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Common Insecticide Can Hurt Bull Breeding Ability

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One common bull management practice could do more harm than good when breeding season rolls around.

“Several [pyrethroids](#) can have devastating effects on the semen quality of bulls,” says Dietrich Volkmann, DVM, a professor of food animal theriogenology at the University of Missouri Veterinary Medical Teaching Hospital. “Aerial sprays as well as pour-on formulations have been implicated in the development of severe secondary sperm defects and very poor sperm motility in exposed breeding animals.”

Various pyrethroid formulations are common in cattle insecticides.

According to Volkmann, research suggests pyrethroids may inhibit production of an enzyme necessary for the conversion of testosterone to dihydrotestosterone (DHT). DHT is necessary for the proper function of multiple accessory sex glands, including the seminal vesicles and prostate, as well as the epididymides.

“The toxic effects have been observed within a few days after the first exposure of bulls to the insecticides and lasted for as long as the pyrethroid exposure continued,” Volkmann says. “After the last exposure, the sperm quality and motility of the vast majority of bulls recovered to normal, but only after two to four weeks.”

Case studies Volkmann has been involved with point to the same results.

Here’s one example: A seedstock producer brought 50 bulls (15-24 months old) to Volkmann and his crew for breeding soundness examinations (BSE) ahead of their annual sale.

“We stopped the examinations after about 20 bulls because only three had acceptable semen quality,” Volkmann says. “When I prompted the client, he told us that he had poured these bulls for ectoparasites two weeks earlier; the product contained a pyrethroid. A sample of the bulls was retested almost four weeks after they had been exposed, but semen quality was still too poor for the majority to pass the BSE. A sample of the group was then tested a third time almost eight weeks after the initial exposure, and these bulls all had normal semen.”

In another example, a commercial contractor showed up unannounced to spray the barn walls of a commercial bull stud for fly control. There were about 50 bulls in the barn.

“Within days of the application of the insecticide, ejaculate volume, sperm motility and the freezability of semen declined sharply,” Volkmann says. “Sentinel animals were used to demonstrate the presence of bifenthrin in semen, blood and urine for about 10 days. Semen quality returned to normal about four weeks after exposure.”

He adds that bifenthrin was the active ingredient in the spray. It’s a synthetic derivative of native pyrethrin, which has much longer residual activity than the native compound.

Volkmann understands these examples aren’t controlled studies. But, he adds, “The evidence generated in lab animals over the last 10 years or so demonstrates rather convincingly that pyrethroids are potent endocrine disruptors and do cause malfunctioning in DHT-dependent organs.”

Consequently, Volkmann recommends that all pyrethroid treatments for bulls be discontinued or avoided no later than four weeks before the start of the breeding season.

“In accordance with the above-mentioned concerns, no live-virus vaccines or any type of pyrethroid insecticides should be administered this late before the onset of a breeding season,” Volkmann says.

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