

A REPRODUCTIVE MOMENT WITH MEL

Mel DeJarnette, reproductive specialist

Some Things Never Change

In today's ever-evolving dairy industry, the only constant seems to be change. However, some things never change, like the semen quality and fertility you've come to expect from Select Sires. For more than 35 years, a cornerstone of our mission statement has been, and always will be to provide our customers with the highest quality semen available in the industry. What follows are but a few of the steps in semen production and quality control that ensure every straw of Select Sires semen has what it takes to get your cows pregnant.

"The end result is that you can count on Select Sires to provide the most fertile semen in the A.I. industry."

HEALTHY SEMEN

Reduced transmission of venereal disease is one of the major benefits of artificial insemination. However, A.I. also is a means for disease transmission if appropriate testing protocols are not implemented to ensure adequate health status of donor bulls. Certified Semen Services (CSS) regulates minimum standards for health testing in participating U.S. A.I. centers. These guidelines call for each bull in the A.I. center to be repeatedly tested for six different diseases at admittance, and regularly retested at six-month intervals thereafter.

Last year, Select Sires resident veterinarians performed in excess of 55,000 health tests on about 1,750 bulls, while screening for at least 12 different diseases. No matter how you measure it, that's more than twice the minimum standard. This is just one example of the many "extras" you get in every dose of Select Sires semen.

PROCESSING CONTROLS ENSURE QUALITY

Select Sires' staff of highly trained laboratory technicians averages more than 15 years per person of on-the-job experience. Their attention to every detail in hygiene and temperature control through every step from collection to processing and freezing ensures optimum post-thaw sperm survival. The number of checks, double-checks, rechecks and calibrations in the semen-processing program is incredible. Thermometers, water

baths, scales, sperm-counting equipment, pipettes, dispensing pumps, thermostats, freeze tanks and even semen evaluators routinely are recalibrated to guarantee the numbers they produce are reliable. Every batch of extender is measured for osmolarity and pH to ensure appropriate formulation prior to use. Antibiotics are added to extenders and raw semen to ensure adequate control of microbial growth. Culture plates are routinely submitted for bacterial testing from all processing laboratories to make certain a hygienic environment is maintained... this could go on all day!

QUALITY CONTROL FOR HIGHLY FERTILE SEMEN

The semen-quality-control program at Select Sires is unmatched in the industry. It's not good enough that a sample simply has motile sperm after thawing. Several straws from each collection are subjected to a "stress test" before measuring both motility and sperm membrane integrity. Research has shown evaluations after "stress" have much greater correlation with fertility than simply evaluating motility immedi-

ately after thawing. In addition, sperm morphology routinely is evaluated on every bull. Any collection that fails to meet strict minimum standards is discarded. As opposed to more opaque extenders, such as milk, Select Sires extender formulation facilitates the evaluation procedure and accuracy in estimates of semen quality.

ROUTINE AUDITS VALIDATE PROCEDURES

If the above standards were not enough, Select Sires routinely contracts leading researchers and experts to observe and evaluate processing procedures. We ask them to tell us what we are doing right and, more importantly, what we can do better. This critique serves to validate the program and ensures that all measures are exhausted to identify potential weak links and correct them before they have the opportunity to become real problems.

STATE-OF-THE-ART CONCEPTION ANALYSIS

Select Sires state-of-the-art quality-control programs are further validated with systems designed to monitor sire fertility. For more than 50 years, Select Sires has used technician non-return rates to calculate an estimate of sire fertility known as Relative Breeding Efficiency (RBE). More recently, insemination records from many progeny-test herds now are routinely collected for use in sire fertility estimates that we call RBE II. The new RBE II system accounts for the effects of herd, month of A.I., lactation number, milk production, days in milk at A.I. and A.I. interval. The initial RBE II evaluation included 200,000 inseminations obtained during a four-month interval. As data are added, the yearly rolling



DAUGHTER PREGNANCY RATES

In February, the U.S. Department of Agriculture released preliminary predicted transmitted abilities (PTA) for daughter pregnancy rate (DPR). DPR values are expressed as percentages. For example, a bull with a PTA DPR of +1.0 is expected to have 1 percent more pregnant daughters with each breeding cycle than a bull with a PTA DPR of 0. Another interpretation is that for each 1 percent increase in the PTA DPR, on average the bulls' daughters would have four fewer days open each lactation.

