

February 2012
Ref: J10106

***Habits and behaviours of high-level consumers of lead-shot
wild-game meat in Scotland***

Food Standards Agency in Scotland Project number FS421005



Authorised Contact Persons:

Mike Pickering
Research Manager
Harris Interactive Ltd
+44 (0)161 242 1360
mpickering@harrisinteractive.com

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EXECUTIVE SUMMARY

The aim of this study was to identify high-level consumers of lead-shot wild-game meat in Scotland and to investigate their habits and behaviours associated with consumption of this type of meat. The data generated in this project will be used to carry out a risk assessment of the levels of lead to which these consumers may be exposed through consumption of the wild-game meat.

The first objective of the study was to establish who are high-level consumers of lead-shot wild-game meat. Following that, the project sought to determine what practises are used in the preparation and cooking of lead-shot wild-game meat and explore habits and behaviours relating to consumption of this type of meat.

In order to meet the project's objectives a mix of both qualitative and quantitative interviews were used in the research. The qualitative research phase included interviews with experts in the field of wild-game meat preparation and lead shot removal (consultant chef, game dealer, gun expert/ stalker/ shooting party organiser and veterinary surgeon) and in-depth preparation/consumption interviews with domestic and commercial respondents involved in wild-game preparation (i.e. butchers, game dealers, shooters and game-keepers). The quantitative research phase consisted of 200 semi-structured telephone interviews with high-level consumers of lead-shot wild-game meat.

It has been established that majority respondents (85%) considered wild-game meat to be suitable and safe for all in the household, including children and elderly members of the family, however a drop in consumption levels have been noted for children under 5 years old and adults between 65 and 74 (23% and 18% respectively) .

Generally, respondents indicated that effort is made to remove as much of the visible particles of lead-shot as possible from meat prior to any cooking or preparation. 48% strongly agreed and 14% agreed they try and remove all the lead shot prior to cooking, whilst 47% strongly agreed and 12% agreed that they remove any pellets that are visible to the naked eye.

The majority of respondents (66%) felt that the size of the wild-game meat portion should be consistent with such meat as chicken, pork or beef, while some (25%) believed that wild-game meat portions should be slightly smaller than those associated pork or beef.

Venison is the wild-game meat of choice for those eating out (94%), with pan-frying as the preferred method of cooking (67%), while the greatest variety of cooking methods is used in preparation of pheasant (pan-frying, roasting, casseroling, stewing, smoking, salting, curing, boiling, cooking in sous-vide, as part of pie, a pâté or a terrine).

Respondents considered it normal to hang, store or freeze wild-game meat (80%) before any preparation, such as plucking or skinning. It is also common to freeze meat following preparation before and/or after cooking (70%). It was thought that freezing of wild-game meat for longer periods of time, i.e. up to six months or longer, ensures availability of meat throughout the year, even outside the normal shooting period.

Finding lead shot in wild-game meat is not common place with the majority of respondents stating that they find a piece of lead-shot only occasionally (28% when eating out, and 32% when eating at home), rarely (35% and 33%) or never (22% and 14%).

Overall, the project has provided valuable data on the habits and behaviours of high-level consumers of lead-shot wild-game meat. This data will be used by the Food Standards Agency to assess whether consumption levels of lead-shot wild-game meat are likely to pose any risk to these consumers, due to exposure to lead and, if necessary, to develop a targeted advice.

INTRODUCTION

Background and the Need for the Research

The Food Standards Agency in Scotland (FSAS) commissioned this study to identify high level consumers of lead-shot wild-game meat in Scotland and investigate the feasibility of a quantitative survey, or qualitative research on consumption habits and behaviours of these high level consumers to generate meaningful and useful data to carry out a risk assessment. This information was required in order to develop advice for these consumers, determine if levels of lead consumption are likely to pose a risk and if so, then identify appropriate risk management action.

Elevated levels of lead are found in wild-game meat as a result of using lead shot, which is known to shatter leading to fragments of lead becoming embedded in the meat. When large wild game is processed at Game Handling Establishments, the affected parts of the carcass should be removed and discarded due to damage caused by the shot (bruising). Therefore the majority of any lead present in the meat would be removed before reaching the consumer. The levels of lead are higher in game birds, like pheasant and partridge, because of their smaller size and also the smaller size of pellet which is more difficult to remove (data from National Surveillance Scheme - NSSⁱ).

The European Food Safety Authority (EFSA) has recently published its opinion on Lead in Foodⁱⁱ in which, despite limited evidence available to assess dietary exposure risks, high consumers of game meat and game offal were identified as consumer groups with higher exposure to lead.

The issue of the risk to human health caused by the use of lead ammunition for shooting wild game has been considered by the FSA and other organisations (such as the Veterinary Medicine Directorate - VMD) in the past and there is data already available on the levels of lead in venison, pheasant and partridge, collected through the FSA's own surveysⁱⁱⁱ as well as the VMD's surveillance (through NSS). The FSA carried out a small scientific review of the risk to the consumer from lead-shot in game meat and concluded that risk to human health from the consumption of lead shot in game was low to very low^{iv}. All these previous considerations concluded that although the general population may not be at risk of exposure to high levels of lead through this route, potentially there would be an increased risk for individuals who regularly eat high quantities of game (consumption of one meal containing lead-shot wild-game meat at least once per week and/or several meals including lead-shot wild-game meat a week during the shooting season)^{iv}. There is anecdotal evidence that those involved in game management (such as shooters, gamekeepers and game beaters) and their families eat higher quantities of wild-game meat than the general population and therefore could be exposed to higher levels of lead. There is no information regarding which other groups could be involved in consumption of large quantities of lead-shot meat in Scotland.

The exposure of consumers to lead from their general diet is measured as part of the FSA's Total Diet Study^v, but there is currently no data available on levels of wild-game meat consumption in individuals involved in game management or others who consume relatively large quantities of lead-shot meat.

There is also a lack of information regarding the typical practices these individuals employ to prepare wild-game meat for consumption., i.e. how is the wild-game meat obtained (shot by a consumer, purchased from a shooter, obtained as a gift), which game is eaten in highest quantities (game birds, venison, etc.), how is meat dressed (is pellet/shot removed, is wounded tissue around the shot channel discarded), what common cooking and preparation techniques are involved (marinating, roasting, cooking, broiling). This information was required for risk assessment since practices such as dressing, marinating and cooking in vinegar can affect the bioavailability of lead on consumption.



Humans that eat game animals that have been shot with lead ammunition can be at risk of poisoning from the fragments of bullets or pellets that remain embedded in the meat or in other edible tissues. Radiographs of shot deer have shown that when a lead bullet breaks up on impact some fragments are too small to be visible to the unaided eye and would probably be retained in the meat after butchering.

One study^{vi} has shown that, individuals that have accidentally ingested lead shotgun pellets have developed symptoms of poisoning and it has been discovered that pellets can be retained in the appendix for several years, although the dissolution rate appears to be slow in such cases. In assessing the level of risk, embedded lead tends to be distributed heterogeneously in bodies and thus tissue samples can, by chance, contain very high or very low lead concentrations, making it difficult to assess the threat to human health with any degree of confidence. However, the potential risk to humans from embedded fragments was demonstrated when samples of contaminated meat were fed to pigs resulting in blood lead levels significantly higher than in pigs fed uncontaminated meat^{vii}.

The FSAS therefore wished to study in this survey of high consumers of lead-shot wild game meat in Scotland their habits and behaviours to generate meaningful and useful data for use in risk assessments.

Current Published Evidence

The FSAS conducted an initial assessment of the currently available literature on the levels of wild game meat consumption and the practices involved in preparing the meat and came to the conclusion that there was very little information available. However, it was decided that a more extensive literature review would provide a useful backdrop to the project and ensure that nothing important had been missed.

This literature review confirms that there is very little published information on the behaviours, habits and attitudes associated with the preparation, cooking and eating of lead-shot wild game meat in the UK in general or Scotland in particular.

There are several issues which need to be borne in mind when reviewing literature on this subject:

- The definitions of game vary in different reports. For example, in the EFSA report^{viii} food category 'Game meat' includes reindeer, deer and pheasant, while rabbit meat is included in the 'Poultry and Rabbit Meat'. Conversely the Mintel Game & Exotic Meat UK report (2007)^{ix} excludes ducks and geese from its definition of game.
- The vested interest/agenda of many of the studies and articles written by the pro- and anti-lead shot ammunition communities, i.e. the shooting fraternity versus the wildlife conservation community.
- Much of the published research was conducted outside the UK.

Consumption of Wild Game in the UK

In the UK the National Diet and Nutrition Survey (NDNS)^x states a mean daily consumption amongst the UK population of 0.681 g per day of game meat (approximately 250 g/year)¹. Duck accounts for 70% of this average annual consumption of 250 g but it is not specified if this duck is wild or farmed.

In the 2008 Living Costs and Food Survey^{xi}, game is included in the "other fresh, chilled or frozen edible meat". Only 40 of the 5,850 households surveyed, 0.7%, reported any expenditure on game and the average weekly expenditure for the whole population was £1m. This level of expenditure would seem to tie in broadly with figures published by Mintel (2010)^{xii} which valued the market in 2008 at £69m. The breakdown of the game market by type and growth over the period since 2006 is shown in Table 1 below.

Type	2006 £m	2008 £m	2009 £m	% growth 2006-9
Venison	32	40	43	+34%
Feathered game	16	19	21	+31%
Other game	9	10	11	+22%
Total	57	69	75	+32%

Table 1 – Growth in Sales of Game in the UK, 2006-2009

¹ Game meat covers pheasant, partridge, grouse, pigeon, venison, duck, goose, guinea fowl, rabbit and hare

In two other Mintel reports (2007^{ix} above, 2008^{xiii}) featuring consumer research undertaken with a representative sample of UK adults, 5% claim to eat game fairly regularly when in season, but there is no definition of “fairly regularly”. The figure for Scotland is 7%, equating to around 350,000 people. The most recent estimate of the number of people involved in shooting and stalking of wild game in Scotland is 200,000^{xiv}. It could be assumed that a high proportion of those consuming game are likely to be the hunters themselves and their families, but this will be explored as part of the following phases of the research programme.

Another way of estimating the overall levels of wild game consumption is to look at the number of birds/animals that are shot every year. According to data supplied by the British Association for Shooting and Conservation (BASC) for the Mintel 2007 report^{ix} above, 20-22m pheasant and 4-5m partridges are released each autumn for shooting (although the number shot is probably lower) and that between 200-500,000 grouse are shot. Estimated numbers for 2004 quoted in a report by PACEC^{xiv} were of just under 19m game-birds and wildfowl shot, of which 80% were pheasants.

High-Level Consumption of Wild Game and Exposure to Lead through Diet

It is currently not possible to identify a tolerable intake level for dietary exposure to lead since it is not possible to identify a threshold for some of its adverse effects, principally neurobehavioural deficits in children and cardiovascular effects and nephrotoxicity in adults. Toddlers are particularly susceptible to the effects of lead on neurodevelopment, with blood lead levels in young children being associated with reduced IQ. The Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment (COT) is an independent scientific committee that provides advice to the Food Standards Agency and other UK Government Departments on matters concerning the toxicity of chemicals. In 2003, the COT^{xv} advised that since there is no threshold for lead, efforts should continue to reduce exposure to lead from all sources.

Previously, the Joint FAO/WHO Expert Committee on Food Additives (JECFA) had set a Provisional Tolerable Weekly Intake (PTWI) of 25 µg/kg body weight for lead. A PTWI is the amount of contaminant that can be ingested over a lifetime without adverse health effects. In 2010, the EFSA^{viii} published its scientific opinion on lead in food and concluded that the PTWI set by JECFA was no longer appropriate. In 2011 JECFA^{xvi} also re-evaluated lead and withdrew its previous PTWI.

The EFSA’s opinion mentioned previouslyⁱⁱ looked at specific diets with high consumptions of foods known to contain higher levels of lead, including game meat. High consumers of game meat were assumed to be eating 200 g of game meat per week or 28 g per day. The impact of this specific diet on dietary exposure to lead was modest in most cases, with a 2.5 fold increase of exposure only for the game meat diet (levels of lead exposure 1.98 to 2.44 µg/kg body weight [b.w.] per day). It is important to note that these values are still below the former JECFA threshold (approximately 17 µg/kg b.w. per week compared with PTWI of 25 µg/kg b.w. per week).

According to the NDNS^{xvii} data, the mean consumption of game meat for those in the general population who reported eating game is 11.7 g per day or 82 g per week and the maximum recorded was 91.2 g daily or 638 g per week. It was estimated that high level consumers would eat an average 47.4 g daily or 331.5 g weekly. However, the usefulness of these figures in terms of this study is limited due to the limited numbers of people who reported game consumption.

Similar values were cited in a Swiss study by Haldimann et al. in 2002^{xviii} which found that during the hunting season hunters ate 2.2 game meals (range 0.3-6) on average per week, equating to approximately 350 g of game meat consumed weekly. This level of consumption, based on the lead exposure levels quoted in the EFSA's opinion^{viii}, would lead to a weekly exposure of up to 24 µg/kg b.w., still just under the current threshold. The study concluded that frequent consumption of wild game meat had no significant effect on blood lead levels. However due to its small sample of only 31 hunters/hunters' family members and a control group of 42, the significance of these data is also limited.

A Spanish study by Mateo et al. in 2007^{xix} evaluated the transfer of lead from shot to meat during the preparation of quail breasts with and without embedded lead shot. They were of the opinion that hunters and their families in rural Spain might eat game daily and, therefore, would be at high risk of lead exposure, but also argued that even much lower consumption rates could put people at risk. As discussed by Mateo et al. in 2011^{xx} there have been studies in various regions of Spain investigating the intake of lead through people's diets. Results found by Rubio et al.^{xxi} ranged from 28.4 to 574 µg/day with a mean of 48 µg/day. Mateo et al. estimated that eating 200 g of quail breasts with 1, 2 or 4 embedded lead shot pellets contributes 162, 580 or 1,727 µg of lead, respectively, which is 3.4, 12 or 36 times higher than the mean daily intake. Taking an estimated weekly dietary exposure to lead in Spain of 336 µg, the inclusion in the diet of only half a quail with 31.5 µg/g (the highest concentration found in the pickled quails they studied) per week would be enough to exceed the former JECFA PTWI. However, the authors recognised that their results needed further investigation, as certain aspects of their experiments did not represent the 'real-life' situation, e.g. they manually embedded lead shot in the meat. It was recommended that further studies should address the actual number of lead shot found in shot small game and that real field samples would also take into account the variability of transfer of lead along the shot path.

Pain et al. (2010)^{xxii} used game sourced from supermarkets, game dealers and shoots in an oven ready state as its samples. The mean number of whole pellets, or large parts of pellets, that were visible on the X-ray images of their sample of game-birds was 2.17 pellets per bird. Over a third of birds (35%) contained no whole pellets or large fragments. There was significant variation among different bird species in the mean number of pellets per bird with means ranging from 0.95 shot per bird for woodpigeons to 3.32 shot per bird for pheasants. The study argues that unusually high but achievable levels of consumption of certain game-bird species could result in exceeding the former JECFA PTWI. Game-bird species for which a daily meal containing 150 g of meat would cause the former JECFA PTWI exceedance are partridge, pheasant (data on lead concentrations in game animals were obtained from the statutory surveillance programme of the VMD) and woodcock (samples collected specifically for the study by staff of the Wildfowl and Wetlands Trust (WWT)). Although a portion size of 150 g would seem reasonable and ties in with the Swiss and Spanish studies mentioned above, eating a daily meal of this size of the species is something that needs to be validated in this research project.

Pain et al. (2010)^{xxii} also used an alternative method of calculation based on the average meat component of the adult UK diet (88 g) being replaced by game. This led to the PTWI being exceeded for consumption of partridge (VMD data) and woodcock (WWT data). Consumption of mallard, woodpigeon and deer appeared to pose a smaller risk of PTWI exceedance. Again, replacing all meat in a diet with game is a hypothesis which needs to be confirmed by the current research.

A survey carried out by the BASC amongst its members in the North-West of England and North-East Wales^{xxiii} measured the frequency of consumption of game meat but not the amount consumed. Just under a quarter (23%) of households ate game meat (excluding venison and wild boar) once a week or more; whilst consumption of venison and wild boar was less frequent (5% ate these meats at least weekly). In terms of seasonality, just under half (43%) of households typically consumed their game meat and venison/wild boar during the shooting season, while the rest (57%) consumed it all year round. However, because the survey was no more specific than “once a week or more” and the portion size not recorded, the level of risk could not be determined.

It is widely accepted that high consumers are likely to be those associated with running shoots, shooters and their families. According to the PACEC^{xiv} report, 44% of birds shot are supplied to game dealers with the rest (56%) being accounted for by the shoot itself, shooters and their families. According to another survey carried out for ‘Game to Eat’ in 2004^{xxiv}, 75% of the game shot in Britain is sold via game dealers, while 14% is given away, mostly to guns, beaters and other shoot helpers and 12% is sold by the shoots directly to the public or to local retail outlets.

Preparation of Lead–Shot Wild-Game Meat

One of the conclusions of the Iqbal et al.^{xxxiii} study in North Dakota was that a careful review of butchering practices and monitoring of meat-packing processes may decrease lead exposure from wild game consumption. However, in that study the vast majority of the participants had either hunted the meat themselves or had been given it by a family member or a friend. Furthermore approximately 82% said they, or a family member, processed the game and 92% discarded the meat around the wound channel.

All those involved in shooting wild game, either for their own consumption or for sale, will try to ensure a clean kill in order to avoid damage to the meat. The presence of lead shot spoils the appearance of game birds and shot pellets are unpleasant to eat. At the very least 3,500,000 birds shot each season are not being sold through game dealers, who have to adhere to food safety and hygiene regulations. Pain et al.^{xxii} identify those involved in the shooting industry as being particularly at risk from lead shot exposure because they are more likely to take birds which are heavily contaminated with shot or damaged, as these would be most likely rejected by game dealers. The study also argues that although pellets visible to the eye are usually removed from game meat, it is the smaller lead fragments which cannot be seen by human eye that pose the problem, as they cannot be removed easily, if at all.

