# Beef Tips

March 2007 Department of Animal Sciences & Industry www.asi.ksu.edu/beeftips

## Upcoming Events

**Cattle Sense**
March 22, 2007
WaKeeney, KS

**Roundup**
April 5, 2007
Hays, KS
See details on page 3

**Beef Improvement Federation**
June 6-9, 2007
Fort Collins, CO
www.beefimprovement.org/convention.html


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## Odde takes ASI department reins

Ken Odde assumed responsibilities as the new head of the Department of Animal Sciences and Industry on Feb. 26, 2007. Odde has been a professor and director of North Dakota State University's Beef Systems Center of Excellence since June 2005. The center is a public-private partnership designed to increase cattle feeding and processing in North Dakota. Prior to that, he served as head of NDSU's Department of Animal and Range Sciences.

"I'm excited about the opportunity to join the Department of Animal Sciences and Industry and KSU. My wife, Arlene, and I are enthused about returning to Manhattan," said Odde, who earned a DVM degree from K-State's College of Veterinary Medicine in 1982 and a Ph.D. in Reproductive Physiology at K-State in 1983.

He also earned a master's degree in reproductive physiology from K-State in 1978 and a bachelor's degree in animal science from South Dakota State University in 1973.

The new department head also has been a manager of cow-calf technical services at Pfizer Animal Health and worked as a senior veterinarian with the Livestock Technical Services division of SmithKline Beecham-Pfizer Animal Health. Prior to those positions he was on faculty at Colorado State University for 11 years (1983-1994) in a teaching and research position specializing in beef cattle reproduction.

Odde has conducted research in such areas as artificial insemination, calving difficulty, endocrine control of postpartum anestrus, estrus synchronization, and factors influencing colostrum production. He has taught numerous courses and authored many scientific papers during his career.

Ken Odde and Arlene, his wife of 34 years, have three children and a grandchild. Their daughter, Sarah, lives in Minneapolis, Minn, where she works in marketing. Their son Carl and his wife, Lyndee, have a 10-month-old son; they live in Brookings, S.D., where Carl works for a soybean processing company. The couple's youngest child, John, is a junior at South Dakota State University in Brookings.

## CATTLE $EN$E Program to be held in WaKeeney

The 2007 Cattle $en$e program will take place on March 22 at the Trego County Fairgrounds in WaKeeney, KS. Barry Dunn, Executive Director, King Ranch Institute for Ranch Management will start off the afternoon with his view on "A Balanced Approach to Successful Ranching." Other speakers include Kevin Dhuyvetter, Extension Ag Economist and Twig Marston, Extension Cow/Calf Specialist, both with K-State Research and Extension, covering marketing conditions and production costs. Watershed specialist, Stacie Minson, will also be on hand to demonstrate the damaging effects of waste run-off. A steak dinner will be served, featuring the humor and insight of Colorado's renowned chef Victor Matthews, Black Bear Restaurant. Registration is $10.00 before March 16th, and $15.00 at the door. Contact Amy Taylor, Trego County Extension Director, at 785-743-6361 or amtaylor@oznet.ksu.edu.

# Tools available to aid selection for fertility

*Jennifer Minick Bormann, assistant professor, animal breeding and genetics*

***"Stayability predicts the ability of bulls' daughters to stay in the herd to age six."***

As you're making your breeding decisions this spring, maybe it's time to think about reproduction. Traditionally, producers have concentrated on growth and carcass traits in bull selection. But fertility and reproduction are extremely important to the economic success of any cow-calf operation. Why haven't breeders and breed associations emphasized fertility in their selection programs?

There are several reasons that fertility has long been overlooked as a trait for selection. Reproduction and fertility traits are lowly heritable. This means that most of the variation we see in the population (the difference between the good ones and the bad ones) is due to something other than genetics. If your herd has poor fertility, the first place to make improvement is in nutrition, or herd health, or some other management factor. Genetic selection and progress can be made in lowly heritable traits, but it is slower and more difficult than in traits with higher heritabilities, like growth or carcass traits. Another reason is that fertility is hard to measure. Should we measure age at puberty, number of cycles per conception, whether or not she conceived, whether or not she calved, age at first calving, calving interval, etc.?

