Livestock Water Tanks – What Are Your Options?

Dr. Dirk Philipp, Assistant Professor

There are a variety of tanks to choose from to deliver water to your livestock. The first step in selecting the right model is to determine what specific challenges you have on your farm. Do you need sophisticated frost-free devices or low-cost alternatives? What is your herd size, and which grazing methods do you use? You may need to consider several options to cover different conditions on your operation.

Concrete tanks are one option to provide water during the cold months of the year. Water is being kept from freezing through soil cover over the back-halves of the tanks and a mechanism that lets water circulate through the tanks during severely cold weather. The many advantages of concrete tanks include their reliability and a holding capacity of up to 250 gallons. These tanks should be placed at least 18 inches above the ground for cattle and horses and around 12 inches for sheep and goats. Burying the tank may result in animals being injured or even drowned.

Another choice might be ball freeze-proof tanks. Some of these models use electric heaters to keep them ice-free, but close access to a power supply is needed in this case. Available energy-free tanks are heavily insulated and installed over geothermal heat wells to keep the water from freezing. As with concrete tanks, installation of ball tanks requires concrete padding. The most important part of energy-free systems is the heat well. A heat well is essentially an open space beneath the pad that conveys the earth’s heat to the tank to maintain it at above-freezing temperatures. These wells should be 3 to 4 feet deep and 12 inches wide in diameter for farms located in northern Arkansas.

Tire tanks are a great option for recycling material you may already have on your farm and to save the cost of purchasing pre-manufactured tanks. However, old machinery tires are very heavy, and you will need the appropriate equipment to put them in place. On the other hand, the possible storage volume makes the effort worthwhile – an 8-foot tire holds about 400 gallons of water, which should be enough for the daily water requirements of 80 head of cattle. To avoid injuries to other classes of livestock in general, avoid using steel-belted tires, since these are equipped with small cables that may stick out after removing the sidewall or sections. Tire tanks are installed over a concrete pad that seals the bottom of the tires. Water inflow and outflow is accomplished via pipes installed in the ground before the tires are placed in their final location. Be sure to thoroughly wash the tires because they may have been filled with harmful chemicals. Covers help prevent algae growth. Sophisticated versions of tire tanks feature electric wires on top to prevent cattle from stepping into them.

If you are looking for a low-cost alternative, portable tanks may be the right choice and are great for seasonal grazing and improving the flexibility of your grazing systems. Available tank sizes range from about 50 to 1,000 gallons in volume. Large (> 100 gallons) tanks are more difficult to move and may not be necessary. Small tanks (< 100 gallons) can be placed under fences and thus provide water to several paddocks at the same time. An important advantage of portable tanks is that they can be placed strategically on pasture to discourage congregating of animals or to draw them away from environmentally sensitive areas. Water valves enhance the practicality of portable tanks and are available with a variety of flow rates.

Again, keep in mind that one type of tank will not fit all watering needs for your livestock. To make the most efficient use of your time, money and material already available on your place, consider many options and visit with experienced producers and extension personnel to develop solutions tailored to your farm.
The Impact of Reducing the Length of the Calving Season

Dr. Tom Troxel, Professor, and Dr. Brett Barham, Assistant Professor

With the profitability of a cow-calf operation more difficult to obtain, reducing the length of the calving season can be the first step toward improved production efficiency. In a 2009 USDA survey, 54.5% of the beef cattle operations, accounting for 34.1% of the beef cows did not have a set calving season. About one-third of the operations (34%) had one breeding season, and these operations accounted for 48.4% of the beef cows. Of operations with one breeding season, 69.7% completed calving within three months, with an average breeding season of 110 days. The most common factors determining the timing of the calving season include tradition, weather, forage availability, increasing weaning weights, market cycle and labor availability. Advantages of a short calving season include uniform lots of calves and improved management of herd health, cow nutrition and culling and selection of replacement heifers.

Six beef cow-calf operations in Howard (n = 2), Dallas (n = 2), Union and Montgomery counties participated in the Arkansas Beef Improvement Program Breeding and Calving Seasons Special Project. The goals of the project were to reduce the length of the calving season and to document the production and economic impact when converting a long calving season (> 200 d) to a short calving season (< 90 d).

In collaboration the producer, county Extension agent and Animal Science faculty developed a three part plan to reduce the length of the calving season. The three parts included 1) determine when cows were calving (annual calving distribution), 2) establish the months and length of the desired calving season and 3) develop a management plan to transition the cow herd to the desired calving season.

