



# Sunflower Supreme Gazette

Volume 1, Issue 2

February 2014

## Special points of interest:

- ... Breeding soundness exams for bulls and heifers
- ... Update for Sunflower Supreme members
- ... Power of artificial insemination
- ... Calving ease sires for Sunflower Supreme heifers

## Inside this issue:

- The power of AI is well beyond sire choices **3**
- Use calving ease EPDs to select sires for Sunflower Supreme heifers **4**

## Evaluating the breeding soundness of bulls and heifers before start of the breeding season

*Drs. Bob Larson, Brad White, Shelie Laflin, Nora Schrag, and Dave Rethorst, Kansas State University, College of Veterinary Medicine*

### Breeding Soundness Evaluation of Bulls

Bulls represent a significant monetary investment associated with purchase price, housing costs, feed, and veterinary care. They also serve as a source of risk to the ranch, with poor reproductive performance having a great impact on percentage of the heifers and cows that become pregnant and the average calf age at weaning. Careful attention to selection based on predictions of genetic contribution to desirable traits, management to protect health, breeding soundness examination to remove bulls with questionable breeding ability, and appropriate bull-to-cow breeding ratios are required to optimize the investment ranchers make in their bulls.

A BSE should evaluate the entire bull, not just his reproductive tract. During the breeding season, bulls will travel many miles per day and sound feet and legs are essential for mating success. Foot and leg problems such as lameness, being post-legged, or having screw-claws will cause a bull to fail a BSE. Respiratory disease and other diseases that limit a bull's ability to be a sexual athlete will cause him to fail a BSE, as will abnormalities of the penis, prepuce, or testicles.



Scrotal circumference is measured because small testicles may not produce adequate amounts of sperm even though the testicles are healthy; or small testicles may be an indication of testicular degeneration and the production of abnormal sperm cells. Testicular degeneration may be temporary or permanent and may involve one or both testicles. In addition, larger scrotal circumference in yearling-age bulls is associated with both the bull and his heifer offspring reaching puberty at a younger age.

If a bull is determined to be free of noticeable defects, the next step in a BSE is to evaluate the semen itself. The semen is examined under a microscope to determine if the motility is normal and at least 70% of the sperm cells are normal in their shape and appearance.

Young bulls should be exposed to fewer females than mature bulls. For bulls less than three years of age, a commonly used rule of thumb is that a bull can successfully breed as many cows as his age in months (e.g. a 15 month old bull should be exposed to no more than 15 cows). Following synchronization and AI, a common assumption is that one-half of the heifers settled to the AI mating and one-half need to be bred by the clean-up bulls. Because the heifers remain somewhat synchronized in subsequent cycles,

See BSE, Page 2.

## Update for Sunflower Supreme Members

*Jaymelynn Farney, Assistant Professor, Beef Systems Specialist, Kansas State University*

Breeding season is coming upon us which means it is PAPERWORK time. This is a short narrative about procedures that should be completed at this point and some guidance for success in the program.


### Completed at this point:

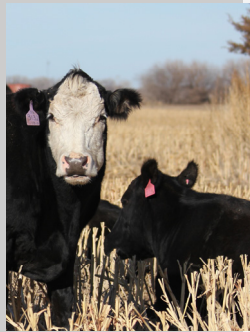
- ... Bangs vaccination
- ... Weaning and Booster Vaccination Sheet (#2)
- ... Affidavit of Ownership for Purchased Heifers (can be found online at [sunflowersupreme.org](http://sunflowersupreme.org) under the documents tab)
- ... BVD-PI test (make sure to turn in the official sheet with individual heifer numbers and the test result)

Once these have been completed you can turn the information in to your local extension office. Questions can be addressed to your local extension office or to Jaymelynn at [jkj@ksu.edu](mailto:jkj@ksu.edu) or (620) 421-4826 ext. 17.

### Thinking Ahead:

*Sire selection:* Remember that the guidelines only have requirements for Calving Ease (CE) EPD or Birth Weight (BW) EPD; however, don't practice single trait selection, try and select sires that are the complete package (aka balanced EPDs). Balanced EPDs indicate that the sire has the ability to have light birth weight calves that have vigor, yet still has the capabilities for growth (weaning and yearling

See UPDATE, Page 3. 



“Breeding soundness exams are important for both bulls and heifers to improve herd reproduction”

## BSE

Continued from Page 1.

the breeding load will be concentrated rather than spread evenly over three weeks, therefore, twice the number of bulls is needed to cover the remaining heifers.

