ANTLER GROWTH AND VELVET PRODUCTION

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The antler cycle starts with the growth of the pedicle during the first year of the stag's life. Pedicle initiation results from an increase in the level of testosterone produced by the testis at puberty, which is mainly a function of body weight and hence nutrition. Although nutrition can influence the timing of pedicle initiation through effects on body weight there is no evidence that nutrition affects pedicle size directly. The relationship between pedicle size and antler size is also unclear.

Although much of the work on nutrition and antler growth has been inconclusive, some general trends are apparent. The main effect of the level of nutrition during the first one to two years is on the ultimate body size of the stag. In this respect antler weight is strongly related to body weight within an age group with the heavier stags tending to have larger antlers and greater velvet production. However even at the same body weight there is a large amount of variation in antler size: such variation is the raw material for selection for a high producing velvetting herd.

Specific effects of nutrition are best considered in relation to influences of nutrition at different times of the year on subsequent velvet production. Nutrition can be considered in terms of either the level of energy intake or in terms of specific nutrients such as protein or trace minerals.

The level of energy intake in the post-rut, early winter period appears to have little effect on the subsequent velvet production providing nutrition later in the winter is adequate. However a high level of energy intake during late winter can in some situations advance the date of hard antler casting and there is some evidence that this may be associated with a greater antler size and velvet antler weight. Restricting the level of feeding during the actual period of velvet antler growth did result in a smaller antler and a lower velvet production. Therefore with respect to the level of energy intake the closer the period of energy restriction is to the actual period of velvet antler growth, the greater the effect: that is good feeding is required in late winter and especially during the antler growing period to ensure maximum velvet production.

With regard to specific nutrients, many have claimed that extra protein or certain minerals such as copper stimulate velvet antler growth. While specific deficiencies of trace minerals would be expected to reduce antler growth, there is no evidence that luxury consumption of minerals will stimulate antler growth and velvet antler production. However the situation with protein is less clear: in one Invermay trial a high protein diet fed to stags during late winter did increase antler size although in a second trial no effect was found. Similarly in two trials there was no effect of a protein supplement during the antler growing period on velvet production. In this respect it is possible that diets which cause changes in the amounts of certain growth-promoting hormones in the stag may influence antler growth. However this aspect will require considerably more research.

Antler size is strongly related to body size and weight in that antler weight increases at about 1.5-2 times the rate that body weight increases. Similarly as a stag gets older, antler size and velvet weight increase as the stag increases in weight, reaching a maximum at about six to eight years of age. The velvet weight per species relationship can also be understood in terms of body weight. Consequently wapiti which are about twice the weight of red deer can be expected to produce three to four times the weight of velvet antler.