Many easily measured fertility traits, such as whether a cow conceived or calved, are threshold traits, which means they are measured as yes/no versus on a numeric scale. Threshold traits are harder to statistically analyze and produce EPDs for than traits measured on a numeric scale. Another reason reproduction hasn't been selected for is that, traditionally, most breeders have only reported part of their calf crop to a breed association. To adequately analyze reproductive traits, every cow must be accounted for every year. This puts an additional burden of data recording on the breeder.

Despite these difficulties, many breed associations have begun working with reproductive data to try to provide their members with an EPD that predicts fertility. The first one that came about was scrotal circumference. Research shows that not only does scrotal circumference predict male fertility, it is also related to female age at puberty. Males with a larger scrotal circumference have daughters with a younger age at puberty. Scrotal circumference is moderately heritable (0.30 to 0.45 depending on breed) and this EPD was a first step in the right direction.

Further research is being done on genetic evaluation of reproductive traits. For example, the Red Angus Association of America recently released a heifer pregnancy EPD. This EPD predicts differences in pregnancy rates of bulls' daughters. American Angus Association is in the final testing stages of a heifer pregnancy EPD. The heritability of this trait has been found to be between 0.11 and 0.27. This means that progress will be slow (because accuracy of the EPD will be relatively low), but genetic improvement can be made. Scientists are also experimenting with other measures of female fertility, such as lifetime calving rate, age at first calving, days open, calving date, and others. Many of these measures are limited by data availability. If producers want good EPDs for reproduction, they need to report every calf every year to their association so every cow can be accounted for every year.

Another EPD that is related to fertility is stayability. Stayability predicts the ability of bulls' daughters to stay in the herd to age six. Failure to breed back is a major cause of culling, so stayability partially predicts fertility. Red Angus, Simmental, Limousin, and Gelbvieh are among the breeds that have stayability EPDs. Most associations report the heritability of stayability to be between 0.10 and 0.25. One problem with stayability is that by the time a sire has daughters old enough for a record (age 6), he may be dead himself, or passed by in the other traits by younger, higher performing sires.

Since fertility EPDs are relatively new, and some are still in the development stage, producers are encouraged to use them with caution. Also recognize that progress will be relatively slow when selecting on these lowly heritable traits. A practical recommendation might be to select sires to produce replacement heifers as usual using other EPDs, with the addition of avoiding any sires that are poor in their heifer pregnancy or stayability EPD.

# Do something now to control spring populations of stable flies in pastures

*Alberto Broce, livestock entomologist*

Spring-early summer populations of stable flies in pastures develop at winter feeding sites of hay. When hay wasted during feeding is mixed with cattle or horse manure it develops into ideal larval habitats for stable flies. The production of stable flies from these habitats is a function of the amount of wasted hay and the accumulation of the hay/manure medium. Hay:manure ratios of 1:1 to 5:1 provide ideal media for developing stable fly larvae. Thus, any measure undertaken to lower the amount of wasted hay and/or to control or reduce the accumulation will help to lower the production of stable flies at these feeding sites. This can be achieved by any of the following practices: a) moving feeding sites frequently to prevent the accumulation in one spot; b) use of feeders, such as cone feeders, demonstrated to lower (although not prevent) the amount of wasted hay; c) unrolling the round bales on pastures, but not over the same site; d) spreading the accumulated hay:manure medium to allow it to dry. Economic levels of stable fly populations in pastures appear to be of significance only during a period of 4 to 6 weeks during the spring-early summer, yet they can during this period reduce weight gain of stockers by 0.5 lb/head/day.

