

BeefTalk: Winter Solstice, Spring Breeding



Reproduction - Cow and bull reproduction is complex, so start thinking now for breeding success next spring.

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I like to ponder, and right now I am pondering about the day with the least amount of daylight in the Northern Hemisphere.

This is important because of the profound impact light has on all of us. Light is central to discussions about how and when living things reproduce and grow, for some much more than others.

Although cattle reproduction is not considered to be controlled by daylight because nutrition, temperature and age have more influence, the subject is worth pondering. Why is cattle reproduction so challenging? The answer is way too often framed as something simple. Feed a little more, vaccinate the cows, more bull exposure, cow/calf separation or estrus synchronization are some of several often-noted solutions to poor reproduction.

In an artificial insemination program, one can do everything “by the book” and still have poor conception. In those cases, blame and finger pointing can dominate the subject, and the complexity of the process gets left out. Even when natural breeding, the fall pregnancy percentage may not be what was expected. Why?

What are we asking? First, the cow needs a functioning ovary that will produce a viable egg, and the bull needs a functioning testis that will produce viable sperm. And our discussions often focus on checking for results at the back end of the chute: the back end of the cow or bull.

In reality, for conception to take place, the controls are at the other end, the brain. Deep within the cow and bull brain, the hypothalamus and the pituitary interact to secrete appropriate products into the circulatory system to trigger the ovary and testis to function. The ovary and testis secrete a different set of products back into the circulatory system to tell the front end what the back end is doing, which we hope is producing an egg and sperm.

The reproductive system is not designed to be turned on all the time; thus, we have this communication between the front and back end. We hope the constant interplay between the front and back end of the cow and bull ends in pregnancy. Once the cow is pregnant, the system

settles down, and additional components come into play among the uterus, developing calf and the rest of the cow's system that, we hope, will allow a full-term pregnancy.

The process seems simple: Perhaps some estrogen, testosterone, is all that is needed, but no, that's not even close. Even the prostaglandins, gonadotropin-releasing hormones or other products do not create the perfect cow-breeding system. Many factors will allow a pregnancy and, interestingly, more factors turn the system off than turn the system on.

The winter solstice reminds me of the complexity of the living systems we try to fit into our managerial desires. Some fit, but some don't. Winter tends to be referenced as cold, long, dark nights we long to be over. But the cow knows, through the eye, the pineal and other body organs, the time of the year.

December solstice is the shortest daylight hours of the year in the Northern Hemisphere (winter) and the longest daylight hours of the year in the Southern Hemisphere (summer). For living things, the winter solstice is followed by the spring equinox, summer solstice and fall equinox. These are important events and certainly impact the world of biology and bring noteworthy biological responses.

The Northern Hemisphere winter solstice generally will be Dec. 21 or 22, and occasionally Dec. 20 or 23. This seems strange, but exactness is not a product of human intervention. In fact, only we humans need a calendar. The cow and other animals biologically already know what the day of the year is; no Gregorian calendar is needed.

The Earth and its reference points within the universe are critical to our survival. For beef producers, the winter solstice generally goes by unnoticed, but the winter does not go unnoticed by sheep, poultry, horses or many other living things. For daylight-sensitive animals, hours of light trigger annual cycles of reproduction. Logically, these events affect cows in some way as well.

Even though beef production seems to be relatively distanced from the seasonal issues of increasing or decreasing light, looking at those livestock directly affected should bring a better appreciation of how delicate the controls of reproduction and growth are. Cow and bull reproduction is not simple; it's complex.

Start thinking now for breeding success next spring. Ask if your cows and bulls are adapted to the world around them. If yes, expect a good breeding season. If not, seek some input.

May you find all your ear tags.