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Annual Beef Bulletin
Jaarlikse Vleisbees Bulletin

2025

"Without data and information you're just someone with an opinion"

Profit drivers of production

NBRIS receives International accreditation

ICAR
CERTIFICATE OF QUALITY
Valid up to December 2029

agriculture, land reform & rural development
Department:
Agriculture, Land Reform and Rural Development
REPUBLIC OF SOUTH AFRICA

National Beef Recording and Improvement Scheme
Nasionale Vleisbeesaantekening en -verbeteringskema

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Herd reports generated from the National Database as a selection tool.

A true reflection of your beef herd performance on profit drivers.

ARC Performance tested - your quality assurance trademark

National Beef Recording and Improvement Scheme

Commercial beef producers can **increase** their **profitability** by:

- **Improvement on weaning,** year and eighteen months' weight
- **Bull selection** to support breeding goals from auction catalogues
- Identification of **best performing replacement heifers**
- Identification of **profitable cows**
- Identification of **non-efficient animals**

ADDITIONAL BENEFITS:

- **Data captured** on the National Database (INTERGIS) and compliance with Animal Improvement Act
- **Farmer's Days** with stakeholders
- **Data available for research** purposes and technology development
- **Central bull testing facilities** and technical staff for regional support
- **On-farm Phase D bull testing**
- **Accredited technicians** for **Real-time Ultrasound** Scanning for carcass traits
- **Services comply** with internationally accredited standards
- **Affordable fees** (subsidised by government)
- **Training courses** in beef herd management, BLUP, performance testing and the auction catalogue
- **Affordable on-farm consultation fee**

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For more information:
Dr Ben Greyling
012 672 9052
ben@arc.agric.za

AD 082 7711 637

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ARC-Animal Production / LNR-Diereproduksie
Private Bag / Privaatsak X2, Irene, 0062, RSA
Tel: +27 12 672 9087 Fax: +27 12 672 9002
Email: ben@arc.agric.za

Editor: Dr. Ben Greyling
Co-editors: Zelda King & Johan Binedell
Front page supplied by Daniel Naudé.
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Editor's note

"If you can't measure it, you can't manage it"

Dr Ben Greyling
Research Team Manager: Beef Scheme
ARC-Animal Production, Irene
Ben@arc.agric.za

Information and technological innovations have become the big allies of the beef industry.

Having listened to what beef farmers say about the challenges that they face on a daily basis, I am now more than ever convinced that to be a successful farmer, you really have to love what you do, otherwise you will never be resilient and able to mitigate the risks attached to your challenges. The latter include many factors over which farmers have little or no control, including fluctuations in market forces and the state of the economy, supply chain issues and the effects of climate change and its associated effects (e.g. droughts and disease outbreaks), to name but a few. Farmers do however have access to information and technological innovations that have become indispensable decision-making tools that enable them to not only address their challenges, but also to seize the opportunities presented in industry.

The following are a few interesting but very relevant examples of information regarding our beef industry that will put both the challenges and opportunities within the beef industry into perspective:

- Our red meat industry is the second largest contributor to the agricultural gross value of production (GVP), while the beef industry contributes approximately 82% to the red meat industry, having generated almost R54 billion in income in 2022.
- From our 12.2 million cattle, we produced close to 780 thousand tons of beef in 2024 of which we consumed 741 thousand tons. The average slaughter weight of our cattle was close to 285 kilogram in 2024.
- South Africa was the 32nd largest agricultural exporter globally and the only African country in the top 40 exporters as recent as two years ago. Our main export markets include Kuwait, Jordan, and the UAE. Accessing international markets is a big driving force of our industry and the recent opening of the Saudi Arabian export market attest to this. These international markets however necessitates that we address trade barriers such as traceability and disease management.
- Of all animal protein consumed by South Africans, 26% is beef, 49% is poultry, 13% is eggs, 7% is pork and 5% is mutton and goat.
- Nationally close to 4,5 million of all households in South Africa are involved in agriculture to some degree (2022). More than 565 000 of these households own cattle, the majority of which (61%) has no more than 10 cattle while less than 3% own more than 100 cattle.
- Our per capita beef consumption is approximately 18kg (2020). We should take note however that this average consumption figure does not reflect the inequalities in beef consumption among the different income groups in our country.
- While our national herd size declined by almost 10% from 2010 to 2020, the total output more than doubled due to a higher proportion of our herds being slaughtered and also as a result of increased meat production

per animal. According to market specialists, this increased economic efficiency can be attributed to amongst others, technological innovations and the desired superior genetics. The latter is a prerequisite for sustainable and profitable beef production.

- When it comes to national food security, we are considered to be secure, meaning we produce enough food to feed our nation. What is however very alarming is the fact that 17.5% and 26.7% of South Africa's households experience severe and moderate food insecurity, respectively. These figures sound even more alarming in view of the fact that more than 10 million tonnes of food go to waste every year in South Africa, which accounts for around a third of the food we produce annually! Close to 70% of this wastage occur in the early stages of production, while the rest occur during post-harvest handling, storage, processing and packaging. It is clear that we should focus much stronger on reducing food wastage to support and enhance food security, in particular on a household level.
- More than 80% of our agricultural households (households involved with agriculture on different scales) produce mainly for their own consumption and to a lesser extent for selling their products. Just over 4% of agricultural households are producing only for selling their products.
- South Africa has just over 40 000 commercial farming operations, of which more than 50% are micro-scale farmers, 2 610 large-scale farming enterprises and 12 570 medium-scale enterprises. Small holder farmers amount to just over 300 000 (BFAP).

What is the message from the bigger picture?

The well-known quote "The only constant in life is change" applies especially to farming, since farmers need to constantly improvise to create opportunities in a relatively complex and ever changing beef value chain. This also necessitates that we share our resources, forge partnerships with all role-players and implement technologies to be able to not only address our challenges but also to transform the agricultural sector in the process. Stakeholders are also in agreement that producers should become more intensely involved with the formal structures of industry. Our farmers are the core of SA's AAMP (Agriculture and Agro-Processing Master Plan) that focuses strongly on strategies aimed at enhancing food security, the creation of employment and to stimulate economic growth within our industry. We also need to focus stronger on building an industry where both small-scale and large-scale farmers can participate in and interact with each other in order to strengthen and develop their industry.

The role of information and scientific technologies in the bigger picture

There is consensus that innovative research and development (R&D) and the implementation of technologies are vital for growing the competitiveness and sustainability of the South African red meat industry, both nationally and internationally. For instance, implementing technologies such as precision livestock farming through the application of performance recording and associated technologies (including Genomics) have been shown to enhance productivity, reduce costs and improve animal health, eventually yielding very positive revenues. For instance, the return on investment (ROI) in scientific technologies both in South Africa and globally, have been shown to range from 3:1 to as high as 10:1. We should not forget that performance recording data forms the basis of many of the scientific innovations used by industry, stressing the fact that without data you don't have info to make informed decisions, drive improvements, or develop new technologies.

In conclusion, to thrive in the beef farming industry, resilience, adaptability, and a deep passion for the work are essential traits of a successful farmer. To thrive also requires unlocking the full potential of their herds which necessitates having access to the relevant information and applying performance recording data and associated technologies, all of which are powerful tools when it comes to informed decision-making relating to profitable beef production.

Artikel met vergunning van
Veeplaas

Structure of the South African red meat industry

Koos du Pisanie
koos@plaasmedia.co.za

Numerous organisations play key roles in South Africa's red meat value chain and until recently each have, to a large extent, been focussing only on their section of the value chain, with organisations not really knowing what the others are doing.

In 2019, the four primary red meat industry role-players, namely the Red Meat Producers' Organisation (RPO), National Emergent Red Meat Producers' Organisation (Nerpo), the South African Feedlot Association (SAFA) and the Red Meat Abattoir Association (RMAA), got together and decided to apply for the new statutory levy.

Purpose of each role-player

Each of these organisations serves its members in a different link of the value chain and each has a cardinal role to play.

The purpose of each of these organisations entails the following:

- **RPO:** The RPO protects and promotes the interests of commercial red meat producers within the red meat industry value chain, and strives to promote the economic success of its members by bargaining on behalf of its members.
- **Nerpo:** The primary aim of Nerpo is to commercialise the developing agricultural sector, and ensure meaningful participation of black individuals within the mainstream commercial agribusiness sector in order to promote the long-term sustainability of the agricultural sector in South Africa.
- **SAFA:** The South African Feedlot Association strives to be an efficient, representative and legal organisation that plays a leading role in all fields contributing to the promotion of the feedlot industry.
- **RMAA:** The Red Meat Abattoir Association aims to provide training at all South African abattoirs in a bid to promote meat quality and safety. This ensures that both the red meat industry and consumers benefit from these high standards.

These four industry role-players have the same goal, namely to support and advance their specific link in the value chain, as well as represent their members in the larger chain and regulatory environment. These organisations, however, did not always work together, so they decided to join forces to steer the entire industry in the same direction so that everyone will be able to share in the benefits.

This led to the establishment of the Red Meat Primary Cluster (RMPC), a non-profit organisation responsible for maintaining and improving the red meat value chain, from the farm to the abattoir.

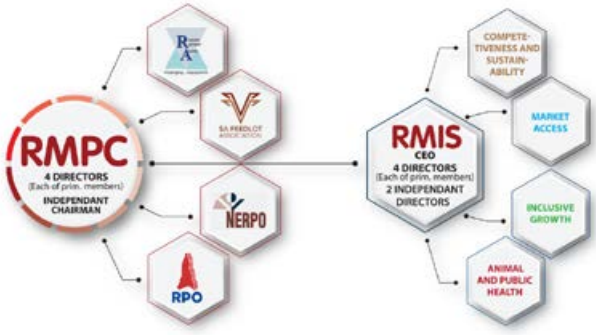

Figure 1 Provides an overview of the RMPC structure.

A new vision

The RMPC approached the Bureau for Food and Agricultural Policy (BFAP) to conduct research into

the industry interventions required for maximising the profits of red meat producers. The study formed the basis of the primary red meat industry's *Vision 2030*, which is aligned with the *Agriculture and Agro-processing Master Plan (AAMP).*

The South African red meat industry is a gold mine, the development of which is possible only if everyone works together. The *Vision 2030* strategy, as signed by all role-players, mentions that the industry can potentially grow with more than 20% and contribute over R1,2 billion annually in real terms to the gross domestic product (GDP) of the South African agricultural sector.

To achieve this, the role-players intend to increase beef exports from 5% of national production to 20%, and small stock from 1 to 6% of national production (this includes both meat cuts and live exports).

Administration charges

Based on Vision 2030, the RMPC applied for a new statutory levy. The levy was approved and came into force on 4 November 2022. Although RMPC members each have their own goals and services to deliver, many of these goals and services tend to overlap. For this reason, a decision was taken to establish Red Meat Industry Services (RMIS), a non-profit company, to take on the role of levy administrator.

The RMIS board consists of an independent chairperson, four directors (one from each of the respective organisations), an executive director who is also the chief executive officer, and two independent non-executive directors.

In short: the RMPC is responsible for establishing policy and to guide RMIS on how to apply the levy in order to advance the industry. The services administered by RMIS are modelled on four pillars, namely animal and public health, inclusive growth, market access, and competition and sustainability.

Preferred services

The goals of Vision 2030 are aimed at benefitting everyone involved, but reaching these goals is easier said than done. The red meat industry needs to make a number of changes and grow in several areas.

The services provided are:

- **Animal health:** This includes controlling animal health according to export standards, decrease in controlled animal diseases, improved application of protocols pertaining to animal health, and the like.
- **Research and development:** Money will be allocated for more research in the red meat value chain to promote industry development. This involves research in all facets of the value chain.
- **Traceability:** The implementation of a sustainable traceability programme backed by all producers and other role-players is crucial. This is currently high on the priority list.
- **Inclusive growth:** Urgent attention is being paid to improving farming methods, especially in the informal sector. The ideal is to improve this sector's low productivity and limit overgrazing. The possibility of making infrastructure available is also being investigated.
- **Meat safety:** The ideal is to apply and monitor meat safety and quality throughout the value chain. This includes providing education and information, and implementing and monitoring meat safety throughout the value chain.
- **Production development:** A 20% improvement in red meat production will give the industry a much-needed boost. Plans are already on the table for improving production through training, the availability of veterinary services, as well as market access.
- **Trade (import and export):** Currently, most red meat is consumed locally, but not enough is being done to expand the market. The export market must be expanded, and several options are currently being looked at.
- **Consumer education and security:** A concerted effort must be made to educate consumers regarding red meat consumption, which will give the local a boost.

For more information, contact Corine Steyn, RPO company secretary, on 083 644 5545.

The ARC National Beef Performers Virtual Awards 2024

Zelda King,
Frans Jordaan & Dr Ben Greyling
ARC-Animal Production, Irene
Zelda@arc.agric.za

Acknowledging and rewarding the accomplishments of our farmers is just one of the numerous objectives of the ARC's National Beef Performers Awards of 2024. This aligns with the National Beef Recording and Improvement Scheme's (NBRIS) main mission, which is to support the adoption and implementation of technologies designed to improve the production efficiency of our beef herds nationally. This enables farmers to produce more profitable and sustainable and simultaneously improves their contribution towards food security and enhancing the socio-economic welfare of our country.

The Scheme has worked alongside industry stakeholders and research institutions for many years to meet their needs and ensure we can adjust to an evolving industry. A key measure of the Scheme's success is the progress and advancement of our farmers and the difference they are creating. The Scheme holds its national awards each year to acknowledge and reward the remarkable progress that farmers have achieved by utilizing performance recording and associated technologies, encompassing the whole range of the production industry. The Scheme places significant importance on the collaboration of farmers representing all sectors, as well as with government and other agricultural stakeholders, to bolster our joint endeavor in improving production and access to the beef value chains in our country.

On 28 November 2024, PlaasMedia broadcasted The ARC National Beef Performers Awards

https://youtu.be/oHamQitUgMc

Congratulations

to all our winners!

Thank you for your support and keep performance testing part of the growing success of your herd

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2024 ARC NATIONAL BEST ELITE COW AWARDS

sponsored by Farmer's Weekly

Only the participating cows' actual performance data is taken into account for this award category. In addition to other economically significant characteristics like maternal aptitude and pre-weaning development rate (weaning weight), participating cows should have remarkable reproduction figures. As before, cows of all breeds compete in this award category, and only one cow per breed will be nominated the top female of each competing breed. For 46 consecutive years, our esteemed partner Farmer's Weekly has been the only sponsor of this award category, which is commendable in itself.

Participation is open to both registered and commercial cows, and particular requirements include the age at first calving, the average interval between calvings, the number of days since the last calving, and the completeness of the weaning weight records.

The 23 ARC National Best Elite Cows with their respective performance figures and owners.