According to industry experts, approximately 96 percent of reproductive success is dependent on management and environmental factors. DPR is an attempt to measure the genetic components of reproduction.

Practically speaking, what does this mean for producers?

CALCULATING THE NUMBERS

DPR is calculated by using days-open information based on DHI records dur-

ing each of a cow's first five lactations, dating back to 1960. Values range from -3.3 to +2.8, and average -0.2. About 65 percent of current bulls have negative values, and reliabilities for first-crop sires range from 50 to 60 percent.

Like many fertility traits, DPR has a low heritability of 3.7 percent. *To put this into perspective, this compares with 30 percent for production traits.*

USING DPR

Because of the preliminary nature of this information, neither Holstein Association USA nor the American Jersey Cattle Association has published DPR PTAs in their official sire-summaries or pedigrees, and are not including them in performance indices. In addition, geneticists have concerns about how well this new trait accurately measures genetic differences in cow fertility.

According to Chuck Sattler, vice president, genetic research and dairy progeny testing, Select Sires, if a producer consistently breeds 100 percent A.I. and uses

only sires that are positive for PTA DPR, and if DPR does indicate true fertility differences, then it might be possible to reduce days open by four days (1 percent DPR) in seven years. However, that same producer likely will lower standards for production, type, inbreeding and other economically important traits.

Industry experts advise producers who use DPR as a selection criteria to do so only as a secondary consideration. ♦

KEY POINTS TO REMEMBER WHEN USING DPR

adapted from New Evaluations Offer a Genetic Approach to Improving Cow Fertility, by Dr. Kent Weigel and Dr. Paul VanRaden

- Producers who use DPR as a selection criterion should make it a secondary consideration.
- When using PTAs for DPR, be sure to consider their reliabilities.
- Reliabilities will be low for bulls that have only first-crop daughters and evaluations may change significantly as information is added.
- Many high-ranking bulls for milk, fat and protein will have negative evaluations for DPR.
- DPR, a measure of female fertility, is not the same as estimated relative conception rate (ERCR), a measure of male fertility.

average is expected to grow to more than 1 million services. Select Sires' innovative RBE II analysis is but another example of our commitment to provide you with the highest fertility semen in the industry.

RESEARCH KEEPS OUR CUSTOMERS ON CUTTING EDGE

Select Sires is an industry leader in research related to bovine fertility. We sponsor an annual symposium that brings together leading experts to share ideas and discuss needs for future research. In the past 20 years, our competitive grants program has contributed more than \$1 million to university research programs for the betterment of our industry. These funds are in addition the research sponsored through National Association of Animal Breeders (NAAB) dues and our "in-house" research program, which is quite extensive in itself. So extensive, in fact, that it became

necessary to establish a new program to orchestrate and implement the numerous ongoing field trials.

THE PROGRAM FOR FERTILITY ADVANCEMENT

The PFA establishes a core group of herds willing to participate in research projects on an ongoing basis. Incentives are built into the program to reward herds for prompt semen usage and return of data, while performance standards allow for replacement of herds that fail to meet expectations. This organized approach allows for more prompt completion of projects and/or implementation of promising new technologies. In the PFA logo, you will note a distinctly different font type for the "p" compared to

the "fa." In scientific research, the "P-value" represents the probability that the observed differences are "real" differences or just numeric bounces of random chance. The special consideration given the "P" in the logo is intended to signify the ethics and integrity that are instilled in the PFA program. From alternative extender formations to novel freezing techniques to investigations of fertility associated sperm-membrane and seminal-plasma proteins, the PFA program ensures that Select Sires rapidly can leverage the latest advances in cutting-edge biotechnologies.

The end result is that you can count on Select Sires to provide the most fertile semen in the A.I. industry. Some things never change. ♦

