforcement by mandating species and origin declarations before listing, prohibiting deceptive labels (such as using ‘fish bone’

for products that DNA testing has identified as shark), and implementing automated keyword-based takedowns for high-risk products.

## MONITORING, RESEARCH & ENFORCEMENT: COLLABORATIVE NATIONAL SURVEILLANCE PROGRAM

The Department of Fisheries, Department of Livestock, Customs Department, and academic institutions should be encouraged to jointly conduct a surveillance program. This should include regular DNA barcoding of market samples, and using tools such as DNA mini-barcoding to accurately identify shark-derived products at the species level. In addition, high-resolution melting real-time PCR (real-time PCR–HRM) may be applied as a complementary technique, particularly for the rapid detection of CITES-listed or threatened species, as well as routine heavy-metal testing and public compliance scorecards for transparency.

Annual trade flow analysis should be conducted using refined HS codes to review import and export volumes. Comparing Customs declarations with DNA-verified species origin will help detect mismatches. This approach will help track presence of vulnerable species in the trade and provide critical data to inform future regulations for these products.

## FUTURE RESEARCH

Globally, recent DNA barcoding studies conducted in Singapore,<sup>35</sup> the United States,<sup>36</sup> and Taiwan<sup>37</sup> have revealed the widespread presence of threatened and CITES-listed shark species in pet food and supplements. These findings add to the growing body of evidence showing that non-fin shark products contribute substantially to shark exploitation. To strengthen future assessments of shark use in the pet food industry, we recommend expanding sampling efforts beyond online retailers. Surveys should include pet food shops with physical storefronts, as well as a wider range of product categories such as canned foods, processed fish-based treats, and powdered dietary supplements. Broadening species identification through DNA barcoding across diverse product types and retail sources will provide a more comprehensive understanding of the shark species being utilized. We further recommend addressing key research gaps related to the geographic origins of sharks and the ecological impacts of harvesting on wild populations. Applying molecular techniques to trace the provenance of raw materials would enhance understanding of supply chains, clarify the impacts of harvesting on shark populations, and support more robust evaluations of sustainability.

**DEMAND REDUCTION:**  
**INCREASE CONSUMER AND PET INDUSTRY**  
**AWARENESS AND SHIFT BEHAVIOR**

Public campaigns should highlight both the conservation and health risks associated with shark-derived pet products. Clear messaging is needed to correct misconceptions about perceived health benefits and communicate science-based evidence of heavy metal accumulation and nutritional imbalances from

long-term exposure. Communication of the decline of shark populations and their key role in maintaining healthy marine ecosystems should also be employed.

Engaging trusted voices such as veterinarians, animal health experts, animal welfare advocates, and influencers can further amplify these messages, dispel misinformation, and promote evidence-based alternatives. Additionally, by emphasizing ethical sourcing and verified nutritional value, consumers can be empowered to make responsible, safer, and better-informed decisions.



Billboard ad for the “Treat or Threat” campaign, launched by WildAid and Ocean Blue Tree in November 2025. The campaign highlights the health risks of shark-based pet snacks to pets and ocean ecosystems.

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