AFRISIM: JVR 13 0024
Hentie Jansen van Rensburg
Noordbrug, North West

Age: **11**
Age 1st calving (months): **28**
Avg Weaning Index: **107**

Number of calves: **8**
Avg ICP (days): **416**

EBVs
Birth Direct: **2.76**
Weaning Direct: **11.2**

Weaning Maternal: **2.1**

Cell: 082 825 2168

Email: obgynae@icon.co.za

Afrisim

Hentie Jansen van Rensburg

JVR 13 0024

ANKOLE: DT 15 0083
Dail van Rensburg
Delareyville, North West

Age: **9**
Age 1st calving (months): **25**
Avg Weaning Index: **117**

Number of calves: **7**
Avg ICP (days): **369**

EBVs
Birth Direct: **-**
Weaning Direct: **-**

Weaning Maternal: **-**

Cell: 082 809 8841

Email: dail@cluesnet.co.za

Ankole

Dail van Rensburg

DT 15 0083

BEEF SHORTHORN: BLK 13 0229
Allistair Brown
Komani, Eastern Cape

Age: **11**
Age 1st calving (months): **31**
Avg Weaning Index: **113**

Number of calves: **7**
Avg ICP (days): **413**

EBVs
Birth Direct: **1.99**
Weaning Direct: **10.4**
Weaning Maternal: **11.1**

Cell: 083 236 4040
Email: akcbrown@global.co.za

Beef Shorthorn


Laurence & Allistair Brown


BLK 13 0229

BONSMARA: FHK 15 0167
De Wet Hartzenberg
Lichtenburg, North West

Age: **9**
Age 1st calving (months): **25**
Avg Weaning Index: **105**

Number of calves**: 7**
Avg ICP (days): **337**

EBVs
Birth Direct: **0.55**
Weaning Direct: **15.8**
Weaning Maternal: **10.5**

Cell: 082 414 6988
Email: dewet172@gmail.com

Bonsmara


De Wet Hartzenberg


FHK 15 0167

BORAN: AAA 08 0010
Braam Dekker
Louis Trichardt, Limpopo

Age: **16**
Age 1st calving (months): **36**
Avg Weaning Index: **96**

Number of calves: **12**
Avg ICP (days): **334**

EBVs
Birth Direct: **0.68**
Weaning Direct: **6.4**
Weaning Maternal: **3.7**

Cell: 082 929 2358
Email: dekkerboerdery@gmail.com

Boran


Braam Dekker


AAA 08 0010

BRAUNVIEH: HB 15 0008
Hans Bester & daughters
Vrede, Free State

Age: **9**
Age 1st calving (months): **30**
Avg Weaning Index: **104**

Number of calves: **7**
Avg ICP (days): **357**

EBVs
Birth Direct: **1.63**
Weaning Direct: **10.7**
Weaning Maternal: **8.8**

Cell: 083 469 1258
Email: daleen22bester@gmail.com

Braunvieh


Dr Daleen Roos, Hans Bester & Dr Hanri Bester-Cloete


HB 15 0008

CHAROLAIS: MCS 11 0043
Clive Marshall
Gaborone, Botswana

Age: **13**
Age 1st calving (months): **32**
Avg Weaning Index: **107**

Number of calves: **9**
Avg ICP (days): **355**

EBVs
Birth Direct: **2.88**
Weaning Direct: **16.8**

Weaning Maternal: **11.2**

Cell: +677 2331440

Email: clive@wolfranch.co.bw

Charolais

Clive Marshall

MCS 11 0043

DEXTER: WN 15 0002
Gerhardus Davis
Delmas, Mpumalanga

Age: **9**
Age 1st calving (months): **28**
Avg Weaning Index: **117**

Number of calves: **8**
Avg ICP (days): **353**

EBVs
Birth Direct: **2.09**
Weaning Direct: **7.4**

Weaning Maternal: **3.0**

Cell: 076 560 9856

Email: sales@mnani.co.za

Dexter

Gerhardus Davis

WN 15 0002

DRAKENSBERGER: CL 09 0069
Carel Nel
Brandfort, Free State

Age: **15**
Age 1st calving (months): **31**
Avg Weaning Index: **103**

Number of calves: **12**
Avg ICP (days): **375**

EBVs
Birth Direct: **-0.04**
Weaning Direct: **12.0**

Weaning Maternal: **8.4**

Cell: 082 828 1984

Email: carelnel02@gmail.com

Drakensberger

Carel Nel

CL 09 0069

DROUGHTMASTER: VOVA 13 0047
Chippy Watson
Underberg, KwaZulu-Natal

Age: **11**
Age 1st calving (months): **33**
Avg Weaning Index: **107**

Number of calves: **8**
Avg ICP (days): **377**

EBVs
Birth Direct: **1.80**
Weaning Direct: **3.8**

Weaning Maternal: **5.1**

Cell: 082 853 4975

Email: admin@vova.co.za

Droughtmaster

Chippy Watson

VOVA 13 0047

LIMOUSIN: LR 06 0029
AJ du Toit
Tulbagh, Western Cape

Age: **18**
Age 1st calving (months): **26**
Avg Weaning Index: **97**

Number of calves: **15**
Avg ICP (days): **385**

EBVs
Birth Direct: **0.90**
Weaning Direct: **15.0**

Weaning Maternal: **3.0**

Cell: 072 377 3792

Email: larhone@obiekwa.co.za

Limousin

AJ du Toit

LR 06 0029

NGUNI: EX 16 0123
Hannes Eksteen
Piketberg, Western Cape

Age: **8**
Age 1st calving (months): **23**
Avg Weaning Index: **110**

Number of calves: **7**
Avg ICP (days): **348**

EBVs
Birth Direct: **1.03**
Weaning Direct: **10.0**

Weaning Maternal: **9.0**

Cell: 082 946 2157

Email: exteen@telkomsa.net

Nguni

Hannes Eksteen

EX 16 0123

PINZGAUER: GB 12 0056
Bertie van Zyl Edms (Pty) Ltd
Modjadjiskloof, Limpopo

Age: **12**
Age 1st calving (months): **33**
Avg Weaning Index: **106**

Number of calves: **9**
Avg ICP (days): **389**

EBVs
Birth Direct: **1.69**
Weaning Direct: **9.2**

Weaning Maternal: **4.2**

Cell: 082 336 7199

Email: grootboom@zz2.co.za

Pinzgauer

Fanie Potgieter

GB 12 0056

PINZ²YL: WE 14 0002
Bertie van Zyl Edms (Pty) Ltd
Modjadjiskloof, Limpopo

Age: **10**
Age 1st calving (months): **32**
Avg Weaning Index: **107**

Number of calves: **8**
Avg ICP (days): **367**

EBVs
Birth Direct: **-0.01**
Weaning Direct: **5.8**

Weaning Maternal: **2.3**

Cell: 082 336 7199

Email: grootboom@zz2.co.za

Pinz²yl

Fanie Potgieter

WE 14 0002

SA ANGUS: ZDW 14 0009
Sanetta du Preez
Stellenbosch, Western Cape

Age: **10**
Age 1st calving (months): **29**
Avg Weaning Index: **101**

Number of calves: **9**
Avg ICP (days): **332**

EBVs
Birth Direct: **0.33**
Weaning Direct: **22.5**

Weaning Maternal: **5.5**

Cell: 082 495 5107

Email: sanetdp@gmail.com

SA Angus

Sanetta du Preez

ZDW 14 0009

SA BRAFORD: NT 13 0005
TJ, Theuns & Marlene de Jager
Ladysmith, KwaZulu-Natal

Age: **11**
Age 1st calving (months): **36**

Number of calves: **8**
Avg ICP (days): **368**

EBVs
Birth Direct: **2.70**
Weaning Direct: **17.0**

Weaning Maternal: **7.0**

Cell: 072 909 1861

Email: marlene.dejager@gmail.com

SA Braford

Theuns de Jager

NT 13 0005

SA HEREFORD: BMH 15 0041
Bertus Mong
Villiersdorp, Western Cape

Age: **9**
Age 1st calving (months): **28**
Avg Weaning Index: **115**

Number of calves: **7**
Avg ICP (days): **350**

EBVs
Birth Direct: **1.26**
Weaning Direct: **20.4**

Weaning Maternal: **13.7**

Cell: 082 947 0701

Email: bertus@ppmong.co.za

SA Hereford

Bertus & PJ Mong

BMH 15 0041

SANTA GERTRUDIS: DJW 11 0009
Amy Williams
Barberton, Mpumalanga

Age: **13**
Age 1st calving (months): **30**
Avg Weaning Index: **104**

Number of calves: **10**
Avg ICP (days): **368**

EBVs
Birth Direct: **1.59**
Weaning Direct: **14.1**

Weaning Maternal: **4.6**

Cell: 083 627 0978

Email: amy@scotston.co.za

Santa Gertrudis

Amy Williams

DJW 11 0009

SENEPOL: VL 13 0026
Theuns Vlotman
Brandfort, Free State

Age: **11**
Age 1st calving (months): **26**
Avg Weaning Index: **109**

Number of calves: **8**
Avg ICP (days): **358**

EBVs
Birth Direct: **1.21**
Weaning Direct: **8.9**
Weaning Maternal: **7.3**

Cell: 083 899 7977
Email: vlotvlei@yahoo.com

Senepol


Theuns Vlotman — VL 13 0026

SIMMENTALER: GV 11 0223
Stephan Voigts
Klein Windhoek, Namibia

Age: **13**
Age 1st calving (months): **20**
Avg Weaning Index: **109**

Number of calves: **11**
Avg ICP (days): **356**

EBVs
Birth Direct: **0.40**
Weaning Direct: **24.0**
Weaning Maternal: **14.0**

Cell: 0026 481 1244430
Email: stephanv@iway.na

Simmentaler


Stephan Voigts — GV 11 0223

SOUTH DEVON: JM 14 1693
John & James Miller
Cathcart, Eastern Cape

Age: **10**
Age 1st calving (months): **37**
Avg Weaning Index: **113**

Number of calves: **7**
Avg ICP (days): **362**

EBVs
Birth Direct: **1.61**
Weaning Direct: **22.7**
Weaning Maternal: **10.9**

Cell: 083 659 8269
Email: johnno@hazeldean.co.za

South Devon


James & John Miller — JM 14 1693

SUSSEX: TZ 15 0108
Theo van Zyl
Ladybrand, Free State

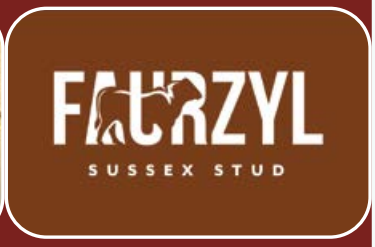
Age: **9**
Age 1st calving (months): **29**
Avg Weaning Index: **105**

Number of calves: **7**
Avg ICP (days): **346**

EBVs
Birth Direct: **2.73**
Weaning Direct: **21.5**
Weaning Maternal: **7.2**

Cell: 082 564 4921
Email: theovanzyl@vodamail.co.za

Sussex

Theo van Zyl — TZ 15 0108

TULI: CR 13 0104
Cornelis Rautenbach
Reitz, Free State

Age: **11**
Age 1st calving (months): **37**
Avg Weaning Index: **111**

Number of calves: **8**
Avg ICP (days): **351**

EBVs
Birth Direct: **0.51**
Weaning Direct: **7.4**
Weaning Maternal: **8.3**

Cell: 082 371 4390
Email: nonstoet@schoolink.co.za

Tuli


Cornelis Rautenbach — CR 13 0104

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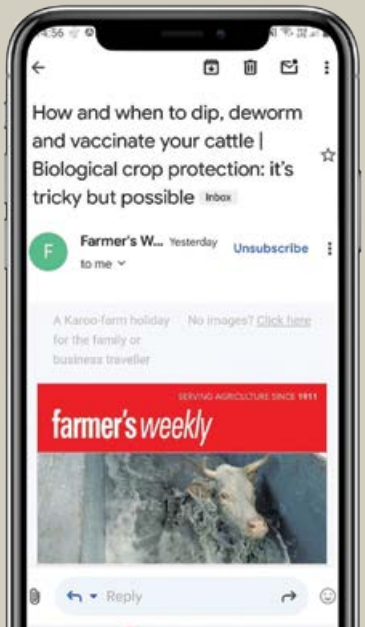

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2024 ARC NATIONAL PLATINUM BULL AWARDS

sponsored by GMP-Leader Products SA

It is known as the “best from the best” award category because, in addition to having outstanding performance figures themselves, bulls can only be eligible for this honour if they were bred from an elite cow. Although more than one bull per breed may be eligible for this prize, the strict adjudication criteria usually mean that very few bulls are eligible. In order to be eligible, bulls had to have passed the ARC’s Phase C test with a Gold Merit certificate, and the bull’s dam had to be granted Elite cow status in the year that the bull was awarded Gold Merit. Additionally, eligible bulls are required to have completed their Phase C test between 1 January and 31 December 2023.

This award category, which has been competed for 28 years, has been sponsored for last thirteen consecutive years by GMP-Leader Products SA, one of the ARC’s esteemed partners.

The 11 ARC National Platinum Bulls with their figures and owners.

Bonsmara

Gert & Gerhard Nel
Danhof, Free State

Cell: 082 800 0444
Email: gertjnel@mweb.co.za

GJN 22 0345
ADG Index: **112**
Adjusted Scrotum circumference: **311**

FCR Index: **115**

Dam: GJN 15 0072
Age (years)**: 9**
Calvings: **7**
Age 1st Calving (months): **31**

Avg ICP (days): **361**

EBVs
Birth Direct: **2.03**
Weaning Direct: **21.8**

Weaning Maternal: **14.3**

GJN 22 0345

GJN 22 0450
ADG Index: **108**
Adjusted Scrotum circumference: **371**

FCR Index: **112**

Dam: GJN 12 0093
Age (years): **12**
Calvings: **9**
Age 1st Calving (months): **34**

Avg ICP (days): **374**

EBVs
Birth Direct: **1.24**
Weaning Direct: **11.4**

Weaning Maternal: **7.0**

GJN 22 0450

Bonsmara

Nick Serfontein
(Sernick Bonsmaras)
Edenville, Free State

Cell: 082 554 7690
Email: nick@Sernickgroup.co.za

NFS 22 0015
ADG Index: **105**
Adjusted Scrotum circumference: **352**

FCR Index: **113**

Dam: VV 14 0046
Age (years): **10**
Calvings: **8**
Age 1st Calving (months): **24**

Avg ICP (days): **366**

EBVs
Birth Direct: **2.40**
Weaning Direct: **20.8**

Weaning Maternal: **5.8**

NFS 22 0015

NFS 22 0203
ADG Index: **104**
Adjusted Scrotum circumference: **383**

FCR Index: **111**

Dam: ZVJ 13 0101
Age (years): **11**
Calvings: **8**
Age 1st Calving (months): **30**

Avg ICP (days): **367**

EBVs
Birth Direct: **1.60**
Weaning Direct: **12.0**

Weaning Maternal: **7.5**

NFS 22 0203

NFS 22 0205
ADG Index: **112** FCR Index: **107**
Adjusted Scrotum circumference: **314**

Dam: NFS 13 0014
Age (years): **11**
Calvings: **8**
Age 1st Calving (months): **29** Avg ICP (days): **421**

EBVs
Birth Direct: **1.90**
Weaning Direct: **19.1** Weaning Maternal: **10.0**


NFS 22 0205

NFS 22 0244
ADG Index: **107** FCR Index: **109**
Adjusted Scrotum circumference: **337**

Dam: VV 14 0529
Age (years): **10**
Calvings: **7**
Age 1st Calving (months): **22** Avg ICP (days): **403**

EBVs
Birth Direct: **0.67**
Weaning Direct: **15.4** Weaning Maternal: **4.6**


NFS 22 0244

NFS 22 0568
ADG Index: **104** FCR Index: **111**
Adjusted Scrotum circumference: **367**

Dam: NFS 10 0135
Age (years): **14**
Calvings: 10
Age 1st Calving (months): **31** Avg ICP (days): **424**

EBVs
Birth Direct: **1.08**
Weaning Direct: **11.4** Weaning Maternal: **6.7**

NFS 22 0568

PINZ²YL: PZ 22 0122
Bertie van Zyl (Pty) Ltd
Mooketsi, Limpopo

ADG Index: **120** FCR Index: **116**
Adjusted Scrotum circumference: **355**

Dam: PZ 14 0333
Age (years): **10**
Calvings: **7**
Age 1st Calving (months): **28** Avg ICP (days): **396**

EBVs
Birth Direct: **0.69**
Weaning Direct: **4.2** Weaning Maternal: **9.5**

Cell: 082 336 7199 Email: grootboom@zz2.co.za

Pinz²yl


Fanie Potgieter


PZ 22 0122

SA HEREFORD: ZK 22 0176
Carl Scholtz
Clocolan, Free State

ADG Index: **129** FCR Index: **122**
Adjusted Scrotum circumference: **368**

Dam: ZK 13 0143
Age (years): **11**
Calvings: **8**
Age 1st Calving (months): **31** Avg ICP (days): **385**

EBVs
Birth Direct: **1.45**
Weaning Direct: **15.4** Weaning Maternal: **6.7**

Cell: 083 305 0668 Email: drscholtz@zuikerkop.co.za

SA Hereford

Willem & Carl Scholtz

ZK 22 0176

SANTA GERTRUDIS: SS 22 0129
Desmond Robertson
Bloemfontein, Free State

ADG Index: **104** FCR Index: **118**
Adjusted Scrotum circumference: **338**

Dam: JO 10 0084
Age (years): **14**
Calvings: **10**
Age 1st Calving (months): **35** Avg ICP (days): **387**

EBVs
Birth Direct: **0.40**
Weaning Direct: **5.8** Weaning Maternal: **6.1**

Cell: 082 494 7032 Email: desmond@desley.co.za

Santa Gertrudis

Desmond Robertson

SS 22 0129

SUSSEX: CC 22 0123
C.B. Cillié
Bloemfontein, Free State

ADG Index: **100** FCR Index: **115**
Adjusted Scrotum circumference: **346**

Dam: CC 13 0032
Age (years): **11**
Calvings: **8**
Age 1st Calving (months): **35** Avg ICP (days): **379**

EBVs
Birth Direct: **2.95**
Weaning Direct: **31.0** Weaning Maternal: **10.2**

Cell: 083 388 0830 Email: ccillie@bfn.co.za

Sussex

Erina Cillié du Preez & C.B. Cillié

CC 22 0123

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2024 ARC NATIONAL KyD PROVINCE OF THE YEAR AWARD

sponsored by Molatek

The objective of this award is to recognise the province with the highest number of participating farmers in the scheme (KyD). These farmers must be registered on INTERGIS and must have loaded data on the database between April of the year preceding the award and March of the year of the award. The three provinces with the highest number of participating farmers will receive the accolades Platinum, Gold and Silver respectively. This award was only introduced in 2016.

This year's finalists for the KyD province of the year were:

- Eastern Cape
- KwaZulu-Natal
- Mpumalanga

The ARC National KyD Province of the Year Award for 2024 was awarded to

Kwa-Zulu Natal
(Platinum award)

Gold was awarded to:
Mpumalanga

Silver to:
Eastern Cape

2024 ARC NATIONAL Kaonafatso ya Dikgomo OF THE YEAR AWARD

sponsored by Plaas Media/Stockfarm

One of the ARC's flagship awards that recognizes emerging beef farmers who excel in herd management and record keeping as part of the Kaonafatso ya Dikgomo (KyD) Scheme. This award, celebrating its 22nd anniversary, identifies finalists from across South Africa who aim to become commercial farmers. The KyD Scheme helps emerging cattle farmers improve productivity through beef recording and selection technologies. With over 8,000 members, the scheme supports improved herd management and economic growth. The award encourages farmers to enhance their livelihoods, promotes KyD participation, and highlights the benefits of performance testing in beef farming.

The purpose of the Kaonafatso ya Dikgomo Scheme is to recognize cattle farmers who excel in herd management and performance.

Key goals include:

1. Encouraging farmers to improve their livelihoods through better animal production;
2. Promoting participation in the scheme;
3. Advancing breeding and management practices in the beef industry;
4. Showcasing the benefits of performance testing by identifying top-performing herds.

The 9 provincial winners for 2024 were as follows:

EASTERN CAPE
Weziwe Zondani
Kings Glen Farm, Komga

Breed: Beefmaster & Brahman
Herd size: 158
Calving rate: 92

Cell: 073 291 9159 /
073 292 6858

FREE STATE
Pule Moalosi
Hoërop, Bultfontein

Breed: Bonsmara
Herd size: 59
Calving rate: 95

Cell: 076 810 6635

GAUTENG
Catherine Sepeng
Portion 14 Jagersbosch Alias,
Van Slagterbosch 407, Fochville

Breed: Commercial
Herd size: 137
Calving rate: 80

Cell: 083 308 7955

KWA-ZULU NATAL
Ziphozakhe Zuma
Amafu Farming, Estcourt

Breed: Simbra
Herd size: 248
Calving rate: 95

Cell: 076 161 4494

LIMPOPO
Azwinndini Maiwashe
Maiwashe Estate,
Morebeng

Breed: Bonsmara
Herd size: 190
Calving rate: 85

Cell: 060 481 0584 /
082 258 7888

MPUMALANGA
Philip Mahlangu
Leeupoortjie JS 267 P4,
Middelburg

Breed: Commercial
Herd size: 75
Calving rate: 76

Cell: 064 951 3381 /
076 367 1690

NORTH WEST
Kgabiso Mookeletsi
Sekai farm, Mahikeng

Breed: Nguni
Herd size: 84
Calving rate: 100

Cell: 076 714 0219

NORTHERN CAPE
Pieter Theys
Membysvlakte, Griekwastad

Breed: Simbra
Herd size: 41
Calving rate: 95

Cell: 073 366 9800

WESTERN CAPE
Thamsanqa Mxokozeli
Riverside Farm, Riverside

Breed: Bonsmara & Sussex
Herd size: 66
Calving rate: 90

Cell: 082 938 9841

The winner of the 2024 ARC National Kaonafatso ya Dikgomo of the Year Award is Thamsanqa Mxokozeli from Riverside

Thamsanqa Mxokozeli
Cell: 082 938 9841

Kaonafatso ya Dikgomo

A new dawn has broken: Contributing to Food Security through Animal Improvement

Agricultural Research Council's Kaonafatso ya Dikgomo is a dedicated animal recording scheme for emerging/smallholder farmers

Solutions Solutions Solutions

- We provide a comprehensive suite of animal health and production services
- We partner with you to determine your needs and action
- We collect animal performance information
- We use scientific methods to select animals and help you grow your livestock enterprise
- We have proven track record of success
- We offer advice on livestock marketing
- Over 7 000 emerging/smallholder farmers are benefitting under the scheme

Eligibility and Participation

Any emerging/smallholder cattle farmer can participate in the scheme and it is operational in all nine provinces.

For more information about the scheme, contact

012 672 9111

Human Communications 129321

For more general information about the Agricultural Research Council, please visit our website at www.arc.agric.za

2024 ARC NATIONAL MENTOR OF THE YEAR AWARD

sponsored by Molatek

MOLATEK

This award category's main goal is to recognise farmers who have demonstrated extraordinary leadership abilities and efforts to develop capacity and skills by sharing information, mentoring, and helping other farmers adopt and apply pertinent technologies and management techniques to increase their sustainability and productivity. To put it briefly, this award category evaluates how a farmer uses his or her expertise, experience, and abilities to help others. Farmers that fall into this group should have a track record of success that demonstrates their efforts to teach and train others, as well as -and this is crucial- the results of their activities and mentoring programs.

