UTILIZING FIXED-TIME AI AND HIGH ACCURACY SIRES TO ADD VALUE TO HEIFERS AND STEERS

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Limited transfer of existing and emerging technologies to beef enterprises precludes those enterprises from reaching their economic potential and places them at a competitive disadvantage relative to livestock enterprises where such technologies are or have been implemented. Project funding we received from the National Institute of Food and Agriculture's (NIFA) National Research Initiative Competitive Grants Program has been used to facilitate implementation of a comprehensive program for beef producers focused on the concept of utilizing fixed-time artificial insemination in conjunction with use of high accuracy AI sires. The Missouri Show-Me-Select Replacement Heifer Program created "Tier 2" within the program (Table 1), which is centered on this theme. Utilization of this technology has already been demonstrated to add value to replacement beef heifers, as shown from sale results after the Fall 2010 and Spring 2011 Show-Me-Select Replacement Heifer Sales (Tables 2 and 3).

Table 1. Show-Me-Select Replacement Heifer Program – Tier 2 Classification: Heifers will be eligible to qualify for Tier 2 in the Show-Me-Select Replacement Heifer Program based on the following minimum accuracies of the heifer's sire at the time of sale for the respective traits listed below.

Trait	Accuracy
Calving ease (direct)	.65
Calving ease (maternal)	.30
Weaning weight	.75
Carcass weight	.20
Marbling	.20

Table 2. Show-Me-Select Replacement Heifer Sale Averages for Fall 2010 and Spring 2011 Sales.

	Totals		
	No. Heifers Sold	Dollars	Average
Fall 2010	908	$1,283,340	**$1,413**
Spring 2011	305	$530,250	**$1,739**
Totals	1,213	$1,813,590	**$1,495**

Table 3. Can producers make more money with adoption of the Tier 2 Program?[1]
➢ **Tier 1 NS bred** (n = 597) baseline avg. **$1,439**
➢ **Tier 1 AI bred** (n = 500) **added $87** = $1,526
➢ **Tier 2 NS bred** (n = 34) **added $136** = $1,575
➢ **Tier 2 AI bred** (n = 82) **added $241** = $1,680
[1]Consider the baseline sale average to be a Show-Me-Select qualified heifer carrying a natural service-sired pregnancy. Observe the added valued resulting from artificial insemination, as it relates to the pregnancy the heifer is carrying (Tier 1-AI bred), but in addition, the genetics of the individual heifer (Tier 2-AI bred).

Additionally, significant potential awaits producers that utilize this technology to add value to their steers. In essence a value chain systems approach could be used to increase profitability of beef farms through creation of a value-added development and marketing program. The definitive outcome of this program will be to add value to beef heifers and steers by expanding marketing opportunities as a result of technology adoption, production verification, collective action, and best management practices.

Examples of this value-added concept are illustrated in the tables below. These tables summarize results for steers from the University of Missouri Greenley Research Center at Novelty (Table 4) and the University of Missouri Thompson Farm at Spickard (Table 5). These herds have been used extensively in our research program for the development of fixed-time AI protocols for beef cows and heifers. The tables summarize carcass merit based on sire group for steers over the past three years (2008-2010) from these farms that were fed at the Irsik and Doll Feedyard in Garden City, KS. Tables 4 and 5 include performance results based on sire group (high accuracy, low accuracy or natural service sires; Greenley Research Center) and the maternal grand sires of the steers based on high accuracy, low accuracy or natural service groups (MU Thompson Farm) over the three year period. Sires and maternal grand sires listed as "high accuracy" meet or exceed the accuracy requirements that are required for Tier 2 eligibility in the Missouri Show-Me-Select Replacement Heifer Program.

Each table summarizes the percentage of steers that qualified for *Certified Angus Beef & Prime*. Significant premiums (> $150/ carcass) were received for steers that realized these premiums compared to those that did not. The data speak for themselves with regard to the potential for adding value to cattle raised in Missouri and across the U.S. by utilizing fixed-time AI and high accuracy sires.

Table 4. Performance data (2008-2010) for steers from the Greenley Research Center, Novelty, MO, that were fed at the Irsik and Doll Feedyard in Garden City, KS.

Sire group	No. of steers	% Choice or higher	CAB & Prime (%)
High accuracy	72	71/72 99%	49/72 68%
Low accuracy	16	16/16 100%	10/16 63%
Natural service	41	23/41 56%	7/41 17%
Totals	129	110/129 85%	66/129 51%

Table 5. Performance data (2008-2010) for steers from the University of Missouri Thompson Farm, Spickard, MO, that were fed at the Irsik and Doll Feedyard in Garden City, KS.

Sire group	Maternal grand sire	No. of steers	% Choice or higher	CAB® & Prime (%)
High accuracy	High accuracy	118	100	84
High accuracy	Low accuracy	53	100	94
High accuracy	Natural service	27	100	74
Totals		198	100	86
Natural service	High accuracy	39	94	69
Natural service	Low accuracy	12	100	67
Natural service	Natural service	23	96	35
Totals		74	96	58

These data should be considered within the context of how they compare with averages for the U.S. cattle industry. Currently, the percentage of cattle that grade choice or higher in the U.S. falls in the range of 68%, with 3% grading prime. The CAB® program in fiscal 2010 identified nearly 15 million head of cattle and certified 3.5 million head for an acceptance rate of 23%. Compare these percentages with those shown in Tables 4 and 5.

Based on the success rates in utilizing fixed-time AI we have reported from our own research, coupled with working examples across Missouri, it is imperative that producers are made aware of the larger opportunities that await them, based on technology adoption and careful sire selection.