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Utilization of Wild Deer Meat as a Food Source



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ABSTRACT

In Japan, damage to crops caused by wild animals such as monkeys, deer, and wild boars is becoming a serious problem, leading to hunting out to control their populations. Traditionally, wild animal meat is discarded. However, in recent years, there has been an effort to use it as food in an effort to make effective use of resources. Deer, are among the most abundant wild animals and cause significant damage. This paper reports on the challenges associated with using venison obtained through hunting for food, and discusses potential solutions to these issues.



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INTRODUCTION

In Kochi Prefecture, Japan, where one of the authors lives, the wild deer population has grown so large that they are causing significant damage to crops. The issue is particularly severe in winter when leaves are scarce and often covered in snow, making them unavailable for deer to use as food¹⁾. Damage caused by other wild animals such as monkeys, wild boars, and bears, has been reported not only in Kochi Prefecture but also throughout Japan. Population control through hunting is necessary to prevent such damages. While some argue that hunting is cruel as it takes the lives of wild animals, many advocate for respecting animal welfare, many believe it is essential to reduce crop damage. Methods such as surrounding fields with electric fences or emitting odors and sounds that animals dislike have proven ineffective, as deer can jump over fences and become accustomed to these deterrants²⁾. Consequently, no effective alternatives to the extermination of wild deer have been found, and population regulation through hunting is currently permitted.

Only individuals with hunting licenses could hunt wild animals. As a result, hunting became a profession. When local governments or other organizations consider it necessary to control the population, they offer rewards to hunters based on the number of animals they exterminate. In such cases, hunting cannot necessarily be considered as a job. This arrangement includes an element of volunteering. The carcasses of wild animals were brought to the government office to confirm the number of animals hunted after which they are disposed as garbage. However, recently, after the carcasses were traditionally disposed of as, and efforts have been made to process them into meat for effective use. In Japan, gibier (meat from wild birds and animals) is consumed in restaurants and its meat can be purchased³⁾. These efforts aim at preventing the waste of the lives and meat of wild animals, which are processed differently from meat from livestock animals such as cows, pigs, and chickens.

In this paper, we report on the effective use of wild animal meat obtained through hunting, as a means of preventing harm to people. Given the significant damage caused by deer, particularly in Kochi Prefecture, where one of the authors resides, we will primarily focus on deer and discussed challenges with using wild venison.

Damage to crops caused by wild deer and their extermination by hunting

Deer, often perceived as cute creatures, are actually the top pest in Japan⁴). The wild deer population in Japan has surged following the extinction of their natural enemy, the wolf (Fig. 1). A 2011 survey estimated that there were approximately 3.25 million wild deer in Japan, with data from the Hokkaido region included in Table 1. This proliferation is largely attributed to the overlap between human-inhabited areas and deer habitats, where deer migrate in search of food. Miyajima, a famous tourist destination in Hiroshima Prefecture, feeds on deer. Traditionally, wild deer in the area would be near the Itsukushima Shrine during the day and return to their forest homes at night; however, recently, an increasing number have been staying within the shrine grounds at night. Thus, when people feed them, deer sometimes appear or settle near their houses or fields. Around 2020, a report indicated that hundreds of thousands of deer were living in Kochi Prefecture. This is likely due to the region's thriving forestry industry, providing abundant habitat and food sources for the deer, such as fallen leaves and tree bark. However, if their population grows unchecked, deer will compete for these natural food sources¹). During winter, when plants are buried under snow, deer increasingly turn to agricultural products grown by humans for sustenance. If deer consume too much tree bark, it can fatally harm the tree, causing significant damage to forestry. The total annual damage to agricultural crops is estimated to be as much as US\$40 million per year throughout Japan⁴). Hunting has been used to manage deer populations and capture harmful birds and animals, as will be described later. In Kochi Prefecture, efforts succeeded in reducing the population to approximately 100,000, at point, through further reduction proved challenging due to the deer's ability to hide in forests and their rapid reproduction. Over time, deer population naturally replenish through reproduction²). However, hunting poses challenges due to the aging license-holder demographic and issues with cost compensation. Since hunting is often not their primary occupation, finding time to hunt between works. There is also a general belief that if people are concerned about animal welfare, they should not hunt; thus, the number of people obtaining licenses does not increase. In addition, if they are asked to exterminate a wild animal, the reward may be considered too low to cover the costs.

Several hunting methods are available. Hunting serves as a dual purpose: obtaining wild animals, such as pheasants, wild boars, and ducks for food, which are then sold for profit. However,

hunting is necessary for capturing harmful birds and animals. Harmful wildlife capture involves capturing wildlife that causes damage to agriculture, forestry, or has a significant impact on the ecosystem⁴). When deer destroy fields, farmers often collaborate with local hunting associations to capture harmful birds and animals. . Additional, population control measures are permitted separately from general hunting separate from general hunting, with permission from the prefectural governor. This does not involve the extermination of specific individuals at specific locations. The difference between capturing harmful birds and animals is that capturing can be performed with permission from the prefectural governor, even without requests from farmers or other affected people.