This year we had two winners for this category:

SCOTSTON FARMS (PTY) LTD • (SANTA GERTRUDIS)
Amy Williams • Barberton, Mpumalanga • Email: amy@scotston.co.za
Cell: 083 627 0978

SERNICK GROUP • (BONSMARA)
Nick Serfontein • Edenville, Free State • Email: nick@sernickgroup.co.za
Cell: 082 554 7690

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Regional Sales Manager
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Gerrit Venter
079 492 2244
Volksrust

CP De Vos
082 415 8239
Standerton

Theuns Botha
082 820 5858
Ermelo

Riaan Raath
082 652 9311
Rustenburg

Pieter Smit
082 467 5549
Middelburg

Nardus Van Wyk
082 775 9437
Lichtenburg

NAMIBIA

Paul Van Der Merwe
081 129 4418
Windhoek, Namibia

BOTSWANA

Nardus Van Wyk
082 775 9437
Botswana

WESTERN & EASTERN CAPE REGION

Gerhard Van As
Regional Sales Manager
082 771 4037
George

Kobus Gerber
082 452 4031
Riversdale/Garden Route

Gawie Bester
082 774 2579
Porterville

JC Vollgraaff
079 264 7965
Overberg/Hermanus

Charl Vorster
084 812 7378
Mid-Karoo/De Aar

Reece Dormehl
083 304 8092
Barkly East

Hennie Slabbert
082 336 6442
Jeffreys Bay/Klein Karoo

Peter Webster
083 232 1249
Alexandria/Cannon Rocks

Neels Van Rooyen
084 578 0820
Cradock

CENTRAL REGION

Stephan Cronje
Regional Sales Manager
082 771 4044
Parys

Arno Ferreira
082 829 3887
Dewetsdorp

Koos Van Rensburg
082 781 3825
Klerksdorp

Bendre Herholdt
082 376 9864
Parys

Neels Muller
082 467 5573
Hoopstad

Gerrit Naude
082 781 3827
Upington

Frikkie Nel
082 771 4033
Senekal

Jayef Steyn
082 826 1058
Delareyville

Jan-Hendrik Zietsman
084 513 8616
Reitz

Reinier Müller
082 924 7835
Kroonstad

Abrie Nortje
082 451 7573
Vrede

LIMPOPO REGION

Pierre Marais
Regional Sales Manager
082 413 4166
Ellisras

Rinus Riekert
071 468 1088
Settlers

Naas Steenekamp
082 497 8492
Modimolle

Fanie Van Jaarsveld
082 325 5574
Vivo

KZN REGION

Espee Olivier
Regional Sales Manager
082 771 4035
Vryheid

Shaun Miles
082 779 3197
Kokstad

Neale White
071 302 0706
Bergville

Erich Beneke
066 195 8334
Vryheid

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MOLATEK

2024 ARC NATIONAL SPECIAL PERFORMANCE TEST CLASS

sponsored by Plaas Media/Stockfarm

This award category, which has been contested for more than 40 years, seeks to honour bulls with outstanding performance characteristics. Bulls that passed the National Beef Recording and Improvement Scheme's standardised growth test (Phase C) in 2023 and received Gold or Silver merit certificates are eligible to compete in this prize category. The attribute known as residual feed intake, or RFI, which characterises a bull's capacity to use feed effectively, is also taken into account. Performance qualities and functional efficiency are both considered in the adjudication criteria, and only one bull in each breed is ultimately chosen to represent the entire breed. As a result, every bull representing his breed who competes, is declared the breed's overall national champion.

Herewith the 20 bulls with their respective performance figures and the owners with their contact details.

BEEFMASTER: DT 22 0001
Timmy Robertson
Bloemfontein, Free State

Birth date: **10/10/2022**
ADG (g): **2144** ADG index: **125**
FCR (kg/kg): **4.25** FCR index: **130**

Adjusted Shoulder Height (mm): **1223**
Adjusted Body Length (mm): **1414**
Adjusted Scrotum circumference (mm): **369**

Centre tested: **Glen**

Tel: 079 496 0115 Email: Robertson12timmy@gmail.com

Beefmaster

Desmond & Timmy Robertson

DT 22 0001

BEEF SHORTHORN: BLK 22 0611
Laurence & Allistair Brown
Alexandra, Eastern Cape

Birth date: **25/03/2022**
ADG (g): **1871** ADG index: **111**
FCR (kg/kg): **6.06** FCR index: **103**

Adjusted Shoulder Height (mm): **1103**
Adjusted Body Length (mm): **1444**
Adjusted Scrotum circumference (mm): **313**

Centre tested: **Winter Castles trading 34CC**

Tel: 083 236 4040 Email: blackstonebeef@gmail.com

Beef Shorthorn

Laurence & Allistair Brown

BLK 22 0611

BORAN: OLI 22 0046
Paul Brits
Naboomspruit, Limpopo

Birth date: **16/10/2022**
ADG (g): **1527** ADG index: **133**
FCR (kg/kg): **5.46** FCR index: **118**

Adjusted Shoulder Height (mm): **1155**
Adjusted Body Length (mm): **1259**
Adjusted Scrotum circumference (mm): **308**

Centre tested: **Irene**

Tel: 084 982 1122 Email: michbrits@gmail.com

Boran

Paul, Michelle & Michaela Brits

OLI 22 0046

BRAHMAN: CRE 22 0052
Ampie & Riki Rossouw
Mokopane, Limpopo

Birth date: **14/11/2022**
ADG (g): **1307** ADG index: **109**
FCR (kg/kg): **5.88** FCR index: **108**
RFI: **-2.139**

Adjusted Hip Height (mm): **1222**
Adjusted Body Length (mm): **1355**
Adjusted Scrotum circumference (mm): **245**

Centre tested: **Bufland**

Tel: 083 273 6330 Email: crebrahmane@mokipane.za.net

Brahman

Ampie & Riki Rossouw

CRE 22 0052

BRANGUS: WW2 22 0042
Myburgh Wessels, Reddersburg, Free State

Birth date: **23/12/2022**
ADG (g): **2028** ADG index: **120**
FCR (kg/kg): **4.71** FCR index: **123**
RFI: **-1.491**

Adjusted Hip Height (mm): **1260**
Adjusted Body Length (mm): **1472**
Adjusted Scrotum circumference (mm): **369**

Centre tested: **Glen**

Tel: 082 333 3396 Email: myburgh@nexia-sabt.co.za

Brangus

Myburgh & Tewie Wessels & David Nel

TWO B BRANGUS

WW2 22 0042

BRAUNVIEH: LT 22 0012
Abie Rademeyer
Petrusville, Northern Cape

Birth date: **08/11/2022**
ADG (g): **2133** ADG index: **117**
FCR (kg/kg): **4.96** FCR index: **116**

Adjusted Shoulder Height (mm): **1204**
Adjusted Body Length (mm): **1455**
Adjusted Scrotum circumference (mm): **363**

Centre tested: **Vryburg**

Tel: 083 282 3996 Email: arenddbrademeyer@gmail.com

Braunvieh

Abie Rademeyer

LT 22 0012

CHAROLAIS: BB 23 0728
Dewald van der Merwe
Lichtenburg, North West

Birth date: **28/01/2023**
ADG (g): **2333** ADG index: **119**
FCR (kg/kg): **4.47** FCR index: **122**

Adjusted Hip Height (mm): **1314**
Adjusted Body Length (mm): **1505**
Adjusted Scrotum circumference (mm): **321**

Centre tested: **Vryburg**

Tel: 079 898 0785 Email: dewald@tacet.co.za

Charolais


Dewald van der Merwe


BB 23 0728

DEXTER: MAC 22 0001
Mark Wiseman
George, Western Cape

Birth date: **03/03/2022**
ADG (g): **1201** ADG index: **100**
FCR (kg/kg): **5.81** FCR index: **115**

Adjusted Shoulder Height (mm): **1096**
Adjusted Body Length (mm): **1332**
Adjusted Scrotum circumference (mm): **326**

Centre tested: **Elsenburg**

Tel: 071 879 7390 Email: info@markwiseman.com

Dexter


Mark Wiseman


MAC 22 0001

DRAKENSBERGER: AAD 22 0032
Jan Dhooge
Heidelberg, Gauteng

Birth date: **14/09/2022**
ADG (g): **2062** ADG index: **117**
FCR (kg/kg): **3.79** FCR index: **129**

Adjusted Shoulder Height (mm): **1177**
Adjusted Body Length (mm): **1436**
Adjusted Scrotum circumference (mm): **373**

Centre tested: **Dhooge**

Tel: 082 892 5762 Email: jandhooge67@gmail.com

Drakensberger


Jan Dhooge


AAD 22 0032

HUGENOOT SA: YARI 22 0043
Frikkie du Plessis
Modimolle, Limpopo

Birth date: **12/07/2022**
ADG (g): **1689** ADG index: **114**
FCR (kg/kg): **5.63** FCR index: **111**

Adjusted Shoulder Height (mm): **1167**
Adjusted Body Length (mm): **1391**
Adjusted Scrotum circumference (mm): **333**

Centre tested: **Bufland**

Tel: 083 229 8798 Email: frikkie@chavari.co.za

Hugenoot SA


Frikkie du Plessis


YARI 22 0043

LIMOUSIN: LULU 22 0002
Louis de Jager, Bloemfontein, Free State

Birth date: **25/06/2022**
ADG (g): **2224** ADG index: **124**
FCR (kg/kg): **4.64** FCR index: **117**
RFI: **-1.67**

Adjusted Hip Height (mm): **1252**
Adjusted Body Length (mm): **1402**
Adjusted Scrotum circumference (mm): **327**

Centre tested: **Glen**

Tel: 083 240 1588 Email: ronelburger13@hotmail.com

Limousin


Louis, Ronél & Louis (jnr) de Jager


LULU 22 0002

NGUNI: ZZN 22 0039
Bertie van Zyl (Pty) Ltd
Mooketsi, Limpopo

Birth date: **22/10/2022**
ADG (g): **1133** ADG index: **107**
FCR (kg/kg): **5.83** FCR index: **110**

Adjusted Shoulder Height (mm): **1159**
Adjusted Body Length (mm): **1344**
Adjusted Scrotum circumference (mm): **310**

Centre tested: **Bufland**

Tel: 082 336 7199 Email: grootboom@zz2.co.za

Nguni


Fanie Potgieter


ZZN 22 0039

PINZGAUER: GB 22 0060
Bertie van Zyl (Pty) Ltd
Mooketsi, Limpopo

Birth date: **12/11/2022**
ADG (g): **1781** ADG index: **105**
FCR (kg/kg): **5.74** FCR index: **106**

Adjusted Shoulder Height (mm): **1142**
Adjusted Body Length (mm): **1410**
Adjusted Scrotum circumference (mm): **347**

Centre tested: **Bufland**

Tel: 082 336 7199 Email: grootboom@zz2.co.za

Pinzgauer


Fanie Potgieter


GB 22 0060

PINZ²YL: PZ 22 0020
Bertie van Zyl (Pty) Ltd
Mooketsi, Limpopo

Birth date: **14/09/2022**
ADG (g): **1557** ADG index: **120**
FCR (kg/kg): **6.03** FCR index: **120**

Adjusted Shoulder Height (mm): **1076**
Adjusted Body Length (mm): **1296**
Adjusted Scrotum circumference (mm): **383**

Centre tested: **Bufland**

Tel: 082 336 7199 Email: grootboom@zz2.co.za

Pinz²yl


Fanie Potgieter


PZ 22 0020

SA ANGUS (Black): SCJ 22 0031
Seymour Currie
Melkbosstrand, Western Cape

Birth date: **22/02/2022**
ADG (g): **1817** ADG index: **95**
FCR (kg/kg): **5.63** FCR index: **105**

Adjusted Hip Height (mm): **1200**
Adjusted Body Length (mm): **1456**
Adjusted Scrotum circumference (mm): **325**

Centre tested: **Elsenburg**

Tel: 072 143 6114 Email: worsie.jdfarms@gmail.com

SA Angus


Seymour Currie


SCJ 22 0031

SA ANGUS (Red): SCJ 22 0094
Seymour Currie
Melkbosstrand, Western Cape

Birth date: **30/05/2022**
ADG (g): **2115** ADG index: **111**
FCR (kg/kg): **5.81** FCR index: **103**

Adjusted Hip Height (mm): **1222**
Adjusted Body Length (mm): **1481**
Adjusted Scrotum circumference (mm): **369**

Centre tested: **Elsenburg**

Tel: 072 143 6114 Email: worsie.jdfarms@gmail.com

SA Angus


Seymour Currie


SCJ 22 0094

SA BRAFORD: GM 22 0061
Gert van der Merwe & Johan de Jager
Bethal, Mpumalanga

Birth date: **03/03/2022**
ADG (g): **2153** ADG index: **121**
FCR (kg/kg): **5.25** FCR index: **106**

Adjusted Hip Height (mm): **1207**
Adjusted Body Length (mm): **1408**
Adjusted Scrotum circumference (mm): **344**

Centre tested: **Sernick**

Tel: 060 966 3693 Email: de.jagerskraal@gmail.com

SA Braford


Gert van der Merwe & Johan de Jager


GM 22 0061

SANTA GERTRUDIS: DS 22 0001
Sandra Janse van Vuuren, Sannieshof, North West

Birth date: **05/02/2022**
ADG (g): **2089** ADG index: **124**
FCR (kg/kg): **5.03** FCR index: **118**
RFI: **-.381**

Adjusted Hip Height (mm): **1259**
Adjusted Body Length (mm): **1423**
Adjusted Scrotum circumference (mm): **373**

Centre tested: **Vryburg**

Tel: 083 508 5376 Email: marius@ramref.co.za

Santa Gertrudis


Sandra Janse van Vuuren


DS 22 0001

SUSSEX: CC 22 0123
C.B. Cillié
Bloemfontein, Free State

Birth date: **14/11/2022**
ADG (g): **1778** ADG index: **100**
FCR (kg/kg): **5.15** FCR index: **115**

Adjusted Hip Height (mm): **1203**
Adjusted Body Length (mm): **1424**
Adjusted Scrotum circumference (mm): **346**

Centre tested: **Glen**

Tel: 083 388 0830 Email: ccillie@bfn.co.za

Sussex

Erina Cillié du Preez & C.B. Cillié

CC 22 0123

WAGYU: FGW 22 0223
Fredericksburg Wagyu Stud
Owned by L'Ormanns
Franschhoek, Western Cape

Birth date: **15/06/2022**
ADG (g): **1969** ADG index: **117**
FCR (kg/kg): **5.18** FCR index: **106**

Adjusted Hip Height (mm): **1208**
Adjusted Body Length (mm): **1381**
Adjusted Scrotum circumference (mm): **301**

Centre tested: **Elsenburg**

Tel: 082 610 5397 Email: stefan@fredericksburg.co.za

Wagyu

Stefan Terblanche (Stud Manager)

FGW 22 0223

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2024 ARC NATIONAL BEEF CATTLE IMPROVEMENT HERD OF THE YEAR AWARD

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A herd had to achieve several minimum performance criteria in order to be considered as a nominee for this category. It is now among the most esteemed award categories. Over and above the performance of the herd, the nominee's involvement in the industry, interactions with other farmers, and attempts to develop and enhance the beef production sector are also evaluated in this category. This award category is open to Southern African breeders and herds of all breeds.

The traits that are assessed relate to the performance of the herd itself and includes:

- The level of reproduction of the herd
- Overall participation and implementation of performance testing as a tool for improvement
- Cow efficiency in the herd (including post-weaning performance)
- The completeness of performance records
- The size of the cowherd (must consist of at least 50 cows)
- The calving performance of the herd
- Genetic trends and progress in the herd and the application of modern scientific breeding techniques.
- The contributions and reputation of the participating herd owner is also considered, in particular regarding his/her leadership and guidance to other farmers and stakeholders.

The 2024 Top 5 finalists for the ARC National Beef Cattle Improvement Herd of the Year were as follows:

ANKO BONSMARAS

André Höll, Vryburg-North West

Cell: 083 260 6479
Email: ankobonsmaras@gmail.com

EXSTEEN NGUNI'S & SANGAS

Hannes Eksteen, Piketberg-Western Cape

Cell: 082 946 2157
Email: exteen@telkomsa.net

LORIZA BRAHMANE

Louis Meyer, Zeerust-North West

Cell: 082 925 3829
Email: loriza@truenw.co.za

ONDEKA SIMBRA

Werner Wilckens, Otjiwarongo-Otjosondijupa

Cell: +264 81 366 5177
Email: wilckens@iway.na

LOUWRENS SANTAS

Manie Louwrens, Leandra-Mpumalanga

Cell: 082 335 7220
Email: Rlouwrens0311@gmail.com

The winner of the ARC National Beef Cattle Improvement Herd of the Year 2024 was EXSTEEN NGUNI'S & SANGAS of Hannes Eksteen

Hannes Eksteen, Piketberg-Western Cape
Cell: 082 946 2157 • Email: exteen@telkomsa.net

Prestigious Certificate of Quality of International Committee for Animal Recording issued to National Beef Recording and Improvement Scheme

The National Beef Recording and Improvement Scheme (NBRIS) of the Agricultural Research Council (ARC) is proud to announce its prestigious accreditation by the International Committee for Animal Recording (ICAR). The accreditation certificate was also shared with a number of other programmes managed by the Animal Production campus that are involved with animal and production recording of dairy cattle and small stock and the genetic evaluation in beef cattle, as outlined below.

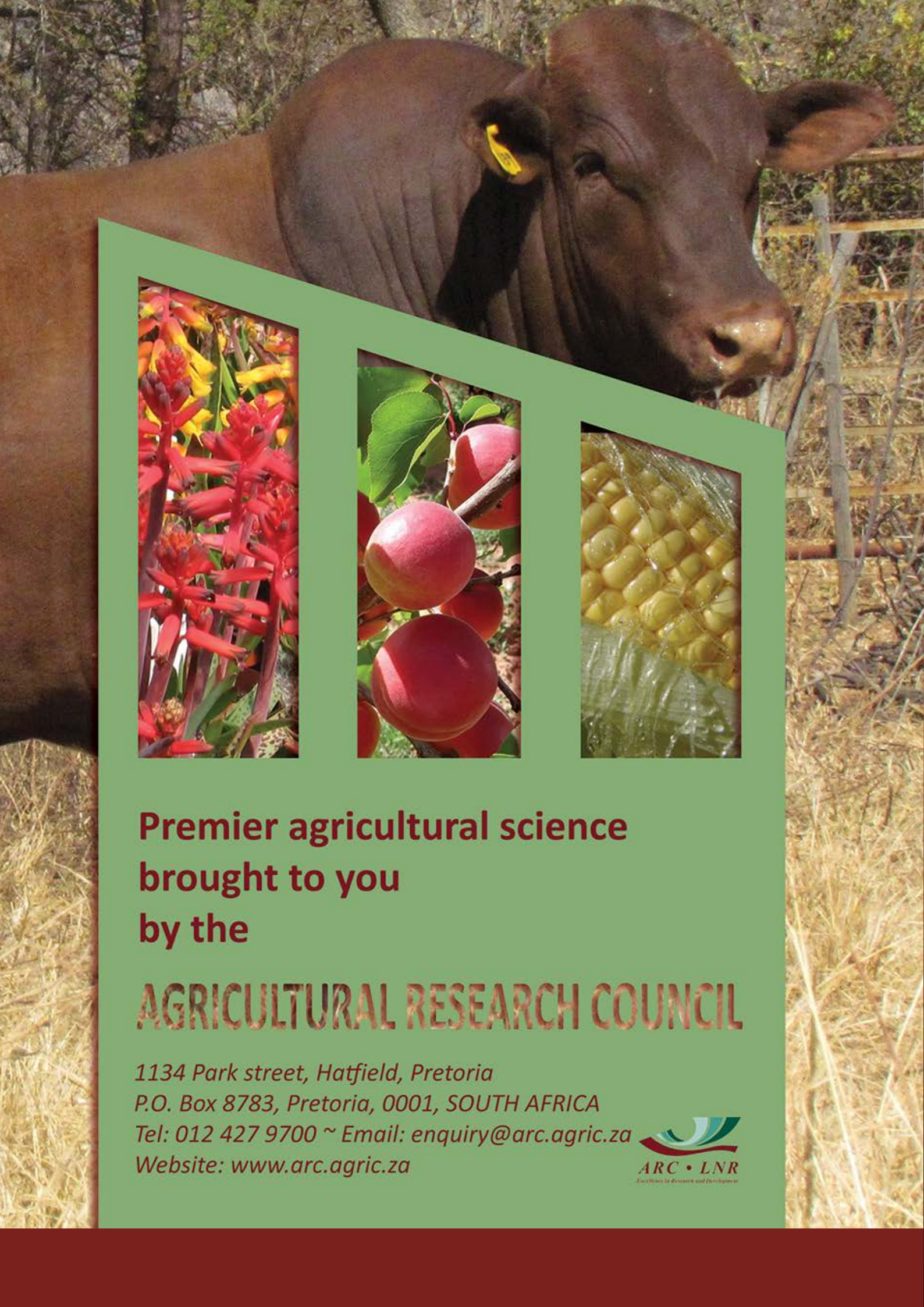
As an International Non-Governmental Organisation (INGO), ICAR aims to promote the development and improvement of animal identification, performance recording and evaluation in farm animal production. Its objectives are achieved through the establishment of definitions and guidelines for measuring characteristics of economic importance. In a nutshell, ICAR champions the creation of quality based animal production systems around the world.

