

1 Firearm Safety as a Veterinary Practitioner

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6 Abstract

7 Firearm safety is crucial in large animal veterinary medicine, particularly when using firearms and captive bolts for
8 the humane euthanasia of livestock. Although these tools are endorsed by organizations like the AVMA and AABP,
9 their use is often underrepresented in veterinary training, leading to potential safety risks. Essential safety principles,
10 such as proper handling, maintenance, and storage must be prioritized to prevent accidents. Veterinary practitioners
11 must be well-versed in these protocols to ensure both their safety and the effective use of these tools. Proper training
12 and adherence to firearm safety rules are critical for minimizing risks and achieving humane outcomes in welfare
13 and human safety.

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15 Keywords: firearm, safety, livestock, cattle

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17 Importance of Firearm Safety

18 The perception of firearms varies depending on an individual's background. Firearms may be seen as weapons,
19 sporting instruments, hunting tools, or versatile implements for different tasks. The context and the operator's
20 intention largely shape their use. For decades, numerous organizations and advocacy groups have promoted the
21 importance of firearm safety through programs like the Hunter Safety Education Program. These groups, operating
22 at local, state, and national levels, have influenced how hundreds of thousands of people view, handle, store, and
23 care for firearms. While these programs primarily target sporting enthusiasts, the principles they teach are highly
24 relevant not only to hunters and target shooters but also to veterinary practitioners working with food animal
25 livestock.

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28 In veterinary medicine, the use of firearms and captive bolts for the euthanasia of livestock is common. (1 & 2).
29 When used correctly, both the American Veterinary Medical Association (AVMA) and the American Association of
30 Bovine Practitioners (AABP) endorse these methods as humane means of euthanizing cattle. (3&4) However,
31 despite their importance, firearms and captive bolts are often underrepresented in veterinary education, usually
32 discussed only in the context of animal euthanasia for welfare purposes. Like any tool, understanding the proper
33 function, operation, and safety measures surrounding firearms is crucial for the user. For veterinarians, these devices
34 serve not only as professional tools but also as essential resources for livestock producers. Veterinarians are
35 frequently responsible for training producers and on-farm workers in the correct protocols necessary for animal
36 welfare. Unfortunately, firearms and captive bolts are sometimes overlooked or misused due to veterinarians' lack of
37 confidence, experience, or knowledge, as well as insufficient training or noncompliance among on-farm workers.

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39 Firearms, by design, discharge projectiles at whatever they are aimed at, requiring human action to point and pull the
40 trigger. Over the past 40 years, there have been numerous reports of accidental injuries and fatalities involving
41 firearms and captive bolts, often resulting in tragic consequences such as the amputation of fingers or limbs, loss of
42 eyesight, or even death. (5 & 6) Many of these incidents could likely have been avoided if basic firearm safety
43 protocols had been followed. Proper safety education is essential to preventing these unnecessary accidents and
44 ensuring both human and animal welfare.

46 Rules of Firearm Safety

47 There is a widely agreed-upon set of safety rules that many programs endorse when it comes to firearms. Although
48 the wording may vary across different organizations, these rules boil down to four fundamental principles that
49 should always be followed when handling a firearm or captive bolt. These principles can be summarized with four
50 keywords: Treat, Keep, Never, and Know. 1) Treat: Treat every firearm as if it is loaded, even when certain it is not.
51 2) Keep: Keep all fingers off the trigger until ready to fire. 3) Never: Never point the muzzle at anything you are not
52 willing to destroy, even for a moment. And 4) Know: Know your target, what's beyond it, and what is to the side of
53 it, ensuring that you are certain of your intended target. In some circles, a fifth fundamental rule is also
54 emphasized: "Guns are not toys." While there are "toy guns", real firearms and captive bolts should never be treated

55 as such. They must be handled with the respect, caution, and seriousness their intended purpose - or even an
56 unintended consequence - demands.

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58 Responsibilities

59 Safe firearm handling is the sole responsibility of the operator. If a veterinary practitioner chooses to use a firearm or
60 captive bolt for euthanasia, they must ensure that the tool is handled with care and in a safe manner at all times. This
61 includes confirming that the type, model, and caliber of the firearm and ammunition are appropriate for the task at
62 hand. (2) Additionally, veterinarians are accountable for the consequences of mishandling the tool or selecting an
63 inappropriate firearm, along with any implications that may arise from such errors.

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65 Veterinarians who incorporate firearms into their practice also bear the responsibility of properly securing and
66 storing them to prevent unauthorized access. Just as controlled drugs used in practice must be locked away when not
67 in use, firearms must also be stored securely, out of sight, and inaccessible to others. Furthermore, the operator is
68 responsible for the upkeep of the firearm or captive bolt, ensuring that it is regularly cleaned, maintained, and
69 correctly assembled.

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71 Most firearms and captive bolts come with user manuals that provide detailed, step-by-step instructions for
72 disassembly, maintenance, and reassembly. If there is any uncertainty, the operator must refer to the manual or seek
73 professional assistance to ensure safe operation. When cleaning a firearm or captive bolt, always adhere to rule #1
74 Treat - ensure the tool is unloaded. Many avoidable accidents occur due to the mistaken belief that a firearm is
75 unloaded during cleaning. Always use the correct cleaning supplies, and if in doubt, consult a professional or refer to
76 the instruction manual. Importantly, do not use WD-40 for cleaning or lubricating a firearm. Using a high-quality
77 lubricant is essential for the proper function and longevity of firearms and captive bolts. There are many reliable
78 brands available, with REM Oil being a trusted option that won't damage the firearm.