There is very little specific guidance with regard to reducing the risks of lead exposure from lead-shot wild game other than the statement of obvious fact of removing pellets, i.e. advice given on the BASC website’s^{xxv} ‘Game On’ section: *“We recommend removing shot or bullet-damaged game meat before cooking to minimise any lead contamination”*. Whereas other articles, such as one by game chef Amy Willcock in the Shooting Gazette^{xxvi}, providing advice on preparing game for table have no mention of lead shot at all.

There are several videos showing how to prepare game in feather for the table and how to butcher deer which can be found on You Tube and various other websites (e.g. www.sportingshooter.co.uk, www.gameforeverything.co.uk), but they too tend not to mention removal of lead shot or lead fragments.

In 2002, prior to the introduction of EC 853/2004 Regulation, FSA commissioned a Qualitative Risk Assessment to inform the negotiations on the level of veterinary supervision required at game plans and post mortem procedures required to protect public health (Coburn et al., 2005)^{xxvii}. The main aim of the study was to assess the risks from handling and consuming of wild game, particularly associated with foodborne disease. The greatest risk factors identified were: *Campylobacter jejuni* in both game-birds and wild ducks, from exposure via both handling and consumption; *Chlamydophila psittaci* in game birds, via exposure from handling; lead shot in wild ducks, via exposure from consumption; and *Escherichia coli* O157 in wild lagomorphs (rabbits and hares), via exposure from both handling and consumption.

Following this risk assessment the FSA issued a 'Guide to Food Hygiene Regulation for Those Supplying Wild Game for Human Consumption'^{xxviii} in which there is mention of lead shot, amongst a whole host of other physical hazards: material such as metal or string that has been eaten by animals, broken needles from veterinary treatment, metal from rails, clips, tags, machinery, knife blades, paint flakes, rust, plastic, rubber bands, jewellery, pens, buttons, hair, glass splinters, bone splinters, wood splinters, sawdust, dust and dead insects and animal droppings. The Scottish Quality Wild Venison Association describes standards for the processing of wild deer but in its most recent guide^{xxix} (reviewed November 2010) it has no mention of removing bullet fragments.

Cooking Practices

Only two studies (discussed in more detail below) were found that commented on the effect of cooking methods on the possible risk from lead shot. Lead is more soluble under acidic conditions and, therefore, the cooking method could possibly affect the concentration of lead in the edible flesh of game.

The Spanish study mentioned earlier (Mateo et al., 2007)^{xix} evaluated the transfer of lead from shot to meat during the preparation of quail breasts with or without embedded lead shot. A traditional Spanish recipe was used which utilised vinegar during cooking to enhance the long-term preservation of the meat. The effect of the acidic conditions generated by the vinegar on lead transfer was compared with the same recipe when the vinegar was substituted with water. The transfer of lead from the embedded shot to the meat was much higher when cooking with vinegar than with water. The effect of storage (up to four weeks) on lead transfer was also evaluated, but in this case the lead transfer under acidic conditions did not increase significantly during long-term storage at room temperature. The findings showed that most of the transfer of lead when vinegar is used occurs during cooking and is affected by the high temperature of the process.

By contrast, Pain et al. (2010)^{xxii} found that lead concentrations in cooked game meals were not significantly affected by the cooking method used, when typical UK recipes were employed (for example roast pheasant or pheasant in cider). In particular, presence or absence of acidic ingredients (wine or cider) did not affect mean lead concentration. The authors surmise that it may be that the acidity of the sauces used in UK recipes or the duration of cooking of meat was lower than in Spain, although the Spanish study does not provide details of how long the quail were cooked.

In non-scientific sources such as sites promoting a game or on producers' websites, if lead shot is mentioned at all in cookery recipes, it is in rather humorous manner and the perception is that damage to teeth is the worst risk, like in a recipe for game stock on the website www.learncooking.co.uk which advised cooks to : *ask whether the game is farmed or wild (wild game is less likely to be contaminated by chemicals, growth hormones and antibiotics but you do need to watch out for the odd pellet or lead shot!)*.

Consumer Habits and Behaviours

No data was found relating to the habit or behaviours of Scottish shooters/consumers of wild game. The only UK report which covered behaviours was the BASC report mentioned previously^{xxiii}. Of potential interest to this study was the finding that 89% of shooters' households, including children, ate game meat. A high proportion of the game consumed was obtained by shooting (this varied by species from around 80% for most game birds to around 30% for venison and wild boar), with the rest being bought, received as gifts or eaten in a restaurant.

Although this study is concerned with high level consumers, Pain et al. (2010)^{xxii} discusses the fact that the issue of lead exposure may not be limited to hunters and their families if the market for game continues to grow. Within the earlier section concerning the consumption of wild game in the UK we noted that the market for game has grown substantially over the past few years and, according to Mintel^{xii}, is likely to continue to grow, as it ties into a number of longer term trends, such as the interest in food origin, animal welfare and adventurous and authentic food.

According to Mintel^{ix} the main reasons consumers choose to eat game are because of its taste and its low fat/nutritious qualities. It could be surmised that hunters would add to these reasons the fact that it is free.

The two key reasons for non-consumption of game are ethical objections to shooting or vegetarianism. Consumers also have concerns over the hygiene standards of these meats or avoid them because they expect not to like the strong taste associated with this type of meat. In its 2007 report^{ix}, Mintel profiled game eaters in the following way:

- People with higher income and higher position in society (ABs) are the key consumers, as they are the most likely to appreciate gourmet food, and game. It fulfils their requirements for an interesting product with flavour.
- Third Age consumers (in the 45-54 age group) appear to be significant regular users of game meat. The low fat/healthy status of game meat is an important factor for this group.
- Younger consumers are the most concerned about whether they have the cooking skills to get the best out of this category of meat (they are also the least likely to shop in butchers through which a lot of game meat is still sold).

Published Research on the Risks to Human Health from Lead Shot

Recently, more scientific evidence is coming to light suggesting that the previously established acceptable limits of dietary exposure to lead may no longer be relevant. As previously mentioned in its Scientific Opinion on Lead in Food^{viii} EFSA's Panel on Contaminants in Food Chain concluded that the JECFA PTWI for lead of 25 µg/kg of body weight is no longer appropriate as there is no evidence for a threshold for a number of critical endpoints in lead-induced effects (2000). In adults, children and infants, the margins of exposures were such that the possibility of an effect from lead in some consumers, particularly in children from 1-7 years of age, could not be excluded.

Although it is reported^{xxx} that game meat may have one of the highest lead levels of various foodstuffs², according to the EFSA's opinion its overall impact on dietary exposure or risk is low (amongst foodstuffs exposure to lead from game accounts for only 0.01% to total dietary exposure to lead) given low levels of consumption amongst the European population.

Recently two extensive reports which review a large number of the published research into the effects of consuming game which has been killed with lead ammunition or consuming game birds which have ingested lead shot.

- Quay (2010) *Review of evidence concerning the contamination of wildlife and the environment arising from the use of lead ammunition*^{xxxi}. Chapter 3 is devoted to evidence of risks to humans
- Pain et al. (2010) *Potential Hazard to Human Health from Exposure to Fragments of Lead Bullets and Shot in the Tissues of Game Animals*^{xxii}

The former report concludes that the assessment of risk for human health from consumption of contaminated meat may be complex, since there are no identified thresholds for certain effects of lead on health and it would be difficult to experimentally determine a safe level of lead in food.

Quay^{xxxi} also suggests that an alternative risk management approach - reduction of exposure to lead from diet to the lowest level possible. An added complication in carrying out a meaningful risk assessment is that different studies examining lead contamination in game do not consistently show the same level of exposure. This appears to be caused, at least in part, by the nature of the contamination: an uneven scattering of lead fragments in a carcass, which can give samples that show a very low or a very high risk.

² 310 food samples were analysed for lead in a study commissioned by the Food Standards Agency (Food Standards Agency, 2007). The highest level recorded was in game meat at 1.63 mg/kg.

The procedures used by most investigators specifically exclude tissue samples with obvious gunshot damage (i.e. Pain et al., 2010)^{xxii}, but results from more recent studies (detailed below) have suggested that some embedded lead particles might have been so small and presumably caused so little tissue damage that they could have been easily missed.

This latter point is a key finding of the study by Pain et al. (2010)^{xxii}, game-birds containing ≥ 5 pieces of lead shot had high tissue lead concentrations, but some with fewer or no shot visible to the naked eye also had high lead concentrations. X-ray analysis show that small lead fragments remain in the flesh of birds even when the shot exits the body, as shown in the diagram below.



Figure1. X-ray of a woodpigeon illustrating four gunshot and numerous small radio-dense fragments^{xxii}

The study argues that certain groups in the population, primarily shooters and their families, may be potentially exceeding the former JECFA PTWI levels for lead due to their probable high consumption of game. It also argues that the frequency of consumption of wild game is on the increase and, therefore, the problem could become more widespread.

The same conclusion regarding difficulty with removal of smaller lead fragments was reached in a 2009 study conducted by Hunt et al.^{xxiii} in the US. Carcasses of 30 White-tailed Deer shot by hunters with standard lead-core, copper-jacketed bullets under normal hunting conditions were X-rayed and all showed metal fragments and widespread fragment dispersion. Minced meat obtained from carcasses of these deer was analysed by fluoroscopy and metal fragments were detected in 80% of the samples. The lead-contaminated minced venison was subsequently fed to pigs to test bioavailability. Mean blood lead concentrations in pigs fed contaminated meat peaked at 2.29 $\mu\text{g}/\text{dL}$ (maximum 3.8 $\mu\text{g}/\text{dL}$) 2 days following ingestion, significantly higher than the 0.63 $\mu\text{g}/\text{dL}$ averaged by controls. This study showed consumption of lead contaminated meat can result in an increased concentration of lead levels in blood.

A study in North Dakota by Iqbal et al.^{xxiiii} is one of the few large-scale surveys (736 people) which analysed the effect of the amount, frequency and types of wild game consumed. These factors significantly increased levels of lead measured in the blood of the study's participants. Blood lead levels were higher in those who ate more meat, who ate it more often and who ate all three types of game (venison, birds other than wildfowl and other game such as bison and elk). Lead levels in blood were also significantly higher in those who had eaten a meal containing wild game in the last month. On average, individuals who ate lead-shot wild-game meat had blood lead levels of 1.27 $\mu\text{g}/\text{dL}$ compared to 0.84 $\mu\text{g}/\text{dL}$ for non-consumers. However, blood lead levels ranged from 0.18 - 9.82 $\mu\text{g}/\text{dL}$.

Conclusion

Whilst this literature review provides little information directly related to the behaviours, habits and attitudes associated with the preparation, cooking and eating of lead shot in wild-game meat in the UK, it does provide a useful backdrop to the project and ensures that no potential insight has been missed.

Inconsistencies around the definition of wild-game meat and which animals fall in to the category of game, highlight the need to provide clear definitions to respondents taking part in the next stages of the research.

Overall Research Objective

The overall objective of the research was:

'To identify high level consumers of lead-shot wild-game meat in Scotland and investigate consumption habits and behaviours in order to generate meaningful and useful data to carry out a risk assessment to assess the levels of lead to which these individuals are exposed'

Specific Objectives

In addressing the overall objective, the research sought to address the following specific objectives:

Identifying High Level Consumers of Lead-shot Wild-Game

- To determine who are the high wild-game meat consumers
- To identify the source the wild-game meat
 - Shot by the consumer, purchased from a shooter/vender of wild-game meat, obtained as a gift, any other means?*

Lead-shot Wild-Game Preparation

- To determine which wild-game meat is prepared (and therefore eaten) in highest quantities
 - Game birds, venison, etc.
- To understand how meat is dressed
 - What proportion of pellet/shot is removed, what happens to wounded tissue around the shot channel
- To explore which common cooking and preparation techniques are involved
 - Marinating, roasting, cooking, broiling, any other method

Lead-shot Wild-Game Consumption

- To explore people's habits and behaviours in relation to their consumption of wild-game
- To investigate perceptions of portion sizes with a view to developing a consistent measure across respondents

* *The MRS guidelines were followed throughout this study.*

Scope of the Research

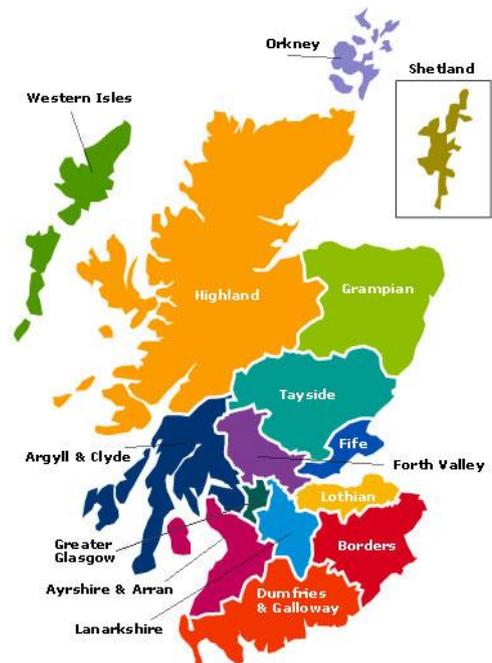
This research focuses on the habits and behaviours of consumers who regularly eat high quantities of lead-shot wild-game meat. The definition of 'high quantities' was originally set as:

“Consumption of one meal containing lead-shot wild-game meat at least once per week throughout the year and/or several meals including lead-shot wild-game meat a week during the shooting season”

However, the research objectives, we expanded upon this definition to include those who are involved in the preparation of wild-game meat for consumption. Within this definition we sought to include the views of:

- **Domestic respondents:**
 - Those that prepare wild-game for their own/family's consumption
- **Commercial respondents:**
 - Those that are involved in preparing wild-game for third parties' consumption

The geographical scope of the research is confined to Scotland. To ensure a true picture of habits and behaviours across the whole country, the methodology took into account views of respondents across all regions.



Research Approach

Having carefully considered the research objectives and the potential difficulties identifying and reaching the target audience, we set out to provide a programme of research involving a mix of both qualitative and quantitative interviews in order to best meet the research objectives. This approach consisted of the following elements: qualitative research phase (phase I), which included expert interviews and in-depth preparation/consumption interviews and quantitative research phase (phase II).



QUALITATIVE RESEARCH PHASE (PHASE I)

Expert Interviews

The programme of expert interviews consisted of two key audiences:

- Experts in the field of lead removal and wild-game preparation
- Organisations representing the potential target audiences

We feel the views of both audiences had significant benefits on this first stage of the research.

Experts in the Field of Lead Shot Removal and Wild-Game Meat Preparation

In order to fulfil the objective of identifying themes and questions that were to be used in the quantitative phase of the research we first needed to understand the practices involved in lead shot removal and wild-game meat preparation.

By conducting interviews with experts in the field, we had the opportunity to explore how meat is typically dressed, the likely proportion of pellet/shot that can be removed from each form of wild-game, to understand how the respondents view of that proportion may differ from the reality of what can actually be removed, along with understanding what may happen to wounded tissue around the shot channel.

Moving further along the chain of preparation, we also sought to include the views of experts who are aware of the effects of varying cooking techniques on the levels of lead available for absorption. By discussing marinating, roasting, cooking, broiling and any other method deemed appropriate we were able to build a greater understanding of those techniques which were to be focused on in more detail within the quantitative phase of research. These interviews had the added advantage of allowing us the opportunity to explore in detail the precise language used when preparing wild-game meat (in addition to information that can be gained from reading studies that have previously been undertaken).

Given the range of practices that could have been covered within each of these interviews and also the extended duration of the interview, these expert in-depth interviews were conducted face-to-face at a location determined by the respondent.

There were face-to-face interviews with the following type of experts:

- Game Expert and Consultant Chef
- Game Dealer
- Gun expert / Stalker / Shooting party organiser
- Academic / Veterinary Surgeon

Organisations Representing the Potential Target Audiences

We were aware at the outset that there may be some level of reluctance to take part in the research amongst the potential target audience, however we felt it was important the views and opinions of organisations representing those individuals were sought. There were key benefits to including this audience as follows:

- Representatives were able to assist us in identifying the pros and cons of collecting quantitative information amongst their members via our proposed methodology, but they were also able to highlight any additional areas of questioning or concerns we needed to take into consideration.
- Including such representatives added a certain amount of credibility to the research and aided our success in recruiting for the latter phases of research.
- As with the expert interviews, our discussions allowed us to be sure that the questionnaire (and the precise language used) for the quantitative stage was appropriate and relevant to each of the target audiences.

Successful telephone interviews were conducted with individuals from the following organisations:

- BASC
- BASC Scotland
- Scottish Game Dealers & Processors Association
- British Deer Society
- Scottish Countryside Alliance

Game Preparation/ Consumption In-depth Interviews

As stated, the information obtained from our expert interviews and discussions with relevant organisation representatives served as a backdrop to the second stage of qualitative research with those who are involved in the preparation of wild-game meat for consumption.

In this instance, in-depth interviews allowed us to explore the range of practices individuals employ to prepare different types of wild-game meat and understand any variations - assessing whether these are at the request of another party or depend on any other variable (for example, geographical variations, differences in the size of the game being prepared, the size of the wound, etc.). These interviews also allowed us to explore in detail the subject of 'portion sizes', identifying any commonalities across respondents or potential difficulties in quantifying this area.

Initially it was thought the in-depth interviews should be conducted by telephone. However, given the need for respondents to demonstrate their techniques (whether that be on real game or by illustrations, mimes or whichever method the respondent was most comfortable with) it was deemed important to the research that these interviews be conducted face-to-face so that the interviewer can see and gauge different methods first hand.

All interviews were conducted by the experienced project team, skilled in conducting in-depth interviews of this nature. In addition to using the findings of these face-to-face interviews for the development of the quantitative questionnaire, the results have also been incorporated into the main results section of this report, adding valuable depth and insight into the findings.

Qualitative Interview Target Audience

The range of audiences that could be included within this stage of the research was potentially wide and varied.

