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ORIGINAL RESEARCH

Survey of the husbandry and biosecurity practices of backyard chicken keepers in the UK

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Abstract

Background: This survey investigated the housing, feeding, health and welfare of backyard chickens kept in the UK.

Methods: Information was collected via an online questionnaire active from May to July 2021. The survey asked about flock demographics, housing, diet, enrichment provision, if the flock was registered with the Animal Plant and Health Agency (APHA) and the reason, preventative health care and biosecurity, and the incidence and methods of euthanasia.

Results: The majority of flocks (48.8%) consisted of one to five birds, were located in rural areas (58%) and were kept as pets (77%) and/or for eggs (71.6%). Enrichment was provided by 78.4% of keepers. Most respondents (69%) were aware of the Animal Plant and Health Agency poultry registration scheme, with 32.8% being registered with the scheme. Kitchen scraps were fed by 29% of keepers. Veterinary services were used by 63.6% of keepers, although 4% said they struggled to find a veterinarian willing to treat backyard poultry. New additions to the flock were isolated by 70.2% of keepers.

Limitations: The survey was distributed through poultry-specific Facebook groups and via chicken rescue centres, so it is not a truly random sample of backyard chicken keepers. All survey-based studies have an inherent element of subjectivity.

Conclusions: The survey identified biosecurity, humane euthanasia training, veterinary training in backyard poultry medicine, and enrichment provision as areas where improvements can be made to improve poultry health and welfare and reduce the risks of infectious disease transmission.

KEYWORDS
backyard poultry, biosecurity, chicken, enrichment, husbandry

INTRODUCTION

Approximately 1.2 million domestic chickens (*Gallus gallus domesticus*) were kept as pets in the UK in 2021,[1] making them the UK's sixth most popular pet. Keeping backyard chickens as pets and for eggs has increased in popularity in recent years, with a spike in interest at the start of the first COVID-19 British national lockdown in March 2020.[2] The British Hen Welfare Trust (BHWT) rehomes 60,000 ex-commercial chickens annually.[3] Despite these statistics, little is known about the husbandry and preventative healthcare practices of owners of backyard chickens in the UK. It is a legal requirement for keepers of poultry flocks of 50 or more individuals to be registered with the Animal Plant and Health Agency (APHA), and registration of smaller flocks is encouraged.[4] This allows the APHA to contact owners in the event of disease outbreaks in their area and to provide information regarding biosecurity and disease control. Backyard poultry are classified as food-producing animals in the UK, and legislation applies accordingly. There is a complete ban on feeding kitchen scraps from non-vegan households,[5] and feeding of dried mealworms is not permitted, a fact often not understood by keepers of pet chickens.[3]

A survey investigating welfare status, biosecurity and disease control issues in backyard flocks in the Greater London urban area concluded that although backyard poultry keepers provided adequate living

conditions for their birds, there was a lack of knowledge of legislation relating to the keeping of these animals.[6] Another study explored the relevance of backyard poultry keepers for national biosecurity in Scotland and found a similar lack of knowledge of relevant legislation and biosecurity measures, alongside infrequent contact with the veterinary profession.[7] Smaller studies have shown similarly variable biosecurity practices in backyard flocks in New Zealand and Canada.[8,9]

A study in the United States found that most respondents kept fewer than 10 chickens and had kept chickens for less than 5 years.[10] The study found that larger flocks were kept in rural areas, and common reasons for keeping chickens were food production and as gardening partners and pets. A lack of knowledge of the risks of disease transmission from wild birds was identified. One-quarter of respondents had killed birds in their flock in the preceding 12 months, with methods including severing the cervical arteries, decapitation (both used most frequently in larger flocks) and cervical dislocation.[10]

The aim of this exploratory study was to investigate the husbandry, health and welfare, and biosecurity practices of backyard poultry keepers across the UK, with an emphasis on husbandry and enrichment provision.