Part one of the plan determined the current annual calving distribution (benchmark year). It was typical for a large group of cows to calve January through May, very few cows calving in the summer months (June, July and August) and an additional group calving in the fall. The second part of the plan was the producer determining the desired calving period (months and length). Some producers selected a fall calving season and some a spring calving season. All of the producers selected a calving season of ≤ 90 days. From the benchmark calving distribution, a plan was developed by the producer, agent and Animal Science faculty to reach the desired calving season of ≤ 90 days. From the benchmark year to the final year (89.2% vs. 46.3%, respectively). The mature cow calving percentage did not change from the benchmark year to the final year (89.2% and 87.2%, respectively). The average length of the calving season decreased from 273.3 d in the benchmark year to 85.2 d in the final year.

Due to the limited number of farms and large variability, there were no differences for herd break-even, specific costs per AU and income over specified costs per AU from the benchmark year to the final year. When comparing averages, break-even decreased 30% from $0.61/pound to $0.43/pound from the benchmark year to the final year, respectively. Specified costs per AU decreased 40% from $209.70 to $126.20 from the benchmark year to the final year, respectively, and income over specified cost improved 100% from $95.00/AU to $189.70/AU from the benchmark year to the final year, respectively. Although these differences were not statistically significant, they were financially significant to the cooperators. This provides evidence these farms increased beef production efficiency and improved profitability by decreasing the length of the calving season. Shortening the calving season is perhaps one of the most important and cost-effective practices that can be implemented by a producer.

University of Arkansas Livestock Judging Camp

Bryan Kutz, Instructor/Youth Extension

Each year the University of Arkansas Animal Science Department hosts a livestock judging camp where youth from across our state can learn about the priorities in livestock selection, update themselves on the current industry trends and improve their communication skills through the presentation of oral reasons. Ninety students ranging in age from 9-17 participated in this year’s camp, which was held Monday, June 8, through Wednesday, June 10.
Students were divided into three divisions depending on knowledge level and experience. These students worked tirelessly the first two days learning all they could about sheep, cattle and swine. The second day ended with some real fun leadership activities in which the teams competed in red-neck relay, egg tossing and the traditional water balloon fight and ice cream social. On the last day the kids were tested on what they had learned by participating in a judging contest that consisted of 6 classes, 2 in each species, with 3 sets of oral reasons. The camp concluded with an awards presentation. The top two scores overall will also receive a scholarship to attend the U of A and major in Animal Science upon graduation.

A big THANK YOU goes out to Diana Watson, Nathan Reinhart, Melissa Beck, parents and chaperones, and all who helped contribute to make this camp a success.

The following are the awards given as a result of the judging contest:

<table>
<thead>
<tr>
<th></th>
<th>Beginner</th>
<th>Intermediate</th>
<th>Advanced</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Swine</strong></td>
<td>1st Kylee Sigmon</td>
<td>Kate Beth Thomas</td>
<td>Hattie Anastatio</td>
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<tr>
<td></td>
<td>2nd Emily Jobe</td>
<td>Carlie Duggan</td>
<td>Blaine French</td>
</tr>
<tr>
<td></td>
<td>3rd Adrienne Pannell</td>
<td>Caleigh Moyer</td>
<td>Thomas Johnson</td>
</tr>
<tr>
<td><strong>Sheep</strong></td>
<td>1st Hunter Vickers</td>
<td>Kate Beth Thomas</td>
<td>Trenton Tosh</td>
</tr>
<tr>
<td></td>
<td>2nd Kylee Sigmon</td>
<td>Kolton Moore</td>
<td>Kallie Sullivan</td>
</tr>
<tr>
<td></td>
<td>3rd Adrienne Pannell</td>
<td>Kelsey Foley</td>
<td>Cassie Godwin</td>
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<tr>
<td><strong>Cattle</strong></td>
<td>1st Ben Youngblood</td>
<td>Kolton Moore</td>
<td>Cheyenne Moyer</td>
</tr>
<tr>
<td></td>
<td>2nd Brandon Baker</td>
<td>Brandon Mangrum</td>
<td>Trenton Tosh</td>
</tr>
<tr>
<td></td>
<td>3rd Kylee Sigmon</td>
<td>Danielle Frachiseur</td>
<td>Kallie Sullivan</td>
</tr>
<tr>
<td><strong>Reasons</strong></td>
<td>1st Kylee Sigmon</td>
<td>Kate Beth Thomas</td>
<td>Hattie Anastatio</td>
</tr>
<tr>
<td></td>
<td>2nd Katie McNinch</td>
<td>Katy Tunstill</td>
<td>Trenton Tosh</td>
</tr>
<tr>
<td></td>
<td>3rd Jordon Strother</td>
<td>Danielle Frachiseur</td>
<td>Kallie Sullivan</td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td>1st Kylee Sigmon</td>
<td>Kolton Moore</td>
<td>Hattie Anastatio</td>
</tr>
<tr>
<td></td>
<td>2nd Hunter Vickers</td>
<td>Caleigh Moyer</td>
<td>Trenton Tosh</td>
</tr>
<tr>
<td></td>
<td>3rd Colton Padgett</td>
<td>Kate Beth Thomas</td>
<td>Cheyenne Moyer</td>
</tr>
<tr>
<td><strong>Scholarship Winners</strong></td>
<td>1st ($1000) Hattie Anastasio</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2nd ($500) Trenton Tosh</td>
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</tbody>
</table>