Being accredited with ICAR is vital for programmes like the NBRIS and associated programmes as it ensures its animal recording systems meet global standards of accuracy, transparency, and reliability. This accreditation also enhances the credibility of the ARC's research, data collection, and genetic evaluation efforts, making our findings and recommendations widely accepted by international stakeholders. Additionally, ICAR accreditation helps its accredited members stay aligned with best practices in animal breeding and performance recording, supporting sustainable agricultural development and improving the effectiveness of breeding programs within the agricultural sector. The guidelines provided by ICAR also sets global standards in beef recording and establishes rules and standards, specific for the purpose of identifying animals, the registration of their parentage, recording their performance and evaluating their genetics.

The ICAR Certificate of Quality will be valid until December 2029 and will be covering the following activities:

- Beef recording
- Animal identification in dairy and beef cattle
- Animal identification in dairy and meat for other species
- Milk recording in cattle
- Data processing
- Meat recording in other species
- Production recording of other traits
- Herdbook recording
- Milk Laboratory analysis
- Genetic evaluation in beef cattle

This prestigious accreditation not only validates the high standards of the National Beef Recording and Improvement Scheme and associated programmes of the Animal Production campus, but also reinforces the ARC's commitment to advancing sustainable, globally recognized practices in animal breeding, data collection, and genetic evaluation.



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How Climate Change is Reshaping Beef Cattle Production in South Africa

Pertunia Mailula,
Noluthando Ngcobo & Mamakie Lungwana
ARC-Animal Production, Irene
MailulaP@arc.agric.za

Introduction

Beef cattle farming is a foundation of South Africa's rural economy, significantly impacting livelihoods and national economic stability. The sector provides employment opportunities; especially in rural areas where, alternative job opportunities are limited. Beef cattle production contributes approximately 0.33% to South Africa's GDP, equivalent to R26,202 million. However, this important sector is increasingly at risk due to climate change, which threatens its long-term sustainability and productivity.

Change on beef cattle production

Climate change causes many challenges to beef cattle production in South Africa, affecting various aspects of the industry. Over the last 30 years, the sector has experienced major changes because of rising temperatures, changes in rainfall patterns, and more frequency of extreme weather events. The most affected areas in the beef cattle industry include heat stress and animal welfare, forage and water resource management, as well as disease and pest dynamics.

1. Heat Stress and Animal Welfare:

Rising temperatures are a serious threat to cattle welfare. Heat stress harms cattle health by lowering their appetite and reducing reproductive efficiency, which results in less milk production and slower weight gain. This not only affects the animals' well-being but also the overall productivity of the farm. In extreme cases, heat stress can cause higher death rates among cattle. To reduce these effects, farmers need to implement heat management strategies such as providing enough shade, improving ventilation in housing facilities, ensuring access to cool and clean water. New technologies such as cooling systems and heat-tolerant cattle breeds are also important in managing heat stress.

2. Forage and Water Resource Management:

Climate change greatly affects the availability of forage and water resources. South Africa's agricultural sector is increasingly affected by unpredictable and reduced rainfall, leading to drought conditions that negatively affect pasture growth and reduce the availability of water supply. Feed shortages are a major concern, as they lead to poorer cattle health and decreased productivity. To cope with the effects of climate change, farmers are adopting sustainable grazing practices, such as rotational grazing, which helps maintain soil health and pasture quality. Additionally, farmers can adopt water-saving techniques, such as using

efficient irrigation systems for forage production and collecting rainwater to ensure there is enough water for their cattle.

3. Disease and Pest Dynamics:

The warmer climate also affects the frequency and spreading of pests and diseases, which affects cattle. Many germs and parasites increase in warmer conditions, leading to increased disease risk. This means that farmers need better ways to manage these threats by doing regular health monitoring and vaccination programs. A combination of pest management practices, such as the use of insecticides and biological controls, is important for managing the increased risk of disease outbreaks. Farmers must stay updated about emerging threats and adjust their management practices accordingly.

Adaptation Strategies and Future Outlook

There are several strategies that farmers can adopt to ensure the resilience of the beef cattle industry towards climate change namely:

- **Innovative Breeding Practices:** Developing cattle breeds that are more resilient to heat and other climate stresses is important. Ongoing research into heat-tolerant breeds and genetic selection aims to improve cattle adaptability, feed efficiency, and overall productivity. Farmers may also benefit from using advanced breeding technologies, such as genomics, to accelerate the development of climate-resilient breeds.
- **Sustainable Agricultural Practices:** Implementing sustainable practices is vital for adapting to climate change. Agroecological approaches, which focus on improving soil health and animal and plant variety, can improve the resilience of pastures and reduce the use of artificial chemicals. Efficient water use practices, such as drip irrigation and soil moisture monitoring, help improve water resources and reduces the impacts of drought. Soil conservation techniques, including cover cropping and reduced tillage, enhance soil fertility and support sustainable forage production.
- **Technological Innovations:** Advancements in technology offer new tools for managing the effects of climate change. Precision agriculture, which uses data and technology to make the best use of resources, can make managing forage and water more efficient. Climate forecasting tools and early warning systems offer important information that helps with planning and making decisions for farmers. Additionally, technology-enabled monitoring systems can track cattle health, forage conditions, and environmental factors, enabling timely interventions and informed management decisions.

What is the way forward?

Moving forward, the beef cattle industry should focus on a few key areas. For example, investing in research to create cattle breeds that can handle climate changes well and adopting new, sustainable farming practices. Also, educating farmers about these methods and technologies will help them adapt better. The Government can also chip in with support and financial incentives to encourage the use of these new strategies. Working together with farmers, researchers, and policymakers, and involving the community, will ensure that solutions fit local needs. Lastly, regularly checking and improving these efforts will help the industry stay strong and sustainable despite climate change.

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Optimum weaner weight for profit

Frans Jordaan
& Dr Ben Greyling
ARC-Animal Production, Irene
Fransj@arc.agric.za

Introduction

Cow productivity is usually associated with the frame size of a cow. Bigger cows tend to produce bigger calves at birth as well as a heavier calf at wean, which is related to a higher or better price per kilogram, paid by feedlots. However, is bigger always the more profitable option in a wean calf production system? Surely, other factors, which can play an important role, should also be considered. The input costs versus output should form the basis when considering a calf production system aimed at the feedlot market.

Heavier animals are usually associated with a bigger frame, as mentioned, which results in an increase in maintenance requirements because of a higher milk production, high visceral organ weight and an increased need for feed supply to sustain high production. These animals are usually higher in body lean weight and lower in body fat when compared with smaller frame animals, which are associated with lower maintenance requirements and lower milk production. Small frame animals have a lower visceral organ weight, low body lean weight and are higher in body fat weight. These animals require a lower feed supply than their bigger frame counterparts. Smaller frame animals will typically be those, which reach maturity at an earlier stage in life than big frame breeds.

This is typical of the two extreme frame sizes which are usually breed specific, but animals within the same breed can also differ quite significantly in frame size which implies a need for balance and a need to identify an adapted, optimum animal based on a specific production environment and market requirements.

Breeding objectives to improve the efficiency of beef production

It is important to maintain or increase production per unit (calf growth and/or milk production of the cow) to enable the commercial beef producer to ensure sustainability of his enterprise or increased profitability. Due to the important role of the cow-calf phase in the production of beef, it makes sense to concentrate on this phase in order to increase the efficiency of production. Sixty- to seventy percent of the cost in producing beef is due to feeding costs and the solution should be to look more closely at the bull and cow for feed efficiency.

Feed efficiency

According to literature, the genetic variation for maintenance linked to energy requirements is moderate to high and this highlights the value of genetic selection to improve feed efficiency. Relevant research is currently applied by all the role players in South Africa. Young bulls are tested in centralized bull testing centres of the Agricultural Research Council to identify the most effective young bulls at converting feed into meat.

Feed conversion ratio

Feed conversion ratio has always been seen as an indication of feed efficiency and is a ratio that indicates the amount of kilogram feed needed by the animal to convert into one kilogram of live weight. This ratio unfortunately does not serve as an ideal trait for selection purposes; because of the combination of two combined traits, e.g. feed intake as well as growth. If used as a selection criteria the outcome will always be selection for growth as well as an increase in body weight and/or frame size.

Residual feed intake

When testing animals for residual feed intake, these two traits can be scientifically separated and the most efficient animals in relation to feed intake can be identified independently from growth. It makes sense to select for superior bulls due to the big genetic influence of the bull in a cowherd.

Also, keep in mind if the female progeny of these bulls are kept as replacement heifers, genetic improvement can then be established within the herd by improving the feed efficiency of the cowherd, and therefore the efficiency of beef production for a specific environment.

Cow weight

Cow weight as an indication of cow size and the tempo of calf growth are essential factors to be considered by the commercial breeder to ensure efficiency of his production system. Hence the importance to also weigh your cows at weaning.

Cow efficiency

Numerous methods have been investigated in the past to evaluate cow efficiency. Kilogram of calf weaned per cow exposed is a combination of production and fertility of the cow to produce. Another option is kilogram of calf weaned per cow exposed per kilogram of cow weight which is the well-known cow-calf ratio used by farmers to evaluate their cows. The benchmark is usually a cow that is able to wean at least 50% of her own weight, but this will only benefit the smaller cows. Keep in mind that 50% of a 300-kilogram cow will produce a 150-kilogram calf, which may not be in demand by feedlots. In general, feedlot agents will see calf wean weight as an indicator for potential growth in the feedlot.

An example of an efficient cow. The photo was taken from the Afrikaner herd at the ARC Irene campus

The option of kilogram of calf weaned per cow exposed per unit of feed requirements (large stock unit) makes provision for feed efficiency as well as the production ability and fertility of the cow. In South Africa, a Large Stock Unit (LSU) is defined as the equivalent of an ox with a weight of 450kg and a weight gain of 500g per day on grass pasture with a mean Digestible Energy (DE) concentration of 55%.

Fertility

Improvement in fertility, which is indicated by the calving percentage, needs to be increased from the current 62% of the commercial sector. The general objective should be an increased wean calf production without an increase in mature cow weight. This can be accomplished by either making use of cross breeding or an increase in the milk production of the dam. The ideal is to produce more from fewer resources to improve on the efficiency of beef production.

What is an ideal weaning weight for the feedlot?

According to a prominent and successful Bonsmara breeder the goal of producing calves at birth between 35 and 37 kilogram with an average growth of 1 kilogram per day up to weaning will ensure a 240 kilogram wean calf, which is in demand by feedlots. This can be a benchmark for beef farmers farming with medium frame animals. He also calculates profitability as the number of calves weaned from the number of cows mated during the mating season.

For the commercial producer, a goal to produce the desired weaner for the feedlot and to satisfy his market by succeeding in that. An average wean calf of 235 kilograms would allow the feedlot to add an additional 200 kilograms of meat over a three or four month period to ensure a profitable calf for the feedlot production system. This implies that the most profitable calf is not always the heaviest calf at wean, but rather an optimum wean calf weight which is acceptable for the commercial market requirements.

Management

Management is an environmental factor, which has a big influence on the efficiency of cow-calf production. The need is for replacement heifers of good quality genetics to maintain production

of the cowherd and also to improve production of the herd. Older cows become less efficient with a decline in milk production and have to be replaced with heifers of good quality. Teeth of older cows start to deteriorate and result in less feed intake, which has a detrimental influence on their body condition, milk production, and they therefore wean below average calves. The production environment is also a determining factor, which will guide breeders to ensure the best-adapted frame type as well. The production environment will determine the optimum cow size and not the other way round.

Manage the condition of cows before mating as well as before calving to ensure higher percentage of pregnancy and a stronger calf at birth. Over-feeding will also increase the birth weights of calves and this should be prevented. If the breeder tries to create an environment for the optimum cow by supplement feeding it is not a sustainable environment for the cowherd and can influence the sustainability of his production system. Always keep in mind that the easier the cow gives birth the quicker and shorter her recovery period will be after birth, and as a result, it will be easier to get her pregnant again in the following mating season.

Genetic selection

The logical way to ensure genetic improvement is to always improve on the current herd sire by utilizing BLUP breeding values and the purchase of registered bulls. Never buy bulls without performance data and BLUP breeding values. The use of a terminal bull (with extreme breeding values) for specific traits, such as growth tempo, is another option to increase cow efficiency in the herd but all progeny of these bulls should be slaughtered and the females should not be kept as breeding material or replacement heifers.

Cow efficiency selection index on auction catalogues

A combination of these traits should form part of a selection index:

- Fertility is the most important trait to ensure a cow produces at least one calf per year
- Growth ability of the calf to ensure a calf which is accepted by the feedlots
- Maternal or milk production of the cow to assist the calf to reach the potential weaning weight
- Cow weight, which is an indication of frame type and should be limited
- Birth weight of the calf to limit calving problems

Service providers calculate selection indices, which is a combination of all above-mentioned traits into one value, known as a cow value index. BLUP breeding values, are valuable genetic selection tools. Breeding values represent the genetic merit of an animal and needs to be considered for mating the most suitable bull with cows to ensure genetic improvement.

Conclusion

Dr Gordon Dickerson used to say “On a farm, an efficient cow herd exhibits early sexual maturity, a high rate of reproduction, low rates of dystocia, longevity, minimum maintenance requirement, and the ability to convert available energy into the greatest possible kilograms of weaned calves”.

Take home message

Get hold of the auction catalogue as early as possible prior to the auction date and do a “genetic selection” of bulls that fit into the breeding objectives specified for the herd and maximum profitability is usually achieved before maximum productivity.

Emerging farmers may catch-up faster in livestock farms than other farm enterprises redistributed as part of land reform

Dr Siphe Zantsi
& Noluthando Ngcobo
ARC, Research Support and Coordination, Hatfield
ZantsiS@arc.agric.za

Introduction

The South African Land reform policy has a constitutional mandate and seeks to achieve both restorative justice and equitable land ownership across all races while protecting the rights of farm workers and people living in former homelands. Since it was signed into policy in 1997 White Paper, the South African land reform policy, especially the land redistribution component has been clouded with negativity: slow pace in redistributing farms to black farmers and poor performance in the farms redistributed to black farmers.

Throughout literature and for the purpose of this article, emerging farmers are understood as farmers that benefited from land reform. This group of farmers come from previously disadvantage racial groups: blacks, Indians and coloureds (hereafter referred to as black farmers in this article). Based on our previously published work it seems that emerging farmers are likely to perform better in livestock farms than other farm enterprises such as horticulture and crop farming. We unpack the implications of this assertion in the success of land redistribution programme of the land reform policy.

The basis of our argument

Productivity gap between small-scale agriculture, where emerging farmers are pulled from, and commercial agriculture is known to be very wide. These are also the basis of the dualism within our agricultural sector. For example, maize yields: according to the crop estimate committee smallholder attain an average of 2 tons per hectare versus an average of 6 tons per hectare in the commercial sector. Here the productivity gap is 4 tons per hectare, which is very huge. Our assumption is that the wider the productivity gap, the slower the catchup time for emerging farmers when they take over some of the commercial farms as they benefit from the land redistribution programme.

In our published study, we found that potential emerging farmers' livestock activities, particularly cattle farming, show a smaller productivity gap than crop activities relative to their commercial counterparts. For example, in cattle, 86% of potential emerging farmers had an offtake between 61% and 100% of the offtake attained by their commercial counterparts. This was lower for goat ranging between 40% - 60% and much lower in sheep where the highest offtake rate was only 6% of offtakes attained by commercial farmers. Comparatively, the productivity gap for maize was lower than livestock but much lower than all enterprises were horticultural enterprises like vegetables.

Why is Livestock Farming a Better Bet?

The success of smallholder farmers in livestock production is attributed to lower input costs. While commercial farmers invest heavily in high-yield maize varieties and advanced farming techniques, smallholders are more focused on cost-effective livestock farming. This means that with proper support and resources, emerging farmers could more quickly scale their livestock operations to match commercial levels.

The study found that cattle farming is particularly promising. Nearly 86% of potential emerging farmers were operating at 61-100% of the commercial productivity level in cattle farming,

which challenges the concept that smallholder farmers are always less efficient than commercial ones.

Additionally, cattle farming plays an important role in rural economies. Many of these emerging farmers don't only raise cattle for their own consumption but also sell their livestock at local markets, helping to support their communities and grow their businesses.

Relevance of the findings to the success of land reform

What is then this narrow productivity gap between emerging farmers and commercial farmers' livestock off-take mean for the success of land redistribution? This simply means that emerging farmers might have higher chances of succeeding in livestock farms specifically beef cattle farms than in farms dominated by other enterprises for example in a wine farm. Of course, productivity gap or farming skill is not the only factor. Hence, we use 'might', because there are also other factors contributing to how an emerging farmer will perform in commercial farm under the land redistribution programme. The productivity gap only reflects farming skill.

Other factors needed to succeed include finance. To run the farm business – purchase inputs, feed, animal remedies, acaricides, vaccines, pay labour etc. need money. For land redistribution beneficiaries this comes under the Comprehensive Agricultural Support Programme (CASP), which according to beneficiaries takes for ever to come. DALRRD is still trying to improve the situation. Other factors include knowledge and access to formal markets. Operating at a commercial level where one sells many weaners at once might need a reliable market than relying on individual sale on animals to cut costs of transportation to the market. And many commercial farms are located far away from the informal markets -communal areas and townships where people want to buy cattle for ceremonies.

The other relevance of the narrower gap stem from the fact that a large share (about 80%) of South Africa's agricultural land is only suitable for livestock grazing. As such, many farms according to the 2017 Census of Commercial Agriculture are mixed farms with larger share of livestock enterprises. Also, most redistributed land reform farms are livestock farms. Thus, a success in livestock farms might mean more success in many redistributed farms.

Moreover, livestock farms where much of the land is for grazing are relatively cheaper than horticultural land with fruit trees or vines and irrigation. Meaning that more livestock farms can be purchased for redistribution to black farmers per given budget than horticultural farmland. However, this does not mean that land reform beneficiaries must be given livestock farms only. Land redistribution must balance racial land ownership and in doing so be mindful of training and investment costs that should accompany each farmland enterprise.

Concluding remarks

The success of land reform is crucial for the sustainability of our agricultural sector and national food security. It is also important to make land reform succeed to change the negativity clouding it. Such success requires coordination and support from all stakeholders. Farmers, government, private sector, researchers, and beneficiaries have a role in making land reform a success.

Inclusion of genomic information in genetic evaluations enhances the accuracy of breeding values

Delight Kgari
& Prof Linky Makgahlela
ARC-Animal Production, Elsenburg, Stellenbosch
Kgarir@arc.agric.za

The South African beef industry is the second fastest-growing segment in the agricultural sector. Beef cattle breeders aim to enhance the genetic merit of animals, while the goal of commercial beef production enterprises is to produce highly desirable beef for consumption in the most efficient manner. Cattle producers strive to improve the reproductive and productive efficiencies of their herds through good management practices and genetic selection, to make their production systems more profitable without drastically increasing input costs. The production efficiency of desirable beef is influenced by traits such as fertility and health, maternal ability, growth rate, feed efficiency, longevity, carcass merit, and conformation or structural soundness.

Traditional breeding programmes based on estimated breeding values (EBV) evaluated using performance and pedigree information, have slower rates of genetic gain. This is more so for traits expressed later in an animal's life and/or are difficult to measure (e.g. fertility and meat quality). Genomic selection is a matured technology aimed to accelerate the rate of genetic gain by enabling higher accuracy of selection for young animals without any phenotypes. In this paper, we present our research findings on the accuracy of estimated genomically enhanced breeding values (GEBV) for fertility and production traits.

