Motivations for and thoughts toward rabbit ownership and factors contributing to companion-rabbit owners’ knowledge

by

Tasha Welch

A Thesis
presented to
The University of Guelph

In partial fulfillment of requirements
for the degree of
Master of Science
in
Population Medicine

Guelph, Ontario, Canada

© Tasha Welch, March, 2015
ABSTRACT

MOTIVATIONS FOR AND THOUGHTS TOWARD RABBIT OWNERSHIP AND FACTORS CONTRIBUTING TO COMPANION-RABBIT OWNERS’ KNOWLEDGE

Tasha Welch
University of Guelph, 2015

Advisor: Dr. Jason B. Coe

Prospective rabbit owners’ pre-acquisition motivations for and thoughts toward rabbit ownership were explored using one-on-one telephone interviews (n=18). Thematic analysis revealed the theme considerations prior to acquiring a companion rabbit, which involved four subthemes: reasons given for acquiring a companion rabbit, considerations when choosing an acquisition source, animal-related pre-acquisition considerations and owner-related pre-acquisition considerations. An online survey involving current rabbit owners (n=2,890) across Canada, the United States and outside of both countries explored factors associated with companion-rabbit owners’ knowledge of rabbit care and the spay or neuter status of companion rabbits. An approximation of logistic regression showed increasing attachment, increasing participant age and regular veterinary check-ups to be associated with higher odds of answering a knowledge question correctly. Logistic regression found increasing knowledge score, regular veterinary check-ups and owning only one rabbit increased the odds of owning a spayed or neutered rabbit. Findings identify educational and future research opportunities relating to companion-rabbit ownership.
ACKNOWLEDGEMENTS

To my advisor, Dr. Jason Coe, although you initially did not have intentions of conducting research on companion rabbits, you have given me an opportunity to follow a passion of mine studying rabbit ownership and relinquishment. I am extremely grateful for your support through this process. When I think of myself as a researcher, when I began this program to now, the difference is incredible, and I attribute that to your guidance. The input and time you have provided over the last two and a half years has helped me tremendously and allowed me to successfully meet my goals in the quality of my work for each thesis chapter. Drs. Emily McCobb and Lee Niel thank you both for your support, advice and input, it was greatly appreciated throughout this program.

I would like to thank the Nestle Purina Pet Care Canada Chair in Communications for funding these projects.

I would like to thank all of shelters, rescues, breeders, pet stores, rabbit and animal-related groups that were involved in this project. Their vital role recruiting participants, whether this involved displaying a poster, sending emails or posting information on social media, it was enormously helpful. I truly appreciate, through many emails back and forth, your patience and prompt response helping with each study. Without your support, collaboration and effort this project could not have taken place with such success.

William Sears, thank you so much for your advice and guidance. Statistics is an extremely intimidating subject, but after hours and hours of meetings, with your patience explaining all of my questions, I feel confident in the statistical programs and analysis techniques used. I really appreciate your support throughout the analysis of the quantitative chapter.

To my friends, I met so many wonderful people throughout this program. As we each went through the challenges of research, stress of deadlines and some sleepless nights, we
learned from each other, supported each other and provided feedback on each others’ projects whenever possible. I am so lucky to have met you all on that first day of graduate classes; you are truly amazing people. To be surrounded by such driven individuals, each with your own passions and goals is inspirational. Watching our projects progress and come to an end has been rewarding as I know how hard we have all worked and I am so excited for the next chapter in our lives. To my friends from high school and horseback riding, what can I say? You guys are the best, I can’t believe how many times you all sat there listening to me ramble on about my research, but I am so thankful for that. There was never a doubt in your minds that I could not do this or that it was too difficult; your respect and support has been amazing.

I am extremely grateful for my parents. My parents have always told me, “be the best you can be, you can do anything you put your mind too”. Throughout my life this is what I heard and this is what I believe thanks to them. Their endless support has been a major motivation for me to pursue the things I am most passionate about. They would listen to me practice presentations, help edit my papers, listen to me rant about the trials and errors of research. Whether or not you had any idea what I was talking about you listened and helped me in any way you could. You’re on my team, you’re my number one supporters with unwavering faith; thank you.

I would also like to acknowledge the rabbits I have owned over the years. Since I was 15 years old I have had four rabbits, each with their own personality and ways of communicating. Developing bonds with these beautiful creatures and having them in my life motivated me to conduct this research to ultimately help promote responsible rabbit ownership and strong human-rabbit relationships. I am grateful for all of the support and advice I have acquired from Rabbit Rescue Inc. This organization, over several years, has opened my eyes to the prevalence of rabbits without homes and how a little education can go a long way to help people be prepared for rabbit ownership.
Last but not least, Jake. Oh my goodness, you have been incredibly supportive. I was always checking my emails or making one last edit, I must have made us late on several occasions and you never said a word and never complained. More than you know I appreciate your patience for when I was frustrated and tired when my research didn’t always go as planned or if I had to push back a deadline. With you by my side I can do anything, your respect and support really has made things easier and I am so thankful for that.
STATEMENT OF WORK DONE

Through the advisement of Dr. Jason Coe and collaboration with members of her advisory committee, Dr. Emily McCobb and Dr. Lee Niel, Tasha Welch decided on the methodology and analyzed the results for both the qualitative and quantitative studies in this thesis.

Chapter 1: Literature Review

Tasha Welch independently searched across several databases to identify articles relevant to the topics under study. The literature review was written by Tasha Welch under the advisement of Dr. Jason Coe. Carol Tinga provided editorial coaching on the chapter. Dr. Emily McCobb and Dr. Lee Niel contributed additional comments and recommended revisions.

Chapter 2: Qualitative Study

Tasha Welch decided on the methodology and wrote all study materials for the qualitative study in this thesis through collaboration with Dr. Jason Coe. A pilot of the study materials was conducted by Tasha Welch under the advisement of Dr. Jason Coe. Study locations were recruited by Tasha Welch. Staff of the study locations were involved with introducing potential participants to the study and Tasha Welch conducted all of the interviews, which included the process of informed consent. A paid transcriber transcribed all of the audiotaped interviews and Tasha Welch reviewed each transcript to ensure accuracy. Rachel O’Connor assisted with team-based coding of the interview transcripts and confirmed the final thematic analysis. With the guidance of Dr. Jason Coe, Tasha Welch developed the final thematic map. A first draft of the manuscript was written by Tasha Welch and reviewed and edited by Dr. Jason Coe. Dr. Emily McCobb and Dr. Lee Niel contributed additional comments and recommended revisions.

Chapter 3: Quantitative Study
Through collaboration with Dr. Jason Coe, Tasha Welch decided on the methodology and wrote all study materials for the quantitative study in this thesis. Tasha Welch created the initial six sections of the online survey by researching and compiling existing surveys, scales and instruments relevant to the topics under study. Dr. Jason Coe, Dr. Emily McCobb and Dr. Lee Niel reviewed and provided edits to the initial survey. The final draft of the survey was pre-tested by Tasha Welch on individuals from the qualitative study that had previously indicated interest in participating in future research. Once feedback was assessed from the pre-test and all advisory committee members approved the final survey, Tasha Welch contacted potential study sources by email and social media to extend the opportunity to help recruit for the study. Tasha Welch distributed the survey poster and online survey link to study sources by email and social media. Tasha Welch exported and cleaned the survey data. Tasha Welch performed statistical analysis under the guidance of Dr. Jason Coe and William Sears. The first draft of the manuscript was written by Tasha Welch and reviewed and edited by Dr. Jason Coe. Dr. Emily McCobb and Dr. Lee Niel contributed additional comments and recommended revisions.

Chapter 4: Conclusions

Tasha Welch wrote the first draft of the conclusions under the guidance and feedback of Dr. Jason Coe. Dr. Emily McCobb and Dr. Lee Niel contributed additional comments and recommended revisions.
TABLE OF CONTENTS

CHAPTER ONE......................................................................................................................1

Introduction, Literature Review, Rationale and Objectives.............................................1

1.0 Introduction....................................................................................................................2

2.0 Literature Review.......................................................................................................3

2.1 Companion-animal ownership....................................................................................3

2.1.1 Prevalence of companion-animal ownership.......................................................3

2.1.2 Motivations for acquiring companion animals......................................................4

2.1.3 The human-animal bond and its benefits.................................................................5

2.1.4 Breakdown of the human-animal bond and potential consequences.....................9

2.1.4.1 Relinquishment of companion animals...............................................................9

2.1.4.2 Overpopulation and spay and neuter of companion animals..............................16

2.2 Methodology..............................................................................................................18

2.2.1 Multi-method strategy.............................................................................................18

2.2.2 Qualitative methods ..............................................................................................18

2.2.3 Quantitative methods .............................................................................................20

3.0 Thesis Rationale and Objectives.................................................................................21

References.........................................................................................................................23

CHAPTER TWO.....................................................................................................................31

Motivations for and thoughts toward rabbit ownership prior to acquiring a new companion rabbit: a qualitative interview study...............................................................31

Abstract............................................................................................................................32
Introduction ........................................................................................................... 34

Methods .................................................................................................................. 35

  Study design ......................................................................................................... 36
  Interview development and structure ................................................................. 37
  Thematic analysis .................................................................................................. 37

Results ...................................................................................................................... 38

  Demographics ....................................................................................................... 38
  Thematic analysis .................................................................................................. 39

1. Reasons given for acquiring a companion rabbit ........................................... 39

  1.1 Love of rabbits and desire for companionship ................................................. 39
  1.2 For a companion for an existing rabbit .......................................................... 41
  1.3 Unplanned or unexpected acquisition of a companion rabbit ...................... 41

2. Considerations when choosing an acquisition source to purchase or adopt a
   companion rabbit ............................................................................................... 42

  2.1 Reputation of acquisition sources .................................................................. 43
  2.2 Convenience and cost of acquisition ............................................................... 46

3. Animal-related pre-acquisition considerations ................................................. 47

  3.1 Undesirable behaviour traits .......................................................................... 48
  3.2 Desirable behaviour traits .............................................................................. 49
  3.3 Desirable physical traits ................................................................................. 50
  3.4 Health status .................................................................................................... 52
  3.5 Compatibility between existing animals ......................................................... 53

4. Owner-related pre-acquisition considerations ................................................ 54

  4.1 Considerations surrounding husbandry and housing .................................... 54
4.2 Lifestyle factors.................................................................55

Discussion..................................................................................56

References..................................................................................67

CHAPTER THREE ..............................................................................73

Factors associated with companion-rabbit owners’ knowledge of rabbit care and the spay or neuter status of companion rabbits.................................................................73

Abstract......................................................................................74

Introduction..................................................................................76

Materials and Methods.................................................................77

Survey development......................................................................78

Recruitment and study procedure...............................................79

Psychometric analysis of the knowledge index and LAPS.................80

Statistical analysis........................................................................82

Results..........................................................................................85

Study participants........................................................................85

Companion-rabbit knowledge....................................................87

Companion-rabbit attachment.....................................................87

Factors associated with rabbit owners’ knowledge surrounding companion-rabbit care.................................................................87

Factors associated with participants owning a spayed or neutered companion rabbit..................................................................................88

Discussion....................................................................................88

References....................................................................................96

CHAPTER FOUR .............................................................................115
Conclusions…………………………………………………………………………………………..115
Summary of Findings………………………………………………………………………………118
Limitations…………………………………………………………………………………………122
Key Recommendations………………………………………………………………………..124
Future Directions for Research……………………………………………………………125
References………………………………………………………………………………………127

APPENDIX A………………………………………………………………………………………..131
A.1: Recruitment Poster………………………………………………………………………132
A.2: Recruitment Email………………………………………………………………………133
A.3: Recruitment Post for Online Classified Advertisement…………………………134
A.4: Researchers First Point of Contact…………………………………………………..135
A.5: Consent Form………………………………………………………………………………137
A.6: Interview Guide……………………………………………………………………………140
A.7: Codebook…………………………………………………………………………………143

APPENDIX B………………………………………………………………………………………..146
B.1: Recruitment for Groups, Organizations and Companies Exploring Interest in
   Helping Distribute the Survey……………………………………………………………..147
B.2: Recruitment Poster………………………………………………………………………149
B.3: Online Advertisement and Forum Recruitment Script……………………………..150
B.4: Consent Form………………………………………………………………………………151
B.5: Survey Regarding Rabbit Ownership, Experience, Husbandry, Knowledge,
   Challenges and Attachment to Companions Rabbits…………………………….153
LIST OF TABLES

Table 2.1 Demographic information for the 18 participants interviewed, in August to November 2012, looking to acquire a new companion rabbit from a breeder, a pet store, a shelter, a rescue or online advertisement within the Greater Toronto Area……………………………………71

Table 3.1 Descriptive statistics of categorical demographic information of 2,890 participating companion-rabbit owners…………………………………………………………………100

Table 3.2a Questions surrounding first time acquisition of a companion rabbit of 2,890 participating companion-rabbit owners………………………………………………………………102

Table 3.2b Questions surrounding acquisition and characteristics of 2,890 participants’ current companion rabbit…………………………………………………………………103

Table 3.3 Rabbit owner knowledge regarding companion-rabbit housing, care, health and behaviour of 2,887 participating companion-rabbit owners………………………………………………105

Table 3.4 Summary statistics for 23 items from the Lexington Attachment to Pets Scalea of 2,890 participating companion-rabbit owners………………………………………………107

Table 3.5 Approximation of logistic regression model with a bias correction term for factors associated with knowledge surrounding companion-rabbit care of 1,740 participating companion-rabbit owners…………………………………………………………109

Table 3.6 Logistic regression model for factors associated with having a spayed or neutered companion rabbit of 2,464 participating companion-rabbit owners……………………………………114
LIST OF FIGURES

Figure 2.1 Thematic map for theme, considerations prior to acquiring a companion rabbit and associated sub themes.................................................................72

Figure 3.1 Least squares means for knowledge scores based on participants’ location of residence of 1,740 participating companion-rabbit owners.............................................110

Figure 3.2 Least squares means for knowledge scores based on where participants acquired their current rabbit of 1,740 participating companion-rabbit owners.............................................111

Figure 3.3 Least squares means for knowledge scores based on where participants heard about the survey of 1,740 participating companion-rabbit owners.............................................112

Figure 3.4 Least squares means for knowledge scores based on whether participants attended regular veterinary check-ups of 1,740 participating companion-rabbit owners.............................113
CHAPTER ONE

Introduction, Literature Review, Thesis Rationale and Objectives
1.0 Introduction

Across the world, keeping animals and developing relationships with them is a common experience (Podbersek 2006). At least half of households in Western societies own a pet (Podbersek 2000), and in Canada specifically, 37% of households have at least one cat and 36% have at least one dog (CAHI 2012). The prevalence of companion rabbits in Canadian households is currently unknown. Perrin (2009) reported the combined prevalence of households with rabbits and hamsters in Canada to be 2%. The relationship people have with their pets is termed the human-animal bond (Toray 2004) and it involves an emotional attachment to a pet, feelings of affection and a responsibility for the well-being of the animal (Lagoni, Butler and Hetts 1994). Companion animals have been known to provide owners of all ages with several unique benefits of pet ownership (Friedmann et al. 1980; Friedmann et al. 1983; Connell and Lago 1984; Garrity et al. 1989; Siegel 1990; Melson and Schwarz 1994). Psychological (Connell and Largo 1984; Cain 1985; Garrity et al. 1989; Friedmann 1990; Cox 1993; Straede and Gates 1993; Melson and Schwartz 1994; Zasloff and Kidd 1994; Whitmarsh 2005; Brown and Rhodes 2006; Knight and Edwards 2008; Wisdom 2009) and physiological benefits (Friedmann et al. 1980; Friedmann et al. 1983; Friedmann 1990; Allen et al. 1991; Schuelke et al. 1991; Baun et al. 1994; Friedmann and Thomas 1995; Siegel 2010; Utz 2014) of pet ownership are well documented. These reports focus most frequently on dog ownership, less frequently on cat ownership and not at all on rabbits. Unfortunately, relationships people have with their pets are not always positive and when human-animal bonds break down the ultimate consequence can be relinquishment of the animals (Kass et al. 2001; Marston and Bennett 2003) with the possibility for euthanasia (Sharkin and Ruff 2011) and overpopulation (Irene 2007). Compared to dogs, cats, and ferrets, rabbits are a more recently domesticated small animal species; domestication began in the sixth century AD (Naff and Craig 2012). Despite hundreds of years of
domestication, little is known about human-rabbit relationships and how companion rabbits are housed and cared for. Qualitative and quantitative methods provide a valuable means to explore questions surrounding companion-rabbit acquisition and ownership, the topics of interest for this thesis.

2.0 Literature Review

2.1 Companion-animal ownership

2.1.1 Prevalence of companion-animal ownership

Companion animals have been a part of human experiences for centuries (Pachana, Massavelli and Robleda-Gomez 2011); keeping animals, developing relationships and allowing animals to become a part of peoples’ lives occurs across the world (Podberscek 2006). Both cats and dogs are common in Canadian households, where it has been found that 37% of households have at least one cat and 36% have at least one dog, resulting in estimates of 7.9 and 6.6 million cats and dogs, respectively, in Canadian homes (CAHI 2012). As more people discover characteristics that make rabbits good pets (e.g., they are generally small and if raised appropriately they can be friendly, social and playful) (Crowell-Davis 2007), they have increased in popularity according to American and United Kingdom authors (Crowell-Davis 2007; Mullan and Main 2006). Although companion rabbits are not often included in companion-animal statistics and household demographics, the United States Pet Ownership and Demographics Sourcebook has estimated the companion-rabbit population in the United States to be 3.2 million (AVMA 2015). According to the American Pet Products Association Pet Owners Survey conducted in 2012, 2.5 million households live with rabbits (HRS 2014). United Kingdom authors suggest that companion rabbits are the third most popular pet (Sayers 2010; Edgar and Mullan 2011). Perrin (2009) reported the Canadian prevalence of companion rabbits combined
with hamsters was 2% of households. Cats and dogs represent the vast majority of companion animals in households. For this reason a significant body of research surrounding companion-animal ownership exists where the main focus is on dog and cat ownership. To date, the prevalence specifically for companion rabbits in households has not been reported in Canada.

2.1.2 Motivations for acquiring companion animals

People have had the desire for companionship with animals since the beginning of recorded history (Hummer 1975), yet very few studies have been conducted describing motivations for companion-animal ownership. Edenburg, Hart and Bouw (1994) used semi-structured interviews and a quantitative survey to explore motivations for owning companion animals in the Netherlands. The study reported that reasons for keeping companion animals were mainly social, with companionship being the principal social reason. This desire for companionship applied to people living alone and to people living with families. Other reasons for owning companion animals were for health reasons, for companionship for other animals and for their usefulness. Non-owners expressed their reasons for not acquiring a companion animal, which included allergies, no time, inappropriate housing, not liking animals and health. To better understand current companion-animal choices, childhood experiences with companion animals have been explored and weak correlations were found between the pet that participants had during childhood and the pet they currently owned. There were significant positive correlations for current companion-rabbit owners who had had a rodent or a bird, but not a dog, cat, fish or rabbit in their childhood. Rabbits were not specifically mentioned anywhere else in the study. The influence of childhood experiences and pet ownership in adulthood was also studied by Serpell (1981). Of 120 adults Serpell (1981) surveyed, pets (cats and dogs) during childhood were significantly associated with the tendency to keep pets as adults, particularly for the same species of pet. Rabbits can be active, inquisitive, social, playful and affectionate, and pet rabbits
that are not confined to small cages may display a variety of complex behaviours (Buseth and Saunders 2015; Crowell-Davis 2007), however, there are no studies specifically describing motives for acquiring companion rabbits.

2.1.3 The human-animal bond and its benefits

Over centuries, both cats and dogs have become increasingly valued as companions (Pachana, Massavelli and Robleda-Gomez 2011). Research surrounding the human-animal bond has gained a considerable amount of attention since the 1970s (Hines 2003). Surveys have illustrated a large majority of people across North America with companion cats and dogs report that they refer to themselves as their pets’ parent (AMVA 2000). Companion animals have become an important part of many human families. The strength of the human-animal bond can be expressed in the experience of the loss of a pet by death or illness, where the result can be overwhelming grief (Toray 2004; Pachana, Massavelli and Robleda-Gomez 2011). For many, loving an animal is a profound experience (Cohen 2002).

Mullan and Main (2007) conducted one of very few companion-rabbit ownership studies and one of the only studies to suggest a bond between owners and their companion rabbits. The study explored the behaviour and personality of pet rabbits and their interactions with their owners through owner interviews and direct observation of their rabbits. The relationship between owner and rabbit was assessed from the terms owners used to describe their rabbits’ personalities. A total of 92 different terms were used across participants, which suggested that owners perceived their rabbits as complex animals. Likely, the rabbit-owner bond underlies this perception of complexity because an owner with little interaction or sympathy for an animal would have difficulty describing its personality (Mullan and Main 2007). The study concluded that confident handling, integrated living between owners and their rabbit, and allowing their rabbit to express a full range of behaviours (that displays its personality to the owner), would
strengthen the bond between the owner and their rabbit. Beyond these findings, little is known about the relationship people have with companion rabbits and if this relationship is parallel to the bond and benefits seen with cat and dog companions.

There are many benefits obtained from a positive human-animal relationship; under the right circumstances, companion animals can provide children, adults, disabled, and elderly individuals with several positive effects (Friedmann et al. 1980; Siegel 1990; Becker 2002; Melson 2003; Whitmarsh 2005; Wisdom 2009). Pets can also help people adapt through life changes (Allen 1995) and are reported by families to be of great importance through times of crisis, loss, transition and adversity (Cain 1985). Evidence has also shown that the pets themselves, specifically dogs, may benefit from positive human-animal relationships (McGreevy, Righetti and Thimson 2005).

Numerous studies have explored the literature surrounding benefits of owning companion animals including both psychological and physiological benefits (Patronek and Glickman 1993; Jennings 1997; Beck 1999; Podberscek 2006). Psychological benefits of companion-animal ownership include reduced loneliness and depression (Garrity et al. 1989; Friedmann 1990; Zasloff and Kidd 1994), family cohesion and adaptability (Cox 1993), stabilization of family conflict and tension (Cain, 1985) and increased owner morale and self-esteem (Connell and Lago 1984). In a qualitative study exploring the attitudes and beliefs of 65 dog owners, Knight and Edwards (2008) found common thoughts surrounding how dogs affected and enhanced respondents’ quality of life. The psychological and social benefits of dog ownership included owners’ perception that dogs provided comfort and acted as therapists, especially during difficult times. Dogs were described as providers of safety and protection when out on walks as well as in their home, promoters of socialization through meeting others walking dogs and for their ability to give and receive unconditional love (Knight and Edwards 2008). Zasloff and Kidd (1994)
studied loneliness and ownership of both dogs and cats among 148 single women. Findings indicated that owning a dog or cat can help reduce feelings of loneliness. No difference was found between owner loneliness and attachment to cats versus dogs, suggesting both cats and dogs provide emotional benefits to women living alone. Decreased loneliness has also been associated with companion-animal ownership for elderly populations (Connell and Lago 1984; Garrity et al. 1989). Straede and Gates (1993) conducted one of very few studies specifically exploring psychological health and cat ownership. The study found among 92 cat owners and 70 non-owners surveyed, cat owners had significantly lower levels of psychiatric disturbances compared to non-owners, indicating that cat owners are psychologically healthier. Although the study sample was small, positive results for psychological health among cat owners supports other study findings of companion-animal ownership and better mental health (Straede and Gates 1993). Most commonly, studies have explored the psychological benefits of dog ownership (Whitmarsh 2005; Brown and Rhodes 2006; Knight and Edwards 2008), fewer explore these benefits with cat ownership (Straede and Gates 1993), and to date, no research has explored these benefits for rabbit owners.

Improved physiological health has been well documented as a benefit to humans from the relationship between humans and companion animals (Friedmann et al. 1980; Friedmann 1990; Allen et al. 1991; Schuelke et al. 1991; Baun et al. 1994). Documented physiological benefits specific to dogs have been established, including a buffer to stress with presence of a pet dog (Allen et al. 1991), decreased blood pressure among women while petting companion dogs (Baun et al. 1994), and promotion of relaxation in hypertensive dog owners (Schuelke et al. 1991). Friedmann and Thomas (1995) investigated the effect of pet ownership on one-year survival among a group of post-myocardial infarction patients. Of 369 patients, 30.4% owned pets (dogs, cats and other pets) and 5.4% of those pet owners died. Dog owners, specifically,
were found to be significantly less likely to die within one year compared to patients who did not own a dog. Overall, independent of physiologic severity and demographic factors, pet ownership improved one-year survival after acute myocardial infarction (Friedmann and Thomas 1995). In contrast to the large body of research supporting the association between pet ownership and better physical health, some research regarding physical health benefits are contradictory (Koivusilta and Ojanlatva 2006; Thorpe et al. 2006). Koivusilta and Ojanlatva (2006) conducted a study using data from a 15-year health and social support study randomly sampling from the Finnish Population Register Centre (n=21,101 individuals). Pet ownership was found to be associated with poor perceived health and higher body mass index. Koivusilta and Ojanlatva (2006) explored ownership of cats, dogs and other animals, and dogs were the most popular. Other pet owners were not defined so it is unclear what other pet owners were included in the category. Most recently, Utz (2014) addressed the association between pet ownership and human health through exploring a nationally representative sample of the United States population. Of 2,474 individuals living alone, dog, cat or other pet owners (n=496) were less likely to be obese, have a diagnosis of congestive heart failure, or to report having arthritis, and both self-rated and physician assessed health indicated pet owners were more likely to have excellent or very good health in comparison to non-owners (n=1,981). Again, dog owners represented the largest portion of the study population and other pets owned were not defined. Overall, similar to research surrounding psychological benefits, dogs are represented as the focus of research on physiological benefits of pet ownership, few studies include cats, and rabbits are not represented.

Although benefits of companion-animal ownership are vast, it is important to note the benefits may be contingent upon level of attachment between the human and his or her pet (Taggart 1996; Jennings 1997; Knight and Edwards 2008). To date, there is no research
exploring the benefits of rabbit ownership or the potential for companion rabbits to provide the same or similar benefits established for owners of companion dogs and cats.

2.1.4 Breakdown of the human-animal bond and potential consequences

2.1.4.1 Relinquishment of companion animals

Even in light of all of the positive benefits of the human-animal relationship, this connection can have negative implications for both the human and animal involved (Sharkin and Ruff 2011). Relinquishment of the animal can be an unfortunate end for an animal resulting from potentially undeveloped, disconnected or broken bonds between humans and animals (Miller et al. 1996; Sharkin and Ruff 2011). For the animal, the experience of being relinquished can be traumatic and the ultimate result can be euthanasia if the animal is not rehomed within a certain period of time (Sharkin and Ruff 2011). In addition, the human experience of relinquishment can be traumatic and can have an emotional toll compromising the well-being of the surrendering individual (Sharkin and Ruff 2011). It has been found that individuals who relinquish their pet often struggle with the decision for a prolonged period of time (DiGiacomo, Arluke and Patronek 1998) and may have feelings of doubt, guilt, regret and/or other difficult emotions (Sharkin and Ruff 2011).

The Humane Society of the United States reported in 2013 that American shelters receive about six to eight million cats and dogs each year (HSUS 2013) and of those animals entering American shelters, 41% of cats and 31% of dogs are euthanized annually (ASPCA 2015). Statistics for relinquishment of companion rabbits were not reported. Relinquishment is not unique to the United States. In a study of 90 Humane Societies and Societies for the Prevention of Cruelty to Animals (SPCA) across Canada investigating animals admitted, reclaimed, adopted or euthanized each year, it was found that 103,433 cats and 46,578 dogs were admitted (CFHS 2013). Of these cats and dogs relinquished to shelters, 33% and 16%, respectively, are
euthanized annually. These numbers are an underestimate of the severity of overpopulation and surrender because only 52% of 172 Human Societies and SPCAs in Canada responded to the survey. In addition, the CFHS (2013) survey did not include other facilities that may shelter homeless animals, such as private shelters, foster groups and municipal animal services. Again, companion rabbits were not included in this study. Although specific numbers for companion rabbits in shelters have not been addressed, the Ontario SPCA and the British Columbia SPCA have both described rabbits as the third most relinquished pet in their shelters (personal communication). According to the Humane Society of the United States, the American Humane Association and the American House Rabbit Society, rabbits have also been suggested to be the third most relinquished companion animal behind cats and dogs (Cotter 2001; HSUS 2010).

Further supporting the need for rabbit-related research, in a scoping review of pet relinquishment, 89.18% of articles investigated dogs, 63.5% of articles investigated cats and only 9.4% of all relevant articles investigated companion animals other than cats and dogs, meaning rabbits, birds, rodents, reptiles, potbellied pigs, horses and other unspecified companion animals (Coe et al. 2014).

Reasons for relinquishment have been investigated (DiGiacomo, Arluke and Patronek 1998; Salman et al. 1998; Scarlett et al. 1999; Shore, Petersen and Douglas 2003; Casey et al. 2009), however, discrepancies are common due to significant differences in methodology (Lambert et al. 2014). Animal behaviour problems are one of the most common reasons identified for relinquishment of companion cats and dogs (Salman et al. 2000; Marston and Bennett 2003; Podberscek 2006; Fatjo, Ruiz-de-la-Torre and Manteca 2006; Shore 2005; Mondelli et al. 2004). Behaviour problems include house soiling, aggression and property destruction (Miller et al. 1996). Diesel et al. (2008) conducted a one-year prospective cohort study of 5,750 rehomed dogs to assess risk factors for returning the rehomed dogs. Seeking
advice for behavioural problems was a significant factor in the risk for return of dogs; if dogs had previously shown aggression towards people and the adopters had not sought advice, the dog had 11.1 (95% CI: 6.6, 18.8) times the odds of being returned compared to dogs without behavioural problems. Supporting these findings, Patronek et al. (1996) found that when dog owners chose not to take their pets to obedience classes, provided insufficient veterinary care, did not have their dogs neutered, had inappropriate care expectations or the dogs demonstrated inappropriate elimination, dogs were at an increased risk for relinquishment. Behaviour problems as a reason for relinquishment are not unique to dogs. Several studies have found behavioural reasons to be common among relinquished companion cats (Miller et al. 1996; Patronek et al. 1996; Salman et al. 1998; Casey et al. 2009). Behaviour problems as a reason for relinquishment of both cats and dogs suggest some behaviours are perceived as intolerable while other reported problems are perceived as normal and something that can be accommodated (Miller et al. 1996).

