Determinants of game meat consumption among hunters residing in Alberta

by

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Abstract

The province of Alberta's diverse ecology and large population of wild game poses the importance of management practices to keep the species population from overpopulating and encountering disease and food shortage. While hunting facilitates these management practices, the success of management strategies depends on a sustainable number of hunters and their continued participation in hunting. Government of Alberta (2022) reports indicate that fewer people have been hunting in recent years, which has caused concerns about declining hunting biological, economic, and social benefits. A potential strategy to encourage big game hunting in Alberta is to promote the harvest of own meat among hunters, which current research has consistently cited as the socially accepted reason for hunting. A survey was conducted to explore how food-related benefits of hunting strengthen the appeal of hunting wild game for food. Eighty-seven game hunters residing in Alberta participated in this on-line pilot study.

Findings indicate that the committed game hunters in this study are actively involved in hunting and consuming game meat and intend to continue doing so. The primary source of game meat for these hunters is either from their own successful hunts or from their friends and families who engage in hunting. The primary motivating factors for hunting are the opportunity to spend time outdoors, relaxation, and obtaining natural food from local sources. Meanwhile, the key drivers for game meat consumption are the quality and freshness of the meat, a desire to utilize natural resources sustainably, and the taste of game meat. However, the limited access to land and hunting opportunities poses significant barriers to hunting and game meat consumption among these hunters. Despite this, there is substantial awareness and recognition of the benefits of game meat, and game hunters have a positive attitude towards meat and game meat consumption. They are highly involved with food, which leads them to try new foods and change their eating habits.

Moreover, they are highly aware and concerned about environmental degradation consequences for themselves, others, and the natural world. Results from the descriptive analysis suggest that key factors that impact game meat consumption frequency are hunting frequency, motivation for hunting, game meat consumption motivation, level of food involvement, environmental beliefs, attitudes toward meat and intention to hunt and consume game meat. Correlation analysis highlights the importance of hunting frequency, hunting motivation, level of food involvement and intention to consume game meat.

The study findings shed light on the efficacy of using food-related, free word association, and meat-eating and food-involvement questionnaires as practical tools to achieve the goal of documenting food-related benefits of hunting. While further investigations are required to obtain a more comprehensive understanding, this research makes a meaningful contribution to the limited research on this topic in Alberta. The practical insights gained from this study can guide future research and offer practical information to wildlife conservation stakeholders.

Preface

This thesis is an original work by Seyedeh Tahereh Mousavi. The research project received research ethics approval from the University of Alberta Research Ethics Board, Project Name "Determinants of game meat consumption among hunters residing in Alberta," Pro00119565, June 20, 2023.

The research reported in this thesis was led by Dr. Wendy Wismer, the principal investigator at the Department of Agricultural, Food and Nutritional Science (AFNS), University of Alberta. The research was financially supported by a research grant from the Alberta Conservation Association (ACA) provided to Dr. Wismer. The research was conducted at the University of Alberta

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Finally, I would like to thank all the participants who took part in this research study.

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List of Abbreviations

CWD: Chronic wasting disease

EC: Environmental Concern

FWA: Free word association

PBC: Perceived behavioural control

TPB: Theory of planned behaviour

TRA: Theory of reasoned action

CHAPTER ONE

1.1 Introduction

Hunting is the most effective tool to provide funding for wildlife management, contribute to wildlife conservation, and control its population (Ljung et al., 2015). The province of Alberta, as a well-known Canadian destination for a large number of big game species (www.ipscnb.ca, 2023), highlights the importance of wildlife management practices such as hunting to keep these species populations from overpopulating and encountering disease and food shortage. While hunting can facilitate these management practices in Alberta, the success of management strategies depends on a sustainable number of hunters and their continued participation in hunting (Alberta Environment & Sustainable Resource Management, 1999), which has declined in recent years. While reports show an increase of 99,001 hunters between 2004 to 2008 in Alberta (Econometric Research Limited, 2009), Government of Alberta reports acknowledge that this number only reached 160,845[1] hunters from 2008 to 2021 (Alberta Government, 2022), indicating that fewer people have been hunting in recent years, which has caused concerns about declining hunting-related benefits for wildlife management (Montgomery & Blalock, 2010) and significant biological, economic, and social consequences (Larson et al., 2014). A potential strategy to encourage big game hunting in Alberta is to promote the harvest of own meat among hunters.

In general, meat has long been regarded as a highly valued food due to its concentrated protein, fat, and mineral content. Across different cultures, consuming significant amounts of meat has traditionally been associated with wealth and social status. As one of the primary staples in many diets, meat remains a popular choice for many individuals. In the Western world, beef is often considered the most favoured member of the meat group (Ruby et al., 2016), and a recent study has brought attention to the significant consumption of red and processed meat in North American

[1] Total hunters hunted in Alberta in 2021/2022, including resident and non-resident hunters (https://albertaregulations.ca/)

countries, ranging from 63% to 73%. In Canada, 65.6% of individuals are meat consumers (Frank et al., 2021). In recent years, research has focused on the significant influence of acquiring game meat on initiating and sustaining hunting activity. Current research indicates that obtaining game meat is a crucial driving force for hunters and significantly impacts their overall satisfaction with the hunting experience (Birdsong et al., 2022; Black et al., 2018; Hinrichs et al., 2021). Obtaining local and free-range meat is consistently ranked among the most satisfactory hunting reasons (Ljung et al., 2012; Decker et al., 2015) and a significant source of inspiration to go hunting, which has made hunting more than just a way for people to socialize, uphold cultural traditions, and provide sustenance meat (Arnett & Southwick, 2015). Thus, the unique contribution of game meat consumption to wildlife conservation highlights that individuals' preference for locally sourced and wild game meat could lead to increased interest in hunting participation. However, studies also point out a research gap that must be filled to investigate potential links between food-motivated stakeholders and the hunting participation rate in Alberta.

1.2 Alberta hunting context

Alberta's 640,330 km2 size and varying ecology have provided this province abundant big and bird game hunting opportunities. In the hunting regions of the province, there are nine big game species, including bighorn sheep, black and grizzly bear, cougar, deer, elk, moose, and wood bison, as well as various upland game bird species, ducks, and geese (Alberta Government, 2022). According to the evidence-based assessment of Alberta Sport Fishing and Hunting, big game hunting is the most favoured type of hunting in Alberta, as most hunters purchase big game licenses rather than small game ones. In 2008, it was found that there were 99,001 adult hunters in Alberta with hunting licenses, of which 89.7% were Canadian (Econometric Research Limited, 2009). As of 2021-2022, the number of hunters in Alberta has increased to 160,845, including 5,537 non-resident hunters and 4,117 non-resident aliens. Among these hunters, 84% prefer to hunt with firearms, while only 16% use archery equipment (Alberta Government, 2022).

Although hunting's social and environmental benefits are challenging to estimate in monetary terms, a recent analysis of hunting's economic impact in 2018 revealed that Alberta's hunting, fishing, trapping, and sport-shooting activities generated total revenue of $2.35 billion in 2018,

which positively impacted Alberta's GDP, contributing $1.8 billion (0.5%), supporting 11,700 jobs, and generating $875 million in labour income. Notably, 25% of total hunting, fishing, trapping, and sport-shooting activities spending in 2018, amounting to $593 million, was from hunting-related expenses. These statistics underscore hunting's significant contribution to the province's economy (Conference Board of Canada, 2018).

The province's abundance of game species, hunting traditional identity, hunting biological and socio-economic benefits present a unique socio-ecological landscape to review the hunting activity decline reasons and the potential influence of increasing awareness of food involvement and the harvest of their own protein as a unique alternative for regular ones retaining hunters in the field and having the benefits of their contributions in wildlife management efforts.

1.3 Literature review

Some studies discuss that modernization and its consequences, such as increased levels of education and income, as well as urbanization, have been causing a large-scale shift in people's beliefs and attitudes toward the acceptance of hunting as a wildlife management action and an increasing decline in North American hunters' participation in the last few decades (Auger, 2006; Cerri et al., 2018; Manfredo, 2008; Manfredo et al., 2009; Stedman & Heberlein, 2001).

Meanwhile, considering cognitive hierarchy to understand changes in human-wildlife interactions at the individual and social levels (Manfredo, 2008; Manfredo et al., 2009) clarifies the importance of socio-psychological considerations and knowledge of humans' ideas and behaviours to encourage participation in wildlife-related activities (Vaske & Manfredo, 2012). Vaske and Manfredo (2012) define sociopsychology as "a scientific study of how people's ideas, attitudes, and behaviours are affected by their environment." In other words, it aims to understand how motives, beliefs, perceptions, attitudes, norms, and life patterns influence behaviours concerning wildlife management actions and assumes motives, attitudes, beliefs, and norms can contribute to understanding behaviours such as participation in hunting.

Additionally, from 1999 to recent years, of the motivations related to hunting, taking the meat home has a special place in most studies (Montgomery & Blalock, 2010). Thus, keeping hunters in the field requires thorough approaches and practical initiatives to increase the satisfaction of

infrequent hunters by focusing on the hunting benefits. As in the study of hunting and the local food movement, Stedman et al. (2017) discuss, efforts are being made in different parts of the United States to explore the possibility of increasing the number of hunters by connecting them with the evolving food culture. It has been observed that people's perception of hunting can be influenced by meat consumption, as hunting to obtain local, free-range meat has been mentioned as one of the acceptable reasons for hunting (Stedman et al., 2017). This approach can potentially contribute to wildlife conservation efforts and possibly slow down the decline in the number of hunters.

Given the significance of demographics and socio-psychological factors in explaining people's intentions and behaviours, as well as the potential influence of game meat as a powerful hunting motivation, this study chose a thorough approach to examine hunters' demographics and motives and obstacles to hunting and consuming game meat, attitudes toward meat, environmental beliefs, social norms, and their involvement with food to explain the possibility of acquiring game meat as a driving force to push people engaging in hunting. The literature reviewed examines demographics and socio-psychological dimensions of people's decision to participate in hunting for meat and demonstrates the association among research variables.

1.3.1 Hunting motivations

The term "motivation" is defined by Manfredo et al. (2004) as a "specific force directing an individual's behaviour to satisfy a goal." Motivation theory helps to answer some questions like "Why do people hunt waterfowl with friends, hunt deer alone, and go wildlife viewing with family members." Hunters typically seek a variety of fulfillments depending on personally significant hunting motivational reasons (Decker et al., 2001). These motivational goals may be to harvest an animal for meat, to spend time outdoors, or to spend time with friends and family (Woods & Kerr, 2010; Watkins et al., 2018; Hinrichs et al., 2021; Vayer et al., 2021). In a case study of 204 Maine (United States) non-resident moose hunters, Auger (2006), through a quantitative survey, found that the significant motivations of non-resident moose hunters were the experience of the hunt, being outdoors, experiencing adventure and excitement, experiencing new and different things, experiencing the challenge of the activity, and being with family and friends. Similarly, Hayslette

et al. (2001), in the mail survey of dove and non-dove small game hunters in Alabama, discuss family traditions, spending time with friends, enjoying nature, and meeting bag restrictions as crucial hunters' motivations that encourage them to hunt (Gigliotti, 2000). The survey of 2169 Nebraska resident and non-resident hunters' satisfaction also discusses that seeing the game, the opportunity to shoot game and harvesting game are the most significant determinants of hunting satisfaction for all types of Nebraska hunters (deer, waterfowl, upland game, and spring turkey hunters) (Gruntorad et al., 2020).

Additionally, Schroeder et al. (2006) discuss the linkage between experience preferences, hunting satisfaction and participation and cite two different groups of hunters as "long-time" and "less engaged" waterfowl hunters. In a survey of 2400 Minnesota waterfowl hunters, Schroeder et al. (2006) found that the most significant motivations of less engaged hunters were enjoying nature and thinking about personal value. Through a cluster analysis, Schroeder et al. (2006) find that long-time hunters are motivated by the experience of being in nature, and their satisfaction is positively dependent on "bagging ducks and geese" and getting food for their families.

Highlighting the importance of hunting experience in directing hunters' motivations, a survey of Alaskan big game hunters found that while the enjoyment of being outdoors, the challenge of hunting, the chance to socialize, the family tradition, and meat are essential hunting motivations for all groups of hunters, advanced hunters are primarily driven by family tradition and social factors and hunting for meat is the most important motivation for intermediate[2] hunters (Aastrup et al., 2021). In Alberta, a telephone survey of 2,023 hunters describes Albertan hunters are younger than hunters from other parts of Canada and prefer primarily buying big game licenses (57%) to small game licenses (6%). Albertan hunters' most significant motivations are spending time outdoors in nature, having quality time with friends and relatives, having good hunting experience in the past, having good access to hunting land, experiencing enjoyment and thrill through new experiences and challenges, and participating in sport and obtaining meat

[2] Self-assessed skill level of the hunter, including beginner, intermediate, and advanced.

(Econometric Research Limited, 2009). In addition, the survey of 25,571 Canadian anglers, hunters, trappers, and sport shooters indicates that while for most of the respondents, the primary motivation for participating in the activities is for recreation and enjoying the outdoors, food or sustenance is the second most popular motivation for hunting (The Conference Board of Canada, 2018).

Some researchers focus on the significant linkage between obtaining wild game meat and participation in hunting activity. They discuss procuring game meat as hunters' top motivation, potentially affecting hunting satisfaction (Birdsong et al., 2022; Black et al., 2018; Hinrichs et al., 2021). The locavore movement survey of the Finger Lakes Region of central New York found that "relaxing and enjoying time outdoors," "interacting with and learning about nature," "spending time outdoors with family and friends," and "improving mental health" were rated high as potential reasons for engaging in wildlife-based recreation like hunting. However, "obtaining natural food from local sources" and "becoming more connected to the place where they live" are the two most direct hunting motivations which encourage the consumption of locally produced or harvested food and hunting participation (Tidball et al., 2014; Stedman et al., 2017).

The survey comparing anglers, small and upland game hunters, and waterfowl hunters' motivation found that big game hunters rank game meat as a more important driving force for hunting (Hinrichs et al., 2021; Watkins et al., 2019). This finding is supported by the study of United States students' motivation to harvest and consume game meat. Authors assert that obtaining game meat and supporting wildlife conservation are the strongest motivations of potential hunters (Vayer et al., 2021). In addition, some studies look at hunting motivation regarding gender. They discuss that women are more likely to hunt to bring meat home than men and rate acquiring high-quality food as a more important reason for hunting (Birdsong et al., 2022; Black et al., 2018; Czarniecka-Skubina et al., 2022).

Highlighting the importance of demographics on the hunting frequency, in the survey of 228 game hunters, Montgomery & Blalock (2010) discuss that demographics and individual characteristics determine who hunts, why they hunt, where, and what they hunt. They found that most hunters are men from rural areas with above-average incomes, the ability to travel locally,

access to private lands, free time, and an increased interest in the sport. In exploring the relationship between income level, hunting site availability, and duck hunters' participation, Montgomery & Blalock (2010) discuss that an increase in both income level and the availability of hunting sites can lead to more hunting opportunities and successful hunts, ultimately impacting participation in a positive way (Miller & Hay, 1981). Inconsistent with these studies, Cerri et al. (2018) discuss that the decline in hunting participation is influenced by urbanization and the socio-economic impacts of modernization, including higher income and education levels.

In the studies reviewed, authors draw attention to the significant hunting motivations, including spending time outdoors in nature, having quality time with friends and relatives, having good hunting experience in the past, having good access to hunting land, experiencing enjoyment and thrill through new experiences and challenges, and participating in sport and obtaining meat. What is evident from the reviewed studies is the significant effect of game meat on hunting participation, as well as its unique contribution to lessening the objections toward hunting. In addition, hunting motivation literature implies differences between men and women in their primary hunting motivation and the difference that demographics bring. Table 1.1 provides the hunting motivation literature summaries.

Table 1.1 Hunting motivations identified from reviewed sources.

Authors	Origin-Respondents(N)	Research Purpose	Method	Major hunting motivation
Gigliotti, (2000)	Dakota, USA, Deer hunters, n=1704	To explore the relationship between harvest success and hunting satisfaction	Mail-back survey	Acquiring meat, trophies, being in nature, solitude, exercise.
Hayslette et al. (2001)	Alabama, USA, Dove hunters, n=1178	To identify hunting motivations contributing to the development and maintenance of dove hunting behaviour	Mail-back survey	Family tradition, friendship, being in nature, and filling bag limits
Schroeder et al. (2006)	Minnesota, USA, Waterfowl hunters, n=2454	To identify different hunting experiences' impacts on waterfowl hunters' satisfaction.	Mail-back survey	Enjoying nature, getting food, getting away from crowds.
Auger, (2006)	Maine, USA, Moose hunters, n=204	To identify the needs, satisfaction, and hunting participation of non-resident moose hunters	Mail-back survey	Being outdoors, experiencing adventure, excitement, and challenge, and being with family and friends.
Econometric Research Limited, (2008)	Alberta, Canada, Hunters, n=2023	To study the socio-economic impact of Hunting and Fishing in Alberta	Telephone and Web-based survey	Being in nature, spending time with friends and relatives, good hunting experience, good access to hunting land, experiencing enjoyment and challenge, acquiring meat.
Tidball et al. (2014)	NY, USA, Hunters and non-hunters, n=471	To identify factors affecting the integration of wild-caught fish and game into local food systems	Web-based survey	Spending time outdoors, learning about nature, being with family and friends, mental health, and acquiring meat.
Black et al. (2018)	Dakota, USA, Deer hunters, n=1386	To assess factors affecting deer hunters' satisfaction	Mail-back survey	Acquiring meat.
Conference Board of Canada, 2018	Canada, all provinces, anglers, hunters, trappers, and sport shooters, n= 25,571	To study the total economic footprint of fishing, hunting, trapping, and sport-shooting activities in Canada	Web-based survey	Recreation and enjoyment of the outdoors, and acquiring food.

Continued Table 1.2 Hunting motivations identified from reviewed sources.

