Game Management Authority

FACT SHEET

Environmental and health risks of lead bullets for deer hunting

Why is the use of lead ammunition an issue?

Lead bullets for deer hunting have been used for centuries. The popularity of lead bullets is largely due to its availability, low-cost and its ballistic properties as a soft and dense metal. However, lead is a toxic heavy metal with no biological function. It is toxic to all animals, including humans, with no safe level of exposure. This means that the ingestion of even small quantities of lead can have negative health impacts[1].

There has been extensive work done over past decades to minimise lead exposure from a range of everyday sources. This includes bans or restrictions on the production and use of lead-based paints, fuel and water pipes. Lead shot for waterfowl hunting has been prohibited in many countries around the world for decades. When a game deer is dispatched with a lead-based bullet, fragments remain in the meat. These fragments are often too small to see and can be ingested when eating game meat. For the consumer, these particles accumulate over time and contribute to raising lead levels, increasing the risk of health problems.

Lead and bone fragments throughout the carcass of a Hog Deer shot with a lead bullet. Fragments can be found up to 45 cm from the wound channel. *Source: Game Management Authority*

There is growing scientific evidence that highlights how the use of lead bullets is causing unnecessary lead exposure to humans, domestic dogs, wildlife and the environment.

On left: Lead bullet and its fragments after impact. Lead bullets typically lose up to 40 per cent of their mass following impact. On right: A solid copper bullet with a plastic tip. Copper bullets generally lose 0–5% of their mass. *Source: huntingwithnonlead.org*

Risks to human health

When lead enters the human body, it is distributed to organs including the brain, kidneys, liver and bones. The human body stores lead in the teeth and bones, where it accumulates over time. Lead can impact on a range of body systems and functions, including the nervous, immune and reproductive systems[2].

Young children are particularly vulnerable to the toxic effects of lead. Young children absorb 4–5 times as much ingested lead as adults from a given source. As a result, they can suffer profound and permanent adverse health impacts on the development of the brain and nervous system[1].

Lead can also cause long-term harm in adults, including increased risk of high blood pressure and kidney damage. For pregnant women, exposure to high levels of lead can cause miscarriage, stillbirth, premature birth and low birth weight[1,3].

Risks to the health of hunting dogs

Dogs fed with lead contaminated game meat can experience the same ill health effects as humans. Studies have shown that feeding game meat harvested with lead-based bullets to hunting dogs

can cause unsafe blood lead levels, placing them at risk of lead-induced health issues[4,5].

Risks to predatory and scavenging wildlife

Predatory and scavenging wildlife, especially birds, are vulnerable to poisoning from feeding on carcass remains and gutpiles of animals harvested with lead bullets. For predatory and scavenging wildlife, lead can cause damage to the nervous system and, in severe cases, can lead to paralysis or death. At lower levels, lead can cause sublethal effects, such as damage to tissues, organs, the reproductive and immune systems, and neurological impairment[6]. Overseas, lead poisoning of Bald Eagles, Golden Eagles and California Condors has been well-documented. Although not as well studied, mammals, such as Brown Bears and American Black Bears, have also been shown to be exposed to lead from ammunition[7,8].

In Australia, a recent study found that greater than 50 per cent of Wedge-tailed Eagles examined from east Gippsland had elevated bone lead levels (>10 mg/kg) and 13 per cent had severe lead exposure (>20 mg/kg)[9]. Similar results have been reported from Tasmania[10]. Scavenging from animal carcasses shot with lead-based ammunition is almost certainly the main contributing factor to this exposure[10]. A study on wild and captive Tasmanian Devils found captive animals had a significantly higher blood lead levels after they were fed the meat of wild animals shot with lead-based ammunition[11]. Other mammals, such as quoll species, could be at risk after feeding on contaminated carcasses, although this has not been investigated.

Risks to the environment

The Game Management Authority estimates that more than two tonnes of lead is deposited in the Victorian environment every year from deer hunting with lead-based bullets.

Under most conditions, lead deposited in soil or water is relatively stable[12]. Over time, it will degrade through erosion and chemical reaction, especially in areas with low pH[2].

Where lead is incorporated into the soil, it can be taken up by plants and invertebrates[2]. Indirect exposure to birds and mammals can also occur from ingestion of soil, water or invertebrates contaminated with lead and preyed on.

What are the solutions? Towards a sustainable future

There is an easy technical solution to prevent the risks of lead exposure. By simply switching to the use of lead-free ammunition (e.g. copper, copper-alloy, brass, tin) when deer hunting, hunters can reduce the risks of lead exposure in humans, dogs and wildlife.

Overseas, a range of lead-free bullets/cartridges in many calibres are commercially available for deer hunting. While availability is currently limited in Australia, as the demand increases, the ammunition industry will import more lead-free bullets and local manufacturing may also emerge.

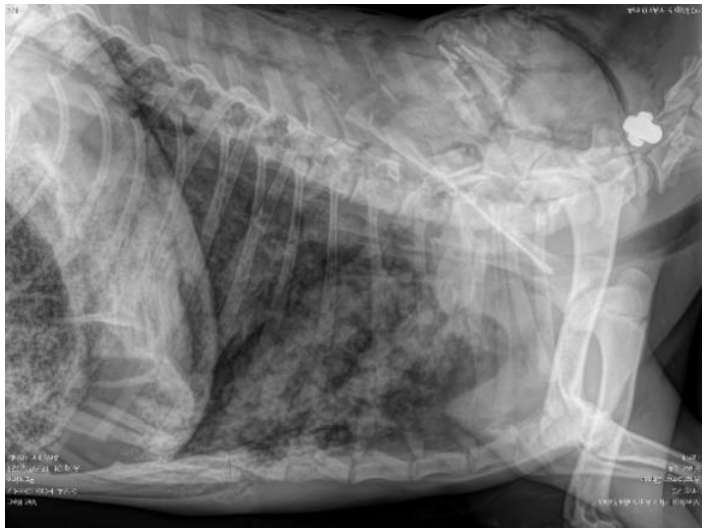
Cost is likely to be higher while availability is limited, but given the total spend on deer hunting, this is likely to be minor and will reduce as more supply becomes available[13].

Are lead-free bullets as effective?

Solid ('monolithic') copper bullets have been shown to be just as effective as lead-based bullets for deer hunting, without the negative environmental impacts of lead[14,15]. Copper bullets have been successfully used for many years in Europe, North America and Africa.

Using the right bullets for the species and distances you are hunting, together with good shot placement, are the most important principles when switching to lead-free ammunition. This applies to all hunting.

There are several other benefits to copper bullets, such as deep penetration (including through bone), almost 100 per cent bullet weight retention and high ballistic coefficients.



A Hog Deer carcass shot with a copper bullet, showing good expansion with no bullet fragments left behind, just bone. *Source: Game Management Authority*

What can you do to prevent the risks?

Many Australian hunters have already made the switch to lead-free ammunition. So, why not give it a go and feel confident that you are minimising your hunting footprint, while also protecting your health and the health of your friends and family. By switching to lead-free bullets, you will also be

supporting a healthier future for our environment.

For more information

The references cited in this fact sheet provide valuable information on the issues with lead ammunition for hunting.

For any questions, please feel free to get in contact with your local GMA Game Manager via 136 186.

They will be more than happy to discuss how you can assist in creating a sustainable hunting future for everyone.

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Transitioning to lead-free hunting ammunition education resources

Scan the QR codes below for more information about transitioning to lead-free hunting ammunition.

Mythbusting copper bullets - Fieldtester

Huntingwithnonlead.org

Oregon Zoo Non-Lead Hunting Education