The value of sexed semen in cattle

The use of traditional semen for artificial insemination (AI) results in a 50% chance to have either male or female offspring.

Sexed semen straws produced by Sexing Technologies is already being imported and used by a variety of dairy farmers and creates the opportunity for the local producer to have more control over what the sex of the offspring will be. Which basically means that if you inseminate with sexed semen, more than 90% of the pregnant females will deliver a calf of your choice. Your best cows can thus be selected for insemination with sexed semen, which can double your replacement heifers. By using the best breeding material, combined with double the number of replacement heifers available for selection, a drastic leap in genetic progress can be achieved. The use of sexed semen is also extremely popular with in-vivo and in-vitro fertilization where oocytes are fertilized with sexed semen.

In bulls the female sperm cell (X) has about 3.8% more DNA than the male sperm cells (Y), which creates a significant weight difference, enabling sperm cells to be sorted according to gender. Sperm cells are stained with a fluorescent agent before sorting. The stained semen sample is then transferred into the flow-spectrophotometer in droplets, where each droplet carries a single sperm cell (X / Y). Due to the weight (% DNA) difference, female sperm cells fluoresce more than male sperm cells when exposed to light. This creates the opportunity for the flow-spectrophotometer to distinguish between male and female sperm cells by means of sophisticated computer software and a laser, causing the stained droplets to obtain a +/- charge. Male (negatively charged) and female (positively charged) sperm cells are then separated by deflector plates as the stained droplets flow through the flow-spectrophotometer while defective/dead sperm cells are discarded. These straws will then contain 90-97% (standard or high purity options available) of the chosen sex sperm cells.

According to the contract with Sexing Technologies the Semen collection of each bull is done before sorting to ensure all the old and dead cells are removed. This sample is also used to determine the quality of the semen (concentration, motility and morphology) – This whole process is called a clean out (CO). CO's takes place 7 to 14 days before the desired sorting date. In case the quality of the semen does not meet the standards, another ejaculate will be examined, or other arrangements should be made. The first CO will be done for free, and afterwards a fee will be charged. The CO's can also be done by a Ramsem approved veterinarian on your own farm two weeks prior to bringing the bull into the station. However, the collection for sorting must be done at the bull station (with applicable health requirements for the center)

Sexed semen straws contain a lower concentration of sperm (2 or 4 million) in comparison with the traditional semen straws (15-20 million). The reason for this is that the majority of

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the defective/dead sperm is removed during the sorting process. This is why the same or even higher conception rates can be achieved when compared to AI with conventional semen.
The majority imported sexed semen is available in straws of 2 million sperms per straw (2M). With the new 4 million (Sexed Ultra4M) straws, the concentration of the semen is doubled which can in turn, lead to a 7% increase conception when using frozen semen.

Furthermore, the option of fresh sex sorted semen is now also a reality – either at 2M or 4 M concentration. Further advances in the fresh semen extender have enabled holding periods of up to 72 hours post collection on fresh semen samples.

Primary vs. Secondary sorting
Primary sorting will include the sperm cells of the highest quantity straws ordered – for example in the dairy industry where X-sorted semen straws are ordered to produce more replacement heifers. In certain scenarios the secondary sort (eg Male / Y- sperm) are also of value – for example in the case where the top breeding beef cows are known to have produced the highest ranking stud bulls. In this case the secondary (male sort) can be used via IVF or Embryo flushings on these high-ranking females to produce more proven stud bulls. The female sorted semen of top bulls will be used on the majority of the herd to improve genetic quality and up to double the amount of replacement heifers. Secondary sorting is done at the same time as primary sorting but at a lower price per straw.

The technology also has the capability to "reverse sort" frozen thawed semen straw in the case where the required bull is not available / deceased. The reverse sort fraction (male or female) has to be used in the IVF lab within 30 minutes of sorting. This process requires careful planning of the Ovum Pick Up dates with our team at Absolute Genetics.

The decision to use sexed semen will be largely dependent on the goals of your herd and company. Herd management is of crucial importance when executing this program. Supplementary feeding, licks and herd health will all have a significant influence on the conception rate. It can be the key factor in the final profits of this investment.

