New generation beef

Making better use of the under-utilised resource of bobby calves is the subject of a Massey University research project. ***Jackie Harrigan*** *reports.*

Growing bobby calves to one-year of age as New Generation Beef has the potential to add value for both dairy and beef farmers through the meat production industry.

Surplus calves from the dairy industry represent an under-utilised resource and has led Massey University animal scientist Nicola Schreurs to launch a research project into the growth and meat characteristics of dairy-beef cattle up to 12 months of age.

Dubbed New Generation Beef, the research programme looks at growing the dairy or dairy-origin cattle for meat processing before or, at one year of age. This end-point would capture benefits associated with a period of growth associated with the most efficient part of the growth curve.

"An increasing proportion of our beef is coming from the dairy industry and there is a growing world population and demand for beef – much of that demand coming from Asia where beef is prepared and consumed in ways that are different to our traditional markets," Schreurs says.

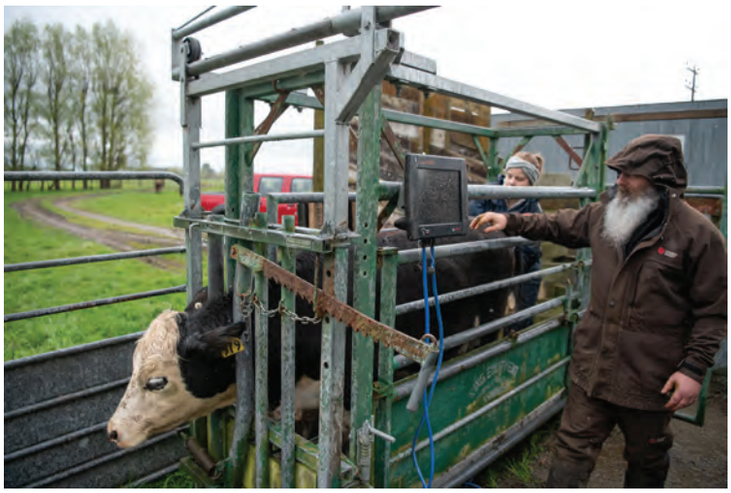
"In the future there may not be the option to slaughter bobby calves and, to be able to utilise the two million-odd bobby calves that are produced on an annual basis, we could consider them for beef production. However, land availability may become an issue if finishing them under our traditional two-three-year finishing regime, so we need to be looking at a range of options."

'We want to know if unaged beef from New Generation Beef cattle is just as good as aged beef from older animals.'

"New Generation Beef could be one option by sending the animals for processing at one-year of age or younger and delivering into markets demanding lean protein."

As part of the research programme a pilot to define the right age for slaughter (trialling eight, 10, 12 and 18 months slaughter dates) has been running since last spring, growing 80 Kiwicross X Hereford calves on Massey farms with regular monitoring of growth rates. The calves were steered, to reflect the fact that the 18-month cattle slaughtered would be prime steers and all carcases will be compared with the prime steer classification.

The calves were weaned at 100kg on to a herb mix (chicory, plantain, red and white clover) and supplemented with meal (0.5kg/head), to maintain a high feed value through a dry early summer period in 2017. A crop of Hunter brassica through the late summer/early autumn was followed by pasture in later autumn early winter period.



LEFT: Young New Generation beef animals before processing at 12 months of age. **ABOVE:** Weighing the cattle prior to slaughter. **BELOW:** Animal science researcher Nicola Schreurs flanked by masters students working on the New Generation Beef products – Josh Hunt (left) and Sam Pike (right). **RIGHT:** Got beef? Nicola Schreurs in the sorting and testing phase.

The calves have maintained an average growth rate of 1kg/day from early December, Schreurs says. Fortnightly weighing has been a useful monitoring tool to make sure the calves are growing consistently. Ultrasound for eye muscle area (EMA) and fat depth are captured prior to slaughter. After slaughter, carcase length and carcase weight is measured to give an idea of the stature and the carcase shape, along with meat to bone and muscularity to identify meat yield.

The strip loins are cut in half, with half being aged for 21 days. Meat colour, pH and shear force (tenderness) are measured in both the aged and unaged beef. Other measurements include sarcomere length, drip loss and myofibrillar fragmentation index to fully understand the influence of the slaughter age on tenderness and eating quality.

Samples have also been kept for sensory testing including flavour and tenderness. Schreurs anticipates sharing trial results alongside preparing meat samples for Fieldays in 2019 to allow a range of people, including farmers, to experience New Generation Beef.

"We made steers out of these, but could you actually use bulls? – they have growth rate advantages."

