

1 **Understanding the context for pet obesity; self-reported beliefs and factors influencing**
2 **pet feeding and exercise behaviour among pet owners**

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16 **Abstract**

17 **Background:** Pet obesity contributes to increased risk of various diseases, such as cancer and
18 diabetes mellitus as well as worsening of orthopaedic problems, and a reduction in survival
19 rate. Changes in feeding regimes and increased amounts of exercise have been an important
20 component of weight management programs. This study identifies the self-reported beliefs
21 and factors that influence owner behaviour around feeding and exercising their pet. Pet
22 owners were recruited through six different private veterinary practices (three city practices;
23 two in regional towns; and one in a rural area).

24 **Methods:** An interview-administered survey questionnaire and focus group discussions were
25 conducted for the study. Data was coded and managed using Nvivo 8 qualitative data analysis
26 software.

27 **Results:** Seven focus groups were conducted with 43 participants in total. Feeding one's pet
28 is influenced by beliefs about pet specific needs and pet food and pet health, pet owners'
29 perceived control over the feeding regime, and the implications for feeding for the pet owner.
30 Treats are used in the absence of owner control over pet begging and emotional attachment,
31 and to influence pet behaviour. Pet exercise is influenced by beliefs about pet specific
32 exercise needs, and the implications of exercising one's pet for the pet owner.

33 **Discussion:** Beliefs, and barriers to appropriate feeding and exercise are useful in explaining
34 pet owners' behaviour and are; associated with the level of control over the feeding regime,
35 control relating to pet behaviour, and the perceived ease of feeding and exercise.
36 Understanding owner behaviours on feeding and exercise allows for a more targeted
37 approach to preventing and treating pet obesity.

38 **Introduction**

39 Obese and overweight pet dogs and cats are a growing problem in higher income countries,
40 with studies showing that between 20-40% of pets are categorised as either overweight or
41 obese developed countries (Edney & Smith, 1986; Lund et al., 2005, 2006; McGreevy et al.,
42 2005; Colliard et al., 2006, 2009). For the purpose of the paper, pet obesity is defined as an
43 accumulation of adipose tissue mass in the body (German, 2006; German et al., 2010).
44 Obesity is the most common nutritional disorder in pet dogs and cats, leading to a series of
45 adverse health consequences including an increased risk of various diseases, such as cancer
46 and diabetes mellitus, a worsening of existing orthopaedic problems, and an overall reduction
47 in survival rates (Sloth, 1992; Klinkenberg, Sallander & Hedhammar, 2006; Zoran, 2010;
48 Laflamme, 2012).

49 Obesity in pet dogs and cats has been associated with certain socio-demographic profiles,
50 including older pet owners, female owners, low income households (Lund et al., 2005, 2006;
51 Colliard et al., 2006; Laflamme, 2012), and increasingly there is strong evidence to suggest a
52 correlation between levels of obesity in humans and obesity levels in pets (Kushner et al.,
53 2006). The human-animal bond, close relationships between owners and their pets and the
54 over-humanization of pets can have negative consequences for levels of pet obesity. This can
55 result in inappropriate feeding behaviour, which in turn influences pet obesity levels (Lund et
56 al., 2005, 2006; Laflamme, 2012). In particular, treats are often used by pet owners as an
57 expression of affection towards their pets, and unsurprisingly, this practice has been
58 identified as a risk factor of pets being overweight (Kienzle, Bergler & Mandernach, 1998;
59 Robertson, 2003; Gibbs, 2008).

60 In addition to these variables, owner beliefs about their level of control over the pet's
61 behaviour, their knowledge about appropriate feeding, and their beliefs around pet exercise
62 are important in explaining owner behaviour towards their pets (Rohlf et al., 2010). For
63 example, owners of obese dogs were more likely to attach less importance to exercise and
64 balanced nutrition than owners of normal weight dogs (Kienzle, Bergler & Mandernach,
65 1998). Pet-specific perceptions are also important in explaining the reasons for pet obesity –
66 the larger the dog is perceived to be, the greater the amount of food that the pet is given
67 (Kienzle, Bergler & Mandernach, 1998). Perceived control over feeding and exercise is also

68 important. Kienzle, Bergler and Mandernach (1998) showed that owners who believe they
69 have control over feeding were more likely to have strong intentions to feed appropriately.
70 Changes in feeding regimes and increased amounts of exercise have been an important
71 component of weight management programs, especially in dogs (Roudebush, Schoenherr &
72 Delaney, 2008; Courcier et al., 2010). As with perceived control over feeding one's pet,
73 owners that felt in control of their dog's behaviour were more likely to exercise
74 appropriately. The more that dog owners identified barriers to exercising their dog (e.g. lack
75 of time, poor access to space to exercise one's dog, etc.), the less likely was their intention to
76 exercise (Rohlf et al., 2010).

