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BRIEF COMMUNICATION

A FIRST CASE OF XY/XYX MOSAIC BULL

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This Holstein-Friesian bull was born on June, 1977 in Japan, and was characterized by a unilateral (left) subcutaneous testis (fig. 1). From the examination of 1.7 years of age, the right testis (9.0×6.5×6.5 cm) was situated in the scrotum. The left testis was 7.0×3.5×3.5 cm in size and the left scrotum was in a state of hypoplasia. The other genital organs were well developed similar to normal bulls.

Semen of this bull were collected by the method of artificial vagina on September, 1978 and January, 1979 and were examined 2 times at each examination (tab. 1). It seemed that the sexual desire of this bull at the time of semen collection was inferior to that of normal bulls. From the results of the examination, the volume and concentration of semen were much lower than those of normal bulls. But the other values of examination were within normal limits.

TABLE 1 *Semen examination in this bull*

TIME OF EXAMINATION	VOLUME	SPERMATOZOAN CONCENTRATION	PERCENTAGE OF ABNORMAL SPERM	MOTILITY	pH	CATALASE ACTIVITY	
	ml	millions/ml	%	%			
'78 Sept.	I	2.0	4.00	—	80	6.8	—
	II	2.5	4.30	5.2	80	6.4	—
'79 Jan.	I	2.7	3.45	5.1	50	6.4	negative
	II	3.0	2.60	2.5	80	6.4	negative

Note: Semen were collected 2 times at each examination.
—, not examined

This bull was chromosomally analyzed by using materials of peripheral blood (fig. 2) and a piece of skin (tab. 2), and it was clearly shown that this bull had a 60, XY/61, XYX mosaicism with similar mosaic ratios in both materials. Furthermore, 9 bulls,

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half-sib sired by the same father bull as this case, were chromosomally analyzed. One bull showed an XX/XY chimerism and the remainder showed only normal 60, XY karyotype. The father bull of this case and 9 bulls mentioned above had a normal karyotype chromosomally (Personal communication from Dr P. K. BASRUR). Unfortunately, mother cow of this bull could not be examined chromosomally because of her death.

TABLE 2 *Chromosomal constitution*

	60, XY	61, XYY
blood	88	78
skin	32	29

The values of various steroid hormones in the peripheral blood of this bull were measured by radioimmunoassay at 1.7 years of age and the results obtained are shown in table 3.

TABLE 3 *The value of various steroid hormone measured*

HORMONES	VALUE (mean \pm SE)
testosterone	22.2 \pm 0.61 ^{ng/ml}
cortisol	1.87 \pm 0.86
progesterone	11.92 \pm 5.42*
estrone	11.96 \pm 5.05
estradiol-17 β	3.80 \pm 2.54

Note: * pg/ml

Until now, cases with an XYY sex chromosome constitution have been reported in human beings (SANDBERG et al., 1961; MAKINO, 1979) and in mice (CATTANACH & POLLARD, 1969; EVANS et al., 1978). Recently in the field of domestic animals, a case of 63, XO/65, XYY in equine was reported (HÖHN et al., 1980), and we have not been able to find an XYY syndrome of bovine in the literature as yet. It is unknown how this XY/XYY mosaic bull was formed. It is conjectured, however, that this case was formed by non-disjunction of chromosomes of abnormal XYY zygote which was formed by two Y sperms or one YY sperm, or normal XY zygote during subsequent cell division in the embryonic stage. It seemed that no spermatogenesis in left testis had an effect on the lower volume and concentration of semen. The value of testosterone in this bull (22.2 \pm 0.61 ng/ml) was lower than that reported by SMITH et al. (1973) and by WEATHERSBEE & LODGE (1976). This low level was likely to be caused by

the fact that the value of testosterone in this bull was measured at the time of young age (1.7 years old) rather than because of the unilateral subcutaneous testis.

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EXPLANATION OF PLATE

PLATE

Fig. 1 The right testis (R) is situated in the scrotum and the left testis (L) is located in abdominal subcutaneous tissue and is movable to some extent.

Fig. 2 The left metaphase plate is XY cell and the right one is XYY cell. Both cells were obtained from peripheral leucocyte cultures.

X; X chromosome, Y; Y chromosome