Twenty steers were slaughtered at eight months at 250kg, a further 20 at 10 months, weighing 300kg. and the 12-month group was processed in September at an average live weight of 340kg. The final group will be processed at 18 months at a targeted liveweight of 550kg.

Preliminary results of the first two slaughter groups are exciting, Schreurs says.

"The meat is lean, and exceptionally tender, even more so after 21 days' ageing and the colour is a medium red – not quite as dark as older meat but still a good red colour that we associate with a red meat product."

"Indications are the results could sit in the middle of veal and prime steer beef in terms of taste, colour and fat content."

"We want to know if unaged beef from New Generation Beef cattle is just as good as aged beef from older animals."

An in-house tasting trial showed a much milder flavour than older beef, very lean with no marbling and no measureable fat but very tender – a very acceptable protein product, Schreurs says.

The next stage will be to consider the optimal calf type to use for New

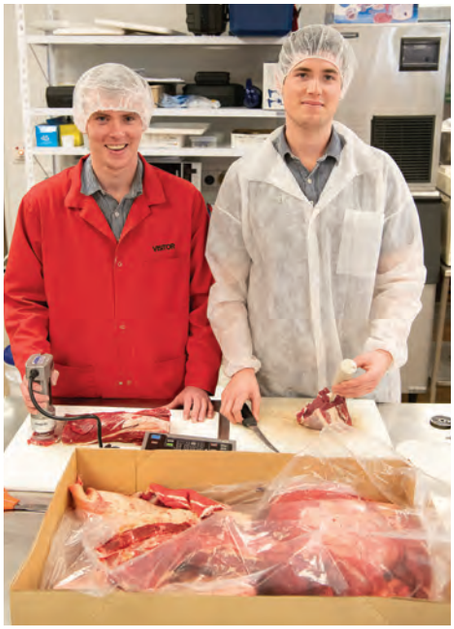
NEW GENERATION BEEF

POSITIVES:

- Improved animal welfare: utilisation of surplus animals from the dairy industry
- Reduced environmental footprint: due to younger slaughter age so less time on-farm and animals off-farm before first winter allowing for reduced GHG and nutrient loss and minimising soil damage
- Better feed efficiency: only feeding animals during their accelerated period of growth
- Feed budgeting options: reducing winter demand

OPPORTUNITIES:

- Tender, lean meat product
- Higher value co-products due to younger age
- World consumer acceptance already proven with yearling beef production in some countries



Sam Pike and Josh Hunt get busy testing the 12-month beef samples.

Generation Beef. So, a bull:steer:heifer comparison, working with Pamu and Massey University farms is being developed for 2019. Further research will investigate whether straight dairy animals are suitable for New Generation Beef, Schreurs says.

"We also need to think about calves from first-calvers in particular, heifers from heifers. We have identified that it is important to look at the prospects for a heifer calf from a first-time calving heifer. Is it suitable for New Generation Beef or, do we need to consider alternative options?"

Researchers are also are well aware of avoiding issues of dystocia (birthing difficulties) by utilising beef bulls Schreurs says. "We don't want to replace a bobby calf animal welfare issue with a dystocia one."

Working with beef researcher Rebecca Hickson on the Dairy-Beef Progeny Test implemented by Beef + Lamb Genetics NZ, in partnership with Massey University, Pamu and Greenlea will help to identify beef-sires that are suitable for putting across dairy cows for calving ease while still providing a calf that grows really well for beef production.

Future work looks at market opportunities for a new product.

"In terms of the markets – it's a bit of a chicken and egg situation. Although we are keen to find a market for New Generation Beef, we need to understand the product first before we can try to develop a market for it."

"We want to try and get as much value from the animal as possible to maximise the return for a lighter carcase weight." This is for the meat but also can be considered for related products such as the skins which is why pelt measurements are also taken by Leather and Shoe Research Association (LASRA) to test whether the younger skins might be of higher quality, Schreurs says.

The economics of production for the New Generation Beef system will be investigated as a masters project for Josh Hunt and fellow masters student Sam Pike is investigating the carcase and meat quality aspects of the research programme, which is supported by the C Alma Baker Trust and Beef + Lamb Genetics.

Slaughtering at about 12 months after the period of early growth when the animal's physiology is more responsive to feed for growth means efficiency can be optimised, while potentially minimising greenhouse gas emissions and nutrient leaching associated with cattle finished over longer periods, Schreurs says.

Ideally there would be flexibility in the system to send cattle for processing early to avoid a winter pinch in feed supply, or to have animals leave the farm before winter periods when soil damage could occur or alternatively extend out the growing period to take advantage of a spring flush to add weight to the young cattle.