77 There are implications for the role of the veterinarian in counselling and advising pet owners
78 to follow appropriate behaviour for the health and wellbeing of their pet. Pet owners may not
79 recognise that their pet is overweight, and this can result in discrepancies between the pet's
80 weight as perceived by the pet owner and that as evaluated by their veterinarian (White et al.,
81 2011). Differences also exist in expectations between the pet owners and the veterinarians
82 regarding obesity management strategies (Bland et al., 2010). These problems are
83 accentuated by the reported differences in veterinary practice around weight evaluation with,
84 for example, some dogs being infrequently weighed, bodyweight not commonly assessed and
85 owners not always being told their dog's weight classification (McGreevy et al., 2005;
86 German & Morgan, 2008). Veterinarians play an important role in providing information to
87 pet owners on appropriate feeding and weight management for their pets; however, this may
88 require additional methods of communication, rather than just providing verbal information
89 (Colliard et al., 2006; White et al., 2011).

90 Understanding owner behaviours concerning pet feeding and exercise on feeding and
91 exercise allows for a more targeted approach to preventing and treating pet obesity. The
92 objective of this study was to identify the self-reported beliefs and factors that influence
93 owner behaviour around feeding and exercising their pet.

94 **Material and methods**

95 **Study design**

96 Research ethical approval was granted by the University College Dublin (UCD) Human
97 Research Ethics Committee. Participants were required to sign a written form of consent. In
98 this study, qualitative research methods, in the form of focus groups, were used.

99 **Participant recruitment**

100 Pet owners were recruited through six different private veterinary practices (three city
101 practices; two in regional towns; and one in a rural area). The practices selected were a
102 convenience sample to ensure compliance and each agreed to participate in the study. Seven
103 focus groups were conducted with 43 participants in total; three to nine participants in each
104 group.

105 **Data collection**

106 Information on pet owner demographics (age, location, type of dwelling, and household
107 composition) and pet demographics (type and number of pets in participating households)
108 were collected using a survey, prior to the commencement of focus groups.

109 A topic guide was used to direct focus group discussion. Questions were asked on views and
110 decisions on pet neutering; feeding and weight control; and pet exercise. A topic guide was
111 used during the focus group process as follows:

- 112 • Why do you have a pet?
- 113 • Why did you choose that type of pet?
- 114 • What are your views on neutering dogs and cats?
- 115 • What influenced your decision to have your pet neutered or not?
- 116 • What are your views on pet diets, both homemade and commercial?
- 117 • What factors influence the weight of your pet?
- 118 • How do you feel about exercising your pet?

119 Results on pet owners perceptions of pet neutering are reported elsewhere (Downes et al.
120 submitted). All focus groups were audio-recorded and transcribed. The coding and the
121 analysis process were assisted using Nvivo 8 (© QSR International Pty Ltd 2007) qualitative
122 data analysis software. Basic codes were developed that described the content of the focus
123 groups. Following this, second-level categories were formalised that provided a human

124 science explanation and interpretation of the data, and lastly, these categories were grouped
 125 together to form broad analytical themes.

126 **Results**

127 Table 1 presents the participant socio-demographic profile.

128 **Table 1: Socio-demographic profile for participating pet owners (N = 43)**

Socio-demographic variable		Frequency (%)
Age	18–24	3 (7.0)
	25–34	7 (16.3)
	35–44	5(11.6)
	45–54	8 (18.6)
	55–64	14 (32.6)
	65+	6 (14.0)
	Total	43 (100.0)
Gender	Female	30 (69.8)
	Male	13 (30.2)
	Total	43 (100.00)
House Type	Apartment	1 (2.3)
	Detached	18 (41.9)
	Semi detached	13 (30.2)
	Terraced house	9 (20.9)
	Missing	2 (4.6)
	Total	43 (100.00)
Household Composition	Lone parent with children	3 (7.0)
	Married or Cohabiting couple	11 (25.6)
	Married or Cohabiting couple with children	13 (30.2)
	Mixed non-family household	8 (18.6)
	One person	8 (18.6)
	Total	43 (100.0)
Marital Status	Cohabiting	3 (7.0)
	Divorced or Separated	2 (4.7)
	Married	18 (41.9)
	Single	20 (46.5)
	Total	43 (100.0)
Urban/Rural Location	Rural	15 (34.9)
	Urban	28 (65.1)
	Total	43 (100.0)

