Management Factors Affecting Fertility

by ***Troy Smith***

The cow-calf business is really all about reproduction. The goal of any serious cow-calf producer is to maximize the number of cows and heifers that become pregnant. So fertility is very important. During the Applied Reproductive Strategies in Beef Cattle (ARSBC) workshop, hosted in conjunction with the 2010 Cattle Industry Annual Convention, South Dakota State University reproductive physiologist George Perry talked about factors influencing fertility. He also offered a number of managerial considerations for maximizing pregnancy rates for breeding programs utilizing natural service or artificial insemination (AI).

Perry advised producers to consider the "equation of reproduction," which includes four factors: 1) the percentage of females detected in estrus (standing heat) and inseminated, 2) inseminator efficiency, 3) the fertility level of the breeding herd, and 4) the fertility of the semen. According to Perry, overall reproductive performance of the breeding herd will never be better than the lowest level of performance in any one of these areas.

With natural service, Perry said, detection of estrus ought to be easy. It's the bull's job. However, Perry reminded producers that libido, or the bull's desire to mate, varies among bulls. And the factors evaluated during a breeding soundness evaluation are not related to libido. It can only be evaluated through close observation of a bull after introducing him to a cow herd and witnessing a demonstration of his desire to detect females in estrus.

When using AI, the herd manager assumes the job of detecting estrus. It is accomplished through observation and with the various commercially available detection aids or "Gomer" bulls. But even when estrus detection aids are used, Perry recommends frequent visual observation to identify the greatest number of animals ready to be inseminated and the most appropriate time for insemination.

"Timing makes a big difference," Perry stated, "for inseminating too early or too late decreases the likelihood of achieving pregnancy."

When semen is placed in the right place at the right time, conception occurs about 95% of the time. With AI, inseminator efficiency is influenced by semen handling and technical skill. However, according to Perry, even AI professionals fail to deposit semen in the right place (within the uterine body) about 20% of the time.

To enhance conception rates, Perry advised adherence to recommendations for thawing semen and care to maintain thermal protection of straws during transport to the cow. He warned against allowing straw-to-straw contact during thawing as some refreezing and rethawing of semen may occur and compromise semen quality. He recommended that insemination be performed within 15 minutes after thawing semen.

"Even bulls err when it comes to insemination efficiency," Perry said, citing reasons that included low libido, low serving capacity, physical deformity and competition among multiple sires.

"Fertility level of the herd may be the hardest factor to evaluate," Perry stated. "Herd fertility includes cycling status, compliance with synchronization protocols, embryonic mortality, body condition (nutrition) and disease."

Stress, particularly heat or shipping stress, can be detrimental to survival of newly formed embryos. Perry explained that stress induces the release of hormones that cause detrimental changes to the uterine environment in which the new embryo is developing. The time when shipping stress is most hazardous to establishing successful pregnancy is between days 5 and 42 after insemination. Shipping during this time may cause up to 10% decrease in pregnancy rates.

Stress as a result of nutritional management can interrupt cyclic activity among breeding heifers and may have a detrimental effect on embryonic mortality in heifers already bred. Perry said this is most apt to occur when heifers are developed in confinement and fed prepared rations, then sent to pasture where they must shift to a diet of grazed forages only.

The final factor in the "reproduction equation" is fertility level of semen. This factor, Perry said, is managed by always buying quality semen for use in AI and always subjecting natural-service bulls to a semen test before turnout.

For more highlights of the ARSBC workshop, visit *www.appliedreprostrategies.com*. **HW**

Nutrition and reproduction

"Fertility and reproductive traits are lowly heritable, so we need to manage for them," said Rick Funston, University of Nebraska Extension reproductive physiologist. "You can do everything right with genetics in your program, but if you manage poorly, you can change all that potential very rapidly."

He shared a few tidbits for successful nutritional management of a cow herd:

- Body condition score (BCS) is important, but even more important is the female's current weight trend. "I would much rather breed a thin cow on an increasing plane of nutrition than try to breed a fat cow on a declining plane of nutrition," he said.
- When dietary protein falls below 7%, the cows can't eat enough to meet their requirement, so you have to supplement. However, excessive protein, either degraded intake protein (DIP) or undegraded intake protein (UIP), can also be a problem if total energy is inadequate. Cattle need balanced protein and energy.
- A mineral supplement is best given 45 days before calving and again before weaning. Feeding ionophores offers real benefits to cows.
- Try feeding dried distillers' grains (DDGs). "I'm convinced there's something in DDGs that has a positive effect on fertility," Funston said. "I don't yet know what that something may be, but I truly believe there's something there we haven't learned yet."
- Feeding fat is not a cure-all. "If your repro rates are poor to begin with, you probably have a better chance of seeing a beneficial difference from feeding fat than if your repro rates were acceptable," he explained. "However, that beneficial effect still probably would not be anything more significant than would be experienced by feeding any supplement to cows in poor condition. If you're trying to decide if you should supplement fat, the bottom line should be its affordability and the current condition of your cows. If you have low repro rates and you can get fat cheap, go ahead and feed it. Otherwise you can probably skip it." **HW**