Given the prevalence of behavioural reasons for relinquishment, it is important to address this risk. In the one-year prospective cohort study conducted by Diesel, Pfeiffer and Brodbelt (2008), attending training classes was found to decrease the chance that adoption would be unsuccessful (OR 0.3, 95% CI: 0.2, 0.4) among 5,750 rehomed dogs. These findings are supported by Salman et al. (1998), who suggested both regular veterinary visits and obedience classes were likely factors associated with reduced relinquishment as a result of reducing the occurrence of behaviour problems. Patronek et al. (1996) also found that obedience training appeared to reduce the risk of relinquishment. Fatjo, Ruiz-de-la-Torre and Manteca (2006) articulated that veterinarians play a central role in providing information regarding the recognition and treatment of behavioural issues. Further, information about pet care and training, realistic expectations of normal behaviours, behaviour modification training, and knowledge of ownership and caretaking expenses are suggested to significantly reduce relinquishment (Kidd,
Kidd and George 1992). If pet owners were knowledgeable of normal, to-be-expected behaviours it is possible that relinquishment for these reasons could be prevented (Sharkin and Ruff 2011).

Owner-related reasons for relinquishment have also been studied. Scarlett et al. (1999) and Salman et al. (1998) both studied reasons for relinquishment of companion animals utilizing data from the American Regional Shelter Survey. The survey collected data on cats and dogs entering shelters, the people relinquishing them and reasons for relinquishment from February to April 1995 in 12 American shelters. Interviews were completed with 3,772 owners that were relinquishing 3,676 dogs and litters and 1,409 cats and litters. Salman et al. (1998) reported personal issues to be among the top ten reasons for relinquishment of both cats and dogs, which included moving, the landlord not allowing pets, cost and personal problems. Supporting these findings, several studies have articulated having a new baby, relationship changes, health issues, financial issues, lack of time (Scarlett et al. 1999; Marston and Bennett 2003; Sharkin and Ruff 2011), moving and incompatible lifestyle (Scarlett et al. 1999; Marston and Bennett 2003) to be common owner-related reasons for relinquishment. Scarlett et al. (1999) suggested that the pet-associated community (e.g., veterinarians, trainers, acquisition source staff etc.) must play a proactive role in educating and counseling owners, which could reduce the risk of relinquishment and support long-lasting pet-owner relationships.

Two studies have addressed reasons for relinquishment of companion rabbits. One study, surveying 30 Canadian rescue shelters taking note of rabbits admitted and adopted over a three-year period, found 2,466 rabbits were admitted to shelters. Of these rabbits, 38.1% were strays and 47.8% were surrendered by their owners; only 5.3% of owner surrenders were for behavioural reasons, including destruction- and aggression-related reasons (Ledger 2010). For destructive-related behaviours, chewing and digging have been suggested to be normal rabbit
behaviours and if rabbits are provided with acceptable means to express these behaviours, such as a litter box to dig in, it has been suggested destruction of carpets or pillows can be avoided (Crowell-Davis 2007), which may reduce relinquishment for that reason. Ledger (2010) found the vast majority of owner surrenders were due to the owners’ circumstances (94.7%). Supporting these findings, Cook and McCobb (2012) conducted a study examining the number and characteristics of rabbits coming into four organizations and shelters in Massachusetts, United States. The total number of rabbits at each of the four locations over the six-year period ranged from 119 to 4,001 and the most common reason for relinquishment was inability or lack of desire to care for the rabbit, suggesting owners may not be prepared for the amount of work that caring for a pet rabbit entails. Other common reasons found were housing-related issues and having too many rabbits. Antoniades (2005) anecdotally reported familiar reasons given for relinquishment of rabbits including “the child lost interest”, “got too big”, “allergies” and “landlord won’t allow”. The findings of Ledger (2010) and Cook and McCobb (2012) present the first scholarly works characterizing rabbit relinquishment and shelter rabbits in Canada and the United States, respectively.

Studies on companion cat and dog ownership have established that people with limited knowledge, unrealistic expectations and who are unprepared to care for their pet are associated with increased risks of relinquishment (Marston and Bennett 2003; How you can 2007; Adkins 2008; Sharkin and Ruff 2011). Relinquishers usually have very little knowledge about animal healthcare, expenses and responsibilities, including basic knowledge on topics such as how to prevent accidental litters (Fournier and Geller 2004; Ramon, Slater and Ward 2010). In 2008, Adkins reported factors contributing to relinquishment of dogs and found owners with higher expectations were associated with higher risks of relinquishing their pets; these individuals found more problems and fewer benefits on a daily basis from dog ownership. Diesel, Pfeiffer and
Brodbelt (2008) studied rehoming and return of dogs in the United Kingdom. Results indicated owners who found the work and effort involved in looking after their dog to be more than expected had 9.9 times the odds (95% CI: 4.1, 24.6) of returning their dog compared to those who found the work and effort to be less than expected. In addition, research findings suggest most dog owners do not seek advice prior to acquiring their pets (Diesel, Pfeiffer and Brodbelt 2008; Diesel, Brodbelt and Pfeiffer 2010). Patronek et al. (1996) explored risk factors for the relinquishment of cats and found, among other factors, expectations about care and a cat’s role in the household were associated with relinquishment. When people are ill prepared to care for pets it can lead to mismanaged and untrained companion animals (Miller et al. 1996; Sharkin and Ruff 2011), and owners who recognize their lack of ability to care for their pet may feel they have no choice but to relinquish them (Sharkin and Ruff 2011).

Of the limited research exploring rabbit ownership, none of it has addressed knowledge and expectations of rabbit owners in relation to relinquishment. One study explored the knowledge of rabbit owners at the point of sale (Edgar and Mullan 2011) and another study touched on expectations of rabbit owners (Mullan and Main 2007). Edgar and Mullan (2011) studied knowledge and attitudes of 52 rabbit owners from the United Kingdom at the point of sale and found 81% of participants had done prior research, but had limited knowledge of the needs of rabbits, particularly regarding diet and socialization. They also found that less than half of respondents planned on feeding hay or grass, even though guidelines describing pet rabbit housing in Europe recommend that rabbits should be provided with hay (Edgar and Main 2011; Buseth and Saunders 2015), since hay provided on a daily basis is essential for digestion (Hansen and Berthelson 2000; Buseth and Saunders 2015). Schepers, Koene and Beerda (2009) suggest that little is still known of the living conditions of pet rabbits. These authors conducted the few studies assessing the welfare of pet rabbits and found that conditions for pet rabbits in
the Netherlands were quite variable, often inadequate and potentially posed a threat to their welfare. Addressing expectations of companion-rabbit owners, a study by Mullan and Main (2006), exploring husbandry, health and behaviour of companion rabbits, recruited 46 owners with 102 rabbits in the United Kingdom and found more than half of the rabbits were bought for children, yet 49% of owners said children could not easily handle their rabbit. A year later, Mullan and Main (2007) commented on these findings suggesting that this situation may lead to unfulfilled expectations and a poor human-animal bond. Further research is needed to explore knowledge and expectations of rabbit owners, especially those in the United States and Canada. It would be beneficial to explore whether owners’ lack of knowledge regarding care of companion rabbits poses the same risk to relinquishment as it does for the relinquishment of companion cats and dogs.

As significant contributors to risks of relinquishment, knowledge and expectations of pet ownership are important targets for the success of human-animal bonds (Marston and Bennett 2003; Shore 2005). Veterinarians and other animal professionals (e.g., animal trainers and acquisition source staff etc.) have been suggested as important points of contact for new and existing pet owners (Scarlett et al. 1999; How you can 2007; Bergman and Gaskins 2008). Veterinary practitioners can provide information on pet ownership, including health care (Sharkin and Ruff 2011), and they can help individuals and families find a pet that fits their lifestyle (How you can 2007; Sharkin and Ruff 2011). For rabbits, a few studies have suggested the importance of education for companion-rabbit owners (Edgar and Mullan 2011; Cook and McCobb 2012) and the role pet stores and veterinarians can play in providing information to rabbit owners (Edgar and Mullan 2011). In addition, Buseth and Saunders (2015) suggest that rabbits are not for everyone and highlight the importance of thinking through all concerns surrounding companion-rabbit ownership before acquiring one.
2.1.4.2 Overpopulation and spay and neuter of companion animals

Companion-animal overpopulation has been discussed in the literature, but it usually refers to cats and/or dogs and not rabbits. Several possible methods to reduce cat and/or dog surpluses have been suggested, including educating pet owners (How you can 2007; Bergman and Gaskins 2008); increasing adoption through public education, substitution of animal sources (i.e., people who would otherwise purchase their pet from a different source) and taxes or restrictions for breeders (Frank 2004); public relations programs to make shelters look more inviting and visible to the public and to make the animals look more desirable (Fournier and Geller 2004); and spay and neuter programs (Frank 2004; Fournier and Geller 2004; Irene 2007). Controlling overpopulation and preventing further overpopulation is a multifaceted issue for which a combination of approaches may be most effective (Frank 2004; Fournier and Geller 2004).

Spay and neuter programs for dogs are proposed to be the most effective solution for overpopulation (Frank 2004). Several viable methods for increasing spayed and neutered pets have been suggested including financial incentives and public information campaigns on the importance of fixing pets; these methods appear to be equally cost effective (Frank 2004). Sterilization legislation has been a leading solution attempted to reduce overpopulation (Arkow 1991; Strula 1993); however, Fournier and Geller (2004) believe the impact of this legislation is unclear as there are no published evaluations of legislation and whether the legislation is being enforced. Addressing cat overpopulation, Kass (2007) suggests that mass application of sterilization has been effective with the cooperation of municipalities, humane organizations, and public and private veterinary practices. Frank (2004) suggested that if the public was more informed about the benefits of sterilization, and costs were reduced, society could achieve a “no kill” status; however this would be a long-term goal, as the abandonment rate would have to be
reduced by 70% to stop euthanasia within one year. Others have suggested that low cost spay and neuter programs might not be the most effective way to combat overpopulation (Fournier and Geller 2004). Manning and Rowan (1992) surveyed 144 cat and dog owners with 209 animals across four Massachusetts communities to explore factors surrounding the sterilization status of their pets, and found that the cost of the procedure was a prohibitive factor for spay and neuter in only 5.3% of intact animals in the study. However, the study only represents a limited area in Massachusetts. In contrast, PetSmart Charities (2012) conducted a survey gathering a nationally representative sample of the United States (n=2,000) as well as a sample of 1,000 participants who had recently acquired a dog or cat in the past 12 months. Of the participants who recently acquired a dog or cat (n=1,000), 32% articulated a top reason for not spaying or neutering their pet was because the procedure was too expensive. Of these participants who stated cost was a barrier to spaying and neutering, 79% were unaware of low cost spay and neuter facilities in their community. This suggests that cost can be a barrier to spaying and neutering companion animals, illustrating the continued need for low cost spay and neuter programs in prevention of euthanasia and overpopulation. The impact or potential impact of sterilization on the overpopulation of companion rabbits has not been described in the peer-reviewed literature.

Although the problem of overpopulation has not been studied for companion rabbits, research has explored the spay and neuter status of companion rabbits and discussed the benefits of spaying and neutering. Mullan and Main (2006) conducted a survey of husbandry, health and welfare of 102 companion rabbits in the United Kingdom, and found only 22% of female rabbits were spayed whereas 63% of male rabbits were neutered. It was suggested that this may be due to the procedure being less invasive and less expensive for males in comparison to females (Mullan and Main 2006). Edgar and Mullan (2011) found about half of respondents at the point
of sale in the United Kingdom were planning to spay or neuter their rabbits. It is recommended rabbits should be spayed and neutered to prevent behaviour problems (Crowell-Davis 2007), pregnancy (Mullan and Main 2006) and diseases such as uterine adenocarcinoma in female rabbits and testicular neoplasia in males (Sayers 2010). Overpopulation of companion animals is a problem created by humans and must be solved by humans (Frank 2004). The suggested prevalence of relinquished and stray rabbits indicates a need to consider overpopulation of companion rabbits in future research in hopes of reducing the number of homeless rabbits.

2.2 Methodology

2.2.1 Multi-method strategy

Over the years, research integrating both qualitative and quantitative techniques has become increasingly popular (Bryman 2006). How to best integrate these techniques is not fully understood (Bryman 2006; WIQR 2007); however, qualitative interviews and survey methods account for a vast majority of multi-method strategies (Bryman 2006). As a common multi-method strategy (Bryman 2006), qualitative interviews may be used first to explore hypotheses, which in turn improves sensitivity and accuracy of survey questions for quantitative research (Malterud 2001). The objective of a multi-method strategy is to provide a better understanding of a research question (Guest, Namey and Mitchell 2013) by drawing upon the benefits and perspectives of each method (Ostlund et al. 2011). The combination of approaches will depend on the research question, time constraints and the research audience (Guest, Namey and Mitchell 2013). As with individual techniques, consideration of research design is necessary to assure quality, validity, reliability and objectivity.

2.2.2 Qualitative methods

Qualitative techniques “study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them” (WIQR 2007). The end
result of qualitative research is to provide a reasonable approximation of participant responses representing the entire data set and to find deeper meanings that go beyond a description of the data (Braun and Clark 2006; Guest, Namey and Mitchell 2013). Due to its flexible nature, qualitative research offers advantages in relation to quantitative studies, by allowing researchers to follow-up on responses and probe participants (Guest, Namey and Mitchell 2013). This follow up provides significant benefit and eliminates the issue of loss of data as seen in quantitative research where response categories are typically fixed (Guest, Namey and Mitchell 2013).

Despite many advantages of qualitative research, some limitations include difficulty acquiring a representative sample, time-consuming data analysis (Guest, Namey and Mitchell 2013) and challenges with reflexivity (i.e., cause and effect) and transferability (i.e., the degree to which results can be generalized to other contexts/settings) (Malterud 2001).

Semi-structured interviewing is a form of data collection for qualitative research allowing researchers to gather information about central topics with the flexibility of exploring new issues and topics as they arise (Wilson 2014). A combination of pre-set questions often guides the interview and the use of open-ended questions prompts further explanations (Wilson 2014). This style of interviewing is a flexible approach that allows the interviewer to go beyond pre-set questions to explore topics in greater depth and to ask for clarification if responses are unclear (Hermanowicz 2002; Whiting 2008). Semi-structured interviewing provides a method to investigate novel research questions, to explore complex topics, to provide methods to redirect conversations and to reduce training time of the interviewer (Wilson 2014). With the flexibility of interviewers exploring additional questions, it is important to be aware of issues surrounding guiding questions and leading responses, which can influence participant responses (Wilson 2014).
Thematic analysis is a widely used procedure for analyzing qualitative data that aims to identify, analyze and report patterns within data (Braun and Clarke 2006). Braun and Clarke (2006) suggest a six-step procedure to use as a guide for thematic analysis. In general, thematic analysis begins with the most basic element of data, the code, which is an assigned term to describe a section of data, and builds the codes into broad overarching themes that portray the data and represent the essence of the data (Attride-Stirling 2001; Braun and Clarke 2006). The goal of the thematic analysis process is to produce a report that provides a concise and logical description of the data with evidence of the themes (Attride-Stirling 2001; Braun and Clark 2006). Flexibility of the procedure also allows the analysis process to be conducted by a single researcher or by multiple researchers. In a protocol proposed by MacQueen (1998), team based coding is a viable approach to develop a refined and thorough codebook created through several revisions and based on team consensus. It is important to recognize that different researchers may perceive what is being studied differently, which may pose a challenge for framing and communication of results (Malterud 2001). However, the use of multiple researchers may strengthen analysis as the codebook is clarified through the contesting of each other’s statements about the situation being studied (Malterud 2001).

2.2.3 Quantitative methods

Quantitative methods involve the collection of numerical data and analysis of this data by statistical methods to explain a phenomenon (Muijs 2011). Quantitative research tests theories or hypotheses and identifies statistically significant relationships and strengths of association (Rosaline 2008). Inferential questions concerning cause and relationships, and descriptive questions quantifying a subject or quantifying numerical change, can be answered by quantitative methods (Muijs 2011). Naturally, data is not formulated in a quantitative manner; but qualitative data such as attitudes, can be turned into quantitative data through measurement
techniques (Muijs 2011). Quantitative methods are beneficial for providing a wide range of information across a large number of units and for looking at causality (Muijs 2011).

Quantitative methods are of limited use when the concept being studied requires in-depth exploration; this is where qualitative methods become beneficial or if both breadth and depth are required a combination of approaches are of use (Muijs 2011).

With the use of the Internet, email and Web based surveys have become increasingly prevalent platforms for survey research (Selm and Jankowski 2006). In contrast to interview-administered surveys or telephone surveys, using computer technology to administer a survey reduces researcher time, cost and transcription errors (Ritter and Sue 2007). Online surveys can collect large amounts of data with minimal effort from the researcher; and are more practical for studies with large sample sizes and participants that are geographically dispersed (Ritter and Sue 2007). In addition, online surveys can access “hidden” populations and populations that are hard to reach (Ramo, Hall and Prochaska 2011). A drawback to online surveys is accessing respondents with limited or no Internet access (De Bernardo and Curtis 2013). With adequate development, design and methodology online surveys can be a suitable tool for data collection and liabilities and challenges can be reduced (Selm and Jankowski 2006).

3.0 Thesis Rational and Objectives

There is no peer-reviewed literature describing why people acquire companion rabbits. Research exploring motivations for and thoughts toward acquiring companion rabbits is important to gain an improved understanding of the process of acquiring a companion rabbit. This research could aid in the development of educational material to support new human-rabbit relationships at the time of acquisition. In addition, it is important to explore rabbit owners’ knowledge in order to identify contributing factors to knowledge of companion-rabbit owners
and to target individuals who would receive the greatest benefit from education intervention. Acquisition sources can provide information on husbandry and care, discuss health and the importance of regular veterinary visits, and address concerns of ownership prior to acquisition so prospective rabbit owners can be prepared for ownership. This research will allow acquisition sources, veterinarians, and companion animal-related groups the opportunity to enhance owners’ knowledge of rabbit care, with the aim of improving rabbit care and owner relationships with companion rabbits. Ultimately, the goal of this research is to reduce rabbit relinquishment along with related issues of euthanasia and overpopulation.

The specific objectives of this thesis are to explore pre-acquisition motivations for and thoughts toward rabbit ownership using semi-structured telephone interviews (Chapter 2), and to explore factors associated with companion-rabbit owners’ knowledge of rabbit care and the spay or neuter status of companion rabbits using an online survey (Chapter 3).
References

Adkins, B.L. 2008. Factors associated with the relinquishment of domestic canines to animal shelters, Doctoral dissertation, Lynn University, United States of America.


Taggart, L.P. 1996. Relationships among affiliation with companion animals, attachment style, depression, loneliness, satisfaction with life, and self-esteem: Implications for human candidate
selection for adjunctive use of companion animals, Doctoral dissertation, University of Tennessee Knoxville, United States of America.


CHAPTER TWO

Motivations for and thoughts toward rabbit ownership prior to acquiring a new companion rabbit: a qualitative interview study

Prepared in the style of Anthroözos
Abstract

Companion rabbits have increased in popularity over the years (Cook and McCobb 2012), with an estimated 3.2 million living in households in the United States (AVMA 2015). Although past literature has explored companion-dog and -cat ownership, few studies have investigated rabbit ownership and the human-rabbit relationship. The objective of this study was to explore peoples’ motivations for and thoughts toward rabbit ownership just prior to acquiring a companion rabbit. One-on-one, semi-structured telephone interviews were conducted with eighteen individuals in the process of acquiring a rabbit in the Greater Toronto Area, Ontario, Canada. Interview questions explored participants’ previous experience with rabbits, motivation for acquiring a rabbit, opinions about ideal attributes of a pet rabbit and expected challenges of rabbit ownership. Inductive thematic analysis, including team-based coding, was conducted and four central themes were developed: considerations prior to acquiring a companion rabbit, the experience of rabbit ownership, general public misconceptions of rabbits and perceived knowledge of rabbit ownership. This paper focuses on the theme considerations prior to acquiring a companion rabbit and associated subthemes. Findings revealed common reasons for acquiring a rabbit were a love of rabbits, animal companionship, and to acquire a companion for an existing rabbit. Reputation was the most predominant factor discussed in relation to participants’ choice of acquisition source, including considerations of whether the rabbits are healthy, the rabbits’ history or experiences prior to arriving at the acquisition source, and how sources handle and care for the rabbits. Animal-related pre-acquisition considerations received the most discussion from all participants including consideration of behavioural and physical trait preferences and concerns about rabbit aggression, rabbit health, and compatibility between new and existing pets. Owner-related pre-acquisition considerations were discussed less often and related to how participants would care for their prospective rabbit, including housing and finding space in their home, and
how a participants’ lifestyle may be affected by acquisition of a new rabbit. Understanding motivations for acquiring companion rabbits and the thought processes prospective owners have prior to acquiring a rabbit has furthered the understanding of rabbit ownership and may assist in the development of educational material to support new and existing human-rabbit relationships.

Keywords: companion animal, human-animal bond, rabbit ownership, thematic analysis
Introduction

Companion animals have been a part of the human experience for centuries (Pachana, Massavelli and Robleda-Gomez 2011). Keeping animals and developing relationships with animals occurs across the world (Podberscek 2006) and companion animals are often described as family members (Albert and Bulcroft 1988; AVMA 2000). The relationship people have with their pets is termed the human-animal bond (Toray 2004) and it involves an emotional attachment to a pet, feelings of affection and a responsibility for the well-being of the animal (Lagoni, Butler and Hetts 1994). Benefits of companion-animal ownership have been established for both the human (Friedmann et al. 1980; Siegel 1990; Becker 2002; Melson 2003; Whitmarsh 2005; Wisdom 2009) and animal involved in these relationships (McGreevy, Righetti and Thomson 2005). For humans, psychological (Connell and Largo 1984; Cain 1985; Garrity et al. 1989; Friedmann 1990; Cox 1993; Straede and Gates 1993; Melson and Schwartz 1994; Zasloff and Kidd 1994; Whitmarsh 2005; Brown and Rhodes 2006; Knight and Edwards 2008; Wisdom 2009) and physiological benefits (Friedmann et al. 1980; Friedmann et al. 1983; Friedmann 1990; Allen et al. 1991; Schuelke et al. 1991; Baun et al. 1994; Friedmann and Thomas 1995; Siegel 2010; Utz 2014) and of pet ownership (cats and dogs) are well documented.

Although companion-animal ownership can be a positive and rewarding experience, not all human-animal relationships are positive. When human-animal bonds break down the ultimate consequence can be relinquishment of the animal (Kass et al. 2001), with many animals ending up in shelters, which places them at risk for euthanasia (Sharkin and Ruff 2011). To predict and explain the development (and potential breakdown) of this relationship it is important to understand the motivation for acquiring a pet in the first place (Edenburg, Hart and Bouw 1994). Edenburg, Hart and Bouw (1994) used semi-structured interviews and a quantitative survey to explore motivations for owning a variety of companion animals in the Netherlands. The study
reported that reasons for keeping companion animals were mainly social with the principal social reason being companionship. Research performed by Edenburg, Hart and Bouw (1994) represent the only peer-reviewed literature that has explored motivations for acquiring companion animals. Rabbits were not specifically mentioned in this study when discussing motivation for acquiring companion animals.

Previous literature has suggested that rabbits can be active, inquisitive, social, playful and affectionate, and pet rabbits that are not confined to small cages may display a variety of complex behaviours (Buseth and Saunders 2015; Crowell-Davis 2007). Authors in both the United States and the United Kingdom have suggested that companion rabbits have increased in popularity (Mullan and Main 2006; Crowell-Davis 2007; Cook and McCobb 2012). Although rabbits are not often included in companion-animal research, the United States Pet Ownership and Demographics Sourcebook has estimated the companion-rabbit population in the United States to be 3.2 million (AVMA 2015). The number of companion rabbits in Canadian households is unknown. To date, very little is known about rabbit ownership and the relationship people have with companion rabbits.

The purpose of the current study was to explore peoples’ motivations for and thoughts toward rabbit ownership prior to acquiring a companion rabbit. Understanding motivations for acquiring companion rabbits and prospective rabbit owners thought processes for acquiring rabbits should further our understanding of rabbit ownership which may assist in the development of educational material to support new and existing human-rabbit relationships.

**Methods**

The study protocol was reviewed and approved by the University of Guelph Research Ethics Board (REB#: 13MY046).
Study design

The study involved a series of one-on-one interviews with individuals expressing interest in acquiring a rabbit from a pet store, shelter, rabbit rescue, rabbit breeder or online source in the Greater Toronto Area. Acquisition sources were initially contacted by telephone or email exploring their interest in helping to recruit participants for this study. Three forms of recruitment were used; all included an incentive of being entered in a prize draw for movie passes (1 in 5 odds of winning) in appreciation for expressing interest in the study. The first method of recruitment involved having a poster promoting the study in the rabbit sales or adoption sections of pet stores and shelters, respectively (Appendix A.1). Interested individuals were asked to place their name and email into a drop box to be contacted by the researcher with more information. The second method involved rabbit breeders, shelters and a rescue including in their email response to individuals interested in acquiring a rabbit a recruitment poster describing the study (Appendix A.2). The email also included a link to a recruitment survey where interested individuals were invited to enter their contact information. Finally, online advertising was used to recruit participants looking to acquire a rabbit through an online classified source (Appendix A.3). Following collection of potential participants’ names and email addresses from the drop boxes and recruitment survey, the researcher contacted each individual by email with an overview of the study, what was expected of participants, and an incentive for participating in the interview ($10 coffee gift certificate) (Appendix A.4). Participants were also emailed the study consent form (Appendix A.5). Verbal informed consent was acquired from participants at the time of the one-on-one interview. Participant recruitment was stopped when a minimum of five potential participants were collected from each acquisition source type.
Interview development and structure

Development of the interview guide occurred in two phases. First, an initial set of open-ended questions was constructed to explore participants’ attitudes toward rabbit ownership, thoughts about pet rabbits, past experience with rabbits and a few demographic questions (Appendix A.6). Second, the interview was piloted on eight individuals who had or had not owned rabbits previously and feedback was collected. The objective of the pilot was to assess if interview questions would be suitable for varying levels of experience with rabbit ownership and to familiarize the author with the interview guide. Modifications to the guide were made to improve flow and clarity by reducing identified ambiguity and redundancy.

Final interviews were scheduled for 30 minutes, conducted using Skype (Skype and/or Microsoft 2015); recruitment was conducted until data saturation was achieved. Interviews were audio recorded (CallTrunk 2012) and transcribed verbatim by a hired transcriber. Next, to become familiar with the data and to ensure accuracy of transcription, the author read and cleaned the transcripts while listening to the audio recordings. The transcripts were then de-identified and imported into data management software for qualitative research (ATLAS.ti 2014).

Thematic Analysis

A team-based coding approach, as described by MacQueen (1998) was followed, using the six-steps of thematic analysis described by Braun and Clark (2006) to analyze the verbatim transcripts. First, the transcripts were read independently several times by the author and a research assistant familiar with qualitative methods. Open coding (i.e., assigning tentative themes and codes in the margin of the transcripts) was then used by each researcher to capture initial ideas formed by the data (Strauss 1987). Following the process for team based coding (MacQueen 1998), each researcher then used axial coding (i.e., identifying relationships among the open codes) (Strauss 1987), starting with two transcripts, to individually produce a
preliminary list of codes for the data. Both researchers then met to review and discuss the two coded transcripts to establish a preliminary team codebook. Disagreements in coding were discussed until agreement was reached by consensus for each code. Subsequent coding followed the same procedure, two transcripts at a time, until all transcripts were coded. A final team codebook was produced including detailed definitions and examples for each code (Appendix A.7). When changes to the codebook occurred throughout the team coding process, previously coded transcripts were re-coded by both researchers and agreement was reassessed. Following the team-based coding, the author organized the codes into sub-themes and themes using the remaining steps of inductive thematic analysis. A thematic map was then developed to visualize the relationships between the sub-themes and themes.

Results

Demographics

As a result of the three recruitment approaches, 56 individuals provided their contact information to obtain more information about the study. Of the 56 individuals, 36 (64.3%) responded to the initial email from the researcher. Seventeen (47.2%) of the 36 potential participants were excluded because they were not actively in the process of acquiring a rabbit and one additional individual indicated they did not have time to participate. The final study included eighteen participants.

The 18 interviews consisted of 16 female and 2 male participants. Eleven percent (n=2) of participants were looking to get a rabbit online; 22% (n=4) wanted a rabbit from a breeder and 67% (n=12) from a shelter. The majority of participants had previously owned a rabbit with only two looking to acquire a rabbit for the first time, both from a breeder. Additional demographic information is shown in Table 2.1. Interviews ranged in length from 17 to 45 minutes (mean 30; median 30).
Thematic analysis

Thematic analysis revealed four central themes relating to participants’ motivations and thoughts toward rabbit ownership: *considerations prior to acquiring a companion rabbit, the experience of rabbit ownership, general public misconceptions of rabbits and perceived knowledge of rabbit ownership*. This paper focuses on *considerations prior to acquiring a companion rabbit* (Figure 2.1) because it received the most attention from participants during the interviews and highlighted opportunities to prevent foreseeable challenges of rabbit ownership. This theme had four subthemes: reasons given for acquiring a companion rabbit, considerations when choosing an acquisition source to purchase or adopt a companion rabbit, animal-related pre-acquisition considerations, and owner-related pre-acquisition considerations.

1. Reasons given for acquiring a companion rabbit

Two common reasons for acquiring a companion rabbit were discussed by participants: participants’ love of rabbits, including their desire for rabbit companionship, and to provide a companion for an existing rabbit. A third reason for acquiring companion rabbits emerged during the interviews at times where experienced participants reflected on the acquisition of their first companion rabbit. This reason, discussed by almost half of participants, was their unplanned or unexpected experience of getting a first rabbit.

