

OESTROGEN STATUS AND PLASMA BIOTIN LEVELS
IN THE FOWL

W.L. BRYDEN AND D. BALNAVE

The importance of biotin in nutrition has been appreciated for many years but there are few reports of the factors which influence the metabolism and tissue levels of the vitamin. Hertz et al. (1949) found that oestrogen injection of sexually immature fowl substantially increased plasma biotin concentration but this observation has not received further study.

Plasma samples were obtained from mature birds of both sexes, from pullets approaching lay, and from immature birds before and after injection with β -oestradiol-3,17-dipropionate. Biotin was assayed in plasma samples by the radiochemical method of Hood (1975) and concentrations are presented in Table 1.

TABLE 1 Concentrations of biotin in plasma (ng/ml)

Immature [†]	Female			Male mature
	Immature	Point of lay	In lay	
34.0 ± 7.8	3.0 ± 0.8	28.6 ± 12.3	19.8 ± 3.4	5.2 ± 0.7

Mean ± SE of 5 observations per group

[†]24 h after receiving the last of 4 daily injections of 10 mg oestradiol/kg bodywt.

Circulating levels of biotin were found to be approximately five to ten times higher in laying hens than in roosters or immature birds. A response of a similar magnitude was elicited in immature females following oestradiol injection. The peak concentration noted at point of lay presumably reflects endogenous oestrogen secretion which is known to be highest at this time (Senior 1974). In a subsequent study it was shown that a single oestradiol injection induces a substantial increase in plasma biotin during the following 48 h.

It is thought that the influence of oestrogen on biotin metabolism is mediated through the hepatic synthesis of a recently isolated biotin-binding protein (Mandella et al. 1978) by the hormone.

- HERTZ, R., DHYSE, F.G. and TULLNER, W.W. (1949). *Endocrinology* **45** : 451.
 HOOD, R.L. (1975). *J. Sci. Fd. Agric.* **26** : 1847.
 MANDELLA, R.D., MESLAR, H.W. and WHITE, H.B. (1978).
Biochem. J. **175** : 629.
 SENIOR, B.E. (1974). *J. Reprod. Fert.* **41** : 107.

Department of Animal Husbandry, University of Sydney, Camden 2570