Authors	Origin-Respondents(N)	Research Purpose	Method	Major hunting motivation
Gruntorad et al. (2020)	Nebraska, USA, Hunters[3], n= 2169	To explore the determinants of Nebraska hunters' satisfaction	Web-based survey	Seeing the game animals, the opportunity to shoot and harvest game.
Hinrichs et al. (2021)	USA, Hunters, n=7,875	To understand the relationships between preferred hunting activity types and hunters' motivations	Web-based survey	Acquiring meat.
Vayer et al. (2021)	USA, Students, n=17,203	To identify factors related to past and future hunting participation	Web-based survey	Acquiring meat and wildlife conservation.
Aastrup et al. (2021)	Alaska, USA, Big game hunters, n=200	To explore beginner, intermediate, and advanced hunters' motivations	Mail-back survey	Being outdoors, experience the challenge of hunting, socializing, family tradition, and acquiring meat.
Birdsong et al. (2022)	Alabama, USA, Hunters, n=700	To identify the non-traditional backgrounds' impacts on pathways into hunting and hunting motivations	Mail-back survey	Acquiring meat.

[3] Resident and non-resident deer, waterfowl, upland game, and spring turkey hunters.

1.3.2 Game meat consumption motivations

Meat has been a dietary staple for many years due to its high protein, fat, and mineral content. However, meat production is a complex and challenging process with swift ethical and environmental implications (Ruby et al., 2016). Beef consumption, for example, has been linked to weight gain because of its high energy density and some degenerative diseases. Moreover, meat production is associated with animal welfare concerns, ethical issues surrounding the treatment and slaughter of animals, and environmental damage, making it a multifaceted and complicated topic. Popoola et al. (2020) noted that consumers' growing awareness about health, environment, and diversity has led them to pay more attention to the nutritional quality and environmental impact of the meat and protein they consume. According to the authors, this shift in consumer behaviour may lead to increased demand for red meat from alternative animal species, which refers to game or non-domesticated animals (Hoffman et al., 2006).

A study by Poławska et al. (2013) compared alternative species' protein and fat content with beef and chicken, highlighting the favourable fat/protein ratio as a critical characteristic of ostrich and venison meat. Authors discuss that despite a constant protein content in all species, ostrich and venison meat have a low-fat range, making alternative species healthier than beef and chicken. Alternative species also have a good profile of fatty acids and iron content compared to beef and chicken meat. Vigano et al. (2019) furthered these findings and drew attention to the good essential fatty acid content and positive ω6/ω3 ratio of wild game meat due to the animal's natural diet.

Considering the unique features of wild game meat, researchers talk about different motivations that push people to consume game meat. In the study of sustainable food consumption, Novi et al. (2014) found healthy eating patterns, interest in cooking, and supporting environmental policy as determinants of sustainable food consumption. Tidball et al. (2014) also discuss the connection between food movements, wildlife conservation and an increased interest in eating local and environmentally sustainable foods.

In a survey of 471 subscribers to the Edible Finger Lakes magazine and newsletter in the Finger Lakes Region of central New York, Tidball et al. (2014) found that people's most significant motivations to join the local food systems were supporting the local area, personal health, and

nature conservation. Through a descriptive analysis, Tidball et al. (2014) find that almost all the respondents (99%) agree to consume locally raised-harvested meat and the significance of "meat quality and freshness," "meat taste," and "conservation-related issues" are motivations of game meat consumption (Stedman et al., 2017).

Aligned with the efforts to strengthen hunting participation through links to food, Kwiecińska et al. (2017) pose the attractive dietary flavour and the outstanding chemical composition of game meat and consumers' nutritional knowledge of game meat and note that game meat can address the needs of today's consumers as an alternative to meat sourced from domestic animals in the coming years. A northern Italy case study of consumer preferences for red deer meat found that meat taste, tradition, and nutritional properties are significant attributes of game meat recognized by participants, motivating them to consume it. The study participants explain that "wild game meat tastes good, possesses good nutritional properties, is traditional and is safe to eat" (Ljung et al., 2015; Ljung et al., 2012; Demartini et al., 2018; Tomasevic et al., 2018). Ljung et al. (2015), in a Survey of Swedish hunters and non-hunters, also mention "animal welfare" and "environmental concerns" as highlighted reasons to eat game meat (Ljung et al., 2012; Tomasevic et al., 2018).

Similarly, Czarniecka-Skubina et al. (2022), in exploring the 1261 adult Poles' preferences to include wild game meat in their diet, discuss that game meat's taste, health properties, family tradition, and game meat natural origin, as well as easy access to game meat, participation in hunting and the need to use the obtained meat are the crucial Poles' reasons for consuming game meat. Authors find that consumers like game meat's taste and other sensory characteristics such as tenderness and juiciness, appreciate game meat's health values, and have easy access to it as well as a family tradition and habit of eating game meat.

The study of 450 purposively selected Polish game meat consumers explores what pushes consumers to include game meat in their diet. Niewiadomska et al. (2020) find that game meat taste, nutritional value, low-fat content, and origin are significant determinants of game meat consumption. Authors discuss an increase in the importance of game meat taste, healthy nutrition,

and the national origin of meat, motivating consumers to consume game meat more often, even in the future (Niewiadomska et al., 2021; De Souza, 2022).

Some papers reviewed deal with the effects of demographics and gender differences in game meat consumption frequency. Czarniecka-Skubina et al. (2022), in the survey of 1261 Poles, discuss that the low frequency of game meat consumption belongs to women. Inhabitants of rural areas are more interested in the consumption of game meat. In addition, the frequent eating of game meat belongs to young and educated consumers with a high-income level. Similarly, in a survey of the Michigan population, through linear regression, Goguen et al. (2020) found that the level of hunting experience, social network, and urbanization were dominant predictors of wild-harvested meat consumption frequency. They discuss that the game meat consumption frequency for someone living in an urban community is lower than for someone living in a rural community. At the same time, gender alone does not determine consumption patterns (Smith et al., 2018).

However, Ruby et al. (2016) look at the role of beef in people's lives based on gender. While beef is a popular food choice among respondents, the results indicate that gender plays a significant role in shaping attitudes towards beef consumption, with men expressing more positive views. The study also found that men tended to consume beef more frequently than women, highlighting the impact of gender on dietary preferences. Additionally, a recently published study by Frank and colleagues (2021) explored the link between socio-demographics and red and processed meat consumption across North American countries. The study revealed that men tend to consume more red and processed meat than women in these regions. Furthermore, among those who do consume meat in the US and Canada, men have a significantly higher average intake than women. The authors also found that education can strongly predict a person's red and processed meat consumption in these countries, with education being a more reliable indicator of dietary quality than wealth or income. As in the US and Canada, well-educated individuals were less likely to consume red and processed meat. Marescotti et al. (2018) imply the positive impact of the highest general awareness of wild game meat and hunting on the consumption level of wild game meat. Table 1.2 summarizes the literature on game meat consumption motivation at one glance.

In the reviewed studies, the authors highlighted various reasons people consume game meat, which include following healthy eating patterns, having an interest in cooking, being concerned about the welfare of game animals, having a tradition of eating game meat, valuing its sensory and nutritional benefits, appreciating its natural origin, continuing a family tradition, having easy access to game meat, and having a need to use the meat obtained. In addition, these studies indicate that one's income level, level of general awareness of wild game meat and hunting, education level, and type of residence impact how often game meat is consumed.

1.3.3 Game meat consumption barriers

Despite the numerous advantages of wild game (sensory and nutritional value and natural origin), there are reasons for the low consumption of game meat that mainly originate in people's concerns about its attributes. Some studies discuss the barriers that prevent people from eating game meat. For example, in a survey of New York locavores, Tidball et al. (2014) find that the lack of skills needed to hunt wild game, absence of hunters in social networks, concerns about food safety and process/preparing wild game meat are the significant reasons for the low consumption of game meat. They also discuss the time required to hunt and prepare game meat and the general reluctance to kill animals as significant deterrents to game meat consumption (Stedman et al., 2017).

In accord, Demartini et al. (2018), in a survey of Italians' preferences for red deer meat, discuss reasons for the negatively disposed to game meat consumption. They found that negative perceptions of game meat's environmental properties, game meat quality and difficulties in game meat cooking were the most significant reasons for reluctance to consume game meat. While it is said that wild-harvested meat is free of antibiotics, hormone supplements, and other additives (Goguen & Riley, 2020), Fantechi et al. (2022), in a survey of Italian game meat consumers and non-consumers, draw attention to food safety concern as the main barrier to wild game meat consumption. In addition, a recent study by Meeks et al. (2022) explores the impact of Chronic Wasting disease risk perception on hunting participation. The study surveyed 5000 deer hunters in Western Tennessee and found that concerns over CWD health risks can discourage hunters from

continuing to hunt. Specifically, Tennessee deer hunters appear to be less inclined to continue hunting when they believe that CWD poses a risk to human health.

However, some studies suggest otherwise. For instance, in a recent assessment of Alberta mule deer hunters' views of the widespread CWD, Pattison-Williams et al. (2020) discuss that hunters still engage in hunting mule deer in CWD-affected regions, and the prevalence of CWD does not significantly impact their hunting activity. Through a nationwide survey, Niewiadomska et al. (2020) focused on the ease of game meat preparation as a significant factor in determining its consumption. They find that consumers who pay more attention to the ease of preparing game meat tend to eat it less frequently. Furthermore, Niewiadomska et al. (2020) discuss that cooking dishes with game meat is considered complicated and time-consuming, which stops consumers from eating it. It has also been revealed that the level of game consumption is determined by consumers' concerns about its safety through exposure to toxic substances or pathogens (Niewiadomska et al., 2021).

The survey of Polish consumers' preferences regarding including game meat in their diet discusses wild game's unfavourable taste and aroma, lack of any tradition of eating game meat and fear of diseases have made game meat less attractive to consumers. Furthermore, the authors found that the lack of knowledge about game meat and the required skills in preparing a tasty dish has made Polish consumers think that game meat would be unpalatable, and negative experiences in the cooking process can cause a lack of acceptance of the taste of the game in general (Czarniecka-Skubina et al., 2022).

The study of Sweden's urban and rural residents also draws attention to the lack of hunting or not having a hunter in the social network as a determinant of less game meat consumption (Ljung et al., 2015). In accord, Niewiadomska et al. (2020) highlight the significance of the level of knowledge about wild game meat and its products predicting game meat consumption. According to the authors' perspective, hunters and their families believe that transmitting knowledge of game meat preparation, along with the tradition of consuming it, encourages the frequent consumption of game meat (Demartini et al., 2018; Czarniecka-Skubina et al., 2022).

The reviewed studies indicate the obstacles that impede hunting and game meat consumption. These hindrances include a lack of hunting skills, insufficient knowledge and time required to process and cook game meat, aversion to animal killing, absence of hunters in social networks, negative perception of game meat's environmental impact and quality, cooking difficulties, safety concerns, inadequate awareness of game meat, inexperience in preparing game meat, unpleasant taste and aroma of game meat, absence of a tradition of game consumption, and safety concerns. Table 1.2 summarizes the literature on game meat consumption barriers at one glance.

Table 1.3 Game meat consumption motivations and barriers identified from reviewed sources.

Authors	Origin - Respondents (N)	Research Purpose	Method	Primary Game meat consumption motivation	Game meat consumption barriers
Novi et al. (2014)	Denmark, Finland, Norway, Sweden Public, n= 8248	To examine sustainable food consumption	Web-based survey	Healthy eating patterns, interest in cooking, and supporting environmental policy	-
Tidball et al. (2014)	NY, USA, Hunters and non-hunters, n=471	To identify factors affecting the integration of wild-caught fish and game into the local food system	Web-based survey	Game meat quality and freshness, game meat taste, conservation-related issues	Lack of skill to hunt, lack of skill and time to process and prepare game meat, dislike killing animals and absence of hunters in social networks.
Ljung et al. (2015)	Sweden, Public, n=1,703	Compare urban and rural residents' attitudes toward hunting	Mail-back survey	Health concerns, game meat price, game meat taste, game animals' welfare and environmental concerns	Low access to game meat.
Kwiecińska et al. (2017)	Poland, Public, n=1000	To identify the determinants of game meat consumption	Web-based survey	Dietary flavour and chemical composition of game meat	-
Demartini et al. (2018)	Italy, Public, n= 721	To identify consumer preferences for red deer meat	Mail-back survey	Game meat taste, game meat eating tradition, game meat nutritional properties	A negative perception of game meat's environmental properties and quality, difficulties in cooking game meat.
Niewiadomska et al. (2020)	Poland, Game meat consumers, n=450	To identify factors affecting consumers' decisions to include game meat in their diet	Computer-assisted and telephone survey	Game meat taste, game meat nutritional value, game meat natural origin	Difficulty in game meat preparation, Game meat safety concerns.
Czarniecka-Skubina et al. (2022)	Poland, Public, n=1261	To identify preferences to include wild game meat in the diet	Web-based survey	Game meat's sensory and nutritional values, natural origin, the family tradition of the eating game, easy access to game meat and the need to use the obtained meat	Lack of Knowledge of game meat, lack of skill in preparing game meat, game meat's unpleasant taste and aroma, absence of a tradition of game consumption, and safety concerns.

1.3.4 Social norms

Norms are expectations an individual learns from and modifies through social interactions (Larson et al., 2014). A norm affects an individual's behaviour depending on factors, including how strongly a person wants to belong to a group, how relevant that group is for a given situation, and how significant the norm is to the group's identity (Decker et al., 2001; Manfredo et al., 2008). For example, people react to an event or situation when it attracts their attention; in this condition, people estimate the need to respond, determine whether action is possible, and assess whether they can act. In such cases, a person's internal beliefs are prompted along with specific subjective norms. Subjective norms will be highly significant if people are conscious of their behaviours' effects and feel committed to the situation (Schwartz & Howard, 1982; Vaske & Manfredo, 2012).

Ljung et al. (2015) point out the positive influence of having a hunter in the household on the attitudes toward hunting activity. Growing up with parents who are hunters and social interaction with hunters apply the power of norms to match individuals' attitudes up to their group of friends and family's thoughts and act as a strong incentive in recruiting and retaining new hunters (Ljung et al., 2012; Marescotti et al., 2018).

Hunting is a "learned and socialized behaviour" entwined with one's actions, beliefs, and social standing and having a hunting history might encourage hunting activity (Stedman & Heberlein, 2001). In the survey of Alabama small game hunters, Hayslette et al. (2001) discuss that social context impacts hunters' decisions to engage in hunting by affecting subjective norms. Family tradition influences attitudes and subjective norms and pushes people to engage in hunting.

Stedman & Heberlein (2001), by a telephone survey of 769 Wisconsin households (United States), found that individuals from hunting families are more likely to take up hunting, and family support lessens the negative effects of living in a large city. Hunting is more common among those who live in small towns, and immediate family members are the primary initiators of hunting involvement. The likelihood of people's engagement in hunting increases if their fathers hunted while they were children. Additionally, childhood and current community residence might influence social norms. Wilkins et al. (2019), in a survey of 1030 United States residents'

perceptions of hunting, discuss that the strongest intention to hunt belongs to individuals who have grown up in rural areas and are still living there, followed by those who have migrated to a larger community. People who move from a rural to an urban area may still know people who hunt and are influenced by those personal norms since they are more inclined to engage in an activity if they know others who do it. In a qualitative study of meat-related norms, Linville et al. (2021) discuss that households with a hunter hold high importance and a taste preference for game meat, as well as the strong beliefs that a healthy diet should include meat. These families' expectations and norms to eat meat daily encourage the measurable wild game consumption frequency, approximately once a day.

In some papers reviewed, the role of hunters' social networks became significant in distributing wild-harvested meat and its consumption frequency (Ljung et al., 2015; Smith et al., 2018; Goguen et al., 2020), which Czarniecka-Skubina et al. (2022) in the survey of 1261 poles found that hunters and their family members or their friends eat game meat more often because of a need to use the obtained meat. They find that half of the respondents eat game less than once a year, and those who eat more often hunt themselves or have a hunter in their family and live in villages or small towns. The New York consuming wild-harvested meat survey also discusses that 77% of locavores receive game meat from family or friends, 8% harvest it themselves, and 10% consume it at a potluck or wild game dinner (Stedman et al., 2017).

Thus, given the studies reviewed, social norms are an integral part of people's daily lives, influencing their behaviour as individuals and as members of groups. People's innate need for acceptance shapes these norms and forms the foundation of group unity. Norms impact not only individuals' behaviour in groups but also when they are alone and consider how others perceive them. Social norms support hunting traditions and the consumption of wild game meat. While attitude is the primary factor in the decision to hunt and consume game meat, social surroundings and subjective norms can also influence this decision, as ultimately, attitude is linked to social pressure in this context.

1.3.5 Attitudes toward meat

Attitude refers to a person's evaluation of an idea, thought, or action, which might be favourable or unfavourable. In addition, attitudes can predict and shape behaviour (Decker et al., 2001). Studying the linkage between one's attitude toward hunting and attitude toward consuming wild game meat is crucial due to the numerous beliefs surrounding hunting. While some view hunting as an effective method of controlling wildlife populations, others may reject it for ethical reasons. Some studies highlight the correlation between attitudes and the consumption of wild game meat (Demartini et al., 2018; Tidball et al., 2014; Marescotti et al., 2019). Understanding attitudes helps address different perspectives on hunting (Fantechi et al., 2022).

Ljung et al. (2015), in a survey of Swedish game meat consumers, discuss the importance of game meat consumption in directing positive attitudes toward hunting. Through a path analysis, they find that game consumption has the most significant effect on attitudes, as Swedes who consume game meat express a positive attitude toward hunting activity. While the impact of game meat consumption seems similar in urban and rural areas, Ljung et al. (2012) discuss that attitudes toward hunting are more strongly correlated with the frequency of game meat consumption than having parents, friends, or household members who hunt. However, Linville et al. (2021), through a qualitative study on meat-related attitudes, discuss individuals with connections to hunting tend to have more positive attitudes towards meat and consume it more frequently.

