



SHOT-SWITCH

Monitoring the transition from lead to non-lead shotgun ammunition for pheasant shooting in Britain

On 24 February 2020, the directors of nine game shooting and countryside organisations issued a joint statement on the future of shotgun ammunition for live quarry shooting¹. The statement expressed their wish to see an end, within five years, to both lead and single-use plastics in ammunition used by those taking all live quarry with shotguns. The intention of these organisations is that this transition should be encouraged to proceed on a voluntary basis. As scientists with experience of studying the use and effects of lead ammunition, we suggest that the progress of this important transition should be monitored. Such a monitoring programme would ideally have several strands, covering the use of shotgun cartridges with different types of shot cups and cases and different metals composing the pellets. In this document, we describe how we intend to monitor one important aspect of this transition: the change in the proportion of wild-shot pheasants offered for sale in retail outlets in Britain which have been killed using lead and non-lead types of shotgun ammunition.

The SHOT-SWITCH project will begin in the shooting season of 2020/2021. In summary, whole pheasants will be purchased from representative retail outlets or obtained from shoots distributed across Britain by the principal investigators and collaborators known personally to them. The location and date of the purchases will be documented. Purchasers will ask the retailer about where the pheasants were shot and aim to purchase birds killed in their local region of Britain to help ensure geographically representative coverage. They will purchase a small number of birds from any one retailer. Each bird will be skinned and dissected with the objective of removing as many whole or near-whole shotgun pellets from areas with fresh tissue damage as can be readily found. There is a possibility that some shot embedded in tissues might be from injuries from a shooting event that the bird survived in a previous season. However, this is considered unlikely because the annual survival probability of pheasants in areas with shooting is low² and searching for pellets in areas of the carcass with fresh wounding will tend to find ones associated with the bird's death. The pellets from each bird will be washed, dried and put in a sample tube labelled with a code linking the sample to data on the circumstances of purchase and sent for analysis to the Environmental Research Institute (ERI), University of the Highlands and Islands (UHI). The shotgun pellets will be examined in the laboratory, first using qualitative methods. These include recording surface colour, effect of mechanical crushing and testing with a magnet. This is done to ascertain whether all the pellets recovered from one bird are similar or whether the bird might have been struck by pellets from two different guns. One pellet

of each type from each bird will be selected at random and analysed chemically to identify its principal (>50%) chemical element. This will be done using total dissolution and Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES) to estimate the proportion of the mass of each pellet made up of each of the metals: lead, tungsten, bismuth, iron and copper. The objective will be to determine the type of shotgun pellets used to kill a sample of >150 pheasants in each shooting season. The bodies of some pheasants killed using shotgun pellets do not contain any recoverable pellets³, so we anticipate that it will probably be necessary to purchase >200 birds to obtain the required sample.

As soon as possible after the end of the shooting season, the proportions of birds killed using shotgun pellets in each class of metallic composition will be published, together with their confidence intervals and details of the methods used and the provenance of the birds. This procedure will be repeated in each of the shooting seasons 2020/2021, 2021/2022, 2022/2023, 2023/2024 and 2024/2025, with publication in each year describing the changes relative to previous seasons. Hence, the study will cover the whole of the period of the voluntary phasing-out of the use of lead shotgun ammunition and will provide a measure of its success of special relevance to public and wildlife health. At the end of the study we anticipate that the full results will be compiled and submitted to a peer-reviewed scientific journal for open-access publication.

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References:

¹<https://www.gwct.org.uk/advisory/lead-ammunition/>

²Madden, J., et al. (2018), European Journal of Wildlife Research 64: 40 <https://doi.org/10.1007/s10344-018-1199-5>

³Pain, D.J., et al. (2010) PLoS ONE <https://doi.org/10.1371/journal.pone.0010315>

Funding:

The following organisations have agreed to contribute financially towards the cost of materials and other project expenses:

Waitrose & Partners

Lincolnshire Game Ltd

Royal Society for the Protection of Birds (RSPB)

NOTE: *Given the COVID-19 pandemic during the 2020-2021 pheasant shooting season, we asked collaborators to avoid additional risks. Everyone was encouraged to combine obtaining pheasants with journeys needed for other purposes and some pheasants were also obtained by mail order. Following government advice, staying safe was essential and our first priority.*