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Comparative Analysis of Sexing by PCR and FISH Techniques in Bovine Embryos

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The nuclear status of blastomeres derived from 8- to 16-cell stage IVF bovine embryos was analyzed to evaluate the representative of single blastomere for embryo sexing in this study. When bovine embryos were analyzed by PCR following biopsy, the coincident rate of sex determination between biopsied-single blastomere and matched blastocyst by PCR was 80 %. Karyotyping of blastomeres in 8- 16-cell stage bovine embryos was conducted to assess chromosome status of IVF embryos. In 22 embryos under the condition, only 8 embryos out of ten that had a normal diploid chromosome complement showed a sex-chromosomal composition of XX or XY (36.4%) and 2 diploid embryos showed mosaicism of the opposite sex of XX and XY in blastomeres of embryo (9.1%). One haploid embryo contained only one X-chromosome (4.5%). Four out of the other 11 embryos having a mixoploid chromosomal complement contained haploid blastomere with wrong sex chromosome (18.2%). When FISH was performed on karyoplasts of biopsed blastomeres with Y-chromosome specific probe labeled with biotin-16-dUTP FISH analysis of bovine embryos gave high reliability (96%) between biopsied blastomeres and matched demi-embryos. These results suggested that morphologically normal bovine embryos derived from IVF had considerable proportion of mixoploid and sex-chromosomal mosaicism and bovine Y chromosome-specific FISH probe was an effective probe for bovine embryo sexing.