

'Resource-poor farmers could one day supply lucrative domestic and international markets'

Beefing up the locals

Australian genetics know-how is helping South Africans to have heavier beef, healthier land, and a happier life. Australia gains too.



A local Nguni cow. In a typical farming village, cattle freely graze and mate. The absence of herd and pasture management has led to poor nutrition and severe overgrazing.

IN THE POOR RURAL regions of the Limpopo and North-West provinces of South Africa, struggling farmers are learning to run cattle enterprises that will generate profits while alleviating severe grazing pressure on local country. Through efforts between Australian and South African science, industry, government and community representatives, the 'resource-poor' farmers could one day supply lucrative domestic and international markets, while contributing valuable genetic material to the northern Australian beef industry.

For the local communities involved, the ACIAR*-funded Beef Profit Partnerships Project is an opportunity to improve their quality of life, and contribute to the economic growth of the country. Currently, the commercial sector of the South African beef industry – some 8.5 million cattle – cannot meet the domestic demand for beef, and must import 300 000 weaner calves and another 35 000 tonnes of beef annually. The resource-poor sector, however, is an untapped source of four to five million cattle.

According to Dr Heather Burrow, deputy CEO of the Cooperative Research Centre (CRC) for Cattle and Beef Quality, the commercial market has been reluctant to buy animals owned by local farmers, because the animals are thought to have poor growth, feed efficiency and carcass characteristics. At first glance, these undernourished, parasite-ridden animals 'look pretty bad'. But early tests suggest otherwise.

'Research indicates that the indigenous 'Sanga' and Sanga-derived breeds (tropically adapted breeds such as the Nguni, Afrikaner, Tuli, Bonsmara and Belmont Red) are comparable to high performing British breeds for traits such as reproduction and meat quality, when reared under good commercial conditions,' Burrow says.

Now, the CRC and the South African Agricultural Research Council (ARC) aim to validate this finding, and equip resource-poor farmers with the infrastructure, knowledge, and skills required to access premium beef markets.

To do this, a growing network of 14 farmer teams has been established in the Limpopo and North-West provinces. In collaboration with teams of scientists and provincial government employees, the network aims to achieve targets in sustainable livestock management, business and marketing.

At the same time, cattle from resource-poor herds are being evaluated at an ARC feedlot, against commercial cattle, for economically important traits. Superior genotypes from commercial cattle are being identified, to provide seed stock to improve resource-poor herds.

'Our aim is to achieve a 5% improvement in farmers' profitability per annum, so that they can get out of subsistence farming and into the commercial beef business,' Burrow says.

Capacity building

In a typical resource-poor farming village, cattle are free to graze where they wish and mate when they want. It may sound idyllic, but the absence of herd and pasture

*Australian Centre for International Agricultural Research.



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Before and after. These are Nguni steers that were sourced from emerging farmers for the feedlot evaluation study. The photo of the black steer (left) was taken on arrival at the commercial feedlot and the second photo (right) was taken just prior to slaughter after 84 days on a special roughage and pelleted concentrate diet.

management has led to overgrazing and poor nutrition. Coupled with a lack of parasite and disease control, it's a tough life. And there is little money to improve it. Farmer support teams employed through the ACIAR project, however, are helping farmers make better use of what money they do have, by teaching them how to calculate their gross margins, and the contribution that new practices and technologies (such as vaccinations, seasonal mating and castration) make to their profit.

'Gross margin analysis looks at the difference between the income each farmer gets from selling their cattle, and the costs incurred prior to the sale,' Burrow says.

'To improve profitability, any future decisions must be made on the basis of how they will affect that margin.'

Support teams have also been training farmers to access market price information and to record the details of individual animals, such as weight and calving frequency. This information provides a basis for sensible decision making now, and will aid identification of genetically superior animals in the future.

Feedlot evaluation

To encourage the uptake of local stock into the commercial market, scientists have evaluated the performance of the cattle under commercial feedlot conditions. Two hundred and fifty representative steers from the Limpopo and North-West Provinces were taken to the ARC feedlot and assessed for growth rate, feed efficiency, disease incidence and meat and carcass quality. The animals were finished and slaughtered according to domestic market specifications.

'The minute we got the cattle into a good environment and under good management, their performance paralleled that of the commercial cattle,' Burrow says.

'We clearly demonstrated that the indigenous cattle could meet the specifications of the commercial sector.'

A second trial group of cattle will be grown according to international market specifications, to test their potential to enter export markets. If the animals show a tendency for marbling (the presence of fat deposits throughout the muscle tissue, which improves texture and flavour), they may interest Australian buyers intent on supplying the lucrative Japanese market.

'We'll finish the cattle to the Japanese market weight and 15% above that weight, to look for expression of marbling,' Burrow says.

'If we can demonstrate a capacity to marble, it could generate a new international market for superior genetics.'

Sustainable spin-offs

As a result of the first ARC feedlot trial, the National African Farmers Union has developed a proposal to establish a new feedlot system, based on resource-poor cattle, which will provide ongoing training and regional development to resource-poor communities. The Union may market the beef directly, as a branded product, to urban communities such as Soweto.