The genomic data were generated for the Afrikaner (456) and Brahman (399) cattle. Performance data for the Afrikaner (AFR) and Brahman (BRM) beef cattle breeds were obtained from the INTERGIS. The Brahman dataset contained 91 287 and 256 565 records for fertility and production traits, respectively, while the corresponding data for the Afrikaner contained 12 825 and 104 581 records, respectively. There were 226 172 and 886 277-pedigree records for the Afrikaner and Brahman cattle, respectively.

Table 1 The average, standard deviation (SD) and heritabilities with standard errors (SE) for fertility and production traits

Trait	Trait definition	Average ±SD	h^2± SE	Average ±SD	h^2± SE
		Afrikaner		Brahman	
Age at first calving (months)	Age at which a heifer had its first calf	33±3.71	0.33±0.03	37± 8.21	0.06±0.02
Inter-calving period (days)	Period between two successive calvings	473±92	0.09±0.02	499±100	0.08±0.01
Birth weight (kg)	The weight of the calf within 24 hours of birth	33±3.21	0.29±0.01	32 ± 4.08	0.19±0.00
Average daily gain (g)	The rate of weight gain per day over a specified period.	862±257	0.48±0.01	953±340	0.33±0.03

For both breeds, the averages for birth weight (BW) and average daily gain (ADG) were within the expected ranges according to their respective breed standards. However, averages for age at first calving (AFC) and inter-calving period (ICP) indicated slightly lower reproductive performance. The heritabilities were low for fertility and moderate for production, indicating a considerable exploitable genetic basis for improvement of reproductive and productive performance through genetic selection.

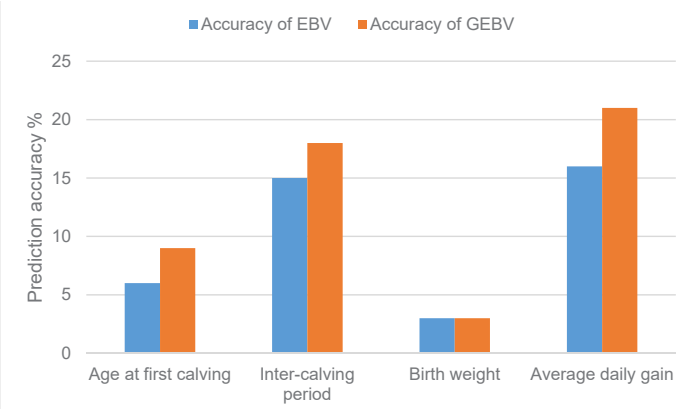

Figure 1 Accuracy of the fertility and production traits for the Afrikaner cattle breed

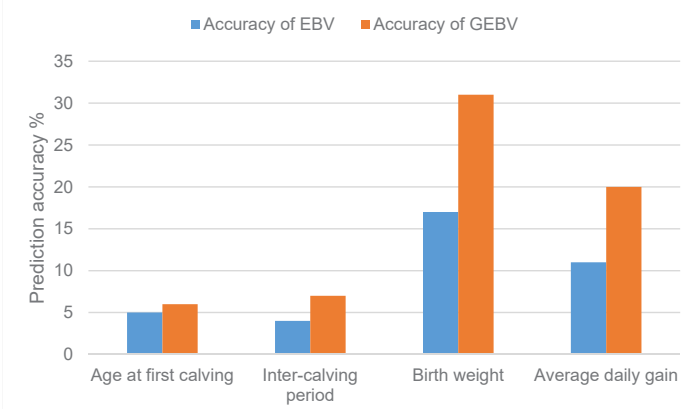

Figure 2 Accuracy of the fertility and production traits for the Brahman cattle breed

Our findings in Figures 1 and 2 show that the prediction accuracies of genomically enhanced breeding values were consistently higher than those of traditional EBVs, across traits and breeds, except for BW in the Afrikaner cattle where the accuracies for both traditional and genomic models were similar. Meanwhile, the accuracy of GEBV for BW (31%) in the Brahman was the highest observed accuracy across traits and breeds. The gains in the accuracy of GEBV were in the range 3-5% for the Afrikaner and 1-14% for the Brahman cattle.

The number of animals with genomic data was less than 500 in this study. Nevertheless, inclusion of these few genotyped animals resulted in GEBV accuracy gain of up to 3% for fertility traits and up to 14% for the production traits. This clearly indicates that prediction accuracy can be much enhanced by inclusion of genomic information into genetic evaluations relative to conventional evaluations. It could be noted that the gain in accuracy from pedigree to genomic predictions could be explained by more improved estimation of relationships from the actual dense marker genotypes. Therefore, to fully profit from this technique, it is recommended that the South African beef production industry ramp up genotyping to further boost GEBV accuracy and continue recording rare phenotypes such as fertility as there is potential for improvement of such low heritable traits.

The fundamentals of profitable beef breeding

Kobus Bester
Simbra Breed Society
Kobus@simbra.org

Setting specific, measurable breeding objectives is critical to the success of any beef breeding operation. Being able to monitor the progress of those objectives over time, will allow the beef breeder to determine areas that require additional attention or areas that are thriving.

One's primary goal, however, should be to be **profitable** and **sustainable** through beef breeding.

- An increase in turnover and a decrease in cost of production will result in profit, which is what is left after you paid all expenses out of the income that your beef breeding operation has earned.
- Sustainability is the balance between the profit you chase and your responsibility towards the long-term impact your profitable beef breeding operation/practices have on:
  - The environment
  - Animal welfare
  - The local community and other people involved in the beef value chain.

It is very important to ascertain what is within your control and what not. You need to optimise what is in your control and mitigate the risk of that which is outside of your control.

Within your control

Natural resources - profitable beef breeding involves optimising the use of available natural resources, as the key to profit through beef breeding, is the conversion of a low cost, self-replacing natural resource into high value product (beef). How you manage and utilise your natural resources (grazing/water) is within your discretion – act wisely!

In sync with nature - ensure that you manage your herd in such a way that their peak energy requirements coincide with the peak performance period (season) of the available grazing, in your region. Additionally, optimised carrying capacity is critical to open the door for synergy between the herd and the veld. Carrying capacity refers to the stocking rate of land at which animals can maintain optimal body condition score without harmfully depleting the natural resources.

Choice of breed – when deciding which breed to farm with, it is important to consider the following factors: adaptation to the climate and environment on your farm, production of the product you seek (weaner calves that meet buyer's preference), a frame size that will perform well in the environment on your farm, and appreciation for the breed. Choose the breed that ticks these boxes.

Choice of quality – it is easy to obtain inferior quality animals; they appear affordable but will be detrimental to the success of your breeding operation and your finances over the long-term. Low quality, underperforming animals take longer to become market ready, which is not cost effective in any production or reproduction system. Bulls are the drivers of genetic progress. Therefore, ensure that you exclusively make use of performance tested bulls (with estimated breeding values), that have passed visual inspection, are structurally sound, functional efficient, free from genetic defects, have tested clean from diseases like CA, trichomoniases and vibrioses, and have been certified as fertile.

Management practices – be disciplined in the implementation and execution of the correct

business plan and strategy. Adapt your practices timeously, prepare for the unexpected (risk mitigation), measure and evaluate performance levels, and do what you can to achieve set goals and targets according to your pre-determined timeline. Pay special attention to record keeping (tagging system with details of reproduction, disease treatment, inoculation programs) and maintaining healthy animals in optimal body condition to produce and reproduce at optimal performance levels.

Outside of your control

Climate – weather conditions, extreme unexpected coldspells, heatwaves, drought. The recent snowstorm has taught us that South Africa is not immune to any type of weather. Therefore, it is advised to always have a plan in place for the unexpected. Even predicted weather is unpredictable, but this should not deter you from educating yourself on weather patterns and trends. Building on that is to familiarize yourself with the ideal management practices for each potential weather wave.

Global disease outbreak - Foot and Mouth disease, even in another region that affects price and movement of animals. Mitigating risk is critical in the instance of disease outbreak. Ensuring the implementation of on-farm biosecurity as a basic, everyday practice, is sure to have positive returns.

Prices – producers are always price takers, no matter the situation, for the price of their product as well as input costs. Familiarizing yourself with annual price/cost trends will allow for preparation instead of surprise and panic. Prices/costs can change due to the "supply and demand" principle. Supply and demand are both influenced by outside factors, such as disease outbreak, seasonal celebrations (Christmas, Eid, or Easter), political factors (war in export countries or shifts in governmental), and climate extremes (drought). Fortunately, history repeats itself. Therefore, educate yourself on current events, both in and out of the agricultural sector, and study historic correlations between prices/costs and similar current events. Although current scenarios may not be the same, there are likely to be similarities and thus you can prepare accordingly.

Fires – the smallest spark can start a fire that burns for days, leading to heartbreaking losses. Plan and prepare for fires, build a reserve fodderbank in a safe place, train everybody on farm with basic firefighting training and put necessary preventative measures in place.

Theft - brand your animals timeously and clearly with your registered brand mark. Check your fences every day and count your animals.

Predators – plan where animals are when calving. Do not leave cows with calves in areas that are preferred and infested by predators. Something to consider, if possible, is to have a "maternity ward" (fenced off calving camp) that is close to home. This will not necessarily deter predators, but can aid you in stepping in to tend to predators more easily than if your cows and calves were out in the veld without any eyes on them, especially at night.

To summarize a winning concept that is fundamental for profitable beef breeding:

1. Choose a sought-after breed that you like, that can adapt well and that can utilize natural resources optimally to produce profitably.
2. Understand your available natural resources and environment and learn how to utilize both optimally.
3. Determine what is within and outside of your control.
4. Have a plan with clear goals & objectives.
5. Understand risks involved and how to mitigate them.
6. Acquire only the best quality animals.
7. Maintain optimal, production level condition score in your animals.
8. Maintain good health in your animals.
9. Happy, healthy animals tend to reproduce more frequently.
10. Optimise stocking rate (carrying capacity) and maximise fertility/reproduction to improve the likelihood of profitability.

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How to use performance data

Dr Michael MacNeil,
Prof Michiel Scholtz & Frans Jordaan
Delta G, Miles City, Montana, USA
Macneil.deltag@gmail.com

Performance data are presented to help you to choose the animals to buy and how much you want to pay for them. To make the best decisions, proper interpretation of the data is essential. Keep in mind the "Breeder's Equation" is:

Phenotype = Genotype + Environment.

The phenotype is equal to the genotype of the animal plus the effect of the environment in which it was raised. Most phenotypic weights and measures are less than 50% heritable, and sometimes much less. Thus, most of what we see, and measure is due to the environment and not to the genetics of the animal. But you cannot buy the environment. The environment does not go home with you when you buy an animal. The way to evaluate and buy genetic potential is to focus on the Estimated Breeding Values (EBV). Statistical science is used to make the EBV the best indication of each animal's genetic potential. Use the EBV to compare the animals in the sale offering. The calves from a bull with a weaning weight direct EBV of +20 kg are expected to weigh 5 kg more than the calves for a bull with a weaning direct EBV of +10. The same simple arithmetic works to compare two animals for any other trait using the corresponding EBV.

No animal is good for every trait. There are trade-offs to be considered. EBV indexes express the genetic value of an animal relative to some base population. How that base population is defined determines the value of the index for the EBV. Because the EBV indexes are all on the same scale, they may create the subjective impression that all traits are of equal economic value. This is simply not true. For example, even though weaning weight direct and weaning weight maternal are expressed on the same scale (kg), weaning weight direct has more value because it does not require processing the energy in the grass through the cow as does weaning weight maternal. A second example; as before a 10 kg difference between two animals in their EBV for weaning weight direct is expected to result in a 5 kg difference between the groups of their offspring. This will result in the offspring of the animal with the higher EBV bringing more money when the weaner calves are sold. Compare this to a -15-day difference in inter-calving period (ICP) between two animals. This difference produces the expectation that the future daughters of the animal with the numerically lower EBV will produce a greater number of progeny than the daughters of the animal with the higher EBV. Having more offspring to sell will result in you receiving more income. These simple comparisons, while glossing over a number of details in the calculation of economic values for different traits, illustrate the fact that not all traits have the same value. Thus, the EBV indexes for different traits cannot be considered equivalent even if they are the same numerically.

Think about how the animals will be used in your breeding program. Maybe that use is simply to add new genetics to your herd. Then their pedigrees become paramount. You are looking for pedigrees that are different from those that are widely represented in your herd today. In this circumstance, the EBV's are of less concern. A second possibility is that the animals are intended to correct a deficiency in the genetic profile of your herd. If, for example, you believe your herd to be short on growth potential then you want to

emphasize indications of high growth. A third possibility is simply that your herd is fine, and you just need to add a couple of stud bulls to your battery. In this case, you want to look for a balance in the EBV profile. Across the board, you'd like to have the animals you choose to have an EBV profile that is more or less similar to the profile of the cattle that are already in your herd. If you believe the herd from which you are considering buying animals to be genetically a bit better than your herd then average EBV indexes should be an improvement. Finally consider the case where you are buying an Afrikaner bull (Figure 1) to use on commercial cows and will be selling all of the resulting calves. In this circumstance, the EBV for ICP and maternal weaning weight should be ignored completely. This is in contrast to the situation where you anticipate retaining some of the progeny of your newly purchased bulls. Then more attention should be given to these "maternal" traits.

Figure 1 From this picture, you cannot tell which bull will suit your requirements the best

It may also be important to look at cow efficiency. Cow efficiency values are estimated from cow weight (indicates inputs) + weaning weight (indicates output) + inter-calving period (how frequent is a calf produced). Most service providers calculate a selection index for cow efficiency based on these components, and this is also published in auction catalogues.

One final thought. Extreme EBV's are not always better than those that are less extreme. The weaning weight maternal EBV provides a classic example of this phenomenon. Superficially, higher values of the weaning weight maternal EBV create the expectation of cows that produce more milk and therefore heavier weaner calves and thus greater income. However, it takes feed energy to produce milk. If the environment in which the cows are to be run does not provide that energy, then their rebreeding after calving may be delayed resulting in fewer calves at the end of the season. In a slightly different line of thinking, a high EBV for weaning weight direct may not result in heavier calves, if the environment in which they are to be raised is not sufficient to support their genetic potential for growth. There is some optimal EBV profile for animals to be raised on your farm. Find that optimal EBV profile and buy animals that correspond to it.

Don't just buy good looks. Buy genetics! EBV's are the GPS that helps you get this done.

Frans Jordaan
& Prof Michiel Scholtz
ARC-Animal Production, Irene
Fransj@arc.agric.za

Afrikaner herd at Irene campus

Background

The ARC-Animal Production and the Northern Cape Department of Agriculture, Environment, Land Reform and Rural Development in the Northern Cape has been collaborating on a crossbreeding project, which includes the Afrikaner breed. As part of the collaboration, surplus animals are transferred to Irene, which created the opportunity to select superior animals for breeding that formed the basis of the herd.

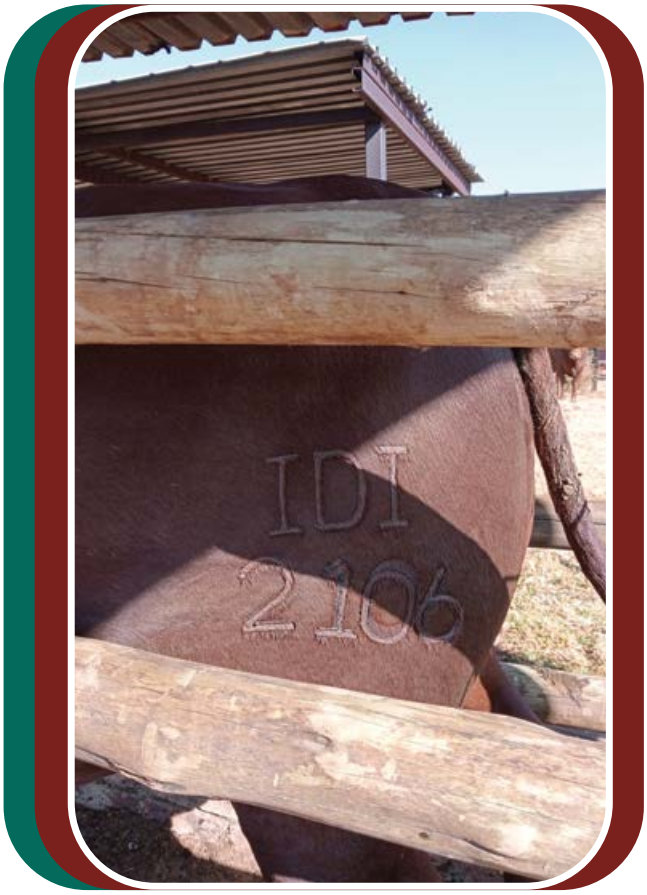

Photo 1 The herd designation mark (HDM) for AP

Photo 2 A group of weaner calves from the herd

Performance Recording

The complete herd is captured on the national database (INTERGIS) to ensure good record keeping and proper pedigree information. Calves born are captured on INTERGIS with all available information, such as date of birth, sex, the cow identification number and sire identification number. Reproduction information is then available on the system for each cow and her fertility in the herd can be monitored.

Weaning weight is recorded for each calf at 7–8 months and recorded on the system. Weaning weight reports are interpreted to identify the calves with the best growth tempo.

Post weaning performance testing include phase C testing at the Irene bull test center to identify potential breeding bulls based on performance and minimum breed standards.

Basic herd management such as a fixed breeding season from December to March are implemented.

Selection

Selection for superior genetics is based on scientific principles. Performance information is most important and although functional efficiency is considered, it will not be the most important criteria for selection. The ARC wants to empower breeders with profitable cattle and selection for "good looks" will not be the basis of our selection. Since officials started purchasing breeding material, traits such as fertility and growth, formed the basis of selection from the auction catalogue. Prior to the auction animals are inspected by breed inspectors and therefor, "quality control" regarding functional efficiency has been done on behalf of the potential buyer.

Photo 3 One of two bulls purchased from the well-known "Afric" stud herd. The depth of the bull is very obvious and a very good trait for a breeding bull

Potential of the herd

The Afrikaner breed is a well-adapted, hardy breed and require limited maintenance. Consider a small to medium frame cow, which is ideal suited for cross breeding with bigger frame bulls. The Afrikaner bulls are ideal to cross with Nguni cows to ensure heavier weaner calves for an increase in profit. The Sanganer is a well-known composite breed developed from this cross between Nguni and Afrikaner.

The herd serve as a demonstration herd at Irene during training sessions. The application of reports from the national database are explained during practical sessions and the application thereof in the herd as a selection tool. The campus is visited by farmers during farmer's days and the breed is promoted as a well-adapted breed that can produce grass fed branded beef as well as a commercial breed, in a well-defined cross breeding program to supply fast growing calves to the feedlot industry. The breed is also ideally suited for our small-scale farmers with limited resources.

Progress made and future plans

Improvement on fertility has been achieved in the past 5 years since the registration of the herd. Age at first calving and inter calving period has been reduced and currently better than the national average of the breed.

The herd has already been awarded by the Afrikaner breeder's society for a good inter calving period achieved by a small herd. More than ten bull calves were tested at the Irene bull testing center in a centralized phase C test and was rewarded with silver and gold merits for exceptional growth- and feed efficiency performance.

Another initiative from Prof Scholtz is an Afrikaner bull that was sent to Ncera, the ARC's experimental farm near East London for a cross breeding trial with Nguni cows. The bull is also from a Heartwater area and we are excited to see how we can improve on the weaning weights by crossbreeding Nguni cows with this Afrikaner bull.