The key to the success of this piece of the research was in the recruitment of a good spread of respondents from each of the sub groups within the target audience (both domestic and commercial). When deciding who to speak to at this phase of the research, a range of different variables was taken into account, these being:

- A range of commercial game meat preparers (game dealers, butchers, etc.)
 - Within that, a spread of different sized businesses
- A range of domestic game meat preparers (by gender, by age, by family composition, etc.)
- A variety of levels of experience (new to the art of preparation versus 'old hand')
- A mix of different wild-game meats being typically prepared
- A spread of geographic locations
- The need to understand a variety of perspectives on portion sizes (and test understanding of any measures identified as appropriate)

With this in mind, we set out to achieve a total of 16 interviews covering a mixture of commercial and domestic perspectives. Ultimately some interviews provided both points of view. The spread of the completed interviews were as follows:

- 3 x Butcher
- 3 x Game Dealer
- 2 x Game Dealer / Butcher
- 2 x Shooter
- 2 x Game Processor / Preparer
- 3 x Restaurant Chef
- 1 x Hotel Chef
- 1 x Game-keeper

A recruitment questionnaire was devised and agreed with the FSAS. A copy of the recruitment questionnaire can be found in Appendix I section of the report.

Qualitative Interview Logistics

Important points to note about the in-depth interviews are as follows:

- Each interview lasted approximately one hour
 - Some interviews extended beyond this length. This was determined by the respondents' experiences with game meat and willingness to go through their preparation techniques
- Each interview was conducted at a time and place convenient to the respondent – in all cases this was the respondent's home or place of business
- With the respondents' permission the interviews were tape recorded for analytical purposes
 - In line with the Market Research Society Code of Conduct, respondents were screened at the initial recruitment stage to ensure they were comfortable with this
- Where appropriate, photographs and video recordings were made of any particularly interesting techniques
 - Again, respondents were screened to ensure they were comfortable with this during the initial recruitment

QUANTITATIVE RESEARCH PHASE (PHASE II)

Quantitative Interviewing

It was considered from the outset of the research that those who are involved in game management, such as shooters, gamekeepers and game beaters and their respective families are likely to eat higher quantities of wild-game meat than the general population. In determining our methodology for this phase of the research, we first considered the potential willingness (or otherwise) of this target audience to take part in the research. Indeed, preliminary, exploratory interviews undertaken as part of this proposal development phase revealed a number of potential concerns:

“People might think you’re something to do with the tax man” (Shooter – Moray)

“People will be very guarded, they’ll be worried about a total lead ban so they wouldn’t want to give a lot away” (Game Dealer – Berwickshire)

“Shooting comes under so much scrutiny from so many sources – you’ll come across a lot of scepticism” (Syndicate Organiser – Perthshire)

“They’re men - they just won’t be bothered to help you” (Gun Club – Dumfries and Galloway)

Despite these concerns, the first six potential respondents contacted as part of this exercise, without exception, agreed willingly to discuss the research and put themselves forward to take part in a quantitative exercise. Encouragingly, these respondents were also willing to provide the contact details and telephone numbers of additional potential candidates.

“You should speak to Graham, he eats loads of game, I’ll give you his number, as long as you tell him I sent you” (Butcher – Dumfries and Galloway)

In light of this, in order to address our key objective of determining who are our high wild-game consumers and uncovering the most appropriate means to access those groups, we used **semi-structured telephone interviews** and the ‘**snowballing**’ of respondents allowing us to recruit willing individuals to take part in the final quantitative stage the research.

Snowballing of Respondents

Our first participants were recruited from contact details of likely target audiences available on the internet. During the course of these recruitment interviews, we discussed with participants any family members, friends or acquaintances they were aware of who may also be able to help us with this research. The same approach would be employed with the objective of reaching the last participant in the chain who does not have anyone else to snowball the research to – at this point, we would then return to our contact sources and recruit again from there. This approach is illustrated in the diagram below:

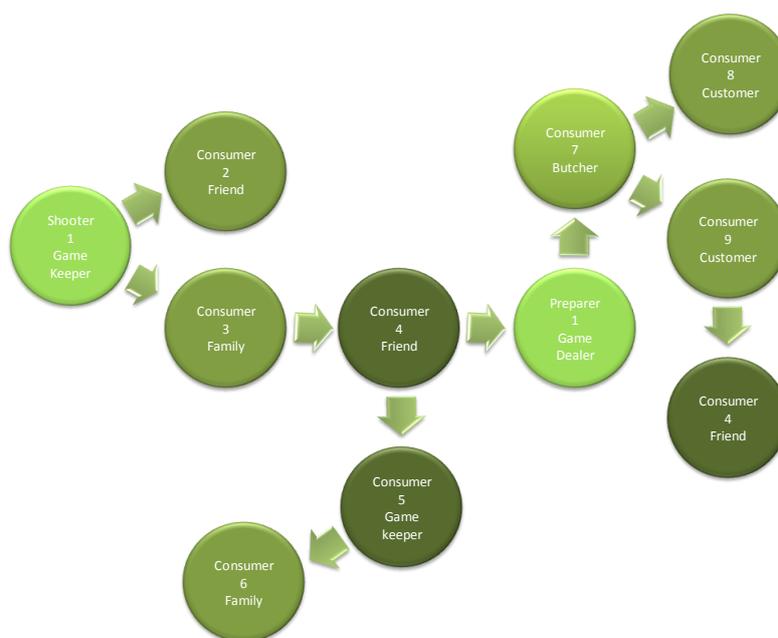


Figure 2: illustration showing the snowballing approach to sampling

Recruiting in this manner provided the added benefit of opening doors to respondents that would not otherwise be included within the research (for example, those that shoot and prepare their own wild-game meat without belonging to any syndicate, association or group).

A further benefit of the snowballing approach ensured that the widening of the circle of recruitment to friends, family and acquaintances of our initial sources was further widened to include friends, family and acquaintances of additional sources across Scotland.

Sample Size and Structure

As with the qualitative interviewing, in determining how many quantitative interviews were to be completed we needed to consider a range of different variables:

- Respondents' backgrounds:
 - Commercial game meat preparers/consumers (game dealers, butchers, etc.)
 - Within that, a spread of different sized businesses
 - Domestic game meat preparers/consumers
 - Within that, a spread of different genders, ages, family compositions, etc.
- The mix of different wild-game meats being typically prepared and consumed
- The spread of geographic locations required to ensure a representative sample

An initial analysis of sample sources available to us suggested we would have a reasonable supply of the following potential respondents/snowballing sources:

- Butchers (500+ available contacts)
- Shooting clubs (250+ available contacts)
- Gun shops (250+ available contacts)
- Farms (100 available contacts)
- Other potential sources (shooting syndicates, game dealers, beaters, game keepers, land owners, shooting party organisers, etc.)

However, despite the number of contacts potentially available, within our thoughts on sample size, we also needed to consider feasibility. Whilst we were confident in the success of the snowballing approach to the quantitative stage of the research, we are not able to gauge exactly how many successful interviews we would be able to achieve at the outset. With this in mind it was agreed with the FSAS to adopt a flexible approach to the overall sample size required.

Throughout the fieldwork process we monitored the progress of interviews closely, taking into consideration the profile of respondents and their location in order to tailor the interviewing to achieve the agreed 200 interviews.

Questionnaire Design

Following the completion of the qualitative interviews the quantitative questionnaire was designed.

The scope of the questionnaire was developed to cover both preparation and consumption habits, and behaviours to ensure a fully rounded view of the objectives. We were aware that not all those who prepare lead-shot wild game would also consume lead-shot wild game (and vice-versa) and therefore all respondents were routed according to their experiences. Most of the questions were closed/structured in nature and the survey lasted no longer than 15 minutes.

Once agreed, the questionnaire was set up on our in-house CATI system and tested by several members of the project team to ensure all response permutations, routing instructions etc. were accurate. This set-up and testing process was essential from a quality control point of view.

A copy of the quantitative questionnaire can be found in Appendix I section of this report.

Recruitment

All interviews were conducted by a specialist team within Harris Interactive's in-house telephone unit. The interviewing team were highly experienced in securing interviews with respondents of this nature. This experience, combined with the project team's ability to work flexibly with both the phone unit and sourcing sample from the internet, ensured the right balance of respondents were recruited to go on to complete the quantitative questionnaire.

- Prior to the start of fieldwork, all interviewers working on the project were required to attend a comprehensive briefing conducted by the Project Manager and the Senior Phone Controller.
- At the start of each interview we carried out a screening process to ensure that all respondents met the criteria of eating sufficient wild-game meat both during the season and out of the main shooting season. The definition of this is detailed within the following section of this document.
- Interviews were either completed at the point of first contact, or an appointment was arranged for a time that was more convenient to the respondent

Levels of Consumption of Lead-Shot Wild-Game Meat

Generally, within the qualitative phase of the research, respondents felt that there is no such thing as a ‘typical’ consumer of wild game and therefore discrepancies arose over the definition of a ‘high level’ consumer. Suggestions included:

- “Once a week in season, then the occasional bit for the remaining 6 months (bbq bits from the freezer)”
- “Personally I feel I am high level and I eat it once a week/once a fortnight”
- “Some people make a point of eating grouse every day in season”
- “During season I tend to have it once or twice a week – out of season, I freeze a lot so still once a week”
- “From a rural perspective – I know a lot of people who would eat it 4/5 times per week – 1 or 2 times per week out of season”
- “In the city you see game on a lot of menus so it’s quite standard to eat it once a week or more”

It was thought that consumption levels are likely to increase during the season due to there not being a perceived ‘healthier’ option available to consumers. Furthermore, some TV chefs were promoting wild game meat which is likely to also serve to increase consumption levels.

On this basis, the definition of a high level consumer was considered to be anybody that ate wild game meat at least once a week during the season, and around the same consumption level out of the normal shooting seasons.

This was therefore a requirement of respondents for the quantitative phase of the research. Although some respondents qualified for the interview against other set criteria, unless this level of consumption was achieved the interview was terminated.

The chart below details the number of interviews which qualified on the set criteria, but failed due to their consumption levels. In total 311 respondents qualified to this stage of the survey. 111 (just over a third) did not qualify on the basis of them not being deemed a ‘high-level consumer’ of wild-game meat:

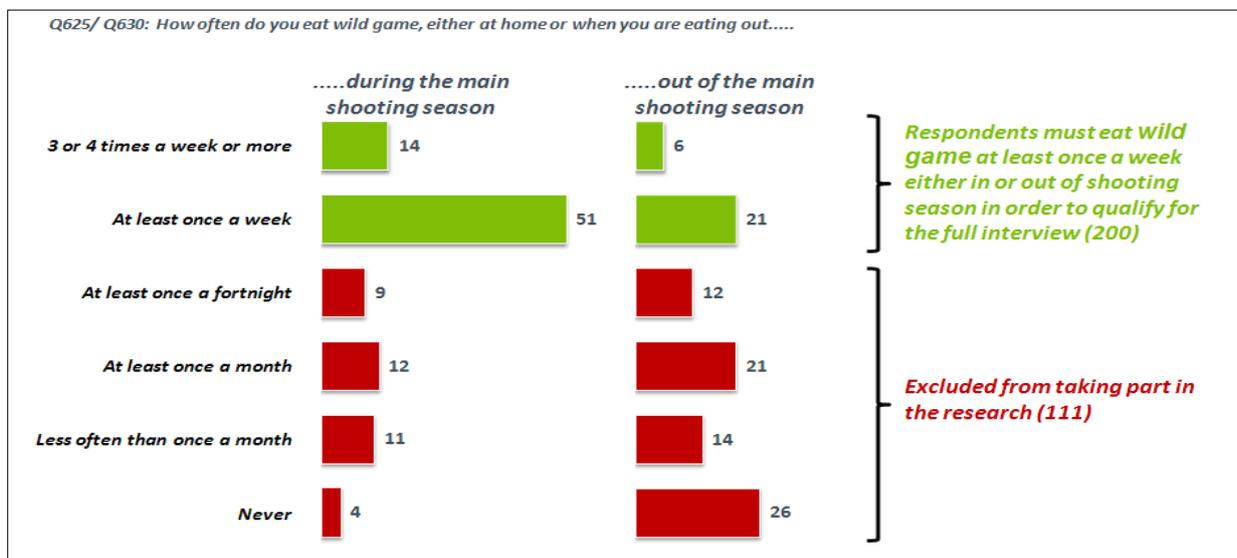


Figure 3: Qualification criteria of consuming wild game meat

Whilst the requirement of the research in defining high-level consumers was to eat wild game meat at least once a week either during the shooting season or out of the main shooting season, wild game meat is not generally considered as an everyday meal. Around three-quarters (73%) of respondents ate wild game meat just once or twice a week.

RESEARCH FINDINGS

Profile of Quantitative Respondents

The quantitative phase of the research began on Thursday 26th May 2011 and was concluded on Friday 30th September. Within this period there was a break in fieldwork for several weeks from Monday 6th June to Monday 1st August whilst a review of the initial pilot phase and the final scoping of the quantitative fieldwork were undertaken.

In all there were 200 quantitative interviews completed across a wide spectrum of individuals. All figures in the following charts detailing the profile of the respondents are percentages, unless otherwise stated.

Gender:

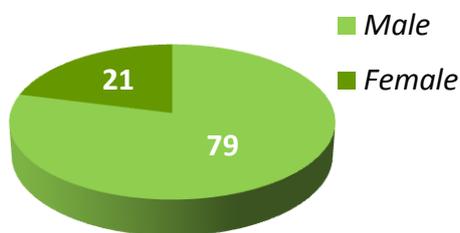


Figure 4: Respondent gender

Age:

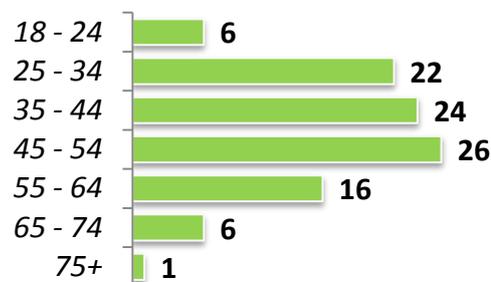


Figure 5: Respondent age bands

As well as being important to ensure a good mix of respondents in terms of age and gender, it was also crucial to the research that, in line with the objectives, opinions and attitudes were sought across all region of Scotland:

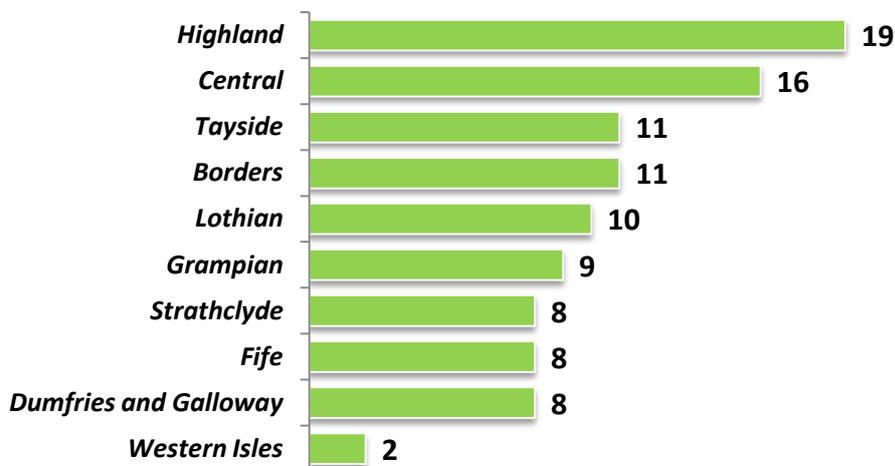


Figure 6: Respondents' region of residence in Scotland

Another key element of the research was to ensure attitudes and opinions were gathered from individuals covering the numerous industries and organisations involved with wild game meat. Involvement in the industry was essential to ensuring we were speaking to the right people who could offer both a commercial and a consumer perspective

Organisation Type		Organisation Type	
Hotel	28%	Game Shooting	2%
Restaurant	20%	Game Dealers	2%
Clay Shooting	5%	Farm Shops	2%
Hunting Trips	5%	Catering outlets/supplier	1%
Farm	5%	Sporting Agency	1%
Butchers	3%	Hunting Hotel & Restaurant	1%
Game Handlers	3%	None of these	22%

Table 2: Capacity in which respondent was involved in wild-game meat industry

The structure and success of the recruitment for the research has ensured a complete and rounded perspective on which to base the findings.

Reactions to the Research

The general reaction to the research amongst respondents was positive, and furthermore supportive. Many of the organisations contacted during the qualitative phase of the research anticipated no issues in achieving the objectives and suggested we would experience no difficulty in contacting others within the industry or have any difficulty in speaking to consumers.

There was acknowledgement that the issue of lead shot being present in wild-game meat had come to the fore in recent years, and considered the research as a possible route in gaining clarification for both organisations and general consumers.

Consensus of opinion was the presence of lead shot in wild-game meat, or the potential effect of lead poisoning was a 'non-issue'. And therefore any research that might confirm or address this could positively encourage consumers to eat more, and ultimately benefit the industry as a whole.

However, there was some reluctance and resistance to the research from a minority of commercial interviewees. There was a belief that the shooting fraternity may not wish to participate in a study that they believe was attempting to limit usage of lead shot.

There were further concerns amongst respondents who are a part of the food industry over the likelihood of increased regulation resulting from any research. To some the selling of wild-game meat was an important revenue stream for their business, and the prospect of additional regulations and guidelines that might impact on this could be detrimental to their livelihood. Another considered threat for some butchers, was the thought that supermarkets were 'sponsoring' the research in order to drive independent retailers out of business.

How the results of the research were to be communicated was also a concern. The term 'scare-mongering' was used on occasions suggesting any negative publicity available in the public domain would have an adverse impact on the industry as a whole.

Presence of Lead in Wild Game Prior to Processing

Some respondents during the qualitative phase of research made the point that not all lead-shot wild game would actually be contaminated with large amount of lead following the processing. There was some concern that lead-shot wild game could be portrayed as containing large amounts of shot, when in some cases the meat had no trace in the cuts or portions of meat that would be considered sellable. For example, birds could be hit in the extremities, such as the head or a wing, which are both fully removed at the processing stage. Also, it has been noted that some birds can die from shock – such as from the presence of dogs – the resulting fall to ground being enough to kill the bird.

It was also noted that different sized lead shot is used for different types of shoots/ game birds. Bigger pellets contain more energy and can therefore kill from a greater distance. They also penetrate birds with thicker down. Smaller pellets were used more often for smaller game birds.

Different ammunition is used depending on the type of wild game animal shot. Although legal, it was considered unlikely to encounter lead shot in rabbit, hare or deer as a rifle shot is deemed as being the most appropriate for these types of wild game due to their accuracy, and potentially the need for shooting from a greater distance.