129 **Bold** = most frequent category

130 **Beliefs and self-reported factors influencing pet feeding**

131 Feeding one's pet – Beliefs about pet specific needs

132 Pet-specific attitudinal beliefs are clear among participant statements. Cats are described as
133 'grazers', and are perceived as being more in control of their food intake. In comparison,
134 dogs are perceived as being less in control and more likely to overeat, therefore greater
135 monitoring of dog food intake was reported. A minority of owners refer to concepts like
136 animal genetics and animal nature to describe the weight of the pet:

137 *'It's in [pet dog] nature, she is big boned and loose skinned and the other dog is the*
138 *opposite. I think some dogs; it is in their nature and some cats. It is very difficult to*
139 *control weight, you can feed them the exact same and one will put on weight and one*
140 *will lose weight'.*

141 Feeding one's pet - beliefs about pet food and associated pet health

142 The types of food used was influenced by pet owner beliefs of what is necessary for good pet
143 health and wellbeing, and this was influenced by how owners perceive the tangible health of
144 their pet.

145 *'I think the cat is allergic to a lot more... we put her on dried food....but if she doesn't*
146 *like it, she won't eat it. So I tried putting her on some other kind of wet food. It's for*
147 *her stomach, there's no meat, there's no milk & all that type of thing. She's very*
148 *picky'.*

149 This owner explains that meat was given to lactating and pregnant female dogs, *'but*
150 *otherwise [the dogs] get just the nuts, they're all in good conditions, with shiny coats, if there*
151 *was any problems I would change the diet, I have no skin trouble'.* Again noting how healthy
152 her cat was, this owner explains that the cat *'lives on [food type], he gets it dry and some*
153 *canned and he is very happy with a little bit of fresh chicken, his coat is very healthy, he's*
154 *fine'.* Discussion was had on the effectiveness of current, popular diets in comparison to past
155 diets (comprising of household leftovers, and vegetable waste):

156 ‘[the dog] lived to a great old age and he got nothing only what came out of the
157 house, big pots of spuds [potatoes] put on for them’.

158 ‘I had another [type of dog]. He only got scraps and he lived to be 16 years or maybe
159 17’.

160 Comments reflect a possible distrust of processed pet foods, especially as past diets prepared
161 at home by the owner did not seem to impact negatively on the pets’ health. These statements
162 show that positive perceptions of pet health, based on an evaluation of tangible signs,
163 reinforce pet owners’ positive beliefs around feeding behaviour.

164 Feeding one’s pet - perceived control over the feeding regime

165 Owner control over feeding was undermined by other people’s feeding behaviour towards the
166 pet. Taking place predominantly among dog owners, this lack of control takes place in
167 households where there is more than one occupant and when the pet spends time with
168 individuals other than the owner. These dog owners explained:

169 ‘My mother is a firm believer of spoiling dogs... I’ve been feeding them [food type]
170 but my mother says that when the dog isn’t eating the food, he doesn’t like that food.
171 She gives them all the bits from the dinner. I know when my mother has given them
172 food because they won’t eat ... I’m fighting a losing battle with my mother’.

173 ‘The dog used to go up to my father’s; he was spoiled, grilled rashers. [My father
174 would] say ‘oh yeah, [the dog] prefers boiled sausages this week, and chicken. [My
175 father] used to give [the dog] everything, steak, and he was getting fatter’.

176 ‘It is very hard when somebody else is giving food [to the dogs], even after you tell
177 them ‘no’, the vet said not to’. My friend comes [to my house], I see her buttering
178 bread, it’s for the dog... so now I have to put [the dog] out when we’re eating... she
179 keeps going under the table with food’.

