

ABS SEXATION™

Technical Guide



The Facts About ABS SEXATION™ Semen

The Sex Sorting Process

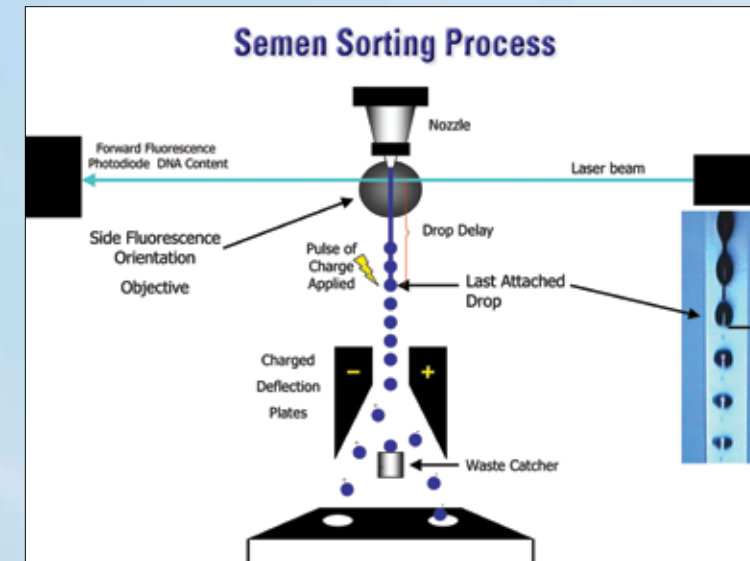
Sex sorted semen goes through a flow cytometry sorting process to sort X (female) from Y (male) bearing cells based on the gender preference of a dairy or beef producer. Sperm gender sorting procedures using the flow cytometer were first studied in U.S. government research labs in the 1980s. In 1990s, the first calf using this procedure was born and since then, researchers have been working to increase the efficiencies of the semen sorting technique. ABS is currently utilizing the flow cytometry technology to sort semen at the DeForest, Wisconsin, USA facilities. This opportunity allows producers to select progeny gender and also allow producers to choose from a globally recognized ABS product offering.



Differentiating Male from Female

The flow cytometer is able to detect a three to four percent difference in DNA content between male and female sperm. The first step in this procedure is to dilute sperm to a very low concentration and stain them with a fluorescent dye. The sample is then sent through the flow-cytometer at 60 mph under 40 to 60 psi of pressure. As sperm pass through the internal laser beam, the fluorescent dye is excited. Because of the larger X chromosome, female sperm emit slightly more fluorescence than Y chromosome bearing male

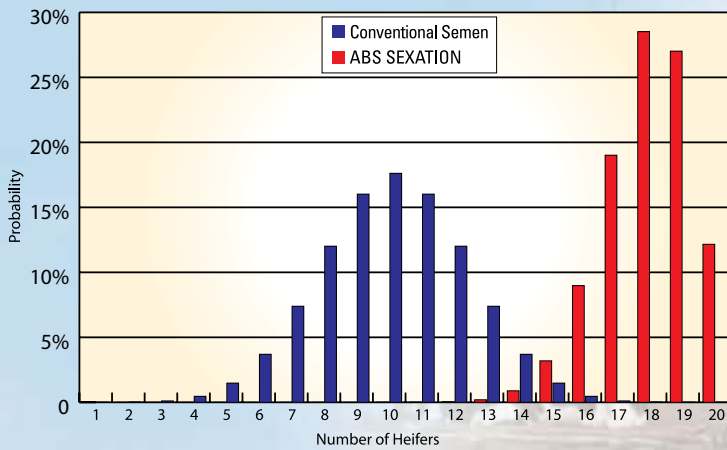
sperm. Detectors measure the amount of fluorescence and assign positive or negative charges to each droplet containing a single sperm. Charged deflector plates then split the single stream into three streams: positively charged particles containing one sex go one way, negatively charged particles containing the opposite sex go the other, while uncharged droplets containing multiple sperm or sperm with unidentified sex pass straight through. In a female sort unidentified/multiple sperm and male sperm are discarded.



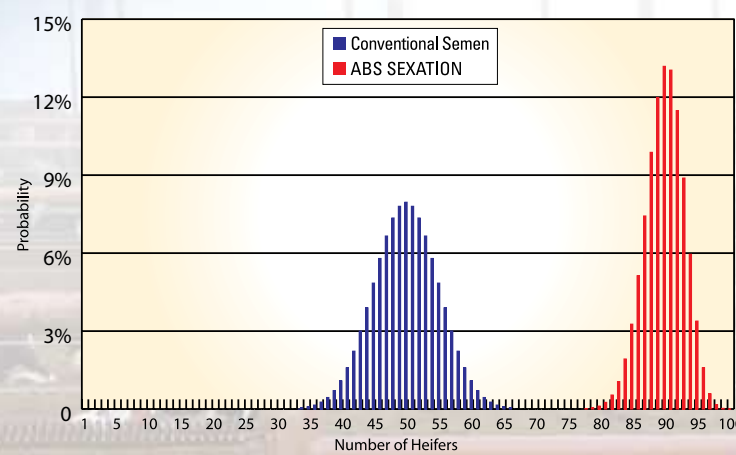
On Average 9 of 10 Calves Born Will Be of the Desired Gender

Each ABS Sexation straw contains 90 percent female or male sperm depending on the desired gender.