Horsback Riding in the Dog Days
Steven Jones, Associate Professor

Horses are unique among large domestic animals. They are not raised to produce meat, milk or wool for human consumption. Instead, horses are raised to be athletes, with work as their principal productive function. Horses are asked to perform many different types of work. These range from high speed racing events to pleasure rides on the back forty.

During the hot and humid Arkansas weather, horses generate a significant amount of metabolic heat during exercise that must be dissipated to prevent thermal injury. During hot, humid conditions, sweat will not evaporate; therefore, evaporative cooling becomes ineffective under those conditions. Such conditions can lead to debilitating and potentially life-threatening situations in a short period of time.

We often use the phrase, “sweating like a horse.” Horses and humans are the only athletic mammals that cool themselves primarily by sweating. Some heat dissipation occurs by means of radiation, conduction, convection and respiratory evaporation. Evaporative cooling through sweating is the most important route for the release of heat from the body to the environment.

Thermoregulation for exercising horses requires ample blood flow to carry heat from the body core to peripheral blood vessels in the skin where dissipation and loss to the environment occur. Simultaneously, the heart begins delivering blood to working muscles, essential organs, tissues and the brain. At the onset of exercise, blood pressure is preferentially maintained at the expense of thermoregulation, resulting in an increase in body temperature. As heat accumulates, blood flow from the body core to the surface (skin) is increased to transport the heat from the body core to the surface. As exercise continues, sweat (water and minerals) carries the heat through the sweat glands to the body surface resulting in heat loss to the environment. Continued exercise and sweating lead to progressive dehydration and loss of plasma water from the bloodstream. The greater the exercise intensity of an event, the greater the heat load generated resulting in a greater need for heat dissipation.

Thermal injury is caused by animal dehydration. With prolonged exercise, water intake may increase 300 percent. Research in humans and a recent series of equine studies show a positive correlation between fluid losses, inability to maintain temperature and onset of fatigue during endurance exercise. The consequences of electrolyte and pH disturbances are fatigue, abnormal gait, poor coordination, increased risk of orthopedic injury and possibly death. Under normal conditions, dehydration
can be minimized through the provision of adequate water, salt and mineral supplementation and a balanced diet. Horses hydrate within a 24-hour recovery period between exercise programs.

Monitoring of weather conditions to determine the potential risk to the horse can prevent thermal injury. Several inexpensive devices are available for quick measurement of temperature and humidity. These are used to calculate the comfort index (the sum of the temperature in degrees Fahrenheit and the relative humidity as a percentage). For example, if the temperature is 80 degrees F and the relative humidity is 40 percent, then the comfort index is 120 (80 + 40 = 120). If the sum is below 130, thermoregulation should not be a concern. When the comfort index is between 130 and 150, horses will sweat, but they should be able to exercise without major problems if normal fluid replacement is allowed. When the comfort index exceeds 150 and the humidity is greater than 75 percent, heat dissipation can be a problem. Horsemens should monitor their horses very carefully during strenuous workouts under these conditions. When the comfort index exceeds 180, normal routes of heat dissipation fail to work and workouts should be discontinued.