180 This cat owner commented:

181 ‘[The cat] is 4 months. He is at the table every minute of the day. It is because my

182 *brother, my mother and my father are insisting on giving the bit of chicken or the bit*
183 *of skin, “ah look he loves it” ’.*

184 Owners believed that having one person in the household with sole responsibility for feeding
185 the pet was a certain way of maintaining a normal weight. One dog owner mentioned the
186 benefit of keeping a feeding calendar:

187 *‘I live with two other people, so we have a calendar... mark that she [the cat] has had*
188 *her breakfast, she has had her dinner so that she is not getting fed by everyone’.*

189 Difficulties were reported around monitoring food intake of individual animals if there were
190 two or more pets in the household and this could lead to one pet eating the other pets’ food,
191 and hence putting on too much weight. A perceived lack of control was evident in
192 participants’ statements on how pets (specifically, cats) *steal* food, or have a particular taste
193 for some food items, without much reference to the owner’s control over what the pet was
194 allowed eat.

195 *‘[the cats] like chicken and hamburger and whatever they can steal from you’*

196 *‘If there’s left over curry, [the cat] will eat that’.*

197 *‘My cat eats an awful lot of tuna and just loves it. No matter what I give him, when*
198 *the tuna comes out he would nearly take the door off the fridge just to get at tuna. He*
199 *loves it every time’.*

200 Feedings one’s pet – perceived implications for feeding

201 The importance of convenience for the owner only features in a small number of comments
202 on choice of diet for their pets. Comments related to; convenience around food preparation,
203 environmental (housing) requirements, longevity of particular food types, and cost. The
204 following were examples of quotes reflecting the influence on convenience on owner’s
205 choice of diet:

206 *‘It’s cheaper to get mince meat and cook it up. In [retail outlet], you get the cheap*
207 *reduced sections of chicken. It’s probably better than the dog food. Sometimes, I go to*

208 [retail outlet], and get the tins of dog food for them. It works out cheaper, feeding
209 them the mince than the [food from the] tins...’.

210 ‘The advertisement on the bag, with the indoor formula assuring that low stool odour
211 - when you live in a small flat in [other EU country], it is important...’.

212 ‘It is convenient. The reason that I started on the [food type] is that you could get it
213 in 10 [kg] packets which, with only two cats to start off, it is a lot of cat food. It would
214 last you a while, don’t have to buy cat food every day. You can have it delivered. It
215 turns up a week later with all your cat food. They might think you are odd buying 40
216 or 50 kg of cat food at a time but the bags don’t go off for a year or so, throw them
217 under the stairs’.

218 Use of treats - perceived control over pet begging and emotional attachment

219 A failure to ignore begging for food, and an emotional attachment to the pet, resulted in
220 giving treats and food when the pet was present during pet owner meal times.

221 ‘ [The dog] gets a little square of toast in the morning, when I’m having mine she sits
222 beside me waiting for her bit to be given to her, that is her one regular treat that she
223 gets...’.

224 ‘She’s [the cat] is there looking at you, and you feel so sorry for her’.

225 ‘I always buy the chocolate drops especially for dogs because when you are watching
226 TV on a Saturday, and you’ve got your chocolate out, the dog is begging for theirs,
227 have to have the treats for the dogs as well’.

228 Hand-feeding was also used where it is reported that the pet was underweight:

229 ‘One of my dogs loves to be hand fed, she is a very fussy eater, she’s very finicky. If
230 she has not eaten for two days, I just have to hand feed her...’.

231 These results also point to a relationship between food and affection for the pet, and how this
232 affection influences control over the feeding regime.

233 Use of treats – influencing pet behaviour

234 Treats were used as a way of influencing the pet's behaviour, such as tempting the pet into
235 the owner's house or encouraging greater food intake. The use of treats may be in response to
236 a low perceived control over pet behaviour and pet feeding.