Edible use of wild venison and its problems

Venison is commonly eaten in Japan alongside wild boar valued for its protein content and medicinal purposes, especially as a source of large animal meat. However, its distribution and consumption in modern Japan significantly lower compared to Europe⁵). From the late 1990s to the 2000s, issues arising from overpopulation of Ezo deer (*Cervus hortulorum*) in Hokkaido became evident, causing damage not only to agriculture and forestry but also traffic accidents involving trains and automobiles. Efforts to utilize Ezo deer as a resource became more active during this period. Ezo deer meat is often used for jingisukan (Mongolian vegetation); but due to its light flavor, it is also suitable for various stews and fried dishes. Wild Ezo deer meat is nutritionally superior to beef or pork, with about one-third the calories, 1.5 times the protein, less than one-fifth the fat, and twice the iron content (Table 1). These characteristics make it an attractive option for preventing lifestyle-related diseases including hypertension, diabetes, and hyperlipidemia. The fact that deer populations are unlikely to decrease through hunting is also advantageous for ensuring a sustainable supply of meat.

Currently, deer captured through hunting are sometimes dissected and disposed for ecological research, but most are used for food. Traditionally, hunters butcher deer and consume it themselves, give it to acquaintances, or sell it to butchers. With population control hunts reporting the authorities each time is unnecessary. Due to the recent gibier boom, hunters may also sell venison directly to restaurants and other eateries³).

Several problems are associated with the consumption of venison. The first issue is the control of

meat-processing methods. Livestock, such as cows, are managed centrally from birth, growth, and processing into meat. Because their feed and growing environments can be strictly controlled by humans, the safety of meat is easy to maintain and confirm. There are some unknowns regarding wild animals, such as the food they ate and where they lived before they were captured. It is stipulated by law in Japan that a veterinarian must check the health of any domestic animal before it is butchered for meat. The amount of wild animal meat captured and distributed is small and inconsistent, and proper slaughtering equipment is often not used. However, it is not well established whether the quality of meat, such as its texture, is stable³⁾. Venison is often considered tough and unpleasantly odorous, but this perception is partly due to improper processing methods, such as inadequate blood drainage⁶⁾. If processed properly, venison is actually known for its tenderness and mild flavor.

The second issue was the presence of infectious diseases. It has been reported that raw meat (eating and drinking as sashimi) may cause food poisoning caused by *Sarcocystis fayeri*. In addition, consuming raw meat, can be a source of hepatitis E infection. Therefore, it is essential to heat it before eating. Consumers generally lack this information, and there are cases where raw meat is served in stores. Currently, raw beef liver is rarely served in stores in Japan due to incidents of bacterial infections. Owing to stricter sanitary controls and higher purchasing and work costs, fewer stores handle raw beef. However, it is sometimes considered acceptable to eat raw meat from wild animals that are not livestock. In reality, there are many uncertainties regarding the safety of wild animals, and eating raw meat is very dangerous³⁾. This is because wild animals are thought to be more susceptible to various diseases than domestic animals. Screwworm flies (*Cochliomyia hominivorax*) may be infesting it⁷⁾. In addition, there have been reports of cases other than in deer in the United States in July 2022 of a person contracting trichinosis after eating undercooked black bear meat⁸⁾. Freezing is effective if raw meat is used to prevent infections other than those caused by viruses, such as hepatitis E. Careful action was required in both cases.

CONCLUSION

Wild venison is increasingly being used as a food ingredient in Japan because an overpopulation of wild deer is causing damage to agricultural crops. Deer are hunted to reduce crop damage. However, several problems are associated with eating venison.

One reason for this is that the methods for processing venison into meat are not as well established as those for other livestock animals such as beef, pork, and chicken³⁾. As a result, the quality of the meat is not consistent, and taste and texture can vary greatly depending on where the meat is bought or the restaurant where it is eaten. Second, the presence of microorganisms, which are sources of infectious diseases, may have been overlooked. Currently, doctors and veterinarians have little knowledge of diseases in animals other than humans⁹⁾.

Wild deer meat is low in fat, high in protein, and high in iron, making it a healthy food that helps prevent obesity¹⁰⁾. Given this knowledge, it seems a very good idea to use venison obtained from culling for gibier or other purposes, rather than wasting it. The problem is to standardize a single processing method, which requires avoiding the unique butchering methods of each individual and instead having a small number of experts with the knowledge and skills to butcher meat in a uniform way. It may also be necessary to objectively inspect meat during processing to determine if the quality has changed due to disease or other factors³⁾. If there are processing and preservation methods that allow meat to be eaten for a long period of time, and if the meat can be seasoned in a way that is acceptable to many people, the distribution and consumption of meat are likely to increase.