The new feedlot system will also help mitigate the environmental and productivity problems caused by overgrazing. As many communities run too many cattle on poor quality pasture, the animals may take up to 12 years to reach a saleable weight. With unrestricted mating, herds build up and put further stress on the grasslands. A feedlot for local cattle, however, will allow farmers to turn-off their animals at around nine months of age. This faster turn-off of smaller animals will help reduce the grazing pressure and physical

Dr Heather Burrow is leading the Beef Profits Partnerships Project and looking for genetic potential.



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One of the 14 farmer project teams from the North-West Province. The local cattlemen are being taught simple tools to analyse their own enterprises for the critical factors that impact on the key drivers of commercial success: profit, environment and efficiency.

impact on the environment. If better animal management – such as seasonal mating – accompanies these changes, further improvements in production and environmental sustainability will accrue.

‘Seasonal mating requires bulls to be separated from cows after the wet season, ensuring that calves are only born when there is plenty of feed to sustain lactation in the cows. This leads to heavier calves, and means that fewer animals are needed to achieve the same productivity and therefore profit,’ Burrow says.

‘It’s just one example of the way this project is equipping farmers with the knowledge and tools to achieve sustainable enterprises. Economic sustainability provides the platform on which environmental sustainability is based.’

Identifying superior genotypes

Another way to reduce animal numbers while boosting productivity and profits is through improved genetics. With this end in mind, Australian scientists are using GeneSTAR® Tenderness and Marbling tests – developed by the CSIRO, CRC and Meat and Livestock Australia, and marketed by Genetic Solutions – to evaluate 250 bulls for their suitability as elite sires in domestic and international markets. The tests identify the presence of alleles (different forms of a gene) involved in meat tenderness and marbling, and are used by Australian farmers to help select suitable animals for breeding programs. As most of the bulls have been selected from commercial herds, owners are being asked to donate 100 straws of semen, if the animal carries favourable alleles. This semen will be used for research, or to improve cattle from local herds.

Benefits to Australia

South Africa experiences a climate similar to that of northern Australia, and its Sanga breeds are already well adapted to the heat and parasites that plague our northern beef herds. Sanga cattle could therefore provide an additional source of tropically adapted genetic material to Australia’s northern beef industry. If the South African sires are also shown to carry genes for meat tenderness and marbling, their value to South African farmers and Australian producers will be even greater.

CRC scientists are now assessing the potential for new Sanga genetics to be introduced into Australia. Calves from Sanga-derived Bonsmara and Belmont Red sires are being compared in South Africa and northern Australia for traits including feed efficiency, carcass and meat quality and female fertility.

‘Instead of feeding the people fish, we’re teaching them how to fish, so they will have the capacity to continually build on the outcomes of this project, with or without us’

‘Sanga cattle can be used in areas that currently run high grade Brahman cattle, to replace a proportion of the Brahman genes and improve the meat quality and fertility of the herd, without significantly reducing its level of adaptation,’ Burrow says.

By improving fertility, fewer breeding cows will be required to produce the same number of calves. This, coupled with the fact that Sanga cattle require similar feed to Brahmans to maintain their body weight, means grazing pressure could decrease.

‘If Sanga breeds produce more calves, or have genes for tenderness or marbling, they will be more profitable because they produce more beef or their meat fetches a premium price,’ Burrow says.

‘This means we can improve our throughput and product quality, and reduce pressure on the environment.’

Improvement and innovation

Importantly, the Beef Profit Partnership Project is designed to enable the local farmers to achieve sustained improvements in profits, long after the project ends. According to the co-ordinator of the ‘farmer network capacity building programs’, Dr Richard Clark of the Queensland Department of Primary Industries, this is because of the project’s adoption of sustainable livelihood principles. These principles focus on giving farmers and their partners the capacity for continuous improvement and innovation.

‘Instead of feeding the people fish, we’re teaching them how to fish, so they will have the capacity to continually build on the outcomes of this project, with or without us,’ Clark says.

This involves the provision of simple tools that allow farmers to analyse their own enterprises and to identify the critical factors that will impact on the three key drivers of enterprise success: profit, environment and efficiency.

‘Farmers now have the capacity to assess options that will make a real difference to their profits, and the tools to design high impact actions, measure results, and continually improve and innovate,’ Clark says.

The project has also focused on establishing networks of individuals, teams and research partners who have SMARTT (Specific, Measurable, Achievable, Relevant, Targeted and Time-framed) goals, roles and responsibilities, and who will work together in the future.

‘The project is about partnerships, not ‘one-off’ services. Partnership will ensure services that meet local and regional needs,’ Clark says.

‘Our focus on profit, environment and efficiency, and the critical success factors and tools that relate to those have also been institutionalised, so that farmers and institutions have a shared model for ongoing improvement and innovation.’

Wendy Pyper

‘Economic sustainability provides the platform on which environmental sustainability is based.’