It is important to carefully monitor bulls during the breeding season. Semen quality can deteriorate after a bull passes a BSE, but in most situations where the quality and quantity of sperm production declines significantly in a previously fertile bull, the bull shows at least moderate signs of illness or injury. Bulls should be evaluated frequently to detect any early signs of injury, excessive weight loss, or illness; and if problems are detected, affected bulls should be replaced by fertile bulls. While many matings occur at times that are not convenient for observation, witnessing successful matings ensures that a bull is able to mount and breed effectively which justifies time and effort to be expended to watch for actual matings.

### Breeding Soundness Evaluation of Heifers

Current tools to evaluate the breeding soundness of replacement heifers include collecting body weight, days of age, reproductive tract maturity, and occasionally pelvic area data. The Kansas State University replacement heifer evaluation system combines several of these into a single 3-point matrix (R, I, & S).

Using the Kansas State University 3-point system (R, I, & S), veterinarians classify pre-breeding heifers as:

**Ready** – adequate weight and body condition, no structural flaws that impede fertility or longevity, and palpable CL or large follicle with good uterine tone consistent with normal estrous cycles and a normally-shaped pelvis with a minimum pelvic area of 130 sq. cm. (This cut-off is considered to be a minimum for cycling heifers. Producers and their veterinarians may choose a higher (e.g. 150 sq cm) cut-off for cycling heifers in specific herds.); **Intermediate** – adequate weight and body condition, no structural flaws that impede fertility or longevity, some uterine tone and small palpable follicles, but may not be cycling at the start of the breeding season; and **Stocker** – heifers that are not adequately heavy or with frame size that does not meet herd goals, structural flaws that impede fertility or longevity, very immature reproductive tracts, heifers with an abnormally shaped pelvis, freemartins, and pregnant heifers.

These classifications are interpreted as:

- « **Ready** – these heifers are ready to breed by AI or bull-exposure.
- « **Intermediate** – these heifers are expected to have good reproductive success to a 30 to 60-

day exposure to bulls, but may have only moderate success to an AI mating at the start of the breeding season. Whether or not to expose intermediate heifers to AI breeding, bull-exposure only, or managed as stocker heifers will be based on the length of time between pre-breeding evaluation and the start of the breeding season, and other herd-specific management and marketing goals and options.

- « **Stocker** – these heifers are not ideal candidates for replacement heifers.

Potential replacement heifers should undergo a thorough physical examination including determination of body weight and palpation of the reproductive tract as early as six weeks prior to breeding and as late as immediately prior to the start of synchronization or natural breeding. The optimum timing of this examination will depend on the nutrition, breeding, and marketing plans for specific herds. Evaluating heifers six weeks prior to the breeding season offers the most time to correct low body weight and corresponds to optimal timing of pre-breeding vaccination, but will provide less certainty about the percentage of heifers that will be cycling when the breeding season starts. Evaluating heifers immediately prior to synchronization or just before bull turn-out provides very accurate information about the percentage of cycling heifers, but affords no opportunity to increase that number. Confirming that a high percentage of replacement heifers are cycling prior to the start of the breeding season as well as identifying and removing freemartins, very immature heifers, and pregnant heifers will increase the success of an estrous synchronization and AI program.

Palpation of the reproductive tract to determine the presence of a corpus luteum (CL) or large follicles on the ovaries and to estimate the size of the uterus is done in order to determine if a heifer is cycling. In order for a high percentage of heifers to become pregnant to an AI mating or to become pregnant in the first 21 days of the breeding season if using natural service, at least 80% of the heifers must be cycling by the start of breeding, with many herds setting a goal of at least 90% cycling.

The use of pelvic area measurement at one year of age has been described extensively, but its value to decrease the risk of calving difficulty should not be overestimated. Critics of using pelvic area measurements to decrease calving difficulty point out that pelvic area is also positively correlated to mature cow size and calf birth weight. Rather than using pelvic area measurement to select for maximum pelvic size, this tool should be used to set a minimum pelvic size as a culling criterion (such as 130 to 150 cm<sup>2</sup> at a year of

See BSE., Page 6.