# Roundup in Hays – April 5

The Agricultural Research Center –Hays annual beef cattle research Roundup will be held on April 5th with registration from 11:30 to 12:00. The program will begin at the ARCH arena at 12:00 with lunch being served followed by a welcome from department head Bob Gillen, viewing of cattle with summaries of the research currently being conducted and a walking tour of the feedlot. The projects highlighted during this portion of the program include odor mitigation, remote sensors for early identification of illness and effects of dietary vitamin A level on beef carcass quality. The program will then move to the auditorium for presentations beginning at 2:00 regarding health and management of early-weaned calves, survivability of cool-season grasses, and effect of finishing diet composition on generation of odor compounds in manure. The program will conclude with presentations focusing on use of distiller's byproducts for beef production by guest speakers Jim Mintert, KSU Extension State Leader, Department of Agricultural Economics; K.C. Olson, KSU Cow-Calf Nutrition and Management; and Sandy Johnson, KSU Livestock Specialist. For more information contact John Jaeger at 785-625-3425 or visit http://www.wkarc.org/news/ARCH_2007Roundup.htm.

# 2007 Cattlemen's Day Research Summaries

The following represent a sampling of the summaries from the 2007 Cattlemen's Day Report. The report can be obtained in its entirety online at http://www.asi.ksu.edu/cattlemensday .

## VALIDATION OF COMMERCIAL DNA TESTS FOR BEEF QUALITY TRAITS

***M. E. Dikeman, A. L. Van Eenennaam, J. Li, R. M. Thallman, R. L. Quaas, C. Gill, D. E. Franke, and M. G. Thomas***

**Objective:** To validate three commercially-available genetic tests (GeneSTAR Quality Grade™, GeneSTAR Tenderness™ and Igenity *Tender*GENE™) for beef quality traits.

**Study Description:** Validation was conducted by the U.S. National Beef Cattle Evaluation Consortium on 400 Charolais X Angus crossbred cattle (GeneSTAR Quality Grade™), and more than 1,000 *Bos taurus* and *Bos indicus* cattle (GeneSTAR Tenderness™ and Igenity *Tender*GENE™ tests). The two tenderness panels of the two companies share two common μ-calpain markers but somewhat different calpastatin markers. Traits analyzed were longissimus Warner-Bratzler shear force and subjectively recorded marbling score and USDA quality grade.

**Results:** The GeneSTAR Quality Grade™ marker panel genotypes were not associated with marbling score; however, the association of marker panel genotypes with increased percentage of carcasses grading Choice or Prime approached significance ($P \leq 0.06$). The genotype effects of the two tenderness panels were very similar to each other, with a 2.2-lb difference in Warner-Bratzler shear force between the most and least tender genotypes.

*See Dikeman on page 4*

***"When hay wasted during feeding is mixed with cattle or horse manure it develops into ideal larval habitats for stable flies."***

# 2007 Cattlemen's Day Research Summaries, continued

*Dikeman continued from page 3*

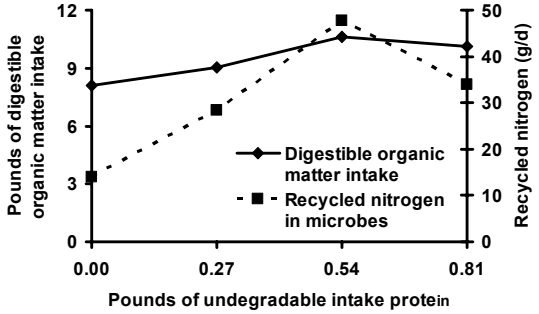
**The Bottom Line:** Tenderness could be markedly improved by selecting for the favorable calpastatin and μ-calpain genotypes included in the GeneSTAR Tenderness™ and Igenity *Tender*GENE™ marker panels. Using the GeneSTAR Quality Grade™ marker panel could result in an increased percentage of USDA Choice or Prime carcasses.