METHODS

In this survey, backyard chickens were defined as chickens owned for non–commercial purposes by private owners. The survey was limited to respondents who lived in the UK and were over the age of 18 years. Information was collected via an online questionnaire (see Supporting Information) that was active from May to July 2021 via Jisc Online surveys (www.onlinesurveys.ac.uk). The survey closed when 500 responses had been collected. The survey asked about demographics, including for how long the respondent had kept backyard chickens, the location of the household (rural, suburban, urban), the purpose of the flock (e.g., for eggs, as pets), the number of birds in the flock, the origin of the birds and whether they owned a cockerel(s). Respondents were also asked to select what housing types were provided for their birds, the diet provided, how water was presented, details of any nutritional supplements provided and any enrichment provided. In addition, respondents were asked if their flock was registered with the APHA and why/why not. Details regarding routine parasite treatment, any supplements provided and whether the birds received regular veterinary visits were also collected. Respondents were also asked whether any birds in their flock had been euthanased in the previous 12 months, and if euthanasia had been performed, whether this was at home or by their veterinarian and, if performed at home, by what method. The respondents were also asked if they isolated new additions to their flock and the duration od this isolation, if they fed kitchen scraps to their birds, if rodents/wild birds could access their chickens' food or water and how concerned they were about this, and what their cleaning regime was. At the end of the survey, any further comments were invited.

The survey was pilot tested by three backyard chicken owners, and minor adjustments to formatting were made. The survey was then promoted to backyard chicken keepers by word of mouth, social media (Instagram and Facebook) and the Poultry Club of Great Britain and Chicken Keepers UK Facebook pages. The survey was also promoted by the BHWT via a press release from their research forum, 'The Coop', in which the survey was featured.

Data collected was cleaned and categorised prior to analysis. Free text answers were categorised into the option that best fit the response, or where multiple similar responses were given that did not fitan existing category, a further category was added. For example, several respondents rescued birds from previous private owners rather than asex-commercial rescues but this had not been an option in the original survey, so the additional category was added. The reasons for registering with APHA (or not registering) were given as free text and answers were grouped according to frequency. Statistical analysis was performed using SPSS (IBM SPSS Statistics, Version 28.0.0). Data were summarised with descriptive statistics and further analysis was carried out using the chi-square test and multivariate logistic regression analysis. Statistical significance was set at a p-value of less than 0.05.

RESULTS

A total of 500 responses to the survey were received and all were included. Three of the questions were not answered by all people eligible to answer them. 'Do you take your chicken(s) to the vet?' was answered by 497 people and 'Have you had to have any chickens euthanased in the last year?' was answered by 498 people. Of 60 people reporting at-home euthanasia, 53 answered the question 'By which method?'. All responses were included in the analyses of the respective questions. For questions where respondents could select more than one answer, the sum of percentages was greater than 100%.

Demographics

The majority (58%, $n = 290$) of respondents reported living in rural areas, with 29.2% ($n = 146$) stating that they lived in suburban areas and 12.8% ($n = 64$) in urban areas. Most of the respondents (49%, $n = 245$) had been keeping backyard chickens for more than 5 years, with 29.2% ($n = 146$) having kept chickens between 1 and 5 years and 21.8% ($n = 109$) for less than 1 year. A flock size of 1–5 chickens was reported by 48.8% ($n = 244$) of respondents, 6–20 birds reported by 34.2% ($n = 171$), 21–50 reported by 10.2% ($n = 51$) and more than 50 reported by 6.8% ($n = 34$). The flocks of 1–5 birds were significantly more likely to be kept

in urban areas than in rural areas (odds ratio [OR] 4.615, confidence interval [CI] 1.709–12.458). Birds were acquired from multiple sources, with 58.8% (n = 294) of keepers obtaining them from a breeder, 49.2% (n = 246) from ex-commercial rescues and 19.2% (n = 96) from breeding their own replacements. Birds were rehomed from other sources (not ex-commercial) by 4.6% (n = 23) of respondents and purchased from farm shops or other suppliers by 2.4% (n = 12). The origin of flocks did not differ significantly between locations, with the exception of home-bred replacements, which were significantly more likely to occur in rural flocks (OR = 2.468, CI 1.133–5.454). Less than half of the respondents (28.6%, n = 143) reported keeping a cockerel, and cockerels were significantly more likely to be held in rural flocks than in urban flocks (OR 4.13, CI 1.97–8.69).