It was considered to be highly unlikely to ever come across a lead shot cartridge in an animal. Due to the sheer velocity and the amount of energy contained within a shot the cartridge is thought to, more often than not, pass through the animal. At most, it was noted that the cartridge may be stuck in the skin on the other side of the animal.

Lead bullets, as opposed to lead shot, are designed to 'mushroom' on impact. This expansion in diameter promotes a more effective and more humane kill due to a bigger hole, and ensures an exit wound resulting in a blood trail for easier tracking of any injured animal. In addition the faster the animal bleeds the quicker the animal will die, again, promoting a more humane kill.

Presence of Lead Shot in Wild-Game Meat at consumption

Whether dining out, or eating at home, finding lead shot in wild game meat is not common place. It is only found either occasionally or rarely when eating in the home, and even less frequently when eating out.

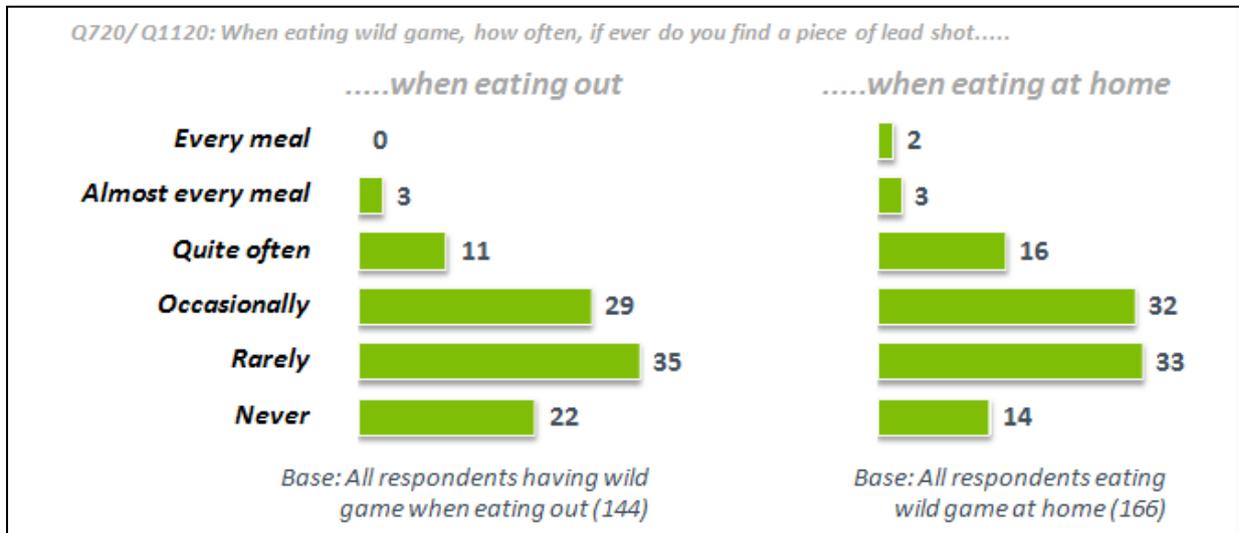


Figure 7: Frequency of finding lead shot in wild game. Figures are % of respondents

Although it is not a common occurrence, there is some expectation of finding lead shot in wild-game meat. When asked whether they expected to find fragment of lead shot in wild-game meat, 40% of respondents strongly agreed and 19% slightly agreed with that statement. And whilst there is that expectation of finding lead shot in wild-game meat, the potential presence of any does not act as a deterrent when buying wild-game meat, with 49% respondents strongly agreeing that they are 'quite happy to buy wild game that contains lead shot'. Although a minority, 12% of respondents stated that they enjoyed finding lead shot in wild-game meat as it proves it is wild.

Sourcing of Wild-Game Meat

The range available for the sourcing of wild-game meat is wide. Almost half (45%) of respondents perform the act of shooting themselves, and 40% have wild-game meat provided by someone else who either shoots or is connected to the shoot. The remainder of respondents mostly sourced from meat from a game dealer or directly from a butcher (33% and 25% respectively). Whilst wild-game meat is sourced from local farm shops (8%) or supermarkets (7%), these are not the most common sources of choice.

Source	Pheasant	Venison	Pigeon	Partridge	Rabbit	Woodcock	Grouse	Snipe	Hare
Shoot Personally (89)	87	80	76	74	73	67	56	55	43
From someone who shoots/ connected with shoot (79)	78	62	45	51	42	33	45	19	22
Game Dealer (66)	67	86	64	66	55	44	61	39	45
Butcher (49)	56	85	52	38	42	25	35	19	33
Local/ farm shop (15)*	50	75	44	31	50	25	31	6	25
Supermarket (14)*	14	93	21	14	14		7		

Table 3: Sourcing of different types of wild game. Figures are % of respondents. Individual base sizes in brackets. *=Low Base

The most popular wild game for respondents who shoot personally, or are connected to a shoot, is pheasant (87% and 78% respectively). Pheasant is sourced highly across the various options available, with the exception of supermarkets (14%). Shooting personally tends not to be restricted to a selection of wild game animals – many respondents shoot across the range of wild game animals. Though not to the same extent, a variety of wild game animals are sourced from someone associated with the shoot, or direct from a game dealer.

As already noted, supermarkets are not the source of choice for wild game meat. However, the most popular wild game meat being sourced from supermarkets is venison – potentially due to its size and the requirement of the meat to be processed in to usable formats ready for cooking.

	Venison	Pheasant	Pigeon	Partridge	Rabbit	Grouse	Hare	Woodcock	Snipe
<i>Base</i>	90	65	63	55	53	50	41	36	30
Whole	24	89	57	96	74	94	78	97	93
Breast meat / steaks / specific cuts	80	32	62	22	30	10	27	6	10
Minced	7	3		4		4		3	3
Sausages / burgers	12	6	2	5	4	2		3	3
Ready meals	1	3		4		2		3	3
Pies or other pre-prepared formats	3	8		4	4	2	2	3	3
Frozen (either whole game or certain cuts / other frozen formats)	10	12	3	9	2	8	2	8	10

Table 4: Formats of different types of wild game sourced. Figures are % of respondents

With the exception of venison, wild-game meat is generally sourced whole. Sourcing wild game whole enables the consumer to determine the cut of meat required and therefore the size of cut required for consumption. It also suggests the various cuts available from the animal are being used.

Venison is said to be sourced whole by nearly a quarter (24%) of respondents. In the main, when obtained whole venison is being sourced direct from game dealers, shot by self or provided by somebody else who has shot it or was connected to the shoot.

Preparation of Wild-Game Meat

Given the majority of respondents are shooting wild game themselves, or sourcing wild-game meat from others that have either shot or are connected to a shoot, and that other than venison wild-game meat is sourced whole, it suggests there is a lot of preparation involved prior to cooking and ultimately consuming wild-game meat. The results of the research shown in the charts below suggest the vast majority are happy and willing to prepare wild-game meat themselves.

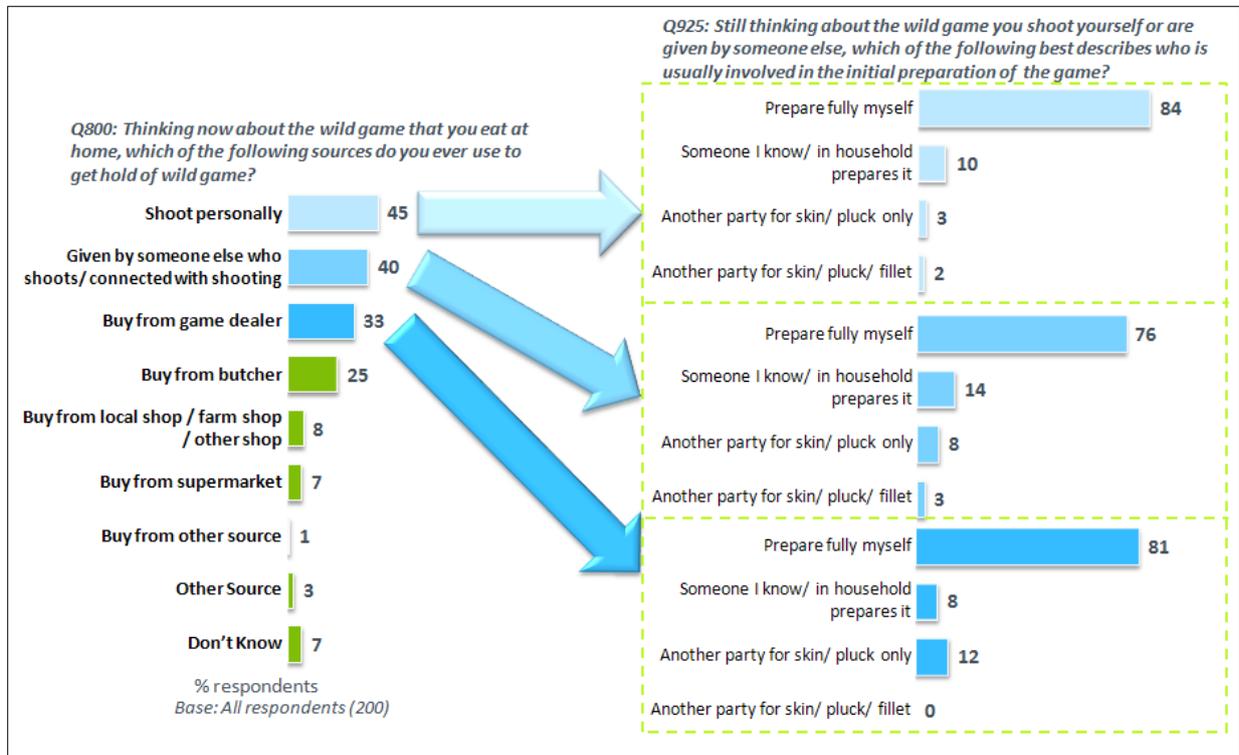


Figure 8: Preparation of wild-game meat.

When preparing wild-game meat themselves the majority (68% strongly agreed, and 12% agreed slightly) discard any meat that is severely damaged as a result of shot. The research provided no definition of 'severely damaged' meat and therefore opinions of what this means might differ depending on the perceptions of the respondent. However, within the qualitative research there was some consistency amongst respondents of what was considered to be 'severely damaged' – that was, wild-game meat which is not presentable, or the best cuts are not edible and the meat deemed unusable. In some instances where cuts of meat were badly damaged and not usable in their true form then the surrounding areas were cleaned from lead shot using the normal methods and used as wild game mix, generally taking the form of wild game pies, burgers or sausages.

For professionals and shooters, it was felt that by selling or distributing badly damaged, or wrongly shot game meat would have an adverse impact on their reputation. Shooters do not want to be known for any bad kills through poor shooting for fear of 'embarrassment' amongst their peers. Similarly, dealers or distributors do not want to provide badly damaged meat for the risk of losing reputation and affecting their livelihood in the future.

There is some expectation (65% strongly agreed and 18% agreed slightly) of finding lead shot in wild-game meat, but there is a tendency to remove as much as possible during the preparation stage (48% strongly agreed and 14% agreed slightly). There are no suggestions of removing lead shot other than what is visible to the naked eye, 47% strongly agreed and 12% agreed slightly that they would remove pellets which are obvious but wouldn't search around for any others. However, there are 28% who strongly agreed they would not remove any lead pellets from the wild-game meat during the preparation stage.

Preserving of Wild-Game Meat

Within the research we looked to understand more about the methods and techniques used for the preserving of wild-game meat. The two methods we concentrated on were the hanging of meat, and the freezing of meat, whether this was pre- or post-preparation and cooking.

Of those shooting wild-game meat, or sourcing through others who shoot or are connected with shooting, 80% hang or store wild-game meat before any form of preparation. Generally this is for a few days, but can be for as long as 2 weeks. For a minority (10%) this can be for up to 4 weeks in duration.

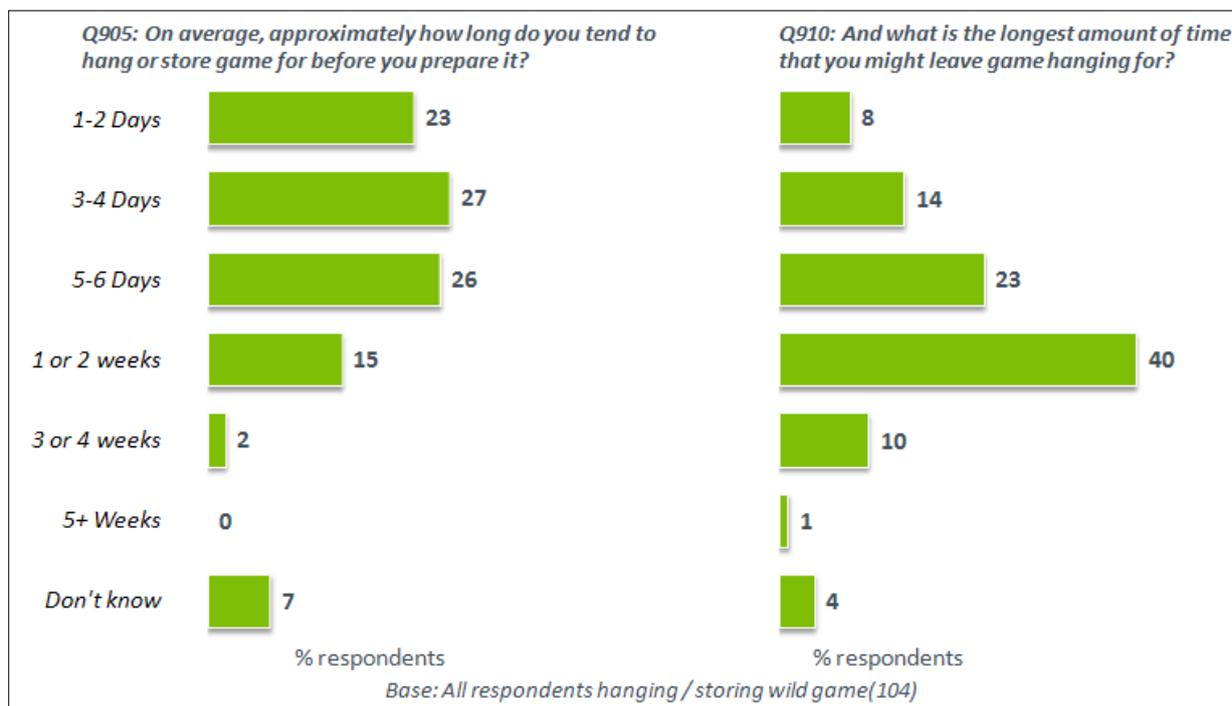


Figure 9: Hanging and storing periods of wild-game meat.

Once the wild game meat has been plucked or skinned almost two-thirds (60%) choose to freeze it prior to any other form of preparation, such as filleting. Nearly half (45%) of those freezing wild-game meat choose to freeze it for a period of more than six months, whilst 26% opt for a period of 2-3 months.

Freezing of wild-game meat for duration of six months ensures that the consumption of wild game meat can be continued out of the shooting season.

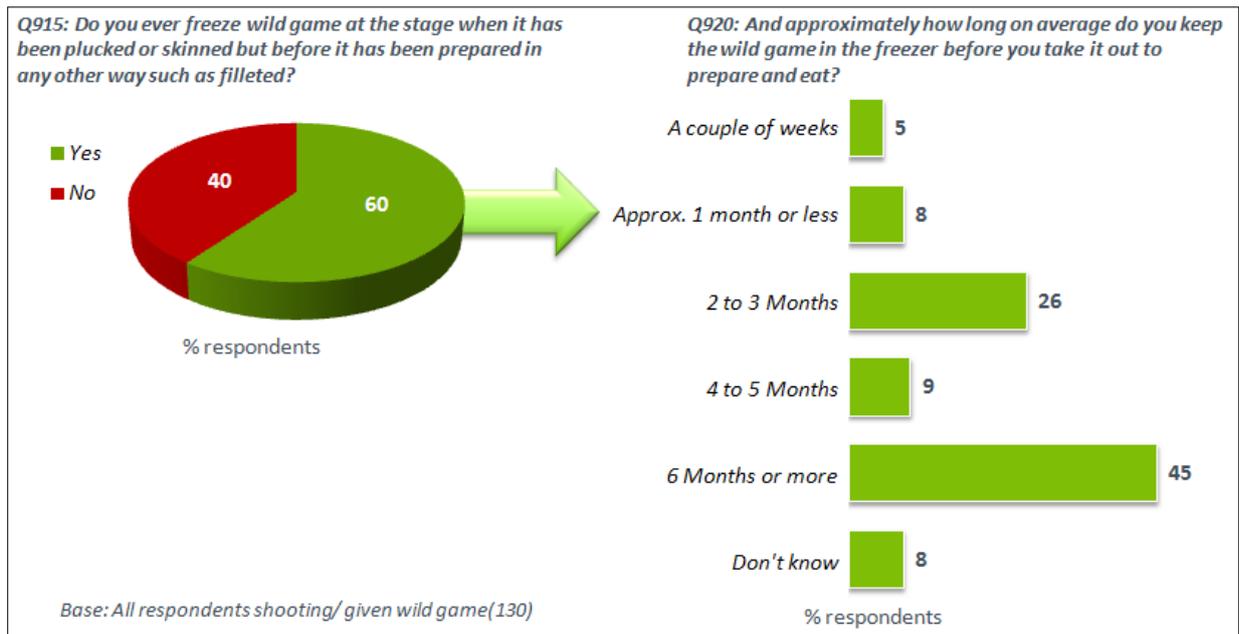


Figure 10: Length of period of freezing of wild-game meat prior to preparation.

Similarly, over two-thirds (70%) of respondents choose to freeze wild-game meat after the preparation stage. Within this group just over a quarter (26%) would freeze wild-game meat before any cooking, 13% after cooking, and the remainder (31%) both before and after the cooking.

