

## SEASONAL TRENDS OF INSULIN-LIKE GROWTH FACTOR BINDING PROTEINS IN RED DEER

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Red deer have been shown to exhibit a seasonal pattern of plasma insulin-like growth factor-I (IGF-I), with peak levels coinciding with maximum growth and antler development (Suttie *et al.*, 1989). IGF-I is specifically bound by a group of six proteins called insulin-like growth factor binding proteins (IGFBPs) (Cohick and Clemmons, 1993). The aim of the present study was to identify whether plasma IGFBPs demonstrated a seasonal pattern. Five yearling stags were maintained indoors and fed a barley based concentrate diet with lucerne hay *ad libitum* and blood sampled weekly for 12 months. Plasma samples taken at four weekly intervals were analysed for IGFBPs using the western ligand blotting technique (Hossenlopp *et al.*, 1986).

Three bands were identified on the autoradiographs, corresponding to 29kDa, 35kDa and a diffuse doublet at 50kDa. The doublet is likely to be IGFBP3 with the 35kDa band possibly corresponding to IGFBP1 and/or IGFBP2. The 29kDa band is most likely to be IGFBP4. The 29kDa IGFBP showed a trend of increasing in levels over the months of April to July (peaking at  $0.168 \pm 0.062$ ) and then decreasing from August to October. The 35kDa IGFBP did not appear to change over the 12 month period. A seasonal cyclic pattern of the 50kDa IGFBP was seen to peak in May ( $1.209 \pm 0.168$ ) and reach a low in August ( $0.401 \pm 0.040$ ).

Increased plasma IGF-I levels at the end of autumn (August) and the beginning of spring (September) is coincidental with the observed decrease of the 50kDa IGFBP (IGFBP3). IGFBP3 is the major IGFBP in the circulation and is proposed to prevent the mobilisation of IGF-I from the peripheral circulation into the tissues. We conclude that the levels of IGFBP3 may decrease in the spring to facilitate the availability of IGF-I for tissue and antler growth.

J Suttie, P Fennessy, I Corson, F Laas, S Crosby, J Butler and P Gluckman (1989) *Journal of Endocrinology*. **121**, 351-360

W Cohick and D Clemmons (1993) *Annual Review of Physiology*. **55**, 131-153

P Hossenlopp, D Seurin, B Segovia-Quinson, S Hardouin and M Binoux (1986) *Analytical Biochemistry*. **154**, 138-143