The impact of husbandry on the welfare of pet guinea pigs in the UK

Guinea pigs are a commonly kept pet in the United Kingdom (UK) with an estimated 0.4 million currently owned based on pet ownership statistics [1]. Whilst the numbers of guinea pigs kept as pets are only slightly lower than for rabbits (0.6 million), comparatively little research has been conducted to investigate the health and welfare of this species in the domestic environment. When considering guinea pigs as a potential pet, there is a lot of information in the public domain from pet shops, pet food companies and animal charities. However, it is not clear how much of this information is evidence-based and owners may be accessing information of variable quality.

There are a number of factors that may impact the welfare of pet guinea pigs and incorrect husbandry and diet can commonly lead to ill health [2]. Furthermore, guinea pigs have specific social requirements and the presence of a conspecific has been shown to reduce stress [3]. This is important, as stress has also been implicated in common pathologies of guinea pigs, including the development of respiratory disease [4]. Some pertinent aspects of guinea pig husbandry have only been established more recently, for example, rabbits are no longer considered acceptable companions. Rabbits exhibit different social behaviours to guinea pigs, have the potential to injure them and can harbour diseases to which guinea pigs are susceptible [2,5].

A recent study identified that dental disease was the most common problem observed in guinea pigs presented to a veterinary practice [6], therefore, diet is paramount in maintaining good health and welfare in this species. In addition to requiring a constant supply of hay to promote tooth wear [7] and maintain gastrointestinal health [8], guinea pigs also require a dietary source of vitamin C to prevent the development of scurvy [9]. Housing of rabbits has received some attention in the published literature, with research concluding that rabbits did not always have access to exercise space, conspecifics or an appropriate diet [10]. Harrup and Rooney have now expanded this work to investigate the welfare state of guinea pigs kept as pets in the UK [11].

Harrup and Rooney utilised a 63 question online survey for owners to measure potential indicators of welfare, both health and behavioural, and aspects of housing and husbandry of pet guinea pigs. In designing the survey, the authors posed questions to assess whether owners were meeting each of the five welfare needs stipulated in the Animal Welfare Act (2006) [12]. The authors were able to achieve a high response rate of 4590 participants which equated to an estimated 3.5% of the UK guinea pig population. In terms of companionship, Harrup and Rooney discovered that the majority of guinea pigs were purchased with a conspecific, with only 9.0% purchased with the intent to house alone and only 0.8% initially housed with a rabbit. This suggests that the message that rabbits do not make good companions for guinea pigs is reaching prospective pet owners, but some may still believe it acceptable to house guinea pigs as a lone animal. Harrup and Rooney reported a significantly higher behaviour score in guinea pigs that lived with a companion indicating that these animals may experience better welfare. Furthermore, larger enclosure sizes resulted in the demonstration of more positive behaviours. This is consistent with findings in rabbits that indicated larger enclosures resulted in an increased behavioural repertoire [13].

Whilst the majority of pet guinea pigs were housed indoors throughout the year, most did have access to a run or exercise area regardless of whether they were kept indoors or outdoors. Indoor housing may be beneficial for maintaining guinea pigs at their preferred temperature range of 18 to 26°C, particularly during the colder months in the UK, and protecting against extremes in temperature that may predispose respiratory disease [4,14]. Interestingly, hay was the most commonly used bedding material (72.4%) ahead of wood shavings or fleece bedding (Fig 1). Whilst hay has been reported to be a suitable substrate for guinea pigs, it is not particularly absorbent, but

does avoid the respiratory issues that have been associated with the use of wood shavings [4]. Harrup and Rooney discovered that ad libitum hay was available to 72.8% of guinea pigs, but it is concerning that this figure was not higher given the importance of hay for dental wear and gastrointestinal health [7,8]. The majority of guinea pigs (99.1%) were fed a pelleted diet (Fig 2), with most owners supplementing vitamin C in some form which is consistent with previous research [15]. However, most owners opted for pellets with added vitamin C as their primary provision which could represent a concern given the propensity for the vitamin C to oxidize once fortified feed has been opened [16]. Nonetheless, many owners did also provide fresh vegetables meaning that guinea pigs may have received additional vitamins via these foodstuffs (Fig 3). Harrup and Rooney found that guinea pigs fed green vegetables had lower levels of reported health issues, likely due to many vegetables providing a good source of ascorbic acid [17]. Green vegetables (kale, cabbage, broccoli etc.) were fed to 69.9% of guinea pigs at least daily and were fed more often than other vegetables such as carrots and cucumber. Some owners reported allowing their guinea pigs constant access to green vegetables which is of interest as some green leafy vegetables are high in calcium and high calcium diets have been proposed as a factor in the development of urolithiasis in guinea pigs [17,18].