In a survey of 625 Italian consumers' behaviour towards wild game meat, Fantechi et al. (2022) discuss that consumers' views on animal welfare and hunting significantly impact their perspective on consuming wild game meat. People who prefer wild game meat express greater attention to animal welfare. Furthermore, they found that young people have a more negative attitude toward wild game meat, and men have a more positive attitude toward game meat than women (Niewiadomska et al., 2020). In accord, Marescotti et al. (2019) assert that male consumers with a higher level of education and income possess a higher level of knowledge about game meat and display favourable attitudes toward consuming wild game meat.

Based on the reviewed studies, it is evident that consuming game meat leads to positive attitudes toward hunting. This, in turn, influences game meat consumption and participation in

hunting activities. Attitudes significantly impact behaviour, and promoting the consumption of game meat can encourage more people to participate in hunting. Furthermore, the studies suggest that factors such as education level, income, and gender can also affect attitudes toward wild game meat.

1.3.6 Level of food involvement

The concept of involvement refers to the level of perceived importance, interest, attachment, and arousal towards a product (Castellini et al., 2022), which consumers link to enduring or situation-specific goals. It impacts the degree of involvement in the products' purchasing and consumption decisions (Verbeke & Vackier, 2005; Kamrath et al., 2019) by involving various psychological dimensions, including social, cognitive, affective, and identity-related factors, influencing consumers' attitudes and evaluations of food. (Castellini et al., 2023; Lee et al., 2019; Lee et al., 2020). In a recent study, Lee et al. (2020) developed a food involvement inventory (FII) for contemporary consumers. Through exploratory factor analysis, the researchers identified four attitudinal components as constructs for the FII: affective, cognitive, behavioural purchase, and behavioural cooking. The authors evaluated the effects of food involvement through items that represent behavioural outcomes. While this research focuses on the affective and cognitive components to measure consumers' emotional and knowledgeable states, it draws attention to the importance of behavioural components to measure consumers' intention or willingness to act, which indicates the progress of cognition and behaviour in specific food-related situations.

A qualitative study on Food Involvement through a psychological perspective discusses that Italian adults experience food involvement as a self-transformative process that enables them to realize their self-centred goals (Castellini & Graffigna, 2022). This process empowers individuals to actively engage with food and use it to transform themselves and their self-concept. This transformation is achieved by incorporating food attributes into personal self-expression, allowing them to become the person they aspire to be. Through fourteen in-depth phenomenological interviews, Castellini & Graffigna (2022) cite four psychological domains for the level of involvement in food. These domains include "emotional balance," where individuals use food as

a source of joy and well-being; “social affirmation,” where individuals use food as a means to signal their social identity to group members or to follow norms of a social group or culture; “self-realization,” where food is used as a means of expressing oneself and one’s personality and “social bonding,” where individuals use food to strengthen their relationships with loved ones. In accord, in a web survey of 512 Italian adults assessing the psychometric properties of the level of Food Involvement, Castellini et al. (2023) found that frequent vegetable-based milk consumption as an alternate beverage by Italians was correlated positively with emotional balance, self-realization and social-affirmation which reflect the symbolic value attributed to this type of product, while meat and fish consumption pattern was significantly associated with higher levels of emotional balance and social bonding. Meat consumption is perceived as a product consumed in a group context with friends and loved ones.

An individual’s level of food involvement could be a driving force for developing healthy eating habits. For example, Marshall and Bell (2004) discuss that individuals with a higher level of food involvement are more interested in exploring new foods and making dietary changes to improve their health. Similarly, in a telephone interview with 350 German consumers, Kamath et al. (2019) discussed that strong involvement in dietary supplements positively affected the intention to search for information about these products and the frequency of consumption.

Highlighting the effects of consumer involvement in fresh meat, Verbeke and Vackier (2005), in a study of 592 Belgium meat consumers, find involvement in fresh meat is a multidimensional construct, including the dimensions ‘‘pleasure value’’, ‘‘symbolic value’’, ‘‘risk probability’’ and ‘‘risk importance’’ which pleasure value is the dominant facet of involvement in fresh meat. Pleasure value implies emotional balance as a significant aspect that can capture consumers’ involvement in fresh meat. This finding supports Kwiecińska et al. (2017)’s study of Polish game meat consumers. Kwiecińska et al. (2017) discuss that consumer behaviours related to the selection and consumption of meat are multidimensional and primarily conditioned by determinants associated with the perception of meat in a given culture and society and depend on the pleasure of eating it.

The reviewed studies shed light on the critical role of food involvement in predicting and explaining responsible and healthy consumption choices. They establish a close relationship between the subjective value of food and such choices. Studies discuss a strong correlation between a person's level of food involvement and their attitudes toward food products, leading to a compelling desire to explore new foods and modify their diets. The level of food involvement highlights the psychological aspects of people's food consumption, such as emotional balance, social affirmation and social bonding, as primary drivers of consumer decision-making regarding specific food products.

1.3.7 Environmental beliefs

Personal values are key determinants of a wide range of environmental beliefs and behaviours (De Groot and Steg, 2008; Steg et al., 2014). Personal values are fundamental basic beliefs that people use to select and justify actions (Schwartz & Howard, 1982), which act under the people's awareness of actions' consequences for themselves, others, and the natural world (Ojea and Loureiro, 2007). Ojea and Loureiro (2007) discuss that the concept of being aware of consequences is rooted in the idea that when a person becomes conscious of the potential outcomes of their actions, they are more likely to take responsibility for their behaviour and make decisions that prevent negative environmental consequences. Various studies have explored the impact of environmental beliefs on an individual's decision-making process, including their acceptance of environmental policies (Nilsson et al., 2016) and participation in wetland restoration (Cyr, 2016). According to these studies, individuals with strong environmental concerns are more inclined to engage in conservation programs regardless of other influencing factors.

In a survey of Spanish residents' willingness to pay for environmental goods and species recovery, Ojea and Loureiro (2007) applied the awareness consequences scale to measure general environmental beliefs based on value orientations. Ojea and Loureiro (2007) find that value orientations by shaping pro-environmental attitudes are positively related to the willingness to pay for wildlife conservation. Through a regression analysis, they found value orientations that drive

people to pay for wildlife conservation origin from the consequences of the common murre[4] extinction on themselves and the things they value most. Another study conducted by Johnson & Horowitz (2014) of 277 residents living near urban wetlands in New Jersey, USA, discusses that public awareness of wildlife's negative impacts can improve wildlife management. The study also revealed that the resident's perception of the ecological effects of deer on the neighbouring wooded wetlands influenced their views on deer management. Those concerned about deer's adverse effects on the wetlands were more likely to support measures to manage the deer population. Moreover, hunting support was mainly influenced by the perceived consequences and effectiveness of hunting and low deer acceptance capacity. Those who believed the neighbouring wetland had high biodiversity were also more likely to support hunting to protect it from deer, possibly due to their concern for its vulnerability. The study suggests that specific care and concern for the wooded wetlands could enhance residents' desire to protect them from negative deer impacts.

In accord, Hrubes et al. (2001) present a "value-attitude-behaviour cognitive hierarchy" and discuss that wildlife value orientations and core life values explain the variation in wildlife-related beliefs and attitudes that ultimately influence whether a person chooses to engage in hunting. In a study conducted by Stern et al. (1995), 199 residents of Fairfax County, Virginia, were interviewed over the phone to determine how their beliefs and values about the impact of environmental conditions could influence their environmental attitudes. The study found that public concerns are often shaped by information linked to commonly held values and the actions of organized interest groups that selectively publicize information to influence people's attitudes. As a result, variations in attitudes toward new environmental issues may be affected by individuals' values and responses to the available information.

Reviewed studies highlight that values significantly guide, motivate, and shape attitudes and behaviours. They act as higher-order cognitive representations of human motivations and life

[4] A marine bird (Ojea and Loureiro, 2007)

orientations, predicting attitudes and behaviours in a causal relationship. Various studies have confirmed this significant relationship between values, attitudes, and behaviours (Boar & Fischer, 2013).

Upon reviewing the game meat consumption literature, it was found that several significant factors impact game meat consumption. Considering these factors, it was determined that the theory of planned behaviour would be the most appropriate approach for assessing the research hypotheses and better understanding the drivers behind game meat consumption.

1.4 Theory of planned behaviour

For the analysis of the game meat consumption intentions in Alberta, the theory of planned behaviour was utilized to understand the various factors influencing the intention to consume game meat and engage in hunting. Ajzen (1991) states, “theory of planned behaviour provides a useful conceptual framework for dealing with the complexities of human social behaviour. The theory incorporates some of the central concepts in the social and behavioural sciences, and it defines these concepts in a way that permits prediction and understanding of particular behaviours in specified contexts”. According to McDermott et al. (2015), the theory of planned behaviour (TPB) suggests that the primary factor influencing behaviour is an individual's intention to perform that behaviour. The authors explain that "intentions" reflect how much effort an individual is willing to put into a particular behaviour based on various factors such as their attitude towards it, their overall evaluation of the behaviour, subjective norms, their beliefs about what others think of their engagement in the behaviour, and their perceived control over it (McDermott et al., 2015).

Graca et al. (2015) discuss that the theory of planned behaviour has been utilized in research on meat consumption to gain insight into consumer behaviour. This theoretical model emphasizes the importance of intentions as a key factor in food choices, which are influenced by attitudes, subjective norms, and perceived behavioural control. Research has shown that intentions to consume meat can accurately predict actual consumption, and three TPB variables have been found to predict intentions to consume meat effectively. In a survey of consumers’ intentions to buy game meat, D’Souza (2022) points out the theory of planned behaviour importance as the directional framework for explaining consumers’ behavioural intentions and the resulting behaviours.

D’Souza 2022 discusses the impact of attitude, social norms, and perceived behavioural control on behaviour and explains that attitudes and social norms positively influence behaviour through intentions, while perceived behavioural control negatively impacts purchase behaviour.

Similarly, Llauger et al. (2021) studied consumers' perceptions of meat and offal-containing products. They discovered that the theory of planned behaviour was a useful tool for predicting consumer attitudes and behaviours. The study's regression analysis revealed that attitude was the most significant predictor of behavioural intention, followed by the subjective norm. Perceived control was the least important factor in the prediction.

Additionally, Hrubes et al. (2001) discuss applying the theory of planned behaviour to predict and model different aspects of human behaviour in wildlife-related recreation contexts. In a survey of hunting intentions and behaviour, Hrubes et al. (2001) found that the theory of planned behaviours dimensions, including attitudes toward hunting, subjective norms, and perceptions of behavioural control, significantly influenced intentions to hunt. These intentions were also strongly correlated with actual hunting behaviour (Wilkins et al., 2019).

Mennozi et al. (2017) apply the theory of planned behaviour to understand young adults’ behaviour in eating novel foods. The results showed that the TPB model was able to predict 78% of the variance in intention and 19% of the variance in behaviour, demonstrating its effectiveness in assessing the likelihood of consuming novel foods. The authors also identified the crucial impact of attitudes and perceived behavioural control on the intention to perform the behaviour. However, the subjective norm was not found to be a significant factor in shaping the behaviour (Povey et al., 2001; Lentz et al., 2018). According to Wilkins et al. (2019), the basic TPB model may not be sufficient in certain situations. Additional background factors may need to be considered to explain more of the variation in behaviour beyond attitudes, norms, and perceived behavioural control.

Thus, this study utilizes a novel theoretical approach by combining the theory of planned behaviour with influential variables found in the literature on game meat consumption. The aim is to gain a better understanding of behavioural intentions. Figure 1.1 displays the theoretical framework of the research, including the hypothetical cause-and-effect relationships between the variables.

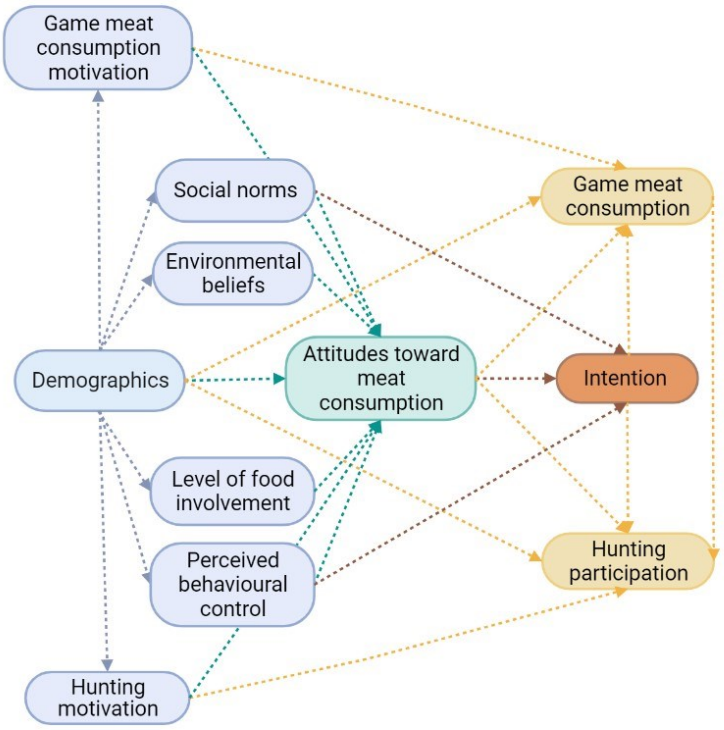

Figure 1. 1. The research theoretical framework [5] identified from the literature reviewed.

1.5 Research objectives and hypotheses

The literature reviewed demonstrates the factors contributing to game meat consumption and hunting participation. Understanding what contributes to and diminishes the motivation to consume game meat and hunting participation is key to creating opportunities to support the efforts to develop these activities. This research aims to examine the impact of the significant factors identified in the existing literature on game meat consumption and hunting participation. Thus, the following research objectives and hypotheses motivate this research:

[5] Created in BioRender.com

The primary objective: Identify key determinants of game meat consumption among hunters residing in Alberta.

The secondary objectives

1. Identify demographic characteristics, hunting experiences, hunting and food-related motivations, attitudes toward meat, social norms, the level of food involvement, environmental beliefs, and game meat consumption patterns.
2. Examine respondents' preferences and barriers related to game meat consumption and hunting.
3. Determine potential connections between wild game consumption and current (or future) hunting participation.
4. Identify how the theory of planned behaviour components contributes to assessing game meat consumption and hunting participation.

The hypotheses to be tested in the study are:

1. Socio-demographic characteristics, environmental beliefs, level of food involvement, hunting and game meat consumption motivations and barriers, and social norms significantly affect attitudes toward meat, intentions to consume game meat and participate in hunting, and game meat consumption and hunting participation.
2. The theory of planned behaviour components (Attitudes toward meat consumption, social norms, and perceived behavioural control) significantly predicts the intention to consume game meat and hunt, and game meat consumption frequency.

CHAPTER TWO

2.1 Introduction

Hunting is a significant aspect of the North American culture (Vayer et al., 2021), serving wildlife agencies to achieve their ecological management goals (Heffelfinger et al., 2013) and contributing to the success of wildlife conservation efforts by forming the foundation of wildlife conservation funding systems (Vayer et al., 2021). In addition, hunting has been reported to socialize, uphold cultural traditions, and provide meat in North American societies, in which wild game as a significant source of natural and local meat can inspire non-traditional hunters to go hunting (Arnett & Southwick, 2015) and affect public perceptions of hunting (Stedman et al., 2017). Despite these benefits, the number of active hunters has declined in recent years. Meanwhile, obtaining game meat as the most acceptable reason for hunting (Decker et al., 2015; Ljung et al., 2012) prompts the exploration of determinants of game meat consumption as a potential strategy to keep hunters continuing their involvement in hunting and to understand what motivates hunters to acquire game meat and include it in their diet.

As outlined in Chapter One, various economic, environmental, and social-psychological factors should be considered when studying game meat consumption and the decline in hunting participation. This research builds on previous studies that have explored the impact of motivations, level of food involvement, environmental beliefs, attitudes, social norms, and perceived behavioural control on behaviour, specifically focusing on game meat consumption and hunting participation behaviour. This chapter explores how the motivations, level of food involvement, environmental beliefs, and components of the theory of planned behaviour, including hunters' perceptions of the benefits of game meat consumption and hunting participation, perceived social pressure to engage in hunting activity, and the difficulty and obstacles hunters perceived to hunt and consume game meat are relevant for Albertan hunters' game meat consumption and hunting participation in the decision-making process.

Studies conducted over the past two decades attribute the decline in North American hunters' participation to the effects of socio-demographic changes, modernization consequences, like

increased levels of education and income, and urbanization, which have brought about significant changes in people's beliefs and attitudes towards the acceptability of hunting as a wildlife management action (Stedman & Heberlein, 2001; Auger, 2006; Manfredo, 2008; Manfredo et al., 2009; Montgomery & Blalock, 2010; Cerri et al., 2018). The emphasis of these studies on the impact of demographics on hunting participation sparks the question of how changing demographics have contributed to recent changes in hunting activity.

In addition, some recent studies suggest socio-demographic factors as dominant predictors of wild-harvested meat consumption frequency. While these studies highlight how factors such as residency type (Kwiecinska et al., 2017; Smith et al., 2018; Goguen et al., 2020; Czarniecka-Skubina et al., 2022), gender (Frank et al., 2021; Niewiadomska et al., 2020; Marescotti et al., 2019; Ruby et al., 2016), age, education, and income (Czarniecka-Skubina et al., 2022; Frank et al., 2021; Niewiadomska et al., 2020; Marescotti et al., 2019) influence consumers' decision to include game meat in their diets, several studies have highlighted socio-psychological factors in understanding human-wildlife interactions (Manfredo, 2008; Manfredo et al., 2009) and discussed how motives, beliefs, attitudes, norms, and life patterns influence behaviours concerning wildlife management actions (Vaske & Manfredo, 2012). Studies reviewed discuss the combined impact of socio-demographic and psychological factors on an individual's choice to hunt and consume wild game meat, highlighting the need for a thorough approach to understanding the key factors that drive these behaviours.