1.1 Love of rabbits and desire for companionship

The majority of participants had previously owned a rabbit; all of these participants commented on having enjoyed their previous experience with rabbit ownership. The opportunity to develop a bond with a rabbit and the companionship they can provide, were described by almost all participants with previous rabbit ownership experience as the reasons for acquiring a new rabbit, “I just wanted a rabbit, I loved having pets and I missed having [their previous rabbit] around, and you know, my boyfriend has had rabbits previously as well so we decided to get a
couple.” For a few of these participants, part of their motivation for acquiring a rabbit was because of the bond they had developed with a previous or current rabbit in comparison to the lack of bond they had experienced with other companion cats and dogs, “I knew that I would want another one because it was just such a satisfying pet to have. Like I’ve had two cats, I’ve had a family dog. But he was by far the most fun to have, and affectionate, like even more so than the dog. Like I don’t have a bond with the dog what-so-ever.” For about half of participants with experience owning rabbits, previous rabbit ownership experience has led them to become “rabbit people”, identifying an interest in always wanting rabbits in their home, “I think I would always want a rabbit and always think of them as a great companion pet just because of my past experiences with [rabbit’s name].” A few participants discussed their experience with the void created with the loss of a previously owned rabbit, “I was so devastated with the loss of him and after a while I kept thinking you know I want a rabbit, I want a rabbit.” Participants described getting beyond the hardship of their loss by thinking positively towards the experience of rabbit ownership and the company a new rabbit would provide, motivating them to acquire a rabbit again, “So I think I’ll always want a rabbit. I think I’ll always have a special place in my heart on the top of the pets list.” For one of the two participants who had not owned a rabbit before, they also identified companionship to be a reason for acquisition as a result of the research they had done, “I always thought they were really cute and now that I have researched about them more I think that they are going to be a very good pet, very good companion.” For this participant, researching companion rabbits, and learning what rabbits could be like as pets, contributed to their motivation for acquiring a rabbit.

Two participants described acquiring a rabbit in part from “pressure” from their children. Although one of these participants, who was new to rabbit ownership, explained their children were a main reason for acquiring a rabbit, the second participant described an experience where
previous rabbits acquired for their children had become a “part of the family”, emphasizing how the whole family “grew fond of them”. This participant’s children and their family’s previous love for their companion rabbits contributed to their motivation for acquiring a new rabbit.

1.2 For a companion for an existing rabbit

Over half of experienced participants were also acquiring a rabbit to be a companion for an existing rabbit in their household. For these participants, the motivation for acquiring a second rabbit was for “social” reasons relating to their existing rabbit, “So it’s for social, like rabbits are social animals and we are away from home because my husband and I work full-time and my daughter is away at school.” More specifically, these participants articulated they thought their current rabbit was lonely, “when there are more people in the room she is way more excited than when I’m just here. So I feel like she is kind of lonely.” Some participants attributed their interest in their rabbits companionship needs to their previous experience or research they had conducted, “we’ve just done a lot of research and we found out he will be happier in a bonded pair.”

Participants described developing a realization that their existing rabbit would benefit from a rabbit companion, “first we got one because we wanted a rabbit but it’s like having a child. The first child you had is for yourself and the second is basically for your child; brother and sister.”

1.3 Unplanned or unexpected acquisition of a companion rabbit

Almost half of all participants shared a story at one point during their interview of an unplanned or unexpected acquisition of a previous companion rabbit. For a few of these participants, they described a time when they acquired a rabbit on a whim after coming across a rabbit at an acquisition source, “The first rabbit I ever got was like ten years ago… I had just gone in [to the pet store], saw her, thought she was cute. I didn’t know anything about rabbits or owning them.” One of these participants specifically expressed how impulse resulted in their acquisition of their first rabbit because they “just saw [the rabbit] and fell in love with him”. For
this participant, they described the rabbit’s “adorable” appearance as the reason for acquisition. The experience described by these participants of being unprepared for rabbit ownership the first time, motivated them to do research and/or look into different acquisition sources in advance of their next rabbit acquisition, “So the second time turned around, when I decided to get rabbits, I thought about adopting instead. I was reading a lot of horror stories about what happens to rabbits coming from pet stores, people getting them, and then not realizing the kind of work it takes to have a rabbit as a pet.” One participant explained unexpectedly acquiring a rabbit as a result of someone not wanting or giving up the rabbit, “some child won him at an auction and his parents didn’t want him so he wanted to give him to the teachers. And the teacher said, ‘well, I don’t want a rabbit’, so [participant’s child] basically volunteered our family”, and a couple of other participants described circumstances where they ended up acquiring a rabbit from friends or family. These participants described, though initially unplanned, they were motivated to acquire a future rabbit to provide it with a home, “I wanted to give another rabbit a good home”.

2. **Considerations when choosing an acquisition source to purchase or adopt a companion rabbit**

   Reputation of acquisition sources and, convenience and cost of acquisition were common influences described by participants in their choice of an acquisition source. Reputation was the most commonly discussed factor weighing into participants’ choice of acquisition source, which included where acquisition sources got their rabbits from, whether the rabbits were healthy, the rabbits’ history prior to arriving at the acquisition source and the sources reputation for handling and caring for their rabbits. Selection of rabbits (i.e., the variety of rabbits available) and location of sources were discussed by participants in relation to convenience of acquisition. Cost of rabbit acquisition was an additional factor in selecting an acquisition source.
2.1 Reputation of acquisition sources

Reputation of acquisition sources received considerable attention from almost all participants in the study. A handful of participants pointedly expressed concerns with the reputation of certain commercial retail sources and breeders. Specifically, participants indicated a concern with not knowing where a commercial retail source may obtain their rabbits, which participants indicated influenced their decision, “Like I don’t want to go through the pet store route because you don’t know where they come from. They can say whatever they want in the store, but really where do these animals come from? You really have no idea.” A couple of participants expressed the same concern with acquisition from sources where rabbits were up for adoption. One of these participants thought in the end adopting a rabbit to give it a home outweighed the risk of not knowing where the rabbit came from, “At least when you’re at the shelter you’ve actually saved an animal’s life.” Although they indicated it was not an easy decision, the other of these two participants shared that they had decided to acquire a rabbit from a breeder due to concerns around the uncertainty surrounding acquisition of a rabbit from an adoption agency, “I was kind of torn. I don’t like the idea of one not having a home, but in the same token will I be inheriting someone else’s problems.” A number of participants related their concern with a source to the acquisition source not being able to provide information about the rabbit’s past, which participants viewed as a reflection of the source’s ability to care for the rabbit, “The pet store owner didn’t even know what type of bunnies, she just read out the description of them, she had no idea about anything about bunnies really.”

A handful of participants discussed breeders as their first choice in acquisition source because of their interest in knowing the health and history of the rabbit they would take home, “I want to go to a breeder, get a rabbit that I know has been safe, has been happy, and it comes straight from there to my home.” Acquiring a rabbit from a breeder was considered a “safe”
choice by these participants and provided them with the comfort in knowing the rabbits’ health and history at the time of acquisition, “from a breeder you kind of know more of what you are getting in a rabbit. I just feel like it’s a little more safer health wise for a rabbit.” Participants who decided to adopt a rabbit also expressed consideration of a rabbit’s health and history; however, these participants often indicated their desire to provide a homeless rabbit with a home was ultimately more important to them, “I’m very very very adamant about, you know, providing the animals that, you know, don’t have homes, homes.”

Over three quarters of participants specifically expressed a concern toward how sources handle and care for their rabbits. These participants would not choose to acquire a rabbit from particular source types in part because of these concerns. Of participants considering handling and care at sources, there were mixed ideas expressed toward how sources handle and care for the rabbits in their possession. Participants looking to acquire a rabbit from a breeder indicated they believed these sources took better care of their rabbits compared to other acquisition sources, “you know they [breeders] handle them more so they tend to be less aggressive, you know because they obviously raised them from babies”. In contrast, a handful of participants were adamant about not purchasing a rabbit from breeders and expressed their perception that these types of commercial sources treat their animals badly, “They’re just not bred very well. They’re kept in really unsanitary conditions and if they are not sold all sorts of horrible things can happen to them. So yea, it’s for ethical terms.” These participants indicated their perception toward breeders was influenced by a desire to support adoption of rabbits to provide a home, “I feel like breeders a lot of the time they don’t really care about the animal itself… I thought I might as well help out rabbits in need and ones without a home.” A couple of participants articulated a concern toward differentiating between responsible and “backyard” or “hobby breeders”, and they did not want to support the latter because of their perceived potential for health risks to the rabbit and
lack of care. There was general concern among most participants that pet stores provide poor care to rabbits and that information on where their rabbits were from was lacking, “sometimes they have so many animals and like their staff aren’t really experts. Their pets aren’t kept in the best conditions.” This perception appeared to be based on participants’ previous experience acquiring rabbits from these sources and general thoughts toward these sources, “I feel that the pet stores should sell pet food and pet supplies, but not pets.” A significant concern for one participant, that did not have previous experience owning a rabbit, was their experience with a lack of support they received from a commercial retail source which appeared to lead to their belief that the source was more interested in making a sale, “I was hesitant to buy something from there [pet store], where I wasn’t getting much support. They would probably just sell it to me and that would be the end of that so I was more interested in a breeder who actually cared about the rabbits.”

It was apparent for all participants with previous experience owning rabbits, their choice of acquisition source was influenced by previous acquisition of rabbits, “Well I won’t go to that pet store again that’s for sure, because they sold me the rabbit with a parasite that actually killed her at very young age.” A number of participants expressed how their previous bad experience with an acquisition source led them to choose a difference source the next time. In addition, participants indicated research into the reputation of sources influenced their perception of particular acquisition sources, “I considered pet stores again but I decided to do more research on rabbits and obviously adoption was up there. During my research I came across some horrible videos and information…but it really turned me off of even breeders and pet stores.”

Although for some participants the reputation of a particular source was easily determined, as a whole, participants described determining the reputation of acquisition sources to be a convoluted decision process, where in some cases, participants felt their questions about a
source’s reputation could not be answered, “with the pet stores you also don’t know, where are they getting their animals from? How do you know if they’re a reputable breeder? I have no idea, how can you tell that? I have no idea.” Almost all of participants articulated a concern toward companion-rabbit acquisition sources and expressed an interest in wanting to be sure their prospective rabbit was coming from a good place, which they identified to be a major factor in their choice of where to get a rabbit.

2.2 Convenience and cost of acquisition

Convenience of acquisition, including the selection of rabbits and location of acquisition sources, were considerations for some participants when deciding where to acquire a rabbit. Cost of companion-rabbit acquisition was also discussed by half of participants. Over half of participants considered the selection of rabbits available at various acquisition sources. Breeders were generally considered to have a good selection of rabbits, “I was thinking a totally different approach you know and having a little bit more choice and what not. I know she is breeding two together and I kind of have an idea of what is going to come out of the litter.” For all participants acquiring a rabbit from a breeder, having the choice of breed, colour, and size was a consideration in their decision to acquire a rabbit from a breeder. Except for one, participants planning on adopting a rabbit did not discuss selection of adoptable rabbits. The one exception was a participant that described exploring different locations with rabbits for adoption in order to find the attributes they were looking for, “The humane society just added a new rabbit that we are interested in [a young, neutered rabbit], but we have been looking around at different Humane Societies.” A couple of participants indicated they chose not to acquire a rabbit from a commercial retail source, in part, because of the often-poor selection, “Plus you know there isn’t really a variety. You might go to the pet store and see one or two rabbits and sometimes you know you don’t like the colour or you don’t like this.” For the participants looking to acquire a
rabbit from an online source, seeing the selection of rabbits online was convenient, “I really liked the [name of online source] interface, that it’s easy to see pictures and have information about the rabbit before even contacting the person about it.” A few participants discussed location of sources as a consideration only after they had chosen a source type, “I would say I mostly look for my geographical area so that's obviously a big factor when browsing ads [online], where is the poster from.” A couple of these participants considered being able to search for a rabbit online by location to be a convenience for this type of acquisition source.

Half of participants discussed the financial aspect of selecting a rabbit acquisition source. Participants thought sources with rabbits for sale were primarily focused on the business aspect of rabbit acquisition as demonstrated by the “mark up” on their sale of rabbits, “I don’t think pet stores are particularly good at being concerned about rabbits’ welfare. It’s more of a business of selling animals for like profit.” Participants only discussed mark up and profit when discussing the sale of rabbits from commercial retail sources and breeders; participants did not discuss the cost of rabbits up for adoption. For almost all of the participants considering cost, cost was described as a factor that influenced their decision not to acquire a rabbit from a commercial retail source or breeder, “Price too is a factor, like when I told my daughter, ‘Well how much are they?’ she said, ‘About forty, fifty dollars’. I said, ‘Well on [name of online acquisition source] you can probably find about two of them for that price.’”

3. Animal-related pre-acquisition considerations

Animal-related compared to owner-related considerations received more discussion by all participants in relation to their pre-acquisition considerations. Undesirable and desirable behaviours, including aggression and affection, respectively, were the most commonly discussed considerations by almost all participants. In addition, participants expressed physical trait preferences they were looking for in their prospective rabbit, including considerations of sex, age,
size or breed. Many participants indicated that the majority of these preferences were not determining factors in their selection of a rabbit. Consideration for the health of the new rabbit and the new rabbit getting along with existing animals in the household were other considerations discussed by the majority of participants.

3.1 Undesirable behaviour traits

Participants unanimously discussed undesirable behaviours, with aggression being identified by all participants as the most undesirable trait in a prospective companion rabbit. Destruction, including defecation, chewing and digging, was the next most commonly identified undesirable behaviours discussed by participants, “My current rabbit does not chew or dig, so it would be very nice to get a rabbit that also doesn’t chew and dig or isn’t very destructive. Ya, so that would be a huge selling point.” Experience owning rabbits and an awareness of rabbit behaviour appeared to play a role in participants’ perceptions of what were undesirable behaviours or traits they wanted to avoid. Many participants who had owned a rabbit before expressed the view that undesirable behaviours were directly related to training, differences in rabbit’s personalities and how people care for their rabbit, “you can also train your rabbits not to do that and I guess again it depends on how they have been cared for in the past”. Specifically, for destructive behaviours, almost all experienced participants discussed their approach to managing these behaviours if they arose, through training, bunny proofing and blocking off areas, “my current rabbit didn’t really get an opportunity to chew or dig because I have all the wires tucked away”. A handful of these participants articulated their belief that it is important to acquire a “trainable” rabbit in order to avoid and prevent destructive behaviours. Their prior experience with rabbits influenced how they would deal with undesirable behaviours if it occurred in their future rabbit, “That’s what I am envisioning is going to happen with any rabbit and just try to figure out what the triggers are and avoid them.” A couple of participants indicated
if they were uncertain with how to deal with undesirable behaviours they would seek advice if their rabbit was aggressive, “I would definitely get in touch with the vet and ask them for advice on maybe how to undo the behaviours or how to train him on new behaviours.” In contrast, a few participants didn’t think undesirable behaviours could be adjusted, “I don’t know, I would just keep it…I don’t know, I don’t think there is anything I could do about it.” Of these participants, one who had never owned a rabbit before articulated they would deal with aggressive behaviour, particularly toward their children, by giving the rabbit away, “again, if there is any harm to the children then I would definitely have to not keep the rabbit.” The safety of this participant’s children was a significant consideration and influenced their thoughts toward owning an aggressive rabbit, where giving away the rabbit was seen to be the only option for dealing with this type of situation.

3.2 Desirable behaviour traits

All participants discussed certain desired behaviour traits that they ideally wanted their prospective rabbit to possess. The most commonly desired behaviour traits were “affection”, “social”, and “trainable”. Almost all participants, regardless of experience and reason for acquiring a rabbit, considered affection as a positive behaviour trait with half of these participants specifically stating they were looking for an affectionate rabbit, “Affectionate like [rabbit’s name], not being skittish or afraid, you know, like open to being patted.” One third of participants, all of which stated they looked forward to the companionship from rabbit ownership, specifically stated acquiring a social rabbit was important because they wanted a rabbit that “wants to be with its owner”, “I would like to have someone that likes to come out and play and sit and be like, with me so they are definitely as much my companion as I am theirs.” Under half of participants indicated “docile”, “calm”, “laid back” and “quiet” behaviours were
ideal. These participants indicated they did not want a rabbit that was overly excited or “too crazy”.

Half of participants indicated trainability was an important trait in a prospective rabbit. These participants indicated trainability was important in order to be able to deal with negative behaviours and/or reinforce positive behaviours, “Over time I found you need to take a lot more calm and positive approach in how you deal with them. Like if they nip you do a high squeal then you go and pet them right away and talk in a nice calm voice and it calms them down.” Not being able to train a rabbit was voiced to be a negative trait for a handful of participants, “It kind of goes hand in hand being trained... Because if you can’t train them then they start having accidents all over the place…” This consideration for a couple of participants was shared as a concern, specifically about the bunny making messes if the rabbit couldn’t be litter trained. One of these participants expressed a fear that they would not want to let the rabbit out to play as much and would feel “guilty” keeping the rabbit in a cage all day.

3.3 Desirable physical traits

Participants discussed desirable traits in their prospective rabbit, including physical considerations such as sex, age, size, and breed. All participants looking to acquire a second rabbit as a companion for their existing rabbit identified the sex of their prospective companion rabbit to be an important consideration for them because they were looking for a rabbit that would be a good match for their existing rabbit, “but we want a female, we want a spayed female because apparently spayed females are the best match for a neutered male.” For these participants, their knowledge that “bonding rabbits” together of a particular sex, and wanting to provide the “best match” for their existing rabbit, influenced their choice of sex.

Over half of participants, including those with and without previous experience owning a rabbit, indicated age of their prospective rabbit was a consideration pre-acquisition. The majority
of these participants considering age, wanted a young rabbit which stemmed from the desire to own a rabbit for the duration of its lifespan, and included participants with and without experience owning rabbits, “I would want a baby rabbit because you know I want a rabbit from birth, I want to be able to grow with it.” Two participants, who were both looking to acquire a second rabbit, specifically stated they did not have a preference for age because, when it came down to it, what mattered was finding a rabbit that would be the best fit for their existing rabbit, “No, just who ever she wants to pick, you know she has to live with him really.”

Size was discussed by over half of participants and was considered in relation to personal preferences, breed preferences, and participants’ housing situation. Most participants stated a preference for smaller rabbits because of their appearance, ease of handling and clean-up, and less food needed, “You know the smaller the rabbit the less litter there is and that’s what I found. And smaller rabbits don’t eat that much.” For a few participants, living situation was identified to influence their considerations of their prospective rabbit’s size, “I don’t really care about breed but I’d rather it be a bit of a smaller breed. Just for my apartment’s sake.” This consideration stemmed from their desire to provide their prospective rabbit with the appropriate housing and space.

Over half of participants discussed their preference for breed, which was often associated with considerations of rabbit size “I’m looking for a small dwarf rabbit, dwarf or Netherland. They’re small and they don’t grow too big.” In addition, common influences indicated by participants in relation to their preference for breed included temperament, personality, appearance, and familiarity with the breed, “I was interested in personality. I was looking at appearance, but mostly personality. And that’s why I went to the Holland lop, they are one of the best companions.” Generally, participants expressed breed was not a final determining factor in choosing a rabbit with the exception of participants in the process of looking to acquire a rabbit
from a breeder, “We were by that point where we were looking for ones [breeders] that had the Holland lops or the lop-ear rabbits.” A couple of participants indicated they were specifically looking for a mixed-breed rabbit because of their perception that there are health issues with pure breeds, “if you have a mix breed then you don’t have the problems. It’s like a dog or a cat, if you have mixed breeds they don’t have as many medical problems and also they live longer.” For participants acquiring a second rabbit and discussing breed, they did not have a specific breed preference, “I personally like Netherland dwarfs or Holland lops. My sister really likes Lionheads, at this point it doesn’t matter what the breed would be.” Their preference was flexible because they did not consider breed as a factor for finding a match for an existing rabbit, “We prefer having the smaller rabbits and in terms of other breeds, other than dwarf, it doesn’t matter to us as long he or she was neutered or spayed and as long as they are around [current rabbit’s] age.”

3.4 Health status

Consideration toward prospective rabbits’ health status was discussed by about half of participants, all of which had previously owned a rabbit. This consideration often stemmed from participants’ previous experiences with a sick rabbit, concern for learned rabbit illnesses and for some participants their concerns with getting their existing rabbit sick. For a couple of participants, having previous rabbits with health concerns was described to have been a difficult and upsetting experience, “That’s really my only concern is that I just don’t want to buy a sick animal. That’s what really upset me about my last rabbit.” These participants’ past experience was motivation to ensure their prospective rabbit was healthy to avoid experiencing a sick rabbit again. A few participants had learned about certain diseases, injuries, and accidents rabbits can have, which led them to be cautious about the health of their future rabbit, “I’ve always heard the most common incident of rabbit deaths is them snapping their spines because they are so
delicate.” Being aware of potential health issues and injuries played a role in these participants’ considerations surrounding the health of their future rabbit. A few other participants were specifically concerned with a new rabbit passing along an illness to their existing rabbit. These participants wanted to be aware of their prospective rabbits’ health status to avoid the risk of getting their existing rabbit sick, “I would want to make sure he is 100% healthy before bringing him into close proximity to my other one.” All participants expressed they care for their future rabbit and its health, but they were not willing to acquire a rabbit that may be sick at the time of acquisition.

3.5 Compatibility between existing animals

All participants who were current companion-animal owners expressed concerns with how a new rabbit would get along with their existing pet(s). For participants with a cat or dog currently in the household, it was important for all pets to get along in order to not have to worry about having all the animals in the same area, “So kind of juggling that, which I feel like is an obstacle and definitely is something you have to work on if you want them all to be friends and get along so we can all hang out together.” A couple of participants articulated concern for their prospective rabbit, specifically for safety when interacting with an existing household pet, “I’d be concerned about the cat and the rabbit and ensuring that the rabbit feels safe.” One of these participants expressed that if their dog could not adjust to, or get along with, their prospective rabbit the solution would be to get rid of the rabbit, “Well we love our dog, but we are not going to get rid of the dog because of a rabbit.” For this participant, their pre-established relationship with their dog took priority over their prospective relationship with a rabbit. All participants who were acquiring a second rabbit for the household expressed consideration toward how their existing rabbit would react to a new rabbit and expressed concern with how the two rabbits would get along, “Like obviously there is a process that is recommended you go through when you’re
bonding rabbits. But if they didn’t get along and they were aggressive towards each other then that would be my main concern.” Some participants with this concern specifically prioritized their relationship with their existing rabbit, “[Rabbit’s name] has been with us for a while, its pretty easy going here. I don’t want another rabbit coming into the house and totally be aggressive towards him.” Regardless of whether participants indicated their existing rabbit would take priority or not, it was apparent participants had an underlying overall interest in both rabbits getting along.

4. Owner-related pre-acquisition considerations

Although receiving less attention compared to animal-related factors, almost all participants discussed owner-related considerations and concerns pre-acquisition. Owner-related factors were most often shared by participants with prior rabbit ownership experience, which included discussion of scenarios in their lives that may affect acquisition of a new rabbit. These participants discussed considerations surrounding husbandry and housing of the rabbit, as well as their lifestyle, and financial situation. The two participants with no previous experience owning a rabbit shared concerns relating to what is involved in the care of a rabbit, and finding a good space in their home.

4.1 Considerations surrounding husbandry and housing

Both inexperienced and experienced participants considered the husbandry and housing of their prospective rabbit. Both participants who never owned a rabbit before expressed concerns relating to the care and clean up associated with the rabbit, having not cared for a rabbit before. As one of these participants indicated, “I don’t know what all is involved in the care quite yet…and we want to make sure we all educate ourselves so we could do a good job with that.” In order to provide proper care and to deal with this concern, both participants stated they planned to do research to learn more about rabbit ownership prior to acquisition. These participants also
identified concern with finding a good spot in their home for the rabbit’s housing, where it would be comfortable, safe and have enough space. Participants with experience owning a rabbit discussed notably more considerations relating to a prospective rabbits’ care including housing, available space and the amount of time involved. A handful of these participants identified having waited to acquire a rabbit until they were in housing they deemed suitable for rabbit ownership, “the apartment I was in in [city name] was definitely not pet friendly so I couldn’t get a bunny when I was out there”. Previous and current rabbit owners referenced their previous experience in being valuable in knowing what rabbit ownership entails which played a role in their consideration of the time involved in rabbit ownership, “If I ended up working a ton more or got crazy busy, I’m a PhD student so I’m lucky enough I got a pretty flexible schedule, but if I started working an eighty hour week I probably wouldn’t get another one just because they are kind of messy and they take time to clean up after, tend to and care for.” A few participants in the process of acquiring a second rabbit at the time expressed consideration of the extra time and work involved with caring for an additional rabbit, “I guess having another rabbit, it would be more to take care of…So it would definitely be a lot more time commitment.” Despite this consideration, these participants articulated acquiring a second rabbit was worth the extra effort for their existing rabbit to have “company”.

4.2 Lifestyle factors

Lifestyle factors discussed by participants included how acquiring a new rabbit may affect their family, any travel and moving plans and participants’ financial situation. Just under half of participants with rabbit ownership experience discussed how their roommates or family members played a role into their considerations of acquiring a rabbit, “…my family finally agreeing to having one.” Experienced participants discussed the importance of making sure everyone was okay with a new rabbit coming into the household. Over half of previous or current rabbit owners
considered potential travel plans and moving prior to acquiring a rabbit. For a few experienced participants, travelling and moving was an important factor because they specifically avoided getting a rabbit until they knew they would not be travelling much or moving in the near future, “Moving a lot can stress them out. They are very susceptible to changes in anything so I wanted to wait ‘til I had everything.” A few other experienced participants specifically discussed how they would deal with moving or travel if it occurred during rabbit ownership, which included finding a baby sitter for travel and finding a home that allows pets if moving. In contrast, one participant considered having a rabbit over a dog as being beneficial in regards to being able to travel, “We like to travel a bit so we thought with having a dog it’s harder you know.”

Considering their active lifestyle and travel, their family thought a rabbit was a more “portable” option that fit their lifestyle. Almost all participants discussed the cost of rabbit ownership with respect to the cost of care and other supplies. In general, these participants viewed rabbits to be an inexpensive pet, “he does have a lot of stuff and initially to get him it was pricey buying the cage but to keep him he is not an expensive pet.” Only a few experienced participants actually discussed their own financial considerations prior to acquiring a rabbit, in terms of whether they would be able to afford the proper care and supplies for their prospective rabbit, “We do have the room for another rabbit, you know the resources, the financial we have all of that to be able to have another rabbit.”

Discussion

The present study offers a deeper understanding of participants’ considerations toward rabbit ownership prior to acquiring a new companion rabbit. These findings provide acquisition sources (e.g., pet stores, breeders, shelter etc.) and other animal professionals (e.g., veterinarians) with insight on common thoughts and considerations of prospective rabbit owners, which can be used in the development of educational material for owners prior to acquisition. With this
information, acquisition sources can prepare information to assist prospective owners in managing their considerations and concerns prior to acquiring a rabbit. This information will better position prospective companion-rabbit owners, particularly during the acquisition of their first rabbit, with information that can be used to support the development and maintenance of positive human-rabbit relationships.

The present study provides an understanding of why individuals and families want companion rabbits in their household. Edenburg, Hart and Bouw (1994) believe that exploring reasons for acquiring companion animals is important to predict and explain companion-animal ownership. The current study found reasons for acquiring companion rabbits are multifaceted, with a number of individuals identifying their primary reason for acquiring a rabbit was for companionship. Among the little research exploring peoples’ motivations for acquiring companion animals, a survey of 459 Dutch companion-animal owners revealed the motive for keeping a variety of companion animals were for social reasons with the principle social reason being companionship. This reason held for both people living alone and for people living with families. With rabbits increasing in popularity in households (Mullan and Main 2007; Cook and McCobb 2012), future research is needed to further understand reasons for and the nature of the relationships that can be formed between humans and rabbits in order to develop educational resources that lead to positive human-rabbit relationships.

In the present study, participants looking for a second rabbit often indicated they were in the process of acquiring a companion for an existing rabbit. Edenburg, Hart and Bouw (1994) also found among the Dutch companion-animal owners they surveyed, companionship for another animal was a common reason for acquiring a companion animal. Although it is more common for rabbits to be studied in laboratory settings than as human companions, rabbits in general have been found to be social animals (Hulls, Brooks and Bean-Knudsen 1991; Whary et
al. 1993; Crowell-Davis 2007; Buseth and Saunders 2015). Buseth and Saunders (2015) suggest veterinarians and other rabbit professionals should be aware of rabbits’ social needs to promote keeping them in compatible groups. Although many participants discussed their rabbits’ social needs during discussion of their desire to acquire a companion for their existing rabbit, others, looking to acquire a single rabbit, did not discuss social needs or their potential for acquiring a second rabbit in the future. Preparing veterinarians and other rabbit professionals with this information will assist in educating owners on the social needs of rabbits and support the development of positive human-rabbit relationships.

Participants in the present study often described their first-time experience acquiring a rabbit to be an impulsive decision involving little planning or preparation. A qualitative interview study found acquiring an animal is often not a planned decision, rather, people see an animal they like and simply want that animal (Edenburg, Hart and Bouw, 1994). Participants of the present study expressed these unplanned decisions were driven by the rabbits’ adorable appearance or by their desire to provide a rabbit with a better home. Research has shown an association between impulse acquisition and risk of relinquishment of companion animals (Wirth no date). Further research into motivations behind impulsive acquisitions of rabbits would likely inform sources and prospective owners about impulsive acquisition and repercussions of acquiring a pet without planning ahead.

Research shows preparing for companion-animal ownership is important. Diesel, Pfeiffer and Brodbelt (2008) conducted a one-year prospective cohort study of 5,750 rehomed dogs in the United Kingdom and found that failure to seek advice is a significant factor in reducing the risk for return of dogs; in situations where dogs had shown aggression towards people and the owner had not sought advice, dogs had 11.1 times the odds of being returned compared to dogs without behavioural problems. Attending training classes significantly reduced the chance that the
adoption would be unsuccessful (OR 0.3, 95% CI: 0.2, 0.4). Results of the same study also
indicated owners who found the work and effort in looking after their dog to be more than
expected had 9.9 times the odds of returning the dog in comparison to those who found the effort
required to be less than they had expected. Educating companion-animal owners at acquisition
sources, in an effort to promote responsible acquisition of companion animals, is likely to aid the
development of a successful human-animal relationship and ultimately reduce the risk of
relinquishment. For companion rabbits, ensuring acquisition sources take an active role in the
acquisition process, including owner education, would increase the likelihood that the purchase
or adoption of rabbits was a well-informed decision.