	Stocker heifer (S)	Intermediate (I)	Ready to breed (R)
% Mature body weight	<50% of mature wt	50-60% of mature wt	55-65% of mature wt.
Reproductive tract	Problem (free martin, pregnancy, adhesions, other), or normal (but in this category due to other reason)	Non-cycling, but relatively close	Cycling heifer (evidence of corpus luteum or follicle; reasonable tract size)
Pelvis	Abnormally shaped, small, or normal (but in this category due to another reason)	Pelvic area > 130 cm <sup>2</sup> (harder to evaluate prior to puberty) normally shaped	Pelvic area > 130 cm <sup>2</sup> , normally shaped

## The power of artificial insemination is well beyond sire choices

Sandy Johnson, PhD, Associate Professor, Livestock Specialist, Kansas State University

Use of artificial insemination (AI) provides practically unlimited sire choices but in today's world of volatile markets and other uncertainties perhaps one of its greatest benefits is the minimization of risk with use of high accuracy sires. This is particularly true for heifers where both calving ease and growth are desirable. Tailoring genetics with great predictability is a key reason many beef producers use AI. However, other benefits can be gained, many of which come with the use of estrous synchronization, a secondary tool that has enabled many to use AI through appointment breeding.

Estrous synchronization will increase the number of calves that are born in the first 21 days of the calving season and these calves have a number of advantages over those born later. As expected these calves are heavier at weaning and at harvest have a greater carcass value, partly due to a greater proportion of carcasses grading average choice or better. Replacement heifer calves that are born in the first 21 days, are heavier at weaning and prior to breeding, have more cycling prior to breeding and have higher pregnancy rates. The advantage

from an earlier first breeding date is retained in heavier calf weaning weights through at least 6 calves and an additional .6 to 1.2 years in the herd.

As more cows calve early in the calving season, the early calving cows are more likely to be cycling before the beginning of the breeding season and early pregnancy rates go up. When every cow has a chance to conceive on the first day of the breeding season, the breeding season can be shortened to 45-50 days while still retaining the same season long pregnancy rate of a 60-70 day season. A shorter breeding / calving season is advantageous when timing vaccinations and nutritional changes.

Early efforts to synchronize estrus were marginally successful, particularly when it came to single fixed-timed AI. Advancements in current protocols that synchronize ovulation (better than synchronizing estrus) have allowed producers to achieve excellent pregnancy rates with three handlings and the third being fixed-timed AI. Tom Brink, an industry consultant formerly with Five Rivers Feedyard, speaking at the 2013 Range Beef Cow Symposium noted "mouth-watering success with fixed-timed AI" when listing his "four **See A.I., Page 6.**

*"..Perhaps one of the greatest benefits of AI is minimization of risk with use of high accuracy sires."*

## Update

Continued from Page 1.

weight). Additionally, looking at the carcass traits is beneficial for your selected sire as it provides a marketing ploy for your heifers bred to that sire.

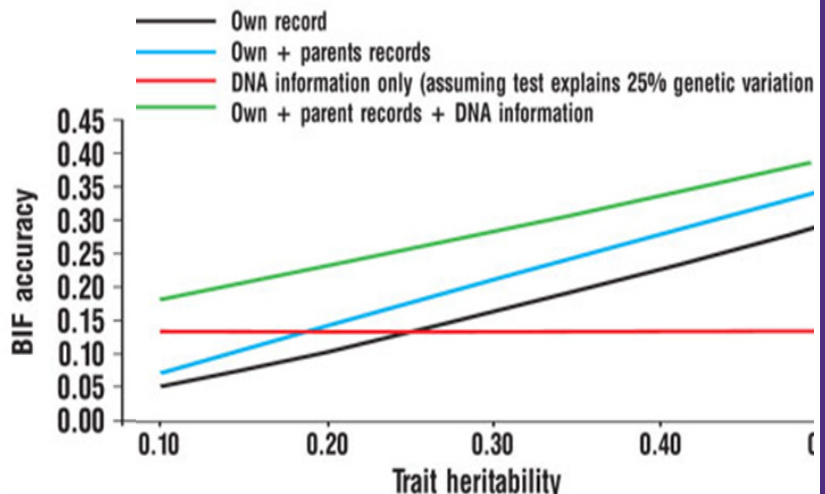
When using a Natural Service sire, trying to capture some accuracy will help with your confidence in calving difficulty associated EPDs. Methods that can increase accuracy in cattle include the bulls own record, parents records, and DNA information. In simplistic terms, the less information associated with that bull, the lower the accuracy value and on the flip-side the more information reported should equate to a higher accuracy number. This is illustrated in the figure to the right that shows the Beef Improvement Federation (BIF) accuracy of a DNA test that accounts for 25% of the genetic variation in a trait.