Photo 4 Mr Simphiwe Nini, Ncera centre manager, with the Afrikaner bull bought from Dr Pieter De Kock from Thabazimbi that will be used in a crossbreeding trial with Nguni cows

Photo 5 The herd was demonstrated during a very successful farmer's day hosted at Irene campus on 14 April 2023

Photo 6 Dr Pieter De Kock, also an Afrikaner breeder from Thabazimbi, explaining the benefits of farming with Afrikaner cattle during the recent farmer's day at Irene campus on 11 September 2024

The herd will serve as a source of genetic material to other ARC experimental farms and as breeding material for small-scale farmers. The ARC is involved with numerous projects to develop small-scale beef farmers into commercial beef producers and to become part of the commercial value chain. New proposed projects with national government are initiated and show good potential for future collaboration.

Farmers interested in this breed can contact Mr Jordaan or Prof Scholtz at ARC Animal Production campus at Irene.

The negative effects of dehorning on calf welfare

Dr Rulien Erasmus
& Dr Simon Lashmar
ARC-Animal Production, Irene
ErasmusR@arc.agric.za

Animal welfare involves that people who work with animals (in any capacity) be mindful of the on-farm practices that they use and the conditions that their animals live in. On cattle farms, calves can be regarded as the most sensitive group of animals. Healthy and thriving calves contribute towards the productivity of the herd in the future, therefore, calf welfare should be considered important to any beef cattle farmer. As with any livestock production system, good stockmanship is the key to minimizing animal welfare problems in extensive beef cattle production enterprises.

For cattle, horns have been associated with many disadvantages. The main concern with horns in cattle is the potential risk of injury to other cattle, as well as animal handlers. Another big concern associated with horns is the risk of bruising when cattle are transported from the farm to the abattoir. Bruised meat on a carcass is condemned and has an economic impact for farmers. Therefore, disbudding and dehorning are standard practices for most beef cattle operations to have hornless cattle and are even recommended to prevent injuries to both cattle and the handlers.

Negative effects of dehorning

Dehorning is a routine management practice performed on most beef cattle farms across South Africa, either to prevent injuries to other cattle or handlers, to adhere to breed standards, or for entry into the feedlot. All methods of dehorning involve tissue destruction and regardless of the method used, dehorning is a painful and stressful procedure for calves, especially since very few farmers administer any form of medication for pain relief. On the majority of beef cattle farms, hot iron cauterization is the most used dehorning method (Figure 1). The use of caustic paste to chemically destroy the horn tissue is less common but is also painful.

Figure 1 Dehorning of a calf using hot iron cauterization

Even though the chronic pain associated with dehorning is difficult to identify and assess, the wound caused by dehorning might take several weeks or even a few months to heal properly. It has also been reported that dehorning influences weight gain negatively, especially during the first two to six weeks after dehorning and this effect may potentially be more significant in warmer climates.

Handling calves

After birth, calves born in extensive production systems may, in some instances, not be handled until weaning at approximately six months of age. Moving calves to kraals for dehorning, and

other management practices, might contribute to a stressful environment. Calves must always be handled gently and carefully, especially when moved and restrained. When handling calves, they should never be thrown, dragged, pulled, or caught by their neck, ears, limbs, tail, or other extremities. Electric prods and whips should not be used on calves when moving or transporting them. Inappropriate handling of calves could result in injuries and, in severe cases, death.

All farm personnel should be properly trained in the care, handling, movement, and restraint of calves of various ages. It is important to always use the least amount of force necessary to ensure the safety of animals and the handlers, as well as to minimize potential stress and injuries to the calf.

Recommendations

Horned calves are born with horn buds that will eventually grow into horns. The horn bud is not yet attached to the skull and horns attach to the skull when the calf is between two and three months old. Research recommends that calves should be dehorned as young as possible (with the use of a hot iron) because the horn buds of younger calves are smaller compared to older calves, which will then minimize the amount of tissue damage and inflammatory pain.

The fact that very few farmers implement the use of local anesthesia and/or inflammatory analgesic medications further emphasizes the need to address welfare concerns. A welfare-friendly and long-term solution to dehorning is to incorporate polled animals in the herd. Polledness is easy to observe and can be selected for in a well-designed breeding program. Polled animals will make dehorning redundant, thereby improving the welfare of calves.

Polledness is an observable phenotype that can be identified at a relatively young age (Figure 2) and does not change with age. Cattle that are polled, have a different head shape compared to horned animals and generally have a narrower more rounded poll (the central prominence of the head) compared to horned animals that present with a broad, flat poll (i.e., horn crown).

Figure 2 The distinct rounded head shape and cowlick in the hair between the ears that can be observed at birth for polled calves

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The Breeding Season: A friendly, cost-effective and natural source of high-quality feed for optimal reproductive performance in extensive beef production

Marble Nkadimeng
& Prof Linky Makgahlela
ARC-Animal Production, Irene
NkadimengM1@arc.agric.za

Progressive farming enterprises are using a well-defined breeding season as a cost-effective tool for sustainable reproductive management of livestock in extensive production systems. A breeding season (BS) could be defined as a management practice of breeding animals during a period of available good quality pastures. It does not typically follow the universal norm because this period varies from one region to another, largely driven by the local weather patterns. However, the golden rule is to coincide BS with months of peak rainfall (i.e., mostly in summer) when conditions for fodder and water availability are most favourable for animals. In tropical regions, extensive beef cattle farming in commercial and smallholder sectors depends on favourable weather conditions for improved herd performance. A year-round breeding plan results in higher operational costs associated with animals being at the peak of production e.g. pregnant, lactating, or ready to re-breed during unfavourable conditions.

The aim of this study was to investigate the effect of a breeding season on reproductive performance in smallholder beef cattle farms. Reproductive performance records, including pregnancy rate (PR), days open (DO) and calving interval (CI) were collected on 3 694 cows from 40 herds. The DO and CI were classified into 4 classes, as follows: 1) acceptable for 121 and 365 days, 2) concern 182 and 425 days, 3) extended for 243 and 456 days and 4) overly extended for 304 and 604 days, respectively. Our results showed favourable likelihoods of 3.8, 2.6 and 2.7 for PR, CI and DO, respectively, indicating that cows bred during the periods of December-March, November-February, and January-March were 2.6 to 3.8 times more likely to get pregnant, have shorter calving intervals, and fewer days open versus those bred all year-round at 0.4. Furthermore, as illustrated in Figure 1, we present the consequence of continuous breeding season on reproductive performance. Farm management practices without any defined BS resulted in 62% non-pregnant cows. Consequently, DO and CI in these herds were alarmingly in the 4th class, with most cows having overly extended DO ≥304 days (46%) and calving interval ≥608 days (68%). Thus, a defined BS is not just about bringing bulls and cows together, however, a game-changer that can make or break the cattle farm enterprise.

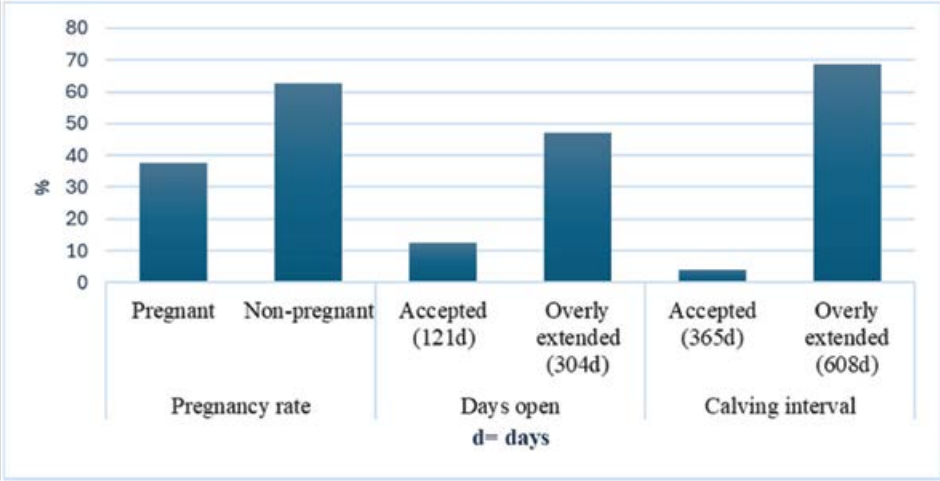

Figure 1 Consequence of continuous breeding season on reproductive performance

How to plan a practical region-specific breeding season

Note that different BS may exist for different farms and/or regions. Therefore, it is critical for farmers to establish a specific window for breeding to align calving and fodder availability. Understanding the local climate is crucial in planning a breeding season. Farmers must ask the following questions: 1) when does the wet/rainy season start? and 2) when does the dry season starts? Generally, it is recommended to commence the BS following the month with the highest rainfall, commonly referred to as the "green date". In South Africa, the wet/rainy season typically runs between October and March, however, due to changing climate this may slightly differ from one region to another. Figure 2 illustrates a breeding calendar with essential periods for introducing bulls for mating (rainy season) and the desired calving season (summer season). It is critical for farmers to also be versatile to the changing environment and adjust to their area-specific green date. As a principle, farmers should limit the BS within a window period of 60 to 90 days, to avoid delayed rebreeding, longer calving intervals and uneven calf production.

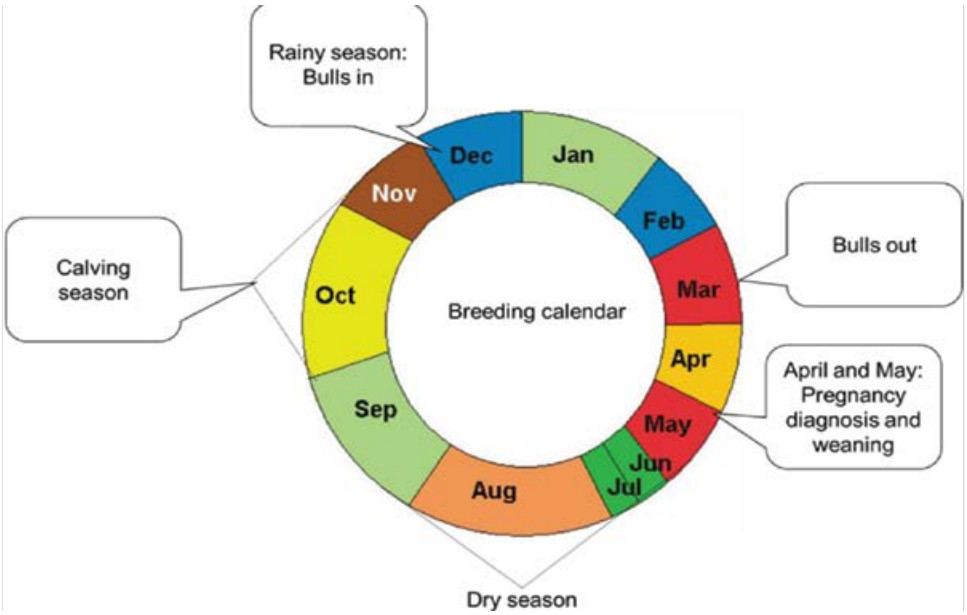

Figure 2 A practical breeding calendar for most South African regions

Benefits of a breeding season

A defined breeding season is a way of optimizing resources in simplifying herd management, feeding and healthcare. Managing breeding for predictable calving improves newborn care by reducing calf losses from harsh weather or inadequate attention. Synchronized breeding simplifies record-keeping and overall farm decision-making because tracking and monitoring of farm events such as oestrus cycles, pregnancy diagnosis and calving become much easier as they occur around the same time. It also improves lifetime productivity by shortening calving intervals. Aligning calving with peak forage availability minimizes the need for supplemental feeding, lowering expensive supplementary feeding costs. Furthermore, it gives farmers the opportunity to buy feed in bulk during off-peak seasons when prices are lower, which can yield significant savings. Breeding season promotes the implementation of herd-wide health management by creating a structured timeline for critical health interventions. This enables bulk treatments, which will lower the costs for veterinary services and medications. Moreover, planning routine farm interventions, such as deworming and vaccinations during the same period will increase efficiency and reduces labour costs. Breeding season is not just about timing but transforming cattle farming into a sustainable business by providing structure, optimization and predictability of herd performance.

Epigenetics – from the second world war to modern animal breeding

Prof Michiel Scholtz[1],
Georgette Pyoos[1], Bhaveni Kooverjee[1] & M Seshoka[2]
[1]ARC-Animal Production, Irene, South Africa; [2]Vaalharts Research Station, Northern Cape, South Africa
GScholtz@arc.agric.za

With the new genetic technology and its use in modern animal breeding, it is important that we as animal breeders and livestock farmers take note of the principle of epigenetics. It has been described as something we do not have in our genes, but which we can still pass on to our children. Epigenetics is associated with the expression of genes and therefore different phenotypes (appearance or performance). These modifications are influenced by environmental factors and can be passed on to the offspring of complex organisms, including humans and our livestock.

The concept of epigenetics is about the fact that the environment can change an animal's genetics, but not its DNA. The DNA is the building blocks of all life. Epigenetics means that there have been changes in the function of the DNA, without a change in sequence of the DNA, so the DNA remains exactly the same.

The famine in the Netherlands in 1944 during the second world war brought forth the first evidence of epigenetics in humans. Children of pregnant women, who were exposed to the famine during the war, were smaller and more susceptible to certain diseases. Poor nutrition of the foetus during pregnancy resulted in restricted growth of the foetus and increased susceptibility to disease in later life. Amazingly, these effects were also passed on to the children of these children, for up to three or four generations. It has since become clear that epigenetic modifications are not erased at fertilization of the affected human or animal offspring, and that the development of the embryo is influenced by a set of epigenetic modifications that can be passed on from both parents. These epigenetic modifications can therefore occur for more than one generation.

Epigenetics is an emerging area of research in animal nutrition, genetics and breeding. The modifications that occur in the epigenome (without changing the DNA sequence) contribute to phenotypic variation of the population. These modifications may have a genetic or environmental origin (e.g. diet, stress, disease), and many of them occur during embryonic development.

What is epigenetics?

Epigenetics occurs through a process known as DNA methylation which involves the addition of a methyl group to a DNA molecule. This can lead to the expression of a gene being turned on or off. When a gene is methylated, its expression is suppressed or turned off. But when the gene is unmethylated, the gene can be expressed or turned on.

The change in the function of the DNA results in a different phenotype (appearance / performance) without the DNA having changed. These changes are influenced by environmental factors and can also be passed on to the offspring. The environmentally induced epigenetic information is transmitted via the ovum and sperm. This then serves as a form of pre-programming in the offspring. If the survival of the parents is affected or limited by environmental factors, the offspring are now pre-programmed with

the necessary information to survive in a similarly adverse environment. However, if the environment differs from the predicted environment, this can lead to maladaptation (in the case of humans, for example, it leads to obesity or certain other diseases).

Another crucial tenet of Genotype-Environment Interaction (GEI) is the reaction norm. Phenotypic plasticity pertains to the manner in which the traits of a genotype are manifested in diverse environments. A response norm is a visual depiction that showcases the observable characteristics of a certain genetic makeup in connection to various environmental factors. The slope of the reaction norm indicates the degree of sensitivity of the genotype to changes in the environment. Steeper slopes suggest more sensitivity, indicating that the genotype's performance is significantly affected by environmental circumstances.

Epigenetics and animal production

Since both milk and meat production can be influenced by environmental factors, it may be possible to use epigenetics to examine these factors and discover the optimum breeding and management solutions to manipulate production. It may therefore be possible to use epigenetics to adapt the next generation of animals to specific environments. This process is going to be faster than conventional Mendelian genetics (or selection), which is a slow process, because it can happen within one generation. This concept also forms the basis of nutrigenomics, which is the interaction between nutrition, epigenetics and the genotype in animals.

Epigenetics is already being used to make poultry more heat resistant and in New Zealand progress have already been made in applying it to dairy cattle. However, most breeding programs do not yet take epigenetics into account, because this is still a very new field.

Overall, the results suggest that nutrition can have a significant impact on the epigenetic regulation of gene expression in dairy cows. By optimizing the diet of dairy cows, it is possible to improve their health (mastitis), milk production and composition by promoting beneficial epigenetic modifications, which will then be passed on to the offspring.

In poultry, there are initiatives to use epigenetics for improved heat tolerance and the utilization of alternative feeding practices for optimizing future broiler production by exposing the broiler parent lines to heat. There is evidence that when chickens or turkeys are exposed to high temperatures within the first few days of life, they have a much greater tolerance for heat stress experienced later in life. If this increased heat tolerance in poultry is caused by epigenetics, it can be passed on to the offspring. With evidence that epigenetics works in chickens, it will also be possible to adjust feed rations or feeding programs for chickens in such a way that they can change the gene expression to benefit the performance of broilers. For example, it may be possible to change feeds for parents or grandparents to benefit the performance of broiler offspring.

Australia is also engaged in an epigenetics study on beef cattle in which it looks at its effect on growth, behavioural and health characteristics.

Examples of epigenetics in South Africa

Is the fact that the Nguni is so widely adapted not possibly due to epigenetics? In the Vaalharts herd, we found that cow weight in the case of the Nguni had no effect on the weaning weight of the calves. The herd of origin did have an effect on weaning weight. This may possibly be the result of differences in the genetic merit between the different herds, but epigenetics cannot be ruled out.

In the crossbreeding project at Vaalharts, Bonsmara bulls are crossed with Nguni cows and Nguni bulls with Bonsmara cows. There are therefore reciprocal crossings. The offspring of Bonsmara bulls were found to perform better than those of Nguni bulls. We initially thought that the difference was due to the maternal characteristics of the

Nguni cow. However, the study of Bhaveni Kooverjee (Photo) produced interesting results. Genes were found in the offspring of Bonsmara bulls that did not occur in the offspring of Nguni bulls. Some of these genes were related lipid metabolism (linked to energy storage, hormone regulation and fat-soluble nutrient transport), body size and immunity. This may be one of the reasons for differences in performance between the reciprocal crosses.

The value of epigenetics

This type of technology can hopefully lead to precision farming where specific diets can be formulated for specific breeds or specific production systems. For example, the genes for muscle growth or fat deposition can be switched on or off. If a diet can be formulated that results in a reduction in methane emissions by switching certain genes on or off, the animal can produce more efficiently, since less energy will be lost due to methane production. This will also result in a lower carbon footprint and selection of appropriate genotypes for diverse circumstances which will lead to an increase in the fertility and productivity of beef cattle in warmer environment. This will also reduce the carbon footprint of beef production.

This 'soft' or epigenetic inheritance can change the next generation more quickly to adapt to new environments ("flash evolution") versus the slow process of Mendelian inheritance.

Both genetic and epigenetic principles influence genetic expression and must be considered when formulating breeding programs for changing environmental conditions. These approaches offer insights into improving breeding and management for sustainable and successful reproduction. Knowledge of epigenetic principles in the diverse environments should enable more effective control and management of such effects. By understanding and using the principles of epigenetics, we can move beyond traditional breeding programs and use new tools to improve productivity through an animal's biological performance and capacity to tolerate heat in the era of climate change. One example is to purchase breeding animals that have been kept under similar conditions to the herd in which they will be used.

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landbouradiog@gmail.com

Simplifying genomics: Its role and applications in the South African beef industry

Dr Simon Lashmar
& Dr Rulien Erasmus
ARC-Animal Production, Irene
LashmarS@arc.agric.za

"Genomics" is a buzzword that has grown in popularity over the past decade amongst various role-players in the livestock industry. It was first introduced to the animal agricultural community by animal breeding and genetics researchers and now forms part of a common language between inquisitive and research-focused farmers. Genomics is a biological field that studies an animal's genetic material, or DNA. In non-technical language, we are all familiar with the saying "It is in your genes" (referring to the fact that a certain trait, for example, one's "good looks" is inherited from his or her parents and grandparents). In the same way, this is exactly the basis of the application of genomics in livestock production – we select the animals that have inherited the "best" genes from their sire and dam, to breed the best-performing animals, for a specific trait, that meets the breeding goals of the farming operation.