Finding a reputable source was identified to be important to participants of the present
study. Participants described giving careful consideration to the reputation of the source their
future rabbit would be coming from, which influenced their decision on whether to avoid a
certain type of acquisition source. In the United Kingdom, the Welsh government recently
published information to guide people on the responsible acquisition of a companion dog or cat
(unknown author 2013). The document advised pet owners to buy an animal from a reputable
supplier, check the animal’s history, and see the animal and the animals’ documentation prior to
buying the animal, and if the prospective owner has any doubts in any of these areas they are
encouraged to speak to a veterinarian before acquiring the animal. The article also recommended
that unknown sources be avoided, drawing particular awareness to animals advertised on the
Internet or through social media. In the present study, a major concern for participants was where
commercial retail sources acquired their rabbits. Participants described avoiding commercial
acquisition sources when there was limited information on the health, history and care of their
prospective rabbit. Preparing prospective owners with questions to ask sources, things to look for
and consider, when deciding where to acquire a companion rabbit is important. Veterinarians or
other animal health professionals should play a role in advising prospective rabbit owners to investigate the source from where they plan to acquire their rabbit. By preparing prospective rabbit owners with questions to ask, rabbit acquisition sources will be expected to offer information about each rabbit’s health, history and other details about their rabbits up-front for prospective owners.

The present study found a large portion of participants wanted to provide a homeless rabbit with a home, making adoption a common choice for acquiring a rabbit. Compared to participants interested in purchasing a rabbit from a commercial retail source or breeder, participants interested in adopting a companion rabbit revealed different considerations. Most participants interested in adoption were less concerned with where the rabbits came from, or the rabbits’ history, because they would be saving a rabbit’s life. The desire to rescue has been demonstrated among prospective adopters of cats and dogs. A recent study of 175 dog and cat adopters found that 84% of participants who had adopted in the last 12 months articulated the reason for acquiring a pet at a pet adoption organization or shelter was because they wanted to save an animal (PetSmart Charities 2012). Only 15% of these participants said they were acquiring a pet from an adoption organization/shelter because it was the most reputable source. These findings are consistent with the results of the present study involving prospective companion-rabbit owners, where saving an animal appears to be a driving factor for choosing to adopt a rabbit from a shelter even when little history may be known about the animal. The findings of the present study suggest people may have different priorities when choosing a source to acquire a rabbit. Regardless of a person’s priority for choosing a source, it is important that all acquisition sources ensure the expectations of prospective owners are realistic and match the characteristic of the animal.
For dogs and cats, two programs have been developed and demonstrated success in matching adopter lifestyle and expectations to the personality and behaviour of the animal (APSCA 2013a; ASPCA 2013b). These programs, “Meet Your Match Canine-ality Adoption Program” (ASPCA 2013a) and “Meet Your Match Feline-ality Adoption Program” (ASPCA 2013b), have shown to increase adoption and decreasing return rates for dogs and cats, respectively (Nobles 2006; Weiss et al. 2015). Several studies have articulated that unrealistic owner expectations are a significant threat to the retention of companion animals and to the human-animal bond (Houpt, Honig and Reisner 1996; Patronek et al. 1996; Shore 2005), supporting the necessity for programs, like Meet Your Match, to ensure that information relating to the owner’s lifestyle and expectations align with characteristics of the animals (e.g. behaviour profile) are considered during the acquisition process. Currently, exploring the personality and behaviour of each individual companion rabbit is not a common practice for shelters with rabbits for adoption. Considering this type of program for rabbits may offer a valuable framework for developing similar outcomes for companion rabbits.

Animal-related considerations prior to acquiring a companion rabbit received the most attention across participants in the present study, with a particular focus on rabbit behaviours considered undesirable. Behavioural problems are one of the most common reasons identified for dog and cat relinquishment (Salman et al. 2000; Mondelli et al. 2004; Shore 2005; Fatjo Ruiz-de-la-Torre and Manteca 2006; Podberscek 2006), and are also possibly one of the most preventable (Salman et al. 2000; Podberscek 2006). For rabbits however, two studies exploring relinquishment did not find behaviour to be among common reasons for relinquishment (Ledger 2010; Cook and McCobb 2012). Despite this, based on participants’ considerations surrounding undesirable behaviours, it is important for prospective rabbit owners to be aware of resources to assist them in preventing or managing behavioural problems in a companion rabbit. Crowell-
Davis (2007) suggested that aggression and destruction among companion rabbits are best prevented or managed by having owners understand the origin of these behaviours. Developing and making resources available for acquisition sources and veterinarians to provide companion-rabbit owners with how to prevent or manage common undesirable rabbit behaviours will have positive implications on the development and maintenance of human-rabbit relationships.

In addition, it is important for prospective rabbit owners to be aware that rabbits have different personalities. Almost all participants in the present study described affectionate behaviour as a desirable trait. As a result, owners may be disappointed or surprised when they bring home a rabbit that is not affectionate. Acquisition sources and animal professionals have a role to play in informing prospective owners on rabbit behaviour and ensuring the expectations of an owner match what their prospective rabbit can provide.

All participants in the current study expressed preferences for physical traits they would prefer in a prospective rabbit. Interestingly, for the majority of participants these preferences were not deciding factors for acquiring a rabbit, which was supported by many participants’ preference for adopting a rabbit regardless of the participant’s physical trait preferences in a rabbit. Generally, participants indicated that they prefer smaller and younger rabbits with ears that flop. This was consistent with a study exploring public perceptions of farmed rabbits and pet rabbits (González-Redondo and Contreras-Chacón 2012). When asked to rate the degree to which they considered several varieties and breeds of rabbit as a pet, participants clearly rated Lop Dwarf, Netherland Dwarf, Angora and Lionhead breeds higher than larger New Zealand White breeds and wild varieties (González-Redondo and Contreras-Chacón 2012), which may be attributed to the fact that these breeds have a cute and furry appearance (Verhoef-Verhallen 2002; British Rabbit Council 2008). In consideration of responsible breeding, commercial sources and breeders should consider the physical traits of the companion rabbits they produce to match the
desires of consumers and reduce the potential for unwanted rabbits resulting from less desirable physical traits. Although most participants did not consider physical features to be a deciding factor for acquisition, a number of participants described their unplanned first-time acquisition of a rabbit based on physical attributes, indicating people can be drawn to the physical traits of a rabbit, which may influence their acquisition. Rabbit sources should be aware of impulsive acquisition in order to take the opportunity to educate prospective rabbit owners about the potential implications of impulse decisions.

The majority of participants discussed their consideration toward the wellbeing of the rabbit that was soon to enter their home. All participants who had previously owned a rabbit were concerned with the health of their prospective rabbit. Interestingly, the two participants who had never owned a rabbit before did not have this concern, perhaps suggesting a potential educational opportunity for first-time rabbit owners. Rabbits, and certain breeds of rabbits specifically, can be prone to illness and injuries (Buseth and Saunders 2014). Some illnesses, digestive disorders in particular, are suggested to be extremely common and potentially life threatening for rabbits (Buseth and Saunders 2015). Prospective rabbit owners should be made aware of common rabbit ailments at the time of acquisition in order to take preventative action to promote the health and care of their companion rabbit. Participants of the present study also expressed specific concern for the safety of their new rabbit coming into a home with a cat or dog. In general, these participants just hoped that all animals would get along. Research involving dogs and cats has identified integration of new animals into a household with current animals can put both animals at risk for relinquishment (Salman et al. 2000; Shore 2005). To ensure the successful introduction of a new rabbit to other family pets, educational initiatives should suggest ways to approach the integration of a new companion rabbit. Participants of the present study with an existing rabbit were concerned with how their existing rabbit would react to a new rabbit in their home.
Protocols for correctly introducing rabbits have been suggested to avoid serious injury to the rabbits involved (Buseth and Saunders 2015); therefore, development of educational resources involving these methods should be considered by acquisition sources for individuals with an existing companion rabbit or other companion animals.

Owner-related considerations received less attention from participants of the present study compared to animal-related considerations. Most often participants who had previous experience with rabbit ownership discussed owner-related considerations, particularly lifestyle considerations, suggesting an association between experience and owner-related considerations. Participants with previous experience owning rabbits considered how their lifestyle might be affected by acquiring a new rabbit. Compatibility between an individual or family and a prospective companion animal is important to ensure the person’s lifestyle is a good fit for pet ownership (How you can 2007). In the US, personality matching between owners and companion dogs has been shown to improve owner satisfaction (Curb et al. 2013) and pre-adoption checklists have also been suggested to help prospective owners select the right companion (How you can 2007). Participants of the present study that were new to rabbit ownership did not explicitly consider lifestyle factors as did owners with previous experience. These findings highlight a potential opportunity to raise awareness for new rabbit owners of possible lifestyle considerations, such as other family members, allergies, travel, moving plans or financial planning, and their role in achieving a successful human-rabbit relationship. Indeed, a lack of consideration of lifestyle factors has been linked to an increased risk of relinquishment. A large multicenter study of 12 American shelters examined reasons associated with the relinquishment of cats and dogs and found human lifestyle factors to be associated with the reason for relinquishment among 25% of dogs and 35% of cats (Salman et al. 1998). Owner circumstances were also found to be common reasons for relinquishment among individuals relinquishing
companion rabbits (Ledger 2010; Cook and McCobb 2012). Acquisition sources can play a role in discussing owner-related considerations prior to acquisition to allow prospective rabbit owners opportunities to consider factors in their life that may or may not fit with owning a companion rabbit. In addition, development of resources to identify compatible matches between prospective rabbit owners and a companion rabbit is likely to aid the development of successful and sustainable human-rabbit relationships.

The present study utilized one-on-one telephone interviews, which offered a feasible approach for capturing a rich understanding of participants’ thoughts and motivations toward rabbit ownership prior to acquisition. The findings of the present study represent the thoughts and ideas of the 18 participants recruited for the present study and are not transferable to all prospective rabbit owners. Nevertheless, the study revealed several consistent themes across participants, allowing acquisition sources to consider opportunities to develop resources for and offer education to their prospective rabbit owners in support of the development of successful and sustainable human-rabbit relationships. Recruiting prospective rabbit owners that were in the process of acquiring a rabbit was difficult. In particular, it was challenging to identify individuals who were new to rabbit ownership. As a result, the study may have had a selection bias toward experienced rabbit owners, and the motivations and thoughts of new and potentially inexperienced rabbit owners are likely underrepresented. Research to further explore the specific considerations and thoughts of individuals who have never owned a rabbit before would be beneficial.

In conclusion, participants’ considerations prior to rabbit acquisition are vast and multifaceted, suggesting the thought process of prospective rabbit owners’ is likely complex. The findings and insight gained from the present study provides evidence for education at the point of acquisition and can be considered by rabbit acquisition sources in the development of educational
resources to assist prospective rabbit owners in developing successful and sustainable human-rabbit relationships. Future research should be developed to assess the efficacy of educational programs and resources for supporting the process of companion-rabbit acquisition.
References


Nobles, M.E. 2006. ASPCA—meet your match: going online to help donors connect pets and pals. *The Non-Profit Times*, April 1, p. 36.


Table 2.1 Demographic information for the 18 participants interviewed, in August to November 2012, looking to acquire a new companion rabbit from a breeder, a pet store, a shelter, a rescue or online advertisement within the Greater Toronto Area

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous rabbit owner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>16</td>
<td>88.9</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td>11.1</td>
</tr>
<tr>
<td>Owns other pets (cat and/or dog)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>3</td>
<td>16.7</td>
</tr>
<tr>
<td>No</td>
<td>15</td>
<td>83.3</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>2</td>
<td>11.1</td>
</tr>
<tr>
<td>Female</td>
<td>16</td>
<td>88.9</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 - 25</td>
<td>9</td>
<td>50.0</td>
</tr>
<tr>
<td>26 - 33</td>
<td>4</td>
<td>22.2</td>
</tr>
<tr>
<td>34 - 41</td>
<td>3</td>
<td>16.7</td>
</tr>
<tr>
<td>42 - 49</td>
<td>1</td>
<td>5.6</td>
</tr>
<tr>
<td>50 and over</td>
<td>1</td>
<td>5.6</td>
</tr>
<tr>
<td>Type of living area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>1</td>
<td>5.6</td>
</tr>
<tr>
<td>Suburban</td>
<td>10</td>
<td>55.6</td>
</tr>
<tr>
<td>Urban</td>
<td>7</td>
<td>38.9</td>
</tr>
<tr>
<td>Education level completed&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school</td>
<td>7</td>
<td>38.9</td>
</tr>
<tr>
<td>University</td>
<td>3</td>
<td>16.7</td>
</tr>
<tr>
<td>College</td>
<td>5</td>
<td>27.7</td>
</tr>
<tr>
<td>Post graduate</td>
<td>3</td>
<td>16.7</td>
</tr>
<tr>
<td>Annual household income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under $30,000</td>
<td>2</td>
<td>11.1</td>
</tr>
<tr>
<td>$30,000 - $60,000</td>
<td>3</td>
<td>16.7</td>
</tr>
<tr>
<td>$61,000 - $90,000</td>
<td>2</td>
<td>11.1</td>
</tr>
<tr>
<td>Over $91,000</td>
<td>4</td>
<td>22.2</td>
</tr>
<tr>
<td>Prefer to not answer</td>
<td>7</td>
<td>38.9</td>
</tr>
</tbody>
</table>

*Note.* <sup>a</sup>The original categories for education level completed included a “none of the above” and “other” option, however, no participants selected these options.
Figure 2.1 Thematic map for theme, *considerations prior to acquiring a companion rabbit*, and associated sub themes

- **Motivations**
  - For love and companionship
  - Reputation
- **Choosing a source**
  - Convenience and cost
- **Animal-related**
  - Companion for an existing rabbit
  - +/- Behaviour traits
  - Physical traits
  - Health
  - Compatibility
- **Owner-related**
  - Lifestyle
  - Husbandry and housing
CHAPTER THREE

Factors associated with companion-rabbit owners’ knowledge of rabbit care and the spay or neuter status of companion rabbits

Prepared in the style of Anthroözos
Abstract

Pet owners’ knowledge of pet care has been shown to affect the human-animal bond and welfare of companion animals. With the number of companion rabbits in households on the rise, and a lack of awareness of standards of care for companion rabbits, it is becoming important to understand the knowledge level of rabbit owners and determine how companion rabbits are being cared for. The purpose of this study was to explore factors associated with companion-rabbit owners’ knowledge of rabbit care and the spay or neuter status of companion rabbits. Current rabbit owners (n=2,890) completed an online survey investigating acquisition of their companion rabbit, husbandry, spay and neuter status and care of their current rabbit, knowledge of rabbit care and attachment to their current rabbit. An approximation of logistic regression modeling revealed increasing attachment (p<0.001), increasing participant age (p<0.001) and regular veterinary check-ups (p<0.001) were all associated with higher odds of answering a knowledge question correctly. Country of residence (p<0.001), where participants acquired their rabbit (p<0.001) and where they heard about the survey (p<0.001) were also found to be associated with participants’ level of rabbit knowledge. Logistic regression on the outcome of spay or neuter status found increasing knowledge scores (p<0.001), regular veterinary check-ups (p<0.001) and owning only one rabbit versus multiple rabbits were associated with increased odds of currently owning a spayed or neutered rabbit. Country of residence (p<0.001) and where participants acquired their current rabbit (p<0.001) were also associated with whether a participant’s current rabbit was spayed or neutered. Several factors were found to influence rabbit owners’ knowledge and whether they own a spayed or neutered rabbit. These findings suggests development of educational material and the role acquisition sources, veterinarians, and companion-animal professionals can play to enhance owners’ knowledge of rabbit care and promote the importance of spaying and neutering companion rabbits.
Keywords: companion rabbit, knowledge, rabbit ownership, relinquishment, spay and neuter status
Introduction

Keeping companion animals has become common practice across the world (Podberscek 2006). At least half of households in Western societies own a pet (Podberscek 2000) and the vast majority of owners describe their pet as a family member (Cohen 2002; Toray 2004; Verga and Michelazzi 2009). Unfortunately, not all relationships between pets and their owners are positive. When the human-animal bond breaks down, the resulting consequence can be relinquishment of the animal and in many cases euthanasia of the animal (Kass et al. 2001). Over the last three decades, euthanasia of healthy companion cats and dogs has been a leading cause of death (Olson et al. 1991). Research has shown limited owner knowledge and unrealistic owner expectations can be main contributors to increased risks of relinquishment for companion animals (Miller 1996; Scarlett et al. 1999; Sharkin and Ruff 2001). Specifically, for companion dogs, studies have found regular veterinary care (Salman et al. 1998) and participation in obedience classes (Patronek et al. 1996; Salman et al. 1998; Diesel, Pfeiffer and Brodbelt 2008) to have a protective association with the risk of relinquishment. In addition, sterilization has been suggested to reduce overpopulation and relinquishment of companion cats and dogs (Fournier and Geller, 2004; Frank, 2004). Spaying and neutering of companion animals has been proposed to be a method to reduce cat and/or dog overpopulation as well as educating pet owners and public information campaigns (Frank 2004; Fournier and Geller 2004; Irene 2007). Most of the research into companion-animal ownership and relinquishment has been focused on dogs and cats; whereas, ownership and relinquishment of other companion animals, including rabbits, has scarcely been investigated. A scoping review of research on the relinquishment of companion animals found that 89.1% (n=171) of the articles concerned dogs and 63.5% (n=122) concerned cats, whereas only 9.4% (n=18) addressed other companion-animal populations (birds, rabbits, rodents etc.) (Coe et al. 2014).
According to authors in both the United States and United Kingdom, rabbits are increasing in popularity (Crowell-Davis 2007; Mullan and Main 2006) and they are now the third most popular companion animal behind cats and dogs (Schepers, Koene Beerda 2009; Sayers 2010). However, in the US, rabbits have also been suggested to be the third most surrendered pet to animal shelters (Cook and McCobb 2012). Thus, it is important to promote positive human-rabbit relationships by improving our understanding of the types of relationships people have with companion rabbits and supporting owners’ knowledge of rabbits and their required care. A recent study in the United Kingdom found companion-rabbit owners knowledge of diet and social needs at the point of sale were limited (Edgar and Mullan 2011). The importance of education on the health and welfare of companion rabbits (Edgar and Mullan 2011; Cook and McCobb 2012) and the role that pet stores and veterinarians play in providing information to rabbit owners (Edgar and Mullan 2011) has been raised by authors in both the United Kingdom and United States. It is unknown what factors contribute to knowledge of rabbit owners and how knowledge might influence other parameters of companion-rabbit ownership such as rabbit spay and neuter status. The objective of the present study was to explore companion-rabbit owners’ knowledge of rabbit care including factors associated with owners’ knowledge and the spay or neuter status of companion rabbits.

Materials and Methods

A cross sectional online survey of current rabbit owners was conducted from February to March 2014. The study protocol was reviewed and approved by the University of Guelph Research Ethics Board (REB#13NV047).
Survey development

An online survey was developed to investigate participants’ acquisition of their companion rabbit, husbandry and care of their current rabbit, owner knowledge of rabbit care, and attachment toward their current rabbit. Participant demographic information was also collected.

Survey development began with an initial review of the literature for existing measures of companion rabbit welfare, companion-rabbit owner knowledge and human-animal attachment. Three existing measures relevant to the research question were identified: a questionnaire of companion-rabbit husbandry, health and behaviour (Mullan and Main 2006), a knowledge index of basic rabbit husbandry and care (Okola, McCobb and Dowling-Guyer publication in progress) and the Lexington Attachment to Pets Scale (Johnson, Garrity and Stallones 1992). The husbandry, health and behaviour questionnaire was modified from an in-person interview guide to an online survey for the purposes of the current study. Additional descriptive questions were also added to the questionnaire in order to explore details surrounding rabbit housing (9 items), outside access (2 items), inside access (1 item), diet (3 items), behaviour (5 items), veterinary history (7 items) and rabbits living with rabbit or other companions (2 items). For the previously developed knowledge index, 25 true or false questions and 19 multiple-choice questions assessed individuals’ knowledge on the basics of rabbit husbandry (Okola, McCobb and Dowling-Guyer publication in progress). In the current study, one additional true or false question was added to the knowledge index to capture the published misconception found commonly among the public and rabbit owners that carrots are a good source of nutrition for companion rabbits (MVMA 2014; RSCPA 2014). An overall knowledge index was created by dichotomizing each knowledge item, where a correct response was given a value of one and an incorrect response was given a value of zero (Okola, McCobb and Dowling-Guyer publication in progress). Missing knowledge items were treated as incorrect responses and given a value of zero. For the Lexington
Attachment to Pets Scale (LAPS) (Johnson, Garrity and Stallones 1992), the term “pets(s)” was replaced with the word “rabbit(s)” for each of the 23 items. Each attachment item was scored on a four-point likert scale (0 = strongly disagree, 1 = somewhat disagree, 2 = somewhat agree, 3 = strongly agree; negatively worded items coding was reversed) (Johnson, Garrity and Stallones 1992). An overall attachment score was created as the sum of the 23 items in the attachment scale. The survey also included a section developed by the author on participants’ acquisition sources of previous and current rabbits, sources for acquiring rabbit knowledge and participant demographics.

Once a draft of the survey was created it was reviewed by a panel of three rabbit owners and three non-rabbit owners to gain feedback on relevancy and clarity. Based on the feedback the survey was revised to reduce identified ambiguities and redundancy. A pilot of the revised survey draft was conducted where a link to the survey was emailed to 29 individuals that had previously indicated interest in participating in future rabbit research, following their participation in a research project exploring prospective owners’ motivations for and thoughts toward companion-rabbit ownership (Chapter 2). Pilot participants were encouraged to provide feedback on the survey and comment on any topics important to rabbit ownership they believed the survey may have missed. All feedback and comments were reviewed and subsequent revisions were made to produce the final survey.

Recruitment and study procedures

Following development of the final survey, snowball sampling was utilized for recruitment of participants for the current study. In contrast to dog owners, who may be regularly seen in public walking their dogs, rabbit owners may be a less easily detected population of pet owners as rabbits are commonly kept indoors. Snowball sampling has been documented as a beneficial technique to target populations that may be ‘hidden’ or hard-to-reach (Faugier and
Acquisition sources, and animal-related societies, groups, organizations and companies were contacted by the author to invite their assistance in recruiting for the study via email and social media (Appendix B.1). Sources that agreed to assist with recruitment posted a brief outline of the study, including information on entry into a draw for $50 with a 1 in 100 odds of winning, and posted a link to the survey on their website, social media page or distributed the information by email to followers (Appendix B.2). In addition, a Google search was conducted by combining the terms companion rabbit, rabbit or bunny with the terms forum, blog or reddit to identify animal related group forums. Once identified, the author posted a description of the study including the information about the incentive and the survey link on the group forum pages (Appendix B.3). The author also posted on free online advertisement web pages (Appendix B.3).

Once potential participants clicked on the survey link they were asked to complete an online consent form (Appendix B.4), and following consent, participants continued to the online survey (Appendix B.5). Participant responses were anonymous, therefore, upon submitting their survey participants were immediately redirected to a second survey where they could provide their name and email address to be entered into the incentive draw for $50.

Participants were excluded from the study if they indicated they did not currently own a rabbit (n=649), self-identified themselves to be under 18 years of age (n=48) or did not complete the survey to the end (n=1,054). Participants meeting one or more of these criteria were removed, therefore the distribution of these exclusions appear to reduce the population beyond the final population of 2,890 current rabbit owners who had completed the study.

**Psychometric analysis of the knowledge index and LAPS**

Content validity of the knowledge index was previously established during its development through consensus on rabbit knowledge items obtained from a several small animal and exotics veterinarians; items with low agreement were dropped (Okola, McCobb and
Dowling-Guyer publication in progress). For the overall knowledge index, the current study assessed reliability for the sub-index of true or false questions and the sub-index of multiple-choice questions separately using Cronbach’s alpha. Based on the reliability analysis, revisions to each sub-index were made independently. Items meeting the following two criteria were retained: (1) inclusion of the item increased Cronbach’s alpha, and (2) the inter-item correlation was between 0.2 and 0.4 indicating optimal homogeneity (Briggs and Cheek 1986). Once alpha had independently reached a maximum for each sub-index, the true or false sub-index and multiple-choice sub-index were combined forming the final overall knowledge index. An alpha value greater than 0.7 was considered acceptable (Cortina 1993). Analysis of reliability and removal of items within the knowledge index was conducted after participants had been recruited and completed the survey.

Three a priori hypotheses were also assessed in support of establishing the construct validity of the knowledge index. First, research has shown that attachment is positively associated with an owner’s desire for veterinary care (Centner and Smeshko 2011) as well as the level of veterinary care the owner acquires (Lue, Pantenburg and Crawford 2008). Therefore, to provide the best possible care for their companion rabbit an attached owner was expected to seek out greater knowledge about companion-rabbit care. The a priori hypothesis tested was that an owners’ attachment to their companion rabbit should be positively associated with an owner’s knowledge of companion-rabbit care. Second, not acquiring regular veterinary care for a pet has been found to be associated with a lack of knowledge regarding the need for regular veterinary care (Volk et al. 2011); therefore, it is hypothesized that attending regular veterinary visits should be positively associated with an owner’s knowledge of companion-rabbit care. Thirdly, research has shown rescue and shelter staff possess higher knowledge of companion-rabbit care than pet store staff (Okola, McCobb and Dowling-Guyer publication in progress); therefore, it is
hypothesized that owners that acquire their companion rabbit from a rescue or shelter will have higher knowledge of companion-rabbit care than owners who acquire their companion rabbit from a pet store.

The LAPS has been extensively used and previously validated for measuring peoples’ attachment to dogs and cats (Johnson, Garrity and Stallones 1992); however, not for attachment to companion rabbits. Cronbach’s alpha was used to assess the reliability of the modified LAPS. In support of the use of the LAPS to measure people’s attachment to companion rabbits, two a priori hypotheses based on research involving dogs and cats were assessed to support the construct validity in using the LAPS to measure peoples’ attachment to companion rabbits. Research has shown that the strength of the bond between owners and their companion animal is positively associated with taking their pets to veterinarians (Lue, Pantenburg and Crawford 2008; Brockman, Taylor and Brockman 2008); therefore, the first hypothesis was an owner’s attachment to their companion rabbit should be positively associated with acquiring veterinary services for their rabbit. Second, the owner-companion-animal bond positively relates to the amount of time spent with companion animals (Cohen 2002; Lue, Pantenburg and Crawford 2008). The a priori hypothesis tested was that the time spent with a companion rabbit should be positively associated with owners’ attachment to their rabbit.

Statistical analysis

Descriptive statistics were performed on the independent variables of interest including mean, standard deviation, median, minimum and maximum for continuous variables and frequencies and percentages for categorical variables. Missing value analysis was conducted on each variable to analyze patterns of missing data. The categorical variable “where the survey was found online” contained a high proportion of “other” responses (>20%). Many of the “other” responses were re-categorized into the pre-established response options by the author or if the
description was slightly different the pre-established category was broadened (Table 3.1 with notes). A small proportion of the “other” category (<1%) could not be re-categorized and remained as a true “other” response.

Knowledge index scores were used as an outcome variable in linear regression modeling. First, individuals that skipped entire sections of the knowledge index (i.e., the true or false section, multiple-choice section or both) or skipped one or more attachment items (including individuals selecting the response category “don’t know or refuse”) were excluded listwise from analysis. The first stage of model building involved conducting correlation analysis to test for collinearity among the variables to be included in the analysis. Univariate analysis was conducted on the following variables: attachment score, rabbit acquisition source, where participants learned about the survey, regular veterinary check-ups, years experience owning rabbits, participant age, gender, highest level of education completed and location of residence. Linearity was assessed for all continuous variables of interest using graphic methods and adding quadratics. If the quadratic variable was significant with its main effect in the univariate model it was considered to model a non-linear relationship and was included in the initial multivariate model. During univariate analysis and assessment of linearity, all variables associated with the outcome (p ≤ 0.1) were included in the initial multivariate model of main effects. Manual backwards selection was then used, with a conservative p-value (p ≤ 0.001) cut-off, to retain significant variables. During the process of manual backward selection, confounding was assessed by removal of a variable. If the coefficients of remaining variable(s) in the model illustrated a 20% or greater change, and represented a plausible relationship, the removed variable was considered a confounder and retained. Among the remaining variables in the reduced multivariate model, all pair-wise interactions of the main effects were entered in the model and tested for significance using manual backward selection to remove non-significant interaction terms, resulting in the final
reduced model. All variables removed during backward selection were then individually added back into the model one at a time to test whether order of removal affected significance of the variable. If the variable was significant when added back, and resulted in a reduction to the AIC measure, the variable was retained in the final reduced model. Residual analysis was conducted to assess linear regression model assumptions. Normality of residuals was tested by visually assessing the pattern of residuals plotted against predicted values. Comparing removal and inclusion of outliers assessed the impact of outliers on the model. Fit of the model was also assessed using skew, kurtosis and the Anderson-Darling test. A logistic regression transformation and a bias correction term was applied to improve fit of the model (Cox and Snell, 1989), transforming the outcome from a continuous knowledge score to a binary outcome with the odds of getting any one knowledge question correct, using the same steps as above to ensure the transformation did not influence the model building procedure. Back transformation was then used for interpretation of results. The transformed model was labelled as an approximation of logistic regression model. Finally, the Tukey-Kramer method was applied to account for multiple comparisons for categorical variables containing four or more groups and was assessed at $p < 0.05$.