Over two-thirds of respondents (69%, n = 345) stated that they were aware of the APHA registration scheme for backyard poultry flocks. Keepers of the smallest flocks were significantly less likely to be aware of the scheme than keepers with flocks of more than 50 birds (flock size 1–5 birds: OR 0.11, CI 0.03–0.47; flock size 6–20 birds: OR 0.12, CI 0.03–0.51). Of those aware of the scheme, 32.8% (113/345) were registered and 67.2% (232/345) were not. The rationale for this choice was asked, but was not a mandatory question, with 204 of 345 keepers responding. Of keepers who were registered with the scheme and gave a reason why (77/204), 61% (47/77) said it was to receive communications regarding disease control (most notably avian influenza [AI]), 29.9% (23/77) stated it was a legal requirement as they had more than 50 birds and 9.1% (7/77) stated responsible ownership. Of the owners who were not registered with the scheme and gave a reason, 70.1% (89/127) stated it was because they had less than 50 birds so did not need to, 12.6% (16/127) said either the registration was too complicated or they felt there was no point in registering, 10.2% (13/127) had not registered yet but intended to, 5.5% (7/127) cited a distrust of APHA or a concern their birds may be culled and 1.6% (2/127) said it was because they were unaware of the need to.

Owners could select multiple motivations for keeping backyard chickens (Figure 1), with the majority citing that they kept their chickens as pets or for pleasure/mental health benefits and for eggs. All respondents answered this question, and no option given had zero selections.

Husbandry practices

Almost all (99.2%, n = 496) flocks had outside access, with only 0.8% permanently housed. All respondents answered this question, and no option given had zero selections. The type of outdoor access is shown in Figure 2.

Nearly all participants (98.4%, n = 492) fed their birds a commercial pellet or a complete poultry feed as a component of the diet, 83% (n = 415) fed corn, seeds and grains ('scratch'), 73.4% (n = 367) fed fresh produce, 29% (n = 145) fed kitchen scraps and 2.8% (n = 14) fed live or dried insects. Of the respondents feeding kitchen scraps, almost all (92.4%, 134/145) reported feeding fruit and vegetables, 38.6% (56/145) fed eggshells, 33.8% (49/145) fed cooked food, including meat, and one respondent (0.7%) fed dairy products. Kitchen scraps were less likely to be fed by respondents who had kept chickens for a shorter time than by respondents who had kept chickens for more than 5 years (duration kept <1 year: OR 0.265, CI 0.145–0.485; duration kept 1–5 years: OR 0.585, CI 0.373–0.919). Water was most commonly provided with specific poultry drinkers (88.8%, n = 444), with 35.0% (n = 175) also offering open water containers and 1.6% (n = 8) reporting other sources of water, including ponds and puddles.

Over three-quarters of respondents (86.8%, n = 434) offered perches and nest boxes to their birds, 84.8% (n = 424) provided dust baths and 88.4% (n = 442) provided grazing or foraging access (e.g., deep litter). Enrichment (defined as provisions to support behaviours indicative of positive welfare, over and above standard husbandry provisions) was provided by 392 participants (78.4%). Of those participants providing enrichment, whole food items were provided by 81.1% (n = 318), hanging food items by 68.4% (n = 268), foraging toys by 30.4% (n = 119), mirrors by 24.0% (n = 94) and other toys, such as xylophones and balls, by 0.8% (n = 4).

When asked about nutritional supplements, most respondents (82.0%, n = 410) provided grit or oyster shell to their birds and 49.8% (n = 249) provided apple cider vinegar. Vitamin and/or mineral supplements were provided by 42.4% (n = 212). Probiotics were administered by 11.4% (n = 57) of respondents and 3.6% (n = 18) gave medicinal herbs/plants (e.g., garlic fed fresh or dried for natural worming, seaweed supplement). Approximately 10% (n = 51) of respondents reported not providing any supplements.

Healthcare practices

Over three-quarters (76.8%, n = 384) of respondents treated the environment of their flocks for parasite prevention. More than half used deworming (71.0%, n = 355) and/or external parasite treatments (55.0%, n = 275) and one-fifth (19.6%, n = 98) reported that their flocks had received vaccinations; however, the survey did not specify against which diseases. Less than 1% of respondents (0.6%, n = 3) reported running routine faecal parasitology and approximately 10% (9.8%, n = 49) stated that they did not provide any routine preventative healthcare.

