

HGPs - GOOD FOR PROFIT, NOT SO GOOD FOR MEAT QUALITY

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The extra growth seen by producers and feedlots from using hormonal growth promotants (HGPs) boosts their profits. But there are mounting concerns the beef industry is not doing its customers any favours when HGPs may cause tougher meat.

Several CRC experiments have defined the eating quality effects on important cuts of the carcass and have come up with processing strategies to offset them.

This article summarises the main issues for beef producers as the Beef CRC continues its ground-breaking work on the underlying genetics and biology.

Good for growth...

- HGP treatment of backgrounding or finishing cattle adds significantly to their weight gain
- The faster the gain, the greater the response – the greatest response occurs in the feedlot and least during periods of slow or negative growth on pasture.
- The vast majority of cattle in feedlots destined for the domestic market are treated and the boost is important for their profit margin
- Additional gain in weight gives a substantial return in

the order of \$30 to \$50 for the few dollars it costs to treat them.

Not so good for meat quality...

- Consumer studies by Meat Standards Australia (MSA) and the Beef CRC confirm that HGP treatment reduces tenderness, especially in the main grilling cuts
- HGP treatment affects some cuts more than others:
 - (i) Those cuts which improve most with post-mortem ageing showed the largest decrease in palatability (eg the striploin)
 - (ii) Cuts that do not improve with post-mortem ageing showed no effect of HGP implants on palatability (eg the oyster blade).
- HGP treatment reduces marbling, important in some markets (e.g. high quality Japan/ Korea)
- Grading by Meat Standards Australia (MSA) reduces the estimated eating quality of some cuts in HGP treated carcasses

Studying the effects

The Beef CRC is continuing to examine the underlying biology of tenderness, and

more recently, the individual genes and how they are expressed.

An experiment in Western Australia showed the expected positive growth rate responses in steers and heifers treated with an appropriate growth implant. The study looked closely at meat quality effects in a number of different muscles.

- When the striploin (a highly valuable grilling cut) was aged for 5 days and cooked, MSA taste panels reported a very significant 10-point reduction in MSA tenderness score in the HGP-treated steers and heifers.
- Samples of oyster blade (a harder-working muscle with more connective tissue) from the same animals showed almost no HGP effect on tenderness.

Other studies show that muscles that improve fastest with ageing have a higher rate of protein turnover in the live animal. Protein turnover is the balance between the on-going natural processes of protein synthesis (buildup) and protein degradation (breakdown).

HGP treatment increases protein synthesis and reduces degradation, resulting



Growth promotants usually increase profit but can reduce tenderness of some cuts

in more muscle growth. Protein synthesis does not affect palatability; the negative impact on eating quality is caused by reduced degradation.

Processing to maximise tenderness

The MSA grading model now estimates the eating quality of each cut according to whether the animal has been treated with HGP.

- Additional ageing of HGP treated carcasses after slaughter (3 weeks) will significantly improve tenderness. Meat from non-HGP treated cattle does not improve as much with ageing
- Tenderstretch hanging will also make a greater improvement than in non-tenderstretch carcasses, going a long way towards offsetting the negative HGP effect
- If management of the abattoir chiller and electrical stimulation are not coordinated to give the optimum pH/temperature drop, this seems to magnify any negative effects.

Related effects

Researchers believe that changes to the synthesis and degradation rates of protein in the live animal are involved in a number of factors known to affect eating quality. These include *Bos indicus* content, temperament, hanging method and ageing.

For example, some *Bos indicus* genotype animals naturally carry genes that cause slower protein degradation. If these animals have been HGP-treated, especially if other processing technologies are not used or optimised, the meat can be very tough.

These relationships and the underlying genetics are being

further studied in CRC III (see “New Light on Tenderness”, p16).

Market signals

Only a few specific markets discriminate against HGP treatment. These include:

- The European Union (EU) where HGP-freedom is a requirement and livestock suppliers must be accredited
- Most feedlots and processors supplying the long-fed Japanese and Korean markets where marbling is more important than yield
- Some branded products and boutique lines where tenderness is very important
- Branded products that promote their product as “HGP-free” beef.

Consumer perceptions

HGPs are registered for use in cattle and are widely used in USA and Australia. The way they work is to produce a hormone which is very similar in structure to the animal’s natural hormones. There are no known health issues associated with consuming beef from treated animals.

Some consumers have a negative attitude to hormone treatment of food animals, largely stemming from side effects of very early synthetic oestrogens used to sterilise male chickens (these have long since gone out of use).

Consumers are naturally concerned that their food is safe and wholesome, and fortunately they have a high level of confidence in Australian beef. They are generally not aware of the details of how our beef is produced.

Given this background, Australian consumers are mainly concerned with consistent eating quality and price.

Many retailers are reluctant to raise the subject of HGPs

in case it causes unnecessary fears. For example, to promote a “HGP-free” product would alert many consumers for the first time that hormones are still used in some beef production systems.

Implications for industry

- If you don’t use HGPs, you are missing out on potential profit from the extra growth achieved by increased feed intake and better feed conversion efficiency. To make up the difference you would need substantial premiums for HGP-free stock.
- Processors should use best practice eating quality technology – tenderstretch, optimal pH/temperature management – to maximise tenderness and offset the negative effects of HGP treatment and high *Bos indicus* content
- If retailers are concerned about meat quality they should market beef cuts by their predicted eating quality, using MSA grading. This adjusts for many factors affecting eating quality, including HGPs.

Bottom line for producers

- HGPs produce more beef and in most cases increase profit
- HGPs may not be suitable in cattle supplied to some niche and high quality markets, especially EU and the high marbling markets such as Japan and Korea
- Check the market premiums for HGP-free cattle - are they high enough to offset the extra weight they produce?
- For all beef markets where eating quality is important, make sure processing is optimised
- To maximise meat quality, don’t use HGPs at all... but you might miss out on some profit unless you are receiving a premium for eating quality.