

Balance is Key

Manage females for optimal fertility in AI systems.

by **Shelby Mettlen**, assistant editor

“It’s a numbers deal,” Rick Funston told his audience at the Applied Reproductive Strategies in Beef Cattle (ARSBC) workshop in Manhattan, Kan., Aug. 29. “I don’t care how a calf’s going to grade at slaughter if I don’t have a live calf born every year,” the Sandhills-region extension beef reproductive physiologist for the University of Nebraska said.

Of a female’s traits, reproduction is the most important, Funston said. “One of the most important factors of reproduction is when animals conceive.”

Importance of early conception

Looking at a set of steer progeny, Funston pointed out that calves born earlier are heavier and grade better through to slaughter. Heifers are also heavier through breeding, breed better, wean a heavier calf and breed back sooner.

Weaning weight, hot carcass weight, marbling score and carcass value all improved in calves that were older when they arrived at the feedlot. In heifer progeny, weaning weights, condition prebreeding and the number of heifers cycling all improved in heifers that were born within the first 21 days of the calving season.

An even more significant consequence of earlier conception and calving, added Funston, was that those animals have a longer period to rebreed after having their first calves. The chance those earlier-conceiving and earlier-calving animals will be open is much less than if they calve late in the calving season.

Retired livestock economist and professor emeritus with North Dakota State University Harlan Hughes stated that it takes the profit from two early-calving cows to cover the loss of one late-calving cow, Funston said. The cow that calves in the first 21 days of the calving season her entire life will produce two more calves.

Heifers that conceive earlier have greater longevity, Funston said, but that’s not completely explained by the age of the female. “Some of those younger heifers will conceive earlier and essentially wean two more calves,” he added.

Breeding protocols

Funston pointed out that in heifers, longer-term progesterone protocols work better. In cows that have calved previously, he added, 7-day CO-Synch + CIDR® works well.

“The key is getting those animals cycling with progestins,” he said.

Producers can increase profits by moving later-calving females up, he added. “We can get anestrous animals pregnant just as well as those that are cycling.”

Producers can advance estrus by two to three cycles by placing CIDRs in later-calving cows for seven days, pulling the CIDRs, giving prostaglandin or turning those cows in with bulls, Funston said. That can increase calves’ weaning weights by as much as 40 pounds (lb.).

Fixed-time artificial insemination (FTAI) protocols do just as well as protocols with estrus detection, Funston offered.

Determine whether all animals are cycling, and if they’re not, determine whether or not this can be overcome using a synchronization protocol, Funston said. “Disease is not one we can overcome,” he said.

Determining how far cows are postpartum, body condition scores and how many are cycling can give producers an idea of what program to implement.

In a study using artificial insemination (AI), most of the oocytes were fertilized, but about 30% of embryos were lost before day 40.

“That’s something to focus on,” Funston said.

Factors affecting embryonic loss

“[There are] a lot of genetic defects we’re never going to find,” Funston said. “Why? Because it results in early-embryonic mortality.”

In addition to genetic factors like lethal genes, abnormal chromosome numbers and inbreeding, nutrition, environment, and influences like age of the dam and hormone levels will have impacts on embryonic loss.

The change in nutrition from the time of AI to day 40-50 of pregnancy is critical to the



► The cow that calves in the first 21 days of the calving season her entire life will produce two more calves over the course of her lifetime, says Rick Funston, Sandhills-region extension beef reproductive physiologist for the University of Nebraska.

success of an AI or natural-service breeding program, Funston said.

Impact of nutrition

Developing heifers on corn residue vs. dry lot, Funston said lighter heifers developed on cornstalks bred better than those that were developed in confinement. Heifers developed on corn residue gained less than a pound a day, he said, while those developed in a drylot and fed a 30% supplement gained about 1.5 lb. per day. When turned out on grass, those previously on corn residue outgained drylot heifers by a pound a day.

“This is key to the establishment of pregnancy,” Funston said. The corn residue-developed heifers received no additional nutrients, but responded differently to that environment based on their previous experience.

In a study involving March- and May-born heifers, Funston found that the older, March-born heifers had a full 20%-30% higher pregnancy rate than the May-born heifers. Ultimately, he said the younger heifers are simply unable to gain enough to begin cycling earlier like the March-born heifers. Yet, Funston found that fatter heifers needed longer than leaner heifers to begin cycling.

The conclusion? It’s all about balance.

Other factors affecting pregnancy

Funston mentioned that excess protein when energy is lacking can have a negative effect on pregnancy. Considering what’s in the environment, but also what antagonists are in the environment can have an impact on pregnancy rates, he said.



Table 1: Time of calving affects feedlot performance

Steer calves (n=661)	Period of calving, 21-day periods		
	1 st	2 nd	3 rd
Weaning weight, lb.	515	483	435
Feedlot ADG, lb. per day	3.61	3.62	3.63
Carcass weight, lb.	816	800	771
Marbling score	574	554	527
Yield grade	3.0	2.8	2.6
Choice, %	84	83	73
≥Average Choice, %	30	17	12
Carcass value	\$1,632	\$1,600	\$1,542

When considering a supplement, Funston recommends an ionophore, not only for the obvious benefit of feed efficiency, but for the potential improvement of pregnancy as well.

Consider where the semen comes from, Funston advised. Semen collected from top AI companies consistently performs about 10% better than custom-collected semen, he said.

“Selection of sires can have long-term effects on the success of your breeding program,” Funston said. The sire is where the genetic change happens. Choose him carefully.

Management of cows and heifers obviously affects pregnancy rate. Heifers that don’t experience dystocia and that are managed well when assistance is needed will breed back sooner.

Management of females postbreeding is also clearly important.

“What we do with those cattle postbreeding is, I think, one of the most important things that influence a successful AI program,” Funston concluded.

For more details of Funston’s

Table 2: Time of calving affects heifer progeny

Heifer calves (n=1,019)	Period of calving, 21-day periods		
	1 st	2 nd	3 rd
Prewaning ADG, lb.	1.83	1.83	1.90
Weaning weight, lb.	483	470	434
Prebreeding ADG, lb.	0.86	0.90	0.90
Prebreeding weight, lb.	653	644	609
Cycling, %	70	58	39
Breeding ADG, lb.	1.59	1.63	1.70
Pregnancy rate, %	90	86	78
Calved in 1st 21 days	81	69	65

presentation, refer to his PowerPoint and proceedings posted to the Newsroom at www.appliedreprostrategies.com. Compiled by the *Angus Journal* editorial team, the site is made possible through sponsorship by the Beef Reproduction Task Force.

Hosted by the Task Force and Kansas State University Research & Extension, the 2017 ARSBC Symposium convened Aug. 29-30 in Manhattan, Kan. Next year’s symposium will be Aug. 29-30 in Ruidoso, N.M.