Several motivation studies have examined specific hunter groups such as mourning dove hunters, moose hunters, big game hunters, turkey hunters, waterfowl and upland game hunters, deer hunters, and anglers. These studies' findings show that people hunt for various reasons, including the desire to obtain meat, spend time outdoors, bond with loved ones, experience adventure and excitement, uphold family traditions, connect with their local environment, and support wildlife conservation (Hayslette et al., 2001; Schroeder et al., 2006; Auger, 2006; Tidball et al., 2014; Watkins et al., 2018; Gruntorad et al., 2020; Hinrichs et al., 2021; Birdsong et al., 2022). The authors not only discuss the importance of understanding the effects of fulfilling or failing to fulfill hunting expectations on hunting satisfaction as one strategy to address the decline

in hunter participation but also emphasize the importance of studying motivations given that species-specific types of hunting and locations for an adequate understanding of hunting satisfaction.

The focus of most recent studies on obtaining game meat as a significant hunting motivation sheds light on game meat as a highlighted hunter motivation and raises the question of why people choose to consume game meat. Much work has been done in the US and European contexts that discusses people's reasons for including game meat in their diets. These motivations include the nutritional and sensory value of game meat, game meat's physical and chemical composition, family tradition and the natural origin of game meat, easy access to game meat and participation in hunting, concerns for animal welfare and the environment general awareness of the nutritional benefits of wild game meat (Ljung et al., 2012; Poławska et al., 2013; Tidball et al., 2014; Ljung et al., 2015; Kwiecińska et al., 2017; Demartini et al., 2018; Niewiadomska et al., 2020; Czarniecka-Skubina et al., 2022; Popoola et al., 2022).

A recent study of the locavore food movement discusses the connections among "hunting, fishing, and foodies." The study's authors discuss creative initiatives that uniquely promote hunting and fishing, emphasizing preparing healthy and tasteful meals (Stedman et al., 2017), which highlights how preparing game meat in flavorful cuisines can affect game meat consumption frequency. In accord, Niva et al. (2014) also discuss that an interest in cooking and healthy eating is associated with sustainable, pro-environmental food-consumption patterns. The discussed studies highlight the significant effect of individuals' connection with food and environmental concerns on their decision-making to consume game meat and incorporate it into their diets.

Research has been conducted to investigate how an individual's level of involvement with food impacts their decision-making regarding food choices. The studies have explored how this involvement affects different aspects, such as food intake patterns (Marshall & Bell, 2004), fish consumption behaviour (Verbeke & Vackier, 2005), dietary habits (Castellini et al., 2023), and food-related lifestyle approaches (Lee et al., 2019). The results of these studies indicate that individuals who are strongly involved with food are exposed to various foods and food-related

information in purchasing, cooking, and eating situations, positively impacting their food consumption intention and frequency.

Several studies have also explored the influence of environmental beliefs on an individual's decision-making process. These studies explore how environmental beliefs affect various aspects, such as acceptance of environmental policies (Nilsson et al., 2016), participation in wetland restoration efforts (Cyr, 2016), and willingness to financially support wildlife conservation (Ojea & Loureiro, 2007). These studies' collective findings suggest that individuals with strong environmental concerns are more likely to participate in conservation programs, regardless of other influencing factors.

The theory guiding this study is the theory of planned behaviour, which has been added to other influential factors in studying game meat consumption and hunting participation to create a more comprehensive approach to this project. The Theory of Planned Behaviour (TPB) is a widely used model for predicting behaviour, and it builds upon the earlier Theory of Reasoned Action (TRA). As McDermott et al. (2015) explain, the theory of planned behaviour suggests that behaviour can be predicted based on intention and perceived behavioural control (PBC). Intention is seen as the primary determinant of behaviour, as it reflects an individual's motivation and willingness to engage in a particular action. PBC, on the other hand, refers to an individual's perception of their ability to perform a behaviour, and it influences behaviour directly and indirectly through its impact on intention. According to the TPB, intention is shaped by attitudes and subjective norms. When individuals hold positive attitudes toward behaviour and perceive social pressure to engage in it, they are more likely to have a solid intention to perform that behaviour. Additionally, if they believe they can perform the behaviour without difficulty, this will further strengthen their intention (Ajzen, 1985).

Throughout this research project, TPB is applied to understand and predict game meat consumption and hunting participation behaviour by considering the ways that attitudes towards meat consumption, social norms (as measured by the level of importance placed on the opinions of friends and family members regarding hunting and the consumption of game meat), and perceived behavioural controls such as the importance of game meat taste, lack of knowledge of

game meat's nutritional value and lack of skills required to hunt all come together to guide consumption and hunting behaviour.

This study seeks to identify the determinants of game meat consumption among Alberta hunters by analyzing the specific motivations, beliefs, involvement with food and components of the theory of planned behaviour on game meat consumption and hunting participation. Wildlife management agencies must comprehend the various factors that motivate the consumption of game meat and, as a result, keep people engaged in hunting, which may ultimately impact the success of wildlife conservation efforts. Additionally, significant variation is observed in variables, and this sample allows measuring and describing the theory of planned behaviour components and examining how attitudes, social norms, perceived behavioural control and intentions relate to other key variables in this study.

2.2 Methodology

An online survey was conducted in July 2023 using Qualtrics survey software (https://www.qualtrics.com). The survey was closed after two months in September 2023. Study protocols were approved by the University of Alberta Research Ethics Board (Pro00119565). Also, in the first step of the survey, participants were provided with a description of the research study and completed informed consent.

2.2.1 Survey instrument

The survey, titled 'Determinants of game meat consumption among hunters in Alberta' (Appendix A), consisted of five sections: perception of eating wild game meat, hunting experience and environmental beliefs, game meat consumption, meat consumption, and demographics and food choices (Figure 2.1). The survey questions were designed to investigate and assess the extent of wild game consumption, the hunting and wild game meat consumption motivations, how participants perceive what their family and friends feel about their hunting activity, attitudes and the perceived ease or difficulty related to control over hunting and consuming game meat activities, the responsibilities the respondent feels toward society and the environment and how participants recognize a food product.

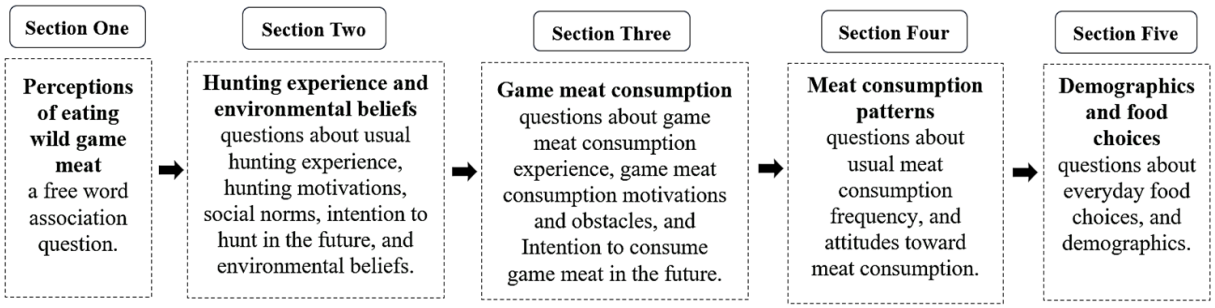

Figure 2. 1. The structure and components of the research survey instrument

2.2.1.1 Perceptions of eating wild game

The survey's first questions asked participants to list their first four initial words, thoughts or images that come to mind when thinking about eating wild game meat. The free word association is a technique to evaluate conceptual structures and explore beliefs or attitudes in psychology and sociology. This method assumes that when a stimulus, concept, or object is presented, asking the respondent to associate ideas that come to their mind freely can provide unrestricted access to their mental representations of that stimulus (Andrade et al., 2016). Some researchers discuss that consumers' initial beliefs and associations about a concept are often linked to their behaviour. Regarding food products, the first associations that come to mind for respondents may be the most important in influencing their choices and purchase decisions (Ares et al., 2008). Therefore, to gain insight into hunters' thoughts and perceptions on consuming wild game meat, the survey's first part asked participants to list their first four initial words, ideas or images that come to mind when thinking about eating wild game meat.

2.2.1.2 Hunting Experience

Hunting experience was measured by asking participants about their usual hunting experience. In addition, to identify the effects of social support for hunting, respondents were asked about who hunts in their lives (family members, friends, etc.).

2.2.1.3 Hunting motivations

Motivations to hunt were measured using Tidball et al. 's (2014) measurement in the study of the wild game consumption and local food movement in New York. The measurement consisted

of 14 items, and respondents were asked to indicate the importance of different reasons a person might choose to participate in hunting on a scale ranging from (-2) not at all important to (+2) Extremely important with a (0) Moderately important.

2.2.1.4 Social norms

To measure the likelihood of participation in hunting, considering how essential others' expectations and support are, two items from Commerçon et al. 's (2021) study of the effect of Chinese social norms on wild bird hunting frequency were applied, in which participants were asked, how their family or friends feel about their hunting activity, with response options of ''disapproved'', "no opinion" and ''approved''.

2.2.1.5 Environmental beliefs

Environmental beliefs were measured using a set of statements from Ojea & Loureiro's (2007) measurement in the study of values and willingness to pay for wildlife. Items considering Stern et al. 's (1995) theory of Environmental Concern (EC) focus on the idea that people take an environmental action motivated by the consequences of this action. Respondents were asked if they agree or disagree with the statements about the environment and to what extent they agree or disagree with belief items on a scale ranging from 1= strongly disagree to 7= strongly agree.

2.2.1.6 Intention to hunt in the future

Intention to hunt in the future was measured by adopting a question from Tidball et al. 's (2014) research on game meat consumption and locavore movement. Respondents were asked, "How likely are you to hunt in the next 12 months?" on a five-point scale ranging from "I am not likely to hunt in the future" (1) to "I am very likely to hunt in the future" (5).

2.2.1.7 Game meat consumption experiences

Game meat consumption experiences were measured by asking participants, "During the last 12 months, how often have you eaten the following?" with the response options of "Deer," "Elk," "Moose," "Bison" and "Bighorn sheep" which estimated on a scale that included the categories of never, rarely (once or twice), occasionally (3-5 times), and often (6 or more times). We also asked

respondents how the game meat they had eaten was obtained, with choices including “Harvested myself,” “Provided by someone I know (e.g., family, friends),” “Purchased from a meat shop,” and “Other,” in which gave respondents the option of writing in other types of game.

2.2.1.8 Game meat consumption motivations

Motivations to consume game meat were assessed using 12 items from Tidball et al. ’s (2014) measurement in the study of the wild game consumption and local food movement, including “taste,” “nutritional or health benefits,” “support for wildlife conservation,” and “connection to local food sources.” Respondents were asked to rate the importance of various factors affecting their consumption choices on a 5-point scale rated from 1=Not at all important to 5=Extremely important. Respondents were also given the option of writing in other reasons which encourage them to consume game meat.

2.2.1.9 Perceived behavioural control

Perceived behavioural control is the third main element used in the theory of planned behaviour that implies a gap between perceived behavioural control and behaviour. The perceived external and internal barriers to consuming game meat were investigated using Tidball et al. ’s (2014) measurement in the study of game meat consumption and locavore movement. The measurement contains 13 constraints, and participants were asked to rate the significance of limitations on a 4-point scale ranging from “not at all” a barrier (1) to “very much” a barrier (4). Respondents were also given the option of writing other constraints they feel in consuming game meat.

2.2.1.10 Intention to eat game meat in the future

Intention to eat game meat in the future was measured by adopting a question from Tidball et al. ’s (2014) research on game meat consumption and locavore movement. Respondents were asked, “How likely are you to consume game meat in the future (i.e., in the next 12 months)?” on a five-point scale ranging from “I am not likely to eat game meat in the future” (1) to “I am very likely to eat game meat in the future” (5).

2.2.1.11 Meat eating habits

Participants' usual meat consumption was measured by asking a question from Graca et al. 's (2015) research on Portuguese people's attachment to meat and willingness to adopt a plant-based diet, which asked respondents about their usual meat consumption.

2.2.1.12 Attitudes toward meat consumption

Respondents' evaluation and the level of attachment to meat consumption were measured by Graca et al. 's (2015) Meat Attachment Questionnaire. Meat Attachment Questionnaire comprises four dimensions: hedonism, affinity, entitlement, and dependence. So, respondents were asked if they agree or disagree with the statements about meat as a source of pleasure, their affinity towards meat consumption, their feelings of entitlement towards meat consumption, and their feelings of dependence on meat and to what extent they agree or disagree with the items on a 5-point Likert scale ranging from 1= strongly disagree to 5= strongly agree.

2.2.1.13 Level of involvement with food

The involvement with food was measured by the 18 items of Lee et al. 's (2020) food Involvement Scale. Participants were asked about their everyday food choices on a 9-point scale ranging from 1= strongly disagree to 9= strongly agree.

2.2.1.14 Demographics

Participants' gender, age, level of education, household income level, occupation and type of residence data were collected.

2.2.2 Survey participants

This research took place in Alberta. The study participants were game hunters who reside in Alberta, were 18 years of age and older and had hunted wild game in Alberta, Canada, during at least one season from 2018 to 2022 (i.e., five hunting seasons).

The research respondents' recruitment was conducted in two phases to collect responses from a total of 50-100 hunters. In the first phase, the survey was emailed to five individuals identified as hunters within the researcher's network of friends and colleagues. We used snowball recruitment to gather participants, and respondents were requested to share the survey anonymous

link with hunters they knew. In the first step of the survey, participants were provided with a description of the research study and asked for their consent to participate in the survey. Participants received two follow-up reminder emails within two weeks (Appendix B). We used an adapted version of the Dillman et al. (2014) approach to administer the questionnaire. This method included two email contacts at approximately weekly intervals. They were asked to share the reminder email with their fellow hunters. As participation was anonymous, and we didn't know if participants had completed the survey, they received a reminder even if they had completed the survey.

In the second phase, the survey was disseminated to the University of Alberta community through the University of Alberta Employee's Digest listserv. It was launched two weeks after the first recruitment phase and repeated three times. This method helped to increase participation and engagement among university employees, potentially leading to a more diverse and representative sample for research purposes (Appendix C).

2.3 Data analysis

The data collected from the completed questionnaires were analyzed using SPSS Statistics (IBM SPSS Statistics 29.0; IBM Corp., Armonk, NY, USA).

A range of statistical analyses were employed to answer the study questions. Descriptive analyses were used to summarize data and identify key features of the research respondents. The two-step Cluster Analysis method was utilized to identify comparable groups or "clusters" of game hunters within the data set. The analysis included a range of categorical variables like gender, type of childhood and current residence, and continuous variables such as hunting frequency, hunting motivations, social norms, game meat consumption motivations, game meat consumption barriers, level of food involvement, game meat consumption frequency, environmental beliefs, attitudes toward meat, intention to hunt in the next 12 months, and intention to eat game meat in the future.

Bivariate correlation was applied to test the theoretical expectations and explore the likelihood of a relationship between demographics, hunting motivations, game meat consumption motivations, game meat consumption and hunting barriers, social norms, level of food

involvement, environmental beliefs, attitudes toward meat, intention to hunt in the next 12 months, intention to eat game meat in the future, and game meat consumption frequency and hunting habits.

2.4 Results

Based on the data collected, the questionnaires distributed to the participants were completed within an average time of 14 minutes and 38 seconds. The fastest completion time recorded was 4 minutes and 32 seconds, whereas the slowest completion time took 38 minutes and 25 seconds.

2.4.1 Descriptive analysis

2.4.1.1 Characteristics of the Sample

Descriptive statistics for the characteristics of the participants are shown in Table 2.1. A total of 87 game hunters participated in the study. Table 2.1 shows that most participants were male (79.3%) and 16.1% were female. The three age groups were evenly represented, with the highest percentage falling between 41 to 50 years old (26.4%), followed by 21 to 30 years old (23%), and 51 to 60 years (22.0%). Of the respondents, 67.8% were employed, 17.2% were retired, and 9.2% were self-employed. Participants were well-educated, with 59.8% having some or all post-secondary education and 36.8% holding graduate or professional degrees, indicating recruitment on a university campus. The highest percentage of household annual income was between $ 53,359 to $106,707 (28.7%), followed by $106,708 to $165,430 and $165,431 to $227,668 (21.8%). While most respondents had grown up in a rural area (51.7%), followed by an urban area (27.6%) and suburban (19.5%), the highest percentage of participants about 83.1% reported currently living in an urban area.

Table 2. 1. Descriptive statistics for the sample

Variable	*Description*	*Total (n=87)*	
		Frequency	*%*
Gender	Male	69	79.3
	Female	14	16.1
	Other	2	2.3
Age			
	less than 20 years	9	10.3
	21 – 30 years	20	23.0
	31 – 40 years	11	12.6
	41 – 50 years	23	26.4
	51-60 years	18	20.7
	61-70 years	4	4.6
	more than 71 years		
Occupation			
	Employed - full-time (30 hours or more per week)	59	67.8
	Employed - part-time (less than 30 hours per week)	2	2.3
	Self-Employed	8	9.2
	Retired	15	17.2
	Student	1	1.1
	Military	1	1.1
	Parent/ Homemaker	-	-
	Not currently employed	-	-
Level of education			
	Some or all high school	2	2.3
	Some or all post-secondary education (college, university, technical school)	52	59.8
	Graduate or professional degree (MS, Ph.D., MD)	32	36.8
Income level	Household annual income (CAD$)		
	$ 53,359 or less	6	6.9
	$ 53,359 to $106,707	25	28.7
	$106,708 to $165,430	19	21.8
	$165,431 to $227,668	19	21.8
	more than $227,668	13	14.9
	Prefer not to answer	4	4.6
Type of childhood residence place	Rural	45	51.7
	Urban	24	27.6
	Suburban	17	19.5
Type of currently residence place	Rural	14	16.9
	Urban	69	83.1

2.4.1.2 Respondents' hunting experience

Descriptive statistics for the respondents' hunting experience are shown in Table 2.2. Results indicate that most respondents (44.8%) had hunted wild game less than five times in the last 12 months, followed by 5 to 10 times (18.4%) and more than 20 times (13.8%). Almost all respondents (96.6%) had hunted in Alberta. The most frequently hunted species were big game (95.5%), followed by game birds (73.6%), fish (60.9%), and waterfowl (39.1%). The most hunted game in the last 12 months was deer, either whitetail or mule (85.1%), followed by elk (46.0%) and moose (37.9%). No respondents reported hunting bison. A significant percentage of hunters (88.5%) reported having friends who hunt, followed by work colleagues who hunt (55.2%) and at least one parent who hunts (44.8%). Additionally, 27.6% of hunters reported having a brother or sister who hunts.

