

Sex Preselection in Domestic Animals - Current status and Future prospects

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Abstract

Sex preselection is a subject that has held man's attention for generations. The most effective way to achieve sex predetermination is to resolve X and Y chromosome bearing sperm populations. One of the most reliable methods of sorting spermatozoa is flow cyto-fluorimetric analysis, which is based on the difference in the DNA content of the X and Y sperm populations. The difference in the DNA content between X and Y spermatozoa of mammals range from 3.5 to 4.2 per cent. Sorting of variable spermatozoa by flow cytometer have been improved over time and the sorting rate with the recent high speed cell sorter is about 11 million sperms of each sex per hour with purity of 90 per cent. Sort re-analysis enables the laboratory validations of the purity of the sex-sorted spermatozoa. Cryo-preservation of the sorted spermatozoa has also been successful without affecting the viability and fertility. Sexed semen has a wide range of applications in animal breeding by increasing the selection pressure for replacement females and in providing more number of female offspring for progeny testing of breedable males consequently increasing the accuracy of selection. Moreover use of sex-sorted semen will also help in the conservation of endangered species. Development of the instrument for increasing the sorting rate and also purity of sorting without affecting the viability and fertility is still an active area of research.

Key words: Sex preselection, Spermatozoa, Fertilization, Domestic animal, Chromosome.