Over half of the respondents who answered this question reported taking their chicken to a veterinarian (63.6%, 316/497), with 2.8% (14/497) taking them for both routine health checks and when unwell, and 60.8% (302/497) taking them only when sick. Of the 498 owners who answered the question, one-quarter (25.9%, n = 129) reported euthanasia of their chickens within the last year. Of those, 53.5% (69/129)

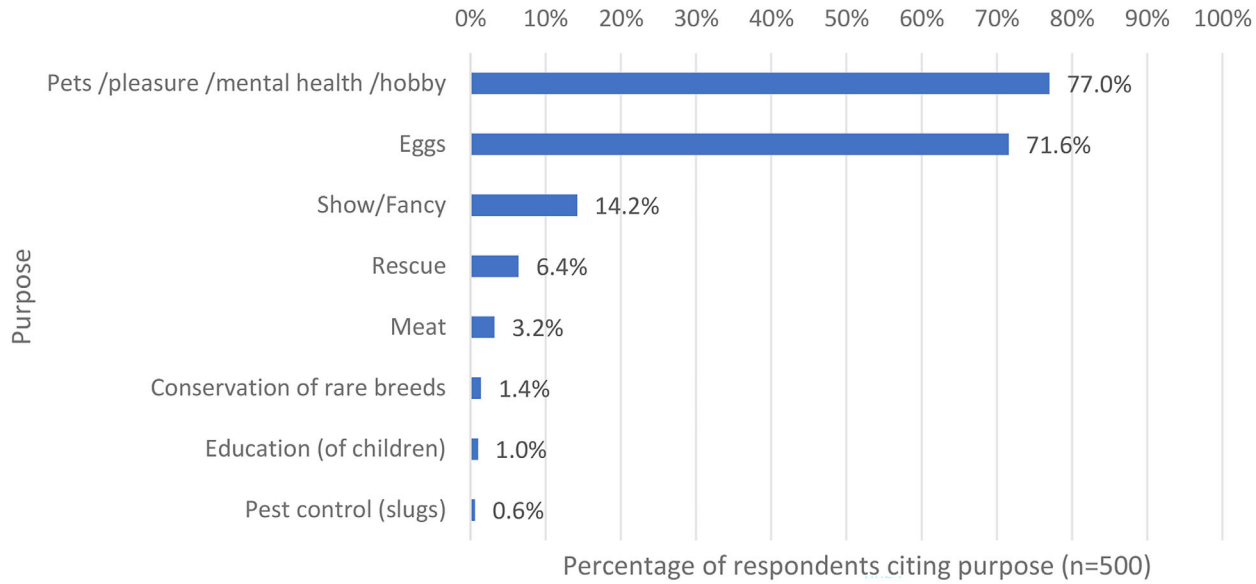

FIGURE 1 Reasons for keeping chickens reported by owners in a survey of UK backyard poultry keepers ($n = 500$). Multiple answers were allowed