237 *'[The cat] won't come in [into the house], so the only way I can get him in is by tuna, I*
238 *only give him a little bit, maybe a tablespoonful, he gets that quite often, tinned tuna,*
239 *normal that I would eat... I need to get him in cause he goes out the front [of the*
240 *house] and his days will be numbered'.*

241 *'To get her [the cat] to be tempted to want to eat her dinner, you have to add a desert*
242 *spoonful of the wet food as well'.*

243 Similarly, treats were also used to reward particular types of pet behaviour, behaviour that is
244 perceived as appropriate by the owner:

245 *'When I'm leaving [the dog] behind, its standard practice, she has to get a dog biscuit*
246 *to mind the house. She hasn't turned the house up yet, so it must be working'.*

247 *'I wanted to have something [in the diet] just for the sake of having something*
248 *different. [The cat] is on heart tablets at the moment, so he gets the tuna. And he gets*
249 *that with tablets, as a little treat. A reward for taking his tablets'.*

250 **Beliefs and self-reported factors influencing pet exercise**

251 Exercising one's pet – Beliefs about pet specific exercise needs

252 There were clear differences between owners' beliefs towards the exercise needs of cats, and
253 those of dogs. The general consensus among pet owners was that cats tend to exercise
254 themselves and exercise can be facilitated through play. Cats were generally regarded as
255 sedentary animals with occasional bursts of skittish activity of running and playing, and this
256 was considered by most as sufficient. A minority of cat owners did play with their cats, or
257 reference was made to other individuals in the household playing with the cat. Exercise was

258 regarded mainly for owner enjoyment and to facilitate social interaction with the cat, rather
259 than as a means to facilitating exercise.

260 *'Cats get their own exercise because they chase one another. Tearing up and down*
261 *the stairs, in the bathroom, and wine glasses being broken... they get their own*
262 *exercise themselves'.*

263 *'We take mice out and balls in the kitchen, so the cat does play with things himself in*
264 *his own time, and he'll run up and down the garden, other times he'll just walk. I don't*
265 *really have a routine of exercise; it's up to him [the cat]'.*

266 A greater number of dog owners agreed that they needed to be actively involved in the
267 exercise of their dogs. The majority of dog owners reported exercising their dog at least once
268 a day, most commonly by walking or swimming. For some, reference to specific dog breeds
269 reflects owners' beliefs of what the dog requires to stay healthy, with emphasis placed on the
270 importance of space.

271 *'[The dog] tends to be a little bit chubby, but I think the [dog type] do tend to be*
272 *chubby. I'm just trying to keep it down. She gets a lot of exercise, plenty of swimming*
273 *and running on the beach every day'.*

274

275 However, as with cats, other participants reported that active play is sufficient exercise,
276 particularly when the dog has access to space and play activities.

277 *'No, I don't need to [exercise the dog], the [type of dog] plays football, she exercises*
278 *herself, they just run around, any of them will go hunting, after birds rats, anything,*
279 *rabbits whatever, and they'll run around the field'.*

280 In general, exercise regimes of dogs were influenced by owners' beliefs of what their pet
281 requires for development, wellbeing and health. Similarly, pets with particular health needs,
282 and/or older pets were often excused from engaging in exercise.

283 *'The dogs at home are not lazy, the only one who is a bitch of 14 years and she's deaf*

284 *so I don't mind her sleeping a lot, but the others are very active*'.

285 For others, exercising the dog was perceived as necessary in controlling the dog's energy and
286 perceived contentment levels.

287 '[The dog] *has to have [exercise] himself, he'd go mental otherwise*'.

288 '[The dog is] *a bundle of energy... like all dogs once they're walked, they're much*
289 *calmer for the rest of the day*'.

290 Allowing the dog to roam without being attached to a lead, and allowing dogs to play with
291 other dogs, was regarded as being more sufficient in exercising high energy dogs. Dog owner
292 comments reflect what was regarded as important for exercise. Overall, participant comments
293 reflected positive attitudes to pet exercise.

294 Exercising one's pet – negative implications of pet exercising for the pet owner

295 Though only reported by a minority of participants, exercise routines were undermined by
296 dog owner experiences of stress. This was associated with fears over aggressive
297 confrontations between dogs and dealing with behaviours that were difficult to manage (such
298 as pulling on the lead).

299 '*I find that stressful! ... Another dog coming or whatever, I just think - Oh this is*
300 *murder! I wouldn't enjoy myself as well...*'

301 '*The dog is strong on the lead and she has never really copped on to that, we never*
302 *properly trained her so she does pull a bit, especially if she sees other dogs so it's not*
303 *the most comfortable thing, and she doesn't get that much exercise from a walk*'.