## SUPPLEMENTATION WITH UNDEGRADABLE INTAKE PROTEIN INCREASES LOW-QUALITY FORAGE UTILIZATION AND MICROBIAL USE OF RECYCLED UREA

***T. A. Wickersham, E. C. Titgemeyer, R. C. Cochran, and E. E. Wickersham***

**Objective:** To determine how supplemental undegradable intake protein impacts low-quality forage utilization, urea metabolism, and the subsequent use of recycled urea by ruminal microbes in cattle.

**Study Description:** Increasing amounts of supplemental undegradable intake protein were provided to cattle consuming low-quality forage. Four levels of supplement were provided (0, 0.27, 0.54, 0.81 pounds per day). Intake, digestion, and nitrogen balance were measured. Urea metabolism was measured following intravenous infusion of labeled urea and the contribution of urea recycling to meeting microbial nitrogen requirements was determined.



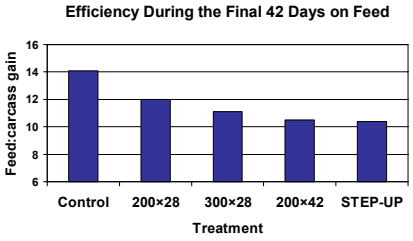

**Bottom Line:** Undegradable intake protein makes substantial contributions to meeting ruminal nitrogen demands in cattle consuming prairie hay. Supplements high in undegradable intake protein are viable alternatives to highly degradable protein supplements.

## LONGER FEEDING TIMES INCREASE RESPONSE TO OPTAFLEXX IN FEEDLOT HEIFERS

***M. J. Quinn, J. S. Drouillard, C. D. Reinhardt, B. E. Depenbusch, and M. L. May***

**Objective:** To determine the effects of Optaflexx, when fed at different levels and for different lengths of time, on non-implanted finishing feedlot heifers.

**Study Description:** Non-implanted crossbred heifers (281 heifers, 1049 lb initial body weight) were fed diets based on steam-flaked corn. A control diet (no Optaflexx) was compared to diets providing 200 mg Optaflexx per animal daily for periods of 28 or 42 days (200x28 and 200x42, respectively); 300 mg/d for 28 days (300x28); and a step-up regimen consisting of 14 days at 100 mg, followed by 14 days at 200 mg and the final 14 days at 300 mg (Step-up).



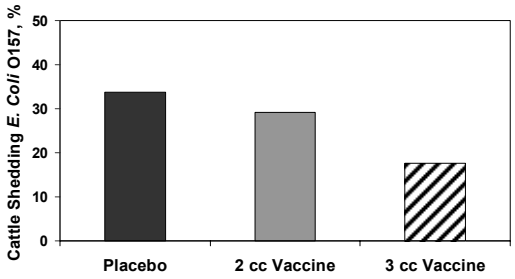

**Bottom Line:** Feeding Optaflexx to non-implanted finishing heifers generally improves carcass gain efficiency with minimal impact on carcass characteristics. Improvements in growth efficiency were greatest with the longer periods of Optaflexx feeding. Feeding higher doses provided no additional advantage.

## VACCINE IMPACTS *E.COLI* O157 IN FEEDLOT CATTLE

***J. T. Fox, D. U. Thomson, J. S. Drouillard, A. B. Thornton, M. E. Jacob, and T. G. Nagaraja***

**Objective**: To test the efficacy of the *E. coli* O157 SRP vaccine in feedlot cattle naturally infected with *E. coli* O157.

**Study Description**: Sixty cattle testing positive for *E. coli* O157 were utilized in this experiment. Cattle were allotted equally to three treatment groups. Treatments were placebo (no vaccine), or 2 or 3 cc of a vaccine designed to reduce *E. coli* O157 in cattle. Cattle were fed a receiving diet and samples were collected for 8 weeks to monitor shedding of *E. coli* O157. Bacterial culture and confirmation were performed on all samples, and procedures were included to identify animals shedding *E. coli* O157 at abnormally high levels.