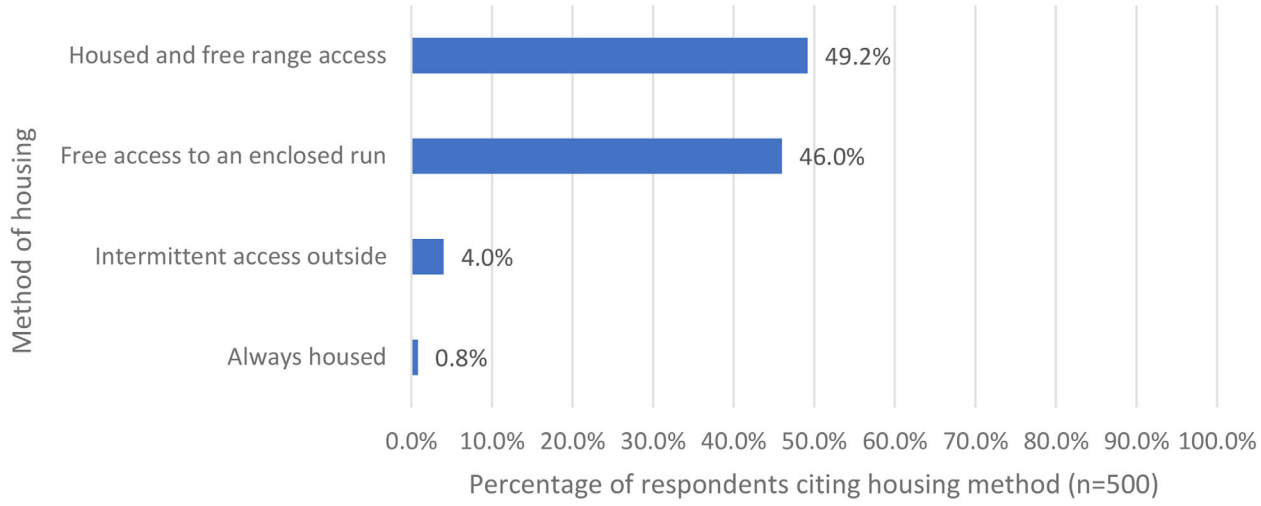

FIGURE 2 Type of outside access provided by keepers of backyard chickens, as reported in an owner survey ($n = 500$)

took the bird to a veterinarian and 46.5% (60/129) performed euthanasia at home. Methods of home euthanasia included neck dislocation (81.1%, 43/56), air gun (11.3%, 6/56) and decapitation (7.5%, 4/56). Four respondents stated in the free text that cervical dislocation was performed by an operator with experience. Owners of smaller flocks were significantly less likely to perform at-home euthanasia than owners of flocks of more than 50 birds (flock size 1–5 birds: OR 0.022, CI 0.003–0.178; flock size 6–20 birds: OR 0.035, CI 0.004–0.293; flock size 21–50 birds: OR 0.081, CI 0.009–0.739).

Biosecurity

Two-thirds of participants (70.2%, $n = 351$) reported isolating new stock brought into the current flock regardless of the new addition's health status. One-quarter of participants (23.6%, $n = 118$) did not isolate new stock at all, and 6.2% ($n = 31$) reported only isolating incoming birds suspected to be sick. Owners of smaller flocks were significantly less likely to isolate new additions regardless of health status than owners of flocks of more than 50 birds (flock size 1–5 birds: OR 0.062, CI 0.008–0.461; flock size 6–20 birds: OR 0.128, CI 0.017–0.976). They were also significantly less likely to isolate birds suspected to be sick (flock size 1–5 birds: OR 0.053, CI 0.005–0.554). Among those that isolated new birds, the majority (67%, 256/382) isolated their birds for between 7 and 14 days, with 15.2% (58/382) isolating for under 7 days and 17.8% (68/382) isolating for over 14 days. Environment cleaning was performed daily by 30.6% of participants ($n = 153$), one to several times per week by 25.0% ($n = 125$), every 2 weeks or less frequently by 42.6% ($n = 213$) and 'when needed' by 1.8% ($n = 9$).

Access to their birds' food and water by wild birds and/or rodents was reported by 56.4% ($n = 282$) of keepers. When asked how concerned they were about

the risks posed by wild birds and rodents on a scale of 1 (not concerned) to 5 (very concerned), the median response was 3 (interquartile range 2–4).

DISCUSSION

Over half of respondents lived in rural areas of the UK, with the lowest number in urban areas, consistent with the distribution of backyard flocks in Scotland.[7] However, this is in contrast to what is reported in the United States, where backyard chicken keepers are nearly equally distributed among rural, suburban and urban areas.[10] Most of the largest flocks were kept in rural areas in this study, in keeping with the findings of other studies[10,11]; however, the proportion of respondents reporting flocks of more than 20 birds (17%) was slightly higher in our study than in the North American study.[10] The sources of birds were mainly private breeders or ex-commercial hen rescue centres, which reflects the findings in Scotland but differs from those in the United States and Canada, where the main sources are commercial hatcheries, feed stores and home-bred replacements, and the rescue of ex-commercial hens is less common.[9,10]

As the study ran from May to July 2021, respondents owning backyard chickens for less than 1 year (21.8%) obtained them during the COVID-19 pandemic. In a large UK survey of pet owners, pet dog, cat and rabbit ownership remained stable over the period from March 2020 to May 2021; however, 47% of respondents who acquired a pet during this period were new pet owners compared to 33% who had acquired their pet prior to March 2020.[12] Comparable data are not available for backyard chicken keepers; however, reports suggest an increase in ownership during the pandemic.[2] The most popular motivations for keeping backyard flocks were as pets and for eggs, with few keeping them for meat, consistent with results of other studies.[6,7,10]