Table 2. 2. Descriptive statistics for the respondents' hunting experience

Variable	*Description*	*Total (n=87)*	
		Frequency	*%*
Hunting game, waterfowl, and birds' frequency in the last 12 months	Less than five times	39	44.8
	5 to 10 times	16	18.4
	11 to 15 times	10	11.5
	16 to 20 times	8	9.2
	More than 20 times	12	13.8
Hunting area			
	In Alberta	84	96.6
	In provinces other than Alberta	1	1.1
	In the US		
	Other locations		
Type of hunted game			
	Big game (e.g., moose, deer)	83	95.4
	Small game (e.g., rabbit)	16	18.4
	Game birds	64	73.6
	Waterfowl	34	39.1
	Fish	53	60.9
Hunted big game in the last 12 months	Deer - Whitetail or Mule	74	85.1
	Elk	40	46.0
	Moose	33	37.9
	Bison	0	0
	Bighorn sheep	3	3.4
	Other (Black bear, bear, antelope, caribou, cougar)	9	10.3
People who hunt			
	One or more parents	39	44.8
	Brother/sister	24	27.6
	Friends	77	88.5
	Work colleagues	48	55.2

2.4.1.3 Hunters' associations with game meat

A total of 344 words were mentioned when participants were asked to write the first four words, terms, and phrases that came to mind when they thought of eating wild game meat. Most of the responses consisted of individual words. As shown in Figure 2.2, the most frequently

mentioned words were related to the sensory characteristics of the meat, hunting, healthy eating, sustainability, and wildlife conservation (Appendix D).

Figure 2. 2. Perceptions of eating wild game meat elicited by Free Word Association

2.4.1.4 Hunting motivations

Table 2.3 presents factors motivating respondents to engage in hunting activity. Results indicate that the motivations considered the most important were spending time outdoors (66.7%), relaxing and enjoying time outdoors (63.2%), obtaining natural food from local sources (59.8%), improving mental health (feeling mentally refreshed) (58.6%), Providing for myself and my family (54.0%), and interacting with and learning about wildlife and nature (50.6%).

Contributing to wildlife management efforts that help local ecosystems and challenging and improving outdoor recreation skills and knowledge also ranked as important motivation by 41.4% and 40.2% of respondents, respectively. Harvesting a trophy animal was considered unimportant, with 46.0% of respondents stating that it is not at all important.

Table 2. 3. Percent rating of motivations to participate in hunting in Alberta (n=85)

Motivations	***Not at all important***	***Slightly important***	***Moderately important***	***Important***	***Extremely important***
Spending time outdoors	-	-	4.6	26.4	66.7
Interacting with and learning about wildlife and nature	1 (1.1)	1(1.1)	5.7	39.1	50.6
Obtaining my own natural food from local sources	-	1.1	8.0	28.7	59.8
Meeting and/or building friendships with other hunters	13.8	21.8	24.1	25.3	12.6
Contributing to wildlife management efforts that help local ecosystems	2.3	5.7	18.4	29.9	41.4
Helping others develop outdoor recreation skills and knowledge	4.6	8.0	20.7	44.8	19.5
Becoming more connected to the place where I live	2.3	5.7	18.4	36.8	34.5
Improving my physical health (getting exercise)	3.4	3.4	23.0	29.9	37.9
Participating in wildlife management efforts that help local communities	3.4	11.5	27.6	32.2	23.0
Improving my mental health (feeling mentally refreshed)	2.3	3.4	9.2	24.1	58.6
Relaxing and enjoying time outdoors	1.1	3.4	5.7	24.1	63.2
Challenging and improving my outdoor recreation skills and knowledge	2.3	6.9	9.2	39.1	40.2
Harvesting a trophy animal	46.0	23.0	18.4	8.0	2.3
Providing for myself and my family	1.1	2.3	11.5	28.7	54.0

2.4.1.5 Social norms

Table 2.4 presents the descriptive statistics for social norms. As the table shows, of all the respondents, 60.9% percent reported that their friends would feel approved of hunting wild game, and 82.8% stated their family supports participation in hunting wild game.

Table 2. 4 Percent rating of social norms items (n=87)

Social norms	***Disapprove***	***Somewhat disapprove***	***No-opinion***	***Somewhat approve***	***Approve***
Friends' feelings about hunting wild game	-	3.4	12.6	20.7	60.9
Family feelings about hunting wild game	-	1.1	2.3	11.5	82.8

2.4.1.6 Environmental beliefs

Respondents' beliefs regarding the potential effects of protecting the environment are shown in Table 2.5. Results show that most participants believed environmental protection benefits their health (90.8%) and will provide a better world for their children and themselves (90.8%). Additionally, 89.7% of respondents believed environmental protection benefits everyone, and 79.3% stated that it improves their overall quality of life. While fewer respondents felt that environmental damage is restricted to local areas (51.7%), 69% believed that the effects of environmental degradation on local plants and animals have far-reaching consequences and have been significant on the entire world. 44.8% of respondents rejected the claims of exaggeration regarding the role of humans in climate change, and 43.6% felt the same about the exaggeration of environmental threats to public health.

Table 2. 5. Percent rating of environmental beliefs statements (n=87)

Environmental beliefs	***Strongly disagree***	***Disagree***	***Neither agree nor disagree***	***Agree***	***Strongly agree***
Environmental protection benefits everyone.	3.4	2.3	3.4	41.4	48.3
Environmental threats to public health have been exaggerated.	19.5	24.1	27.6	12.6	14.9
Environmental damage generated here harms people all over the world.	10.3	14.9	21.8	36.8	14.9
Environmental protection is beneficial to my health.	1.1	-	-	52.9	37.9
Environmental protection will provide a better world for my children and me.	1.1	1.1	5.7	44.8	46.0
Environmental protection will help me to have a better quality of life.	1.1	1.1	17.2	47.1	32.2
Over the next decade, thousands of species of plants and animals will become extinct.	18.4	20.7	20.7	31.0	8.00
Claims that we are changing the climate are greatly exaggerated.	29.9	14.9	12.6	25.3	16.1
While some local plants and animals may have been harmed by environmental degradation, over the whole earth, there has been little effect	23.0	46.0	13.8	12.6	3.4

2.4.1.7 Intention to hunt

Respondents' intention to hunt in the future is shown in Table 2.6. Nearly all respondents stated that they are very likely to hunt in the future (95.4%).

Table 2. 6. Percent rating of intention to hunt in the future (n=87)

Intention to hunt	***I am NOT likely to hunt in the future***	***Not sure about hunting in the future***	***I am likely to hunt in the future***	***I am VERY likely to hunt in the future***
How likely are you to hunt in the next 12 months?	-	-	2.3	95.4

2.4.1.8 Game meat consumption frequency

Table 2.7 presents the frequency of different types of game meat consumption over the past 12 months. The most frequently consumed type of game meat was deer, with 72.4% of respondents reporting that they consume it very often. Moose was the second most frequently consumed game meat, with 44% of respondents consuming it more frequently. Elk followed closely behind, with 35% of respondents stating its consumption often. However, bison and bighorn sheep meat were not as commonly consumed, with 82.7% and 94.2% of respondents reporting never or rarely consuming bison and bighorn sheep, respectively.

Table 2. 7. Percent rating of different types of game meat consumption in the last 12 months (n=87)

Game meat consumption	***Never***	***Rarely (1-2 times)***	***Occasionally (3-5 times)***	***Often (6 or more times)***
Deer	4.6	6.9	13.8	72.4
Elk	24.1	23.0	14.9	35.6
Moose	18.4	14.9	19.5	44.8
Bison	56.3	26.4	9.2	3.4
Bighorn sheep	83.9	10.3	1.1	-

2.4.1.9 Sources of game meat

As outlined in Table 2.8., most game meat (97.7%) was harvested by the respondents themselves, with 67.8% coming from family and friends. Additional sources of game meat were noted by respondents, such as game meat provided by "coworkers," "students," and "wild game dinners."

Table 2. 8. Descriptive statistics for the sources of game meat (n=87)

Variable	***Description***	***Total (n=87)***	
		Frequency	***%***
Sources of game meat	Harvested myself	85	97.7
	Provided by someone I know (e.g., family, friends)	59	67.8
	Purchased from a meat shop	5	5.7
	Other	3	3.4

2.4.1.10 Game meat consumption motivations

Table 2.9 displays the reasons cited by respondents for consuming game meat. Results reveal that the most notable factors that motivated game meat consumption were game meat quality and freshness, with over 90% of respondents rating them as important or extremely important. The second extremely important motivation was a desire for sustainable use of natural resources (85.1%), followed by the taste of game meat, which was considered important and extremely important by 81.6% of respondents and contributed to wildlife conservation efforts (78.1%). Additionally, game meat nutrition value or health benefits, its traditional origin, connection to local food sources, and sharing knowledge about hunting and game meat were also important motivations, with over 70% of respondents rating them as important or extremely important. Fewer respondents expressed concern about the possibility of the presence of Chronic Wasting Disease in game meat and reported it as a moderately important factor.

Table 2. 9. Percent rating of motivations to consume wild game meat (n=87)

Motivations	***Not at all important***	***Slightly important***	***Moderately important***	***Important***	***Extremely important***
Taste	1.1	4.6	11.5	50.6	31.0
Quality and freshness	-	2.3	3.4	29.9	62.1
Concern about CWD (Chronic Wasting Disease) presence in the game meat	14.9	13.8	28.7	19.5	21.8
Where game meat was obtained	8.0	12.6	18.4	31.0	28.7
How game meat was obtained	2.3	10.3	8.0	47.1	31.0
Nutrition or health benefits	1.1	6.9	13.8	37.9	39.1
Sustainable use of natural resources	1.1	6.9	5.7	39.1	46.0
Support for wildlife conservation	1.1	6.9	12.6	21.8	56.3
Connection to local food sources	2.3	8.0	16.1	40.2	31.0
Demonstrating healthy eating habits for family and friends	5.7	14.9	10.3	35.6	32.2
Sharing knowledge about hunting and game meat consumption	4.6	6.9	13.8	37.9	35.6

Thirty-four percent of respondents mentioned several other motivations for consuming game meat, as shown in Table 2.10. Results show that the most noted motivation was the cost-effectiveness of consuming game meat compared to store-bought options. This finding was followed by the reassurance that the animal was treated humanely during its final moments. Additionally, respondents noted their satisfaction in personally butchering and preparing the meat and the sense of independence and self-sufficiency that comes with consuming game meat.

Table 2. 10. Game meat consumption motivations mentioned by respondents.

Motivation	***Frequency***
The sense of independence and being self-sufficient	3
The satisfaction of personally butchering and preparing the meat	3
Cost-effective compared to purchasing meat from a grocery store	11
The assurance that the animal was treated humanely in its final moments	5
The environmental benefits of consuming wild game	1
A preference for lean meat that is free of hormones and antibiotics	1

2.4.1.11 Barriers to consuming game meat

Respondents' perceived barriers to eating game meat are presented in Table 2.11. Results indicate that a significant percentage of respondents do not consider the lack of knowledge about the nutritional value of wild game meat, discomfort with the act of killing wild game, and insufficient hunting skills as game meat consumption barriers, with rates of 90.8%, 81.6%, and 80.5%, respectively.

However, respondents reported several minor barriers to eating game meat. These included not liking the game meat taste, lacking the skills required to process and prepare wild game meat, the cost of a hunting license, not having enough information about where to hunt or obtain game meat, and concerns about the environmental quality where the game was harvested. The percentages of respondents who reported each of these barriers were 24.1%, 25.3%, 26.4%, 26.4%, and 29.9%, respectively. Over half of the respondents identified the time required to catch and prepare wild game, the cost of hunting equipment and travel, and concerns about the quality and safety of the meat and personal health as not a barrier or minor barrier to consuming game meat, with rates of 51.7%, 62%, and 66.6%, respectively. The only major barrier to consuming game meat, as rated

by the respondents, was limited access to land and hunting opportunities, which was rated as a moderate and major barrier by 54% of the respondents.

Table 2. 11. Percent rating of barriers to consuming wild game meat (n=87)

Barriers	***Not a barrier***	***Minor barrier***	***Moderate barrier***	***Major barrier***
Don't like the taste	66.7	24.1	8.0	-
Don't like the act of killing wild game	81.6	11.5	5.7	-
Don't know the nutritional content of the wild game meat	90.8	8.0	-	-
Concerns about environmental quality where the game was harvested	50.6	29.9	12.6	5.7
Concerns about wild game quality/safety and personal health (e.g., CWD; Chronic Wasting Disease)	19.5	40.2	26.4	12.6
Limited access to land and hunting opportunities	18.4	26.4	27.6	26.4
Lack of information about where to hunt or obtain game meat	55.2	26.4	10.3	6.9
Lack of skills required to hunt wild game	80.5	13.8	2.3	2.3
Lack of skills required to process and prepare wild game meat	71.3	25.3	1.1	1.1
Lack people to hunt with and learn from	73.6	20.7	3.4	1.1
Time required to catch and/or prepare wild game	40.2	33.3	18.4	6.9
Cost of hunting license	56.3	26.4	12.6	3.4
Cost of hunting wild game (equipment, travel, etc.)	26.4	42.5	19.5	10.3

Twenty-one percent of respondents mentioned several other obstacles to consuming game meat, as shown in Table 2.12. The most noted obstacle was the limited availability of tags for some species, like moose, followed by gun access regulations and the high fuel cost.

Table 2. 12. Game meat consumption barriers mentioned by respondents.

Barriers	***Frequency***
limited availability of tags for some species	4
Access to gun	2
Cost of fuel	2

2.4.1.12 Intention to eat game meat

Table 2.13 shows the respondents' intention to eat game meat in the future. Almost all respondents (96.6%) expressed a strong likelihood of consuming game meat in the future.

Table 2. 13. Percent rating of intention to eat game meat in the future

Intention to hunt	*I am NOT likely to eat game meat in the future*	*Not sure about eating game meat in the future*	*I am likely to hunt in the future*	*I am VERY likely to eat game meat in the future*
How likely are you to consume game meat in the next 12 months?	-	-	2.3	96.6

2.4.1.13 Consumption of meat and its products

Table 2.14 displays the frequency of meat consumption among respondents. The results indicate that 65.5% of participants reported consuming meat and meat products at least five times weekly.

Table 2. 14. Weekly consumption of meat and meat products (n=87)

Meat consumption	*Never*	*Less than once per week*	*once or twice per week*	*three or four times per week*	*five times or more per week*
How often do you consume meat and meat products (e.g., chicken nuggets, wieners) in an average week?	1.1	10.3	6.9	14.9	65.5

2.4.1.14 Attitudes toward meat

Respondents' attitudes toward consuming meat are shown in Table 2.15. As results indicate, most of the participants expressed a strong dependence on meat, with a significant portion reporting that they do not feel bad about consuming meat (92%) and believing that consuming meat is not disrespectful towards life and the environment (94.3%). Moreover, a majority (97.7%) did not associate meat with diseases, and a significant number of respondents (87.3%) reported that eating meat does not recall the suffering and death of animals.

The next category, hedonism, revealed that many respondents find pleasure in eating meat, with 92% expressing their love for it, 89.6% being big fans, and 87.3% agreeing that it brings them great pleasure. Additionally, 70.1% consider a good steak incomparable to any other food.

The survey results suggest a high affinity for meat consumption among participants, with 81.6% considering meat an essential part of their diet and an equal percentage feeling uncomfortable with the idea of a meat-free diet. Moreover, 90.8% of respondents cannot imagine a life without regularly consuming meat, and 77% would feel sad if forced to stop eating meat.

The data also indicates a sense of entitlement towards meat consumption, with 86.2% of participants viewing meat consumption as a natural and indisputable practice and 60.9% believing that meat consumption is an unquestionable right of every person.

Table 2. 15. Percent rating of respondents' attitudes toward meat consumption (n=87)

Attachment to meat	***Strongly disagree***	***Disagree***	***Neither agree nor disagree***	***Agree***	***Strongly agree***
Hedonism					
To eat meat is one of the pleasures in life.	1.1	1.1	9.2	37.9	49.4
I love meals with meat.	1.1	1.1	4.6	32.2	59.8
I'm a big fan of meat.	1.1	8.0	-	28.7	60.9
A good steak is without comparison.	1.1	10.3	17.2	35.6	34.5
Affinity					
By eating meat, I am reminded of the death and suffering of animals.	70.1	17.2	4.6	5.7	1.1
To eat meat is disrespectful to life and the environment.	82.8	11.5	2.3	2.3	-
I feel bad when I think of eating meat.	73.6	18.4	2.3	2.3	2.3
Meat reminds me of diseases.	82.8	14.9	1.1	-	-
Entitlement					
To eat meat is an unquestionable right of every person.	5.7	8.0	24.1	20.7	40.2
According to our position in the food chain, we have the right to eat meat.	6.9	6.9	31.0	11.5	42.5
Eating meat is a natural and undisputable practice.	3.4	3.4	5.7	31.0	55.2
Dependence					
Meat is irreplaceable in my diet.	2.3	9.2	5.7	27.6	54.0
I would feel fine with a meatless diet.	51.7	29.9	8.0	8.0	1.1
If I couldn't eat meat, I would feel weak.	6.9	17.2	25.3	25.3	24.1
If I was forced to stop eating meat, I would feel sad.	4.6	6.9	10.3	31.0	46.0
I don't picture myself without eating meat regularly.	1.1	3.4	3.4	39.1	51.7

2.3.15 The level of involvement with food

The data presented in Table 2.16 provides insights into the respondents' interest, involvement, and care for food. Most of the respondents expressed their interest in cooking (72.4%), food (74.7%), and recipes (77%). Furthermore, a considerable number of respondents mentioned that they find pleasure in food (73.5%) and often cook and share it with others (64.4%).

