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**STUDIES ON THE TESTICULAR DEVELOPMENT OF
THE NEW ZEALAND ROMNEY RAM**

**A thesis presented in partial fulfilment of
the requirements for the degree of
Master of Veterinary Science
at Massey University**

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ABSTRACT

The growth of 33 N.Z. Romney rams was observed between birth and 269 days of age. The weight and histology of the testes of these lambs were studied and compared with the histological changes of the testes in 44 foetuses between the ages of 42 days and birth.

Testis growth changed sharply to a faster rate, from 70 days of age when the body weight exceeded 20 kilograms. This change in growth rate was associated with the commencement of spermatogenesis. The completion of the first cycle of spermatogenesis was dependent on the attainment of a testis size of 34 grams in a ram at least 22 weeks of age.

Changes in the epithelium and boundary tissue of the sex cords and seminiferous tubules were closely related to the different phases of testes' growth. The sex cords were present in the testis of the 42-day foetal lamb, but did not show a definite boundary tissue until 53 days of foetal life. Little variation in their development was apparent until the onset of spermatogenesis. The transition from sex cords to seminiferous tubules followed a greater rate of increase in tubular diameter. The gonocytes which were more centrally placed in the sex cords than the nuclei of the supporting cells, became transformed into prospermatogonia before their evolution to adult stem cells at the boundary tissue. Lumen formation in the seminiferous tubule was concomitant with the completion of Sertoli cell development and the appearance of the more advanced forms of germ cells.

At birth the boundary tissue consisted of a non-cellular layer, which had reached its widest margin, and an outer multi-cellular layer of fibroblast-like cells. Differentiation

of the four component tissues in the mature tubular wall, the inner non-cellular layer, the inner cellular layer, the outer non-cellular layer and the outer cellular layers, became apparent about the time spermatogenesis commenced, and appeared to be fully developed when the first cycle of spermatogenesis was completed. The inner non-cellular layer became thinner as the outer non-cellular layer became evident.

Throughout their developmental phases fibres of elastic tissue were dispersed evenly within the two non-cellular layers. During puberty increases to adult proportions were most rapid in the outer non-cellular layer. The significance of elastin in the boundary tissue of the seminiferous tubules in the ram could not be determined. The density of the elastin component as a measure to indicate the degree of immaturity of the testis of a ram was postulated.

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