Most respondents voluntarily registering their flock with the APHA backyard flock registration scheme did so to be updated regarding AI or stated, 'it was the right thing to do'. However, less than one-third of respondents were voluntarily registered, indicating ongoing poor engagement with this scheme by backyard chicken owners. Some owners expressed mistrust of the APHA or worried that their birds might be culled in a disease outbreak. This distrust of the government's motivation for implementing disease control in backyard flocks was reported in a similar survey of backyard poultry keepers in Canada.[13] The perceived failure of the APHA to connect with small-scale poultry keepers and to recognise their value as 'pets, not commodities' was an important theme in a recent UK survey of backyard poultry keepers' attitudes towards AI regulations and guidance.[14] At the time of our survey, the role of backyard chicken flocks in the spread of AI was considered insignificant in the UK and Europe.[15] The situation changed in October 2021, with an unprecedented outbreak of H5N1 AI affecting commercial poultry, backyard flocks and other settings,[14] highlighting the importance of biosecurity measures.

Biosecurity practices were variable in our study, with just under a quarter of respondents reporting no isolation of new stock prior to introduction to the existing flock. A limitation of this question was that some respondents mentioned in the comments section that they reported 'no' as they had not yet introduced new birds, but they would isolate if they did. The owners reporting that they would only isolate new stock if they suspected the incoming bird was sick were reliant on being able to recognise potentially subtle signs of illness and were not accounting for subclinical carriers of disease. Furthermore, over half of the flocks in our survey had food and water sources that could be accessed by wild birds and/or rodents, and concern expressed by keepers regarding contact with pests was not high. This is lower than 88% of backyard flock owners in California who reported contact between their flock and wild bird populations in another study,[16] but nonetheless represents a significant area for further education for flock owners to avoid potential spread of disease from wildlife reservoirs. Co-produced recommendations from attendees of a UK workshop and survey responses regarding AI regulations and guidance include clearer, more targeted biosecurity recommendations for backyard poultry flocks and suggest poultry suppliers and veterinarians as potential communication routes.[14]

In our survey, almost all flocks were given access to outside areas, something that was also prioritised by keepers in the Canadian survey.[13] Our survey was conducted during the summer months in a period when there was no legal requirement for housing of birds due to AI risk; however, respondents were not asked about accommodation provisions during periods of national restriction due to disease outbreaks. The number of respondents reporting feeding kitchen scraps to their birds, including cooked food and meat, was similar to one previous study but lower than another.[6,7] It is unclear from our survey if owners were unaware of the legislation that bans the feeding of kitchen scraps unless coming from a completely vegan kitchen,[5] or if they chose to ignore it. This raises concern since legislation exists to prevent the potential (albeit small) risk of the introduction of notifiable diseases, such as Newcastle disease, which may be spread from feeding contaminated meat to poultry[17], in addition to preventing other infectious diseases, such as salmonellosis. Indeed, Papadopoulou et al.,[18] on behalf of the UK government, asked British veterinary practitioners to remind their clients of the illegality of this practice to prevent disease transfer risk. A survey of backyard poultry keepers in France found that 41.6% of respondents were aware of Newcastle disease virus, while 96.7% were aware of AI.[11] A history of wild bird contact significantly increased the risk for Newcastle disease virus in backyard flocks in the United States[16] and in Ethiopia,[19] countries where the disease is endemic, suggesting that a focus on

biosecurity measures would have more impact than a focus on feeding kitchen scraps.

Consistent with findings in the United States,[10] approximately one-quarter of our survey respondents had required the euthanasia of one or more birds in the previous 12 months. Just under half of these respondents performed euthanasia at home, with cervical dislocation the most common method, similar to results in Scotland.[7] This survey revealed that few respondents had a certificate of competence for the slaughter of animals. In contrast, the most common slaughter method in the United States involved severing the arteries in the neck.[10] The American Veterinary Medical Association guidelines for the euthanasia of animals consider the above methods acceptable if they are performed by competent personnel.[20] Our survey did not ask about levels of experience; however, four respondents stated that cervical dislocation was performed by an operator with experience, although further details were not provided. Manual cervical dislocation is the most widely used method of emergency on-farm slaughter in commercial poultry units, with 98.6% of respondents in a recent study reporting that they felt confident with the method.[21] There is a welfare implication if home euthanasia is carried out without appropriate training, which indicates an opportunity for further education of backyard poultry owners, something owners have expressed a desire for.[10]