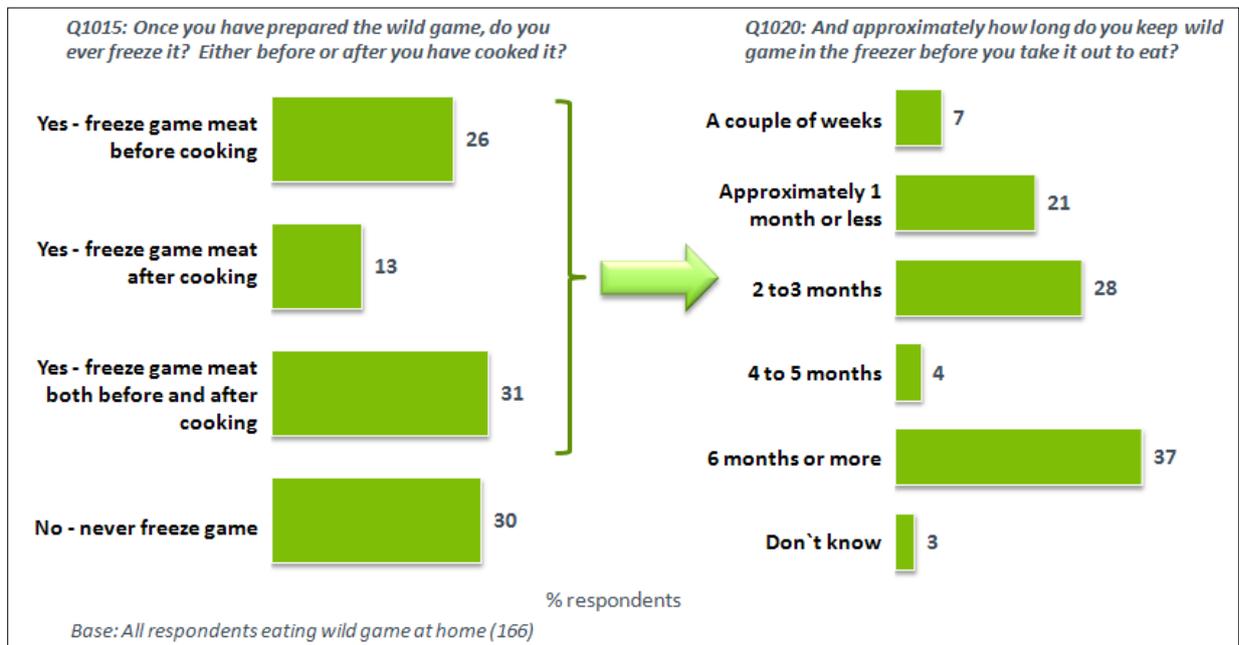


Figure 11: Freezing of wild-game meat after preparation but before and/or after cooking.

Wild-Game Meat Cooking Methods

Whether eating in the home or eating out, it was thought the methods available for the cooking of wild game meat are wide and varied, and can vary depending on the type of meat.

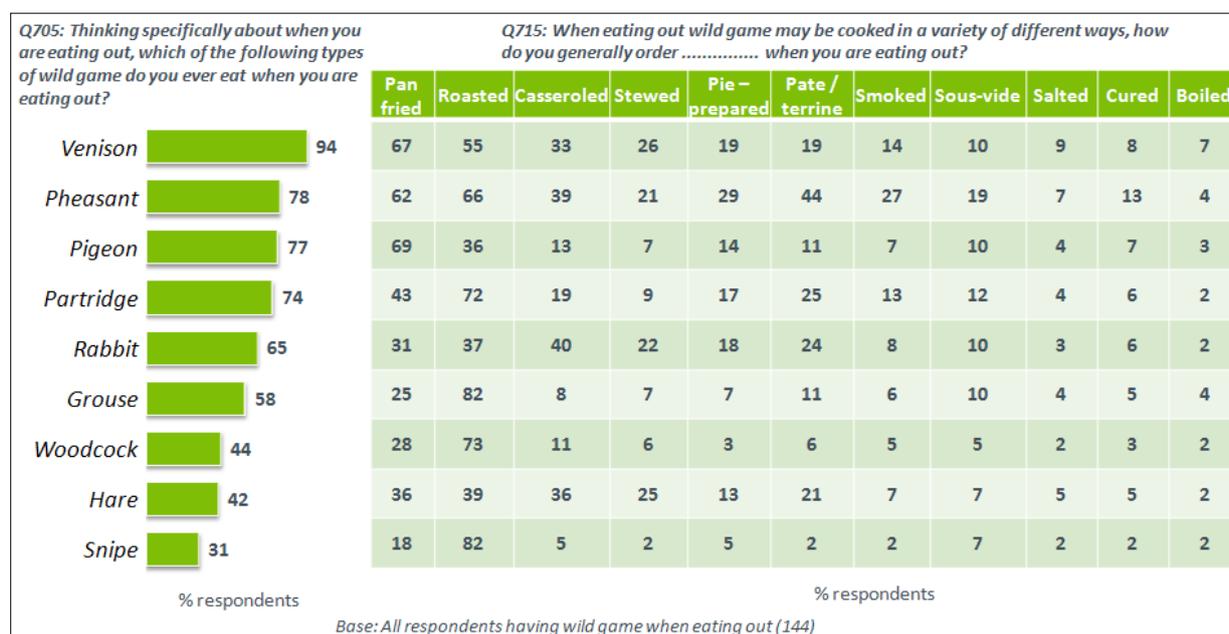


Figure 12: Formats of wild-game meat when eating out.

Venison is the most commonly eaten wild-game meat when eating out, and more often than not it is either pan-fried (67%) or roasted (55%), or sometimes eaten within a casserole (33%) or stew (26%). Pheasant is eaten with some regularity when eating out, and the cooking method adopted is much more varied than for other wild-game meats.

Generally, pan-frying was the cooking method of choice for most meat types, particularly amongst the larger wild-game meats available. For the smaller species however, such as partridge (72%), grouse (82%), woodcock (73%) and snipe (82%), there is more likelihood of them being roasted.

There are some minor differences in methods between those adopted at home versus those when eating out. Although there seems to be increasing domestic numbers employing differing methods of preparation, restaurants and commercial organisations are more likely to be associated with potted terrines, smoking, or salting and curing of wild-game meat.

Traditionally, roasting and pan-frying are considered to be the most popular cooking methods in a domestic environment, but more and more individuals are becoming adventurous and therefore more comfortable with new cooking methods providing a greater variety of styles of wild-game meat in the home.

Other traditional cooking methods include casseroles, stewing and the making of stocks. Within these cooking methods there are a wide variety of ingredients being used, with wine (88%) being the most commonly used ingredient added, followed by olive oil (74%). By using more acidic ingredients, such as wine, when preparing lead-shot wild-game meat there is more risk of lead leaching in the meat.

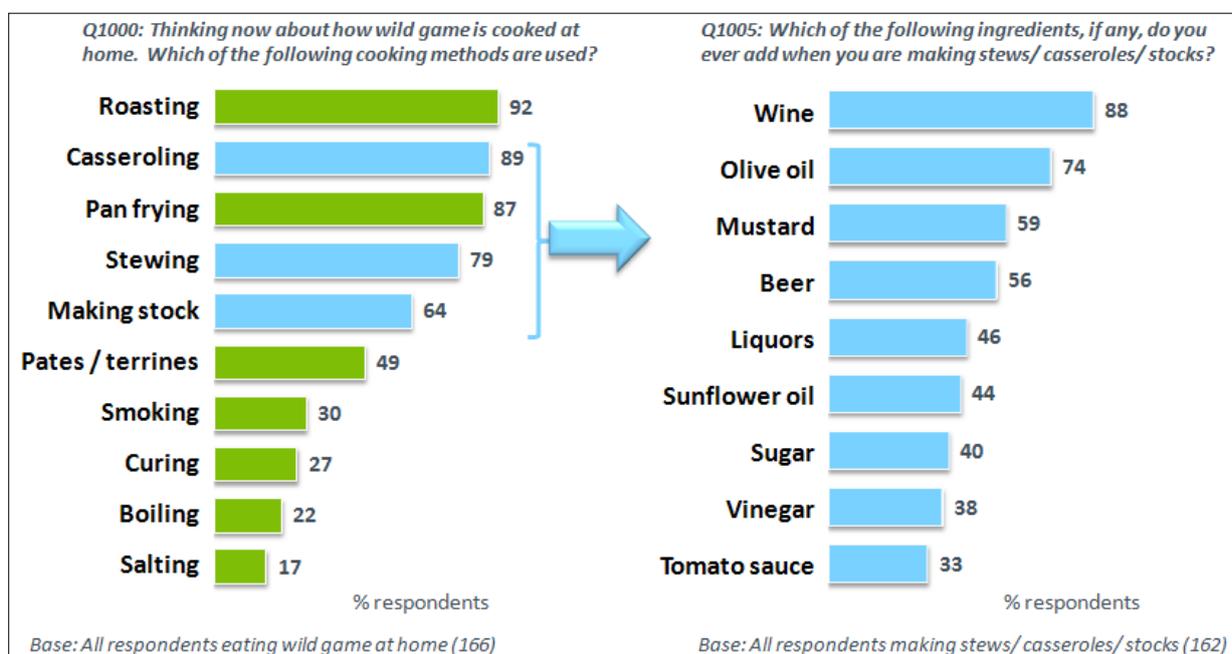


Figure 13: Ingredients used when making casseroles, stews or stocks with wild-game meat.

When respondents are making stocks within the home, generally they are making these quite thick (39%) using a normal size sieve, or quite thin (42%) by using a fine sieve. When using a fine sieve this should be sufficient in removing any very small pieces of lead shot from the meat, but will not be sufficient in removing smaller elements of lead shot. Making stock using a normal sieve is likely to remove most larger pieces of lead shot, though much of the smaller pieces could potentially be missed and remain in the stock.

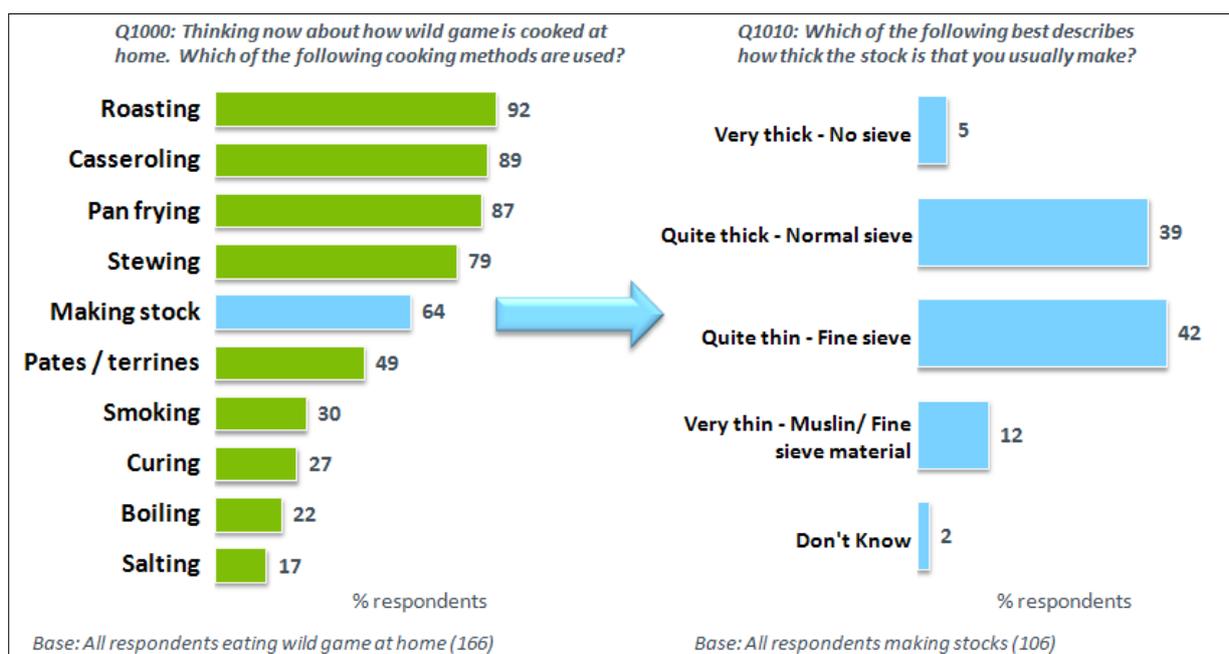


Figure 14: Thickness of stocks when made with wild-game meat.

Wild-Game Meat Portion Sizes

A key element of the research was to have gain understanding of what is considered to be the average portion size of wild-game meat.

Within the qualitative phase of the research we found there was little agreement on how best to assess portion sizes. Most respondents were keen to highlight that wild game are not farmed animals and therefore size and weight can vary significantly according to age and stage of the shooting season. There was an opinion that although the wild game seasons last for several months, some feel there is a period when the meat is at its best size, weight and ultimately quality, this was said to be several weeks after the start of cold winters – thought to be the period from mid December to mid January.

The larger species of game birds were likened to chicken, in that they could be categorised as small, medium or large. Typical examples of portioning for birds is either the whole bird or breast fillets, but can often be judged in terms of how many people could be fed by each. For example:

- Snipe or woodcock is normally eaten as a starter, and tends to be the whole bird.
- Pigeon is also generally considered as a starter consisting of one or two breasts per person.
- For a main meal, grouse is thought to be a whole bird.
- Pheasant is also considered to be a main meal, of usually two breast portions per person
- Whole pheasant was thought to be sufficient in providing a meal for two adults

One respondent within the qualitative phase recalls the FSA commenting on a guide for a portion size of wild game as being around ‘200 grams at a sitting’. A further respondent responsible for the development of recipes thought 200 g of game-meat per portion was also considered appropriate.

However, from a commercial perspective portion sizes of venison were noted to be below average, generally weighing in at 125 g per person. Any larger than this would be considered as being too expensive for supermarket customers, and could therefore impact on sales volumes.

Overall, when prompted, most respondents were in agreement that portion sizes of wild-game meat would be very similar to portion sizes of farmed animals such as chicken, beef or pork. This was confirmed within the quantitative phase of the research where the majority (66%) thought the portion size of wild-game meat should be the same, and a quarter saying that wild-game meat portion sizes should be slightly smaller than other meats.

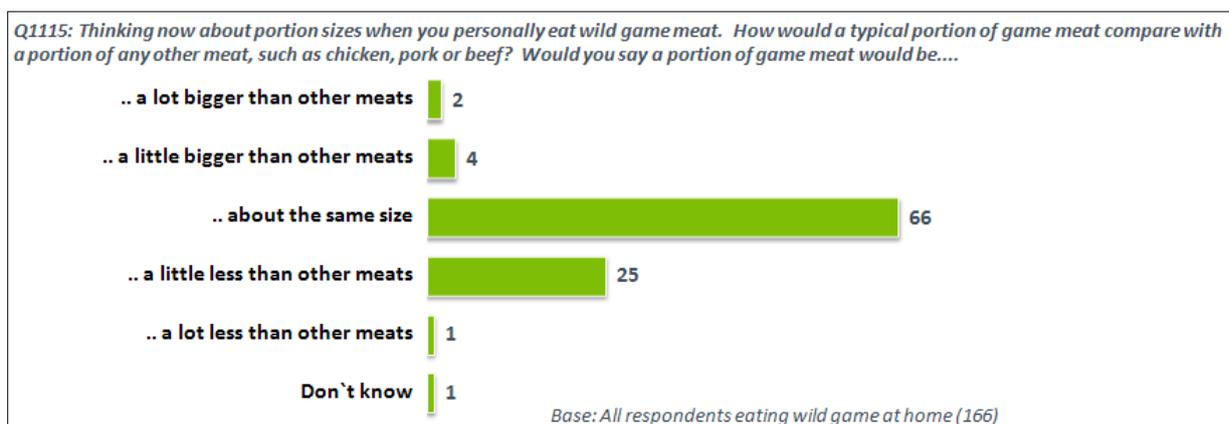


Figure 15: Suggested typical portion size of wild-game meat. Figures are % of respondents

Attitudes towards Wild Game and Risk from Lead

Two-thirds of respondents agreed (45% strongly, and 22% slightly) that the presence of lead shot in wild-game meat poses no threat to human health. Furthermore, 85% strongly agreed (10% agreed slightly) that they would happily serve wild-game meet to anyone. The belief that wild-game meat is healthy and would be happily served to anyone is further evidenced in the configuration of the household, and who from within the household is consuming wild-game meat. As seen in the charts below, only a minority of those present in the household were not consuming wild-game meat when eating at home suggesting it was perceived as a food suitable for all. The largest consumption drop is amongst children under 5 years old (77% eating wild game meat) and in adults between the ages of 65 and 74 where 82% eat wild-game meat.

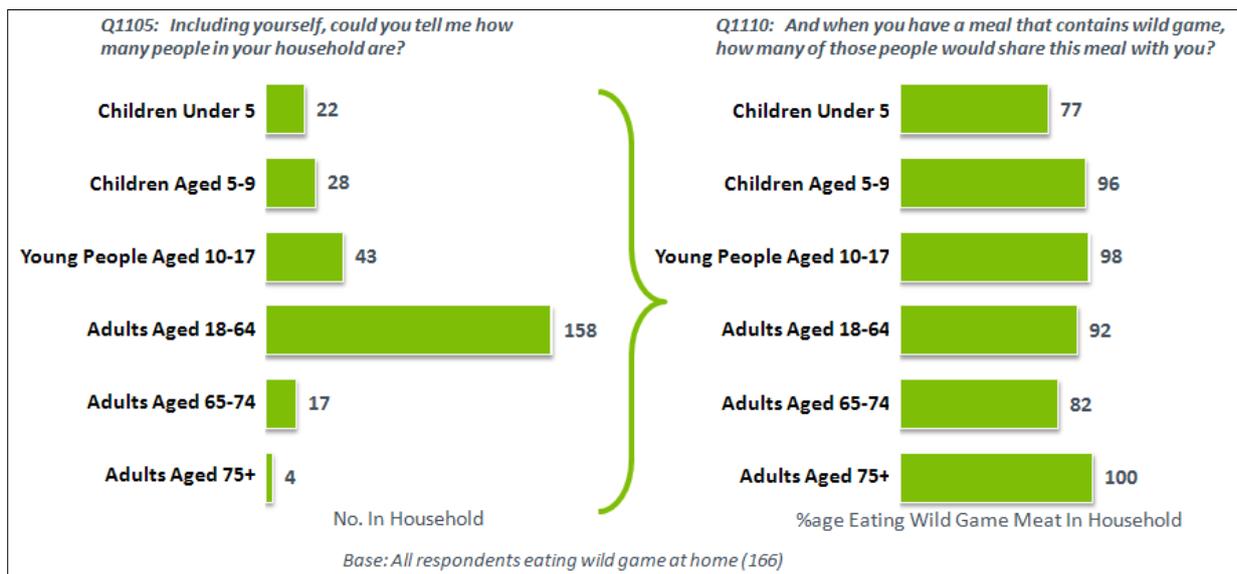


Figure 16: Household composition and the levels of wild-game meat consumption in the household.