In addition, over 60% of the participants reported making delicious food after eating it elsewhere (62%) and enjoying buying and preparing food (54%). Moreover, 78.1% of the respondents reported that food is an integral part of their lives, and 75.8% claimed that they have knowledge about food and cooking. Finally, more than half of respondents stated that they consider many things when buying food, check the information on the package, and are very concerned about what they eat, with rates of 65.5%, 63.9%, and 57.5%, respectively.

Table 2. 16. Percent rating of respondents' involvement with food (n=87)

Involvement with food	***Strongly disagree***	***Disagree***	***Neither agree nor disagree***	***Agree***	***Strongly agree***
After eating delicious food elsewhere, I make it myself	2.3	1.1	13.8	42.5	19.5
I am interested in recipes	-	-	1.1	33.3	43.7
I often prepare food and share with people	1.1	1.1	3.4	34.5	29.9
I like cooking	-	2.3	3.4	27.6	44.8
I enjoy buying and preparing food	1.1	6.9	11.5	29.9	24.1
I enjoy food-related information on SNS, blogs and food-related TV programs	3.4	13.8	19.5	23.0	13.8
I have knowledge about food and cooking	-	-	1.1	40.2	35.6
Food gives me pleasure	-	1.1	1.1	28.7	44.8
Food is an important part of my life	-	-	1.1	21.8	56.3
I am very concerned about what I eat	-	4.6	13.8	27.6	29.9
I am interested in food.	-	1.1	-	37.9	36.8
I often think about what I ate or am going to eat.	-	2.3	11.5	26.4	24.1
I enjoy talking about food.	1.1	4.6	11.5	34.5	17.2
I consider many things when I buy food.	-	4.6	10.3	43.7	21.8
When I buy food, I check the information on the package.	1.1	2.3	10.3	33.7	30.2
I look for several retailers (online and offline) before purchasing food.	8.0	29.1	18.6	12.8	11.6
I spend much time and effort choosing food	-	19.5	9.2	23.0	10.3
I recommend food items to others	2.3	4.6	5.7	52.9	12.6

2.4.2 Cluster analysis

A cluster analysis was used to identify comparable groups and organize respondents into meaningful groups based on the variables that describe the key features of the observations (Table 2.17). Table 2.17 shows the distribution and frequency of each cluster. Seven of the 87 cases were excluded from the analysis due to missing values on one or more variables. Of the 80 cases assigned to clusters, 77 were assigned to the first cluster and 3 to the second. The results reveal the homogeneity of the survey respondents. In order of the predictive importance of variables shown in Figure 2.3, the most predictable variables were the higher likelihood of participating in hunting and eating game meat. It is followed by game meat consumption frequency, social norms, environmental beliefs, game meat consumption barriers, hunting motivations, hunting frequency and level of food involvement. The highest percentage of each variable is the Cluster One attribute, which contained 96.3% of observations.

Table 2. 17. Cluster distribution

		N	*% of Combined*	*% of Total*
Cluster	1	77	96.3	88.5
	2	3	3.8	3.4
	Combined	80	100	92.0
Excluded cases		7		8.0
Total		87		100

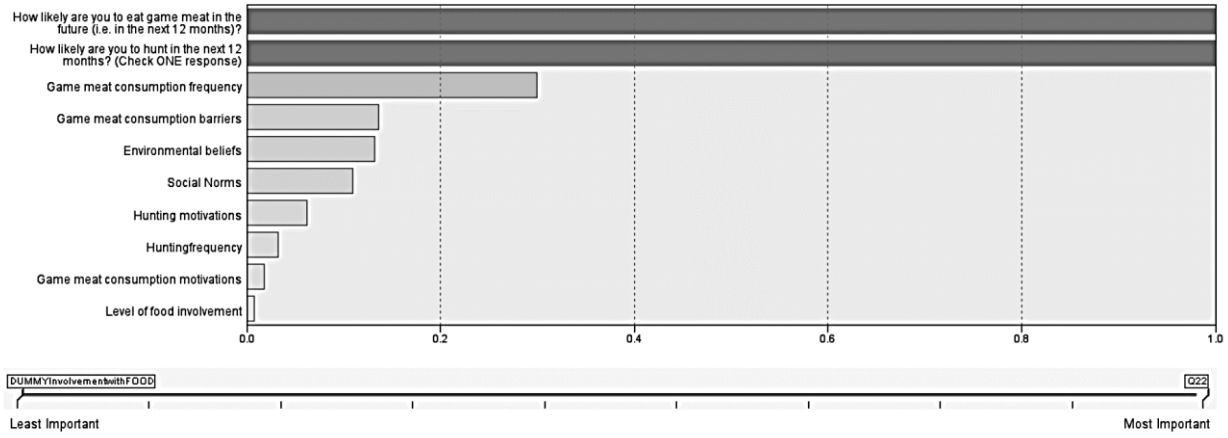

Figure 2.3. The predictive importance of variables in the cluster analysis

2.4.3 Correlation Analysis

The relationships between the game meat consumption frequency and the research variables were investigated using bivariate correlations. Table 2.18 presents how much research variables contribute to game meat consumption frequency. As expected, these results show that hunting frequency positively correlates with game meat consumption frequency (0.33**). Hunting motivation is significantly correlated with game meat consumption frequency (0.27*) and strongly correlates with game meat consumption motivation (0.67**).

Game meat consumption motivation and social norms have slightly positive and insignificant relationships with game meat consumption frequency. As expected, the correlation analysis also shows an insignificant negative relationship between game meat consumption frequency and perceived barriers to consuming game meat (-0.20). It is also negatively correlated with hunting frequency (-0.20). The attitude toward meat consumption positively correlates to the game meat consumption motivation (0.28*) and hunting motivation (0.25*). Similarly, environmental beliefs have positive significant relationships with game meat consumption motivation (0.22*) and hunting motivation (0.25*).

The results show that the level of involvement with food is one of the effective variables that contribute positively not only to game meat consumption frequency (0.33**) but also significantly correlates with game meat consumption motivation (0.36**), hunting motivation (0.33**) and attitudes toward meat (0.25*). While the intention to consume game meat in the future is positively and significantly correlated to game meat consumption frequency, the intention to hunt in the future has a positive insignificant relationship with game meat consumption frequency.

Intention to hunt in the future significantly correlates with hunting motivation (0.22*), social norms (0.25*)., environmental beliefs (0.26*) and intention to consume game meat (0.56**).; as expected, a significant negative relationship exists between intention to hunt in the future and hunting and game meat consumption barriers (0.29**).

Age is negatively correlated to game meat consumption frequency (-0.18). However, the relationship between age and research variables is weak and can be considered negligible. While the level of education shows a slight negative correlation with game meat consumption frequency,

it is significantly correlated with intention to consume game meat (0.21*). The results show no or slight significant relationships between demographics and game meat consumption frequency and research other variables.

Table 2. 18. Bivariate correlations for all variables

Correlates	*1.*	*2.*	*3.*	*4.*	*5.*	*6.*	*7.*	*8.*	*9.*	*10.*	*11.*	*12.*	*13.*	*14.*	*15*	*16.*	*17.*	*18.*
1. Game meat consumption frequency	1.000																	
2. Hunting frequency	0.33**	1.000																
3. Game meat consumption motivation	0.08	0.08	1.000															
4. Hunting motivation	0.27*	0.07	0.67**	1.000														
5. Social norms	0.18	0.16	0.16	0.20	1.000													
6. Game meat consumption barriers	-0.20	-0.20	-0.03	-0.09	-0.11	1.000												
7. Attitudes toward meet	0.04	0.02	0.28*	0.25*	0.20	-0.05	1.000											
8. Environmental beliefs	0.01	-0.13	0.22*	0.25*	0.06	0.05	0.13	1.000										
9. Level of involvement with food	0.33**	-0.01	0.36**	0.33**	0.09	0.02	0.25*	0.13	1.000									
10. Meat consumption frequency	-0.09	-0.11	-0.17	-0.20	-0.05	0.19	0.12	0.05	-0.03	1.000								
11. Intention to consume game meat	0.26*	0.06	0.13	0.18	0.04	-0.15	0.03	0.15	0.13	0.04	1.000							
12. Intention to hunt	0.22	0.19	0.09	0.22*	0.25*	-0.29**	0.05	0.26*	0.03	-0.002	0.56**	1.000						
13. Age	-0.18	0.05	0.26*	0.02	-0.03	-0.15	0.08	-0.23*	0.10	-0.01	0.19	0.10	1.000					
14. Level of education	-0.11	0.02	-0.06	-0.12	-0.25*	0.23*	-0.20	-0.11	0.16	0.16	0.21*	0.01	0.05	1.000				
15. Employment	-0.03	0.07	0.26*	0.14	-0.02	-0.15	0.16	-0.18	-0.04	0.10	0.04	0.22*	0.60**	-0.11	1.000			
16. Household income	0.04	-0.01	0.06	0.07	0.08	-0.16	-0.22*	-0.07	0.12	-0.03	0.18	0.13	0.01	0.29**	-0.12	1.000		
17. Type of childhood residence place	-0.08	-0.08	-0.11	-0.05	-0.09	0.03	-0.15	-0.09	0.09	0.08	0.08	-0.09	0.10	0.37**	-0.01	0.34**	1.000	
18. ***Type of current residence place***	0.07	-0.16	0.12	0.14	-0.44	0.02	-0.02	0.21	0.23*	-0.02	0.25*	-0.07	-0.07	0.13	-0.24*	0.21	0.32**	1.000

Spearman's *p<.05. **p<.0

2.5 Discussion

Given the declining trend of hunting participation in recent years and constantly cited acquiring game meat as an accepted reason for hunting, it is important to understand the factors influencing game meat acquisition and consumption. This study used data provided by Albertan game hunters to explore how food-related benefits of hunting strengthen the appeal of hunting wild game for food. A key part of this pilot study was to test the effectiveness of food-related questions, free word association questions, and meat-eating and food-involvement questionnaires, aiming to employ this survey in a larger population.

The results illustrate a homogeneity among hunters who participated in this small study and provide interesting insights into wild game meat consumption in Alberta. The initial screening question confirmed that nearly all respondents are experienced game hunters who had hunted in the last 12 months and plan to continue doing so. Most respondents are men (Birdsong et al., 2022; Black et al., 2018; Czarniecka-Skubina et al., 2022), well-educated, with above-average incomes (Black et al., 2018), and currently living in an urban area. They were typically over 41, with a significant number of young hunters aged 21 to 30. This demographic profile reflects an inconsistency with studies conducted over the past two decades that attribute the decline in North American hunters' participation to the effects of increased levels of education and income and urbanization, which have brought about significant changes in people's beliefs and attitudes towards the acceptability of hunting as a wildlife management action (Stedman & Heberlein, 2001; Auger, 2006; Manfredo, 2008; Manfredo et al., 2009; Montgomery & Blalock, 2010; Cerri et al., 2018). The current results align with a survey conducted among Albertan hunters in 2008, revealing a new wave of younger hunters in Alberta (Econometric Research Limited, 2009). The findings also demonstrate that most respondents consume game meat harvested by themselves and their friends more often and plan to continue doing so in the future, which indicates that wild game meat was a current dietary staple for most respondents. These results support earlier research on game meat consumption that found young and educated consumers with high-income levels to be frequent game meat consumers (Czarniecka-Skubina et al., 2022).

The current research results align with previous research, indicating that respondents were highly motivated to hunt for various reasons, including spending time outdoors, relaxing, obtaining natural food from local sources, improving mental health, providing food for themselves and their families, and interacting with and learning about wildlife and nature. These motivations have been previously identified in studies conducted by Hayslette et al. (2001), Schroeder et al. (2006), Auger (2006), Tidball et al. (2014), Watkins et al. (2018), Gruntorad et al. (2020), Hinrichs et al. (2021), and Birdsong et al. (2022). In addition, this study found that motivations for game meat consumption were consistent with those identified in previous research. These motivations included game meat quality and freshness, a desire for sustainable use of natural resources, game meat taste, contributing to wildlife conservation efforts, game meat nutrition value and health benefits, game meats' traditional origin, and sharing knowledge about hunting and game meat (Ljung et al., 2012; Poławska et al., 2013; Tidball et al., 2014; Ljung et al., 2015; Kwiecińska et al., 2017; Demartini et al., 2018; Niewiadomska et al., 2020; Czarniecka-Skubina et al., 2022; Popoola et al., 2022). According to the results of the correlation analysis conducted in this study, there was a positive and significant relationship between hunting motivation, game meat consumption motivation, and game meat consumption frequency. In essence, those who possess a strong desire to hunt are also highly driven to consume game meat, and they consume it more frequently (Birdsong et al., 2022; Hinrichs et al., 2021; Vayer et al., 2021; Watkins et al., 2019).

The results of the free word association task in this study align with previous research by Tidball et al. (2014), Kwiecińska et al. (2017), and Stedman et al. (2017), indicating that perception and awareness of wild game meat encourage its consumption. Participants mentioned various words, suggesting that multiple factors may influence hunters' decisions to consume game meat. The most frequently mentioned terms in a word association task can be regarded as those most influential on hunters' eating wild game meat decisions. In this study, the most commonly mentioned dimension was related to the sensory characteristics of game meat (Ljung et al., 2015; Ljung et al., 2012; Kwiecińska et al., 2017; Demartini et al., 2018; Tomasevic et al., 2018), healthy eating patterns, and nature conservation (Ljung et al., 2012; Tidball., et al., 2014; Novi et al., 2014; Tomasevic et al., 2018). Participants also mentioned some words related to special occasions, such

as barbecue, families, friends, enjoyment, and self-sufficiency, which might predict liking and overall satisfaction with hunting and eating wild game. It is worth noting that the appropriateness of the product in its context has a more significant impact on consumers' emotional associations with product consumption than the frequency of consumption (De Andrade et al., 2016).

Additionally, game hunters primarily associate game meat with words related to health, nutrition, no hormones, and antibiotics, indicating their positive perception of the nutritional value of this type of meat. The study results suggest that respondents were highly aware of the benefits of game meat, as evidenced by their high hunting and consumption frequency. In accord, Marescotti et al. (2018) discuss that the highest awareness of wild game meat positively impacts its consumption level (Kwiecińska et al., 2017).

Hunters showed high food involvement, which could explain their considerable perception and awareness of game meat consumption in the FWA task. The correlation results further indicated that food involvement was significantly associated with attitudes towards meat, game meat consumption, and hunting motivations. In essence, hunters' deep involvement with food has resulted in positive attitudes towards meat, high consumption of game meat, and strong motivations for hunting. These findings are consistent with previous studies (Castellini et al., 2023; Lee et al., 2019; Lee et al., 2020), which suggest that food involvement positively correlates with an individual's connection to food-related information and knowledge that influences their perception and consumption decisions. The level of involvement includes attempts to uncover the reasons behind an individual's consistency in their attitudes towards a particular object, influencing their evaluations and attitudes towards food. Therefore, hunters' high cognitive effort prompts them to extensively search for and utilize food-related information (Kamrath et al., 2019). These results align with the study's descriptive findings, which show that hunters are deeply involved with food and consume game meat more frequently.

Findings indicate game hunters were highly aware and concerned about environmental degradation consequences for themselves, others, and the natural world, which implies a high level of environmental beliefs. Correlation results show that environmental beliefs significantly correlate with game meat consumption and hunting motivations. The highly concerned individuals

strongly desire to hunt and consume game meat. These findings are supported by previous studies by Nilsson et al. (2016) and Cyr (2016), which suggest that individuals with strong environmental concerns are more likely to participate in conservation programs, originating from the perceived outcomes of their actions on themselves and the things they value most. These results are consistent with studies by Johnson & Horowitz (2014) and Ojea and Loureio (2007), indicating that people aware of their actions' potential outcomes are more likely to take responsibility and make decisions that prevent negative environmental consequences. Given that public concerns are often influenced by information that aligns with commonly held values and actions of interest groups, the present study finding highlights the role of available information in shaping individuals' attitudes and values towards new environmental issues.

Based on the theory of planned behaviour utilized in this study, it is possible to analyze the results similarly to how the theory was applied, considering attitudes, norms, and behavioural control. A descriptive analysis reveals a strong, positive attitude towards meat, suggesting a favourable association with meat consumption. Furthermore, correlation analysis shows that attitudes towards meat significantly correlate with hunting and game meat consumption motivation. As previously discussed, the motivation to hunt drives the intention to pursue it in the future, which, in turn, predicts the frequency of game meat consumption. Therefore, individuals with a favourable attitude towards meat are more likely to hunt and consume wild game meat, which could have an impact on the frequency of game meat consumption (Demartini et al., 2018; Tidball et al., 2014; Marescotti et al., 2019). These findings emphasize the crucial role of attitudes towards meat when considering game meat consumption. They offer valuable insight into how individuals with a positive connection to meat feel about hunting for wild game meat.

