GROWTH PROMOTANTS IN DEER - EFFECTS AND IMPLICATIONS

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There is little perceived benefit in the use of growth promotants in deer as this contravenes the "natural food" image that venison has in the market places of the world. However, if sufficient advantage in growth of animals could be shown as a result of judicious use of the available ruminant growth promoters, then it is possible that widespread use of these products could occur. Although few if any of these products are registered for use in deer they are freely available, and are not tested for at the time of slaughter. While the proponents of the natural product market are certain that the use of growth promotants in venison production will do great harm to any export potential in Australia, the reality is that these products may be used by some, and without any risk of detection.

There are many different growth promotants available in agriculture. While some are entirely synthetic in origin others are derived from natural products and are perhaps more acceptable. Since not all of the world markets supplied with meat from Australia are opposed to the use of growth promotants, perhaps this country would be wise to adopt a balanced view and judge each product on it's merits. In assessing the merits of organically grown foods Herrick (1990) suggests that as guardians of the nation's food supply scientists should be well informed and present the scientific viewpoint. At present the available data on various growth promotants that have been used in deer is not convincing evidence that these products have sufficient beneficial effect on growth to allow their use in jeopardy of the export and domestic markets.

Research

There has been little research effort in the use of growth promotants in deer. Why should there be when consumers are calling for a reduction in the use of chemicals in other meat producing animals? A blanket ban by the EEC on the purchase of meat products suspected of having been derived from animals treated with chemical growth promotants has led to a cautious approach by trading partners. New Zealand in particular has taken a hard line on the use of growth promotants in agriculture so as not to jeopardise their trading position in the lucrative European market, especially with venison. However there is a limit to the "ostrich" approach, and indeed a limit to the notion of "organically grown" animals for meat production. Veterinarians in particular find themselves increasingly having to justify the use of anthelmintics, vaccines etc. for none other than animal welfare reasons to a public clearly suspicious of anything injectable. Is this another example of "solutioneering" by the general public, which has been defined by James (1984) as jumping to a solution without defining the problem, or even being sure that there is one?

Results from trials using growth promotants in deer indicate that increased liveweight gains (LWG) can be achieved in both entire and castrated animals on a high plane of nutrition. Hamilton *et al.*,(1986) demonstrated that castrated rising 2 years old (2yo) red deer stags treated with oestradiol-17ß regained all of a 20% growth penalty associated with castration. Suttie et al.(1985) reported a 30% increase in LWG in entire 2yo red stags treated with testosterone in spring, when entires are virtual castrates. Fennessy and Moore (1977) reported a 19% increase in LWG in rising 2yo red stags treated in spring with the xenobiotic growth promotant zeranol. In a study of entire and

castrated fallow deer bucks treated with zeranol at 6 months (6mo) old and again at 9mo old there was an increase in LWG during spring when feed was abundant (Mulley 1989) but there was no significant increase in liveweight or carcass weight when these animals were slaughtered at 17mo old. Furthermore, dissection of carcasses into individual muscles, bones and fat demonstrated that zeranol did not act as a muscle anabolic in any of the animals treated. However there was a significant increase in fat accretion in all body depots in the animals treated with zeranol, which accounted for small differences in liveweight gain, and there was little or no antler growth on treated entire bucks.

Farmers selling deer on a liveweight basis can possibly gain extra income by using growth promotants in young animals that are well fed, albeit that such products are not registered for use in deer. However, is muscle mass being increased in the carcasses of animals being treated with growth promotants, or is the treatment targeting non-commercial parts of the body? Much of the available literature on ruminant growth promotants has been obtained from their use in cattle and is reviewed by Sawyer and Barker (1988). Most studies in cattle have shown convincing evidence of increases in liveweight gain, much of which is said to be muscle based on protein accretion studies (Trenkle 1976). However, in fallow deer treated with zeranol (Mulley 1989) the skin and some other organs that are discarded as offal were heavier than in their untreated counterparts, a result that supports the idea that non-target body tissues may be affected more than muscle. When this result is combined with the increased fat deposition in fallow deer treated with zeranol, such ill-gotten weight gains can only work to the detriment of deer farming and venison marketing, since venison enjoys the reputation of being a low fat meat (Drew 1990) that suits the health conscious consumer.

Side effects

Side effects that may impare future reproductive potential in animals selected as breeders have been reported in sheep and cattle treated with oestrogens and their analogs, and the same problems are also likely to occur in deer under similar treatment regimens. Pre-puberal bulls treated with zeranol have been shown to have decreased scrotal circumference, retarded sexual development and sperm granulomas (Ott 1986). Fallow deer bucks treated with zeranol (Mulley 1989) developed similar characteristics. Prolapse of the uterus, vagina and rectum (Blood et al.1983) and premature bone ossification (Field et al. 1990) have been reported in sheep treated with oestradiol. Other identified side effects such as high-tail in cattle (Anon 1986) are of less economic significance and are yet to be reported in deer. Although such anomalies can be tolerated or controlled in animal production terms for what may be a short term production gain, of wider concern to the consumers of products from treated animals is whether these products are carcinogenic, tumourogenic or mutagenic. There is no evidence to suggest that any of the currently available growth promotants do any of those things, but this is insufficient solace to disregard objectivety and further research.

Worldwide consumer demands are for leaner meat. One of the major effects of treating pre-puberal fallow bucks with the growth promotant zeranol was to increase fat deposition in all body depots, including muscle (Mulley 1988), an effect that clearly mitigates against the marketability of venison as an alternative lean red meat.

Implications

The question, "should growth promotants be used in the production of venison" is

embroiled in the wider issue of "how much chemical intervention is acceptable in an agricultural production system"? Quite clearly the indications are that it does not matter whether growth enhancing substances are naturally occurring or synthetic in origin, but whether they should be used at all. As Lamming (1986) has pointed out there is a great deal of information on the available growth promotants that suggests that they are not harmful to the consumer, yet public perception of the use of growth promotants will herald a call for their decreased use. The future cost effectiveness of the use of growth promotants in those countries that allow their use will be determined by the rigour of the market place and whether potential or suspected use will alter the ability to sell a product. It appears that consumers would prefer non-use of "chemical" growth promotants yet farmers are free to graze stock on oestrogenic clovers or feed their stock mouldy corn covered with fungi rich in oestrogens to achieve growth enhancement.

The Future

World consumer demand for red meat appears to be heading towards lean product that has been grown with minimal chemical intervention. The view of Fennessy and Drew (1987) that there is no place for growth promoters in venison production still holds firm and will continue to do so into the future in most of the international market places for venison. The Australian domestic market and marketing opportunities in the USA for venison may be less influenced by trends in Europe and elsewhere with regard to the use of growth promotants since both countries allow freedom of use in other domestic stock. Sawyer and Barker (1988) suggest that as many as 45% of eligible cattle in Australia are implanted with growth promotants without appreciable consumer resistance. However, much more work using growth promotants in deer is required to determine the efficacy of such products. At the moment there is insufficient evidence from trials previously conducted that the beneficial effects of such treatments are worth the risk of adverse market scrutiny. Woodford (1987) suggests that the deer industry is a "market-led" industry, that is, one which starts by asking what consumers want and what they will pay a premium for. If he is right then the use of growth promotants in deer should not occupy the minds of many deer farmers. Of far greater importance to the improvement of growth and efficiency of deer in the future will be the application of genetic engineering techniques, recent advances in artificial breeding and hybridisation. These techniques have the potential to provide long term production gains without focusing adverse public reaction towards the deer industry.

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