Please feel free to contact us for more information or a quotation on above services:
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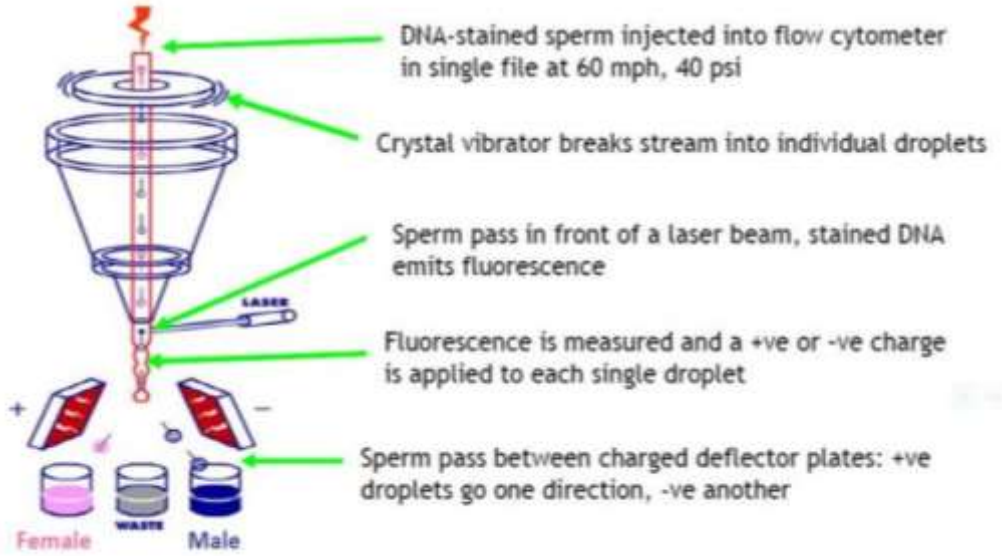
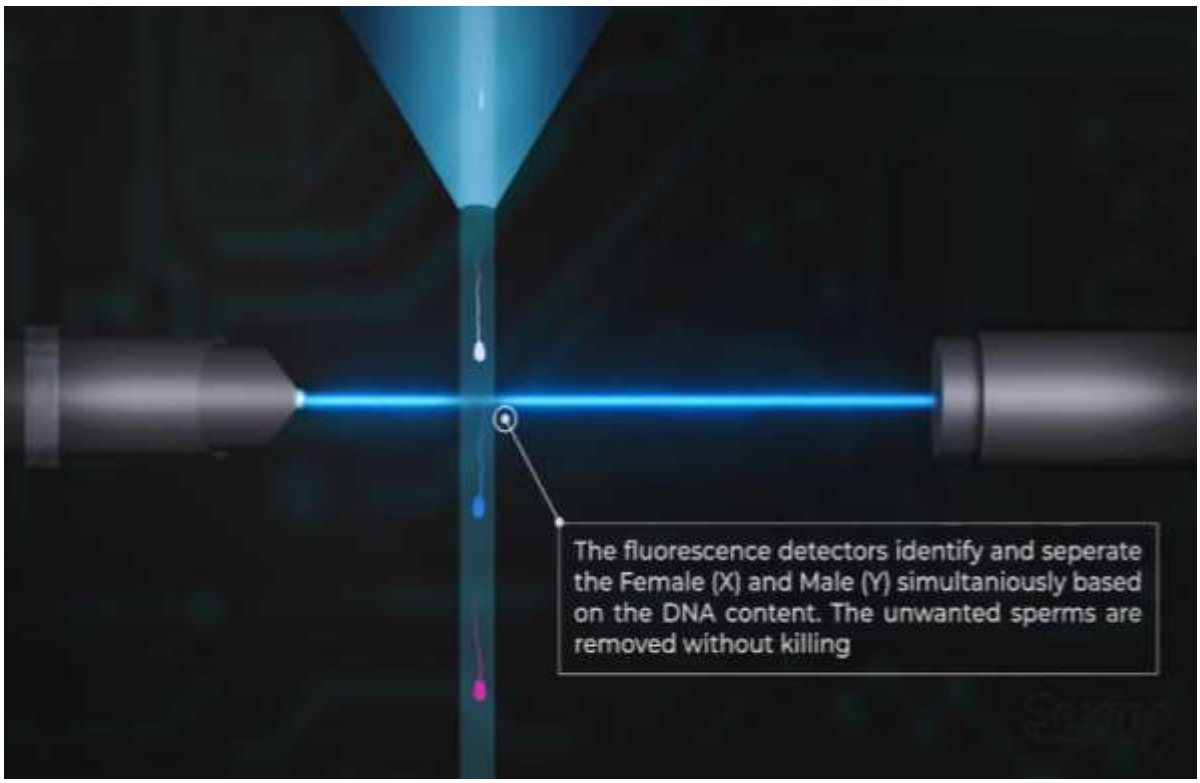
Sexed semen – the technology

'Female' sperm contain ~ 4% more DNA than 'male' sperm





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