ANTLER RESEARCH IN NEW ZEALAND. STATE OF THE ART 1996

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Production systems for antler in New Zealand are designed to maximise antler size while retaining a relatively low level of calcification. Post removal handling and processing systems are important to ensure the colour of dried antler each market requires. New Zealand antler is undervalued because it is subjectively considered to be of low quality, typically being smaller from the traditional Russian and Chinese antlers of similar type. It is also perceived to be more calcified than these traditional types. A clear market signal for New Zealand producers has been to increase 'quality', but objectively what is quality, and how can we measure and improve it? The use of antler size and morphology as a subjective indicator of quality, in terms of biological or therapeutic efficacy, is not supported by preliminary data from AgResearch Invermay. Indeed, it suggests that other factors, such as stage of growth at harvest and antler processing method, are at least as important. A key aspect of the Velvet Antler Research New Zealand (VARNZ) research programme at Invermay has been to define and objectively measure quality and to instigate research into what factors influence quality and what we can do to improve it. The Korean regulatory authorities are in full support of this process and indeed want to buy in to the findings.

We have examined the effect of timing of antler removal (i.e. stage of growth) on composition and biological/therapeutic efficacy, and shown that important changes which reduce levels of biologically active substances start to accelerate from around the time the antler is half to two-thirds grown, 60-80 days after casting. In addition the relative abundance of active substances varies both with stage of growth and with the part of the antler. This background information on the basic patterns of antler growth is of enormous significance in planning objective grading strategies based on chemical/biological indices of quality.

As Koreans perceive 'good' colour to be significant indicator of quality, we have investigated which harvest and post harvest procedures affect antler colour. In this work, equipment developed to objectively measure colour of venison has been utilised. The darkest, most red colour is achieved using local anaesthetic only and by laying the antler on its side following removal and during freezing. A very low level of sedative in conjunction with local anaesthetic seems to have little effect on colour. The time taken to freeze the antler from cutting does not appear to influence colour but in some studies microbiological contamination increases with time. Immediate freezing seems the most conservative advice for farmers.

The clear direction for the next few years is to determine which chemical substances are indicators of quality, and their abundance within the antler and to determine the magnitude of the differences between stags. These indicators may or may not be the active ingredients themselves. The quality indicators must relate to the parameters we are developing to assess the biological activity (or the efficacy) of antler preparations. Once quality can be measured objectively, selection can take place for superior stags, possibly using marker assisted (genotypic) selection based on our knowledge of the genes which regulate antler growth.

The future is exciting for the velvet industry and we can expect to see a range of antler production systems for whole stick, sliced and various extract forms. The New Zealand antler will move away from its low quality commodity image and transcend the barrier to a valued, effective product.