DNA, the carrier of genetic information

DNA is the molecule that carries the genetic code for the development and functioning of any animal. For cattle, this genetic code is made up of approximately 2.7 billion building blocks that are referred to as nucleotide bases, and with only four types of bases (referred to here as "A", "C", "G", and "T" bases), the "genome" of an animal is, simply put, a 2.7 billion-letter word consisting of variations of A, C, G, and T-bases. Genes are smaller "strings" of letters (on average 40 000 letters long) within the larger 2.7 billion-letter "word" (the genome), that each code (either on their own or collectively) for specific characteristics or traits, for example, Polledness or birth weight in beef cattle. Collectively, the genetic makeup of any given animal determines all its physical (visual) and performance attributes. Animal breeders and geneticists have, therefore, had a long-lived interest in determining the exact genetic "code" of animals. This became a possibility for the first time in 1977 when a method for DNA "sequencing" was introduced, allowing researchers to "capture", and "read" small parts of DNA at a time (approximately 1000 bases at a time).

Since the introduction of sequencing methods, genomic technologies have evolved relatively quickly, allowing more automated capturing of longer pieces of DNA, and through the addition of more pieces, and fitting them together (like a puzzle), the first fully sequenced genome for cattle was published in 2007. This sequenced genome could then be used as a "reference" or benchmark genome to compare any forthcoming cattle genomes against. Any two human genomes are 99.9% identical, for example, and this percentage is expected to be slightly smaller but equally as high for cattle. Between animals, it is only a small percentage (0.1% in humans) of the genome that accounts for phenotypic differences (from their shape and size to susceptibility to disease). These differences in "code" between animals are referred to as "variations" or "mutations" and can vary from single-basepair (or single "letter") differences to larger, multi-basepair (or multiple "letters") differences. To keep things simple, the focus here will be on discussing single-basepair (or single "letter") differences, called single nucleotide polymorphisms (SNPs, pronounced "snips").

SNPs as DNA markers

SNPs are scattered across the 2.7 billion-basepair genome and serve as markers for genetic diversity. If the entire genome of an animal were written out as a book, there would be "bookmarks" or "sticky notes" at each SNP location to point us to where the variation is. The identification of these variations allowed for the development of "SNP chips" (Figure 1), which are essentially testing (or "genotyping") devices that include "probes" for only the most important variations (i.e. SNP markers that show differences in the most popular beef breeds globally) to recognize and attach to, so that only those "letters" of DNA can be read. The first and most widely used SNP chip includes approximately 50,000 SNPs (called the Illumina® 50K bovine SNP chip). A SNP can have two possible "letters" (between A, C, G, and T) in a population (or breed) at any of these positions or "probes", in other words, for SNP X (any one of the 50,000 SNPs on the chip) any animal can have either, for example, an "A" or a "G" at that SNP position. Animals can be "tested" or "genotyped" on the 50K SNP chip, to allow animal breeders and geneticists to read which letter (or basepair) an animal has at each one of the 50,000 marker positions.

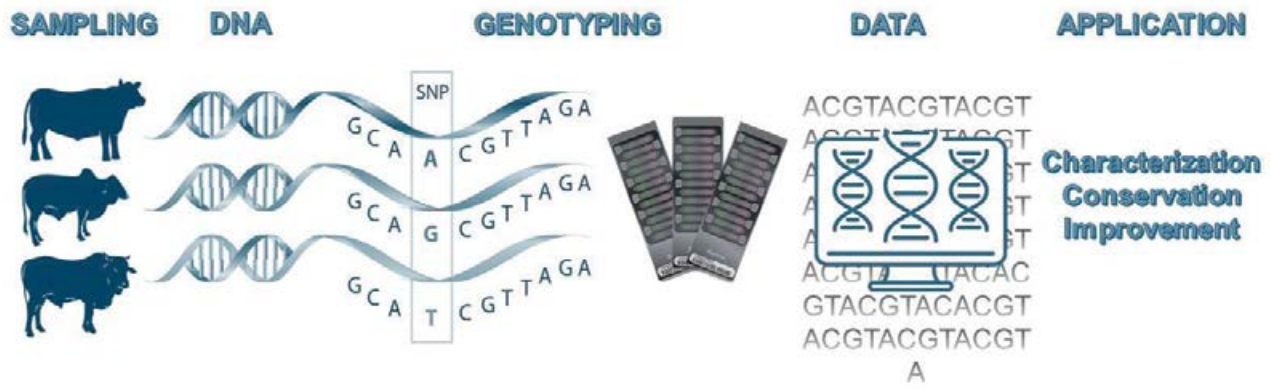

Figure 1 Basic genomics workflow, from sampling of genetic material (e.g. blood, hair) to application

Application of genomics

An animal's genotype at any single marker position or the combination of its genotypes at all its 50,000 marker positions can provide a multitude of information on the genetics of the animal. The study and application of this information (set of genotypes) is referred to as genomics. A major advantage of genomics is the ability to conduct "higher-resolution" genetic characterization of the within- and between-breed genome-level diversity of beef breeds, to look at their inbreeding levels and genetic composition (for conservation), and to investigate the selection "signatures" or "fingerprints" left on the genome through conventional breeding. The primary application of genomics has also been the generation of genomic breeding values, which enables more accurate, DNA-level selection for the genetic improvement of animals.

The beef industry was the first livestock industry in South Africa to reap the benefits of genomics, and this came about through the establishment of a national Beef Genomics Project (BGP), funded by the Technology Innovation Agency (TIA), in 2015. Among other goals, one of the project's primary objectives was to improve the number of genotyped animals in participating breeders' societies to establish reference populations for genomic selection. The developed, commercial beef sector was expected to be the first to benefit from genomics considering that pedigree and performance recording and, hence, traditional BLUP-based estimated breeding values (EBVs) were already in place for animal improvement. Genomics has always aimed to supplement and enhance existing phenotypic information in the characterization and improvement of beef breeds – not replace it.

In the developing, non-commercial beef sector, the main limitation of applying genomics as a selection tool is the lack of accurate record-keeping (pedigree or performance data) due to unaffordability and inaccessibility of resources to smallholder and communal farmers. There are, however, projects in place, including the Kaonafatso ya Dikgomo (KyD) scheme, which serves to facilitate the participation of non-commercial farmers in the mainstream beef industry through science-supported services that include information dissemination, technology transfer, and farmer training to improve animal recording. In the meantime, and this instance, genomics might be more fitting as a characterization, conservation, and management tool, rather than a selection one. The second phase of the BGP, initiated in 2024, will undoubtedly make significant strides toward the improvement of the developing sector (with planned genotyping of 20 000 KyD cattle) and further the improvements already made in the developed sector (with the genotyping of an additional 40 000 stud cattle planned).

Since the initial "talks" of genomics, however, sequencing technologies have advanced to become more automated, have a shorter turnaround time (i.e. quicker), and be more precise (accurate); these improvements have significantly reduced the cost of per-animal genotyping. Considering the past and present achievements, and future potential of genomics research on South African beef cattle, the beef industry is well set up to be a competitive and sustainable livestock industry.

AURA.
52duim van Benella Ankole in Stellenbosch. Foto geneem deur Daniel Naudé

A comparison between Phase C and Phase D Growth Tests

Melville Ferreira
& Freek Botes
ARC-Animal Production, Armoedsvlakte, Vryburg
ferrreiram@arc.agric.za

Background

Why should I do performance testing? The answer to this question is simply that you need to measure to know if you are making progress or going backwards. If you do not measure, you will not know how your animals are performing in terms of their efficiency. Your bull has by far **the greatest impact on the genetic progress of your herd** - at any one time your breeding bull makes up to 50% of the genetics of your herd. By doing Phase C or D tests, you will be able to determine if you are achieving your breeding objectives, in particular when it comes to how feed efficient your animals are and also their growth traits in terms of daily gain.

Due to a continuous rise in the population that is associated with an increased demand for protein, sustainable beef production is also becoming more important to ensure the demand is met over the long term. Together with the rise in the population, the natural resources are also under pressure and beef producers need to produce the proverbial "more from less". In South Africa, livestock production contributes substantially to food security. The livestock sector is also a major role player in the conservation of biodiversity through a variety of well-adapted indigenous and non-indigenous breeds, as well as rare game species. The South African beef industry is challenged by globalisation, increasing volumes and competition, strong industrialization of the value chain, shortage of skilled staff and pressures to meet changing customer needs. All this stresses the importance of having data and information pertaining to how efficient we are and the level of the genetics of our national herd.

Feed is one of the major cost drivers of beef production, and due to its high cost, it is important to have a positive feed margin. A positive feed margin can be influenced by the feed price and feed efficiency (gain/kg feed consumed). This can be achieved by improving the Average Daily Gain (ADG) and reducing the feed costs by breeding animals that utilize feed more efficiently.

The National Beef Cattle Recording and Improvement Scheme (NBRIS) was established in accordance with Section 20 of the Animal Improvement Act, 1998 (Act 62 of 1998), whereby the performance of animals is recorded and progeny summaries are calculated.

The NBRIS of the Agricultural Research Council (ARC) has 7 phases namely.

- Reproduction phase (Phase A1)
- Suckling phase (Phase A2)
- Post weaning phases:
  - On-farm recordings (Phase B)
  - Central performance tests (Phase C)
  - On-farm performance tests (Phase D)
  - Feedlot recordings (Phase E1)

Table 1 A comparison between Phase C and D

	Phase C	Phase D
Age	151 to 250 days	Maximum age 425 days (variation within group not more than 100 day)
Adaption	28 days	21 – 90 days
Feed	Bulls receive standardised ration across all ARC testing stations.	Each breeder decides what ration he wants to use.
Weight limits at start of test	Depending on breed	Only when more than 1 breeder form part of the test.
Regularity for weighing of bulls	Weekly	Bi-weekly
Reports	Breeder receives interim reports bi-weekly	Breeder to submit weights bi-weekly to ARC
Test length	84 days	84 – 270 days
Minimum bulls per test	1	10
Traits measured		
• ADG	Yes	Yes
• FCR	Yes	No
• Kleiber	Yes	Yes
• Body measurements	Yes	Yes
• RTU	Yes	Yes
Individual feed intake measured	Yes	No
Merit awarded	Yes	No
Performance compared to	An individual bull's performance is compared to the 10 year rolling average per breed per station.	Bulls are compared within the group.

ADG – Average Daily Gain, FCR – Feed Conversion Ratio, RTU – Real Time Ultrasound scan

Summary

Both phases C and D have advantages as indicated in table 1. Phase C is the only test where individual feed intake can be measured. Bulls are fed individually and weighed weekly and feed intake is measured weekly. On a bi-weekly basis when interim reports are issued, the ADG and Feed Conversion Ratio (FCR) are calculated. FCR is a ratio of the amount of feed consumed by the bull and the weight gained over the test period. Currently the average FCR in SA is 4.5 – 7.5 across all breeds. In Phase D tests individual feed intake cannot be measured, there is however, a Kleiber ratio value calculated. The Kleiber ratio is a useful indicator of growth efficiency and an indirect selection criterion for feed conversion. Phase C tests are more expensive than Phase D tests because a Phase C test is an intensive test (lasting 84 days) with individual feed intake calculated.

The global trend is however to focus more on RFI (Residual Feed Intake) since it is phenotypically independent of growth and body weight. The trait is also moderately heritable (18-49%) which enable us to improve feed efficiency by selecting for efficient animals. RFI is the difference between actual and predicted feed intake and in line with an animal's maintenance requirements in relation to its body weight and growth. It is suggested that it may be more desirable to select for a trait such as RFI, since, by selecting for high ADG and low FCR, it may result in bigger animals with higher maintenance requirements.

Feed costs amounts to 55% – 70% of the total production cost, and a 10% improvement in feed efficiency of animals may result in a feed cost saving of several hundred million rand per annum for the industry as a whole. Measuring efficiency will assist in decisions that increase productivity without increasing costs of production and will result in greater profit margins. Feedlot studies in the USA demonstrated that a 10% improvement in ADG as a result of a 7% increase in intake improved profitability by 18%, whereas, a 10% improvement in feed efficiency returned a 43% increase in profits. By improving feed efficiency, it will thus significantly contribute to a more sustainable and profitable production system.

Sout inname vir herkouers

Dr Klaas-Jan Leeuw
ARC-Animal Production, Irene
Kleeuw@arc.agric.za

Sout, of natriumchloried (NaCl), is 'n essensiele produk vir soogdiere, insluitend herkouers soos beeste en skape. Natrium word benodig in klein hoeveelhede in die liggaam om seine deur die senuwee stelsel te stuur, om spiere te laat saamtrek of onstspan, om 'n goeie balans van water en minerale te handhaaf (elektroliet balans) asook om die regte bloeddruk handhaaf. Waar die natrium ook van belang is by transport van glukose (tipe suikers vir energie voorsiening in die dier se selle) deur die selwand in die sel in.

Die sout behoefte kan voorsien word in lekke. Die koeie en skape eet sout na behoefte en sal die inname verminder van lekke as die sout te veel word. Die hoeveelheid sout in 'n lek sal bepaal hoeveel 'n dier sal inneem van die lek. Die hoeveelheid sout in 'n beeslek bepaal die inname van 'n lek, soos weergegee in tabel 1. Waar diere te veel sout ineem sal dit deur die niere in die urine uitgeskei word, maar die beskikbaarheid van voldoende vars en skoon drinkwater is belangrik om die oorbodige sout uit die liggaam te kry. Waar sout lekke of lekke met sout voorsien word is dit belangrik om voldoende vars en skoon drinkwater te voorsien. Waar die drinkwater hoë sout gehalte het, word die aanbied van sout lekke beperk of nie gedoen nie. Herkouers het 'n hoë tolerransie vir sout, waar sout vergiftiging voorkom kan dit met die volgende simptone verskyn: blindheid, intense senuweeagtigheid, diaree en uituidelike ineenstorting en vrekte. Dit was onder geforseerde toestande met twee skape om die gevolge van oormaat sout te bepaal. Dit sal beslis nie onder praktiese toestande gebeur nie. By beeste kan dit verminderde eetlus, verlaagde water inname en daarmee verlaagde melk produksie, speeksel uitvloei uit die bek wees, braking, diarree, in kringe stap, aggressie, blindheid, en gedeeltelike verlamming. Waar sout vergiftiging vermoed word, word aanbeveel dat 'n veearts geraadpleeg word om dit te bevestig en om die veeart se aanbevole behandeling te kry en uit te voer. Sout vlakke in die water moet verkieslik onder 0.5% wees terwyl bo1,5% giftig kan raak vir herkouers.

Tabel 1 Die persentasie soutinsluiting in 'n fosfaatlek en hoeveelheid (gram) wat 'n volwasse bees as 'n duimreël per dag inneem.

Sout-insluiting %	Gram lek/dag
50%	100-150g
30%	400-500g
20%	600-900g
10%	1500-2000g

Waar sout tekort aanwesig is kan diere klippe en ysters begin lek, grond vreet, boom bas begin vreet en urine drink. Die laatste omdat soos eerder bespreek sout deur die niere in die urine uitgeskei word. As daar onvoldoende sout (natrium) in die dier is, sal die volgende ioon gebruik word wat gewoonlik magnesium is en daarna kalsium. Die beskikbaarheid van sout kan 'n rol speel in die voorkoming van gras tetanie en goiter deur die jodium wat in sout voorkom. Die tetanie omdat magnesium vir ander doeleindes gebruik word anders as om nitrate in die bloed te hanteer. Die jodium in die sout verhoed vergroting van tiroide klier. Ander invloede kan wees die verminderde hormoon reguleering wat versteur word deur 'n gebrek aan natrium en chloor wat die elektroliet balans versteur.

Chloor is ook belangrik vir beeste en skape, dit help met metaboliese funksies soos die beheer van osmotiese druk in die liggaam, die elektroliet balans,

die bloed se suurstof en koolstof di-oksiede transport en die handhaaf van verterings vloeistowwe se pH, soos sure in die abomasum en gal. Waar chloor tekort is in die liggaam, kan asemhaling vertraag, diere raak lusteloos en hardlywig. Meer spesifiek sal 'n verlaagde voer en water inname die produksie verlaag. Gelukkig vind 'n chloor gebrek in die praktyk selde plaas. 'n Oormaat aan chloor in die blood kan lei tot bloedasidose, dat die dier ge-dehidreer is of 'n nier probleem het. Die niere verwerk die oormaat en skei dit uit deur die urine. Weereens, soos met natrium, kan dus voldoende skoon en vars water inname die oormaat chloor verminder.

Volwasse koeie benodig ongeveer 30 gram sout per dag om by hulle natrium en chloor behoefte uit te kom. Die gaan gewoonlik saam met so 9 gram fosfaat per dag. Daar is baie lekke beskbaar wat dit kan voorsien. 'n Eenvoudige een is waar een sak veesout en een sak P12 gemeng word, en as mineraal lek aangebied word aan koeie en kleinvee deur die jaar. Skape se sout behoefte is so 9 gram per dag. In die somer maande (somer reenval gebiede) mag jy dalk agterkom dat die diere min van die sout mineraal lek gebruik maak. 'n Gewone sout blok is dan meestal voldoende. Waar tekorte aan ander minerale (makro elemente en mikro elemente) kan voorkom, kan kommersiële mineraal lek met spoorelemente voorsien word. Waar 'n gebrek aan spoor elemente vermoed word, kontak die veearts. Die veearts se aanbeveling kan gevolg word. Dit kan 'n mineraal lek met spoorelemente wees of 'n inspuiting met 'n meervoudige mineraal produk wees.

Die doel van enige lek voorsiening is dat dit tekorte moet aanvul in die diere se voeding. In die geval van sout aanvulling is dit redelik gemaklik en goedkoop en die diere sal dit na behoefte inneem. Die voordele, soos verbeterde dier gesondheid en produksie (groei, reproduksie), maak dit 'n uiters belangrike belegging vir die bees en kleinvee boer.

Salt Intake for Ruminants

Salt, or sodium chloride (NaCl), is an essential product for mammals, including ruminants such as cattle and sheep. Sodium is required in small amounts in the body to transmit signals through the nervous system, to contract or relax muscles, to maintain a good balance of water and minerals (electrolyte balance), and to regulate blood pressure. Sodium is also important for the transport of glucose (a type of sugar that provides energy to the animal's cells) across the cell membrane.

Salt needs can be met through salt blocks and in mineral licks. Cattle and sheep consume salt as needed and will reduce their intake if it becomes excessive. The amount of salt in a lick will determine how much an animal will consume of the lick or supplement. The salt content in a cattle lick affects intake, as shown in Table 1. If animals consume too much salt, it will be excreted by the kidneys in urine; thus, having sufficient fresh, clean drinking water is crucial to remove excess salt from the body. If drinking water has a high salt content, the provision of salt licks may be limited or avoided altogether.

Ruminants have a high tolerance for salt, but salt poisoning can occur, presenting symptoms such as blindness, intense nervousness, diarrhoea, severe collapse, and death. This has been studied under forced conditions with two sheep to determine the effects of excess salt, which would not occur under practical conditions. In cattle, symptoms may include reduced appetite, decreased water intake leading to lower milk production, drooling, bloating, diarrhoea, circling, aggression, blindness, and partial paralysis. If salt poisoning is suspected, it is recommended to consult a veterinarian for confirmation and treatment.

Salt levels in water should preferably be below 0.5%; levels above 1.5% can be toxic to ruminants.