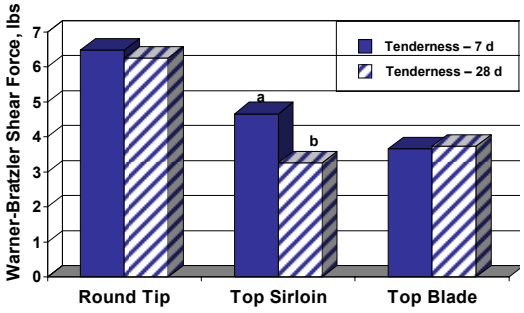

**Bottom Line:** The *E. coli* O157 SRP vaccine at the higher dose reduced prevalence of cattle shedding *E. coli* O157 and there is evidence that the vaccine decreases the number of cattle shedding high levels of the organism.

## AGING, BLADE TENDERIZATION, AND ENZYME INJECTION IMPACT TENDERNESS OF MUSCLES FROM FED CULL COWS OF KNOWN AGE

***S. Hutchison, J. A. Unruh, T. T. Marston, and M. C. Hunt***

**Objective:** To determine if 7- or 28-day aging affects packaging losses, cooking losses, and tenderness of blade-tenderized and enzyme-injected steaks harvested from cow carcasses.

**Study Description:** Whole muscle cuts were removed from both sides of 31 cow carcasses ranging from 3 to 15 years of age. Cuts from each side were vacuum aged for 7 or 28 days, then frozen. Frozen, aged beef was thawed, then blade tenderized and injected with a typical industry enhancement containing bromelin. Round tip, top sirloin, and top blade (flat iron) steaks were measured for package loss, cook loss, and tenderness.




[a,b] Denotes significant difference (P<0.01)

**Bottom Line:** For blade tenderized, enhanced beef, vacuum aging round tip and top blade steaks for 7 days is sufficient to improve tenderness. Additional aging of top sirloin steaks enhances tenderness without impacting packaging or cooking loss.

## DE-GERMED CORN DISTILLER'S GRAINS HAVE FEED VALUE SIMILAR TO TRADITIONAL DISTILLER'S GRAINS

*B. E. Depenbusch, J. S. Drouillard, E. R. Loe, M. J. Quinn, and M. E. Corrigan*

**Objectives:** The objectives of this study were to 1) compare diets based on steam-flaked corn with and without distiller's grains with solubles and 2) to compare a high-protein, low-fat, low-phosphorus distiller's byproduct to a more traditional distiller's grains with solubles.

**Study Description:** Six hundred and ten crossbred-yearling heifers (765 lb) were used in a finishing study comparing three diets. All three diets were based on steam-flaked corn and were formulated to contain 14% crude protein. The first diet served as the control and contained no distiller's grains; the second diet contained 13% (dry basis) corn dried distiller's grains with solubles; and the third diet contained 13% of a partially de-germed corn dried distiller's grains with solubles.

**Bottom Line:** Feeding distiller's grains at 13% of diet dry matter had no effect on feedlot performance or carcass characteristics, but increased manure production by 11 to 16%. De-germed distiller's grains have a feeding value similar to more traditional distiller's grains.

| Item | CONTROL | DDGS[a] | DEGERM[b] |
|---|---|---|---|
| Dry matter intake, lb/day | 20.1[xy] | 20.7[x] | 19.7[y] |
| Average daily gain, lb/day | 2.55 | 2.61 | 2.44 |
| Feed:gain | 7.89 | 7.93 | 8.08 |
| Apparent dry matter digestibility, % | 75.9[x] | 72.3[y] | 72.2[y] |
| USDA Choice or better, % | 41.2 | 47.4 | 43.9 |

[a]DDGS = Corn dried distiller's grains with solubles.
[b]DEGERM = Partially de-germed corn dried distiller's grains with solubles.
[xy]Means within a row without common superscripts are different ($P<0.05$).

