

WOOD, J. L. N., LUND, J. J. & DONE, S. H. (1991) The natural occurrence of scrapie in moufflon. *Veterinary Record* **130**, 25-27

YUZBASIYAN-GURKAN, V., KREIBEL, J. D., CAO, Y. & VENTA, P. J. (1999) Development and usefulness of new polymerase chain reaction-based tests for detection of different alleles at codons 136 and 171 of the ovine prion protein gene. *American Journal of Veterinary Research* **60**, 884-887

## Arachnomelia in four Italian Brown calves

S. TESTONI, A. GENTILE

IN recent decades, undesirable genetic defects have occurred in Brown cattle (Brown Swiss, Braunvieh and Italian Brown), of which the weaver syndrome has been the most well known. As a result of preventive genetic programmes and the availability of genetic tests for detecting carriers, the prevalence of disease in the population has been substantially reduced. Spinal muscular atrophy, spinal dysmyelination and congenital myopathy – other defects of young calves – have also been the subject of intensive studies. Their genetic origin has been established, although not in a definitive manner.

Arachnomelia ('spider-legs'), a congenital abnormality of the skeletal system giving the animal a spidery look, has been reported as another undesirable and fatal genetic disease of Brown cattle (Rieck and Schade 1975, Brem and others 1984, König and others 1987, Leipold and Steffen 1989). Although it has not been possible to find candidate genes so far, this disease is attributed to a simple recessive genetic defect, with an American Brown Swiss bull or a cow of the same breed postulated as the origin of the defect (König and others 1987). This short communication describes the most important pathological findings of four affected calves, which were submitted as part of a surveillance plan for genetic diseases in Brown cattle in Italy.

Four dead, newborn Italian Brown calves (three female and one male) were brought to the Department of Veterinary Clinical Science, Padua, because of macroscopic skeletal malformations of the skull and the hindlegs. All of the calves could be traced back to the same sire, which was already known to be a carrier of the defect.

Facial deformities were evident in all of the animals, and were mainly characterised by a short (approximately 5 to 10 cm) lower jaw (brachygnathia inferior) and concave rounding of the dorsal profile of the maxilla (Fig 1). The tip of the maxilla was tapered and slightly turned upwards, and was also shifted laterally in one calf. The head profile resembled that of a pointer dog.

All of the calves looked 'crouched' due to a pronounced kyphosis. Their legs appeared much longer and thinner than normal (dolichostenomelia) and were curved. The thinness did not affect the epiphyses of the long bones, but did affect the diaphyses, especially those of the metacarpus and the metatarsus. In addition, severe angular deformities were observed in the distal part of the hindlegs, characterised by marked bilateral hyperextension of the fetlocks with the extremity of the toe forward and parallel to the trunk of the body (Fig 2). The fetlock joints were stiff.

Long bone fragility was suspected on the basis of multiple leg fractures in three of the calves, possibly as a consequence of a traumatic event such as calving, and the muscles of the legs were atrophic. Radiographs of the legs showed that the diaphyses of the long bones were curved, and the thinness prevalently affected the bone medulla.



**FIG 1:** Concave rounding of the dorsal profile of the maxilla and brachygnathia inferior in a calf with arachnomelia



**FIG 2:** 'Crouched' aspect, dolichostenomelia and angular deformities of the hindlegs in a calf with arachnomelia

Cardiac malformations were evident in one calf; they were characterised by complete transposition of the arterial trunks and bilateral concentric ventricular hypertrophy. This was very severe in the left ventricle; in fact, the left ventricular cavity was one third the size of the right ventricular cavity.

Although some overlap between this abnormality and Marfan syndrome in human beings has been highlighted, the rapid fatal course observed in the four calves makes clinical identification with the human disease inappropriate. In fact, Marfan syndrome in human patients is not usually fatal. Moreover, a true 'bovine Marfan syndrome', more closely resembling human Marfan syndrome, has also been described (Potter and others 1993, Potter and Besser 1994).

To the authors' knowledge, this is the first documentation of arachnomelia in Italian Brown calves. As the sire of the calves has been widely used for artificial insemination in Italy in recent years, further cases of the disease are expected.

As neither chromosomal nor biochemical tests are available to detect the carriers of this defect, only the reporting of malformed calves and the identification of clinical cases enable carrier animals to be established in retrospect.

### References

- BREM, G., WANKE, R., HONDELE, J. & DAHME, E. (1984) Zum Auftreten des Arachnomelie-Syndroms in der Brown-Swiss x Braunvieh Population Bayerns. *Berliner und Münchener Tierärztliche Wochenschrift* **97**, 393-397
- KÖNIG, H., GAILLARD, C., CHAVAZ, J., HUNZIKER, F. & TONTIS, A. (1987) Prüfung von Schweizer Braunvieh-bullen auf das vererbte Syndrom der Arachnomelie und Arthrogrypose (SAA) durch Untersuchung der Nachkommen im Fetalstadium. *Tierärztliche Umschau* **42**, 692-697
- LEIPOLD, H. W. & STEFFEN, D. (1989) Syndrome of arachnomelia and arthrogryposis (SAA) in Brown Swiss calves. *Brown Swiss Bulletin* **September 1989**, 86-87
- POTTER, K. A. & BESSER, T. E. (1994) Cardiovascular lesions in bovine Marfan syndrome. *Veterinary Pathology* **31**, 501-509
- POTTER, K. A., HOFFMAN, Y., SAKAI, L. Y., BYERS, P. H., BESSER, T. E. & MILEWICZ, D. M. (1993) Abnormal fibrillin metabolism in bovine Marfan syndrome. *American Journal of Pathology* **142**, 803-810
- RIECK, G. W. & SCHADE, W. (1975) Die Arachnomelie (Spinnegliedrigkeit), ein neues erbliches letales Mißbildungssyndrom des Rindes. *Deutsche Tierärztliche Wochenschrift* **82**, 342-347

*Veterinary Record* (2004) **155**, 372

**S. Testoni**, DVM, Department of Clinical Veterinary Science, University of Padua, Via dell'Università 16, 35020 Legnaro (Padova), Italy  
**A. Gentile**, DVM, Veterinary Clinical Department, University of Bologna, Via Tolara di Sopra 50, 40064 Ozzano dell'Emilia (Bologna), Italy

Correspondence to Professor Gentile