According to data recently released by the Ministry of the Environment, it has been reported that the number of wild animals in Japan has decreased by two-thirds in the last 50 years due to the effects of global climate change¹¹⁾. If this is true, there may be no need to exterminate them through hunting, and wild animals may be protected as protected objects. Venison is distributed not only by hunting wild deer directly, but also by capturing live wild deer and temporarily raising them, or by obtaining meat from deer kept completely in captivity. However, the proportion of patients in the former group was very high. If people want to sustainably eat deer meat, there may be a time when they raise it in the same way as livestock animals, and it is also conceivable that gibier will become rare and prized³⁾. In this case, the meat quality and nutritional value would be different from what is currently being said, and the characteristics of venison may also change. Domestication may have led to decreased physical activity and increased fat content.

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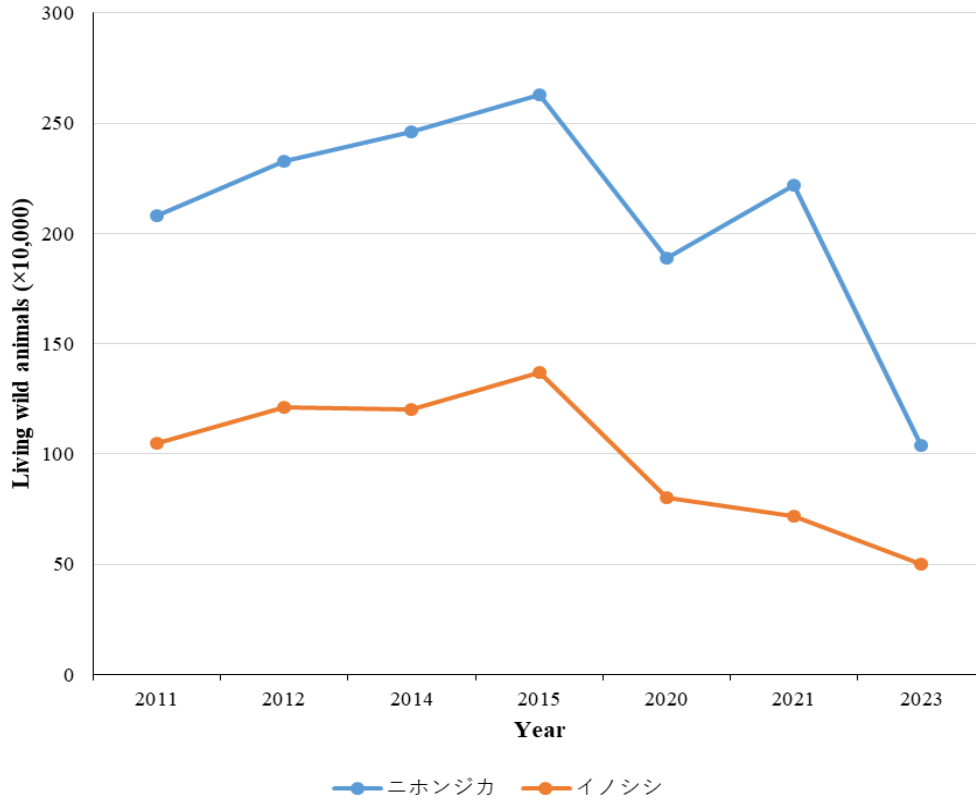


Fig. 1 Wild deer population

For the Japanese deer (*Cervus nippon*), data were from Honshu southward (does not include data from the Hokkaido region).

Based on data from reference 11).

Table 1 Venison nutrition

Nutritional value per 100g	Venison	Boar meat	Beef	Pork
Energy (kcal)	119	244	294	237
Protein (g)	23.9	18.8	17.1	17.1
Fat (g)	4.0	19.8	25.8	19.2
Iron (mg)	3.9	2.5	2.0	0.6
Vitamin B ₁ (mg)	0.20	0.24	0.07	0.63
Vitamin B ₂ (mg)	0.35	0.29	0.17	0.23
Vitamin B ₆ (mg)	0.60	0.35	0.35	0.28
Vitamin B ₁₂ (µg)	1.3	1.7	1.4	0.5

Venison data is based on the use of raw lean meat from Japanese deer.

Wild boar data is based on the use of raw meat with fat.

The beef data were based on raw lean meat from Wagyu beef (sirloin).

Pork data were based on raw shoulder loins with fat from a large meat breed.

Based on data from references 5) and 12).