Spay or neuter status of participants’ current rabbit was used as an outcome for logistic regression modeling. Individuals that skipped sections of the entire knowledge index or skipped one or more attachment items were excluded listwise from analysis. In the first stage of model building, correlation analysis assessed collinearity among the variables to be included in the analysis. Univariate analysis was then conducted on the following variables: knowledge score, attachment score, rabbit acquisition source, where participants’ learned about the survey, regular veterinary check-ups, number of rabbits currently owned, if participants’ rabbit(s) was litter trained, participant household income, participant age, gender, highest level of education
completed and location of residence. Quadratics and graphic methods assessed linearity of continuous variables. All variables and quadratics associated with the outcome (p ≤ 0.1) were added to the initial multivariate model. Next, backward selection was used to remove non-significant variables and quadratics with a conservative p-value (p ≤ 0.001) cut-off. Confounding was assessed by a change in variable coefficients of greater than 20% and by the plausibility of relationships. All pair-wise interactions of significant variables were then added to the reduced multivariate model, followed by backward selection of interactions producing the final model (p ≤ 0.001). Variables removed during backward selection were re-entered to test whether the order of removal affected significance of the variable. The Tukey-Kramer method was applied to categorical variables and assessed at p < 0.05.

Descriptive statistics were conducted using standard statistical software (SPSS version 21, IBM Corporation). Linear and logistic regression model building was conducted using SAS (version 9.3, SAS Institute Inc. Cary, NC).

Results

Study Participants

A total of 38 sources, reaching international audiences, agreed to help share the survey information and link through their website and social media platforms (15 rabbit related groups, education or welfare organizations, 9 rabbit rescues, 5 shelter organizations, 5 pet stores, 3 rabbit supply stores and one breeder). In addition, the researcher posted on two classified advertisement websites (e.g., Kijiji and Hoobly Classifieds) and two rabbit related online forum pages (e.g., Reddit and Rabbitchonline.net). A total of 4,494 individuals accessed the survey over a three-week period. Following exclusion of individuals that did not currently own a rabbit, had incomplete data, or were under the age of 18, the final sample population was 2,890 (66.3%) current rabbit
owners. Missing value analysis revealed less than 5% missing across all items providing evidence that missing values occurred at random (IBM SPSS 2011).

Demographic information for the 2,890 participants is provided in Table 3.1. The vast majority of participants were female (90.8%; n=2,604), varying in residence type, education and annual household income. Participants were from the United States (63.2%; n=1,805), Canada (21.4%; n=611) and outside of the United States and Canada (15.4%; n=440). The median age of participants was 32.0 years (mean 35.1; range 18.0 – 79.0).

Information regarding participants’ first companion rabbit owned and current rabbit can be found in Table 3.2a and Table 3.2b, respectively. About thirty percent (n=867 of 2,890) of participants acquired their first rabbit from a pet store and 25.7% (n=737) from a rescue or shelter. In contrast, when asked about their current rabbit, 14% (n=400) of participants reported that their current rabbit was acquired from a pet store and 49.1% (n=1,403) were from a rescue or shelter. Participants’ primary reasons for obtaining their first rabbit were for companionship (55.7%; n=1,593) and to give a rescue or shelter rabbit a home (16.9%; n=483). In contrast, participants’ primary reasons for obtaining their current rabbit were for companionship (32.1%; n=913), to give a rescue or shelter rabbit a home (29.1%; n=827) and to bond to an existing rabbit (25.1%; n=713). Thirty-one percent (n=889) of participants’ current rabbits were not spayed and neutered. Just over half (55.5%; n=1,602) of participants had more than one rabbit and about half (50.5%; n=1,460) of participants had a rabbit companion for their existing rabbit. About two thirds (64.4%; n=1,655) of participants took their current rabbit for regular veterinary check-ups. The median years’ experience that participants had with owning rabbits was 5.5 (mean 7.7; range 3 weeks – 49 years).
Companion-rabbit knowledge

Analysis of questions missed resulted in removal of three participants’ knowledge scores as they skipped the entire true or false section, multiple-choice section or both. Following reliability analysis, a total of 20 true or false items and 11 multiple-choice items remained within the knowledge index; Cronbach’s alpha was 0.75 for the final 31-item knowledge index The median companion-rabbit knowledge score was 29.0 out of 31.0 (mean 28.2; range 7.0 – 31.0). Table 3.3 displays the results for each knowledge item.

Companion-rabbit attachment

Analysis of missing items resulted in removal of 863 (29.9%) participants’ attachment scores as they skipped at least one attachment item (including items with the response category “don’t know or refuse”). Cronbach’s alpha of the modified LAPS was 0.92. The median companion rabbit attachment score was 57.0 out of 69.0 (mean 54.9; range 12.0 – 69.0). Table 3.4 displays descriptive statistics for each item.

Factors associated with rabbit owners’ knowledge surrounding companion-rabbit care

The pattern of residuals plotted against the predicted values for knowledge score were strongly left skewed, and both kurtosis and the Anderson-Darling test revealed large values indicating linear regression modeling did not fit the data. An approximation of logistic regression with a bias correction term of 0.5 was applied to the final model (Cox and Snell, 1989). This transformation resulted in large improvements to skew, kurtosis and the Anderson-Darling test supporting the application of the transformation. The final approximation of logistic regression model revealed increasing attachment \((p<0.001)\), increasing participant age \((p<0.001)\) and regular veterinary check-ups \((p<0.001)\) were all associated with higher odds of answering a knowledge question correctly (Table 3.5). Country of residence \((p<0.001)\), where participants acquired their rabbit \((p<0.001)\) and where they heard about the survey \((p<0.001)\) were also found
to be associated with participants’ level of rabbit knowledge. Figure 3.1 - 3.4 provides graphical representations of least squares means for knowledge scores for the four categorical variables.

Factors associated with participants owning a spayed or neutered companion rabbit

The final logistic model for factors associated with participants owning a spayed or neutered rabbit at the time of the study found increasing knowledge scores \((p<0.001)\), regular veterinary check-ups \((p<0.001)\) and owning only one rabbit versus multiple rabbits to be associated with increased odds of currently owning a spayed or neutered rabbit (Table 3.6). Country of residence \((p<0.001)\) and where participants acquired their current rabbit \((p<0.001)\) were also associated with whether a participant’s current rabbit was spayed or neutered.

Discussion

In the current study, a number of factors were found to be associated with participants’ knowledge of rabbit care and whether participants’ current rabbit was spayed or neutered. Among the limited research previously conducted in relation to rabbit ownership, a study involving 102 rabbit owners in the United Kingdom assessed participants’ knowledge and attitudes toward rabbit ownership at the point of sale from pet shops (Edgar and Mullan 2011). The study found that the majority of participants indicated that they had carried out research prior to acquisition, yet they possessed limited knowledge of the needs of rabbits. Edgar and Mullan (2011) also found nearly half of respondents were not planning on getting their rabbit spayed or neutered, which was attributed to the idea that their rabbit would not have access to the opposite sex, or that they were unaware of the health and behavioural benefits. Not surprisingly, the current study found that as knowledge score increased, the odds of having a spayed or neutered rabbit increased, which is important to management of companion-animal population numbers and rabbit health. These findings offer encouragement for acquisition sources and veterinary
professionals to develop and distribute information pertaining benefits, both societal and animal, of spaying and neutering companion rabbits.

Acquisition source was found to be associated with both owners’ knowledge score and current rabbit spay or neuter status. Participants acquiring their rabbit from a rescue or shelter, or as a stray, on average had the highest overall knowledge scores, and significantly higher odds of getting any one knowledge question correct compared to participants who got their rabbit from other sources. Some of these findings are consistent with the results of a study that assessed the knowledge of personnel employed by various rabbit sources (Okola, McCobb and Dowling-Guyer publication in progress). The study found shelter and rescue staff to have higher knowledge of companion-rabbit care and husbandry compared to pet store staff. Interestingly, participants who acquired their rabbit as a stray, on average, had the highest overall knowledge scores. This finding may suggest an area for further research as it is unclear specifically how strays are acquired and whether this source for acquisition is similar to rescuing a rabbit.

In addition, in the present study, acquisition of a companion rabbit from a shelter or rescue was found to have the highest odds of a participant currently owning a spayed or neutered rabbit compared to participants who acquired a rabbit from another source. It is possible shelters and rescues are more likely to adopt out already spayed and neutered rabbits, since they are generally strong advocates of spay and neuter programs for the purpose of population control (CFHS, 2014). Supporting this, a study by Cook and McCobb (2012) explored the number and characteristics of rabbits entering four Massachusetts shelters and found that 81.5% (n=4,406) of all rabbits were unaltered at the time of intake; however, all rabbits adopted out by theses shelters were already spayed and neutered by the time of adoption. In addition, promotion of spay and neuter by shelter and rescue organizations has become commonplace through programs such as low cost spay and neuter programs (Fournier and Geller 2004; Frank 2004; Miller and
Zawisowski 2012), financial incentives for spaying and neutering (Frank 2004), public education campaigns (Frank 2004; Miller and Zawistowski 2012) and sterilization legislation (Fournier and Geller 2004). Therefore, participants adopting rabbits from shelters or rescues may have acquired their rabbit already altered or received more education or information about spay and neuter than provided by other sources. Given the issue of companion-animal overpopulation leading to euthanasia of healthy animals (Olson et al. 1991; DiGiaccomo, Arluke and Patronek 1998), acquisition sources have an important role to play in educating companion-rabbit owners about the care and welfare of companion rabbits, including the importance of spay and neuter. The development of widely accessible educational materials on husbandry and care of companion rabbits may be valuable in positioning all acquisition sources with the information needed to educate prospective companion-rabbit owners.

Regular veterinary check-ups were found to be associated with both owner knowledge and the spay or neuter status of companion rabbits. Participants who took their rabbit for regular veterinary check-ups, on average, had greater knowledge scores and greater odds of answering a knowledge questions correctly when compared to participants who did not attend regular veterinary check-ups. Veterinarians have been identified to play a key role in providing accurate knowledge and resources for new and existing dog and cat owners (How you can 2007; Sharkin and Ruff 2011), it is not unreasonable to think veterinarians should have a similar role in educating companion-rabbit owners. Beyond promoting the health of companion animals, veterinarians can influence the development and maintenance of human-animal relationships and ensure prospective owners select the right pet for their lifestyle (Scarlett et al. 2002). Through veterinary care, owners can be informed about basic husbandry, the importance of training classes and prevention and treatment of behavioural problems to prevent misconceptions about pets (Scarlett et al. 2002). Specific to companion-rabbit ownership, veterinarians have also been
suggested to be an excellent source of education for owners on the needs of rabbits (Edgar and Mullan 2011). In addition to providing routine preventive rabbit healthcare, promoting regular veterinary care for rabbits provides an opportunity for veterinarians to educate clients on the care and welfare of companion rabbits.

Further supporting the role veterinarians may have, the odds of owning a spayed or neutered rabbit were greater for participants who took their rabbit for regular veterinary check-ups compared to participants who did not. Given the benefits of spaying and neutering companion rabbits, including reduced undesirable behaviours (Crowell-Davis 2007; Sayers 2010) and improved health (Sayers 2010), veterinarians can play an important role in educating current rabbit owners on the healthcare of their companion rabbits including spay and neuter. Developing resources to assist veterinarians with distributing education about rabbit husbandry and healthcare would position veterinarians to play an active role in providing rabbit owners with accessible, accurate and valuable information to improve their knowledge of rabbit ownership and ultimately improve the welfare of companion rabbits.

Participant age in the current study was found to be associated with knowledge scores; as participants increased in age, a small increase in the odds of correctly answering a knowledge question occurred. Limited research has examined the association between age and animal care knowledge. One study, by Ramón, Slater and Ward (2010), found cat and dog owners’ age to be significantly associated with companion-animal knowledge. Except for the age category 45 to 54, owners’ companion-animal knowledge was found to be significantly higher for all age categories when compared to companion-animal knowledge of participants over the age of 65. Due to the small effect found between age and companion-rabbit knowledge in the current study the role of age in companion-animal owners’ knowledge requires further exploration. In addition, the number of years experience participants had with owning rabbits was found to influence the
relationship between age and owner knowledge which may be a more appropriate indicator of owner knowledge. Further research may explore the relationship between age, years experience and companion-rabbit owners’ knowledge.

Owner knowledge and the spay or neuter status in the current study appeared to be influenced by where participants lived; participants that identified themselves to reside in the United States or Canada on average answered more knowledge questions correctly compared to participants residing outside of these two countries. In addition, individuals residing in the United States had significantly greater odds of owning a spayed or neutered rabbit compared to individuals residing outside of the United States and Canada. Although there is a lack of research specific to rabbit ownership, cultural differences in peoples’ thoughts toward companion animals and beliefs about companion-animal ownership practices have been explored (Risley-Curtiss Holley and Wolf 2006). Risley-Curtiss Holley and Wolf (2006) found that individuals who identified themselves as Hispanic or Spanish in origin were less likely to have their cat or dog spayed or neutered. The study indicated there were many instances where trends revealed cultural differences in thoughts toward companion-animal ownership. Future research may address these potential cultural and geographical differences in their association to rabbit owner knowledge and spay or neuter status.

The number of rabbits owned by each participant was found to be associated with whether their most recently acquired rabbit was spayed or neutered. Interestingly, owning a single rabbit was associated with greater odds of having a spayed or neutered rabbit compared to individuals who owned two or more rabbits. This result was contrary to what was expected; intuitively one may expect individuals with two or more rabbits would have their rabbits spayed and neutered in order to avoid unwanted litters. It may be that owners with more than one rabbit (55.5%) had intentions of breeding their rabbits or were less likely to acquire their rabbit from a source where
rabbits are routinely spayed and neutered. Spaying and neutering of companion rabbits has benefits beyond prevention of unwanted litters, including improved heath (Sayers 2010) and reduced undesirable behaviours (Crowell-Davis 2007; Sayers 2010). The fact that a relatively high percentage of single rabbit owners had had their pets spayed or neutered could reflect the owners’ knowledge of the health and behaviour benefits of the procedure. This influence of the number of rabbits owned on whether participants’ current rabbit was spayed or neutered suggests an area for further research.

A previously developed knowledge index and a previously developed attachment scale were adapted to explore factors associated with rabbit owners’ knowledge and the spay or neuter status of companion rabbits. Both adapted tools demonstrated acceptable reliability with the current study population. In support of the construct validity of the knowledge index all three a priori hypotheses were found to be supported. Similarly, support for the adaptation of the LAPS to measure human attachment to companion rabbits was found with both a priori hypotheses confirmed. These results support the construct validity of the knowledge index and the modified LAPS, and their use in measuring owner knowledge and owner attachment to companion rabbits.

In the current study, some limitations exist in relation to interpretations of results and the study’s sample population. Modeling knowledge score as an outcome required a transformation from a linear regression model to an approximation of logistic regression that changed the outcome from a continuous knowledge score to a binary score with odds of getting any one question correct. This outcome assumes participants are equally likely to answer any one knowledge question correctly and each question is assumed to be of equal difficulty. Future studies should address this challenge and attempt to explore ways of assessing rabbit care knowledge as a continuous summed score. Whether individuals owned a spayed and neutered rabbit or an intact rabbit was an outcome with a limitation; it was unknown whether participants
chose to spay or neuter their rabbit after acquisition, or if they acquired their rabbit already spayed or neutered. This constraint limits the ability to comment on participants’ decision to spay or neuter their rabbit. Although participants were asked what factors influenced whether their rabbit was spayed or neutered, the number of participants who chose to spay or neuter their rabbits versus the number of participants who acquired their rabbit already spayed or neutered was still unclear. Future studies should aim to explore this difference and factors associated with the decision to spay or neuter a rabbit to further inform educational initiatives in this area.

This study had other limitations, namely the method of recruitment, which affected generalizability of findings and sampling bias. Snowball sampling limits the generalizability of findings because this method of recruitment is non-random (Faugier and Sargeant 1997). Snowball sampling encourages participants to share the study with whomever they choose, which may have introduced bias from respondents choosing where and who to share the study information with (Faugier and Sargeant 1997). In the current study, participants who heard about the survey from rabbit education groups, rabbit welfare groups and rescue or shelter groups, on average, had the highest knowledge scores compared to participants who heard about the survey from other sources. These groups are likely to provide information and website links on their group pages allowing followers to gain potentially valuable information on the care and husbandry of companion rabbits. Learning about the survey from these sources may have influenced the study population because these participants may be more likely to be rabbit owner enthusiasts leading to sharing the survey with other ‘keen’ rabbit owners. Despite this limitation, the current study recruited a large sample of current rabbit owners (n = 2,980) contributing to the understanding of rabbit ownership among this large population. Finally, the vast majority of participants were female (90.8%), limiting the ability to comment on gender differences and potentially underrepresenting gender differences in the outcomes being studied. Future studies
examining companion rabbits should consider recruitment strategies that may capture a broader range of rabbit owners to improve the generalizability of findings.

Several factors were found to influence both owner knowledge and whether owners had a spayed or neutered rabbit. In particular, acquisition source and regular veterinary check-ups had an impact on both outcomes and are important targets for educating prospective rabbit owners as well as enhancing or correcting the knowledge of existing owners. Acquisition sources can prepare prospective owners by informing them on the basics of care prior to individuals bringing home a new rabbit, and as animal-health experts, veterinarians can support this information and provide additional details on health and welfare if owners are encouraged to take their rabbit for regular veterinary check-ups. In addition, reliable, readily available resources for distributing information to individuals who take in a stray or acquire a rabbit from other sources, such as a friend, family member, or a farm, are likely to broaden companion-animal rabbit owners’ knowledge of rabbit care. Providing a multi-faceted approach to educating prospective and current companion-rabbit owners will help enhance companion-rabbit owners’ knowledge of husbandry and care in order to ultimately provide a starting point for positive, long-lasting, human-rabbit relationships.
References


Okola, A., McCobb, E., & Dowling-Guyer, S. (publication in progress). *Knowledge of rabbit husbandry at rabbit acquisition sites: A survey of pet stores, animal shelters, and rabbit rescues in Massachusetts and Rhode Island*. Unpublished manuscript, Center for Animals and Public Policy, Cummings School of Veterinary Medicine, Massachusetts, United States of America.


Table 3.1 Descriptive statistics of categorical demographic information of 2,890 participating companion-rabbit owners

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>245</td>
<td>8.5</td>
</tr>
<tr>
<td>Female</td>
<td>2604</td>
<td>90.8</td>
</tr>
<tr>
<td>Other</td>
<td>18</td>
<td>0.6</td>
</tr>
<tr>
<td><strong>Country</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td>611</td>
<td>21.4</td>
</tr>
<tr>
<td>United States of America (USA)</td>
<td>1805</td>
<td>63.2</td>
</tr>
<tr>
<td>Other (Outside of Canada and the USA)</td>
<td>440</td>
<td>15.4</td>
</tr>
<tr>
<td><strong>Residence type</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apartment/condo</td>
<td>906</td>
<td>31.6</td>
</tr>
<tr>
<td>Attached house/town house</td>
<td>413</td>
<td>14.4</td>
</tr>
<tr>
<td>Detached house</td>
<td>1437</td>
<td>50.1</td>
</tr>
<tr>
<td>Other</td>
<td>113</td>
<td>3.9</td>
</tr>
<tr>
<td><strong>Education level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than high school, no diploma</td>
<td>33</td>
<td>1.2</td>
</tr>
<tr>
<td>Graduated high school</td>
<td>230</td>
<td>8.1</td>
</tr>
<tr>
<td>Some college/university, no diploma</td>
<td>595</td>
<td>20.8</td>
</tr>
<tr>
<td>Trade/technical/vocational training</td>
<td>183</td>
<td>6.4</td>
</tr>
<tr>
<td>Graduated college/university (e.g., Bachelor’s degree)</td>
<td>1157</td>
<td>40.5</td>
</tr>
<tr>
<td>Attended graduate/professional school (e.g., Master, MD)</td>
<td>656</td>
<td>23.0</td>
</tr>
<tr>
<td><strong>Annual household income</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under $19,000</td>
<td>332</td>
<td>12.4</td>
</tr>
<tr>
<td>$20,000 - $39,000</td>
<td>557</td>
<td>20.7</td>
</tr>
<tr>
<td>$40,000 - $59,000</td>
<td>537</td>
<td>20.0</td>
</tr>
<tr>
<td>$60,000 - $79,000</td>
<td>414</td>
<td>15.4</td>
</tr>
<tr>
<td>$80,000 - $99,000</td>
<td>343</td>
<td>12.8</td>
</tr>
<tr>
<td>$100,000 and over</td>
<td>505</td>
<td>18.8</td>
</tr>
<tr>
<td><strong>Where the survey was found online</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pet store or pet food store</td>
<td>61</td>
<td>2.1</td>
</tr>
<tr>
<td>Rescue or shelter group</td>
<td>639</td>
<td>22.3</td>
</tr>
<tr>
<td>Breeder</td>
<td>19</td>
<td>0.7</td>
</tr>
<tr>
<td>Online classifieds</td>
<td>49</td>
<td>1.7</td>
</tr>
<tr>
<td>Group forum or blog</td>
<td>409</td>
<td>14.3</td>
</tr>
<tr>
<td>Rabbit education group</td>
<td>378</td>
<td>13.2</td>
</tr>
<tr>
<td>Rabbit welfare group</td>
<td>347</td>
<td>12.1</td>
</tr>
<tr>
<td>Animal-related group</td>
<td>144</td>
<td>5.0</td>
</tr>
<tr>
<td>University</td>
<td>34</td>
<td>1.2</td>
</tr>
<tr>
<td>A friend</td>
<td>302</td>
<td>10.6</td>
</tr>
<tr>
<td>Social media in general (Facebook, Twitter etc.)</td>
<td>461</td>
<td>16.1</td>
</tr>
<tr>
<td>Other</td>
<td>18</td>
<td>0.6</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^a\) Includes participants who found the survey through a pet store or pet food store, rescue or shelter group, breeder, online classifieds, group forum or blog, rabbit education group, rabbit welfare group, animal-related group, university, friend, social media in general (Facebook, Twitter etc.), and other.

\(^b\) Age distribution is not provided in the table.
Note. Descriptive statistics of categorical demographic information of 2,890 participants completing the survey online from February 17th to March 10th 2014 from various locations within Canada, the United States and outside of both countries (numerical variation due to missing values). aThe original categories for where the survey was found online were: pet store, rescue group, breeder, online classifieds, group forums, rabbit education group, rabbit welfare group, animal group, university, a friend and other. bThe median age of participants was 32.0 years (mean 35.1 ± 11.7; range 18 – 79).
Table 3.2a Questions surrounding first time acquisition of a companion rabbit of 2,890 participating companion-rabbit owners

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Before getting your first rabbit, which resources did you use for rabbit care information?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breeders</td>
<td>322</td>
<td>11.1</td>
</tr>
<tr>
<td>Veterinarians</td>
<td>508</td>
<td>17.6</td>
</tr>
<tr>
<td>Shelter/rescue staff</td>
<td>806</td>
<td>27.9</td>
</tr>
<tr>
<td>Pet store staff</td>
<td>614</td>
<td>21.2</td>
</tr>
<tr>
<td>Books</td>
<td>1380</td>
<td>47.8</td>
</tr>
<tr>
<td>Internet</td>
<td>1980</td>
<td>68.5</td>
</tr>
<tr>
<td>Other rabbit owners</td>
<td>1193</td>
<td>41.3</td>
</tr>
<tr>
<td>Other</td>
<td>225</td>
<td>7.8</td>
</tr>
<tr>
<td><strong>Thinking back to when you got your first rabbit, what was the primary reason you obtained a pet rabbit?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For companionship</td>
<td>1593</td>
<td>55.7</td>
</tr>
<tr>
<td>Got as a gift</td>
<td>212</td>
<td>7.4</td>
</tr>
<tr>
<td>Found as a stray</td>
<td>160</td>
<td>5.6</td>
</tr>
<tr>
<td>For physical appearance (i.e., it was cute and fluffy)</td>
<td>184</td>
<td>6.4</td>
</tr>
<tr>
<td>Wanted to give a rescue/shelter rabbit a home</td>
<td>483</td>
<td>16.9</td>
</tr>
<tr>
<td>For a family member</td>
<td>144</td>
<td>5.0</td>
</tr>
<tr>
<td>Pressure from others (i.e., kids, spouse)</td>
<td>83</td>
<td>2.9</td>
</tr>
<tr>
<td><strong>Where did you get your first rabbit from?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pet store</td>
<td>867</td>
<td>30.2</td>
</tr>
<tr>
<td>Breeder</td>
<td>377</td>
<td>13.1</td>
</tr>
<tr>
<td>Gift</td>
<td>63</td>
<td>2.2</td>
</tr>
<tr>
<td>Stray</td>
<td>128</td>
<td>4.5</td>
</tr>
<tr>
<td>Farm</td>
<td>86</td>
<td>3.0</td>
</tr>
<tr>
<td>Online advertisement</td>
<td>84</td>
<td>2.9</td>
</tr>
<tr>
<td>From a friend/family</td>
<td>265</td>
<td>9.2</td>
</tr>
<tr>
<td>Rescue or shelter</td>
<td>737</td>
<td>25.7</td>
</tr>
<tr>
<td>Other</td>
<td>261</td>
<td>9.1</td>
</tr>
</tbody>
</table>

*Note.* Companion-rabbit first time ownership parameters and current ownership parameters was captured from 2,890 participants completing the survey online from February 17th to March 10th 2014 from various locations within Canada, the United States and outside of both countries (numerical variation due to missing values).
Table 3.2b Questions surrounding acquisition and characteristics of 2,890 participants’ current companion rabbit

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Now that you have owned a rabbit(s), which resources do you use for rabbit care information?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breeders</td>
<td>237</td>
<td>8.2</td>
</tr>
<tr>
<td>Veterinarians</td>
<td>2159</td>
<td>74.7</td>
</tr>
<tr>
<td>Shelter/rescue staff</td>
<td>1428</td>
<td>49.4</td>
</tr>
<tr>
<td>Pet store staff</td>
<td>212</td>
<td>7.3</td>
</tr>
<tr>
<td>Books</td>
<td>1449</td>
<td>50.1</td>
</tr>
<tr>
<td>Internet</td>
<td>2649</td>
<td>92.0</td>
</tr>
<tr>
<td>Other rabbit owners</td>
<td>2111</td>
<td>73.0</td>
</tr>
<tr>
<td>Other</td>
<td>287</td>
<td>9.9</td>
</tr>
<tr>
<td><strong>What was the primary reason you obtained your most recently acquired pet rabbit?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For companionship</td>
<td>913</td>
<td>32.1</td>
</tr>
<tr>
<td>Got as a gift</td>
<td>81</td>
<td>2.8</td>
</tr>
<tr>
<td>Found as a stray</td>
<td>124</td>
<td>4.4</td>
</tr>
<tr>
<td>For physical appearance (ex. It was cute and fluffy)</td>
<td>69</td>
<td>2.4</td>
</tr>
<tr>
<td>Wanted to give a rescue/shelter rabbit a home</td>
<td>827</td>
<td>29.1</td>
</tr>
<tr>
<td>For a family member</td>
<td>83</td>
<td>2.9</td>
</tr>
<tr>
<td>Pressure from others (ex. Kids, spouse)</td>
<td>33</td>
<td>1.2</td>
</tr>
<tr>
<td>To bond to an existing rabbit</td>
<td>713</td>
<td>25.1</td>
</tr>
<tr>
<td><strong>Where did you get your current rabbit from?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pet store</td>
<td>400</td>
<td>14.0</td>
</tr>
<tr>
<td>Breeder</td>
<td>306</td>
<td>10.7</td>
</tr>
<tr>
<td>Gift</td>
<td>45</td>
<td>1.6</td>
</tr>
<tr>
<td>Stray</td>
<td>124</td>
<td>4.3</td>
</tr>
<tr>
<td>Farm</td>
<td>58</td>
<td>2.0</td>
</tr>
<tr>
<td>Online advertisement</td>
<td>103</td>
<td>3.6</td>
</tr>
<tr>
<td>From a friend/family</td>
<td>216</td>
<td>7.6</td>
</tr>
<tr>
<td>Rescue or shelter</td>
<td>1403</td>
<td>49.1</td>
</tr>
<tr>
<td>Other</td>
<td>200</td>
<td>7.0</td>
</tr>
<tr>
<td><strong>Of the resources listed below, which do you think provides the best information on rabbit care for new rabbit owners?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breeders</td>
<td>64</td>
<td>2.2</td>
</tr>
<tr>
<td>Veterinarians</td>
<td>577</td>
<td>20.1</td>
</tr>
<tr>
<td>Shelter/rescue staff</td>
<td>691</td>
<td>24.0</td>
</tr>
<tr>
<td>Pet store staff</td>
<td>5</td>
<td>0.2</td>
</tr>
<tr>
<td>Books</td>
<td>114</td>
<td>4.0</td>
</tr>
<tr>
<td>Internet</td>
<td>587</td>
<td>20.4</td>
</tr>
<tr>
<td>Other rabbit owners</td>
<td>642</td>
<td>22.3</td>
</tr>
<tr>
<td>Other</td>
<td>195</td>
<td>6.3</td>
</tr>
<tr>
<td><strong>Do you take your rabbit for regular veterinary check-up?</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

103
<table>
<thead>
<tr>
<th><strong>ups?</strong></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>1655</td>
<td>64.4</td>
</tr>
<tr>
<td>No</td>
<td>913</td>
<td>35.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Is your rabbit spayed or neutered?</strong></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>1959</td>
<td>68.2</td>
</tr>
<tr>
<td>No</td>
<td>889</td>
<td>31.0</td>
</tr>
<tr>
<td>Unknown</td>
<td>23</td>
<td>0.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>If you had your rabbit spayed or neutered, what factors influenced your decision?</strong></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Didn’t want babies</td>
<td>1099</td>
<td>38.0</td>
</tr>
<tr>
<td>Behavioural problems</td>
<td>1369</td>
<td>47.4</td>
</tr>
<tr>
<td>To prevent uterine cancer</td>
<td>1175</td>
<td>40.7</td>
</tr>
<tr>
<td>Recommended by pet shop</td>
<td>26</td>
<td>0.9</td>
</tr>
<tr>
<td>Recommended by vet</td>
<td>856</td>
<td>29.6</td>
</tr>
<tr>
<td>Recommended by breeder</td>
<td>65</td>
<td>2.2</td>
</tr>
<tr>
<td>Other</td>
<td>766</td>
<td>26.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Does your rabbit have a rabbit companion?</strong></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>1460</td>
<td>50.5</td>
</tr>
<tr>
<td>No</td>
<td>1404</td>
<td>48.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Current number of rabbits:</strong></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>1282</td>
<td>44.5</td>
</tr>
<tr>
<td>Two or more</td>
<td>1602</td>
<td>55.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Years experience</strong> (^a)</th>
<th></th>
<th></th>
</tr>
</thead>
</table>