Number of Heifers Expected in 20 Calvings
ABS SEXATION vs. Conventional Semen



Number of Heifers Expected in 100 Calvings
ABS SEXATION vs. Conventional Semen



ABS Sexation Packaging



Like all other ABS semen, ABS Sexation straws are frozen through ABS advanced technology, and evaluated for quality control standards. However, ABS Sexation semen has a 529 stud code versus the traditional 29 so that it is not confused with the conventional



(standard) semen product. It is packaged in a red ¼ ml straw for female and a blue ¼ ml straw for male and the respective colored racks. It is clearly identifiable by the color and 529 stud code to ensure proper identification and handling.

Male and Female Availability

ABS Sexation female semen is available for a wide range of reliable ABS dairy and beef bulls. ABS Sexation male semen is available from the ABS beef line-up.

Pregnancy Production With ABS Sexation

This process may affect your ability to produce pregnancies. Conception rates are approximately 75 to 90 percent of conventional semen in well managed programs. ABS Sexation semen is recommended for use on virgin heifers only.



Chris Spitzley
Herd Manager/Owner
Spitzley Dairy Farms, LLC - 300 cows
Portland, Michigan, U.S.A.

*“We are looking to expand our 300 cow dairy and feel that **ABS SEXATION** is a great tool. There is a definite benefit from using this product – we can grow our herd internally using a good base of heifers. It has been exciting to see the results when used in our most fertile animals on the dairy. We want to be progressive and use a tool to benefit us the most, and **ABS SEXATION** has provided this opportunity.”*



Marty House
Marty House’s A.I. Service
Visalia, California, U.S.A.

*“After using over a thousand units of **ABS SEXATION** semen, my customers and I have been pleasantly surprised with the conception rates of the product; between 40% and 60% on virgin heifers. With these ratios it is quite easy to justify the expense, in fact it is down-right crazy not to use **ABS SEXATION** semen.”*

Calving Ease Considerations

Sires with a calving ease of 11 are expected to have a CE of 9 with ABS Sexation product.

To explain, all calving ease proofs from USDA-AIPL are based upon percentage difficult calvings for heifer and bull calves born from virgin heifers. However we know, from USDA-AIPL data, that the calving difficulty for heifer calves is lower than calving difficulty for bull calves – overall 2.6 percentage points lower than both sexes combined. See table at right.



USDA Calving Difficulty*

| Records considered | No. | % Difficult |
|--------------------|------------------------|-------------|
| Heifer Calf | 812,419 | 5.4 % |
| Bull Calf | 812,791 | 10.6% |
| Total | 1,625,210 | 8.0% |

*for 1st Parity Cows Calving in 2000-2006, adjusted to a population base of 8 percent

Percent Difficult Calving Example for ABS SEXATION

With a 90% female sex-skew, we can use data from above table to estimate a percent difficult for ABS Sexation sires as:

Example Bull

USDA-AIPL CE = 11% (50% heifers, 50% bulls)

2.6% lower for heifer calves

$$11\% - 2.6\% = 8.4\% \text{ for heifer calves}$$

2.6% higher for bull calves

$$11\% + 2.6\% = 13.6\% \text{ for bull calves}$$

ABS SEXATION Expected Percent Difficult

90% Heifers x 8.4%

+ 10% Bulls x 13.6%

Expected 9.0% (2% lower than conventional)

Therefore, you can expect a calving difficulty 2 percent lower with an ABS Sexation sire vs. calving ease for the same sire conventionally.

ABS Sexation and Embryo Transfer

ABS Sexation is not recommended for use in flushes. Preliminary research shows decreased fertilized embryos and fewer transferable embryos.