In the study by Harrup and Rooney, most owners only presented guinea pigs to the veterinary practice if they felt that their animal was unwell, this is unsurprising given that guinea pigs have no routine vaccinations that would necessitate a yearly visit [9]. The authors suggest that whilst few owners instigated a six-monthly veterinary check-up, this would be considered a best practice approach. Considering that guinea pigs are prey animals that often hide signs of disease until they are seriously unwell, regular check-ups may be advisable. In addition, not all owners appeared able to accurately assess the severity of health issues in order to ascertain the need for urgent veterinary attention. Less than half of the respondents to Harrup and Rooney's survey felt that anorexia was a symptom that required same day veterinary attention. Anorexia is in fact a medical emergency in guinea pigs as gastrointestinal stasis, fluid and electrolyte imbalances and hepatic lipidosis can develop soon after small herbivores stop eating [19].

Key conclusions that can be drawn from the paper by Harrup and Rooney are that whilst guinea pig owners may be well informed on some aspects of health and husbandry, further knowledge dissemination is warranted. The welfare of pet guinea pigs may be compromised through the use of too-small enclosures and the lack of provision of an appropriate companion.

<u>What you need to know</u>

- Guinea pig owners may not be well informed on the space requirements for housing, nor the need for social interaction with appropriate conspecifics.
- Most guinea pig owners do supplement their guinea pig with vitamin C, but owners provide this in different ways, so ascertaining that an animal is receiving an adequate dietary source may be prudent.
- Inappropriate housing and companionship results in a decrease in positive behaviours in guinea pigs which may indicate a poor welfare state.
- Guinea pig owners cannot always determine whether specific medical issues or clinical signs constitute an emergency, so may present guinea pigs to the veterinary practice in a serious condition.

<u>Figure Captions</u>

Fig 1. Guinea pig on hay bedding

Fig 2. Guinea pig fed a pellet based diet

Fig 3. Guinea pig fed fresh vegetables

Alison P. Wills, PhD, BSc (Hons), Department of Animal and Agriculture, Hartpury University, Gloucestershire, GL19 3BE

References

1 PMFA. Pet Population 2019. 2019.https://www.pfma.org.uk/pet-population-2018 (accessed 21 Jun 2019).

2 Fawcett A. Management of husbandry-related problems in guinea pigs. *In Practice* 2011;33:163–71.

3 Sachser N, Dürschlag M, Hirzel D. Social relationships and the management of stress. *Psychoneuroendocrinology* 1998;23:891–904.

4 Yarto-Jaramillo E. Respiratory system anatomy, physiology, and disease: guinea pigs and chinchillas. *Veterinary Clinics of North America: Exotic Animal Practice* 2011;14:339–55.

5 Rougier S, Galland D, Boucher S, *et al.* Epidemiology and susceptibility of pathogenic bacteria responsible for upper respiratory tract infections in pet rabbits. *Veterinary Microbiology* 2006;115:192–8.

6 Minarikova A, Hauptman K, Jeklova E, *et al.* Diseases in pet guinea pigs: a retrospective study in 1000 animals. *The Veterinary record* 2015;177:200.

7 Reiter AM. Pathophysiology of Dental Disease in the Rabbit, Guinea Pig, and Chinchilla. *Journal of Exotic Pet Medicine* 2008;17:70–7.

8 DeCubellis J, Graham J. Gastrointestinal disease in guinea pigs and rabbits. *Veterinary Clinics of North America: Exotic Animal Practice* 2013;16:421–35.

9 Meredith A. Guinea pigs: common things are common. *Veterinary Record* 2015;177:198–9. doi:10.1136/vr.h4465

10 Rooney NJ, Blackwell EJ, Mullan SM, *et al.* The current state of welfare, housing and husbandry of the English pet rabbit population. *BMC Research Notes* 2014;7:942.

11 Harrup A, Rooney NJ. Current welfare state of pet guinea pigs in the UK. *Veterinary Record* 2020.

12 Animal Welfare Act. 2006. Statute Law Database 2006.

13 Dixon LM, Hardiman JR, Cooper JJ. The effects of spatial restriction on the behavior of rabbits (Oryctolagus cuniculus). *Journal of veterinary behavior* 2010;5:302–8.

14 Donnelly TM, Brown CJ. Guinea pig and chinchilla care and husbandry. *Veterinary Clinics of North America - Exotic Animal Practice* 2004;7:351–73.

15 Norman R, Wills AP. An investigation into the relationship between owner knowledge, diet, and dental disease in Guinea pigs (Cavia porcellus). *Animals* 2016;6.

16 Donnelly TM. Guinea Pigs. MSD Manual. 2020.https://www.msdvetmanual.com/exotic-and-laboratory-animals/rodents/guinea-pigs?query=guinea pigs (accessed 5 Feb 2020).

17 Riggs SM. Guinea pigs. In: *Manual of exotic pet practice*. Elsevier 2009. 456–73.

18 Johnson-Delaney CA. Rabbit Respiratory System: Clinical Anatomy, Physiology and Disease. *Veterinary Clinics of North America: Exotic Animal Practice* 2011;14:257–66.

19 DeCubellis J. Common Emergencies in Rabbits, Guinea Pigs, and Chinchillas. *Veterinary Clinics of North America: Exotic Animal Practice* 2016;19:411–29.