*Note.* Companion-rabbit first time ownership parameters and current ownership parameters was captured from 2,890 participants completing the survey online from February 17th to March 10th 2014 from various locations within Canada, the United States and outside of both countries (numerical variation due to missing values). \(^a\)The median years experience participants had owning rabbits was 5.5 years (mean 7.7 ± 7.1; range 3 weeks – 49 years).
Table 3.3 Rabbit owner knowledge regarding companion-rabbit housing, care, health and behaviour of 2,887 participating companion-rabbit owners

<table>
<thead>
<tr>
<th>True false knowledge items</th>
<th>Correct</th>
<th>Incorrect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angora rabbits make great pets for first time rabbit owners.</td>
<td>2635 (91.3)</td>
<td>252 (8.7)</td>
</tr>
<tr>
<td>Rabbits over 1 year of age should be fed a high calcium diet.</td>
<td>2611 (90.4)</td>
<td>276 (9.6)</td>
</tr>
<tr>
<td>Rabbits hide discomfort because they are prey species.</td>
<td>2609 (90.4)</td>
<td>278 (9.6)</td>
</tr>
<tr>
<td>Store bought packaged treats are a healthy treat for rabbits.</td>
<td>2729 (94.5)</td>
<td>158 (5.5)</td>
</tr>
<tr>
<td>Spaying female rabbits is a difficult procedure and is often not recommended.</td>
<td>2670 (92.5)</td>
<td>217 (7.5)</td>
</tr>
<tr>
<td>Rabbits can be in cages all the time if the area is large enough to hop around.</td>
<td>2460 (85.2)</td>
<td>427 (14.8)*</td>
</tr>
<tr>
<td>Rabbits over 1 year of age should be fed a high fibre, low carbohydrate diet.</td>
<td>2640 (91.4)</td>
<td>247 (8.6)</td>
</tr>
<tr>
<td>Rabbits can regulate body temperature even at extreme temperatures.</td>
<td>2633 (91.2)</td>
<td>254 (8.8)</td>
</tr>
<tr>
<td>Intact male rabbits mark objects by “spraying” them.</td>
<td>2613 (90.5)</td>
<td>274 (9.5)</td>
</tr>
<tr>
<td>Rabbits do not need to visit a veterinarian.</td>
<td>2820 (97.7)</td>
<td>67 (2.3)</td>
</tr>
<tr>
<td>It is east to tell when rabbits are in pain.</td>
<td>2691 (93.2)</td>
<td>196 (6.8)</td>
</tr>
<tr>
<td>Rabbits have low bone density, making them susceptible to back fractures and broken bones.</td>
<td>2637 (91.3)</td>
<td>250 (8.7)</td>
</tr>
<tr>
<td>It is normal for rabbits to have runny eyes.</td>
<td>2808 (97.3)</td>
<td>79 (2.7)</td>
</tr>
<tr>
<td>Generally, rabbits are solitary animals and like to be by themselves.</td>
<td>2740 (94.9)</td>
<td>147 (5.1)</td>
</tr>
<tr>
<td>Rabbits will resort to destructive behaviour if they are bored.</td>
<td>2806 (97.2)</td>
<td>81 (2.8)</td>
</tr>
<tr>
<td>It is alright to let a child be the primary caretaker of a rabbit.</td>
<td>2806 (97.2)</td>
<td>81 (2.8)</td>
</tr>
<tr>
<td>Rabbits have a scent gland under their chin they use to mark possessions.</td>
<td>2766 (95.8)</td>
<td>121 (4.2)</td>
</tr>
<tr>
<td>A rabbit’s teeth naturally wear down, so they do not need to have them checked.</td>
<td>2766 (95.8)</td>
<td>121 (4.2)</td>
</tr>
<tr>
<td>It is alright to pick up a rabbit by their ears if you support their back end.</td>
<td>2857 (99.0)</td>
<td>30 (1.0)</td>
</tr>
<tr>
<td>Carrots are a good source of nutrition for rabbits.(^a)</td>
<td>2478 (85.8)</td>
<td>409 (14.2)*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Multiple-choice knowledge items</th>
<th>Correct</th>
<th>Incorrect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Which bedding type is not recommended for lining rabbit cages?</td>
<td>2312 (80.1)</td>
<td>575 (19.9)*</td>
</tr>
<tr>
<td>Spaying female rabbits...</td>
<td>2701 (93.6)</td>
<td>186 (6.4)</td>
</tr>
<tr>
<td>Which of the following health concerns can be helped through a change in diet?</td>
<td>2592 (89.9)</td>
<td>295 (10.2)</td>
</tr>
<tr>
<td>Rabbits should get exercise outside of the cage:</td>
<td>2822 (97.7)</td>
<td>65 (2.3)</td>
</tr>
<tr>
<td>Pellets should be rationed according to a rabbit’s:</td>
<td>2689 (93.1)</td>
<td>198 (6.9)</td>
</tr>
<tr>
<td>Rabbits are most active:</td>
<td>2442 (84.6)</td>
<td>445 (15.4)*</td>
</tr>
<tr>
<td>Statement</td>
<td>Correct Responses</td>
<td>Incorrect Responses</td>
</tr>
<tr>
<td>-----------</td>
<td>------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>When rabbits thump their back legs, this means that they feel:</td>
<td>2813 (97.4)</td>
<td>74 (2.6)</td>
</tr>
<tr>
<td>Rabbits should be given an unlimited amount of:</td>
<td>2809 (97.3)</td>
<td>78 (2.7)</td>
</tr>
<tr>
<td>An appropriate toy for rabbits is:</td>
<td>915 (31.7)</td>
<td>1972 (68.3)*</td>
</tr>
<tr>
<td>Ideally, rabbits should be held:</td>
<td>2826 (97.9)</td>
<td>61 (2.1)</td>
</tr>
<tr>
<td>The majority of an adult rabbit's diet should be:</td>
<td>2672 (92.6)</td>
<td>215 (7.4)</td>
</tr>
</tbody>
</table>

Note. The knowledge instrument was developed and verified by Okola, McCobb and Dowling-Guyer (publication in progress) containing 25 true or false and 19 multiple-choice questions. The instrument was modified to 20 true or false and 11 multiple choice; one item was added and fourteen items were removed to improve reliability (Chronbach's Alpha = 0.746). The instrument assessed knowledge of husbandry, nutrition, health and behaviour. *An additional true false question was added surrounding the misconception of carrots as a good source of nutrition for rabbits (MVMA, 2014; RSCPA, 2014). All questions in the knowledge instrument were coded in a binary manner where 0 was incorrect and 1 was correct for scoring purposes. A total of 2,890 participants completed the online survey from February 17th to March 10th 2014 from various locations within Canada, the United States and outside of both countries. Three participants were removed from analysis of knowledge items and scoring due to skipping entire true false and or multiple-choice sections; their data was retained for descriptive statistics. *The most poorly answered items. The median companion-rabbit knowledge score was 29.0 out of 31.0 (mean 28.2 ± 2.8; range 7.0 – 31.0). Cronbach’s alpha for this scale was 0.75 indicating acceptable reliability.
### Table 3.4 Summary statistics for 23 items from the Lexington Attachment to Pets Scale\(^a\) of 2,890 participating companion-rabbit owners

<table>
<thead>
<tr>
<th>Item</th>
<th>Min. Value</th>
<th>Item Mean</th>
<th>S.D.</th>
<th>Item Median</th>
<th>Item Mode</th>
<th>Max. Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>My rabbit means more to me than any of my friends.</td>
<td>0</td>
<td>1.960</td>
<td>0.890</td>
<td>2.000</td>
<td>2.00</td>
<td>3</td>
</tr>
<tr>
<td>Quite often I confide in my rabbit.</td>
<td>0</td>
<td>1.834</td>
<td>1.042</td>
<td>2.000</td>
<td>2.00</td>
<td>3</td>
</tr>
<tr>
<td>I believe that rabbits should have the same rights and privileges as family members.</td>
<td>0</td>
<td>2.092</td>
<td>0.942</td>
<td>2.000</td>
<td>3.00</td>
<td>3</td>
</tr>
<tr>
<td>I believe my rabbit is my best friend.</td>
<td>0</td>
<td>1.822</td>
<td>0.976</td>
<td>2.000</td>
<td>3.00</td>
<td>3</td>
</tr>
<tr>
<td>Quite often, my feelings toward people are affected by the way they react to my rabbit.</td>
<td>0</td>
<td>2.065</td>
<td>0.931</td>
<td>2.000</td>
<td>2.00</td>
<td>3</td>
</tr>
<tr>
<td>I love my rabbit because he/she is more loyal to me than most of the people in my life.</td>
<td>0</td>
<td>1.581</td>
<td>1.034</td>
<td>2.000</td>
<td>2.00</td>
<td>3</td>
</tr>
<tr>
<td>I enjoy showing other people pictures of my rabbit.</td>
<td>0</td>
<td>2.680</td>
<td>0.587</td>
<td>3.000</td>
<td>3.00</td>
<td>3</td>
</tr>
<tr>
<td>I think my rabbit is just a rabbit.(^b)</td>
<td>0</td>
<td>2.505</td>
<td>0.824</td>
<td>3.000</td>
<td>3.00</td>
<td>3</td>
</tr>
<tr>
<td>I love my rabbit because it never judges me.</td>
<td>0</td>
<td>1.975</td>
<td>0.939</td>
<td>2.000</td>
<td>2.00</td>
<td>3</td>
</tr>
<tr>
<td>My rabbit knows when I’m feeling bad.</td>
<td>0</td>
<td>1.934</td>
<td>0.928</td>
<td>2.000</td>
<td>2.00</td>
<td>3</td>
</tr>
<tr>
<td>I often talk to other people about my rabbit.</td>
<td>0</td>
<td>2.560</td>
<td>0.642</td>
<td>3.000</td>
<td>3.00</td>
<td>3</td>
</tr>
<tr>
<td>My rabbit understands me.</td>
<td>0</td>
<td>1.674</td>
<td>0.923</td>
<td>2.000</td>
<td>2.00</td>
<td>3</td>
</tr>
<tr>
<td>I believe that loving my rabbit helps me stay healthy.</td>
<td>0</td>
<td>2.530</td>
<td>0.660</td>
<td>3.000</td>
<td>3.00</td>
<td>3</td>
</tr>
<tr>
<td>Rabbits deserve as much respect as humans do.</td>
<td>0</td>
<td>2.590</td>
<td>0.685</td>
<td>3.000</td>
<td>3.00</td>
<td>3</td>
</tr>
<tr>
<td>My rabbit and I have a very close relationship.</td>
<td>0</td>
<td>2.417</td>
<td>0.712</td>
<td>3.000</td>
<td>3.00</td>
<td>3</td>
</tr>
<tr>
<td>I would do almost anything to take care of my rabbit.</td>
<td>0</td>
<td>2.691</td>
<td>0.573</td>
<td>3.000</td>
<td>3.00</td>
<td>3</td>
</tr>
<tr>
<td>I play with my rabbit quite often.</td>
<td>0</td>
<td>2.565</td>
<td>0.634</td>
<td>3.000</td>
<td>3.00</td>
<td>3</td>
</tr>
<tr>
<td>I consider my rabbit to be a great companion.</td>
<td>0</td>
<td>2.724</td>
<td>0.541</td>
<td>3.000</td>
<td>3.00</td>
<td>3</td>
</tr>
<tr>
<td>My rabbit makes me feel happy.</td>
<td>0</td>
<td>2.891</td>
<td>0.331</td>
<td>3.000</td>
<td>3.00</td>
<td>3</td>
</tr>
<tr>
<td>I feel that my rabbit is a part of my family.</td>
<td>0</td>
<td>2.889</td>
<td>0.368</td>
<td>3.000</td>
<td>3.00</td>
<td>3</td>
</tr>
<tr>
<td>I am not very attached to my rabbit.(^c)</td>
<td>0</td>
<td>2.831</td>
<td>0.569</td>
<td>3.000</td>
<td>3.00</td>
<td>3</td>
</tr>
<tr>
<td>Owning a rabbit adds to my happiness.</td>
<td>0</td>
<td>2.874</td>
<td>0.364</td>
<td>3.000</td>
<td>3.00</td>
<td>3</td>
</tr>
<tr>
<td>I consider my rabbit to be a friend.</td>
<td>0</td>
<td>2.639</td>
<td>0.648</td>
<td>3.000</td>
<td>3.00</td>
<td>3</td>
</tr>
</tbody>
</table>

*Note.* \(^a\)All 23 attachment items were modified from the Lexington Attachment to Pets Scale (Johnson, Garrity and...
every item that used the word pet(s) was changed to rabbit(s). Items were coded in a continuous manner where 0 was “strongly disagree”, 1 was “somewhat disagree”, 2 was “somewhat agree”, and 3 was “strongly agree”. The response “don’t know or refuse” was also coded as system missing. The coding scheme was reversed for negatively worded items. A total of 2,890 participants completed the online survey from February 17th to March 10th 2014 from various locations within Canada, the United States and outside of both countries (numerical variation due to missing values). Due to listwise deletion, 863 participants did not have attachment scores and were considered incomplete with at least one item on the scale missing; data from these participants was retained for analysis of attachment items in the above table and descriptive statistics. The median companion rabbit attachment score was 57.0 out of 69.0 (mean 54.9 ± 10.5; range 12.0 – 69.0). Cronbach’s alpha for this scale was 0.92 indicating excellent reliability.
Table 3.5 Approximation of logistic regression model with a bias correction term for factors associated with knowledge surrounding companion-rabbit care of 1,740 participating companion-rabbit owners

<table>
<thead>
<tr>
<th>Variable</th>
<th>Odds Ratio</th>
<th>95% C.I.</th>
<th>Adj. 95% C.I.</th>
<th>p-value</th>
<th>Adj. p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attachment score</td>
<td>1.008</td>
<td>1.003, 1.012</td>
<td></td>
<td>0.0004</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>1.007</td>
<td>1.004, 1.011</td>
<td>&lt; 0.0001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USA / Other</td>
<td>1.670</td>
<td>1.484, 1.880</td>
<td>&lt; 0.0001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canada / Other</td>
<td>1.518</td>
<td>1.315, 1.752</td>
<td>&lt; 0.0001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Where did you get your current rabbit from?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breeder / Farm</td>
<td>1.678</td>
<td>1.238, 2.273</td>
<td>1.037, 2.714</td>
<td>0.0009</td>
<td>0.0242</td>
</tr>
<tr>
<td>From a friend/family / Farm</td>
<td>1.703</td>
<td>1.245, 2.331</td>
<td>1.037, 2.799</td>
<td>0.0009</td>
<td>0.0247</td>
</tr>
<tr>
<td>Rescue or shelter / Farm</td>
<td>2.097</td>
<td>1.584, 2.776</td>
<td>1.345, 3.270</td>
<td>&lt; 0.0001</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Other / Farm</td>
<td>2.111</td>
<td>1.540, 2.894</td>
<td>1.281, 3.480</td>
<td>&lt; 0.0001</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Online advertisement / Farm</td>
<td>1.781</td>
<td>1.243, 2.552</td>
<td>1.007, 3.149</td>
<td>0.0017</td>
<td>0.0445</td>
</tr>
<tr>
<td>Stray / Farm</td>
<td>2.304</td>
<td>1.647, 3.224</td>
<td>1.354, 3.923</td>
<td>&lt; 0.0001</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Rescue or shelter / Pet store</td>
<td>1.330</td>
<td>1.176, 1.504</td>
<td>1.094, 1.617</td>
<td>&lt; 0.0001</td>
<td>0.0002</td>
</tr>
<tr>
<td>Stray / Pet store</td>
<td>1.461</td>
<td>1.171, 1.824</td>
<td>1.028, 2.077</td>
<td>&lt; 0.0001</td>
<td>0.0231</td>
</tr>
<tr>
<td>Where did you hear about the survey?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rabbit education group / Social media in general</td>
<td>1.364</td>
<td>1.177, 1.580</td>
<td>1.067, 1.743</td>
<td>&lt; 0.0001</td>
<td>0.0022</td>
</tr>
<tr>
<td>Rabbit welfare group / Social media in general</td>
<td>1.308</td>
<td>1.128, 1.518</td>
<td>1.021, 1.676</td>
<td>0.0004</td>
<td>0.0203</td>
</tr>
<tr>
<td>Do you take your rabbit for regular vet check-ups?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes / No</td>
<td>1.275</td>
<td>1.170, 1.391</td>
<td>&lt; 0.0001</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Derived from online survey data from 1,740 people who currently own a pet rabbit within Canada, the United States and outside of both countries, from February 17th to March 10th 2014. The Tukey-Kramer method was applied to all models for categorical variables containing three or more groups. This method is very conservative and ensures statistically significant multiple comparison differences (p<0.05). Significant differences (p≤0.001) for categorical variables with less than four groups were not Tukey-Kramer adjusted.
Figure 3.1 Least squares means for knowledge scores based on participants' location of residence of 1,740 participating companion-rabbit owners

Note. Derived from online survey data from 1,740 people who currently own a pet rabbit within Canada, the United States and outside of both countries, from February 17th to March 10th 2014.
Figure 3.2 Least squares means for knowledge scores based on where participants acquired their current rabbit of 1,740 participating companion-rabbit owners.

Note. Derived from online survey data from 1,740 people who currently own a pet rabbit within Canada, the United States and outside of both countries, from February 17th to March 10th 2014.
Figure 3.3 Least squares means for knowledge scores based on where participants heard about the survey of 1,740 participating companion-rabbit owners

Note. Derived from online survey data from 1,740 people who currently own a pet rabbit within Canada, the United States and outside of both countries, from February 17th to March 10th 2014.
Figure 3.4 Least squares means for knowledge scores based on whether participants attended regular veterinary check-ups of 1,740 participating companion-rabbit owners

Note. Derived from online survey data from 1,740 people who currently own a pet rabbit within Canada, the United States and outside of both countries, from February 17th to March 10th 2014.
Table 3.6 Logistic regression model for factors associated with having a spayed or neutered companion rabbit of 2,464 participating companion-rabbit owners

<table>
<thead>
<tr>
<th>Variable</th>
<th>Odds Ratio</th>
<th>95% C.I.</th>
<th>Adj. 95% C.I.</th>
<th>p-value</th>
<th>Adj. p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge score</td>
<td>1.156</td>
<td>1.110, 1.204</td>
<td></td>
<td>&lt; 0.0001</td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td>1.656</td>
<td>1.274, 2.155</td>
<td></td>
<td>0.0006</td>
<td></td>
</tr>
<tr>
<td>Where did you get your current rabbit from?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Rescue or shelter / Breeder</td>
<td>3.861</td>
<td>2.770, 5.376</td>
<td>2.288, 6.536</td>
<td>&lt; 0.0001</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Rescue or shelter / From a friend/family</td>
<td>5.291</td>
<td>3.717, 7.576</td>
<td>3.021, 9.346</td>
<td>&lt; 0.0001</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Rescue or shelter / Farm</td>
<td>4.107</td>
<td>2.212, 7.626</td>
<td>1.542, 10.940</td>
<td>&lt; 0.0001</td>
<td>0.0003</td>
</tr>
<tr>
<td>Rescue or shelter / Gift</td>
<td>5.893</td>
<td>2.959, 11.735</td>
<td>1.980, 17.536</td>
<td>&lt; 0.0001</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Rescue or shelter / Other</td>
<td>4.421</td>
<td>3.060, 6.388</td>
<td>2.469, 7.918</td>
<td>&lt; 0.0001</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Rescue or shelter / Online advertisement</td>
<td>5.079</td>
<td>3.073, 8.395</td>
<td>2.293, 11.253</td>
<td>&lt; 0.0001</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Rescue or shelter / Pet store</td>
<td>3.861</td>
<td>2.860, 5.214</td>
<td>2.400, 6.213</td>
<td>&lt; 0.0001</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Rescue or shelter / Stray</td>
<td>2.837</td>
<td>1.769, 4.550</td>
<td>1.343, 5.993</td>
<td>&lt; 0.0001</td>
<td>0.0005</td>
</tr>
<tr>
<td>Do you take your rabbit for regular vet check-ups?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes / No</td>
<td>1.483</td>
<td>1.205, 1.822</td>
<td></td>
<td>0.0002</td>
<td></td>
</tr>
<tr>
<td>Current number of rabbits</td>
<td>1.657</td>
<td>1.337, 2.054</td>
<td></td>
<td>&lt; 0.0001</td>
<td></td>
</tr>
</tbody>
</table>

Note. Derived from online survey data from 2,464 people who currently own a pet rabbit within and outside of North America, from February 17th to March 10th 2014. The Tukey-Kramer method was applied to all models for categorical variables containing three or more groups. This method is very conservative and ensures statistically significant multiple comparison differences (p<0.05). Significant differences (p≤0.001) for categorical variables with less than four groups were not Tukey-Kramer adjusted.
CHAPTER FOUR

Conclusions
Companion-animal ownership is a common practice across the world (Podberscek 2006). In Canada 37% of households have at least one cat and 36% have at least one dog, resulting in estimates of 7.9 and 6.6 million cats and dogs, respectively (CAHI 2012). Although rabbits are not often included in companion-animal statistics and household demographics, the United States Pet Ownership and Demographics Sourcebook has estimated the companion-rabbit population in the United States to be 3.2 million (AVMA 2015). The number of rabbits in Canadian households is unknown. With the popularity of companion animals in households, research surrounding companion animal ownership and human-animal bonds has gained considerable attention (Hines 2003). This research however, rarely includes companion rabbits.

One study has been conducted to describe motivations for companion animal ownership. In the Netherlands, Edenburg, Hart and Bouw (1994) used semi-structured interviews and a quantitative survey to explore motivations for owning companion animals. Although their study did not differentiate particular species of companion animals, the authors found that reasons for keeping pets were mainly social with companionship being the principal social reason. Reasons for acquiring rabbits, specifically, have not been explored in the peer-reviewed literature. The relationship people have with their pets has been termed the human-animal bond (Toray 2004) and it involves an emotional attachment to a pet, feelings of affection and a responsibility for the well-being of the animal (Lagoni, Butler and Hetts 1994). Under the right circumstances, both humans (Friedmann et al. 1980; Siegel 1990; Becker 2002; Melson 2003; Whitmarsh 2005; Wisdom 2009) and animals (McGreevy et al. 2005) can receive benefits from this bond. Psychological (Connell and Largo 1984; Cain 1985; Garrity et al. 1989; Friedmann 1990; Cox 1993; Straede and Gates 1993; Melson and Schwartz 1994; Zasloff and Kidd 1994; Whitmarsh 2005; Brown and Rhodes 2006; Knight and Edwards 2008; Wisdom 2009) and physiological benefits (Friedmann et al. 1980; Friedmann et al. 1983; Friedmann 1990; Allen et al. 1991;
Schuelke et al. 1991; Baun et al. 1994; Friedmann and Thomas 1995; Siegel 2010; Utz 2014) of pet ownership have been well documented, particularly for dog ownership. To date, benefits of rabbit ownership have not been explored.

Although many relationships between humans and their companion animals are positive and fulfilling (Marston and Bennett 2003), other human-animal bonds may breakdown where the ultimate consequence can be relinquishment of the animals (Kass et al. 2001; Marston and Bennett 2003) with the possibility for euthanasia (Sharkin and Ruff, 2011). Studies on companion cat and dog ownership have established that people with limited knowledge, unrealistic expectations and who are unprepared to care for their pet at the time of acquisition are associated with higher risks of relinquishment (Marston and Bennett 2003; How you can 2007; Adkins 2008; Sharkin and Ruff 2011). As significant contributors to relinquishment, pet owner knowledge and expectations of pet ownership are important targets for the success of human-animal bonds (Marston and Bennett 2003; Shore 2005). Podberscek (2006) believes that educating new and existing companion-animal owners through information provided by veterinarians, shelter workers and other animal professionals is an opportunity to enhance relationships between humans and animals.

Over the years, companion rabbits have become an increasingly popular pet in the United Kingdom and the United States (Mullan and Main 2006; Cook and McCobb 2012). Unfortunately, at least in the United States, rabbits have also become the third most relinquished pet behind companion cats and dogs (Cotter 2001; HSUS 2010), and in Canada, the Ontario SPCA and British Columbia SPCA have both described rabbits as the third most relinquished pet in shelters (personal communication), suggesting the breakdown of human-rabbit relationships is not uncommon. Little research has explored relinquishment of companion rabbits, though some studies, similar to research on companion cats and dogs, have suggested the importance of
educating rabbit owners (Edgar and Mullan 2011; Cook and McCobb 2012) and the role of veterinarians and acquisition sources in providing information to owners (Edgar and Mullan 2011).

Findings of this thesis contribute to the limited scientific literature regarding companion-rabbit acquisition and ownership within Canada, and more broadly in the United States and internationally. Specifically, (a) Prospective companion-rabbit owners’ motivations for and thoughts toward rabbit ownership prior to bringing a new rabbit home and (b) Factors associated with companion-rabbit owners’ knowledge of rabbit husbandry and care and the spay or neuter status of companion rabbits.

Summary of Findings

This thesis presents findings from two studies: a qualitative interview study exploring prospective rabbit owners’ considerations prior to acquiring a new companion rabbit and a survey study investigating factors associated with the knowledge of current rabbit owners and the spay or neuter status of companion rabbits. The qualitative interview study involved 18 one-on-one semi-structured telephone interviews with individuals actively looking to acquire a companion rabbit. The interviews were conducted to provide an understanding of the reasons individuals want to acquire companion rabbits and their thought processes surrounding the acquisition of new companion rabbits. Interviews explored individuals’ previous experiences with rabbits, motivations for acquiring a rabbit, ideal attributes of a pet rabbit and expected challenges of rabbit ownership. Thematic analysis was conducted on the 18 interviews and it revealed four central themes: considerations prior to acquiring a companion rabbit, the experience of rabbit ownership, general public misconceptions of rabbits and perceived knowledge of rabbit ownership. One theme, considerations prior to acquiring a companion rabbit, was selected for
further analysis because it received the most attention from participants and highlighted opportunities to improve the process of companion-rabbit acquisition.

Within the theme *considerations prior to bringing a new rabbit home*, four subthemes were developed: reasons given for acquiring a companion rabbit, considerations when choosing an acquisition source to purchase or adopt a companion rabbit, animal-related pre-acquisition considerations, and owner-related pre-acquisition considerations. Companionship was the most common reason for acquiring a rabbit. For participants acquiring a second rabbit, their primary reason was to provide their existing rabbit with a companion. Participants’ motivations for acquiring a companion rabbit were driven by thoroughly enjoying previous experiences owning rabbits, and for new owners, researching what rabbits were like as pets. Many experienced owners discussed acquisition of their first rabbit to be unexpected, unplanned or impulsive suggesting further investigation of first time acquisition may be an important area for future research in order to promote responsible first-time acquisition of companion rabbits. Participants devoted a considerable amount of thought to choosing an acquisition source; almost all participants had concerns about the reputation of acquisition sources with the exception of sources with rabbits for adoption. Regardless of prior experience with rabbits, prospective owners wanted to know where sources got their rabbits. Prospective owners were deterred from acquiring a rabbit from sources that were not certain about where their rabbits were from. Animal-related considerations received more attention from participants than owner-related considerations. Aggression and affection were the most common undesirable and desirable behaviours, respectively, across participants. Experienced participants appeared to be generally aware that rabbits can have different personalities and that rabbit behaviour can be influenced by training and care. Experienced owners were concerned about the health of their new rabbit. For prospective owners with existing animals in their home, compatibility between animals was a
consideration that was driven by participants’ desire to have all animals in the same space and concerns for the safety of their new rabbit. Owner-related considerations were mainly discussed by experienced participants whereas participants new to rabbit ownership were concerned with what was involved in rabbit care and finding a good space in their home. Experienced participants often indicated they had considered their lifestyle prior to bringing a new rabbit home (i.e., considering their family, any travel or moving plans and their financial situation). The two new prospective rabbit owners did not discuss their consideration of their lifestyle, which may be of importance. Findings from this study offer an understanding of motives for acquiring a companion rabbit and thought processes, considerations and concerns surrounding the acquisition of a new companion rabbit. It may be beneficial for acquisition sources to be aware of common pre-acquisition considerations in order to provide support to new owners and to ensure that owners feel prepared prior to bringing a new rabbit home.

The survey study was developed to compliment findings of the qualitative interviews. Moving from the study of prospective owners, the survey study focused on individuals who currently owned a companion rabbit. A literature review was conducted to find existing measures of companion-rabbit welfare, companion-rabbit owner knowledge and human-animal attachment. Three measures were relevant to the study objectives and were adapted for use in the survey: a questionnaire on companion-rabbit husbandry, health and behaviour (Mullan and Main 2006), a knowledge index of basic rabbit husbandry and care (Okola, McCobb and Dowling-Guyer publication in progress) and the Lexington Attachment to Pets Scale (Johnson, Garrity and Stallones 1992). The survey study recruited 2,890 current rabbit owners through snowball sampling recruitment methods, starting from 38 sources (15 rabbit-related groups, education or welfare organizations; 9 rabbit rescues; 5 shelter organizations; 5 pet stores; 3 rabbit supply stores and one breeder) that agreed to share the survey information and link through their website.
and social media platforms. A description of the study and the survey link was also posted on group forum pages and free online advertisement web pages. The survey collected information regarding participants’ acquisition of their companion rabbit, husbandry and care of their current rabbit, knowledge of rabbit care, owner attachment to their current rabbit and owner demographics. An approximation of logistic regression modeling and logistic regression modeling was conducted to explore factors associated with owners’ knowledge of rabbit husbandry and care and the spay or neuter status of companion rabbits, respectively.