## VALUE OF ANIMAL TRACEABILITY SYSTEMS IN MANAGING A FOOT-AND-MOUTH DISEASE OUTBREAK IN SOUTHWEST KANSAS

*D.L. Pendell and T.C. Schroeder*

**Objective:** To study the economic impacts of different depths of animal identification systems in the event of a hypothetical foot-and-mouth disease outbreak that poses a threat to U.S. livestock competitiveness.

**Study Description:** With the 2003 discovery of BSE in the U.S. and more recent cases in 2005 and 2006, the need for having the ability to rapidly trace animal movements has become apparent. In the event of a contagious animal disease like foot-and-mouth disease (FMD), tracking animal movement in a timely manner is essential to disease containment. Animal identification would help limit disease spread which will reduce costs and minimize trade losses. To help combat spread of contagious animal diseases, the USDA has recently launched the National Animal Identification System with intent to trace movement of any infected animal within 48 hours. An epidemiological disease spread model was used to evaluate the impact of a foot-and-mouth disease outbreak. The information obtained from the disease spread model was then used in conjunction with an economic model to determine the economic impacts on producers and consumers.

**Results:** Our assessment suggests that as animal surveillance is increased, the number of animals destroyed in the event of an FMD outbreak decreases, as do the associated FMD related costs. This results in smaller losses for consumers and producers. Low, medium, and high animal surveillance levels result in losses of $584 million, $502 million, and $405 million for beef producers, respectively. Consumer losses are $271 million, $220 million, and $154 million for low-, medium-, and high-level animal identification systems, respectively.

**The Bottom Line:** Animal identification could be of substantial benefit in minimizing the economic impact of a contagious disease outbreak.

# Vitamin A stores depleted in 2 to 6 months

*Larry Hollis, D.V.M., M. Ag., extension beef veterinarian*

Vitamin A is an essential vitamin that has to be provided to beef cattle, either by the conversion of carotene contained in green forages into vitamin A, through dietary supplementation, or by injection. The preferable route of vitamin A intake is obviously through conversion from carotene in green forages, which occurs readily when such forages are available. Vitamin A is stored primarily in the liver, which can hold up to 2 to 6 months supply of the vitamin (see Table 1 below). However, if the period between when the grass normally dries up in the fall and when it typically greens up the following spring is longer than the storage capability, or when pastures dry up unseasonably early due to drought, vitamin A will need to be supplemented to ensure that deficiency problems do not occur. Vitamin A is necessary for proper development and function of all internal and external surfaces in the cow's body (skin, eyes, intestinal tract, respiratory tract, reproductive tract, mammary gland, etc.). It is also critical for proper semen development in the bull. Finally, it is necessary for proper bone and tissue development in the fetus. Adequate vitamin A helps prevent poor colostrum and milk production, poor reproduction, poor feed efficiency, scurfy skin and retarded growth, as well as a variety of overt disease problems such as diarrhea, pneumonia, retained placentas, eye problems, etc. Vitamin A deficiency problems can be compounded by high nitrate feedstuffs and water sources that also tend to occur under drought conditions.

***"Vitamin A….. critical for proper semen development in the bull."***

**Vitamin A supplementation guidelines:** Ideally, cattle should be supplemented through the diet during dry seasons of the year. If animals are not deficient going into the dry season, the normal recommended daily level of vitamin A supplementation is 30,000 IU for pregnant cows and 45,000 IU for nursing cows. If cows are possibly deficient at the start of the supplemental feeding season, it is recommended that cows be given an injection of 1 to 2 million IU (2 to 4 mL of a 500,000 IU/mL product) to "catch the cows up", and then provide the dietary supplement for the remainder of the non-green period.

Table 1. Number of days to deplete liver stores of vitamin A[a]

| | |
|---|---|
| Light feeder steers | 40 - 80 days |
| Heavy feeder steers | 80 - 140 days |
| Yearling steers | 100 – 150 days |
| Cows | 120-180 days |

[a]http://muextension.missouri.edu/xplor/agguides/ansci/g02058.htm