304 '*It's stressful because the little terrier, ever since she was a pup, bites my legs, she*
305 *gets really excited and she only does it to me . When she gets outside the door, she*
306 *goes into play stance and then bites, and even the Rottweiler, he's kind of looking at*
307 *her and hitting her, trying to protect me from being bitten I suppose. Dragging me,*
308 *well she is so small she doesn't drag but she will try to pull me down the road*'.

309 Only one cat owner referred to a desire to exercise her cat; however, she explained: ‘I’m
310 afraid what people would think’.

311 Discussion

312 Overview

313 This study used qualitative research methods to explore the self-reported beliefs and
314 behaviours of pet owners around feeding and exercising their pets (cats and dogs). The
315 authors have found no other study in Ireland that has looked at feeding and exercise
316 behaviour among pet owners. Overall, the results show that attitudinal beliefs and factors
317 associated with the level of control over the feeding regime, control relating to pet behaviour,
318 and the perceived ease of feeding and exercise, are useful in explaining pet owners’ feeding
319 and exercise behaviour. Similar to the findings of Rohlf et al. (2010), subjective norms (i.e.
320 social pressures and the level of motivation to follow these) are not as apparent in pet owner
321 explanations on feeding and exercising of their pets. Only one pet owner referred to the social
322 consequences of what other people would think if she actively exercised her cat.

323 The feeding of one’s pet draws on specific beliefs about pet-specific behaviours, what is
324 needed for pet health and wellbeing, and how pet owners perceive tangible health signs.
325 Similarly, exercise behaviour draws on beliefs about what the specific pet (i.e. cat or dog)
326 requires. Cats were regarded as being self-sufficient, whereas exercise regimes for dogs were
327 influenced by owners’ beliefs of what their pet dog requires for development, wellbeing and
328 health. Overall, participant comments reflect positive attitudes to pet exercise and only a
329 minority of pet owners referred to difficulties experienced while exercising their dog.
330 Interestingly, barriers such as cost of pet food and the negative implications of exercising
331 one’s pet are only reported by a minority of pet owners. The reported ease of maintaining a
332 normal weight in pets is made difficult by a lack of control over the feeding behaviour of
333 other individuals who have access to the pet. A perceived lack of control is evident in
334 participants’ statements on how pets (specifically, cats) *steal* food, or have a particular taste
335 for some food items, without much reference to the owners control over what the pet is
336 allowed eat. In the absence of a lack of control over pet behaviour, treats are used to
337 influence and reinforce certain behaviours. The use of treats also reflects a failure to say ‘no’
338 to pets begging for food. Given the predominance of these two areas in explaining pet owner

339 feeding and exercise behaviour, the following discusses the implications for veterinary advice
340 and weight control.

341 **Implications for veterinary advice and weight control initiatives**

342 Veterinarians are in a unique position to communicate with animal owners about animal
343 health (Wensley, 2008). In order to address obesity, it is important for veterinarians to
344 understand why pet owners behave the way they do when feeding and exercising their pets.
345 This understanding will assist veterinarians in tailoring communication strategies and
346 initiatives around weight control (White et al., 2011). Results show that beliefs about pet
347 specific characteristics, pet needs, and the resulting perceptions of pet health and welfare are
348 important in explaining why particular diets are used. Factors such as palatability and diet
349 performance affect owners' perception of food (Sanderson et al., 2005). In this study, pet
350 health outcomes are important in reinforcing positive beliefs about certain feeding regimes
351 and food types. For example, healthy skin and hair condition are tangible outcomes that
352 justify choosing particular diets for owners. Understanding owner beliefs is important for
353 weight control initiatives and in order for owners to respond appropriately they need to
354 believe and acknowledge that the pet is overweight (Rohlf et al., 2010). This involves
355 recognition of the obesity problem, followed by preparing for change in feeding and exercise
356 behaviour and subsequently, implementation and maintenance of a disciplined programme of
357 weight reduction (Gibbs, 2008). Owner education and motivation is also crucial (Courcier et
358 al., 2010).

359 The results show differences in beliefs towards the exercise needs of specific pets, with dogs
360 receiving some exercise and play being deemed sufficient for cats. While owners do not
361 necessarily see the need to exercise their cat, time spent playing with a cat has been shown to
362 be an effective method of assisting weight control (Kienzle & Bergler, 2006). This is a
363 feature of pet cat ownership that can be further developed by veterinarians as part of a weight
364 management program; by explaining the benefits of playing with a pet cat, both for the pet
365 and the owner.