Under normal conditions, a balanced ration and a salt-mineral supplementation program should be sufficient to maintain electrolyte balance. However, with intensive exercises, substantial sweating occurs, leading to water and electrolyte deficiency. The results are weakness, muscle cramps, acid-base imbalance and decreased performance. Mechanisms for the conservation of sodium and potassium improve with the horse’s acclimation to temperature and humidity. It is critical to monitor and, when appropriate, to provide electrolyte supplementation to horses beginning a vigorous training schedule or who are adjusting to elevated environmental temperatures.

Thermal stress resulting from exercise-induced dehydration can affect performance, causing serious problems for your horse or death. However, this is preventable with provision of adequate water, salt, minerals, monitoring of environmental conditions and use of some common sense.

The Arkansas youth beef show season can be categorized as a fall system because of the county, district and state fair sequence from August through mid-October. As a result of this system, the preparation for the show season occurs in late spring and summer. Heat, humidity and day length are working against us as we try to get cattle to gain weight, “bloomed” for show and to grow hair for grooming. It takes some planning, self-discipline and hard work to manipulate Mother Nature.

After the initial halter breaking, you should tie up your heifer or steer for a few hours each day. After this daily routine is completed, you should walk the steer to develop familiarization and confidence between yourself and the calf.

Like people, show cattle become accustomed to daily routines. After the calf becomes comfortable with its new environment and learns the mannerisms of its owner, it is time to set up a daily routine. Summer is the time for you to seriously train and work with each calf. Calves should be fed at least twice daily, exercised, cleaned, brushed and practice being shown. Clean the pen thoroughly, and keep the stalls fresh and raked, allowing each calf to be comfortable during the hot, summer days. It is best to begin feeding early in the morning before the day becomes uncomfortably warm. In Arkansas, a good feeding time is around 6 to 7 a.m. Feed each calf in an individual stall. While the calf is eating, you should have few problems placing the halter on the calf and tying it to a fence. Next, prepare the stall. This includes raking, picking up manure and lightly spraying the stall with water to slightly dampen it and keep down dust. Also, make sure manure is dumped far away from the stall to keep flies and other insect populations from building up around the calf. After the calf finishes eating, it is time to exercise and sharpen the showmanship skills of the calf and yourself. It takes about 15 minutes to lead, stop, set up and scratch it with a show stick. Next, lead the calf to a wash rack and rinse it with a water hose and nozzle. After rinsing thoroughly, train the hair by brushing everything forward with a rice-root brush. The summer is not the time to grow hair, but is the time to teach and train. Day length triggers hair growth. Therefore, keeping the calf in the shade during the day and turning out at night mimics shorter days and stimulates the calf’s hormones that control hair growth. Keeping the animal cool and fed in the cool part of the day enhances appetite and feed efficiency. Even if the animal is to be shown slick shorn, it still should be kept clean. Beef cattle that are placed in a clean and sanitary environment will be more efficient performers. After rinsing and brushing, move the calf to its clean stall. It is a good idea to keep the calf tied up until it is completely dry. This will build stamina to more effectively prepare it for show. After a couple of hours, the calf can be untied and allowed to rest. The calf should rest until late afternoon. At this time, the owner should clean the stall and rinse and brush the animal again if possible. End the day with the evening feeding.

Two weeks before the first show of the season, start handling the calves just as you will at the show. A good practice is to make some type of “tie outs” at home along a fence and tie the calves as you will at the show. The bedding should be the same type you will use at the show. Calves should be tied in the barn all day and exercised each afternoon. Continue to tie the calves during the day and turn them loose in the lot or small trap at night. Feed and water the calves just as you would at the show – twice a day out of the same feed and water buckets you will use at the show. Some handlers add small amounts of molasses or Kool-Aid® to the water to hide the taste of chlorine in city water.

Not everyone can have the best, most complete beef project. However, you can gain an advantage in the show ring if you work at home correctly. You have selected the best possible animal, you have studied its nutritional needs and fed it properly and you have maintained its general health. You also have worked tirelessly in handling and training your animal. Remember to practice your showmanship skills, because practice makes perfect. A great show person always leaves the judge with a favorable impression.
Evaluation of Nontraditional Fertilizers for Bermudagrass Forage Yield

High fertilizer prices have caused many producers to look for alternatives to reduce costs. Nontraditional fertilizers are being marketed with low recommended application rates making cost per acre appealing to producers. These products are often marketed based on testimonials with little or no research data for forage production. In the summer of 2008, we conducted a trial to compare three nontraditional fertilizers with urea, ammonium nitrate and liquid urea for effect on bermudagrass dry matter yield.

