

free of lipidic inclusions. The reticular zone of the gland was much congested; nearly every cell showed a pycnotic nucleus, and many were overcharged with pigmentary inclusions. In the testis, a number of seminiferous tubules were atrophied, and the cells of the spermatogenic series were arranged in only one or two rows. Cells in the condition following the primary spermatocyte had disappeared, with the consequent diminution of the number of mature spermatozoa. Many cells had pycnotic or lytic nuclei. The interstitial tissue was frankly atrophied.

Post-mortem examination of these animals revealed that all the viscera were atrophied, especially the glands, the weight and dimensions of which were much less than those of the controls. The pituitary gland and the fossa pituitaria were relatively small, and the testes were reduced to a third of the normal.

Irradiation of the hypophyseal zone with high doses of X-rays had no appreciable effect on guinea pigs during the growth period. Thus, a guinea pig of 200 gm. exposed to X-rays twice weekly during a fortnight (totalling 1,600 r.), grew to 410 gm. after 45 days. In the same period its unexposed twin brother, the initial weight of which was 230 gm., reached 420 gm. in the same period.

It may be concluded that ultrasonic irradiation constitutes an excellent and bloodless method of affecting the hypophysis of the guinea pig, so as to obtain animals with pituitary insufficiency. It may be possible to apply this method to bigger animals.

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¹ Dussik, K. T., Dussik, F., and Wyt, L., *Wiener Med. Wschr.*, **38**, 425 (1947).

² Ballantine, H. T., Bolt, R. H., Hueter, T. F., and Ludwig, G. D., *Science*, **112**, 525 (1950).

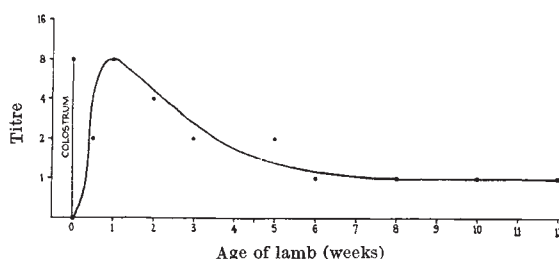
³ Cicardo, V. H. (unpublished results).

Absorption of Anti-Nematode Antibodies from Ewe's Colostrum by the New-born Lamb

DURING experimental work on helminth immunity, it was observed that the sera of month-old worm-free lambs gave positive reactions for anti-nematode antibodies. When this observation was made, all the available ewes but one had lambed. A small-scale test was made to determine whether antibodies to parasitic nematodes could be detected in the colostrum of nematode-infected ewes and whether their offspring acquired these antibodies as a result of suckling.

A colostrum sample was taken from a parturient ewe and serum samples were collected from the lamb at birth, that is, prior to suckling, three days later, and then at weekly or fortnightly intervals for three months. The lamb was allowed to run on pasture with its dam; but, though exposed to nematode infestation, eggs could not be detected in its faeces.

All sera and the colostrum were stored at -20°C . until the end of the experiment. They were then titrated by means of the hæmolytic complement-fixation test. The antigen used was prepared from a mixed culture of *Cooperia curticei* and *Strongyloides papillosus*, following the technique described by Stewart¹.



The results (see graph) showed that the colostrum contained antibodies of relatively high titre. The serum of the new-born lamb did not contain any demonstrable antibodies until after suckling. The antibody titre reached a maximum at one week. During the next five weeks it decreased to a low level, which was maintained for at least three months.

These observations show that anti-nematode antibodies can be transmitted in a manner similar to the more commonly identified antibodies.

Whether the antibodies in the lamb's serum are related in any way to a resistance to nematode infestations has yet to be investigated.

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¹ Stewart, D. F., *Aust. Vet. J.*, **24**, (5), 112 (1948).

Changes in Electrical Conductivity during Bacterial Growth

PARALLEL measurements of the electrical conductivity and bacterial count in a solution containing glucose and peptone, in which a small amount of inoculum of *Bact. subtilis* has been introduced, show the typical lag, logarithmic and stationary phases, and have brought out the striking result that, even before the multiplication of bacteria takes place, there is an appreciable increase in conductivity. This result is to be attributed to the initial activity of bacteria through their multi-enzyme systems in splitting up the peptone in the medium into amino-acids, which are absorbed by the bacteria from the surrounding medium and provide the nutrient material for their growth. Chemical estimation of the amino-acids formed in the medium revealed a close parallelism between their concentration and the electrical conductivity of the suspension at various stages of bacterial growth. This investigation has thus clearly shown that amino-acid formation takes place through bacterial action in the medium before the bacteria begin to multiply.

The observation mentioned above provides evidence for the view that substances are passed from the cells into the medium during the lag phase, a view which is also supported by another observation of ours that the conductivity of a suspension of washed bacteria in 'conductivity water' increases exponentially with time for about six hours, although this increase is comparatively small, being about 0.2×10^{-12} mho per bacterium on the average.

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