The majority of respondents were not aware of anybody suffering any health problems arising from consuming lead-shot wild-game meat which instils respondents' confidence in wild-game meat being healthy. 61% strongly agreed, and 21% agreed slightly that lead-shot wild-game meat is the healthiest meat you can buy. Opinions are that wild game animals benefit from being in their natural habitat as opposed to being farmed, resulting in more healthy meat. Half of respondents strongly agreed, and a further 20% agreed slightly that there is more of a threat to humans from lead in the environment than there is of consuming lead shot within wild game meat. Many consider lead water pipes that may still exist in some older houses to be more of a threat to the public health given the more prolonged exposure over time.

Generally the accidental consumption of lead shot from wild game is not regarded as a concern anywhere within the industry. During this study, there has not been any concern expressed at any stage in the supply chain – whether by respondents from estates, shooters, game dealers, butchers and ultimately through to end consumers.

Although the respondents expressed much confidence in the health aspects surrounding wild-game meat, there was a feeling that clarification is required on the safe levels of lead to humans. 29% strongly agreed and 13% agreed slightly that there are no clear guidelines on acceptable levels of lead within the human body.

There was a high level of awareness and acknowledgement that the presence of lead shot could potentially be a conservation issue. It was recognised that there are regulations in place with regard to shooting over wetlands, and references were made to the grinding plates in water fowl which suggests lead is ingested and broken down in these birds.

There was also appreciation that the use of lead shot is not without potential health issues, and the use of alternative shot has been raised and considered, but there was strong reluctance to using alternative shot until a more suitable solution was available. The cost of alternatives, such as bismuth, steel, tungsten/iron, and tungsten/polymer shot, was the main cause for resistance – “...normal lead costs about £7.50 for a box of 25. Non-lead about £25 - £35 per box.”

In addition to the cost element, there were also opinions that less dense materials used in shot can result in a less humane kill for the animal, also some toxicity concerns were expressed surrounding oxidisation of alternative shot materials. There were also some minor concerns for human safety due to potentially higher risk of ricochets.

The Appeal of Lead-Shot Wild Game

Growth in the market for wild game has been rising considerably for a number of years. Wild-game meat is becoming more available to the mass market, and no longer seen so much as being ‘exclusive’. As detailed in the literature review, it was revealed that venison sales have grown 34% between 2006 and 2009, along with 31% for feathered game and 22% for other types of game meat.

Supporting this sales growth have seen campaigns such as ‘Game’s On’ and ‘Game to eat’ promoting the eating and enjoyment of wild-game meat. Indications are that this growth looks set to continue in the coming future.

All respondents within the qualitative phase of this research were avid supporters of game, with some actively promoting it to adults and children. Various game dealers and commercial butchers were also promoting wild game meat to hospitals and schools throughout Scotland.

A potential growth area highlighted was thought to be through the sale of burgers and sausages. These are considered a ‘familiar format’ for everyday consumers as they are easy and quick for consumers to deal with. Coupled with the ease of freezing such formats, it was felt that consumption is likely to increase both out of season as well as during the shooting seasons.

CONCLUSIONS

The project has been successful in providing valuable data on habits and behaviours of high-level consumers of lead-shot wild-game meat. Much interest has been generated through the fieldwork, in those involved in the industry. Regardless of the capacity of involvement there has been a very positive reaction to the research, whether from representative organisations, or those considered experts in the field, through to game dealers and butchers and ultimately to end-consumers.

The interest and recognition of the research created was further evidenced in the success of the snowballing technique which was used to generate additional sample and contact information to be used within the quantitative phase of the research. By using this technique we have been able to seek the views and opinions of individuals, both domestic and commercial, whom we would have not been able to contact had the more traditional and standard methods of sample generation been used. The result is a respondent base with a very rounded and varied profile on which to base the research findings.

Levels of Consumption of Wild-Game Meat

‘High-level’ consumers of wild game have been categorised as those eating at least one meal per week containing wild game meat during the season, and similarly out of the shooting season. Amongst this group of consumers, wild-game meat is generally eaten no more than once or twice a week, so in the main it is not considered an everyday meal, even amongst high-level consumers.

Almost every person within the household is eating wild game meat in the home. Wild-game meat is considered to be suitable and safe for all members of the family and is made available to all.

The age group where there is the largest consumption drop is amongst children under 5 years old and in adults between the ages of 65 and 74 – this was 77% and 85% respectively in each group eating wild game in comparison to between 96-100% in other age groups. However, this drop in consumption level is deemed quite low, and is possibly due to reasons not associated with wild-game meat and the use of lead shot. Such reasons were not a part of this research study.

There is some minor conflict in what should be deemed as being the suitable portion size, or average portion size of wild-game meat. Though generally it is felt the size of wild-game meat portions should be consistent with other meats, such as chicken, pork or beef (66%), in practice the portion sizes are determined by the type of wild-game meat, and the cooking method used.

In some cases there is the opinion that portion size of wild-game meat should be slightly smaller than is seen for meats such as pork or beef (25%). Whilst the latter have a tendency to be sold in 200 g weights in some supermarkets, it is thought wild-game meats such as venison should be sold in slightly smaller sizes due to the costs. Associated costs with larger portions of meats such as venison being sold in supermarkets could make wild-game meat appear more expensive and out of reach to some consumers, having a negative impact on sales volumes.

Preparation and Cooking Practices

Amongst consumers there is a tendency to try to remove as much lead shot as possible prior to any cooking or preparation methods being used. However, this is only done to any particles visible to the naked eye.

Any wild-game meat that is considered severely damaged tends to be discarded and deemed unusable. Perceptions of what is deemed severely damaged were consistent across both domestic and commercial respondents during the qualitative research. Perceptions and definitions of what is deemed to be 'severely damaged' was not investigated as part of the quantification phase of the research.

In some cases severely damaged meat seen as 'not presentable' or the best cuts which are not edible in their true form, might be cleaned of all lead shot fragments using the same removal methods and used for other general mix purposes.

When eating out, venison is the wild-game meat of choice (94%) and is usually cooked utilising a variety of cooking methods. However, pan-frying is the most preferred method when cooking venison (67%).

Of all the different wild-game meats available, pheasant is the one that uses a much greater variety of cooking methods than any other type of meat (pan-frying, roasting, casseroles, stewing, smoking, salting, curing, boiling, cooking in sou-vide, as part of pie, a pâté or a terrine).

Due to its size, venison is the only type of wild-game meat that is tended to be sourced whole least frequently (24%). For all other types of wild-game meat in most cases they are sourced whole (57-97%). The vast majority of respondents (84%) are happy and willing to prepare wild-game meat themselves, even if that involves the removal of any lead shot present in the meat.

Wild-game meat is being preserved by consumers in order to increase longevity. It is considered normal to hang, store or freeze wild-game meat before the preparation stage (80%). The typical periods for hanging and freezing vary, but generally these are up to a week for hanging (76%), and up to 6 months for freezing (93%).

It is also considered normal to freeze wild-game meat following the preparation stage, prior to or after the cooking of the meat (70%). Again, this can be for a period of up to six months (60%), however a large proportion of respondents indicated periods of six months and longer (37%).

By freezing wild-game meat for this length of time it is ensured that the meat is available for consumption and can be enjoyed by the family throughout the year, including outside of the normal shooting season period.

There tends to be a firm belief (61% strongly agree and a further 21% agree) that wild-game meat is the most natural and healthiest meat available, and is less prone to contamination than farmed meat. Views are that wild-game meat is in its natural environment and living naturally off the land's offerings rather than having food that has been provided for them.

Attitudes Towards Lead Shot in Wild Game

There are a high number of individuals shooting wild game animals themselves, or are provided with wild game by others shooting or connected with the shoot, and it is therefore expected that lead shot might be found in wild-game meat. There is also some expectation of finding lead shot within wild-game meat that has been sourced through either a butchers or a game dealer.

The potential presence of lead shot does not deter consumers from purchasing wild-game meat, if anything it is making the meat become more appealing as it has come from a natural environment.

Finding lead shot in wild-game meat is not common place. When eating at home lead shot is found less than occasionally by 79%, and even less (85%) when eating out. There is likely to be more stringent attention to detail in removing it within the commercial environment.

The possibility of there being lead shot in wild-game meat does not deter customers from buying it from dealers and butchers. It is accepted that wild game meat might contain lead shot (59%), and in some cases there are consumers who request that the butcher does not remove the lead shot during the plucking and preparation stage prior to selling.

The opinion of those considered to be high-level consumers of wild-game meat is there is little or no threat to human health from the presence of lead shot (67%). There is more concern about the effects on human health of the use of water lead pipes, which can be present in some older houses, or other contaminants that may be present within the environment.

Generally there is no knowledge or awareness of others having health problems from handling or ingesting lead shot. Unless consumers are aware of others having health problems, they will always be of the opinion that there is no issue surrounding lead shot in wild game.

There is some appreciation and recognition for the warning labels placed on the packaging of some wild-game meat products. Whilst it is not imperative, it was felt that it is advisable to continue this practice where appropriate in order to keep consumers informed.

There is a definite lack of clarity and information on the guidelines of what are acceptable and unacceptable levels of lead within the human body. It was noted that there was some uncertainty about the potential effects of lead shot, and therefore any information needs to be clearly communicated, not only to the general public but also to those directly associated with the industry.

However, there is concern within the industry that any negative press or 'scare-mongering' would only serve to confuse consumers, and ultimately harm the wild game industry in the future. All communications need to be carefully considered before entering the public domain.

APPENDIX I

Face-to-face Interview Recruitment Questionnaire

Version: 1	Date: 9 th March 2011	Designer: MP			J10106

High Level Consumers of Lead Shot In Wild Game In Scotland FSA in Scotland Face-to-face Interview Recruitment Questionnaire

Respondent Name: _____

Address: _____

Telephone: _____

Email: _____

Quota / Classification Information

Respondent Type

Game Shooters/ Handlers	<input type="checkbox"/>	1	
Game Dealers	<input type="checkbox"/>	2	Commercial
Butchers	<input type="checkbox"/>	3	
Catering Outlets/ Suppliers	<input type="checkbox"/>	4	
Consumers – friends/ relatives/ acquaintances	<input type="checkbox"/>	5	Domestic

FRIEND/ FAMILY CONTACT DETAILS

Name _____

Contact Telephone Number _____

Contact Email Address _____

Introduction

Good morning/afternoon. My name is I work for Harris Interactive, an independent market research company. We are conducting a research project on behalf of the Food Standards Agency in Scotland to understand the habits and behaviours of those people who eat lead-shot wild-game. We're interested to find out about how often people eat game, how they prepare the meat and how they cook it.

IF NECESSARY:

I can assure you that this is not a sales approach and everything you say shall remain completely confidential. We don't have any other agenda with the research other than finding out about how much wild game people eat, who else in the household eats wild game - questions purely to do with consumption and behaviours. The information will be used to help the Food Standards Agency understand how much wild game is being eaten across Scotland and will not be used for any other purposes.

Screening

ASK ALL COMMERCIAL

S1 Firstly, can I just check that you are the right person in your company to speak to about the handling and preparation of wild game meats? We understand this could be very seasonal but are interested to know whether you deal with wild game meat at any time during the year.			
	Yes	<input type="checkbox"/> 1	CONTINUE
	No – need to speak to someone else	<input type="checkbox"/> 2	ASK TO SPEAK TO CONTACT
	No	<input type="checkbox"/> 3	THANK & CLOSE

ASK ALL COMMERCIAL WILLING TO TAKE PART

S2 And can I confirm the nature of your company?			
	Game Shooters/ Handlers	<input type="checkbox"/> 1	
	Game Dealers	<input type="checkbox"/> 2	
	Butchers	<input type="checkbox"/> 3	
	Catering Outlet/ Suppliers	<input type="checkbox"/> 4	

INTERVIEWER: IF ALREADY RECRUITED HIGH NUMBER OF ONE TYPE OF ORGANISATION, THANK RESPONDENT AND EXPLAIN THAT A MIX OF ORGANISATIONS ARE REQUIRED

ASK ALL COMMERCIAL

S3 For how long have you been involved with the handling and preparation of wild game meat?			
	Less than 1 month	<input type="checkbox"/> 1	
	Between 1 and 6 months	<input type="checkbox"/> 2	
	Between 6 and 12 months	<input type="checkbox"/> 3	
	Longer than 12 months	<input type="checkbox"/> 4	

ASK ALL COMMERCIAL

S4 For which types of wild game meat do you have involvement with the handling and preparation of?			
	Pheasant	<input type="checkbox"/> 01	
	Partridge	<input type="checkbox"/> 02	
	Grouse	<input type="checkbox"/> 03	
	Woodcock	<input type="checkbox"/> 04	
	Snipe	<input type="checkbox"/> 05	
	Hare	<input type="checkbox"/> 06	
	Rabbit	<input type="checkbox"/> 07	
	Pigeon	<input type="checkbox"/> 08	
	Venison	<input type="checkbox"/> 09	
	Wild Boar	<input type="checkbox"/> 10	
	Other _____	<input type="checkbox"/> 11	

ASK ALL COMMERCIAL

S5 Are you involved in the shooting of wild game?			
	Yes	<input type="checkbox"/> 1	
	No	<input type="checkbox"/> 2	

ASK ALL COMMERCIAL

S6	Do you provide un-prepared wild game meat to any of your friends and family?		
	Yes	<input type="checkbox"/> 1	
	No	<input type="checkbox"/> 2	

ASK ALL PROVIDING UN-PREPARED MEAT TO FRIENDS AND FAMILY

S7	We are also interested in speaking to those people who are not directly associated/ employed with the preparation of wild game meat. Do you think those you provide un-prepared wild game meat to would be interested in talking to us?		
	Yes	<input type="checkbox"/> 1	ENTER CONTACT INFORMATION BELOW

Domestic Screening:

S10	First of all, can I check whether you eat wild game at all? We understand this could be very seasonal but are interested to know whether you eat wild game at any time during the year.		
	Yes, eat wild game at home	<input type="checkbox"/> 1	CONTINUE
	Yes, eat wild game when I am dining out	<input type="checkbox"/> 2	CONTINUE
	No – but know someone else who does eat wild game	<input type="checkbox"/> 3	CONTINUE WITH REFERRAL
	No – do not eat wild game	<input type="checkbox"/> 4	THANK & CLOSE

FOR REFERRAL:

FRIEND/ FAMILY CONTACT DETAILS

Name: _____
 Contact Telephone Number: _____
 Contact Email Address: _____

S11	How often do you tend to eat wild-game in season either in the home or when you are dining out?			
		In home	Dining out	
	Several times a week	<input type="checkbox"/> 1	<input type="checkbox"/> 1	CONTINUE
	Weekly	<input type="checkbox"/> 2	<input type="checkbox"/> 2	CONTINUE
	Fortnightly	<input type="checkbox"/> 3	<input type="checkbox"/> 3	THANK & CLOSE
	Monthly	<input type="checkbox"/> 4	<input type="checkbox"/> 4	THANK & CLOSE
	Less often than once a month	<input type="checkbox"/> 5	<input type="checkbox"/> 5	THANK & CLOSE

RESPONDENT MUST EAT WILD GAME IN THE HOME AT LEAST WEEKLY

S12	Do you yourself prepare the wild game before you eat it? By that I mean, do you prepare the carcass for cooking, including removing any lead that might still be in it?		
	Generally yes – prepare it myself	<input type="checkbox"/> 1	CONTINUE
	Generally no – someone else does it for me	<input type="checkbox"/> 2	THANK & CLOSE

Domestic Profiling

S13 Does anyone else in your household eat the wild game that you prepare and cook?			
	Yes – partner	<input type="checkbox"/>	1
	Yes – partner and children	<input type="checkbox"/>	2
	Yes - others	<input type="checkbox"/>	3
	No	<input type="checkbox"/>	4

S14 Do you actually shoot wild game yourself?			
	Yes	<input type="checkbox"/>	1
	No	<input type="checkbox"/>	2

S15 Which of the following types of wild game do you shoot yourself during season?			
S16 And which of the following types of wild game do you prepare yourself?			
		Shoot	Prepare
	Pheasant	<input type="checkbox"/>	<input type="checkbox"/>
	Partridge	<input type="checkbox"/>	<input type="checkbox"/>
	Grouse	<input type="checkbox"/>	<input type="checkbox"/>
	Woodcock	<input type="checkbox"/>	<input type="checkbox"/>
	Snipe	<input type="checkbox"/>	<input type="checkbox"/>
	Hare	<input type="checkbox"/>	<input type="checkbox"/>
	Rabbit	<input type="checkbox"/>	<input type="checkbox"/>
	Pigeon	<input type="checkbox"/>	<input type="checkbox"/>
	Venison	<input type="checkbox"/>	<input type="checkbox"/>
	Wild Boar	<input type="checkbox"/>	<input type="checkbox"/>
	Pheasant	<input type="checkbox"/>	<input type="checkbox"/>
	Other _____	<input type="checkbox"/>	<input type="checkbox"/>

Recruitment Instructions

RECRUIT FOR IN-DEPTH INTERVIEWS

Thank you for your help so far, as part of our research we are looking to conduct a number of in-depth interviews and would very much like you to take part to discuss your views. We're really interested to understand in greater detail the techniques you use to prepare wild game meat and the methods you use to cook it.

As a 'thank you' for taking part we will offer you £40 in either cash or as a donation to charity.

The interview would be conducted by one of our experienced researchers at a time and location to suit you and would expect it to take no longer than an hour. Would you be willing to participate in one of these interviews?