**Methods:** Fertilizer treatments were applied to 10' x 25' plots in a common bermudagrass hay meadow in Faulkner County, Arkansas. Treatments were applied on 6/27/08, and plots were harvested on 7/28/08 to simulate hay production and on 8/7/08 with subsequent harvest on 10/17/08 to simulate stockpiled bermudagrass pasture production. Rainfall occurred within 24 hours of fertilizer application for both dates. Plots were sprayed with 2,4-D on 6/27/08 for broadleaf weed control. Fertilizer treatments were ammonium nitrate, urea, liquid urea, Monty’s Plant Food (analysis 8-16-8), Fish Emulsion (analysis 5-1-1) and Sea 90 Mineral (analysis at http://www.seaagri.com/). Application rates were ammonium nitrate, urea and liquid urea – 75 lb/acre of N; Fish Emulsion – 4 gallons/acre; Sea 90 Mineral – 2 lb/acre; and Monty’s Plant Food – 1.5 pints/acre. The nontraditional products were foliar applied alone at labeled recommended rates and also in combination with urea at 75 lb/acre N. Nitrogen content and total nitrogen applied per acre for each product are shown in Table 1. All treatments and combinations were replicated four times. All plots received P and K fertilizer on 6/26/08 according to soil test recommendations for bermudagrass hay at a 4 ton/acre yield goal (x-92-240 per acre). Dry matter yield results are presented in Table 2.

**Table 1. Nitrogen content and total nitrogen applied for the fertilizer products used in this trial**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>% N</th>
<th>lb N/unit</th>
<th>lb N applied/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium Nitrate</td>
<td>34%</td>
<td>680 lb/ton</td>
<td>75</td>
</tr>
<tr>
<td>Urea</td>
<td>46%</td>
<td>920 lb/ton</td>
<td>75</td>
</tr>
<tr>
<td>Liquid Urea</td>
<td>23%</td>
<td>2.5 lb/gal</td>
<td>75</td>
</tr>
<tr>
<td>Monty’s Plant Food</td>
<td>8%</td>
<td>0.9 lb/gal</td>
<td>0.2</td>
</tr>
<tr>
<td>Fish Emulsion</td>
<td>5%</td>
<td>0.6 lb/gal</td>
<td>2.4</td>
</tr>
<tr>
<td>Sea 90 Mineral</td>
<td>0%</td>
<td>0 lb/ton</td>
<td>0</td>
</tr>
</tbody>
</table>

**Results:** Bermudagrass dry matter yield for both harvests was significantly increased by application of N as ammonium nitrate, urea and liquid urea compared to the untreated check treatment (Table 2). Urea and liquid urea were not statistically different than ammonium nitrate but produced 10% to 16% less dry matter. Dry matter yield for Monty’s Plant Food, Sea 90 Mineral or Fish Emulsion applied alone was not different than the untreated check treatment for either harvest. Addition of 75 lb/acre urea with these products did not increase dry matter yield over urea alone. The urea/fish emulsion combination yielded statistically less (19%) on the July harvest than ammonium nitrate, but the reason for this difference is not known. Results show that the nontraditional fertilizers (Monty’s Plant Food, Sea 90 Mineral and Fish Emulsion) did not improve bermudagrass dry matter yield when applied alone or in combination with urea. Liquid urea and urea were effective for improving dry matter yield but produced 10% to 16% less bermudagrass dry matter than ammonium nitrate.

