

70 j, une phase de masculinisation (développement de certaines caractéristiques masculines du tractus génital interne et différenciation de structures testiculaires dans la gonade).

L'analyse du chimérisme XX/XY, effectuée chez les fœtus freemartins durant la phase initiale d'inhibition (jusqu'à 70 j), ne montre aucun parallélisme entre le pourcentage de cellules XY dans le foie (très probablement des cellules hématopoïétiques) et le degré d'inhibition des gonades et des canaux de Müller, et il ne semble pas y avoir de chimérisme dans les tissus somatiques autres que les tissus hématopoïétiques.

De plus, lorsque dans les gestations multiples, on laisse s'établir les échanges cellulaires qui sont précoces (à partir de 30 j), et que l'on empêche expérimentalement les passages hormonaux en séparant chirurgicalement *in utero* les fœtus jumeaux avant l'apparition des premières anomalies sexuelles (50 j), les jumeaux femelles peuvent montrer (à 60 j) un important chimérisme XX/XY dans le foie (jusqu'à 56 p. cent de cellules XY) sans être affectés par l'inhibition caractéristique des gonades et des canaux de Müller.

Ces résultats indiquent que la phase initiale du freemartinisme chez les Bovins ne dépend pas du chimérisme XX/XY mais plutôt d'une hormone; peut-être le facteur testiculaire d'inhibition des canaux de Müller.

Single-born XX/XY chimaeric bulls with normal phenotype

A. KOVACS, J. STUKOVSKY, E. GIPPERT, G. CSONTOS, I. MESZAROS and J. NAGY *

Central Station for A.I., 1440 Budapest 70 P.O.B. 19., Hungary

** *Central Veterinary Institute, Budapest*

In repeated blood cultures of a *German Simmenthal* × *Hungarian Simmenthal* A.I.-bull out of 1363 cells evaluated 98,61 p. cent female and 1,39 p. cent male were found. His sperm-production and fertility is out-standing (65,7 p. cent from 4 525 first inseminations; the average of the other 113 bulls was 51,3 p. cent in the same period). The sex-ratio of calves born from this bull as well from his father was found as normal. His dam, three paternal half-sisters, seven half-brothers and eight sons were found as karyotypically normal. In one single-born paternal half-brother out of 125 lymphocytes investigated 98,7 p. cent were XX and 2,4 p. cent XY. This second chimaera was producing also sperm and was found as normal according to the necropsy and histological investigation of the testis. In his bone marrow two XX, in the kidney six male and one female, in the testis one male mitoses were found. The two bulls were born in two well-known cooperative-farms, so their birth data are acceptable. The two dams were not relatives. No singleborn intersexes were observed in the mentioned groups. No blood-chimaerism was detected using the direct methods; the blood-type of the XY-cell-line of the A.I.-bull was reconstructed on the basis of his normal sons accepted according to the blood-type of their paternal grand-parents. All of the blood-factors (blood-group, Tf, Hb) of the XX- and XY-cell-lines agree at least one allele.

It is supposed, that these consequently identical alleles in the blood-type of both XX- and XY-cell-lines are of maternal origin and this suggests to the fusion of two early embryos originated from the fertilisation of the ovum and the second polar body (both originating from the same meiosis II and so having the same gene complements). The fact, that these two bulls are paternal half-brothers suggests to the possible role of a factor being in the sperm in the polocyte fertilisation and early embryo-fusion.

A freemartin calf with XX/XXY mosaicism

A.R. DAIN and P.S. BRIDGE *

Institute of Animal Physiology, Babraham, Cambridge, U.K.

* *Department of Veterinary Medicine, University of Cambridge, U.K.*

The *friesian* heifer was born twin to a dead bull calf. The vulva was aplastic and the long anogenital distance was unusual for the classic freemartin condition. Neither clitoris nor penis were palpable, but the urethral orifice lay just above the level of the mammary gland. At laparotomy neither gonads nor Wolffian nor Mullerian structures could be found in the broad ligament. The level of circulating testosterone was extremely low (200 pg/ml). Cytogenetic and blood typing work showed erythrocyte chimaerism and XX/XY/XXY lymphocytes. Skin cells showed XX/XXY mosaicism and a small number of cells with a translocation anomaly. There

were some polyploid cells, but the normal pattern of inheritance of plasma transferrin types from both parents did not indicate either digyny or dispermy. Triploidy has not therefore been shown. It is likely that the XY lymphocytes were of fraternal origin.

