The Economic Benefits of ESAI

Reproductive physiologist urges cattlemen to re-evaluate the cost comparison of synchronized AI vs. natural service.

*by **Troy Smith,** field editor*

The disciplined application of estrus synchronization and artificial insemination (ESAI) can have a lasting economic advantage. University of Tennessee Reproductive Physiologist Justin Rhinehart thinks these complementary technologies would be more widely used if commercial cow-calf producers understood how adoption could impact profitability.

"Estrus synchronization and AI can improve both short-term and long-term profitability," Rhinehart told an audience gathered May 31 for the National Association of Animal Breeders (NAAB) Symposium in Athens, Ga. The symposium was convened as part of the Beef Improvement Federation (BIF) Research Symposium and Convention hosted May 31-June 3.

Rhinehart lamented the fact that fewer than 10% of all beef producers utilize estrus synchronization and AI. Among the reasons many producers say they shy away from the reproductive technologies are perceptions regarding labor, time and facility requirements, as well as the overall cost.

There was a time when ESAI typically was more expensive than natural service, he admitted. However, considering current bull purchase and maintenance costs, Rhinehart advises producers to re-evaluate the alternative.

"With an 85% pregnancy rate (about the national average) using a $5,000 bull, natural service costs $60 to $70 per pregnancy — about the same as synchronized AI," stated Rhinehart. "The cost is similar when calculated on an equivalent production basis."

Rhinehart said producers implementing ESAI can realize a short-term economic impact of up to $50 per cow as a result of having more calves born early in the calving season, increased uniformity in the calf crop and a heavier average weaning weight.

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►It usually takes five years to see the impact of maternal genetics through retention of AI-sired heifers, said Justin Rhinehart of the University of Kentucky. However, producers can work toward the realistic goal of increasing the pounds of calf weaned per pound of cow exposed.

"Estrus synchronization and AI can improve both short-term and long-term profitability."
— Justin Rhinehart

Adopting Technology

Speaker encourages use of AI to make genetic and profit gains.

The beef industry's greatest challenge and greatest opportunity are actually one and the same, said the University of Missouri's Dave Patterson at the National Association of Animal Breeders (NAAB) Symposium hosted May 31 as part of the Beef Improvement Federation (BIF) Symposium in Athens, Ga.

Patterson, creator of Missouri's Show-Me-Select™ replacement heifer program, said the industry's greatest challenge is producer reluctance to adopt new technology. Its greatest opportunity? On-the-shelf technology not being used — that works.

Nearly 70% of cow-calf enterprises are reported by producers as being a secondary income source. Only 10%-15% of all beef cattle enterprises utilize artificial insemination (AI). That can and should be improved, Patterson said.

"In many respects, it's a value-added program," Patterson said of the Show-Me-Select program. AI adds value.

What Patterson called "the technology problem" is well-intended. As more research is conducted, more advanced technology results, leading to greater complexity and

PHOTO BY TROY SMITH

►The industry needs more and better reproductive data, the University of Missouri's John Patterson said. "It all begins with heifers."

Table 1: Fewer than 10% of beef producers currently use estrus synchronization and artificial insemination

- ►13.6% of operations in the western United States
- ►11.5% of operations in the central United States
- ►4.9% of operations in the south-central United States
- ►5.5% of operations in the eastern United States

Source: Justin Rhinehart, 2017 NAAB Symposium, Athens, Ga.

Fig. 2: Selection for heavy weaning weights and lower cow weights simultaneously over a 9-year period using ESAI