S20 Would you be interested in taking part?		
Yes	<input type="checkbox"/>	1 RECRUIT TO FACE-TO-FACE DEPTH
No	<input type="checkbox"/>	2 THANK & CLOSE

S21 For ease of analysis, the discussion will be audio recorded. None of your comments will be attributed back to you unless you otherwise give permission. Would you still be happy to take part if it is recorded?		
Yes	<input type="checkbox"/> 1	CONTINUE
No	<input type="checkbox"/> 2	THANK & CLOSE

S22 Finally, we may wish to record specific views on a hand held camera at the end of the discussion. You may have heard of these referred to as Vox Pops and seen them on news items. They really help to bring the research alive. Would you be happy for this to happen?		
Yes	<input type="checkbox"/> 1	
No	<input type="checkbox"/> 2	NOTE RESPONSE

Thank you for your help. We will send out an email/letter to confirm the details of the discussion.
RECRUITER TO USE THE PHONETIC ALPHABET TO ENSURE EMAIL IS CORRECT.

INTERVIEWER:

Just to confirm that the interviews will be conducted in compliance with the Market Research Society code of conduct and will be recorded for analysis purposes. Please be assured that your anonymity is guaranteed and that this is genuine market research. No-one from the Food Standards Agency in Scotland will be given your details and there is no selling involved.

If you want to verify that Harris Interactive is a *bona fide* market research agency, I can give you the Freephone number of the Market Research Society to ring.

GIVE NUMBER IF REQUIRED (0500 396 999)

THANK & CLOSE

INTERVIEWER COMPLETE: I confirm that this person has been recruited in accordance with my briefing instructions and MRS code of conduct.

Signed

Consuming Lead-Shot Wild-Game in Scotland
Organisation Interviews
Discussion Guide

Introduction:

Brief introduction to the research:

Harris Interactive is an independent market research agency. We are conducting a survey for Food Standards Agency Scotland to understand the habits and behaviours of high-level consumers of lead-shot wild-game meat in Scotland.

- More about the research
 - Confidentiality / MRS code of conduct
 - Duration of interview

Respondent Background:

Can we start with some background about you...

- Who are they?
- What is their main role / role within organisation?
- What is their experience in relation to lead-shot wild-game?
 - How long have they been involved in this area?
 - Where / how did they gain their experience?
- Which varieties of wild-game do they generally deal with?
 - How is this affected seasonally?
- What influence do they have on others in relation to wild-game:
 - Probe: teaching / demonstrating / writing / anything else?

Background to the Research:

Overall objective of the research:

'To identify high level consumers of lead-shot wild-game meat in Scotland and investigate consumption habits and behaviours in order to generate meaningful and useful data to carry out a risk assessment to assess the levels of lead to which these individuals are exposed'

- Were they already aware of the study?
- Overall opinion of the research
 - *Opportunity to voice opinion on risk / lack of risk associated with consuming lead shot (basis of their opinion if any)*
- Awareness of any other similar / related studies
- What do they see as the key issues in terms of establishing consumers' habits and behaviours?
- Do they foresee any difficulties with the research?
 - Any barriers to collecting the information?
 - How do they think their members will feel?
 - Do they think we'll get honest answers?
 - What concerns will their members have?
 - Is there anything we can say/do to alleviate these concerns?
 - Any issues foreseen with consistency of the information?

Lead-Shot Removal:

- How much of an issue is lead-shot removal perceived to be?
 - To themselves / to others they come in contact with
 - Are risks associated with lead consumption ever raised spontaneously?
 - Are there any common myths associated with lead consumption / lead removal?
 - What's the general consensus of opinion?
- Talk us through how to go about the removal of lead-shot
 - How do they define the amount of lead-shot present?
 - Probe: Size? Weight? Something else?
 - How does it differ by type of wild-game?
 - Is it always visible to the naked eye?
 - What happens to the lead-shot that is not visible?
 - How much variation is there in terms of:
 - Amount of lead shot present
 - Size of lead shot
 - Difficulty of removal
 - What proportion of lead shot do they expect to remove from the game?
 - If 100% - Is that always the case?
 - If less than 100% - why?
 - What happens to the lead-shot that is not removed?
 - What do they perceive as an acceptable % of lead-shot left remaining?
 - What do they advise others in relation to this lead-shot?
 - Does anyone ever question the safety of this presence of lead-shot?
 - Is any game ever discarded due to high lead-shot content?
 - How would they define this amount of lead-shot?
 - Are they aware of any differences in methods of lead-shot removal?
 - Does this differ between types of wild-game?
 - Are there any regional variations?
 - Are there any preferred methods / methods considered to be better than others?
 - What happens to the wounded tissue around the shot channel?
 - Overall, how important is lead-shot removal perceived to be?
 - Is it something people tend to do themselves?
 - What level of expertise do they generally come across?
 - Are there differing attitudes towards an acceptable amount of lead removal?
 - What proportion of lead do people expect to remove?
 - Probe: 100%? Less? Do people actually care?
- *In terms of our survey:*
 - What do they see as the key issues we should take into account?

Wild-Game Meat Preparation:

- Following the removal of lead-shot, is there anything else that is done to the meat before it can be cooked with?
 - Does this vary by type of game?
 - Does this vary by method of cooking intended?
- Do they tend to use all of the meat / certain parts of the meat?
 - Does this vary by type of game?
 - Does this vary by method of cooking intended?
- *In terms of our survey:*
 - Is there anything we should take into account in terms of preparing the meat?

Cooking Wild-Game:

- What are the main (most popular) methods of cooking wild-game?
 - Does this vary by:
 - Type of game?
 - Area of the country?
 - Shooting season / time of the year?
 - Profile of the person who is doing the cooking (male versus female, young versus old, etc.)
 - Who is eating the wild-game?
 - Are many recipes acidic in nature?
- Is there any language that is specific to cooking wild-game meat?
- What are the most commonly asked questions in relation to cooking wild-game?
- Are any methods:
 - Unique to the nature of wild-game meat?
 - Not suitable for lead-shot wild-game?
 - More likely to cause a health hazard associated with lead-shot within the wild-game?
 - On what basis have they formed this opinion?
- How do they measure portion sizes?
 - Probe: Specific measurements or general?
 - Does this depend on:
 - The type of wild-game?
 - The person doing the cooking?
 - The person eating the wild-game?
 - The recipe being used?
- How would they define a 'small, medium or large' portion of wild-game?
 - How would they make this easily understood?
 - Are there any common definitions?
- *In terms of our survey:*
 - What do they see as the key issues we should take into account?

Wild-Game Consumption:

- What do they see as a typical monthly / weekly consumption of wild-game?
 - What is considered average amongst the people they deal with?
 - What is the range of consumption?
- How would they define a 'high-level' consumer of wild-game?
- Are they aware of any guidelines / recommendations on lead-shot wild-game consumption levels?
 - Where have they obtained this information?
 - Is this commonly held knowledge?
- Do people ever ask them about the effects of consuming wild-game that has been shot with lead bullets?
- Are they aware of any general concerns in relation to consumption levels?
- Are they aware of any general concerns in relation to the person consuming the lead-shot wild game (for example, the impact on children, pregnant women, anyone else?)
- *In terms of our survey:*
 - What do they see as the key issues we should take into account?
 - Do they see any issues in relation to being able to identify high level consumers of lead-shot wild-game?
 - Do they see any issues in relation to gaining their participation in the study?

Membership Help:

- Is there anything they can do to help us with the research?
- Any way they can encourage members to take part in the research?
- Anyone else they think we should speak to?
 - Any well known experts in the field whose views we should take into account?
 - Have they heard of the experts we have selected to take part in the research:

www.gameforeverything.com. Specialists in game catering. Mark Gilchrist.

Game To Eat - www.gametoeat.co.uk

Game's On - www.basc.org.uk/en/games-on

Specialist cookery courses for game animals - Mike Robinson of the Pot Kiln, Harwood Arms

<http://www.wherewisemenshoot.com/game-cooking-course>

- Opinion on the experts we have picked
- If not already spoken to other organisations....
- Are they aware of who we need to speak to within...

Scottish Gamekeepers Association – www.scottishgamekeepers.co.uk

Scottish Countryside Alliance - www.scottishcountrysidealliance.org

National Organisation of Beaters & Pickers Up - <http://www.nobs.org.uk/>

Finally:

- Are there any other issues they would like to bring to our attention?

Quantitative Questionnaire

SECTION 600: SAMPLE PRELOAD AND SCREENING QUESTIONS
--

BASE: ALL RESPONDENTS

Q30 PHONE NUMBER

BASE: ALL RESPONDENTS

Q38 CONTACT NAME

BASE: ALL RESPONDENTS

Q600 SAMPLE PRELOAD – ADDRESS

BASE: ALL RESPONDENTS

Q605 SAMPLE PRELOAD – TYPE

- 1 Butchers
- 2 Cartridges & ammunition
- 3 Catering outlets/supplier
- 4 Clay Shooting
- 5 Country House
- 6 Farm
- 7 Farm Shops
- 8 Game Dealers
- 9 Game Farm & Shooting Trips
- 10 Game Handlers
- 11 Game Shooting
- 12 Hotel
- 13 Hunting Estate
- 14 Hunting Hotel & Restaurant
- 15 Hunting Trips
- 16 Restaurant
- 17 Sporting Agency
- 18 Target Shooting
- 99 Other

BASE: ALL RESPONDENTS

Q620 (Q1) Good morning/afternoon. My name is and I'm calling from Harris Interactive, an independent market research company. We are conducting a research project on behalf of the Food Standards Agency in Scotland looking into the habits and behaviours of people who eat wild-game meat, such as grouse, venison and pigeon.

We are really interested in finding out about how much wild game people eat, how they prepare the meat, how they cook it and who else in the household eats wild game - questions purely to do with consumption and behaviours. The information will be used to help the Food Standards Agency understand how much wild game is being eaten across Scotland and will not be used for any other purposes. We don't have any other agenda with the research.

This is a really important piece of research and we're trying to speak to a good cross-section of people from all across Scotland. As part of this research we've already spoken to The British Association for Shooting and Conservation, the Scottish Game Dealers & Processors Association, the Scottish Countryside Alliance, a number of Game Dealers, Butchers, Chefs and a range of people who go game-shooting to get their view and help us develop this questionnaire. The results of the research will be published on the FSA's website and are likely to be of great interest to a number of parties so you might hear about the study in the media once it is completed.

I can assure you that this is not a sales approach and everything you say shall remain completely confidential.

The interview will last for approximately 10 to 15 minutes.

Do you have time to answer some questions?

ADD IF NECESSARY: All of your responses will be treated in the strictest of confidence, your details will not be given to any third parties and you will not receive any sales or marketing information.

- | | | |
|---|-------------------------------|-----------------------|
| 1 | Yes | [CONTINUE TO Q625] |
| 2 | Yes – but not now | [ARRANGE APPOINTMENT] |
| 3 | Refusal – don't eat wild-game | [CONTINUE TO Q640] |
| 4 | Refusal – no reason given | |
| 5 | Refusal – no time | |
| 6 | Refusal – not interested | |
| 7 | Refusal – other reason | |

BASE: ALL WILLING TO TAKE PART (Q620/1)

Q625 (Q2) Thank you for agreeing to take part in this survey. Before we start, could I first check how often you eat wild game, either at home or when you are eating out, during the main shooting season (we are specifically referring to wild game that has been shot rather than farmed game)? <P>

(INTERVIEWER: DO NOT READ OUT BUT PROMPT WITH BANDS IF NECESSARY)

- 1 3 or 4 times a week or more
- 2 At least once a week
- 3 At least once a fortnight
- 4 At least once a month
- 5 Less often than once a month
- 6 Never
- 9 Don't know (DO NOT READ OUT)

BASE: ALL WILLING TO TAKE PART (Q620/1)

Q630 (Q3) And how often do you eat wild game out of the main shooting season, again either at home or when you are eating out? <p>

(INTERVIEWER: DO NOT READ OUT BUT PROMPT WITH BANDS IF NECESSARY)

- 1 3 or 4 times a week or more
- 2 At least once a week
- 3 At least once a fortnight
- 4 At least once a month
- 5 Less often than once a month
- 6 Never
- 9 Don't know (DO NOT READ OUT)

BASE: ALL WILLING TO TAKE PART (Q620/1)

Q635 HIDDEN QUESTION – EAT SUFFICIENT WILD GAME

- 1 Eat sufficient wild game either in or out of the main shooting season
- 2 Don't eat sufficient wild game

BASE: ALL RESPONDENTS UNWILLING/UNSUITABLE TO TAKE PART IN THE RESEARCH (Q620/3 OR Q635/2)

Q640 (Q4) We're actually looking to speak to people who eat wild game once a week or more. As we need to contact a large number of people across Scotland to complete this study, we are asking everyone we speak to whether they know of anyone that eats wild game and might be able to help us out by speaking to us? As before, we would only be interested in asking about how much wild game they eat, how they prepare the meat, how they cook it - questions purely to do with consumption and behaviours. Would you know anyone that you think might be able to help us out with this?

(RECORD ALL NAMES AND NUMBERS GIVEN).

- 1 Yes, know people who can help
- 2 Don't know anyone that might be able to help [EXCLUSIVE]
- 3 Refused [EXCLUSIVE]

SECTION B: CONSUMPTION BEHAVIOUR – DINING OUT

BASE: ALL QUALIFIED RESPONDENTS (Q99/1)

Q700 (Q5) I'd now like to think about how often you eat wild game in the home compared with eating out. First of all, approximately what proportion of the wild game that you eat is eaten in home versus eating out?

(READ OUT)

- 1 All in home
- 2 Mostly in home
- 3 About an equal split in home versus eating out
- 4 Mostly eating out
- 5 All eating out
- 9 Don't know (DO NOT READ OUT)

BASE: ALL RESPONDENTS WHO EAT WILD GAME WHEN DINING OUT (Q700/2-5)

Q705 (Q6) Thinking specifically about when you are eating out, which of the following types of wild game do you ever eat when you are eating out?

(INTERVIEWER NOTE: PLEASE ENSURE RESPONDENT IS AWARE MEAT IS WILD GAME AND NOT FARMED GAME)

[RANDOMISE; MULTI-CODE]

- 1 Pheasant
- 2 Partridge
- 3 Grouse
- 4 Woodcock
- 5 Snipe
- 6 Hare
- 7 Rabbit
- 8 Pigeon
- 9 Venison
- 94 Other 1 [Q706 MANDATORY TEXT BOX]
- 95 Other 2 [Q707 MANDATORY TEXT BOX]
- 96 Other 3 [Q708 MANDATORY TEXT BOX]
- 99 Don't know if Wild Game meat or farmed (DO NOT READ OUT) [EXCLUSIVE]

BASE: ALL RESPONDENTS WHO EAT WILD GAME MEAT (Q705/1-9)

Q710 HIDDEN QUESTION – LOOP DRIVER

- 1 Pheasant
- 2 Partridge
- 3 Grouse
- 4 Woodcock
- 5 Snipe
- 6 Hare
- 7 Rabbit
- 8 Pigeon
- 9 Venison

[PN: GET CODES SELECTED AT Q705]

BASE: ALL RESPONDENTS WHO EAT WILD GAME MEAT (Q705/1-9)

Q715 (Q7) 1st LOOP DISPLAY “When eating out wild game may be cooked in a variety different ways, how do you generally order [INSERT Q710] when you are eating out?”

2ND LOOP ONWARDS DISPLAY “how do you generally order [INSERT Q710] when you are eating out?”]

(INTERVIEWER: READ OUT COOKING METHODS) <p>
[RANDOMISE; MULTICODE]

- 1 Roasted
- 2 Boiled
- 3 Pan fried
- 4 Stewed
- 5 Casseroled
- 6 Smoked
- 7 Salted
- 8 Cured
- 9 Within a pie other prepared format
- 10 Pâté / terrine
- 11 Sous-vide – method of cooking using plastic bags in water
- 94 Other 1 [Q716 MANDATORY TEXT BOX]
- 95 Other 2 [Q717 MANDATORY TEXT BOX]
- 96 Other 3 [Q718 MANDATORY TEXT BOX]

BASE: ALL RESPONDENTS WHO EAT WILD GAME MEAT (Q705/1-9)

Q720 (Q8) Given that we are speaking about wild game, how often, if ever do you find a piece of lead-shot in your meal when you are eating out?

- 1 Every meal
- 2 Almost every meal
- 3 Quite often
- 4 Occasionally
- 5 Rarely
- 6 Never
- 9 Don't know (DO NOT READ OUT)

SECTION C: SOURCE OF WILD GAME

BASE: ALL QUALIFIED RESPONDENTS (Q99/1)

Q800 (Q9) Thinking now about the wild game that you eat at home, which of the following sources do you ever use to get hold of wild game?

[RANDOMISE; MULTICODE]

- 1 Shoot personally
- 2 Given by someone else who shoots/ connected with shooting
- 3 Buy from butcher
- 4 Buy from game dealer
- 5 Buy from supermarket
- 6 Buy from local shop / farm shop / other shop
- 7 Buy from other source [Q801 MANDATORY TEXT BOX]
- 8 Other source (not buying) [Q802 MANDATORY TEXT BOX]
- 9 Don't know (DO NOT READ OUT) [EXCLUSIVE; ANCHOR]

BASE: ALLWHO USE SOURCE (Q800/1-8)

Q805 HIDDEN QUESTION – LOOP DRIVER

[GET CODES SELECTED AT Q800]

- 1 Shoot personally
- 2 Given by someone who shoots
- 3 Buy from butcher
- 4 Buy from game dealer
- 5 Buy from supermarket
- 6 Buy from local shop / farm shop
- 7 Buy from other source
- 8 [INSERT Q802]

BASE: ALLWHO USE SOURCE (Q800/1-8)

Q810 (Q10) Thinking about the type of wild game that you [INSERT Q805], which of the following types of wild game do you [IF Q805/1 "shoot" Q805/2 "get given" Q805/3-7 "buy" Q805/8 [INSERT Q802]

[RANDOMISE; MULTICODE]

- 1 Pheasant
- 2 Partridge
- 3 Grouse
- 4 Woodcock
- 5 Snipe
- 6 Hare
- 7 Rabbit
- 8 Pigeon
- 9 Venison
- 97 None of the above [EXCLUSIVE; ANCHOR]

[LOOP BACK TO Q805]

BASE: ALL (Q805/1-8 AND Q810/1-9)

Q815 HIDDEN QUESTION – LOOP DRIVER

- 1 Pheasant
- 2 Partridge
- 3 Grouse
- 4 Woodcock
- 5 Snipe
- 6 Hare
- 7 Rabbit
- 8 Pigeon
- 9 Venison

[GET CODE 1 IF Q810/1 FOR ANY OF THE LOOP WHERE Q805/3-7]

[GET CODE 2 IF Q810/2 FOR ANY OF THE LOOP WHERE Q805/3-7]

[GET CODE 3 IF Q810/3 FOR ANY OF THE LOOP WHERE Q805/3-7]

[GET CODE 4 IF Q810/4 FOR ANY OF THE LOOP WHERE Q805/3-7]

[GET CODE 5 IF Q810/5 FOR ANY OF THE LOOP WHERE Q805/3-7]

[GET CODE 6 IF Q810/6 FOR ANY OF THE LOOP WHERE Q805/3-7]

[GET CODE 7 IF Q810/7 FOR ANY OF THE LOOP WHERE Q805/3-7]

[GET CODE 8 IF Q810/8 FOR ANY OF THE LOOP WHERE Q805/3-7]

[GET CODE 9 IF Q810/9 FOR ANY OF THE LOOP WHERE Q805/3-7]

BASE: ALL (Q805/1-8 AND Q810/1-9)

Q820 (Q11) Thinking about the types of wild game that you buy, which of the following presentations do you ever buy [INSERT Q815] in?