The external genitalia resembled those of some other cows with disgenic gonads and absence of Wolffian or penile structures (LOJDA, 1968; RIECK, 1973). They also had elongated urethrae. Their vestigial gonads had tunical albugineae, evidence of early testicular development. It is suggested that these cases, and possibly the present one, demonstrate the earliest stage of masculinization of the genitalia, in which only the genital sinus is stimulated to form an elongated, male urethra. The gonads then degenerated before the Wolffian system could be stimulated. In the classic freemartin the earliest stage is missing, but the fraternal stimulus provokes testicular development in a second stage while the Wolffian structures are still sensitive. Neither the animals with disgenic testes nor the freemartins achieve the third stage in which the penile structures, derivatives of the genital papilla, are stimulated to full masculinization.

The present case therefore, probably owes the masculinizing of her urethra to her own XXY cells, which may have initiated early growth of disgenic testes, rather than to the influence of her male twin, since elongation of the urethra is usually missing from the classic freemartin syndrome.

We thank Dr. Stephen Main of the Institute of Animal Physiology for the testosterone assay, and Dr. J. G. HALL of A.B.R.O. Edinburgh for the blood group study.

Étude cytogénétique sur certaines races bovines italiennes en voie de diminution ou menacées de disparition

L. MOLTENI, G. SUCCI, Annamaria de GIOVANNI

*Istituto di Zootechnia Generale,
Facoltà di Agraria-Via Celoria 2-Milano, Italie*

Dans le cadre des recherches que nous avons entreprises dans le but de caractériser, du point de vue cytogénétique, la population bovine italienne, nous avons considéré, entre les races à viande, quelques-unes dont les effectives sont encore considérables, d'autres qui sont menacées de disparition, à plus ou moins long terme.

Nous rapportons dans cette communication les données relatives aux races suivantes : *Romagnola*, *Chianina*, *Marchigiana*, *Modicana*, *Rendena* et *Modenese*. Notre étude a porté surtout sur les taureaux présents dans les centres d'insémination artificielle ou utilisés, dans certaines zones, pour la monte naturelle.

Parmi les 205 animaux étudiés, tous phénotypiquement normaux, dont 122 (63 mâles et 59 femelles) appartenaient à la race *Romagnola*, 48 (44 mâles et 4 femelles) à la *Rendena*, 16 (11 mâles et 5 femelles) à la *Modicana*, 8 (7 mâles et 1 femelle) à la *Marchigiana*, 8 (tous mâles) à la *Chianina* et 3 (tous mâles) à la *Modenese*, nous avons pu observer la translocation 1/29 dans les suivantes : *Romagnola*, *Modicana*, *Chianina* et *Marchigiana*.

Seulement en ce qui concerne la race *Romagnola*, dont nous avons pu faire une enquête systématique plus approfondie, nous rapportons les données relatives à la fréquence de cette anomalie, qui a été de 28,69 p. cent à l'état hétérozygote et de 3,28 p. cent à l'état homozygote.

On peut en outre signaler la présence, dans tous les animaux mâles étudiés de race *Rendena*, d'un chromosome Y de taille supérieure à la moyenne de l'espèce bovine.

The karyotype of a male *Bubalus anoa* *depressicornis quarleseii* Ouwens 1911

E. SCHEURMANN, H. HOHN and H. FISCHER

Institut für Tropische, Veterinarmedizin, Wilhelmstrasse 15, Giessen 63, R.F.A.

The karyotype of a male *Mountain Anoa* calf was found to be $2n = 45$. 15 autosoms were metacentrics and 28 acrocentrics. The gonosomes are acrocentric. It is assumed that the unpaired metacentric chromosome has been formed by the fusion of two acrocentric autosoms.