Husbandry provided for flocks in our survey included nest boxes, dust baths, perches and opportunities for foraging, which are considered the main behavioural needs of laying hens.[22] However, fewer keepers (80%) provided these than in the United States, where more than 92% of owners provided perches and 98% provided nest boxes,[10] indicating an area in which UK poultry welfare could potentially be improved. Environmental enrichment improves the welfare of commercial laying hens by reducing feather pecking and increasing productivity,[23] and this should also be encouraged in a backyard setting. Over half of the respondents in our study offered whole food and hanging food items for enrichment, which may be valuable for pecking and foraging behaviours.[24] Toys such as mirrors, balls and xylophones were provided by approximately a quarter of respondents; however, the value of these items to chickens is unclear.

Over one-third of respondents reported not having taken their chickens to the veterinarian, a lower proportion than reported in Greater London.[6] However, owners were not asked if they would take their chicken to the veterinarian if they had health concerns in the future, and in the closing feedback, some owners commented that they had selected 'no' for this question, but only because they had not had the need. Additionally, 20 owners mentioned in the closing feedback that they have struggled to find a veterinarian willing to treat backyard poultry or cited experiences where they felt the veterinarian did not have enough poultry-specific knowledge to offer treatment for their bird. A lack of experience or interest in treating backyard poultry by UK veterinarians is cited as a reason owners may be reluctant to seek veterinary attention for their birds.[25] Additionally, they reported requests for diagnosis and treatment over the phone because it is 'not worth spending much on a chicken'. The need for improved access to confident veterinary care has been noted by previous studies both in the UK and United States.[6,10,26] The RCVS code of professional conduct states that a veterinary surgeon should not unreasonably refuse to provide (at least) emergency first aid and pain relief for any animal of a species treated by the practice during normal working hours.[27] Given that domestic poultry were the sixth most popular pet in the UK in 2023,[28] there is a clear need to address this knowledge gap within undergraduate veterinary training and continued professional development.

To our knowledge, this is the first study looking at husbandry practices, biosecurity, owner attitudes and enrichment provision in backyard chicken populations across the whole UK. However, our study has some limitations. The survey was distributed through poultry-specific Facebook groups and via chicken rescue centres, so it is not a truly random sample of backyard chicken keepers. All survey-based studies have an inherent element of subjectivity, where owners may interpret questions in different ways. Some questions did not allow an option for owners to state how they would act if a specific situation arose that had not yet; for example, they may not have isolated new stock but did not have the option to state that they would do if they acquired new birds. This was partially mitigated by the free text boxes that some respondents used to highlight the issue. This study was piloted to a small number of poultry keepers in advance of the final launch to identify any ambiguous areas and allow minor adjustments to be made.

To conclude, this study provides further insight into backyard chicken keeping in the UK and identifies biosecurity, humane euthanasia training, veterinary training and enrichment provision as areas where potentially significant improvements can be made to improve poultry health and welfare and to reduce the risks of infectious disease transmission. Further work is required to better understand the concerns and motivations of UK backyard chicken keepers. These results may be used to develop veterinary and owner education to improve the health and welfare of backyard flocks in the UK.

AUTHOR CONTRIBUTIONS

Vicki Baldrey and Keiran Ragoonanan were responsible for the conception and design of the study. Keiran Ragoonanan was responsible for the survey dissemination and extraction of data. Vicki Baldrey, Keiran Ragoonanan and Heather Bacon carried out the data analysis. Vicki Baldrey and Keiran Ragoonanan were mainly responsible for drafting the manuscript. Vicki Baldrey and Heather Bacon were involved in interpreting the results, revising the manuscript and giving final approval of the version to be published. All authors have read and approved the manuscript.

CONFLICT OF INTEREST STATEMENT

The authors declare they have no conflicts of interest.

FUNDING INFORMATION

The authors received no specific funding for this work.

DATA AVAILABILITY STATEMENT

The data are available upon request from the authors.

ETHICS STATEMENT

Ethical approval for the study was granted by the Social Science Research Ethical Review Board at the Royal Veterinary College under the reference number URN SR2021-0140.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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