([INTERVIEWER: READ OUT PRESENTATION OPTIONS])

[RANDOMISE; MULTICODE]

- 1 Whole
- 2 Breast meat / steaks / specific cuts
- 3 Minced
- 4 Sausages / burgers
- 5 Ready meals
- 6 Pies or other pre-prepared formats
- 7 Frozen (either whole game or certain cuts / other frozen formats)
- 8 Other format [Q821 MANDATORY TEXT BOX]
- 9 Don't know (DO NOT READ OUT)

[LOOP BACK TO Q815]

BASE: ALL QUALIFIED RESPONDENTS WHO BUY WILD GAME (Q805/3-7)

Q825 (Q12) Do you ever buy "general game mix" (a mixture of off-cuts of different types of wild game)?

- 1 Yes
- 2 No
- 9 Don't know (DO NOT READ OUT)

SECTION D: PREPARATION OF WILD GAME

BASE: ALL RESPONDENTS WHO SHOOT/ARE GIVEN WILD GAME (Q805/1,2)

Q900 (Q13) Thinking about the wild game you [IF Q805/1,N2 INSERT “shoot yourself” Q805/N1,2 “are given by someone else” Q805/1,2 “shoot yourself or are given by someone else”], do you ever hang or store the game before preparing it?

- 1 Yes
- 2 No

BASE: ALL RESPONDENTS WHO HANG WILD GAME (Q900/1)

Q905 (Q14) On average, approximately how long do you tend to hang or store game for before you prepare it? (we appreciate this might depend on the weather but we’re just looking for an average amount of time)

- 1 1 -2 days
- 2 3 – 4 days
- 3 5 – 6 days
- 4 1 or 2 weeks
- 5 3 or 4 weeks
- 6 5 weeks or longer
- 9 Don’t know (DO NOT READ OUT)

BASE: ALL RESPONDENTS WHO HANG WILD GAME (Q900/1)

Q910 (Q15) And what is the longest amount of time that you might leave game hanging for?

- 1 1 -2 days
- 2 3 – 4 days
- 3 5 – 6 days
- 4 1 or 2 weeks
- 5 3 or 4 weeks
- 6 5 weeks or longer
- 9 Don’t know (DO NOT READ OUT)

BASE: ALL RESPONDENTS WHO SHOOT/ARE GIVEN WILD GAME (Q805/1,2)

Q915 (Q16) Do you ever freeze wild game at the stage when it has been plucked or skinned but before it has been prepared in any other way such as filleted?

- 1 Yes
- 2 No

BASE: ALL RESPONDENTS WHO FREEZE WILD GAME SHOT/OR GIVEN BY SOMEONE ELSE (Q915/1)

Q920 (Q17) And approximately how long on average do you keep the wild game in the freezer before you take it out to prepare and eat?

- 1 A couple of weeks
- 2 Approximately 1 month or less
- 3 2 to3 months
- 4 4 to 5 months
- 5 6 months or more
- 9 Don’t know (DO NOT READ OUT)

BASE: ALL RESPONDENTS WHO SHOOT/ARE GIVEN WILD GAME (Q805/1,2)

Q925 (Q18) Still thinking about the wild game you [IF Q805/1,N2 INSERT “shoot yourself” Q805/N1,2 “are given by someone else” Q805/1,2 “shoot yourself or are given by someone else”], which of the following best describes who is usually involved in the initial preparation of the game? (By initial preparation we mean skinning, plucking and filleting the game meat).

(READ OUT)

- 1 Prepare it fully myself
- 2 Someone else I know/ in my household prepares it fully
- 3 Pass on to another party to skin or pluck only (for example, to a game dealer or butcher)
- 4 Pass on to another party to skin, pluck and fillet (Please Specify who would do this for you)
[Q926 TEXT BOX]
- 9 Don't know (DO NOT READ OUT)

BASE: ALL RESPONDENTS WHO SHOOT/ARE GIVEN WILD GAME (Q805/1,2)

Q930 (Q19) Thinking specifically about the wild game that you [IF Q805/1,N2 INSERT “shoot yourself” Q805/N1,2 “are given by someone else” Q805/1,2 “shoot yourself or are given by someone else”], that has been shot with a shot-gun. I'm going to read out some statements that other people have said in relation to how they prepare the meat themselves and for each one I'd like you to tell me the extent to which you agree or disagree.

(READ OUT)

Q931

- 1 Strongly Agree
- 2 Agree Slightly
- 3 Neither agree nor disagree
- 4 Disagree Slightly
- 5 Strongly Disagree
- 6 Never eat game meat that has been shot with a shot gun

[RANDOMISE]

- 1 I always try and remove all the lead-shot pellets from game meat before cooking
- 2 I discard any game-meat that has been severely damaged
- 3 I expect to find the odd bit of lead-shot in wild game meat
- 4 I would remove any pellets that are obvious but wouldn't search around for any others
- 5 I don't try to remove any lead pellets at this stage

BASE: ALL WHO RATE Q19 (Q931/1-5)

Q935 (Q20) Thinking specifically about the wild game that you buy. I'm going to read out some statements that other people have said in relation to the presence of lead-shot in wild game and for each one I'd like you to tell me the extent to which you agree or disagree. <p>

(READ OUT)

Q936

- 1 Strongly Agree
- 2 Agree Slightly
- 3 Neither agree nor disagree
- 4 Disagree Slightly
- 5 Strongly Disagree

[RANDOMISE]

- 1 I expect to find the odd bit of lead-shot in any wild game meat I buy
- 2 I am quite happy to buy wild game that contains lead-shot
- 3 I like to find a bit lead-shot in game meat as it proves that it's wild
- 4 It's not obvious whether the game meat I buy contains lead-shot or not
- 5 There is always a warning that the game meat I buy may contain lead-shot

SECTION E: COOKING PRACTICES

BASE: ALL RESPONDENTS EATING WILD GAME AT HOME (Q700/1-4)

Q1000 (Q21) Thinking now about how wild game is cooked at home. Which of the following cooking methods are used?

(READ OUT)

[RANDOMISE; MULTICODE]

- 1 Roasting
- 2 Boiling
- 3 Pan frying
- 4 Stewing
- 5 Casseroling
- 6 Making stock
- 7 Smoking
- 8 Salting
- 9 Curing
- 10 Pâtés / terrines
- 96 Other [Q1001 MANDATORY TEXT BOX]
- 99 Don't know (DO NOT READ OUT)

BASE: ALL RESPONDENTS WHO MAKE STEWS/CASSEROLES/STOCKS AT HOME (Q1000/4-6)

Q1005 (Q22) Which of the following ingredients, if any, do you ever add when you are making [IF Q1000/4 INSERT “stews” Q1000/5 “casseroles” Q1000/6 “stocks”]?

(READ OUT)

[RANDOMISE; MULTICODE]

- 1 Wine
- 2 Liquors
- 3 Olive oil
- 4 Beer
- 5 Sunflower oil
- 6 Vinegar
- 7 Mustard
- 8 Sugar
- 9 Tomato sauce
- 96 Other [Q1006 MANDATORY TEXT BOX] [ANCHOR]
- 99 Don't know (DO NOT READ OUT) [EXCLUSIVE; ANCHOR]

BASE: ALL RESPONDENTS WHO MAKE STOCKS AT HOME (Q1000/6)

Q1010 (Q23) Which of the following best describes how thick the stock is that you usually make?

(READ OUT)

- 1 Very thick – don't sieve it at all
- 2 Quite thick – use a normal sieve
- 3 Quite thin – use a fine sieve
- 4 Very thin – use muslin or other very fine sieve material
- 9 Don't know (DO NOT READ OUT)

BASE: ALL RESPONDENTS EATING WILD GAME AT HOME (Q700/1-4)

Q1015 (Q24) Once you have prepared the wild game, do you ever freeze it? Either before or after you have cooked it?

(READ OUT)

- 1 Yes – freeze game meat before cooking
- 2 Yes – freeze game meat after cooking
- 3 Yes – freeze game meat both before and after cooking
- 4 No – never freeze game
- 9 Don't know (DO NOT READ OUT)

BASE: ALL RESPONDENTS WHO FREEZE WILD GAME (Q1015/1-3)

Q1020 (Q25) And approximately how long do you keep wild game in the freezer before you take it out to eat?

- 1 A couple of weeks
- 2 Approximately 1 month or less
- 3 2 to 3 months
- 4 4 to 5 months
- 5 6 months or more
- 9 Don't know (DO NOT READ OUT)

SECTION F: CONSUMPTION IN THE HOME

BASE: ALL RESPONDENTS EATING WILD GAME AT HOME (Q700/1-4)

Q1100 (Q26) I'd now like you to think about the meals that you eat at home that contain wild game. In a typical week in the middle of the game season, how often would you eat a meal that contains wild game meat at home? That includes, full meals and also any meals that you eat of left-overs.

- 1 One or two
- 2 Three or four
- 3 Five or more
- 9 Don't know (DO NOT READ OUT)

BASE: ALL RESPONDENTS EATING WILD GAME AT HOME (Q700/1-4)

Q1105 (Q27) Just to put this information in context. Including yourself, could you tell me how many people in your household are:

[NUMERICAL RESPONSE (0 TO 99)]

Q1106

- 1 Children under 5
- 2 Children aged 5-9
- 3 Young people aged 10-17
- 4 Adults aged 18-64
- 5 Adults aged 65-74
- 6 Adults aged 75+

BASE: ALL RESPONDENTS WITH MORE THAN ONE PERSON IN THE HOUSEHOLD (SUM Q1106 >1)

Q1110 (Q28) And when you have a meal that contains wild game, how many of those people would share this meal with you:

[NUMERICAL RESPONSE (0 TO 99)]

Q1111

- 1 Children under 5
- 2 Children aged 5-9
- 3 Young people aged 10-17
- 4 Adults aged 18-64
- 5 Adults aged 65-74
- 6 Adults aged 75+

BASE: ALL RESPONDENTS EATING WILD GAME AT HOME (Q700/1-4)

Q1115 (Q29) Thinking now about portion sizes when you personally eat wild game meat. How would a typical portion of game meat compare with a portion of any other meat, such as chicken, pork or beef? Would you say a portion of game meat would be.... <p>

(READ OUT)

- 1 ..a lot bigger than other meats
- 2 .. a little bigger than other meats
- 3 ..about the same size
- 4 .. a little less than other meats
- 5 .. a lot less than other meats
- 9 Don't know (DO NOT READ OUT)

BASE: ALL RESPONDENTS EATING WILD GAME AT HOME (Q700/1-4)

Q1120 (Q30) When you personally eat wild game at home, how often, if ever do you find a piece of lead-shot?

- 1 Every meal
- 2 Almost every meal
- 3 Quite often
- 4 Occasionally
- 5 Rarely
- 6 Never
- 9 Don't know (DO NOT READ OUT)

SECTION G: ATTITUDES TOWARDS DANGERS OF LEAD

BASE: ALL QUALIFIED RESPONDENTS (Q99/1)

Q1200 (Q31) I'd now like to ask you about your attitude towards the presence of lead-shot in wild game meat. As before I'm going to read out some statements that other people have said and for each one I'd like you to tell me the extent to which you agree / disagree with each one?

(READ OUT)

Q1201

- 1 Strongly Agree
- 2 Agree Slightly
- 3 Neither agree nor disagree
- 4 Disagree Slightly
- 5 Strongly Disagree
- 9 Don't know (DO NOT READ OUT)

[RANDOMISE]

- 1 I believe that the presence of lead-shot in wild-game meat poses no threat to human health
- 2 There is more risk to humans of lead in the environment than there is of lead-shot in wild-game
- 3 Swallowing a piece of lead-shot never did anyone any harm
- 4 I would happily serve wild game to anyone
- 5 Wild game meat is the healthiest meat you can buy
- 6 I don't know anyone who has ever suffered a health issue due to consuming lead-shot
- 7 I have no concerns about handling cartridges that contain lead
- 8 There are no clear guidelines on the acceptable amount of lead in the body

SECTION H: FINAL CLASSIFICATION
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BASE: ALL QUALIFIED RESPONDENTS (Q99/1)

Q1300 (Q32) Thank you very much for your time so far, the final few questions are for classification purposes only so that we can analyse our results by different types of people. <p>

First of all, can you tell me which of the following age bands you fall into? <p>

(INTERVIEWER: PROMPT WITH BANDS AS NECESSARY)

- 1 18 to 24
- 2 25 to 34
- 3 35 to 44
- 4 45 to 54
- 5 55 to 64
- 6 65 to 74
- 7 75 +
- 9 Refused

BASE: ALL QUALIFIED RESPONDENTS (Q99/1)

Q1305 (Q33) Gender (INTERVIEWER INSTRUCTION: DO NOT ASK – CODE BY OBSERVATION)

- 1 Male
- 2 Female

BASE: ALL QUALIFIED RESPONDENTS (Q99/1)

Q1310 (Q34) What is your marital status?

- 1 Married/Co-habiting
- 2 Single
- 3 Separated/Divorced/Widowed
- 9 REFUSED

BASE: ALL QUALIFIED RESPONDENTS (Q99/1)

Q1315 (Q35) Which of the following regions best describes where you live?

- 1 Strathclyde
- 2 Dumfries and Galloway
- 3 Borders
- 4 Lothian
- 5 Central
- 6 Fife
- 7 Tayside
- 8 Grampian
- 9 Highland
- 10 Western Isles
- 90 Refused

BASE: ALL QUALIFIED RESPONDENTS WHO SHOOT (Q805/1)

Q1320 (Q36) And which of the following regions do you go shooting in?

[MULTICODE]

- 1 Strathclyde
- 2 Dumfries and Galloway
- 3 Borders
- 4 Lothian
- 5 Central
- 6 Fife
- 7 Tayside
- 8 Grampian
- 9 Highland
- 10 Western Isles
- 90 Refused

BASE: ALL QUALIFIED RESPONDENTS (Q99/1)

Q1325 (Q37) Which of the following income group's best describes your TOTAL ANNUAL household income prior to any reductions (e.g. Tax)?

(READ OUT)

- 1 Under £5,000
- 2 £5,000 - 9,999
- 3 £10,000 - 14,999
- 4 £15,000 - 19,999
- 5 £20,000 - 24,999
- 6 £25,000 - 34,999
- 7 £35,000 - 44,999
- 8 £45,000 - 54,999
- 9 £55,000 - 99,999
- 10 £100,000 or more
- 99 Refuse to answer

BASE: ALL QUALIFIED RESPONDENTS (Q99/1)

Q1330 (Q38) What is the occupation of the head of the household?

- 1 Senior Manager
- 2 Professional Occupation
- 3 Associate Professional Occupation
- 4 Clerical and Office Occupation
- 5 Skilled Manual Occupation
- 6 Emergency and Protective Service Occupation
- 7 Sales Occupation
- 8 Factory Operative
- 9 Unskilled Worker
- 10 Retired
- 96 Other [Q1331 MANDATORY TEXT BOX]
- 99 Refused

BASE: ALL QUALIFIED RESPONDENTS (Q99/1)

Q1335 (Q39) Finally, as we need to contact to a large number of people across Scotland to complete this study, we are asking everyone we speak to whether they know of anyone that eats wild game that might be able to help us out by speaking to us? As before, we would only be interested in asking about how much wild game they eat, how they prepare the meat, how they cook it - questions purely to do with consumption and behaviours. Would you know anyone that you think might be able to help us out with this?

(RECORD ALL NAMES AND NUMBERS GIVEN).

- | | | |
|---|--|-------------|
| 1 | Yes (INTERVIEWER RECORD ON NEXT SCREEN) | |
| 2 | Don't know anyone that might be able to help | [EXCLUSIVE] |
| 3 | Refused | [EXCLUSIVE] |

BASE: ALL QUALIFIED RESPONDENTS (Q99/1)

Q1345 In the event that we need to clarify any of your responses or ask additional questions, would you be willing to be re-contacted about this survey?

- | | |
|---|-----|
| 1 | Yes |
| 2 | No |

BASE: ALL QUALIFIED RESPONDENTS (Q99/1)

Q1350 "Would you be willing to have your details and comments passed back to the Food Standards Agency in Scotland?"

- | | |
|---|-----|
| 1 | Yes |
| 2 | No |

BASE: ALL SAYING NO (Q1350/2)

Q1355 Would you be willing to have your comments passed back if they are not attributable to you personally.

- | | |
|---|-----|
| 1 | Yes |
| 2 | No |

BASE: ALL QUALIFIED RESPONDENTS (Q99/1)

Q1360 (Q40) Thank you very much for your help. Can I remind you that this interview is part of a market research survey being carried out by Harris Interactive. If you want to verify that we are a bona fide agency, I can give you the Freephone number of the Market Research Society to ring.

GIVE NUMBER IF REQUIRED (0500 396 999).

Literature Review References

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- iii You can find the full survey report at:
<http://www.food.gov.uk/science/surveillance/fsisbranch2007/fsis0107>
- iv You can find the review at: <http://www.food.gov.uk/multimedia/pdfs/gg12034.pdf>
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- xxv www.basc.org.uk, 25th November 2010
- xxvi Amy Willcock, 18th December 2007, *Shooting Gazette*
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