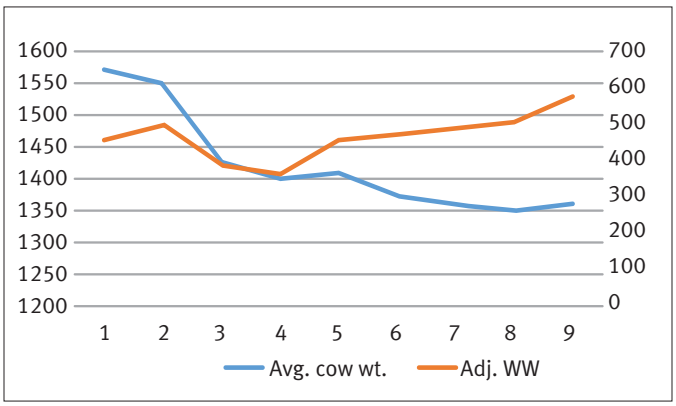
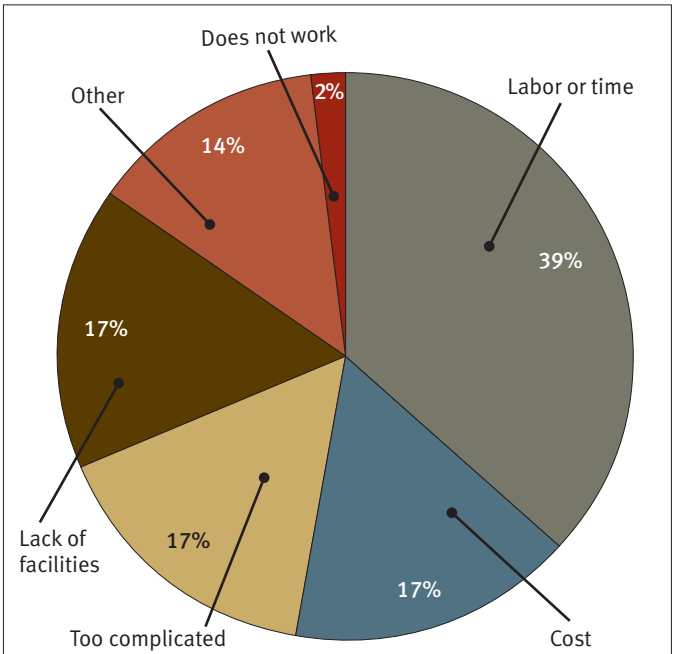


Fig. 1: Reasons people say they don't use artificial insemination



Source: Justin Rhinehart, 2017 NAAB Symposium, Athens, Ga.

The postpartum interval for cows can also be reduced.

Long-term profitability can be improved through disciplined application of synchronized AI over time. Rhinehart said it usually takes five years to see the impact of maternal genetics through retention of AI-sired heifers. At the same time, producers can work toward the realistic goal of increasing the pounds of calf weaned per pound of cow exposed (see Fig. 1).

Rhinehart cited case studies illustrating how producers using ESAI over a period of nine years applied selection pressure to increase the average adjusted weaning weight of their calves while, at the same time, selecting for reduced mature weight of females retained as replacements.

"It is possible to select for heavy calves at weaning and lower mature cow weights simultaneously," stated Rhinehart. "That results in increased pounds of calf weaned per pounds of cow exposed. It is a realistic goal."

sophistication. Fewer people understand it, fewer people trust it, and progress is slowed, he said.

In 1996, Patterson created the Show-Me-Select program to create an understanding of the importance of heifer development based on reproductive outcomes. Since the program's inauguration, nearly 130,000 heifers have been enrolled in the program. Only 32,381 of those have been sold — primarily because the animals are being held as replacements.

The program draws on the fundamentals that founded Extension and land-grant systems: It works to transfer science-based knowledge that enables participants to make practical production and management decisions based on economics.

Two of the most notable outcomes of the program are the expanded uses of fixed-time AI (FTAI) and ultrasound for performing pregnancy checks.

The discussion raises the question: Can producers make more money by adopting these technologies? The short answer, said Patterson, is "yes."

Research results from the program between 2010 and 2016 illustrate that the use of AI consistently added value over natural-service breeding, with premiums surpassing $400 compared to heifers bred by natural service (see Table 1).

Looking ahead, animal scientists, including reproductive physiologists and geneticists, need to work more closely with veterinarians and the AI industry, Patterson pointed out. The industry needs more and better reproductive data, and "it all begins with heifers," he said.

Table 1: Can producers make money marketing heifers developed and bred through Show-Me Select?

Tier	Type of service	No. heifers	Avg. price
Tier 1	Natural	3,831	$2,018
Tier 1	AI	4,956	$2,202
Tier 2[a]	Natural	341	$2,086
Tier 2	AI	686	$2,262

[a]Tier 2 heifers would be second-generation heifers born into the program and rebred within the program.

*— by **Shelby Mettlen**, assistant editor*

Editor's Note: *These two articles are provided as part of Angus Media's coverage of the 2017 Beef Improvement Federation Research Symposium and Convention hosted May 31-June 3 in Athens, Ga. For additional coverage, including PowerPoint presentations, proceedings and audio, visit* www.bifconference.com.