Social norms play a critical role in the Theory of Planned Behavior (TPB), as they help shape individuals' social and cultural identities. People tend to conform to established "norms" within their communities and social groups. Descriptive analysis shows that respondents' families and friends approve of their hunting and game meat consumption. They also receive a significant portion of the consumed game meat from family, friends, and colleagues, suggesting that social norms positively contribute to the frequency of game meat consumption, hunting, and the

motivations behind these activities. These findings are consistent with previous research by Ljung et al. (2015), Smith et al. (2018), Goguen et al. (2020), and Czarniecka-Skubina et al. (2022), which emphasize the influence of hunters' social networks on the distribution and consumption of wild-harvested meat. Moreover, growing up in a household with hunters and socializing with hunters reinforces the power of social norms. It aligns individuals' attitudes with those of their friends and family, providing a strong incentive to be involved in hunting activity (Ljung et al., 2012; Marescotti et al., 2018).

The present study's correlation analysis indicates that social norms is significantly correlated to hunters' intentions to hunt in the future, consistent with Wilkins et al. (2019). Wilkins et al. (2019) discuss that a strong intention to hunt belongs to individuals who have grown up in rural areas and are still living there, followed by those who have migrated to a larger community. People who move from a rural to an urban area may still know people who hunt and are influenced by those personal norms, making them more likely to engage in hunting activities if they know others who do it. The present research findings suggest that individuals who are highly likely to hunt and consume game meat were raised in rural areas but currently reside in urban areas, supporting the results of a previous study conducted by Wilkins et al. (2019).

To capture the concept of behavioural control, respondents were asked about the barriers they feel to hunting and consuming game meat. Analyzing the responses, it was apparent that most respondents did not have significant perceived barriers to consuming game meat. Thus, it is unsurprising that hunting and game meat consumption were relatively frequent among this group. However, the primary obstacle identified was limited access to land and hunting opportunities. Additionally, the correlation analysis revealed that respondents who felt less restricted regarding game meat consumption were more likely to engage in hunting in the future (Tidball et al., 2014; Demartini et al., 2018; Fantechi et al., 2022).

This pilot study provided valuable insights into the potential outcomes of the larger-scale research, which will aid researchers in refining the research questions and hypotheses for larger-scale research. The average completion time for the survey suggests that the questions were appropriate for the group of hunters surveyed and that the survey was well-received. However, the

survey results indicate that the sample was biased toward hunters with a high motivation to consume game meat, and the small homogeneous sample limits the ability to representative findings.

The study has provided valuable insights and observations that can guide future hunting and game meat consumption research in Alberta, Canada. Based on the findings, some recommendations have been generated for future studies. The study found a wave of young hunters that can be the focus of prospective studies. These studies can explore what motivates young people to go hunting and consume game meat and their preferences. Future studies should consider the demographics of the pilot respondents, who were young, well-educated, and had above-average incomes, when designing questionnaires for potential research participants. Some respondents highlighted the importance of self-sufficiency and independence (e.g., enjoying the satisfaction of providing for yourself and your family) as motivators for consuming game meat. Further research could be undertaken to understand these factors' influence on game hunters' food choices.

The study findings suggest that information can play an important role in shaping game hunters' values and attitudes toward new environmental issues. Therefore, it is recommended that future studies assess the access to information, type of information, and source of information. The study also suggests that hunting barriers may not be significant for young, well-educated, and high-income individuals. However, the questions in this section should be revised to obtain more accurate results.

Although the study confirms that social norms are an important factor in predicting intention to hunt and consume game meat, they were not found to be significant in influencing hunting and game meat consumption behaviours. Using this factor in a larger survey could help to gain more accurate insights into this variable.

Finally, the study shows that the theory of planned behaviour can help understand game meat consumption behaviours. However, modifying the theory constructs, such as revising the social norms and behavioural control items considering young, affluent, well-educated, and urban participants, can lead to more accurate and representative results.

2.6 Conclusion

The present research findings indicated that socio-demographic characteristics, environmental beliefs, level of food involvement, motivations and barriers towards hunting and game meat consumption, and social norms are related to hunters' attitudes towards meat, their willingness to consume game meat, and their interest in participating in hunting activities. The small homogeneous sample limited comparisons among study variables. Furthermore, it was found that the components of the planned behaviour theory predict individuals' intentions to consume game meat and hunt, and game meat consumption, which supports the research hypothesis.

CHAPTER THREE

3.1 General discussion and conclusions

In recent years, there has been a decrease in hunting activity, yet acquiring game meat remains a frequently reported motivation for hunting. It is important to explore the underlying factors that drive game meat acquisition and consumption. Hence, this pilot study was conducted to understand the key determinants of game meat consumption among hunters in Alberta. The insights from this study will be used to design a comprehensive survey for a larger population to obtain a representative understanding of how food-related benefits of hunting strengthen the appeal of hunting wild game for food in Alberta.

The study findings have provided important insights into the various factors influencing game meat consumption behaviour. Notably, the research shed light on the efficacy of using food-related, free word association, and meat-eating and food-involvement questionnaires as practical tools to achieve this goal. While further investigations are required to obtain a more comprehensive understanding, this research makes a meaningful contribution to the limited research on this topic in Alberta. The practical insights gained from this study can guide future research and offer practical information to wildlife conservation stakeholders.

3.2 Main findings and implications

The initial screening question confirmed a homogeneity among hunters who participated in this small study. Nearly all respondents are experienced game hunters who have hunted in the last 12 months and plan to continue doing so. Most respondents are men, well-educated, with above-average incomes, and currently living in an urban area. They were typically over 41, with a significant number of young hunters aged 21 to 30.

Results from this research study indicate that game hunters are actively involved in hunting and consuming game meat and intend to continue doing so. The primary source of game meat for these hunters is either from their own successful hunts or from their friends and families who engage in hunting. The primary motivating factors for hunting are the opportunity to spend time outdoors, relaxation, and obtaining natural food from local sources. Meanwhile, the key drivers

for game meat consumption are the quality and freshness of the meat, a desire to utilize natural resources sustainably, and the taste of game meat. However, the limited access to land and hunting opportunities poses significant barriers to hunting and game meat consumption among these hunters. Despite this, there is substantial awareness and recognition of the benefits of game meat, and game hunters have a positive attitude towards meat and game meat consumption. They are highly involved with food, which leads them to try new foods and change their eating habits. Moreover, they are highly aware and concerned about environmental degradation consequences for themselves, others, and the natural world.

The research's primary objective was to determine the key determinants of game meat consumption among hunters in Alberta. Results from the descriptive analysis of the research sample of Albertan game hunters suggest that Key factors that impact game meat consumption frequency are hunting frequency, motivation for hunting, game meat consumption motivation, level of food involvement, environmental beliefs, attitudes toward meat and intention to hunt and consume game meat. However, the correlation analysis highlights the importance of hunting frequency, hunting motivation, level of food involvement and intention to consume game meat. These results resonate with prior studies, emphasizing the significance of acquiring game meat as a highly satisfying aspect of hunting (Ljung et al., 2012; Decker et al., 2015). Furthermore, the level of involvement with food emerges as a potentially influential force in promoting game meat consumption behaviour that aligns with the assertion that individuals with a heightened food involvement are more inclined to explore new foods and make dietary adjustments for improved health (Marshall & Bell, 2004). Additionally, the theory of planned behaviour, emphasizing intention and perceived behavioural control, provides a valuable framework for understanding the motivational and decision-making processes that underlie game meat consumption. Game hunters do not perceive barriers in hunting or acquiring game meat and show a high intention to hunt and consume game meat, which underscores the predictive power of intention in shaping behaviour, reflecting game hunters' motivation and readiness to undertake specific actions (McDermott et al., 2015)

The consumption and interest in wild game meat suggest that food-related benefits of hunting strengthen the hunting activity. Efforts to address barriers to hunting and consuming game meat by providing hunting opportunities through longer seasons, larger bag limits, or increased access could reinforce the value of hunting for this group of young, well-educated, and urban hunters. While results indicate eating wild game can be a stepping stone to hunting participation, research has also shown that being part of a network of hunters and even participating in hunting-related activities, such as eating game meat, can work as a driving force to be a hunter. Finally, the young, affluent, well-educated, urban-suburban hunters surveyed suggest that managing their interests and preferences for hunting and consuming wild game could strengthen the hunting community and maintain their support for the activity.

3.3 Future direction

The pilot study conducted on hunting and game meat consumption in Alberta, Canada, has provided valuable insights and paved the way for promising future research directions in this field. The study findings highlight several areas that warrant further investigation and refinement to contribute to a more comprehensive understanding of the subject matter.

One of the key findings of the study is the significance of young hunters as a major demographic in this context. Therefore, future research should explore their motivations and preferences for hunting and consuming game meat. This demographic is likely to have distinct motivations and influences compared to other age groups, and understanding their attitudes and behaviours can shed light on evolving trends in hunting and game meat consumption.

The pilot study also emphasizes the importance of considering the demographics of the study participants when designing questionnaires for larger-scale research. It highlights that factors such as age, education, and income levels can significantly influence attitudes and behaviours related to hunting and game meat consumption. Hence, future studies should incorporate this awareness into their questionnaire design to obtain more accurate and representative results.

The study's findings on self-sufficiency and independence as motivators for game meat consumption suggest that there is potential for further research into these factors. Exploring how

these values impact food choices among game hunters and the associated social and environmental implications would be a valuable avenue for future research.

Moreover, the role of information in shaping game hunters' values and attitudes toward environmental issues is an intriguing aspect that deserves more attention. Therefore, future studies should delve into this area, examining the access to information, the type of information, and its sources to better understand how it influences hunting and game meat consumption behaviours.

While the study confirms the significance of social norms in predicting intention to hunt and consume game meat, it suggests that these norms might not have a substantial impact on actual behaviours. Therefore, to gain more accurate insights into this variable, it is recommended to incorporate this factor in a larger survey, considering a broader and more diverse sample.

Finally, the study has demonstrated the utility of the theory of planned behaviour in understanding game meat consumption behaviours. However, it also suggests that modifications to the theory's constructs, especially in the context of young, affluent, well-educated, and urban participants, can lead to more accurate and representative results. Therefore, future research should consider refining these constructs to align with the characteristics of the target population.

Given the inclination of ambivalent hunters to hold less stable and more pliable positive or negative evaluations toward an object or behaviour and the strength of environmental beliefs, social norms, and perceived control impact on hunting intention, it is crucial to investigate game hunters' information access and the types of information they receive, along with the social norms they encounter. It is also essential to examine the concept of perceived behavioural control, which can be divided into intrapersonal, interpersonal, and structural categories. These categories encompass personal perceptions, family obligations, fear of peer judgment, and available resources, providing a more nuanced understanding of the sources of hunter ambivalence towards the activity.

In conclusion, this preliminary study delves into the hunting practices and game meat consumption in Alberta. By examining the various factors that influence hunting and game meat consumption practices and preferences, it presents an understanding of the population's unique demographics, values, attitudes, and behaviours. Researchers can use the findings to refine

theoretical frameworks and contribute to a more nuanced understanding of hunting and game meat consumption in Alberta. Furthermore, the study provides recommendations that offer a clear path for researchers to build upon the insights gained from this initial investigation and further advance the understanding of the benefits of hunting for food impacts on encouraging sustained hunting practices.

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Appendices

Appendix A. Survey instrument

Study title: Determinants of game meat consumption among hunters in Alberta

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Invitation to Participate

You are invited to participate in this research study about the determinants of game meat consumption and how game meat consumption affects hunting participation. Your hunting and game meat consumption experiences can help us explore this topic. You have been invited to participate in this study because a member of the research team has identified you as a game hunter or a study participant has extended the survey invitation to you.

Purpose of the Study

The primary objective of the study is to explore key determinants of game meat consumption among hunters residing in Alberta. We wish to learn about your hunting experiences, game meat consumption patterns, preferences, challenges to game meat consumption, and your level of interest in food.

Participation

If you wish to participate in this study, please click on the URL below. The survey takes approximately 15 minutes to complete. You do not have to answer any questions that you do not want to answer. If you cannot complete the survey in one sitting, the data will be saved automatically, and you will be able to return to the link and continue where you left off.

The survey will close on September 10th. In about one week, we will send you one follow-up reminder to participate and to share this email survey invitation with fellow hunters. As participation is anonymous, and we will not know if you have completed the survey, you will receive a reminder even if you have completed the survey.

Benefits

There are no direct personal benefits to participation in this study.

Risks
There are no foreseeable risks to participation in this study.

Confidentiality and Anonymity

The information you will share will remain strictly confidential and will be used solely for the purpose of this research. The only people who will have access to the research data are the researchers listed above.

Survey data will be collected using Qualtrics software, which complies with Canadian privacy laws and will not share your responses with third parties. To minimize the risk of security breaches and to help ensure your confidentiality, we recommend that you use standard safety measures such as signing out of your account, closing your browser, and locking your screen or device when you are no longer using them or when you have completed the study.

The results of the study will be published in aggregate format. Your answers to open-ended questions may be used verbatim in presentations and publications, but you will not be identified.

Anonymity is guaranteed since you are not being asked to provide your name or any personal information in the survey, and your IP addresses will not be recorded. If we have contacted you directly, our contact list with your name and email address will be destroyed on August 31, 2023, when data collection closes. If you are receiving the survey through a friend or hunter who is a colleague, we will not know your identity.

Data Storage: Electronic copies of the data will be stored on a password-protected computer in the Department of Agricultural, Food and Nutritional Science at the University of Alberta for at least five years.

Voluntary Participation. Participation in this study is completely voluntary, and you may withdraw from the survey at any time before submitting your answers. If you decide to withdraw from this study by exiting out of the survey, we will use the data you have provided up to that point. As no personal identifiers are attached to your data, you will not be able to withdraw from the study after the completed survey is submitted.

Information about Study Results. You will have access to the research results once an academic publication is available.

Contact Information. If you have any questions about this study, please contact the principal investigator Tahereh Mousavi [tahereh.mousavi@ualberta.ca]

The plan for this study (Pro00119565) has been approved by a Research Ethics Board at the University of Alberta. If you have any questions about your rights or how research should be conducted, you can call (780) 492-2615. This office is independent of the researchers.

By selecting "I agree", you indicate that you have read and understood the information provided above, and you give consent to participate in the survey. Please save this form for your records by taking a screenshot or saving it as a pdf file.

Do you agree to take part in this voluntary research study?

☐ I agree ☐ I disagree (exit survey)

In this survey we will ask you about your perceptions of hunting and eating wild game meat. We define game meat as "meat obtained from animals that are hunted in their natural habitats".

There are five sections to this survey:

1. Perceptions of eating wild game meat
2. Hunting experience and environmental beliefs
3. Game meat consumption
4. Meat consumption
5. Demographics and food choices

Please select the best response to each question. There are no right or wrong answers, it is your opinion as a game hunter that is important.

Part 1. Perceptions of eating wild game meat

What comes to your mind when you think of **eating wild game meat**. Please write down your first **4** words, thoughts, or images.

1. _____
2. _____
3. _____
4. _____

Part 2. Hunting Experience and Environmental Beliefs

In this section, we would like you to answer questions about your usual hunting experience, such as how often you hunt, the game you hunt, and your environmental beliefs.

How many times have you gone hunting (game, waterfowl, birds) in the last 12 months? _____

Where do you usually hunt?

□ In Alberta

□ In provinces other than Alberta

□ In the US

□ Other locations

What type of game do you hunt? (Check all that apply)

□ Big game (e.g. moose, deer)

□ Small game (e.g. rabbit)

□ Game birds

□ Waterfowl

□ Fish

Which big game animals have you hunted in the last 12 months?

□ Deer - White tail or Mule

□ Elk

□ Moose

□ Bison

□ Bighorn sheep

□ Others (please specify)_____

Do any of the following people in your life hunt? (Check all that apply)

□ One or more parents

□ Brother/sister

□ Friends

□ Work colleagues

□ Other: _____

How important are the following factors to you when deciding if you will participate in hunting?

	Not at all important	**Slightly important**	**Moderately important**	**Important**	**Extremely important**
Spending time outdoors	□	□	□	□	□
Interacting with and learning about wildlife and nature	□	□	□	□	□
Obtaining my own natural food from local sources	□	□	□	□	□
Meeting and/or building friendships with other hunters	□	□	□	□	□
Contributing to wildlife management efforts that help local ecosystems	□	□	□	□	□
Helping others develop outdoor recreation skills and knowledge	□	□	□	□	□
Becoming more connected to the place where I live	□	□	□	□	□
Improving my physical health (getting exercise)	□	□	□	□	□
Participating in wildlife management efforts that help local communities	□	□	□	□	□
Improving my mental health (feeling mentally refreshed)	□	□	□	□	□

Relaxing and enjoying time outdoors	□	□	□	□	□
Challenging and improving my outdoor recreation skills and knowledge	□	□	□	□	□
Harvesting a trophy animal	□	□	□	□	□
Providing for myself and my family	□	□	□	□	□

When you are hunting wild game, how do your friends feel about it?

□	□	□	□	□
Disapprove		No-opinion		Approve

When you are hunting wild game, how does your family feel about it?

□	□	□	□	□
Disapprove		No-opinion		Approve

Your thoughts about the environment

To which extent do you agree or disagree with the following statements about the environment?

	strongly disagree	**moderately disagree**	**disagree**	**neither disagree nor agree**	**agree**	**moderately agree**	**strongly agree**
Environmental protection benefits everyone.	□	□	□	□	□	□	□
Environmental threats to public health have been exaggerated.	□	□	□	□	□	□	□
Environmental damage generated here harms people all over the world.	□	□	□	□	□	□	□
Environmental protection is beneficial to my health.	□	□	□	□	□	□	□
Environmental protection will provide a better world for my children and me.	□	□	□	□	□	□	□
Environmental protection will help me	□	□	□	□	□	□	□

to have a better quality of life.							
Over the next decade, thousands of species of plants and animals will become extinct.	□	□	□	□	□	□	□
Claims that we are changing the climate are greatly exaggerated.	□	□	□	□	□	□	□
While some local plants and animals may have been harmed by environmental degradation, over the whole earth, there has been little effect.	□	□	□	□	□	□	□

How likely are you to hunt in the next 12 months? (Check ONE response.)

