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.

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
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 2. Minimum benchmarks for pasture quality and quantity

<table>
<thead>
<tr>
<th>Crop</th>
<th>Benchmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer forage crop (grazed at 100 cm)</td>
<td>2500 kg DM/ha (green)</td>
</tr>
<tr>
<td></td>
<td>65% digestibility</td>
</tr>
<tr>
<td>Winter forage crop (grazed at 20 cm)</td>
<td>2500 kg DM/ha (green)</td>
</tr>
<tr>
<td></td>
<td>65% digestibility</td>
</tr>
<tr>
<td>Lucerne (grazed at 20 cm) (80% lucerne/20% ‘grass’)</td>
<td>1500 kg DM/ha (green)</td>
</tr>
<tr>
<td></td>
<td>68% digestibility</td>
</tr>
<tr>
<td>Improved sown pasture (5% legume content)</td>
<td>1700 kg DM/ha (green)</td>
</tr>
<tr>
<td></td>
<td>70% digestibility</td>
</tr>
</tbody>
</table>

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

When to use HGP in your production system

To maximise the benefit of HGP, 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 HGP used and for 5 years of all animals treated.

Calf marking

Do not implant calves less than 6 weeks of age.

Applying HGP 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 HGP 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 HGP will be dependent on the amount of green feed in the herbage mass.

Table 1. Daily weight gain in kg/day

<table>
<thead>
<tr>
<th>Control</th>
<th>Ralgro 200</th>
<th>Ralgro 400</th>
<th>Compudose 200</th>
<th>Compudose 400</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3</td>
<td>0.41</td>
<td>0.48</td>
<td>0.36</td>
<td></td>
</tr>
<tr>
<td>0.4</td>
<td>0.51</td>
<td>0.58</td>
<td>0.47</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>0.62</td>
<td>0.68</td>
<td>0.58</td>
<td></td>
</tr>
<tr>
<td>0.6</td>
<td>0.72</td>
<td>0.78</td>
<td>0.69</td>
<td></td>
</tr>
<tr>
<td>0.7</td>
<td>0.82</td>
<td>0.88</td>
<td>0.80</td>
<td></td>
</tr>
<tr>
<td>0.8</td>
<td>0.93</td>
<td>0.98</td>
<td>0.91</td>
<td></td>
</tr>
<tr>
<td>0.9</td>
<td>1.04</td>
<td>1.08</td>
<td>1.02</td>
<td></td>
</tr>
</tbody>
</table>
If the weaners were treated with HGPs 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 no 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 carcase 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.