366 The giving of treats by other persons in the household reflects an expression of affection
367 (Gibbs, 2008). In this study, treats are used to reward and influence pet behaviour. Giving
368 human foods to pets during meal times and while food is being prepared is noted in the

369 results, and is presented by owners as being part of the routine of the owner-pet relationship.
370 Owners themselves may receive positive rewards from giving human food to their pet and so
371 the treat-giving is reinforced (Rohlf et al., 2010). This behaviour increases the risk of pet
372 obesity (Kienzle, Bergler & Mandernach, 1998; Robertson, 2003; German, 2006). Owners
373 who use play, rather than food, as a treat are more likely to have normal weight pets (Kienzle
374 & Bergler, 2006) and this message needs to be communicated by veterinarians in weight
375 management initiatives.

376 A lack of perceived control over the pet's feeding behaviour (such as stealing food) and the
377 pet having specific food tastes was apparent in this study. Counselling can be beneficial to
378 help owners build a greater sense of self-efficacy in managing their pet's diet and behaviour.
379 Given the problem of multiple feeders in a household, veterinary practices need to take into
380 account that in a multi-person household, with an overweight pet, more than one person may
381 be responsible for over-feeding the pet. These situations require weight counselling to include
382 all members of the household and not just the visiting pet owner. Encouraging a feeding
383 regime that requires only one person to be in control of all the food that the pet receives could
384 be beneficial. Given that owners often fail to complete a weight loss programme (Yaissle,
385 Holloway & Buffington, 2004), lifestyle management, strategies to assist animal owners and
386 continual monitoring of progress are important to maintain owner enthusiasm and
387 cooperation (Sloth, 1992; German, 2006).

388 It is important to recognise owners' level of perceived control over exercising and the reality
389 of access to open space. In this study, dog owners reported the benefits of allowing their dog
390 to exercise off the lead. However, encountering aggressive or large dogs while out walking is
391 a barrier for exercising a dog, as was negative interactions with people with children (Cutt,
392 Giles-Corti & Knuiiman, 2008). In Ireland, legislation is in place that states that dogs must be
393 kept on a lead at all times in a public place (Irish Statute Book, 1998). Encouraging greater
394 pet exercise requires the need for dog owners to have special areas where dogs can be safely
395 allowed to exercise and interact with other dogs without a lead. Recognising a dual obesity
396 epidemic (among owners and their pets), Kushner et al., (2006) highlight the effectiveness of
397 a combined *People and Pets Exercising Together* (PPET) programme on both owner and pet
398 weight reduction. There is potential for veterinary services to link with human medical
399 services (including nutritional care services) to adopt a combined approach to pet and owner

400 obesity reduction. Further, there is also potential for veterinary services to advice
401 professionals involved in human health care provision on involving pets in owner weight
402 reduction programmes (Brown & Rhodes, 2006; Kushner et al., 2006).

403 **Limitations in the study design and recommendations for future research**

404 Focus groups were deemed the appropriate method for data collection. This type of group
405 discussion enabled pet owners to share and compare experiences and opinions (Kitzinger,
406 1995; Gibbs, 1997). There were some limitations to the study. The sample was not stratified
407 by gender, and this led to an over representation of female owners. The sample was not
408 stratified by socio-economic group, though different geographical locations, urban and rural,
409 were chosen to minimise this bias. Recruitment was through private veterinary practices, and
410 therefore, it is probable that participants were more engaged in their pet's health.

411 Theory of Planned Behaviour (TPB) has been applied to understanding pet owner intentions
412 and their behaviour towards their pets (Rohlf et al., 2010; Toukhsati et al., 2012). According
413 to TPB, behavioural change requires changes in attitude and the use of behaviour-change
414 techniques. TPB was not applied to this study; however, the research findings are consistent
415 with the TPB in that behavioural beliefs and control beliefs do appear to underlie some of the
416 participants self-reported behaviour.

417 At the time of research, there was no prevalence rate for pet obesity in Ireland. In the absence
418 of this, the authors recommend that an indicator of prevalence be conducted, so as determine
419 the extent of the problem. Results from this study would add an insightful dimension to a
420 measurement of the prevalence of obesity.

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