Where rabbits were acquired from and whether participants took their rabbit to regular veterinary check-ups influenced owner knowledge of companion-rabbit care. On average, owners who acquired their rabbit from a rescue or shelter or as a stray had higher knowledge scores compared to owners who acquired their rabbit from all other sources. Attending regular veterinary check-ups was significantly associated with increased odds of answering a knowledge question correctly. Increasing attachment and increasing age were also associated with increased odds of answering a knowledge question correctly. Owners residing in the United States and Canada on average had higher knowledge scores than individuals living outside of Canada and the United States. Where participants heard about the survey was also associated with owner knowledge, which may be attributed to particular sources such as rabbit education, or welfare groups providing information on rabbit care through their websites and social media pages. Where participants obtained their rabbit from and whether participants took their rabbit to regular veterinary check-ups was also associated with whether owners currently had a spayed or neutered rabbit. Compared to owners who acquired their rabbit from all other sources, owners who acquired their rabbit from a rescue or shelter had significantly higher odds of having a spayed or neutered rabbit. Owners who took their rabbit for regular veterinary check-ups had significantly higher odds of having a spayed or neutered rabbit compared to owners who did not take their
rabbit for regular veterinary check-ups. Increasing knowledge scores were associated with increasing odds of currently owning a spayed or neutered rabbit. Compared to owners who had two or more rabbits, individuals who owned one rabbit had significantly higher odds of owning a spayed or neutered rabbit. Owners residing in the United States had significantly higher odds of having a spayed or neutered rabbit compared to owners residing outside of Canada and the United States. Residents of Canada did not have significantly different odds of owning a spayed or neutered rabbit compared to residents of the United States or outside of Canada and the United States. Findings from this study provide support for the belief that acquisition source staff and veterinarians can influence owner knowledge, which in turn appears to have an influence on whether a rabbit is spayed and neutered. Acquisition sources and veterinarians may consider developing educational material that can be offered to both new and experienced owners at the point of acquisition or during veterinary check-ups, respectively. Providing educational materials will help ensure that individuals are informed about the needs and requirements of owning a companion rabbit.

In summary, the findings of both the qualitative and quantitative study indicate an opportunity for acquisition sources to play a role in educating prospective owners prior to, and during, the process of acquisition. Throughout rabbit ownership, acquisition sources can support owners as a source for advice and provide other resources for information, such as veterinarians. Both studies offer a greater understanding of companion-rabbit ownership and advocate the need for available educational material for companion-rabbit owners to support the development of sustainable, positive, human-rabbit relationships.

**Limitations**

Each study in this thesis had its own limitations. For the qualitative interview study, the objective was to explore through in-depth interviews and thematic analysis a topic that has
received little attention. While attempting to find deeper meanings and themes among the data, the small sample size and nature of non-random data collection limits transferability and generalizability of findings to broader populations. In addition, recruiting prospective rabbit owners that were in the process of acquiring a rabbit was difficult, and in particular, identifying individuals who were new to rabbit ownership. As a result, there was a selection bias toward experienced rabbit owners.

The sample size of the quantitative survey was large, providing power to the study; however, the sample appears to have been biased toward experienced and enthusiastic rabbit owners due to where they had heard about the online survey. To reach a large sample population without geographical restraint, snowball sampling was used to allow sources and individuals to share the online survey to whomever they wanted which may have introduced this selection bias. A second challenge arose in the differentiation of participants who acquired their rabbit already spayed or neutered and participants who chose to get their rabbit spayed or neutered after acquisition. Gaining an understanding of the decision to spay or neuter a rabbit may help further inform education initiatives that promote the spaying and neutering of companion rabbits.

In this thesis, a challenge for both studies was recruiting participants with little or no experience owning rabbits. New rabbit owners may have been deterred from volunteering to participate in the studies due to their lack of experience. Of interview study participants, only two individuals had never owned a rabbit before. Future research exploring the perspective of prospective rabbit owners that have never owned a rabbit before is warranted. In the survey study, the majority of participants were experienced rabbit owners. Future research exploring knowledge of inexperienced companion-rabbit owners could identify knowledge gaps and populations that would benefit from enhancing their knowledge through educational material. The limited findings specific to new rabbit owners from this thesis suggests that this may be a
unique population worth studying in the future. Finally, in this thesis a large majority of participants were female which may indicate more females want to own and currently own companion rabbits or possibly that males were more difficult to recruit for participation in each study. This would be an interesting area for future research consideration.

**Key Recommendations**

The findings of this thesis offer a basis for several key recommendations:

- Acquisition sources and veterinarians should consider opportunities and approaches to educate prospective rabbit owners about rabbit husbandry, care and spay and neuter.
- Acquisition sources should offer special consideration for educating first time rabbit owners about the needs and requirements of companion rabbits in order to reduce potential issues associated with unexpected or unplanned acquisitions.
- Acquisition sources and veterinarians should consider their role and approach to exploring prospective rabbit owners’ pre-acquisition considerations and concerns in order to address or manage these concerns prior to acquisition.
- Acquisition sources should consider providing prospective rabbit owners with information on where they obtain their rabbits, the health status of their rabbits, the history of their rabbits and how rabbits are cared for prior to arriving at the source, to aid prospective owners in their choice of acquisition source.
- As important contributors to knowledge of companion-rabbit owners, acquisition sources, veterinarians and other animal professionals, should consider developing educational material to be provided at the point of sale or adoption to promote proper rabbit husbandry and care.
- Acquisition sources and veterinarians should consider advising prospective rabbit owners about the importance of regular veterinary check-ups to promote the healthcare of
companion rabbits and as an additional resource for enhancing owner knowledge and rabbit health.

- Acquisition sources and rabbit professionals should consider approaches for promoting and advising current and prospective rabbit owners about the importance and benefits of spaying and neutering rabbits.

**Future Directions for Research**

The findings of this thesis provide numerous areas for future research.

In this thesis, considerations prior to acquiring a rabbit and knowledge of companion-rabbit owners were primarily studied in a population of individuals with experience owning companion rabbits. Focusing future research on individuals new to rabbit ownership should provide a broader understanding of the process of acquisition for new owners and knowledge gaps for inexperienced rabbit owners.

In the interview study, participants had several concerns about the reputation of acquisition sources. Further research could investigate the characteristics of reputable acquisition sources in order to develop evidence-based guidelines for prospective owners on responsible acquisition of companion rabbits through reputable sources.

The main recommendations of the current thesis relate to the value of owner education. Further studies should explore the impact of education intervention at the point of acquisition and during veterinary visits on owner knowledge and whether owners spay and neuter their rabbit. Implementing education programs at the point of acquisition could help new owners in the process of acquisition gain knowledge of rabbit care and potentially enhance experienced owners’ knowledge of rabbit ownership.

It is important to note however, that acquisition sources may differ in their willingness and ability to implement these programs. Therefore, developing research to examine the
outcomes of educational initiatives is important in order to position acquisition sources and veterinarians with the information needed to make evidence-based choices about education interventions they implement.

Overall, this thesis provides an understanding of prospective owners’ considerations surrounding the acquisition of a new companion rabbit, and factors associated with the knowledge of rabbit owners and the spay or neuter status of companion rabbits. Future research would be advantaged to utilize similar multi-method strategies to enhance our understanding of companion-rabbit ownership and to further the current studies findings that acquisition sources and veterinary care have significant roles in rabbit-owner knowledge. Several opportunities for improving the process of acquisition and increasing knowledge of rabbit owners through educational material have been suggested and may be most beneficial if provided at the point of acquisition and during early veterinary check-ups.
References

Adkins, B.L. 2008. Factors associated with the relinquishment of domestic canines to animal shelters, Doctoral dissertation, Lynn University, United States of America.


McGreevy, P.D., Righetti, J. and Thomson, P. 2005. The reinforcing value of physical contact and the effect on canine heart rate of grooming in different anatomical areas. Anthrozoös 18(3): 236–244.


Okola, A., McCobb, E., & Dowling-Guyer, S. (publication in progress). *Knowledge of rabbit husbandry at rabbit acquisition sites: A survey of pet stores, animal shelters, and rabbit rescues in Massachusetts and Rhode Island*. Unpublished manuscript, Center for Animals and Public Policy, Cummings School of Veterinary Medicine, Massachusetts, Unites States of America.


APPENDIX A

Considerations of rabbit ownership prior to acquiring a new companion rabbit: a qualitative interview study

A.1: Recruitment Poster
A.2: Recruitment Email
A.3: Recruitment Post for Online Classified Advertisement
A.4: Researchers First Point of Contact
A.5: Consent Form
A.6: Interview Guide
A.7: Codebook
**RESEARCH OPPORTUNITY:**

*Let’s talk about rabbits!*

Research study conducted by:
Tasha Welch (welcht@uoguelph.ca), MSc candidate
Dr. Jason Coe, DVM, PhD, faculty advisor

**Purpose:**
- To discover thoughts people have about owning a pet rabbit

**Participation requires:**
- A 30 minute telephone interview
- Talking about past rabbit experience, your interest in rabbits and thoughts about owning a rabbit
- Also a few questions about you

Please write your name and email and place it in the box if you are interested in participating in this study!

For putting your name in the box you will be automatically entered into a prize draw for movie passes! Odds of winning are 1 in 5!

*University of Guelph*

REB# 13MY046
A.2 Recruitment Email

RESEARCH OPPORTUNITY!

The University of Guelph is conducting a study on peoples’ thoughts and attitudes of rabbit ownership prior to acquiring a pet rabbit. If you are interested in participating, please see the poster attached to this email for additional information about the study and how you can get involved.

If you are interested in learning more about the research project please click on the following link to provide your contact details and the researchers will follow-up with you by email. [https://surveys.ccs.uoguelph.ca/limeSurvey/index.php?sid=41225&lang=en] You will automatically be entered into a prize draw for providing your contact information. The researcher will randomly contact five people to complete the phone interview. Your choice to participate in this study will not affect your adoption process with Rabbit Rescue and Rabbit Rescue is not affiliated with the University of Guelph or this study.
A.3 Recruitment Post for Online Classified Advertisement

University of Guelph Research Project (REB: 13MY046): Let's talk about rabbits!

My name is Tasha Welch and thank you for your interest in my graduate research at the University of Guelph. I am a Masters student at the Ontario Veterinary College who is researching peoples’ thoughts toward pet rabbits and attitudes toward rabbit ownership. If you are in the process of acquiring a rabbit and would like to participate you can contact me at welcht@uoguelph.ca and I will provide you with more information on the study.

To be involved in this research project, we would like you to complete a short telephone interview. Your choice to participate is entirely voluntary and if at any point you decide you wish to not participate you have the right to do so. This research has been granted Research Ethics Approval through the University of Guelph (REB: 13MY046). If you have any questions about the study or participation, please don't hesitate to email me and I will get back to you as soon as possible.

Kind regards,
Tasha R. Welch MSc. Epidemiology (Candidate)
welcht@uoguelph.ca

**RESEARCH OPPORTUNITY:**

*Let’s talk about rabbits!*

Research study conducted by:

Tasha Welch (welcht@uoguelph.ca), MSc candidate

Dr. Jason Coe, DVM, PhD, faculty advisor

**Purpose:**

- To discover thoughts people have about their rabbits and owning a pet rabbit

**Participation requires:**

- A 30 minute telephone interview
- Talking about past rabbit experience, your interest in rabbits and thoughts about owning a rabbit
- Also a few questions about you

If you are interested in learning more, please contact Tasha at welcht@uoguelph.ca and she will follow up with you by email.
A.4 Researchers First Point of Contact

Dear ________,

Thank you very much for your interest in the rabbit ownership study. My name is Tasha Welch and I am conducting this research at the University of Guelph. We are doing a study on individuals who want to or have purchased or adopted a rabbit to explore thoughts about pet rabbits and attitudes toward rabbit ownership. The study is important because it can be used by pet store, shelter and rescue staff, and breeders to ensure they understand why people want pet rabbits and to develop educational materials for individuals interested in acquiring a new pet rabbit.

Participation in the study would involve talking to me over the phone about your past pet rabbit experience, your thoughts about rabbits and rabbit ownership as well as some information about yourself. The interview would be audio-taped but you will have complete confidentiality. The interview will take approximately thirty minutes of your time and you will be given a $10 Tim Hortons’s gift card as a token of appreciation for taking the time out of your day to participate in this study.

We are currently looking to talk with people who are in the process of purchasing or adopting a rabbit. Are you looking to get a rabbit in the near future?

We would really appreciate your input, would you have time to talk about your pet rabbits and future rabbit?

If individual responds to the email and answers no,

Researcher’s email response: ‘I understand. Thanks for your time!’

If individual responds to the email and answers that they currently are not looking for a rabbit,

Researcher’s email response: ‘Thank you very much for your interest in this study, however, we are currently looking to speak with people who are in the process of buying/adopting a rabbit. Thank you for your time!’

If individual responds to the email and answers yes,

Researcher: ‘I really appreciate your interest in taking the time for this! What would be a good day, time and phone number to reach you at to complete this interview?

I have attached a copy of a consent form for this study, which outlines what to expect and your rights as a participant. Please read it through and feel free to ask any questions. We will also go over the form before we start the interview if you have further questions. Finally, since I’m calling from a Skype account the number that is displayed will not appear as a normal Ontario number just so you are aware.’
If an individual does not respond to the first point of contact within three days, the researcher will follow up with them to ensure they received the initial email and determine if they are still interested in the study.

Dear ________,

Thank you very much for your interest in the rabbit ownership study. I just wanted to follow up with you to see if you were still interested in participating in the Guelph Rabbit Studies. Some more details can be found below.

My name is Tasha Welch and I am conducting this research at the University of Guelph. We are doing a study on individuals who want to or have purchased or adopted a rabbit to explore thoughts about pet rabbits and attitudes toward rabbit ownership. The study is important because it can be used by pet store, shelter and rescue staff, and breeders to ensure they understand why people want pet rabbits and to develop educational materials for individuals interested in acquiring a new pet rabbit.

Participation in the study would involve talking to me over the phone about your past pet rabbit experience, your thoughts about rabbits and rabbit ownership as well as some information about yourself. The interview would be audio-taped but you will have complete confidentiality. The interview will take approximately thirty minutes of your time and you will be given a $10 Tim Hortons gift card as a token of appreciation for taking the time out of your day to participate in this study.

We are currently looking to talk with people who are in the process of purchasing or adopting a rabbit. Are you looking to get a rabbit in the near future?

We would really appreciate your input, would you have time to talk about your pet rabbits and future rabbit?

If the individual responds, the researcher will proceed as stated above. If the individual still does not respond the researcher will not attempt to follow up again.
A.5: Consent Form

CONSENT TO PARTICIPATE IN RESEARCH
REB# 13MY046

‘People’s thoughts about rabbit ownership prior to acquiring a pet rabbit’

You are asked to participate in a research study conducted by Dr. Jason Coe, DVM, PhD and Ms. Tasha Welch from the Department of Population Medicine at the University of Guelph. The results of this study will contribute to Ms. Welch’s MSc thesis. If you have any questions or concerns, please feel free to contact Dr. Jason Coe at 519-824-4120 Ext. 54010 or jcoe@uoguelph.ca. This research is funded by Nestle Purina PetCare Canada Chair in Comminucations.

PURPOSE OF THE STUDY

The purpose of the study is to discover common thoughts individuals have prior to acquiring a pet rabbit. Information gathered during this study may be used for publication as well as to develop educational materials for individuals interested in acquiring a new pet rabbit. It may also be used in directing future research projects.

PROCEDURES

If you volunteer to participate in this study, we would ask you to do the following things:

- Participate in a one-on-one telephone interview with the researcher. The interview will be audio-recorded and will take approximately thirty minutes. Questions about past rabbit experience, thoughts about rabbit ownership, and reasons for purchasing or adopting a rabbit will be covered in addition to a few questions about you.

POTENTIAL BENEFITS TO PARTICIPANTS AND/OR TO SOCIETY

You may enjoy talking about your current and previous pets with researchers, and reliving funny and loving memories of pets.

Information from the study will be used to inform future research in this area. It is hoped that these studies will provide insight into the expectations and needs of individuals who acquire a rabbit from various sources and that this information will be used to better understand what information will be helpful to pet rabbit owners before and after acquiring a rabbit.

POTENTIAL RISKS AND DISCOMFORTS
Since the interview will ask questions about previous pets and your experience with and feelings towards previous pets, you may feel an emotional response when remembering experiences with previous pets.

The interview will be carried out in a very respectful and compassionate manner. As a participant, you have the right to refuse to answer any questions that make you uncomfortable or to withdraw from the study at any time without penalty or judgment. Every effort will be made to ensure the confidentiality of participants in connection with this study.

Since the interview will be audio-recorded, there is a privacy risk. This risk will be minimized through storing interview recordings on an encrypted laptop, giving surveys, interviews and consent forms unique codes, and having only study researchers and a professional transcriber have access to study data.

**RENUMERATION FOR PARTICIPATION**

Everyone who shows interest in the study by providing their name and email in the contact drop box or through the survey link will be entered into a prize draw in appreciation for their interest in the study. Participants will receive a $10 Tim Hortons gift card by mail as a token of appreciation for participating in the study.

**CONFIDENTIALITY**

Every effort will be made to ensure confidentiality of any identifying information that is obtained in connection with this study. Interview recordings will be stored on an encrypted laptop, and consent forms and surveys will be kept in a locked filing cabinet in the Ontario Veterinary College and only the study researchers and professional transcribers will have access to them. Data will be kept for approximately seven years, after which, the audiotapes will be deleted and written material will be shredded. Any findings released from the outcome of this study will not be directly linked to any of the project participants. In signing this consent you are aware and agreeable to the use of non-identifying verbatim quotes in published materials and presentations.

**PARTICIPATION AND WITHDRAWAL**

Participation in this study is completely voluntary. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you don’t want to answer and still remain in the study. The investigator may withdraw you from this research if circumstances arise that warrant doing so.

**RIGHTS OF RESEARCH PARTICIPANTS**

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this research study. This study has been reviewed and received ethics clearance through the University of Guelph Research Ethics Board. If you have questions regarding your rights as a research participant, please contact:
SIGNATURE OF RESEARCH PARTICIPANT/LEGAL REPRESENTATIVE

Consenting to participate in this study acknowledges you have read the information provided for the study “People’s thoughts about rabbit ownership prior to acquiring a pet rabbit” as described herein. Your questions have been answered to your satisfaction, and you are agreeing to participate in this study with the assurance that your identity on written materials and audio recordings will remain completely confidential. In addition, you are agreeing to the use of verbatim quotes in any published materials and presentations as long as your identity remains protected.
A.6: Interview Guide

*Turn on tape recorder*

Researcher: ‘Thank you so much for agreeing to talk with me today. I would really like to hear about your interest in rabbits and thoughts toward rabbit ownership. The interview will be recorded but everything you say will be confidential and if you have any questions throughout the interview, please feel free to ask me at any time. If there are any questions you would prefer not to answer that is not a problem, just let me know. If you wish to stop at any point, you have the right to do so. Have you had an opportunity to read the consent form I sent to you by email in advance (If no – please take a few minutes to read the consent; If yes or following review of consent - Do you have any questions about the consent form?) May we begin?

Key questions:

1. Tell me about your interest in rabbits?
   - Prompt: What’s brought you to think about getting a rabbit?
   - Prompt: Tell me about your past experience with rabbits?
   - Probe: Can you tell me more about []?
   - Probe: You mentioned [], could you tell me more about that?

2. Do you have or have you had a rabbit in the past?
   - Prompt: What was your rabbit’s name? Would you tell me more about [rabbit’s name]?
   - Prompt: Can you talk about anything you might do differently this time around?
   - Probe: Can you tell me more about []?
   - Probe: You mentioned [], could you tell me more about that?

3. What brought you to want to have a rabbit?
   - Prompt: Would you tell me about some of the things that made you want a rabbit?
   - Prompt: Did you have a particular rabbit you were looking for? Tell me more about that.
   - Probe: Can you tell me more about []?
   - Probe: You mentioned [], could you tell me more about that?

4. Would you mind describing your ideal rabbit?
   - Prompt: What are some characteristics you would want in your rabbit?
   - Prompt: What are you looking for from your rabbit in terms of its behaviour?
   - Probe: Can you tell me more about []?
   - Probe: You mentioned [], could you tell me more about that?

5. Tell me the things you would want to avoid in a rabbit?
   - Prompt: What are some characteristics you would want to avoid in a pet rabbit?
   - Prompt: Are there any reasons you would not want a rabbit?
• Probe: Can you tell me more about []?
• Probe: You mentioned [], could you tell me more about that?

6. What brought you to [acquisition source name] to get your rabbit?
• Prompt: What are your feelings toward getting a rabbit at a [different acquisition source]?
• Probe: Can you tell me more about []?
• Probe: You mentioned [], could you tell me more about that?

7. What concerns do you have in relation to getting a new pet rabbit?
• Prompt: What challenges do you anticipate in getting a new rabbit?
• Prompt: What do you think the biggest challenge is with rabbit ownership?
• Probe: How would you handle this?
• Probe: Can you tell me more about []?
• Probe: You mentioned [], could you tell me more about that?

8. Can you tell me about any research you may have done on rabbits?
• Prompt: Did you use any resources like books, the internet or friends to learn about pet rabbits?
• Probe: Can you tell me more about []?
• Probe: You mentioned [], could you tell me more about that?

Cool down:

8. So is there anything we have missed? Is there anything else you would like to add to your past experience, interest and thoughts toward rabbit ownership?

____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

Researcher: Now I’m just going to summarize some of the things you have said to make sure I have understood everything you said. In summary, you said [give summary of key points from interview]. Is this a fair summary of what you said?

If participant says no, researcher will ask participant to elaborate.

If participant says yes,

Researcher: Thank-you very much for taking the time to speak with me today. I really appreciate it and I enjoyed hearing about your interest and thoughts toward pet rabbits. Before we finish, I just have a few final questions to get a bit more information. Everything you say will still be kept confidential and if any of the questions I ask make you uncomfortable you may stop at any point. May we begin?
**Demographic questions:**

Could I confirm that you have [had/not had] a rabbit before?

Do you have any other pets?

How long did you think about getting a rabbit before getting one? Hours, days, weeks, or months?

Would you consider where you live to be rural, suburban or urban?

May I confirm that you are [male/female]?

Which age category would you be in? 18 – 25, 26 – 33, 34 – 41, 42 – 49, or 50 and over?

From these education categories, which one have you completed? High school, university, college, postgraduate, none of the above or other?

What income category would your household fall in? Under $30,000, $30,000 - $60,000, $61,000 - $90,000, over $91,000, or prefer to not answer?

**Researcher:** Great, thank-you very much for that information. Finally, what is your address so I can mail you your Tim Hortons’s gift certificate?

*Acquire participants mailing address and repeat it back to confirm.*

**Researcher:** Thanks again for your participation do you have any other comments or questions regarding this interview? Ok and lastly if you would like a copy of the results, feel free to email me at anytime, this project will be complete by August 2014. Have a great day.
### A.7: Codebook

<table>
<thead>
<tr>
<th>Sub Theme Name</th>
<th>Code Name</th>
<th>Description of Code Name</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>(Main Theme) Considerations prior to acquiring a companion rabbit</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reason for acquiring</td>
<td>• For love and companionship</td>
<td>• Participants discuss their love of rabbits and companionship-related reasons for acquiring a new rabbit</td>
</tr>
<tr>
<td></td>
<td>• Companion for an existing rabbit</td>
<td>• Participants discuss wanting to acquire a companion for an existing rabbit</td>
</tr>
<tr>
<td></td>
<td>• Unexpected or unplanned</td>
<td>• Participants discuss the first time they acquired a rabbit as unexpected, unplanned, impulsive, involving little thought etc.</td>
</tr>
<tr>
<td>Factors in choosing an acquisition source</td>
<td>• Reputation</td>
<td>• Participants discuss factors that led to their decision to choose a particular acquisition source through their concerns and perceived issues relating to an acquisition sources’ reputation. This includes choosing between sources (e.g., shelter vs. breeder) and/or between different locations of the same type of acquisition source (e.g., different shelter locations)</td>
</tr>
<tr>
<td></td>
<td>• Convenience and cost</td>
<td>• Participants discuss factors that led to their decision to choose a particular acquisition source including availability, cost and location. This includes choosing between sources (e.g., shelter vs. breeder) and/or between different locations of the same type of acquisition source (e.g., different shelter locations)</td>
</tr>
<tr>
<td>Animal-related considerations</td>
<td>• Positive behaviour traits</td>
<td>• Participants discuss positive behaviours they would like their future rabbit to display including positive traits of their current or past rabbits</td>
</tr>
<tr>
<td></td>
<td>• Negative behaviour traits</td>
<td>• Participants discuss negative behaviours they would like to avoid in their future including negative traits of their current or past rabbits</td>
</tr>
<tr>
<td></td>
<td>• Physical traits</td>
<td>• Participants discuss considerations and preferences toward the sex, age, size and breed of rabbit they would like to acquire</td>
</tr>
<tr>
<td></td>
<td>• Health</td>
<td>• Participants discuss the health of rabbits including the health of their current rabbit, prospective rabbit and concerns toward a sick and/or injured rabbit</td>
</tr>
<tr>
<td></td>
<td>• Compatibility</td>
<td>• Participants discuss how existing and new animals would get along whether it be existing</td>
</tr>
<tr>
<td>Owner-related considerations</td>
<td>• Husbandry and housing</td>
<td>• Participants discuss factors surrounding the care of a new rabbit such as the workload, time commitment, space and housing of owning a rabbit</td>
</tr>
<tr>
<td>------------------------------</td>
<td>------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>• Lifestyle</td>
<td>• Participants discuss how a new rabbit might influence their lifestyle (e.g., travelling, moving, cost etc.)</td>
</tr>
</tbody>
</table>

(Theme) The experience of rabbit ownership

<table>
<thead>
<tr>
<th>The human-animal bond</th>
<th>• Rabbit experience</th>
<th>• Participants discuss their level of experience with companion rabbits with respect to how many rabbits they have owned and for how long</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Relationships with rabbits</td>
<td>• Participants discuss the emotional and social aspects of the relationship between themselves and their rabbit, and/or their family/friends and their rabbit. This may include both positive and negative aspects of the human-animal bond</td>
</tr>
<tr>
<td></td>
<td>• Specific personality</td>
<td>• Participants discuss behaviours and traits of their current or past rabbits in a neutral manner (neither positive or negative), which may include discussing ‘the way their rabbit is’</td>
</tr>
<tr>
<td></td>
<td>• Changing others’ opinions of rabbits</td>
<td>• Participants discuss how their, and/or other people’s opinions surrounding rabbits as pets and rabbit behaviour have changed after interacting with or owning rabbits</td>
</tr>
</tbody>
</table>

(Theme) General public misconceptions of rabbits

<table>
<thead>
<tr>
<th>General public misconceptions and lack of knowledge</th>
<th>• Misconception</th>
<th>• Participants discuss general public misconceptions and public perceptions of rabbit ownership (e.g., smell, litter training, workload, affection etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Expectations</td>
<td>• Participants discuss issues surrounding expectations of rabbit owners (both new and experienced owners)</td>
</tr>
<tr>
<td></td>
<td>• Lack of knowledge</td>
<td>• Participants discuss the lack of information surrounding rabbits, rabbit care, and rabbit ownership. This may include discussing lack of knowledge of ‘animal professionals’</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Issues with commitment</th>
<th>• Impulse</th>
<th>• Participants discuss impulse acquisition of rabbits and repercussions of impulse acquisition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Commitment</td>
<td>• Participants discuss issues surrounding commitment in acquiring and keeping a rabbit</td>
</tr>
</tbody>
</table>

(Theme) Perceived knowledge of rabbit ownership
<table>
<thead>
<tr>
<th>Rabbit husbandry</th>
<th>Rabbit care</th>
<th>Adjustments to new surroundings</th>
<th>Overall rabbit behaviour</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Participants discuss what is involved in rabbit care including their rabbit care routine, feeding, cleaning, housing, veterinary care, etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Participants discuss how their current/past rabbit(s) have adjusted to new surroundings, including adjustment to a current pet, home environment, etc., or how the participant expects their new/future rabbit to adjust. This can also include methods described by participants in how they plan to help their new rabbit adjust.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rabbit knowledge</td>
<td>Rabbit knowledge and things learnt</td>
<td>Advice for new owners</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Participants discuss their level of knowledge or lack thereof, in addition to discussing the advice they have acquired on rabbit ownership and the knowledge they have gained surrounding rabbit care and health.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Participants give advice for prospective/new/existing rabbit owners with respect to things they should or shouldn’t do surrounding rabbit ownership</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Importance of research and education</td>
<td>Quality, credibility and amount of information</td>
<td>Importance of research and education</td>
<td>Sources for information</td>
</tr>
<tr>
<td></td>
<td>Participants discuss the quality (i.e., how good or bad the information is, how helpful or informative they found the information) of available information on rabbit ownership and how much information is available.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Participants discuss how important it is to do research prior to ownership and become educated on how to care for rabbits</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Participants discuss the sources they used to find information on rabbits</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX B

Factors associated with companion-rabbit owners’ knowledge of rabbit care and the spay or neuter status of companion rabbits

B.1: Recruitment for Groups, Organizations and Companies Exploring Interest in Helping Distribute the Survey

B.2: Recruitment Poster

B.3: Online Advertisement and Forum Recruitment Script

B.4: Consent Form

B.5: Survey Regarding Rabbit Ownership, Experience, Husbandry, Knowledge, Challenges and Attachment to Companion Rabbits
B.1: Recruitment for Groups, Organizations and Companies Exploring Their Interest in Helping Distribute the Survey

To whom it may concern (source name),

My name is Tasha Welch and I am a Master's student at the University of Guelph in Ontario. I began my Master's last year and through my passion for pet rabbits and working with rescues over the years I decided to dedicate my research exploring rabbit ownership and welfare.

Last year I conducted a review of literature published on rabbit ownership and found that there is minimal research done on pet rabbits in North America. There are some studies completed on rabbit health and behaviour, but not much or nothing exists exploring rabbit welfare and ownership. After discussing the gaps in rabbit research, my committee and I decided on two projects that would really help this field.

The first portion of my project is just wrapping up, which involved interviewing people who were looking into adopting or buying a rabbit. The goal of the interview was to explore what motivated people to get a rabbit. Was it that impulse purchase because their cute and cuddly, or were they searching for the perfect companion.