Understanding the accuracy associated with your natural service sires become important in instances where a sire is on the "bubble" for Sunflower Supreme requirements for natural service or clean-up purposes. A "bubble" sire might not be the best management decision for your success within the program especially if he is a virgin bull that has the potential to decrease his CE EPD through the year. If you can give yourself some lee-way by using a

**Effect of DNA information on Beef Improvement Federation (BIF) accuracy of EPDs given different sources of information and trait heritability**

that sire producing calves with calving difficulty.

Pre-approval of the sires to use in the Sunflower Supreme program is required. Once your sires EPDs, go into your local extension office for confirmation to use that sire(s). A hard-copy of the bulls EPDs will need to be on file with the Extension office and those EPDs will be that bulls "official" EPDs for the year. There are breed associations that update sire EPDs regularly so there is a possibility that your bulls CE and/or BW EPD can change through the year. Therefore, to minimize issues with changing sire EPD numbers, once we receive a hard-copy of that sires **See UPDATE, Page 5.**





**“Economically relevant traits are those that directly generate revenue or incur costs in beef production systems”**

## Use calving ease EPDs to select sires for replacement heifers in the Sunflower Supreme Heifer Program

*Bob Weaver, Ph.D., Associate Professor and Cow-calf Extension Specialist, Kansas State University*

When one begins the process of selection of bulls to produce replacement heifers or bulls to be service sires of replacement heifers a number of criteria come to mind. Certainly among these are breed composition and the contribution the bull may provide to direct and/or maternal heterosis, as well as a variety of growth, maternal and carcass traits. Perhaps among the most important is calving ease.

In the case of replacement heifers we need to think of calving ease as both a trait of a calf (how easy it is born or direct calving ease) as well as a trait of the cow (how easy the cow gives birth or maternal calving ease). There is a genetic component to both the direct and maternal aspects of the calving ease trait. As such, producers should be aware of when to use which measure to aid in the production of high quality replacement females with the expectation of long productive lives as well as to minimize dystocia in first calf heifers.

Before we discuss the two different Calving Ease EPDs, a brief discussion on why producers should use Calving Ease EPDs rather than birth weight EPDs to control dystocia rates in heifers and cows. For cow-calf producers, calving ease is the economically relevant trait associated with dystocia. Economically relevant traits (ERTs) are those that directly generate revenue or incur costs in beef production systems. For a commercial cow-calf producer, dystocia is what generates costs in a cow herd through direct losses of calves and their dams, increased labor costs, and certainly lower reproductive rates among cows that have experienced dystocia. Birth weight is an indicator trait and only ac-

counts for 55 to 60 percent of the genetic variation in calving ease. So, selection for reduced birth weight alone won't improve calving ease as much as selecting directly on calving ease. It's important to recognize that there is an optimal range of birth weights in beef cattle. Certainly, too heavy of a calf is a problem during delivery of the calf. However, too small of a calf at birth is problematic as well. During severe cold stress, low body weight calves are more susceptible to hypothermia and subsequent death or disease issues. If you are using artificial insemination, select bulls with high accuracy Calving Ease EPDs to further minimize risk of dystocia events.

We'll start our discussion on the use of Maternal Calving Ease (MCE) EPD (or Calving Ease Maternal (CEM) in some breeds) and its use in selection of bulls to produce replacement heifers. Maternal Calving Ease EPD describes the difference in the expected rate of dystocia among sire groups of daughters. For instance, if Bull A has a MCE EPD of +10 and Bull B has a MCE EPD of -2, we'd expect Bull A's daughters to have 12% more unassisted calvings (i.e. fewer dystocia events) compared to daughters of Bull B when these daughters are mated to service sires of similar genetic merit for Calving Ease and birth weight. Remember, MCE is calving ease viewed as the ability of a sires' daughters to calve unassisted. Typically, MCE has a negative genetic association with Calving Ease (direct) and a positive genetic relationship with growth and mature size. So it's important that producers don't just select for higher levels of Calving Ease in their herd as that will have a tendency to de-

See EPDs, Page 5.

