

Using hormonal growth promotants in NSW beef production

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Introduction

Hormonal growth promotants (HGPs) can be a cost effective technology to increase liveweight and reduce age at turn-off in beef production systems.

A review of Australia-wide on-farm grazing trials has shown that HGP (oestrogenic) treated steers showed significant liveweight gain responses when compared to untreated steers growing at low daily weigh gains (0.3 to 0.5 kg). This is relevant to HGP selection in grazing cattle.

Research has shown that HGPs, used appropriately, are safe for the animal and the consumer. In many markets HGP treated cattle are accepted without discrimination. In NSW, treated cattle are earmarked with an equilateral triangle mark placed in the centre of the animal's right ear.

All HGPs are manufactured as a permanent and palpable marker, using either compressed pellets carrying a steel ball, or a silicone rubber.

HGP use is declared on the LPA/National Vendor Declaration (NVD) / waybill at Question 1. ('LPA' = Livestock Producer Assurance.)

Research work (2004) at the Beef CRC Armidale has revealed that HGPs cause toughening of beef premium cuts but this can be overcome by appropriate processing technology.

Feedlots are now naming HGP products that they will accept in their feeder cattle supply.

What is an HGP

The compounds used in HGPs are either male hormones (called androgens and progestins), female hormones (called oestrogens) or compounds which mimic the actions of these sex hormones.

Importantly, these compounds occur naturally in cattle. They are synthetically produced derivatives of naturally occurring hormones.

HGP manufacturers use these compounds as single ingredients, or in combination, to make implants for use in steers and heifers destined for slaughter. Products are made as steer only or heifer only and registered as such.

HGPs that contain both oestrogenic and androgenic products result in an additive effect as the products act independently.

'Aggressive' implants

Combination implants which contain trenbolone acetate (TBA) in conjunction with oestrogenic and/or androgenic compounds are known as 'aggressive' implants.

This term is used because these TBA combination products generally increase growth rate, improve feed efficiency and delay fattening to the greatest extent (compared to non-TBA compounds).

Principles of designing an implant program

As a result of the Beef CRC HGP research program (led by Dr Bob Hunter, CSIRO) into HGP use there are seven principles that can be followed to design individual property implant programs.

1. Greater responses in liveweight gain are achieved when cattle are gaining weight than when they are at weight maintenance or losing weight (see table 1).
2. The more frequently cattle are treated with a new implant, the greater the response in liveweight gain (but no more often than stated on the label).
3. Once an implant program has been started it should be continued until slaughter.
4. Sustained growth promotion can be achieved through repeat implantation with oestrogenic hormones or by alternate treatment of an



oestrogen and a combination implant of an oestrogen plus an androgen.

5. Repeat treatment with implants containing an androgen may reduce carcass fatness and lead to visual androgenisation (bullishness) of cattle.
6. Oestrogenic treatment – even repeat treatment – does not modify carcass composition by itself. Cattle attain mature carcass composition at higher mature liveweights.
7. Repeated implantation, especially with combination implants, is likely to result in a reduction in eating quality. Treatment with only one or perhaps two oestrogenic implants is less likely to affect eating quality.

Responses to HGP treatment

The APVMA requires all manufacturers to submit weight gain data and information to support any product label claims.

On current information the advantage to HGP use in grazing cattle varies from 11% to 30% when measured as average daily gain (ADG).

Beef CRC researcher Dr Bob Hunter reviewed a comprehensive set of on-farm grazing trials for liveweight responses from oestrogenic HGP use.

Table 1 shows the predicted growth rates from three oestrogenic HGP products compared with the growth rate from non-HGP control cattle in that group.

For cattle grazing pasture or fodder crop, the HGP response is dictated by the feed energy quality (MJ ME) and the herbage mass quantity (kg dry matter /ha) of the pasture or crop.

Where average daily gains (ADG) approach 1.0 kg/day or more in grazing situations, combination implants will maximise the response.

Feedlot cattle will maximise the response to combination HGP implants because their diet will allow maximum intake and have a high energy density (more than 9.5 MJ/kg DM).

Table 1. Daily weight gain in kg/day

Control	Ralgro	Compudose 200	Compudose 400
0.3	0.41	0.48	0.36
0.4	0.51	0.58	0.47
0.5	0.62	0.68	0.58
0.6	0.72	0.78	0.69
0.7	0.82	0.88	0.80
0.8	0.93	0.98	0.91
0.9	1.04	1.08	1.02

Pasture quality and quantity

The benefit of HGP treatment occurs because the basal diet of the animal is of sufficient quantity and quality to provide surplus energy for growth. The longer the time period that this occurs, the more consistent the total ADG response.

Table 2 gives minimum benchmarks for pasture quality and quantity for yearling, European x British breed, 330 kg liveweight at 13 months old.