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80 Continued Fundamentals

81 When handling a firearm or captive bolt, the four fundamental safety rules must always be followed. However,
82 additional considerations are equally important for safe and effective use. One key factor is the operator's stance—
83 ensuring solid footing, balance, and proper positioning. A secure, controlled grip on the handle (if present, as some
84 captive bolts do not have a "pistol grip") is essential. The grip should be neither too tight (which can lead to
85 excessive tension) nor too loose (which could result in dropping or losing control of the tool). Hand placement is
86 also critical, ensuring that fingers are clear of the hammer, slide, or other moving parts of the firearm to prevent
87 injury.

88
89 Proper target alignment and sight picture are fundamental. Operators must have a clear view of the intended target.
90 For veterinary applications, such as euthanasia, it is important to consult the AABP Guidelines for Humane
91 Euthanasia of Cattle, which provides detailed instructions on identifying anatomical structures, landmarks, and the
92 correct sight picture for euthanasia by firearm.

93
94 One commonly overlooked fundamental is breath control. Opinions on its importance may vary; for example, some
95 military members argue that breath control is less significant than maintaining consistent sights on the target. They
96 suggest that breath control is secondary to trigger timing. However, the natural rise and fall of the chest during
97 breathing can cause the extended arms holding a firearm to move vertically, even slightly. While this may seem
98 minor, if the operator does not control their breath at the moment the trigger is pulled, there is a high chance that the
99 muzzle will move, affecting the trajectory of the bullet or bolt. Even a few millimeters of movement can mean the
100 difference between hitting the brainstem and striking the sinus. To minimize this, it's recommended that the shooter
101 align their natural breathing pattern with their aim, holding the sights steady on the target before pulling the trigger.
102 Additionally, the trigger should be squeezed smoothly and firmly, not jerked or abruptly pulled, as this will help
103 ensure proper shot placement.

104

105 Tools for the Job

106 Research has been conducted into the appropriate firearm and caliber combinations for the euthanasia of cattle, with
107 ongoing studies for different ages and species. (2) When selecting a firearm, it is important to choose the "best tool"
108 for the job, rather than what appears "cool" or seems appealing. The goal should be achieving a humane death.

109 Firearms, like a hammer or a pack of sutures, come in various sizes, brands, and types, each designed for specific
110 purposes. Using one that is too small or too large may be inappropriate for the procedure.

111 Additionally, the type of ammunition is crucial for ensuring both success and safety. (2) Different bullets serve
112 different purposes: hollow points are designed to maximize soft tissue damage, while solid bullets cause blunt-force
113 trauma and penetrate more deeply. To extend the hammer analogy, striking a nail with a hammer applies “blunt-force
114 trauma”. Hollow-point bullets are unsuitable for penetrating bone, especially the skull, to reach the brainstem. While
115 they may be suitable for personal protection or target shooting, they have no place in a veterinarian’s toolbox for the
116 euthanasia of livestock.

117
118 Personal preference also plays a role in the selection of firearms or captive bolts, just as it does with other tools.
119 Some veterinary practitioners may prefer captive bolts, rifles, shotguns, or pistols. Regarding pistols and captive
120 bolts, some argue that they are easier to secure in a lock box in a veterinary truck or clinic. Like most tools, each
121 option has its pros and cons.

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123 Revolvers are generally easier to clean, have fewer parts, perform well in dirty conditions, do not leave “brass”
124 (bullet casings) on the farm (similar to captive bolts), and often accommodate a variety of bullet calibers. On the
125 other hand, semi-automatic pistols typically hold more bullets than revolvers. However, they have more moving
126 parts (springs), require more parts to clean, are more prone to malfunction in dirty conditions, offer less flexibility in
127 ammo choices (for a single firearm), and tend to leave bullet casings behind on the farm (unless collected).

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129 Importance to a Veterinary Practitioner

130 For large animal veterinarians, firearms and captive bolts serve as essential tools in their practice, particularly when
131 dealing with welfare procedures and humane euthanasia. (3 & 4) Just like other instruments in the veterinarian’s
132 toolbox, the proper selection, use, and maintenance of these devices are critical to ensuring the safety and
133 effectiveness of their application. However, the use of firearms and captive bolts demands an even greater level of
134 discipline, awareness, and responsibility, given the potential risks they pose not only to the practitioner but also to
135 those nearby.

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137 Beyond their own use, veterinarians often take on the added responsibility of educating producers and on-farm
138 workers on how to properly and safely utilize these powerful tools in everyday situations. Ensuring that safety
139 protocols are consistently followed, veterinarians play a crucial role in promoting the welfare of animals and
140 minimizing the risk of accidents or harm. Thus, a deep understanding of the associated safety rules surrounding
141 firearms and captive bolts is essential to maintaining both personal and public safety, while ensuring humane animal
142 care.

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