**Table 2. Evaluation of nontraditional fertilizers for bermudagrass yield**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>July*</th>
<th>October</th>
<th>Total Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dry Matter Yield (lb/acre)**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ammonium Nitrate</td>
<td>3229 A</td>
<td>4244 A</td>
<td>7474 A</td>
</tr>
<tr>
<td>Urea</td>
<td>2872 AB</td>
<td>3722 AB</td>
<td>6595 AB</td>
</tr>
<tr>
<td>Liquid Urea (23% N)</td>
<td>2877 AB</td>
<td>3546 B</td>
<td>6423 AB</td>
</tr>
<tr>
<td>Urea + Monty’s Plant Food</td>
<td>2919 AB</td>
<td>3412 B</td>
<td>6332 B</td>
</tr>
<tr>
<td>Urea + Fish Emulsion</td>
<td>2619 B</td>
<td>3670 AB</td>
<td>6289 B</td>
</tr>
<tr>
<td>Urea + Sea 90 Mineral</td>
<td>2913 AB</td>
<td>3300 B</td>
<td>6212 B</td>
</tr>
<tr>
<td>Monty’s Plant Food</td>
<td>928 C</td>
<td>1526 C</td>
<td>2455 C</td>
</tr>
<tr>
<td>Fish Emulsion</td>
<td>965 C</td>
<td>1307 C</td>
<td>2273 C</td>
</tr>
<tr>
<td>Sea 90 Mineral</td>
<td>847 C</td>
<td>1178 C</td>
<td>2025 C</td>
</tr>
<tr>
<td>Untreated Check</td>
<td>745 C</td>
<td>1127 C</td>
<td>1873 C</td>
</tr>
</tbody>
</table>

* July: treatments applied 6/27/08 and harvested 7/28/08; October: treatments applied 8/7/08 and harvested 10/17/08.

** Treatment followed by the same letter are not significantly different at the 0.05 level.**
Many producers find the use of EPDs impossible when trying to select bulls from several different breeds. Normally, the EPDs of bulls from different breeds can’t be compared because most breed associations compute their EPDs in separate analyses and each breed has a different base point. The across breed (AB) adjustment factors allow producers to compare the EPDs for animals from different breeds for these traits; these factors reflect both the current breed difference (for animals born in 2007) and differences in the breed base point. They should only be used with EPDs current as of July 2009, because of potential changes in EPD calculations from year to year.

Using this table, bulls of different breeds can be compared on the same EPD scale by adding the appropriate

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**Table 1. Adjustment factors to add to EPDs**

<table>
<thead>
<tr>
<th>Breed</th>
<th>Birth Weight</th>
<th>Weaning Weight</th>
<th>Yearling Weight</th>
<th>Maternal Milk</th>
<th>Marbling Score</th>
<th>Ribeye Area</th>
<th>Fat Thickness</th>
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<tr>
<td>Angus</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
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<tr>
<td>Hereford</td>
<td>2.9</td>
<td>-2.8</td>
<td>-16.1</td>
<td>-17.5</td>
<td>-0.36</td>
<td>-0.24</td>
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<td>Red Angus</td>
<td>2.9</td>
<td>-5.4</td>
<td>-4.4</td>
<td>-3.0</td>
<td>-0.01</td>
<td>-0.21</td>
<td>-0.045</td>
</tr>
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<td>Shorthorn</td>
<td>6.1</td>
<td>19.9</td>
<td>52.8</td>
<td>23.1</td>
<td>0.06</td>
<td>0.12</td>
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<td>Beefmaster</td>
<td>7.7</td>
<td>44.2</td>
<td>44.0</td>
<td>2.6</td>
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<td>Brahman</td>
<td>11.2</td>
<td>36.3</td>
<td>2.2</td>
<td>29.0</td>
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<tr>
<td>Brangus</td>
<td>4.7</td>
<td>21.9</td>
<td>19.9</td>
<td>2.4</td>
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<tr>
<td>Braunvieh</td>
<td>7.5</td>
<td>21.4</td>
<td>12.8</td>
<td>30.6</td>
<td>-0.26</td>
<td>0.78</td>
<td>-0.149</td>
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<td>Charolais</td>
<td>9.7</td>
<td>38.2</td>
<td>51.9</td>
<td>5.6</td>
<td>-0.50</td>
<td>0.63</td>
<td>-0.244</td>
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<td>Gelbvieh</td>
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<td>1.7</td>
<td>-12.6</td>
<td>9.9</td>
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<td>Limousin</td>
<td>4.2</td>
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<td>-28.6</td>
<td>-14.2</td>
<td>-0.80</td>
<td>0.93</td>
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<td>Maine-Anjou</td>
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<td>-10.7</td>
<td>-22.8</td>
<td>-0.8</td>
<td>-0.92</td>
<td>1.07</td>
<td>-0.197</td>
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<td>Salers</td>
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<td>22.7</td>
<td>52.3</td>
<td>13.1</td>
<td>-0.11</td>
<td>0.78</td>
<td>-0.224</td>
</tr>
<tr>
<td>Simmental</td>
<td>5.5</td>
<td>25.0</td>
<td>22.4</td>
<td>13.7</td>
<td>-0.60</td>
<td>0.92</td>
<td>-0.193</td>
</tr>
</tbody>
</table>
adjustment factor to the EPDs produced in the most recent genetic evaluations for each of the 18 breeds. The AB-EPDs are most useful to commercial producers purchasing bulls of more than one breed to use in crossbreeding programs. For example, in terminal crossbreed systems, AB-EPDs can be used to identify bulls in different breeds with high growth potential or favorable carcass characteristics.