Table 2. Minimum benchmarks for pasture quality and quantity

Crop	Benchmark
Summer forage crop (grazed at 100 cm)	2500 kg DM/ha (green) 65% digestibility
Winter forage crop: (grazed at 20 cm)	2500 kg DM/ha (green) 65% digestibility
Lucerne: (grazed at 20 cm) (80% lucerne/20% 'grass')	1500 kg DM/ha (green) 68% digestibility
Improved sown pasture: (5% legume content)	1700 kg DM/ha (green) 70% digestibility

Pasture quality and quantity below or above these benchmarks will provide lesser or greater consistent responses respectively.

When to use HGPs in your production system

To maximise the benefit of HGPs, their application must be timed to suit the feed quality/quantity available and the market specification being targeted. Records must be kept for 2 years of all HGPs used and for 5 years of all animals treated.

Calf marking

Do not implant calves less than 6 weeks of age.

Applying HGPs at marking aims at increasing calf weaning weight. Depending on the age of the calf use either a 100 day (most common) or 200 day product.

Use products registered for vealer use for calves to be sold, finished, at 8–10 months old.

Weaning

Applying HGPs at weaning is warranted if the weaners are to be placed on fodder crop or improved pasture. Where weaners are placed on native pastures over winter, the response to HGPs will be dependent on the amount of green feed in the herbage mass.

If the weaners were treated with HGP at calf marking, check that the 'payout' period has finished before re-implanting.

A 100 day product is commonly used as the weaning implant for cattle to be placed on fodder crop or improved pasture.

A 200 day, or longer, product can be used when the grow out period is for 7 to 13 months. This is useful in extensive grazing situations.

Yearling age

At 12–15 months old, grazing spring/summer pasture, HGP treated cattle will maximise HGP responses. Cattle of this age and weight (340–380 kg) can be treated with 100 day implants or 200 day implants.

Repeated applications of 100 day implants are normal.

2 tooth/4 tooth steers

At these ages apply HGP implants to suit the pasture quality and quantity. Application dates should be timed to ensure the 'payout' period has expired, before turn-off, for cattle being sold to feedlots or slaughter.

For 4 tooth steers destined for the Japanese grass-fed market as 6T/8T cattle, long payout HGP products offer advantages (one application, one muster) in extensive grazing situations. However, a greater liveweight gain response will occur when cattle are treated more frequently with a new implant i.e. 100 or 200 day re-implantation.

Observing the 'payout' period

The choice of HGP must be made relative to the time frame for turning off the treated cattle.

For pasture finished cattle, to maximise the benefit, the 'payout' period should be completed before the cattle are sold into the grass fed beef market.

For pasture grown feeder steers the same rule applies. Feedlots do not want the 'baggage' of unknown implants and remaining 'payout' time to manage.

Re-implanting

Before re-implanting HGPs, ensure that the manufacturer's re-implant period has been observed. Check your HGP use records to confirm this. Do not use two implants at the same time, either of the same or different types.

HGPs for steers and heifers

HGPs are made for use on steers only or for heifers only. This is usually indicated on the label or in the name, for example XXXXX-S where the 'S' indicates steer only. An 'H' would indicate heifer only. Do not use steer only products on heifers or vice versa.

Choices of HGP product

The 'aggressive' implants containing TBA in combination with other compounds are commonly used in the feedlot phase.

Evidence from USA research work shows repeated application of TBA combination and TBA solo products impacts negatively on meat quality. For this reason the repeated use of TBA products during grazing (pasture/crop) phase is not recommended.

If a specific feedlot/market end point is the target then ask the operator for any HGP product use specification they may have.

Health programs

To maximise HGP responses it is important for drenching and vaccination programs to be maintained. Rural Lands Protection Board (RLPB) veterinarians have guideline programs for their districts.

To be sure that drenches are working, use a drench test kit 10 days after treatment.

Warning and cautions

It is important to have an accurate record system that traces all HGP use. Losses and damaged HGP implants must be recorded. Grazing cattle treated with a TBA and androgen compound implant should receive minimal handling for two months after treatment.

The known side effects in implanted cattle are bullying, aggressiveness, handling difficulties, nervousness, preputial prolapse, rectal prolapse, vertical oedema and elevated tail heads.

At the current time most over the hook selling pays on a carcass weight/P8 fatness grid. Subsequent adjustments are for pH or meat colour. Of these, HGPs impact only on fatness. It is also now known that HGP application has a negative effect on meat eating quality. However, few meat markets adjust prices for specific meat quality attributes.

The MSA grading model now includes an HGP treatment effect. It will have the one penalty for all HGP products. Research has shown that HGPs will reduce marbling (intramuscular fat) so this impacts on the MSA score. The same research also found that the HGP effect varied across different cuts (muscles). The main grilling cuts (higher priced) show the greatest effect.

Processors can use tenderstretch hanging and/or extended ageing (cryovac) to offset the negative eating effects.

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