Breed Group	Sire Breed	Calving Ease	Maternal Calving Ease *
British	Angus	8.0	10.0
Hybrid	Balancer	13.0	9.0
Continental	Charolais	8.2	6.4
Continental	Gelbvieh	11	8.0
Hybrid	LimFlex	11.0	5.0
Continental	Limousin	12.0	6.0
Continental	Maine Anjou	10.5	5.2
Hybrid	MaineTainer	8.9	3.9
British	Polled & Horned Hereford	2.1	2.7
British	Red Angus	8.0	8.0
Continental	Salers	0.9	0.6
British	Shorthorn	1.92	0.6
Hybrid	SimAngus	13.0	10.1
Continental	Simmental	12.3	12.3

\*Depending on breed - Maternal Calving Ease, Calving Ease Maternal, Calving Ease Daughters

## EPDs

### Continued from Page 4.

crease the maternal calving ease genetic potential in the cowherd.

Once a producer has used MCE in the selection of sires to produce replacement heifers, one should transition the selection focus to identification of high Calving Ease (CE) EPD (Calving Ease Direct or CED in some breeds) sires to be mated to virgin heifers to produce their first calf. In this scenario, selection for high CE EPD helps increase the percentage of calves born without assistance to first calf heifers. In this case if Bull C has a CE EPD of +12 and Bull D has a CE EPD of +2, we'd

expect Bull C's calves to have 10% more unassisted births.

Recommendations for MCE EPD minimums for sires to be used to produce replacement heifers and CED EPD minimums for heifer service sires are in Table 1. Producers may adjust this recommendation up based on individual needs that reflect herd based experience in dystocia rates in first calf heifers.

Combining the use of Calving Ease and Maternal Calving Ease EPDs in your selection system will help assure a successful calving season and decreased dystocia in your first calf heifers.

## Update

### Continued from Page 3.

EPDs (pre-breeding), that sire will be approved and those EPDs will be the numbers that will go into the sale catalog. The catalog will report that sires registered name (bull must have a registered number), breed, calving ease, birth weight, weaning, yearling, milk, and ribeye and marbling (if reported within breed association). Additionally, the accuracies for all those reported EPDs will be listed in the sale catalog. The sale catalog will report the EPD numbers for both A.I. and "clean-up" bulls if you chose to use that option. Since all that information will be reported in the sale catalog, having a hard-copy of all the above information is needed when getting approval for your sire(s).

As the year progresses, if your sire's EPDs improve, you can re-submit a new hard-copy of EPDs which will then become the new "official" EPDs for the sire.

**REMEMBER...** artificial insemination sires are the only sires that have a minimal accuracy requirement (0.60) for CE and BW. Use of high accuracy sires for these important calving concern estimates should provide greater confidence to potential buyers and for retained ownership of

these heifers.

*Pre-breeding Exam and Paperwork:* When you are completing the pre-breeding exam with your veterinarian, take the Pre-breeding Sheet (#3) with you and record information on ALL heifers evaluated. Once you take that sheet into your local extension unit, you will identify, with the agent, those heifers you are choosing to enroll in the program. Those that you identify for enrollment will be charged a \$2.50/head enrollment fee. Those that you choose not to enroll will not be charged. It is important to remember that all the information on the "non-enrolled" heifers can not be used at a later date to certify the heifers in the instance that those you are enrolling do not make it through the certification process.

There are many great resources for helping understand EPDs and work within your operation to develop breeding practices to maximize heterosis. The link below is for the 2nd Edition of the "Beef Sire Selection Manual" from the National Beef Cattle Evaluation Consortium: <http://www.asi.k-state.edu/doc/beef-genetics/nbccbeefsireselctionmanual2ndedition.pdf>.

This manual is a great tool to use in your operation and to help with your success in the Sunflower Supreme program.



## Schedule of Events

- ... February 11—  
**Winter Ranch Management town-hall style meeting. To be held at noon in Cottonwood Falls.**
- ... February 25—  
**Sunflower Supreme meeting regarding pre-breeding management. To be held at the Function Junction, South of Erie, KS on Hwy 59 beginning at 6 p.m. Please RSVP by February 21 to Jaymelynn at [jkj@ksu.edu](mailto:jkj@ksu.edu) or 620.421.4826.**
- ... February 27—  
**Animal Health Day, Independence, KS. To be held at the Independence Civic Center beginning at 5:30 p.m.**
- ... March 7—  
**Cattlemen's Day, Manhattan, KS**





**K-STATE**  
Research and Extension

Southeast Area Research Center  
PO Box 316  
Parsons, KS 67357

Phone: 620-421-4826 ext. 17  
Fax: 620-421-0136  
E-mail: jkj@ksu.edu

[Sunflowersupreme.org](http://Sunflowersupreme.org)

Like Us on Facebook  
Sunflower Supreme



## BSE

Continued from Page 2.

age) without assigning preference for heifers that exceed the minimum.