As an example, suppose a Gelbvieh bull has a weaning weight EPD of +42.0 lb and a Simmental bull has a weaning weight EPD of +24.0 lb. The across breed adjustment factors for weaning weight (Table 1) are 1.7 lb for Gelbvieh and 25.0 lb for Simmental. The AB-EPD is 42.0 lb + 1.7 lb = 43.7 lb for the Gelbvieh bull and 24.0 lb + 25.0 lb = 49.0 lb for the Simmental bull. The expected weaning weight difference when both are mated to cows of another breed (e.g., Angus) would be 43.7 lb – 49.0 lb = -5.3 lb.

It’s important to note that the table factors (Table 1) don’t represent a direct comparison among the different breeds because of base differences between the breeds. They should only be used to compare EPDs (AB-EPDs) of animals in different breeds. To reduce confusion, breed of sire means (i.e., when sires from two different breeds are mated to cows of a third unrelated breed) between 2007 born animals under conditions found at the U.S. Meat Animal Research Center are presented in Table 2.

### Table 2. Breed of sire means for calves born in 2007

<table>
<thead>
<tr>
<th>Breed</th>
<th>Birth Weight</th>
<th>Weaning Weight</th>
<th>Yearling Weight</th>
<th>Maternal Milk</th>
<th>Marbling Score</th>
<th>Ribeye Area</th>
<th>Fat Thickness</th>
</tr>
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<tbody>
<tr>
<td>Angus</td>
<td>84.7</td>
<td>525.6</td>
<td>907.8</td>
<td>516.7</td>
<td>5.84</td>
<td>12.14</td>
<td>0.549</td>
</tr>
<tr>
<td>Hereford</td>
<td>88.9</td>
<td>520.3</td>
<td>879.7</td>
<td>494.6</td>
<td>5.21</td>
<td>11.92</td>
<td>0.483</td>
</tr>
<tr>
<td>Red Angus</td>
<td>85.7</td>
<td>507.9</td>
<td>878.3</td>
<td>509.2</td>
<td>5.58</td>
<td>11.83</td>
<td>0.492</td>
</tr>
<tr>
<td>Shorthorn</td>
<td>90.8</td>
<td>516.3</td>
<td>904.0</td>
<td>521.8</td>
<td>5.59</td>
<td>12.10</td>
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</tr>
<tr>
<td>Beefmaster</td>
<td>90.7</td>
<td>533.7</td>
<td>884.3</td>
<td>500.8</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Brahman</td>
<td>95.5</td>
<td>532.0</td>
<td>852.1</td>
<td>531.0</td>
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<td></td>
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<tr>
<td>Brangus</td>
<td>87.8</td>
<td>525.9</td>
<td>887.8</td>
<td>505.8</td>
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<td></td>
<td></td>
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<tr>
<td>Braunvieh</td>
<td>89.8</td>
<td>504.4</td>
<td>842.1</td>
<td>527.0</td>
<td>5.28</td>
<td>12.79</td>
<td>0.386</td>
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<tr>
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<td>543.6</td>
<td>920.9</td>
<td>508.2</td>
<td>5.06</td>
<td>12.79</td>
<td>0.295</td>
</tr>
<tr>
<td>Gelbvieh</td>
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<td>524.8</td>
<td>889.2</td>
<td>524.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limousin</td>
<td>88.4</td>
<td>521.3</td>
<td>878.3</td>
<td>503.3</td>
<td>4.73</td>
<td>13.33</td>
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<td>Maine-Anjou</td>
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<td>511.5</td>
<td>884.1</td>
<td>515.4</td>
<td>4.83</td>
<td>13.22</td>
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<tr>
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<td>909.6</td>
<td>517.7</td>
<td>5.42</td>
<td>12.79</td>
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<td>539.5</td>
<td>907.7</td>
<td>514.0</td>
<td>5.07</td>
<td>12.99</td>
<td>0.355</td>
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