□	□	□	□	□
I am NOT likely to hunt in the future		Not sure about hunting in the future		I am VERY likely to hunt in the future

Part 3. Game Meat Consumption

In this section, we would like you to tell us about your consumption of game meat.

During the last 12 months, how often have you eaten the following?

	Never	**Rarely (1-2 times)**	**Occasionally (3-5 times)**	**Often (6 or more times)**
Deer	□	□	□	□
Elk	□	□	□	□
Moose	□	□	□	□
Bison	□	□	□	□
Bighorn sheep	□	□	□	□

From which sources do you usually obtain game meat you eat? (check all that apply)

□ Harvested myself

□ Provided by someone I know (e.g. family, friends)

□ Purchased from a meat shop

□ Other (please specify)_____

How important are the following factors to you when deciding if you will eat wild game meat? (Check ONE response for each factor.)

	Not at all important	**Slightly important**	**Moderately important**	**Important**	**Extremely important**
Taste	□	□	□	□	□
Quality and freshness	□	□	□	□	□
Concern about Chronic Wasting Disease presence in the game meat	□	□	□	□	□
Where game meat was obtained	□	□	□	□	□
How game meat was obtained	□	□	□	□	□
Nutrition or health benefits	□	□	□	□	□
Sustainable use of natural resources	□	□	□	□	□
Support for wildlife conservation	□	□	□	□	□
Connection to local food sources	□	□	□	□	□
Demonstrating healthy eating habits for family and friends	□	□	□	□	□
Sharing knowledge about hunting and game meat consumption	□	□	□	□	□
Spending time with others who enjoy eating wild game meat	□	□	□	□	□

Are there other factors not in the list above that influence your decision to eat wild game meat?

□ No

□ Yes (please specify) _____

Which of the following are obstacles or barriers to your consumption of wild game meat? (Check ONE response for each factor.)

	Not a barrier	**Minor barrier**	**Moderate barrier**	**Major barrier**
Don't like the taste	□	□	□	□
Don't like the act of killing wild game	□	□	□	□
Don't know the nutritional content of the wild game meat	□	□	□	□
Concerns about environmental quality where the game was harvested	□	□	□	□
Concerns about wild game quality/safety and personal health (e.g. CWD; Chronic Wasting Disease)	□	□	□	□

Limited access to land and hunting opportunities	□	□	□	□
Lack of information about where to hunt or obtain game meat	□	□	□	□
Lack of skills required to hunt wild game	□	□	□	□
Lack of skills required to process and prepare wild game meat	□	□	□	□
Lack people to hunt with and learn from	□	□	□	□
Time required to catch and/or prepare wild game	□	□	□	□
Cost of hunting license	□	□	□	□
Cost of hunting wild game (equipment, travel, etc.)	□	□	□	□

Are there other factors not in the list above that are obstacles or barriers to your consumption of wild game meat?

□ No

□ Yes (please specify)

How likely are you to consume game meat in the future (i.e. in the next 12 months)?

□	□	□	□	□
I am NOT likely to eat game meat in the future		Not sure		I am VERY likely to eat game meat in the future

Part 4. Meat Consumption

In this section, we would like you to tell us about your consumption of meat in general.

We define meat as red and white meats (e.g. beef, lamb, pork, chicken, turkey, fish, seafood etc.) that are either unprocessed or processed.

How often do you consume meat and meat products (e.g., chicken nuggets, wieners) in an average week?

□ Never

□ Less than once per week

□ once or twice per week

□ three or four times per week

□ Five times or more per week

Please rate your level of agreement with the following statements (1 = strongly disagree; 5 = strongly agree)

	strongly disagree	disagree	neither disagree nor agree	agree	strongly agree
To eat meat is one of the pleasures in life.	□	□	□	□	□
Meat is irreplaceable in my diet.	□	□	□	□	□
According to our position in the food chain, we have the right to eat meat.	□	□	□	□	□
I feel bad when I think of eating meat.	□	□	□	□	□
I love meals with meat.	□	□	□	□	□
To eat meat is disrespectful to life and the environment.	□	□	□	□	□
To eat meat is an unquestionable right of every person.	□	□	□	□	□
A good steak is without comparison.	□	□	□	□	□
I would feel fine with a meatless diet.	□	□	□	□	□
I'm a big fan of meat.	□	□	□	□	□
If I couldn't eat meat, I would feel weak.	□	□	□	□	□
If I was forced to stop eating meat, I would feel sad.	□	□	□	□	□
Meat reminds me of diseases.	□	□	□	□	□
By eating meat I'm reminded of the death and suffering of animals.	□	□	□	□	□
Eating meat is a natural and undisputable practice.	□	□	□	□	□
I don't picture myself without eating meat regularly.	□	□	□	□	□

Part 5. Demographics and food choices

This is the final section of the survey.

In this section, we would like you to tell us about your everyday food choices and answer some questions about yourself.

Everyday Food Choices

Indicate how much you agree or disagree with the following statements.

	strongly disagree		**disagree**		**neither disagree nor agree**		**agree**		**strongly agree**
After eating delicious food elsewhere, I make it myself	□	□	□	□	□	□	□	□	□
I am interested in recipes	□	□	□	□	□	□	□	□	□
I often prepare food and share with people	□	□	□	□	□	□	□	□	□
I like cooking	□	□	□	□	□	□	□	□	□
I enjoy buying and preparing food	□	□	□	□	□	□	□	□	□
I enjoy food-related information on SNS, blogs and food-related TV programs	□	□	□	□	□	□	□	□	□
I have knowledge about food and cooking	□	□	□	□	□	□	□	□	□
Food gives me pleasure	□	□	□	□	□	□	□	□	□
Food is an important part of my life	□	□	□	□	□	□	□	□	□
I am very concerned about what I eat	□	□	□	□	□	□	□	□	□
I am interested in food	□	□	□	□	□	□	□	□	□
I often think about what I ate or am going to eat	□	□	□	□	□	□	□	□	□
I enjoy talking about food	□	□	□	□	□	□	□	□	□
I consider many things when I buy food	□	□	□	□	□	□	□	□	□
When I buy food, I check the information on the package	□	□	□	□	□	□	□	□	□
I look for several retailers (on-line and off-line) before purchasing food	□	□	□	□	□	□	□	□	□
I spend much time and effort for choosing food	□	□	□	□	□	□	□	□	□
I recommend food items to others	□	□	□	□	□	□	□	□	□

What is your gender?

□ Male
□ Female
□ Other

How old are you?

□ Less than 20 years

□ 21 – 30 years

□ 31 – 40 years

□ 41 – 50 years

□ 51-60 years

□ 61-70 years
□ More than 71 years

What is your highest level of education?

□ Some or all high school

□ Some or all post-secondary education (college, university, technical school)

□ Graduate or professional degree (MS, Ph.D., MD)

How many person(s) are currently living in your household (including children)? (Write response)

_____

What is your current employment status?

□ Employed - full-time (30 hours or more per week)

□ Employed - part-time (less than 30 hours per week)

□ Self-Employed

□ Retired

□ Student

□ Military

□ Parent/ Homemaker

□ Not currently employed

□ Prefer not to answer

What was your approximate household income last year before taxes?

□ $ 53,359 or Less

□ $ 53,359 to $106,707

□ $106,708 to $165,430

□ $165, 431 to $227,668

□ More than $227, 668
□ Prefer not to answer

How would you best describe the area where you grew up?
□ Rural
□ Urban
□ Suburban

What are the first 3 digits of your postal code? (Write response) _____

Thank you for completing this survey!

We appreciate the time you have taken to help us with our research study.

Please click 'submit' to finalize the survey.

SUBMIT

Appendix B. Survey invitation and follow-up reminder emails

Contact email/ invitation

SUBJECT LINE: Game meat consumption among hunters in Alberta; survey invitation from a University of Alberta MSc student

I am conducting an online survey with game hunters who reside in Alberta. The aim of the survey is to explore the relationship between game meat consumption and hunting participation. If you are 18 years of age and older and have hunted wild game in Alberta within the past 5 years, we invite you to participate in the survey.

The survey will take about 15 minutes to complete. Please complete the survey as soon as possible, but no later than July 27th, 2023.

The survey is anonymous. Please be assured that the information you provide will be kept confidential. The plan for this study (Pro00119565) has been approved by a Research Ethics Board at the University of Alberta.

To complete the online survey, please click on the URL below or copy it into your internet browser location bar. If you cannot complete the survey in one sitting, the data will be saved automatically. You will be able to return to the link and continue where you left off.

SURVEYLINK

Please forward this email to other hunters who might be interested in completing the survey.

If you have any questions regarding this study or problems accessing the site, please email me at [tahereh.mousavi@ualberta.ca]. Your participation is very important to us! Thanks for your time and input. It is much appreciated.

Best regards,

Tahereh Mousavi

MSc student
Agricultural, Food and Nutritional Sciences
University of Alberta
Edmonton, Alberta

Subject: Your Valuable Insights Matter! Survey reminder

This is a friendly reminder about the survey on game meat consumption among hunters in Alberta, in which Dr. Sven Anders recommended you as a potential participant. Your perspectives and experiences as a hunter are essential to achieving meaningful insights, and I kindly request a few minutes of your time to complete the survey. Since this survey is anonymous, I am unable to identify those who have already participated. Therefore, if you have completed the survey, I appreciate your contribution and kindly request that you share this email with any other hunters you have invited to participate.

This is the final reminder I'll be sending out. Your participation will certainly make a difference, and I look forward to receiving your input before the survey closes on August 15th. Here is the link to the survey: [Survey Link]

Warm regards,

Tahereh Mousavi

MSc student
Agricultural, Food and Nutritional Sciences
University of Alberta
Edmonton, Alberta

Appendix C. Digest message

Participants needed for the study of Game meat consumption among hunters in Alberta.

The aim of this anonymous online survey is to explore the relationship between game meat consumption and hunting participation. If you are 18 years of age and older and have hunted wild game in Alberta within the past five years, we invite you to participate in the survey.

The survey will take about 15 minutes to complete. The survey closes on September 10th, 2023.

Thank you very much for your participation.

University of Alberta Ethics ID: Pro00119565

SURVEY LINK: https://ualberta.ca1.qualtrics.com/jfe/form/SV_bey85fDRrxUkxbo

Appendix D. Free word association tables

FWA (1)	Frequency	Percent
Cheaper	1	1.1
clean	2	2.3
Connection to nature	1	1.1
Cutlets	1	1.1
Deer	3	3.4
delicious	1	1.1
Delicious	5	5.7
earned	1	1.1
Elk	2	2.3
Ethical	1	1.1
Flavour	2	2.3
flavourful	1	1.1
food	1	1.1
Food	1	1.1
Fresh	1	1.1
grilled duck	1	1.1
Health	1	1.1
healthy	7	8.0
Healthy	8	9.2
Healthy and fresh	1	1.1
humane harvest	1	1.1
Hunt it	1	1.1
hunting	2	2.3
Hunting	1	1.1
Jerky	1	1.1
lean	2	2.3
Lean	1	1.1
LEAN	1	1.1
living	1	1.1
meat I grew up eating	1	1.1
Moose	1	1.1
Natural	1	1.1
nature	1	1.1
No hormones	1	1.1
Nutritious	1	1.1
organic	1	1.1
Organic	2	2.3
pride	1	1.1
Quality	1	1.1
Respect	1	1.1
Rewarding	1	1.1
sacrement	1	1.1

Satisfaction	1	1.1
sausage	1	1.1
self sufficient	1	1.1
Steak	1	1.1
Steaks	1	1.1
strong	1	1.1
sustainable	1	1.1
Sustainable	2	2.3
Taste	2	2.3
tasty	1	1.1
Tasty	2	2.3
ungulates	1	1.1
Unique	1	1.1
Unique taste	1	1.1
Wholesome	1	1.1
Yum	1	1.1
Total	87	100.0

FWA (2)	**Frequency**	**Percent**
An animal that has lived its entire life free and as an animal should	1	1.1
as nature intended	1	1.1
BBQ	1	1.1
BBQ	1	1.1
Bear	1	1.1
Butcher it	1	1.1
charcuterie	1	1.1
Connected	1	1.1
Conservation	1	1.1
Cost of living	1	1.1
Cuts of meat	1	1.1
Deer	1	1.1
delicious	1	1.1
Delicious	1	1.1
delicious and healthy meat	1	1.1
different	1	1.1
Earned	1	1.1
Elk	1	1.1
Enjoyment	1	1.1
ethical	1	1.1
Field to table	1	1.1
Fresh	1	1.1
get outdoors	1	1.1
Harvest	1	1.1

healthy	2	2.3
Healthy	6	6.9
HEALTHY	1	1.1
high quality	1	1.1
history	1	1.1
Hormone and antibiotic-free	1	1.1
Humane	1	1.1
hunting	1	1.1
Hunting	1	1.1
independent	1	1.1
Lean	3	3.4
lean meat	1	1.1
Moose	1	1.1
natural	1	1.1
Natural	1	1.1
natural order	1	1.1
nature	1	1.1
Nutrition	1	1.1
nutrition	1	1.1
nutritious	1	1.1
Nutritious	1	1.1
off	1	1.1
organic	1	1.1
Organic	1	1.1
Origin	1	1.1
outdoors	1	1.1
Personal pride	1	1.1
pleasure	1	1.1
Quality	2	2.3
rich	1	1.1
Roasts	1	1.1
Satisfaction	1	1.1
Satisfaction of hunting for red meat	1	1.1
Sausages	1	1.1
Steak	1	1.1
Super lean	1	1.1
sustainable	1	1.1
Sustainable	2	2.3
sustaining	1	1.1
taste	1	1.1
tasty	2	2.3
Tasty	1	1.1
Tender	1	1.1
turkey	1	1.1
Ultra-low fat	1	1.1

Venison	1	1.1
Way of life	1	1.1
Wholesome	1	1.1
Wild	1	1.1
Work	1	1.1
Yummy	1	1.1
Total	87	100.0

FWA (3)	**Frequency**	**Percent**
autumn	1	1.1
Back to the land	1	1.1
Benefit	1	1.1
Butchering	1	1.1
Clean	1	1.1
Clean Lean Protein	1	1.1
cruelty-free	1	1.1
deer	1	1.1
Deer	1	1.1
delicious	2	2.3
Delicious	2	2.3
different	1	1.1
duck confit	1	1.1
Economical	1	1.1
Elk	1	1.1
Fall	1	1.1
fall weather	1	1.1
family	2	2.3
Family friendly	1	1.1
Flavour	1	1.1
Flavourful	1	1.1
food	1	1.1
Fowl	1	1.1
Full	1	1.1
Fun	1	1.1
good	1	1.1
Good	1	1.1
Great taste	1	1.1
Grouse	1	1.1
Hamburgers	1	1.1
health	1	1.1
healthy	3	3.4
Healthy	3	3.4
Heritage	1	1.1
honest	1	1.1
low fat	1	1.1

mallard	1	1.1
Memories	1	1.1
my primary source of protein	1	1.1
natural	2	2.3
Natural	1	1.1
nature	1	1.1
organic	2	2.3
Organic	1	1.1
organic nonGMO	1	1.1
Part of my tradition and culture	1	1.1
Passing on the skill to next generation	1	1.1
Powerful	1	1.1
Pride	1	1.1
Provide for family	1	1.1
provider	1	1.1
providing for yourself	1	1.1
Recreation	1	1.1
Reward	1	1.1
Roast	1	1.1
Satisfaction	1	1.1
Sausage	1	1.1
save money	1	1.1
self-sufficient	1	1.1
SELF SUFFICIENT	1	1.1
Store it	1	1.1
Sustainable	6	6.9
Tacos	1	1.1
taste	1	1.1
Tasty	2	2.3
Tough	1	1.1
Traditional	1	1.1
Trout	1	1.1
Type animal	1	1.1
Unique	1	1.1
Variety	1	1.1
Total	87	100.0

FWA (4)	**Frequency**	**Percent**
Aligned with my values	1	1.1
atavistic	1	1.1
butchering moose	1	1.1
Canada goose flying	1	1.1
Challenges	1	1.1

CLEAN	1	1.1
connectedness	1	1.1
Connection	1	1.1
Conservation	1	1.1
Cost savings	1	1.1
dark	1	1.1
desirable	1	1.1
druidic	1	1.1
Earned	1	1.1
Eat it	1	1.1
enjoyable	1	1.1
Enjoyable	1	1.1
environmentally friendly	1	1.1
Ethical	1	1.1
Ethics	1	1.1
Family	1	1.1
Family oriented activity	1	1.1
Flavourful	1	1.1
forest	1	1.1
Forest	1	1.1
free	1	1.1
friends	1	1.1
Gamey	1	1.1
Geese	3	3.4
good	1	1.1
Grandmother	1	1.1
Hard work	2	2.3
harvesting	1	1.1
healthy	2	2.3
Healthy	2	2.3
Independence	1	1.1
Indigenous	1	1.1
Inexpensive	1	1.1
Jalapeno cheddar smokies	1	1.1
lean	2	2.3
less expensive	1	1.1
Local and sustainable	1	1.1
manage wildlife	1	1.1
Memories	1	1.1
Merciful	1	1.1
Moose	1	1.1
Natural	1	1.1
Necessity	1	1.1
No additives	1	1.1

Organic and Pure	1	1.1
Outdoors	1	1.1
Personalized	1	1.1
Presentation	1	1.1
Provider	1	1.1
Rare	2	2.3
Respect	1	1.1
Rewarding	1	1.1
sausage	1	1.1
self-reliance	1	1.1
Self reliance	1	1.1
Self sufficient	1	1.1
Sensible	1	1.1
Smoker	1	1.1
Smoking	1	1.1
sufficiency	1	1.1
sustainable	2	2.3
Sustainable	1	1.1
tasty	2	2.3
Tasty	3	3.4
Together	1	1.1
uncontaminated	1	1.1
unique	1	1.1
wild flavours	1	1.1
wildlife management	1	1.1
Work	1	1.1
Total	87	100.0