Pelvic area tends to increase more rapidly near the time of puberty than during the pre-pubertal period. This knowledge is used when concluding that a heifer that is cycling and is of adequate yearling weight but who has a small pelvis (<130 cm<sup>2</sup>) has a high probability of dystocia due to a having a small pelvis at the time of calving as a two-year-old. Whereas, a heifer with the same pelvic area that has not reached puberty and has not reached her target weight may very well have an adequate pelvis at calving if management changes are made

## A.I.

Continued from Page 3.

game changers in the next five years”. University of Missouri field trials report fixed-timed AI pregnancy rates averaged 62% in 73 herds (7,028 cows) with only 7 herds with pregnancy rates under 50%. The current protocols make it very feasible to schedule AI well in advance. Highly skilled AI technicians and portable breeding barns can be hired for those that need the help.

Breeding on one day does not mean they will all calve on the same day. After timed AI, calving typically occurs over a 16 to 21 day period with a peak of 20% in any one day. Producer reports and research both support fewer assisted births and more live calves at weaning following synchronization.

*How do you know if your herd is a good candidate for AI and synchronization of estrus?* For cows, a history of pregnancy rates around 90% or greater in a 60 day breeding season is a good indication that past nutritional management and overall fertility have been good. In a given year, body condition at the time of calving will influence how soon cows resume normal estrous cycles and should average 5 for mature cows and 5.5 to 6 for 2-yr olds. Pregnancy rates will be higher in cows that are 50 days or more since calving at the time of AI. Young, thin and late-calving cows are less likely to have resumed normal estrous cycles at the beginning of the breeding season and will benefit from a synchronization protocol that includes a progestin such as the CIDR. Cows less than 21 days since calving at the time of CIDR insertion are not good candidates for AI. Response will be lower in cows that experienced calving difficulty, are sick or have not regained a positive energy balance since calving.

Heifers that are good candidates for AI programs have had either no implants or no more than one implant labeled for use in young calves and appro-

so that she reaches puberty and becomes pregnant.

If heifers are evaluated immediately prior to the initiation of a estrous synchronization protocol for AI breeding, the producer and veterinarian may elect to only include “Ready” heifers to ensure the greatest response to synchronization and the highest percent of heifers bred AI that conceive to the AI mating. If the heifers are evaluated four to six weeks ahead of AI breeding, the veterinarian and producer may elect to include some or all of the “Intermediate” heifers in the group to be synchronized based on criteria such as age or weight. If natural service is to be used, both “Ready” and “Intermediate” heifers are expected to have a high percentage pregnant following a 30 to 60-day exposure to bulls.

priately timed. Winter programs should allow heifers to gain enough to achieve 60 percent of mature weight prior to breeding without becoming too fleshy. Producers that score heifer reproductive tracts (1=infantile to 5= tract mature and ovary contains a corpus luteum) 50 to 60 days before breeding have a true measure of physiological maturity and time to adjust rations before breeding. Estrous synchronization programs tend to be more successful when 50 percent of heifers have a tract score of 3 or greater 50 to 60 days before breeding. Protocols that include a progestin such as MGA or CIDR will induce some prepubertal heifers to cycle.

In order to assist producers in protocol selection, a short list of recommended synchronization protocols has been developed based on research and field use. The recommendations are reviewed each fall so look for the date to know you have the most recent recommendations. You will find the 2014 recommendations in 2014 sire catalogs and at [www.beefrepro.info](http://www.beefrepro.info). You will also find a short fact sheet entitled “Protocols for Synchronization of Estrus and Ovulation” and other helpful resources.

Many producers like to try the latest thing in synchronization protocols each year. At this point in our research it is unlikely that big changes in pregnancy rates will come from modifying protocols. If one of the recommend protocols is used and results are unsatisfactory, the protocol selected is the least likely culprit. Focus on other details such nutrition, low stress handling, proper implementation of the protocol, semen handling, and insemination technique.

Artificial insemination and estrous synchronization have enabled many producers to add significant value to their operations. Producers should recognize both genetic and non-genetic advantages when considering the value of the technology in their own operations.

***The purpose of this program is to provide cattle producers “best management” guidelines for replacement heifers and provide educational opportunities for improvements in revenue, reproductive success, and longevity within their cattle operation.***

*Program is a joint effort between K-State Research and Extension and the Kansas Department of Agriculture*