ABS Sexation Fertility and Handling Recommendations

There are fundamental differences between sorted semen and conventional semen. The sorting process discards unknown cells and those of the undesired gender. Due to this process, there are fewer live sperm cells available to be packaged in each straw compared to conventional semen. The lower sperm concentration can affect semen fertility. The sorting process may also compromise the ability of the sperm cells to impregnate animals. Thus, it is essential to follow recommended protocols to maximize results. ABS has several basic use recommendations to achieve the highest possible results:



- Use only on well grown, well managed virgin heifers
- Use on virgin heifers 12 hours after observed/expressed heats
- Carefully follow the published guidelines for semen thawing and handling (see sidebar at right)
- Handle the ¼ ml ABS Sexation straws with the same care as traditional ¼ and ½ ml straws
- While thawing and handling standards are identical, the margin for error is greatly reduced
- Whenever possible, highly experienced and trained ABS Professionals should be utilized
- Even with proper care and handling, conception rates will average 75 to 90 percent of conventional semen



Mr. Gianantonio Locatelli
Dairy Owner - 750 Cows
Gagnano, Italy

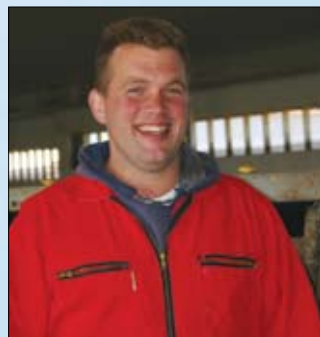
Mr. Gianantonio Locatelli, dairy owner, enters 20 bulls into A.I. each year. So far he has obtained exceptional conception results with ABS SEXATION.

“ABS is the only stud offering sorted semen on modern pedigreed bulls that match my selection targets for both conventional and sorted semen,” says Mr. Locatelli. “I began using ABS SEXATION to increase the number of females and also to rapidly improve the genetics in my herd.”



Semen Handling Recommendations

- 1. Semen Transfer:** Make all semen transfers between nitrogen tanks or retrieval of semen from a nitrogen tank within 10 seconds or within 5 seconds if extreme heat or high winds are present. This time range will keep sperm within a safe temperature range. ¼ ml straws are smaller in diameter, so it is even more imperative that the transfer directions are followed to prevent overexposure.
- 2. Thaw Procedure:** Thaw semen in 95 to 98°F (35 to 37°C) water for 30 seconds but less than 15 minutes. Fertility comparisons show an advantage for semen thawed in warm water.
- 3. Move the Air Bubble:** Shake the straw to move the air bubble towards the crimped end of the straw before cutting. In the ABS Sexation straw the air bubble is positioned in the middle of the straw and will need to shaken a bit more. **This will not damage sperm**, and if the air bubble is not moved, 1 to 5 percent of the sperm will be lost.
- 4. Protect the Semen:** Protect semen from environmental changes while loading into insemination equipment and transferring to the heifer. Failure to protect sperm can either cause cold shock or heat stress, both of which will result in lowered fertility.
- 5. Number of Units:** Thaw only the number of units of semen that can be placed in the reproductive tract within 15 minutes. The advantage of warm water thawing only exists for up to 15 minutes. However, the actual number of units of semen to thaw should be based on inseminator efficiency and facility impacts (pen size, lock ups, pass-throughs, etc.)



Bart Bikker
Herd Manager/Owner
Mellowdale Dairy, LLC - 325 Cows
Barrhead, Alberta, Canada

“We have been using ABS SEXATION semen for three months and have had good results so far. Paying close attention to heats and semen handling has paid off with our Sexation semen performing at or close to our conventional semen. The three main reasons we use the product are: looking to expand our herd and do not want to purchase outside replacements; there is a calving ease benefit to heifers; and bull calves are worth nothing. I like the ability to choose when I replace animals in my herd by having a foundation of heifers, ABS SEXATION will allow this flexibility in the future.”

ABS SEXATION™



Customer Benefits:

- Create 90% females*
- Reduce disease risk from purchased replacements
- Control replacement costs

* 90% female sperm in each straw



Klaus Sievers and his daughter Merle Smith-Sievers Family - 60 cows
Elsdorf, Schleswig-Holstein, Germany

*"We started straight away with **ABS SEXATION** when it came available and have had a 75% conception rate. In my breeding program I am looking for body traits, overall quality of udder and feet and legs.*

*I am not necessarily looking for the highest production but healthy and durable cows are important for me. I have found **ABS SEXATION** sires to fit this need in my herd. Breeding additional heifers from your own farm gives you great opportunity in your genetic program. Buying great replacement heifers is never possible and if I have surplus of heifers I can easily sell them. **ABS SEXATION** gives me this ability."*



Ms. Paulina Lobos
Dairy Manager
Agrícola Los Gamos - 500 cows
Osorno, Chile

"Sexed semen is an excellent tool for dairies that are looking to grow and can generate additional income by creating more heifers to sell. Our fertility results

have been 57% at first service, these are the fertility numbers we had expected given our conventional semen results.

ABS provides us instruction in heat detection, insemination techniques and is always concerned with providing professional assistance on a regular basis."

Visit with your local ABS Representative to learn more about **ABS SEXATION** and **GROW from Within™**.



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