The second portion of my project is to assess current and past rabbit owners’ knowledge and determine how people are caring for their rabbits (diet, housing etc.). This will be done in the form of an online survey to be completed by anyone who currently or has previously owned a rabbit. So it's quite a large scale, but the goal is to really get a snapshot of rabbit owners and their rabbits so future studies may be able to target exactly what aspects need changing in the rabbit world. Although many rabbit people could discuss areas they think need adjustments in how rabbits are cared for, this has not been scientifically studied. My hopes are to get this work published and available for people to read so it can bring more attention to the field of rabbit ownership.

Right now I am still developing the survey and methods but I just wanted to explore your interest in helping 'spread the word' to current and past rabbit owners about the survey. Spreading the word may involve posting a link on your website, Facebook page, rabbit forums or even just sending the link via word of mouth. Whatever you or anyone you know could do to get the survey 'out there' and completed. Anyone over 18 who currently owns a rabbit or has owned one in the past will be able to voluntarily complete the survey and the more that complete it the better!

Let me know what you think. Again, it won't be ready until the new year so nothing needs to be done right now.

Thanks,

Tasha Welch (MSc. Candidate)
Department of Population Medicine
Ontario Veterinary College
University of Guelph
We’re interested in learning more about pet rabbits!

Do you have a pet rabbit? Have you had a rabbit in the past?

If yes, please participate in our 30 minute online survey about your experiences with pet rabbits!

To access the survey click here: [www.petrabbitsurvey.com](http://www.petrabbitsurvey.com)

Chance to win $50 with 1 in 100 odds!

The University of Guelph Research Ethics Board approved this research project.
B.3: Online Advertisement and Forum Recruitment Script

University of Guelph Survey: Do you have a pet rabbit? Have you had a rabbit in the past? Prize draw for participating!

My name is Tasha Welch and thank you for your interest in my graduate research at the University of Guelph. I am a Masters student at the Ontario Veterinary College and I’m exploring peoples’ experience of owning a pet rabbit.

To be involved in this research project, we would like you to complete an online survey that will take 20 - 30 minutes of your time. In appreciation for your participation you will be entered into a prize draw for $50 (odds are 1 in 100).

If you have a pet rabbit(s) or had a rabbit(s) in the past please click on the link to participate.

http://fluidsurveys.com/s/rabbitsurvey

If you have any questions about the study or participation, please don't hesitate to email me and I will get back to you as soon as possible.

Kind regards,
Tasha R. Welch MSc. Epidemiology (Candidate)
welcht@uoguelph.ca
(REB #: 13NV047)

Note:
In forums or advertisements that allow photos to be posted the researcher posted Appendix B.2 with the text above.
B.4: Consent Form

CONSENT TO PARTICIPATE IN RESEARCH
REB# 13NV047

‘Exploring the experience of owning a pet rabbit’

You are asked to participate in a research study conducted by Dr. Jason Coe, DVM, PhD and Ms. Tasha Welch from the Department of Population Medicine at the University of Guelph. The results of this study will contribute to Ms. Welch’s MSc thesis. If you have any questions or concerns, please feel free to contact Dr. Jason Coe at 519-824-4120 Ext. 54010 or jcoe@uoguelph.ca. This research is funded by Nestle Purina PetCare Canada Chair in Communications.

The purpose of the study is to explore experiences of owning a pet rabbit including human rabbit relationships, rabbit care and the challenges of rabbit ownership. Information gathered during this study may be used for publication as well as to develop educational materials for individuals interested in acquiring a new pet rabbit. It may also be used in directing future research projects.

If you currently have a rabbit(s) or had a rabbit(s) in the past, and are 18 years of age or above, we would ask you to do the following things:

• Answer questions about your experiences with a pet rabbit(s), rabbit care, challenges of rabbit ownership and a few questions about you. The survey takes 20 - 30 minutes. The survey is anonymous.
• You can enter a prize draw at the end of the survey for $50 (odds are 1 in 100). To enter your contact information, you will be directed to a second small survey to fill in your name and email for the prize draw. Your contact information will not be associated with your responses from the first survey. Information will only be kept until a winner is chosen.

You may feel an emotional response when remembering experiences with your rabbit(s). You can skip any questions that you don’t want to answer. Every effort will be made to ensure the confidentiality of participants in connection with this study. Please note that confidentiality cannot be guaranteed while data are in transit over the internet. Be aware non-identifying verbatim quotes may be used in published materials and presentations. Participation in this study is completely voluntary; you may withdraw at any time without consequences of any kind. The investigator may withdraw you from this research if circumstances arise that warrant doing so. Your survey cannot be withdrawn once it has been submitted because the data cannot be identified.

You are not waiving any legal claims, rights or remedies because of your participation in this research study. This study has been reviewed and received ethics clearance through the
University of Guelph Research Ethics Board. If you have questions regarding your rights as a research participant, please contact the Director of Research Ethics at (519) 824-4120, ext. 56606 or by email sauld@uoguelph.ca.

If you consent, click “I agree” to continue to the survey.
B.5: Survey Regarding Rabbit Ownership, Experience, Husbandry, Knowledge, Challenges and Attachment to Companion Rabbits

* = questions (modified) from Mullan and Main (2006)
** = questions from Okola, McCobb and Dowling-Guyer (publication in progress)
*** = questions from Johnson, Garrity and Stallones (1992)
× = questions of the knowledge portion that were removed in reliability analysis

CONSENT TO PARTICIPATE IN RESEARCH
REB# 13NV047

‘Exploring the experience of owning a pet rabbit’

I: Introduction Questions

Do you currently have a pet rabbit?
Note: This question must be answered to continue.

○ Yes
○ No

Have you had a rabbit in the past?
Note: this question must be answered to continue.

○ Yes
○ No

Approximately how long has it been since you've had a pet rabbit?
Note: please enter numbers only Ex. Years: 6 and Months: 4

Years: __________________________

Months: ________________________

Do you plan on getting a rabbit in the future?

○ Yes
○ No
○ Maybe
○ I don't know
Before getting your first rabbit, on a scale of 1 to 100, how much planning went into your decision to get a rabbit?
First rabbit meaning the first rabbit you owned NOT including childhood pet rabbit(s).

1 = No planning ------------------------------- 100 = Significant planning

Before getting your first rabbit, on a scale of 1 to 100, how much advice did you acquire on rabbit ownership?
1 = No advice ----------------------------------- 100 = Significant advice

Before getting your first rabbit, on a scale of 1 to 100, how much research did you do on owning a pet rabbit?
1 = No research ----------------------------------- 100 = Significant research

Before getting your first rabbit, which resources did you use for rabbit care information?
Select any that apply.

☐ Breeders
☐ Veterinarian
☐ Shelter/rescue staff
☐ Pet store staff
☐ Books
☐ Internet
☐ Other rabbit owners
☐ Other, please specify... ______________________

Where did you get your first rabbit from?

☐ Pet Store
☐ Breeder
☐ Rescue or Shelter
☐ Gift
☐ Stray
☐ Farm
☐ Online advertisement
☐ From a friend/family
☐ Other, please specify... ______________________
Thinking back to when you got your first rabbit, what was the primary reason you obtained a pet rabbit?

- For companionship
- Got as a gift
- Found as a stray
- For physical appearance (ex. it was cute and fluffy)
- Wanted to give a rescue/shelter rabbit a home
- For a family member
- Pressure from others (ex. kids, spouse)

**How many years experience do you have owning a pet rabbit(s)?**
Note: please enter numbers only
Ex. Years: 4 and Months: 3

Years: 

Months: 

On a scale of 1 to 100, please rate your overall experience with pet rabbits.
1 = No experience 100 = Very experienced

**How many rabbits do you currently have?**
Note: please enter a number only. For example: 2

What was the primary reason for obtaining your most recently acquired pet rabbit?

- For companionship
- Got as a gift
- Found as a stray
- For physical appearance (ex. it was cute and fluffy)
- Wanted to give a rescue/shelter rabbit a home
- To bond to an existing rabbit
- For a family member
- Pressure from others (ex. kids, spouse)

What characteristics would be most important to you today if you were choosing a pet rabbit?
Select any that apply.

- Appearance
☐ Personality/Friendliness
☐ Size
☐ Age
☐ Sex
☐ Health
☐ If they are neutered/spayed
☐ Other, please specify... ______________________

Now that you have owned a rabbit(s), which resources do you use for rabbit care information? Select any that apply.

☐ Breeders
☐ Veterinarian
☐ Shelter/rescue staff
☐ Pet store staff
☐ Books
☐ Internet
☐ Other rabbit owners
☐ Other, please specify... ______________________

Of the resources listed below, from your experience please rate on a scale of 1 to 10 the quality of information provided by each source on pet rabbit care (1 = poor quality and 10 = excellent quality). Note: if you have not used a source in the list below, please select "have not used" in the drop down.

Breeders: __________
Veterinarian: __________
Shelter/rescue staff: __________
Pet store staff: __________
Books: __________
Internet: __________
Other rabbit owners: __________
Of the resources listed below, which do you think provides the best information on rabbit care for new rabbit owners?

- Breeders
- Veterinarian
- Shelter/rescue staff
- Pet store staff
- Books
- Internet
- Other rabbit owners
- Other, please specify... ______________________

II: Questions about your pet rabbit!

Please answer the following questions to the best of your ability. There are no right or wrong answers. If you have more than one rabbit, please think of your most recently acquired rabbit when answering all of the questions in this section.

*Breed of your most recently acquired rabbit:
Note: if you are unsure, please enter "do not know"

*Approximate age of your most recently acquired rabbit:
Note: please enter numbers only Eg. Years: 3 and Months: 6

Years: ______________
Months: ______________

*Sex of your most recently acquired rabbit:
- Male
- Male neutered
- Female
- Female spayed
- Unknown

*If you had your rabbit spayed and neutered, what factors influenced your decision? Select any that apply.
- Didn't want babies
Behavoural problems
To prevent uterine cancer
Recommended by pet shop
Recommended by vet
Recommended by breeder
Other, please specify... ______________________

*Where did you get your most recently acquired rabbit from?
- Pet Store
- Breeder
- Rescue or Shelter
- Gift
- Stray
- Farm
- Online advertisement
- From a friend/family
- Other, please specify... ______________________

*Who was the rabbit primarily acquired for?
- Myself
- Another adult member of the family
- A child member of the family
- Everyone in the family equally
- Other, please specify... ______________________

*Who is the main caretaker of the rabbit?
- Myself
- Another adult member of the family
- A child member of the family
- Everyone in the family equally
- Other, please specify... ______________________

*Approximately how old was your most recently acquired rabbit when you got him/her?
Note: please enter a number only Eg. Years: 2 and Months: 6
Years: ______________________
Months: 

**II a: Housing Questions**

**How is your rabbit housed?**
- Free range in all of the house
- Free range in most of the house (ex. some restricted areas in house)
- Free range in a room
- In a cage (closed top)
- In a pen (open top)
- Custom built
- Other, please specify... ______________________

*Where did you get your rabbits enclosure?*
Note: enclosure is the space your rabbit is contained to (ex. pen, cage, crate etc.)

- Pet shop
- Friend
- Homemade
- Online
- Not applicable, my rabbit does not have an enclosure
- Other, please specify... ______________________

**What type of floor does your rabbits housing have?**
Select any that apply.

- Plastic
- Carpet
- Wood
- Laminate
- Wire
- Vinyl
- Sheets/blankets
- Bedding/litter
- Other, please specify... ______________________
Does your rabbit's housing have any kind of platform or ramp to jump up on?
  o  Yes
  o  No

Does your rabbit's housing have a covered place for your rabbit to rest or hide?
  o  Yes
  o  No

How much time does your rabbit spend out of its enclosure?
  o  None
  o  Less than 30 minutes
  o  30 minutes to 1 hour
  o  1 - 3 hours
  o  More than 3 hours
  o  Not applicable, my rabbit does not have an enclosure

How often do you clean your rabbit's housing area?
  o  Every day
  o  A few times a week
  o  Once a week
  o  Once every other week
  o  Once a month
  o  Less than once a month

If your rabbit has a litter box, how often do you clean your rabbit's litter box?
  o  Every day
  o  A few times a week
  o  Once a week
  o  Once every other week
  o  Once a month
  o  Less than once a month

Do you provide your rabbit with any toys?
Note: a toy can be anything you provide to occupy your rabbit, play with or chew.
  o  Yes (specify): ______________________
  o  No
*Does your rabbit chew any part it's housing?*
Select any that apply.

- No
- Wood
- Wire/bars
- Carpet
- Blanket
- Cardboard
- Plastic
- Other, please specify... ______________________

**What type of litter do you use in your rabbit's litter box/cage?**
Note: If you use a mixture, select any that apply.

- Wood shavings
- Newspaper material
- Fibrous material
- Paper based
- Other, please specify... ______________________

**II b: Outside Access**

*Does your most recently acquired rabbit live outside?*
- Yes
- No

*If your rabbit lives indoors, do you ever bring your rabbit outside?*
- Yes
- No

*How often does your rabbit go outside?*
- Daily
- Weekly
- Monthly
- Seasonal
- Yearly
*Does your rabbit have access to it's housing when outside?*  
Ex. a run or free access back to it's housing/sheltered area  

○ Yes  
○ No  

*What factors influence whether you allow your rabbit outside?*  
Select any that apply.  

☐ Weather  
☐ Someone in the house (ex. allergies)  
☐ Predators  
☐ Digging  
☐ Time  
☐ Other, please specify... ______________________

*Where does your rabbit rest when outside?*  
Select any that apply.  

☐ Under shelter/brush  
☐ Along an edge in the open  
☐ In shallow grass  
☐ My rabbit doesn't rest outside  
☐ Other, please specify... ______________________

*Does your rabbit display any of the following behaviours when outside?*  
Select any that apply.  

☐ Digging  
☐ Grazing  
☐ Eating shrubs/other plants  
☐ Fast hopping/running  
☐ Resting  
☐ Sleeping/dozing  
☐ Any other behaviours: ______________________

**II c: Inside Access**

*Is your most recently acquired rabbit allowed to roam freely in areas of your house?*  
Note: access beyond his/her housing area.
*How often is your rabbit allowed inside?*
- Daily
- Weekly
- Monthly
- Seasonally
- Yearly

*What factors influence inside access?*
Select any that apply.
- Weather
- Supervision
- Flooring
- Other pets
- Urine/defication
- Other, please specify... ______________________

*What factors influence whether your rabbit is allowed to roam freely to areas of your house?*
Note: access beyond his/her housing area. Select any that apply.
- Supervision
- Flooring
- Other pets
- Urine/defication
- Type of furniture
- Ability to rabbit-proof areas
- Other, please specify... ______________________

*Have you tried to litter train your rabbit?*
- Yes
- No
*Is your rabbit litter trained?
  o Yes
  o Urine only
  o Feces only
  o No

*Does your rabbit make a mess (urine/feces) where it's not supposed to?
  o Yes
  o Sometimes
  o No

*Has your rabbit ever chewed/scratched anything undesirable?
Select any that apply.

- No
- Electric cables
- Wallpaper
- Wood
- Carpet
- Mats
- Shoes
- Baseboards
- Furniture
- Other, please specify..._____________________

II d: Diet

*Do you feed your most recently acquired rabbit any concentrate food?
Note: concentrate food is food in the form of a pellet.
  o No
  o Pellets (uniform)
  o Mix (ex. pellets with corn or seeds)

In cups (250mL measuring cup), how much concentrate food does your rabbit eat per day?
Note: please enter a number or fraction only (ex. 1/4)
Cup(s):  

*Does the concentrate food have a brand name?  
○ Yes (specify): ________________________  
○ No  

*Where do you buy your rabbit's concentrate food?  
○ Pet shop  
○ Veterinarian  
○ Grocery store  
○ Bulk foods store  
○ Other, please specify... ________________________  

*If you feed a mix, does your rabbit favour any part(s)?  
Select any that apply.  

☐ Pellets  
☐ Grains  
☐ Oats  
☐ Corn  
☐ Peas  
☐ Beans  
☐ Biscuits  
☐ Other, please specify... ________________________  

*If you feed a mix, does your rabbit reject any part(s)?  
Select any that apply.  

☐ Pellets  
☐ Grains  
☐ Oats  
☐ Corn  
☐ Peas  
☐ Beans  
☐ Biscuits  
☐ Other, please specify... ________________________
*Have you changed your rabbits diet during it's life?
  o  Yes
  o  No

*What influenced your decision to change your rabbits diet?

_____________________________________________________________________________
_____________________________________________________________________________

*Do you give your rabbit any supplements?
For example: vitamins or minerals

  o  Yes
  o  No

*If yes, what type of supplement(s) do you use?
Select any that apply.

  □  Salt block
  □  Papaya Enzyme
  □  Mineral block
  □  Other, please specify... ______________________

*Does your rabbit have hay available?

  o  Yes
  o  No

If yes, how much hay does your rabbit get daily?

  o  A handful
  o  A few handfuls
  o  As much as he/she can eat (ex. available at all times)

*Does your rabbit have water available at all times?

  o  No
  o  Yes, a bottle
  o  Yes, a bowl

*Do you ever give your rabbit vegetables?

  o  Yes
  o  No

*If yes, what types of vegetables do you feed?

_____________________________________________________________________________
_____________________________________________________________________________
*If yes, how often do you feed vegetables?
○ Twice a day
○ Once a day
○ A few times a week
○ Other, please specify... ______________________

If you give your rabbit treats, what kind of treats do you feed your rabbit?
Select any that apply.

☐ Nuts
☐ Fruits
☐ Seeds
☐ Dried fruits
☐ Carrots
☐ Pet store packaged treats, please specify: ______________________
☐ Other, please specify... ______________________

*Do you ever give your rabbit anything else to eat?
○ Yes (specify): ______________________
○ No

II e: Behaviour

*On a scale of 1 to 100, how confident are you handling your rabbit?
1 = Not confident ------------------------------------------ 100 = Very confident

*On a scale of 1 to 100, how easy is it for children to handle your rabbit?
Note: if your rabbit is never handled by children you may leave blank
1 = Very difficult ------------------------------------------ 100 = Very easy

*How often do you handle your rabbit per day?
○ Once
○ 2 - 3 times
○ 4 - 5 times
○ 6 - 7 times
○ More than 7 times

On a scale of 1 to 100, how easy is it to catch your rabbit?
1 = Very difficult ------------------------------------------ 100 = Very easy
On a scale of 1 to 100, how confident are you picking up your rabbit?
1 = Not confident ------------------------------------------ 100 = Very confident

*Does your rabbit get his/her nails trimmed?
  ○ Yes
  ○ No

*How often do you groom your rabbit?
  ○ Weekly
  ○ Monthly
  ○ Seasonally
  ○ Yearly
  ○ Never

If you groom your rabbit, on a scale of 1 to 100 how easy is it?
1 = Very difficult ------------------------------------------ 100 = Very easy

How much time do you spend with your rabbit per day?
Ex. near by or in the same room
  ○ None
  ○ Less than 30 minutes
  ○ 30 minutes to 1 hour
  ○ 1 - 3 hours
  ○ More than 3 hours

How much time do you spend interacting with your rabbit per day?
Note: interacting in close contactEx. playing, socializing, sitting with, petting etc.
  ○ None
  ○ Less than 30 minutes
  ○ 30 minutes to 1 hour
  ○ 1 - 3 hours
  ○ More than 3 hours

*How would you describe the personality of your rabbit in three words?
1. 
2. 
3. 

168
On a scale of 1 to 10, please select your agreement with the following statements (1 = strongly disagree and 10 = strongly agree).

Rabbits make good pets for children. ____________
Rabbits make good pets for adults. ____________
I would not recommend rabbits as pets. ____________

II f: Veterinary History

*Has your rabbit ever been to the vet?
○ Yes
○ No

Do you take your rabbit for regular veterinary check-ups?
○ Yes
○ No

How often do you take your rabbit to the vet?
○ Never
○ For emergencies only
○ As needed for healthcare
○ Other, please specify... ______________________

If your rabbit became very ill, what is the maximum amount of money you would be willing to spend on veterinary care if your rabbit had a 90% chance of returning to good health?
○ $50
○ $100
○ $200
○ $500
○ $1000
○ I would not have a maximum price

If your rabbit became very ill, what is the maximum amount of money you would be willing to spend on veterinary care if your rabbit had a 50% chance of returning to good health?
○ $50
○ $100
○ $200
○ $500
○ $1000
I would not have a maximum price

If your rabbit became very ill, what is the maximum amount of money you would be willing to spend on veterinary care if your rabbit had a 25% chance of returning to good health?

- $50
- $100
- $200
- $500
- $1000
- I would not have a maximum price

*Has your rabbit ever had any of the following conditions?*
Select any that apply.

- Dental disease
- Fur mites or dandruff
- Impacted caecotrophs or dirty bottom
- Maggots
- Abscess
- Gas
- Ear infection
- Stasis
- Urine burns
- Head tilt
- Respiratory issues
- Sticky eyes
- Paralysis/weak legs
- Sore hocks
- Other, please specify... _____________________

*Is your rabbit vaccinated?*

- Yes
- No

Does your vet specialize in rabbits?

- Yes
On a scale of 1 to 100, please rate how confident are you in your vet's knowledge of rabbits.
1 = Not confident ------------------------------------------ 100 = Very confident

II g: Rabbits living with companions

Please answer the following questions about the rabbit companion(s) your rabbit lives with.

*Does your rabbit have a rabbit companion(s)?
  o Yes
  o No

Are your rabbits bonded together?
  o Yes
  o No
  o I don't know

*On a scale of 1 to 100, how would you rate the relationship between your rabbit and its companion(s)?
  1 = Not close at all ------------------------------------------ 100 = Very close

How is your rabbit and its companion(s) housed?
  o In the same cage/pen
  o In different cages/pens within sight of each other
  o Free range together
  o In different rooms (ex. out of each others sight)
  o Other, please specify... ______________________

III: Challenges with rabbit ownership:

Please answer the following questions to the best of your ability. There are no right or wrong answers.

Have there been any aspects of rabbit ownership you have found to be difficult?
  o Yes
  o No

If yes, please explain which aspects were difficult.
______________________________________________________________
Have you been able to overcome the challenges you have faced in owning a rabbit(s)?
- Yes
- No
- In the process of overcoming challenges

**How did you overcome these challenges?**
______________________________________________________________________________
__________________________________________________________________

If you have children, have you had to face pressure from your children to get a rabbit?
- Yes, please explain: ______________________
- No

Have you ever thought about no longer owning your rabbit(s)?
- Yes
- No

Have you ever had to give away, surrender or return a pet rabbit you've owned?
- Yes
- No

What was the reason you had to give away, surrender or return a pet rabbit?
______________________________________________________________________________
__________________________________________________________________

Have you ever had to sell a pet rabbit you've owned?
- Yes
- No

What was the reason you had to sell a pet rabbit?
______________________________________________________________________________
__________________________________________________________________

**IV: Questions about pet rabbits in general**

Please answer the following questions to the best of your ability.

**Angora rabbits make great pets for first time rabbit owners.**
- True
- False

**Rabbits show signs of heat stress when temperatures approach 80 degrees (27 degrees Celsius).**
- True
- False
**Larger rabbits require a larger cage than smaller rabbits.**
- True
- False

**Rabbits over 1 year of age should be fed a high calcium diet.**
- True
- False

**Rabbits hide discomfort because they are prey species.**
- True
- False

**Store bought packaged treats are a healthy treat for rabbits.**
- True
- False

**Spaying female rabbits is a difficult procedure and is often not recommended.**
- True
- False

**Rabbits can be litter box trained.**
- True
- False

**In general, cages with only wire mesh floors are hazardous.**
- True
- False

**Rabbits can be in cages all the time if the area is large enough to hop around in.**
- True
- False

**Rabbits over 1 year of age should be fed a high fibre, low carbohydrate diet.**
- True
- False

**Rabbits can regulate body temperature even at extreme temperatures.**
- True
- False

**The larger the rabbit, the longer they live.**
- True
- False
**Intact male rabbits mark objects by "spraying" them.
- True
- False

**Rabbits do not need to visit a veterinarian.
- True
- False

**It is easy to tell when rabbits are in pain.
- True
- False

**Rabbits have low bone density, making them susceptible to back fractures and broken limbs.
- True
- False

✗**Female rabbits ovulate regularly once every month.
- True
- False

**It is normal for rabbits to have runny eyes.
- True
- False

**Generally, rabbits are solitary animals and like to be by themselves.
- True
- False

**Rabbits will resort to destructive behaviour if they are bored.
- True
- False

**It is alright to let a child be the primary caretaker of a rabbit.
- True
- False

**Rabbits have a scent gland under their chin they use to mark possessions.
- True
- False

**A rabbit's teeth naturally wear down, so they do not need to have them checked.
- True
- False
**It is alright to pick up a rabbit by their ears if you support their back end.**
- True
- False

**What is an appropriate choice of diet for a rabbit less than 1 year old?**
- Alfalfa hay
- Timothy pellets
- Grass hay
- All of the above

**What is the average lifespan of an indoor rabbit?**
- 1 - 2 years
- 3 - 5 years
- 6 - 12 years
- 13 - 16 years

**To decrease chances of leaping out of arms, rabbits should be...**
- put down with their backend first.
- picked up by their scruff and placed on the ground.
- put down facing forward.
- it's alright to let them leap out of arms.

**Which bedding type is not recommended for lining rabbit cages?**
- Hay
- Pine chips
- Fiber-based
- Recycled newspaper

**Rabbits reach sexual maturity...**
- between 2 and 3 months.
- between 3 and 6 months.
- between 8 months and 1 year.
- by 2 years of age.

**Spaying female rabbits...**
- can decrease behavioural problems.
- reduce their chances of getting uterine cancer.
- eliminate unwanted litters.
**Which of the following health concerns can be helped through a change in diet?**
- GI stasis
- Respiratory illness
- Head tilt
- Internal parasites

**Rabbits should get exercise outside of the cage:**
- Once a week
- Twice a week
- Every day
- They do not need exercise outside of the cage

**Pellets should be rationed according to a rabbit's:**
- Weight
- Height
- Ability to finish what is given to them
- Pellets should be unlimited

**Generally, rabbits are considered seniors at age:**
- 3
- 4
- 5
- 6

**Enrichment with toys:**
- Prevents boredom
- Increases destructive behaviour
- Reduces bonding with human caretaker
- All of the above

**Rabbits are most active:**
- Throughout the day
- At night
- In the morning
- At dawn and dusk
**When rabbits thump their back legs, this means that they feel:**
- Happy
- Tired
- Threatened
- Content

**Rabbits should be given an unlimited amount of:**
- Timothy-based pellets
- Leafy greens
- Fresh fruits
- Good-quality hay

✗ **Spaying and neutering of rabbits...**
- can reduce the likelihood of cancers.
- will create behavioural problems.
- is not recommended.
- will have no health benefits.

**An appropriate toy for rabbits is:**
- Treated wood blocks
- Hard baby keys
- Redwood twigs
- All of the above

**Ideally, rabbits should be held...**
- in a loose grip.
- away from the body.
- by the scruff.
- supporting their back end.

✗ **The adult weight of a mini-lop rabbit is how many pounds?**
- 2
- 6
- 8
- 12

**The majority of an adult rabbit's diet should be:**
- Mixed-ration pellets (ex. pellets with seeds)
o Good quality hay
o Leafy greens
o Fresh fruits

**Carrots are a good source of nutrition for rabbits.**
o True
o False

**V: Please tell us whether you agree or disagree with some very brief statements about your current pet rabbit(s).**

For each statement, check whether you strongly agree, somewhat agree, somewhat disagree, or strongly disagree. You may refuse to answer.

***My rabbit means more to me than any of my friends. __________
***Quite often I confide in my rabbit. __________
***I believe that rabbits should have the same rights and privileges as family members. __________
***I believe my rabbit is my best friend. __________
***Quite often my feelings toward people are affected by the way they react to my rabbit. __________
***I love my rabbit because he/she is more loyal to me than most of the people in my life. __________
***I enjoy showing other people pictures of my rabbit. __________
***I think my rabbit is just a rabbit. __________
***I love my rabbit because it never judges me. __________
***My rabbit knows when I’m feeling bad. __________
***I often talk to other people about my rabbit. __________
***My rabbit understands me. __________
***I believe that loving my rabbit helps me stay healthy. __________
***Rabbits deserve as much respect as humans do. __________
***My rabbit and I have a very close relationship. __________
***I would do almost anything to take care of my rabbit. __________
***I play with my rabbit quite often. __________
***I consider my rabbit to be a great companion. __________
***My rabbit makes me feel happy. __________
***I feel that my rabbit is a part of my family. __________
***I am not very attached to my rabbit. __________
***Owning a rabbit adds to my happiness. __________
***I consider my rabbit to be a friend. __________

VI: Finally, a few questions about you!

Please indicate your gender:
○ Male
○ Female
○ Other

Please indicate your current age:

Please enter the country where you currently reside:
○ Canada
○ USA
○ Other, please specify... ______________________

Please enter the province or state in which you currently reside:

Please indicate the type of residence that best captures where you currently reside:
○ Apartment/condo
○ Attached house/town home
○ Detached house
○ Other, please specify... ______________________

Please indicate the number of children and adults residing in your household:
Note: please enter numbers only. Ex. Children: 1 and Adults: 3
Children (under 18): ______________________
Adults (18 and over): ______________________

Please indicate the highest level of education you have completed:
○ Less than high school, no diploma
○ Graduated high school
○ Some college/university, no diploma
○ Trade/technical/vocational training
○ Graduated college/university (ex. Bachelor's degree)
○ Attended graduate or professional school (ex. Master, Ph.D, MD, Lawyer)

Please indicate your current annual household income:
○ Under $19,000
○ $20,000 - $39,000
○ $40,000 - $59,000
○ $60,000 - $79,000
○ $80,000 - $99,000
○ $100,000 and over

Where did you find out about this survey?
○ Pet store
○ Rescue group
○ Breeder
○ Online classifieds
○ Group forums
○ Rabbit education group
○ Rabbit welfare group
○ Animal group
○ University
○ A friend
○ Other, please specify... ______________________

Once you click "submit" you will be directed to a page where you can enter your contact information to be included in the prize draw for $50 (odds are 1 in 100).

Note: your contact information will not be linked to this survey, therefore, your responses will remain anonymous. If you wish to follow-up with the researcher at a later date to obtain results of the study please contact Tasha Welch at welcht@uoguelph.ca