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A hard day's night: The lingering effects of the rut

by David Hewitt and Randy DeYoung

Springtime brings about the end of the hunting season. Bucks have mostly shed their antlers or will soon cast them. Many deer biologists and managers are quite relieved, as the exhausting 5-month managed lands deer permit season has finally come to an end. It is now time to do all of the chores and household tasks that accumulated during the season. We are spending less time in the blinds and can't recognize individual bucks without antlers, anyway. Most of our attention is occupied by the aforementioned chores, as well as planning brush treatments, burning, and the myriad other tasks that go into managing a ranch. However, something very important is about to happen, if it hasn't already occurred. The Reaper has come to visit and some bucks will not see the next hunting season.

Post-rut is the peak period of natural mortality for adult bucks, but ascertaining causes of mortality in field studies is difficult because scavengers are very efficient and can make quick work of a carcass. One of the authors once encountered a tag-team consisting of a large feral boar, two coyotes, and several Caracaras feeding from the carcass of an old buck that had become entangled in a fence overnight. In less than 12 hours, the carcass was reduced to little more than the head, feet, a few vertebrae, and a piece of hide! Regardless of the source of mortality, if an adult buck is going to die from natural causes, now is the time.

So, what specifically is happening to the bucks that die after the rut? The answer is that no one **specific** thing is happening. The forces of nature converge in a perfect storm because of behavioral and physiological changes that occurred during the rut. A simple, albeit tongue-in-cheek, way to describe the increase in buck mortality after the rut is "testosterone poisoning" because many potential causes of death during and after the rut can be attributed to the large increase in testosterone coursing through the bucks at this time of year. Examples of testosterone's effects are:

- Testosterone changes buck foraging behavior and movements. Bucks reduce food intake and increase activity during the rut. They use their body reserves to meet the resulting energy deficit and may lose up to 25% of their body weight during rut. Some bucks may push the envelope too far, and if good foods are not available after the rut, they may succumb to starvation.
- Testosterone makes bucks more aggressive. Bucks that gathered in amiable bachelor groups during summer and autumn may fight during the rut, especially if they are similar in rank and an estrous doe is up for grabs. Bucks unfamiliar with one another may fight. Although serious injuries and death are not common, they do happen. In addition, some bucks are weakened by the cumulative effects of many minor fight-induced injuries and subsequent infections.



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- Testosterone inhibits a deer's immune system. Instead of using energy and nutrients to maintain the immune system, rutting bucks divert some of those resources to rutting activity. Doing so makes bucks more susceptible to infection, and some bucks succumb to disease.



A buck before the rut in late September.



The same buck after the rut in mid January.

- Testosterone causes bucks to become bolder. Any buck that flees at every broken twig or slinks in the brush during the rut will not breed many, if any, does. Buck behavior changes so that bucks are seen standing in the open or single-mindedly chasing does during midday. Bucks during the rut may be less likely to flee from predators (and hunters). Because of their testosterone induced boldness, and perhaps also because they are in poor shape, some bucks succumb to predators during winter.



So, why has nature, with its ruthless efficiency in promoting the fittest animals, allowed testosterone poisoning? The answer is simple. The correct amount of testosterone results in a trade-off between the animal's physical condition and siring fawns. Note that "fit" in this context isn't about defined pectoral muscles or sculpted abs. In the game of life, the fittest animals are the ones who leave the most descendants—one cannot become an ancestor without leaving descendants! Any buck with poor testosterone production may live a long, peaceful, healthy life, but will leave few offspring if he cannot compete for does. Conversely, bucks with too much testosterone may be highly competitive for breeding rights, but may succumb to an early death as a result of being too aggressive, taking too many chances, or rutting until body condition is too low to recover. Thus, bucks in our deer populations today are the product of a long history of balancing risk of mortality with the drive to breed. In the end, we can understand post-rut mortality as the cost of having the most-fit bucks sire fawns.

From a manager's perspective, what can you do? Trying to change past eons of selection is about as effective as spitting into the wind; some mature bucks are going to die post-rut and that is that. Managers can ensure that good-quality foods are available during post-rut so that bucks can have a better chance to recover from the stress of the rut. In addition, one can maintain good age structure and ensure plenty of younger bucks are poised to enter the mature ranks. Obviously, not all mature bucks will die post-rut in any given year. Nevertheless, leaving a buck for next year will always be a gamble.

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