Table 1 Percentage of Salt Inclusion in a Phosphate Lick and Amount (grams) Consumed Daily by an Adult Cattle

Salt Inclusion %	Grams Lick/Day
50%	100-150g
30%	400-500g
20%	600-900g
10%	1500-2000g

When there is a salt deficiency, animals may start licking rocks, eating dirt, gnawing on tree bark, and

even drinking urine. This is because, as discussed, salt is excreted through the kidneys in urine. If there is insufficient salt (sodium) in the animal, the next ion typically utilized is magnesium, followed by calcium. The availability of salt can play a role in preventing grass tetany and goitre due to the iodine present in salt. Tetany occurs because magnesium is used for purposes other than handling nitrates in the blood. The iodine in salt prevents enlargement of the thyroid gland. Other influences may include reduced hormonal regulation disrupted by a lack of sodium and chloride, which disturbs electrolyte balance.

Chloride is also important for cattle and sheep; it assists with metabolic functions such as regulating osmotic pressure in the body, electrolyte balance, oxygen and carbon dioxide transport in the blood, and maintaining the pH of digestive fluids like acids in the abomasum and bile. A deficiency in chloride can lead to slowed respiration, lethargy, and constipation, specifically resulting in decreased feed and water intake, which lowers production. Fortunately, chloride deficiencies are rare in practice. Excess chloride in the blood can lead to blood acidosis, indicating that the animal is dehydrated or has kidney problems. The kidneys process the excess and excrete it through urine. Again, as with sodium, sufficient intake of clean, fresh water can reduce excess chloride.

Adult cattle require approximately 30 grams of salt per day to meet their sodium and chloride needs, usually along with about 9 grams of phosphate per day. Many mineral licks are available to provide this. A simple mixture involves combining one bag of livestock salt with one bag of P12, offered as a mineral lick to cattle and small livestock throughout the year. Sheep require about 9 grams of salt per day. During the summer months (in summer rainfall areas), you may notice that animals utilize less mineral salt licks. A standard salt block is usually sufficient. If deficiencies in other minerals (macro and microelements) are suspected, commercial mineral licks with trace elements can be provided. If a deficiency in trace elements is suspected, consult a veterinarian. The veterinarian's recommendations can be followed, which may include a mineral lick with trace elements or an injection with a multiple mineral product.

The purpose of any lick provision is to supplement deficiencies in the animals' diet. In the case of salt supplementation, this is relatively easy and inexpensive, and animals will consume it as needed. The benefits, such as improved animal health and production (growth, reproduction), make it an extremely important investment for cattle and small livestock farmers.

Legislation on registration of reproduction operators

Thabang Mashilo,

Mmaphuti Setati & Joel Mamabolo

Department of Agriculture, Land Reform and Rural Development, Directorate: Animal Production, Sub-directorate: Animal Production Regulatory Support, Arcadia, Pretoria, RSA

ThabangMah@dalrrd.gov.za

The Department of Agriculture, Land Reform and Rural Development is the custodian of the Animal Improvement Act, 1998 (Act 62 of 1998; AIA), which serves a tool to regulate animal production in South Africa. The Act aims to improve the quality and productivity of South Africa's animal production industry by regulating breeding practices and encouraging the use of genetically superior animals in breeding programs. This helps to enhance competitiveness of South African animals both locally and internationally.

The AIA contains provisions on the implementation and use of biotechnology in artificial insemination and embryo transfer. It regulates the registration of reproduction operators, which include artificial inseminator, semen collector, embryo collector, and embryo transferor in terms of section 7 (a), (b) and (c) of the AIA. Certification in these practices ensures that only qualified individuals are involved in the reproductive processes of animals to provide quality services.

Registration of reproduction operators is crucial in ensuring accountability and transparency within the industry. It also assists in protecting the rights and interests of all parties involved in assisted reproductive procedures. Therefore, requiring operators to be registered ensures that they are held accountable to certain standards and guidelines, ultimately safeguarding the well- being of recipients and donor animals. Furthermore, registration can help prevent unethical practices and ensure that procedures are carried out ethically and responsibly. Training facilities conducting reproduction operator courses must be recognized under the AIA. These facilities adhere to strict guidelines to ensure that operators are well-equipped to handle animals and genetic materials responsibly. Registration of reproduction operators lasts for a period of 12 months and must be renewed regularly to ensure compliance with the AIA.

Reproduction operators are responsible for the intensification use of Assisted Reproductive Technologies (ARTs) to improve genetic diversity and overall animal improvement. These operators play a crucial role in facilitating the process of breeding animals through various techniques, such as semen collection, artificial insemination, embryo collection and embryo transfer in cattle, sheep, goats, pigs, and horses. Reproduction operators utilize these technologies to conserve vulnerable animal breeds and maintain healthy populations in particularly ex-situ conservation, collaborating with veterinarians to ensure ethical and sustainable practices for animal long-term health.

Registration as a reproductive operator typically requires completion of specific animal production courses, hands-on training, and passing of practical examination. This ensures that animals receive the best possible reproductive care and that breeders can trust in the expertise of those performing these procedures. The course of instruction for reproduction operators should cover ARTs, anatomy and physiology, animal reproduction diseases, veterinary hygiene principles, animal breeding and genetics basics, semen conveyance theory and practice, and the AIA. As a result, only

operators trained at registered training centres are eligible to apply for registration as a reproduction operator.

It is an offence to collect semen from animals, inseminate animals or collect or transfer embryos if you are not registered as a reproduction operator under the AIA. Any person who fails to provide the owner of an animal with the prescribed certificate in contravention of section 13(2) of the AIA shall be guilty of an offence and on conviction liable to a fine or imprisonment for a period not exceeding one year. It is also an offence in terms of section 18(1) (c) of the AIA to make false advertisements regarding rendering services on semen collection, artificial insemination, transferring of ova/embryos to recipient animals or collection, evaluation, processing, packing, and labelling of genetic material.

For more information on registration of breeders' societies, please contact the following offices:
Registrar of Animal Improvement: 012 319 7595
Animal Production Regulatory Services offices: 012 319 7424 / 7434 / 7486 / 7576


Angus voldoen
aan al jou behoeftes
www.angus.org.za
info@angus.org.za
051 447 9849
Rasadviseur: Danie Dames
Sel: 082 3069 358
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What is the difference between linebreeding and inbreeding?

Prof Michiel Scholtz[1]
& Dr Michael MacNeil[1,2]
[1]ARC-Animal Production, Irene, South Africa;
[2]Delta G, Miles City, Montana, USA
GScholtz@arc.agric.za

Linebreeding can be thought of as inbreeding with a purpose, where the purpose is to increase the genetic relationship to an outstanding individual. At the same time, the accumulation of additional inbreeding to less worthy ancestors is to be avoided. In the normal course of a breeding program in which the mating of close relatives is avoided, the combination of genes that gave rise to the outstanding individual is continually diluted over time. Thus, after the passing of a relative few generations, the combination of genes that gave rise to an outstanding individual is in all probability lost forever. Linebreeding is the tool in a breeder's toolkit that can be used to prevent this loss.

For a linebreeding program to be fully successful, it should be accompanied by genetic selection among the linebred individuals. Thus, performance recording and the calculation of EBV for traits such as birth weight, weaning weight, cow weight and fertility (inter-calving period) is important.

Inbreeding results from the mating of related animals. Everyone realizes that the mating of a father with his daughter or the mating of a brother and sister definitely produces inbreeding. But what about the mating of a grandfather with his granddaughter, a nephew with his niece or two cousins, is that inbreeding? In humans, the latter is commonly regarded as inbreeding (incest) and is normally forbidden.

The primary effect of inbreeding is that it increases the chance that an animal will receive the same allele of a gene from both parents. This will reduce the degree of heterozygosity in the population and lead to greater uniformity. However, inbreeding also increases the chance of deleterious recessive alleles becoming homozygous and causing conditions such as: Curly calf syndrome or Arthrogyrposis Multiplex, which results in stillborn calves with bent limbs, twisted spines, and diminished muscling. It can also cause Fawn calf syndrome or Contractual Arachnodactyly, which affects the connective tissue of muscles, causing the upper limbs to contract and the joints of the lower limbs to loosen; and hypotrichosis that causes affected calves to be born with partial or complete absence of hair. Despite the risks associated with inbreeding it was used in combination with selection to form of many breeds in the past.

Inbreeding depression is the reduction in the performance of inbred animals. This reduction is more subtle and more important than the occurrence of adverse recessive traits that are influenced by few genes and that are usually associated with inbreeding. It is known that inbred animals do not adapt as well to changing conditions, and their reproduction and production are also likely to be lower, compared to contemporary animals that are not inbred. Inbreeding should thus be avoided, unless it is done with a specific aim in mind.

To be successful in a linebreeding program, a breeder must also understand the principles of inbreeding and relationship. Of primary importance in a linebreeding program is the selection of the "outstanding" individual that will serve as its foundation. Today, this foundation animal should be characterized by an EBV profile that is highly desirable and very accurate. Finally, success in a linebreeding program entails also patience, persistence and good luck.

The pedigree diagram in Figure 1 illustrates the

mating of a sire to one of his daughters. Numerically, the relationship of the sire to his daughter is 0.50. The relationship of the sire to the progeny is 0.75, and the inbreeding of the progeny is 0.25, which is one-half the relationship of the progeny's parents.

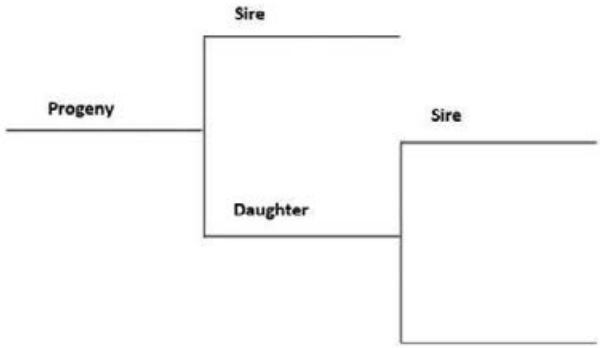


Figure 1

It should be recognized that linebreeding also increases risk of failure in the breeding program. This risk is present because the chosen outstanding individual might also be a carrier of a recessive allele that is undesirable. The inbreeding that accompanies any linebreeding program might also yield inefficiencies in production that prove to be too costly. As a rule of thumb, the outstanding individual that is chosen as the basis of a linebreeding programme should be a truly elite individual within its breed.

A successful linebreeding program requires patience and persistence as it entail several generations of breeding. With a nine-month gestation period, being able to first bear offspring at two to three years of age, and producing less than one offspring per female per year, cattle have a long generation interval. Modern assisted reproduction technologies like artificial insemination, embryo transfer, and juvenile follicle aspiration may hasten the program along somewhat. However, breeders considering a linebreeding program would be well advised to think in terms of at least a 10-year planning horizon.

When related individuals are mated, as in a linebreeding program, their progeny are expected to have alleles that are identical for more genes than if the parents were not related. If inbreeding and relationships are intertwined, why is inbreeding to be avoided when a degree of relationship is desired? Alleles with detrimental effects tend to be masked by an alternative allele of the same gene (i.e., the detrimental alleles tend to be recessive). Thus, the detrimental alleles only become apparent when they are identical on both chromosomes.

In South Africa, there are a few breeds where there is a lack of good quality unrelated breeding bulls. In this situation, it is important to take note of the relationship coefficients for prospective matings. There are computer programs that will alert the breeder if a certain mating will result in a level of inbreeding that is generally unacceptable. These programs may be less useful in a linebreeding program because the level of inbreeding that is generally unacceptable may be deemed acceptable if it arises from relationship to the outstanding foundation animal. To advertise a linebred animal, the "outstanding" foundation animal should also be identified. Irrespective of the breeding strategy that is used, it is important to accurately record pedigree data, especially in breeds with small numbers of animals. The Ankole breed in South Africa is an example of such a breed (Photo 1), where the number of cattle in South Africa is limited and it is therefore unavoidable that inbreeding will occur. In a breed like the Ankole in South Africa, inbreeding will be the result of the limited number of bulls available that are not related to the females. It is therefore important that Ankole, and breeders from other breeds with small numbers in South Africa, understand both inbreeding and linebreeding.

Photo 1 Due to the limited numbers of Ankole cattle in South Africa, it is unavoidable that inbreeding will occur

Irene Beef Cattle Farmer's Day

Una-Lou Orffer
ARC-Animal Production, Irene
UOrffer@arc.agric.za

Information dissemination has become a prerequisite when it comes to facilitating the adoption of scientific technologies in the beef production industry, which has been shown to be central to the ability of producers to be sustainable and profitable. The latter is of particular importance in view of the competitive nature of our beef value chains. One of the main deliverables of the National Beef Recording and Improvement Scheme (Scheme for short) focuses on the adoption and implementation of performance recording and associated technologies to enhance the genetic potential of our national herd, which consists of more than 12 million cattle. The adoption of scientific technologies requires amongst others a strong focus on information dissemination initiatives, which include training courses, on-farm service delivery and consultations, liaison with the media via popular articles and webinars and of course the hosting of farmer's days on a national level.

The Scheme hosted a very successful Beef Cattle Farmer's Day on 11 September 2024 on the ARC-Animal Production Campus at Irene, exploring the "Basics of Beef Farming". Two expert presentations contributed to the day that was attended by more than 180 people, most of which were emerging and commercial farmers. Following the official welcome by the ARC-AP General Manager, Prof Norman Maiwashe, Mr Ernest Makua, Livestock Technical Advisor, Red Meat Industry Services (RMIS), gave an overview of the role of the RMIS in empowering emerging Beef Cattle farmers. Mr Makua said that it is important for farmers to ask themselves whether they are running a business or a "busyness". "Busyness" referred to a farm that might look nice on social media platforms but is however unprofitable. It is crucial that farmers should measure their profit margins and continuously improve their farming operations. Mr Kobus Bester, Director: Livestock Registering Federation (LRF), followed by giving an overview of the fundamentals of profitable beef breeding. Mr Bester said that there are basically ten building blocks to a profitable beef farm: Choose a sought after breed you like and that can adapt and produce profitably, utilizing natural resources. It is crucial to understand your available natural resources and environment. He also stressed the importance to determine what is within your control and to have a plan with clear objectives and goals. Farmers need to understand risks involved and how to mitigate it. It is also crucial to acquire only the best quality animals and to maintain an optimal production level condition score in your animals. Maintaining good health in your animals is also not negotiable. Mr Bester also stressed the fact that happy, healthy animals tend to reproduce and highlighted the importance to optimize on stocking rate and to maximize on fertility/reproduction to ensure profitability.

The presentations were concluded by Dr Ben Greyling (Research Team Manager: National Beef Recording and Improvement Scheme) who did the vote of thanks to attendees, presenters and sponsors of the event: Livestock Improvement Scheme Trust, RMIS, Putter Voere, Bidvest Steiner, Farmer's Weekly, Radium and Irene Beef Cattle Improvement Committee. The event also featured four practical demonstrations at the Bull Testing Centre: Dr Pieter de Kock (Pronk Afrikaners) presented on the Afrikaner breed, Mr Sietze Smit (Breed Director, Brahman Breeders' Society of South Africa) on the Brahman breed, Mr John Devonport (Devlon Limousins) on the Limousin breed and Mr Kobus Bester (Breed Director: Simbra Breeders' Society of South Africa) on the Simbra Breed. The ARC, Department of Agriculture and various sponsors showcased their products, culminating in a networking lunch and new business connections. The high number of attendees and interaction between all farmers at the farmer's day was very encouraging and again confirmed the importance to ensure we unlock the opportunities when it comes to accessing the market value chains of South Africa.

AP Beef Cattle Farmer's Day
Mr Kobus Bester (LRF), Prof Norman Maiwashe (ARC), Mr Ernest Makua (RMIS) and Dr Ben Greyling (ARC)

AP Beef Cattle Farmer's Day
Farmer's Day Attendees

AP Beef Cattle Farmer's Day
The ARC, Department of Agriculture and various sponsors showcased their products

AP Beef Cattle Farmer's Day
Dr Pieter de Kock presenting practical session on Afrikaners

AP Beef Cattle Farmer's Day
Mr Sietze Smit presenting practical session on Brahmans

Beef Cattle Farmer's Day
Mr John Devonport presenting practical session on Limousins

Beef Cattle Farmer's Day
Mr Kobus Bester presenting practical session on Simbra's

Beef Cattle Farmer's Day
Ms Magdeline Magoro (Meat Technology Sciences) and Ms Bhaveni Kooverjee (Animal Genetics) with visitors at the ARC-AP stand

Beef Cattle Farmer's Day
Mr Katlego Moyaba (Dairy Processing) with visitors at the ARC-AP stand

Consumer perceptions and purchase intent on goat meat products

Dr Ennet Moholisa,
Dr Annie Basson, Prudence Seema,
Dr Kedibone Modika & Dr Kgantjie Moloto
Meat Science & Technology, ARC-Animal Production, Irene
moholisae1@arc.agric.za

South Africa lags behind the rest of the world, where global goat meat consumption has increased over the last several years. Even though many South Africans have been exposed to goat meat from a young age, its consumption remains low. This is because goats are usually used in traditional rituals and some consumers perceive goat meat as tough, has a pungent smell and unpleasant flavour. These views are also shared by many consumers that have no experience eating goat meat and it is widely considered inferior compared to beef, pork and lamb. Research has shown that a large number of goats in South Africa (two-thirds indigenous goats) are reared by small-scale farmers, especially in the Eastern Cape, Limpopo and KwaZulu Natal provinces, accounting for over half of South Africa's goats. These animals are generally fully dependent on rangeland, with little or no nutritional supplements or pharmaceuticals. Considering that traditional methods of goat production produce a smaller carbon footprint, use less water and have a lower impact on rangeland than other ruminant livestock (especially cattle), this makes goat production a greener alternative. This is particularly important for the discerning consumer that is willing to spend more money on their meat products in order to protect the planet, but is also looking for a healthier red meat.

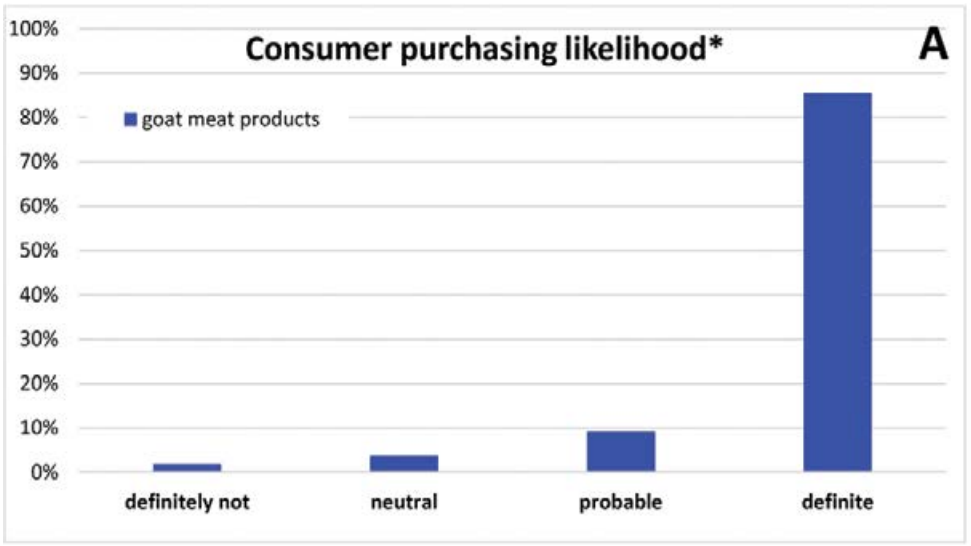
During the Harvesting Heritage Culinary Competition held at Brooklyn Bridge shopping centre in 2023, the Agricultural Research Council in partnership with EKIM Wildlife, showcased chevron (goat meat) products. The aim was to evaluate consumer purchase intent towards these indigenous products. Fifty-five volunteers completed questionnaires after tasting goat meat products that would normally be widely available for sale, but produced using beef, mutton and pork. These included blood sausage, wors, chilli bites and meat patties, all made using indigenous goat meat.

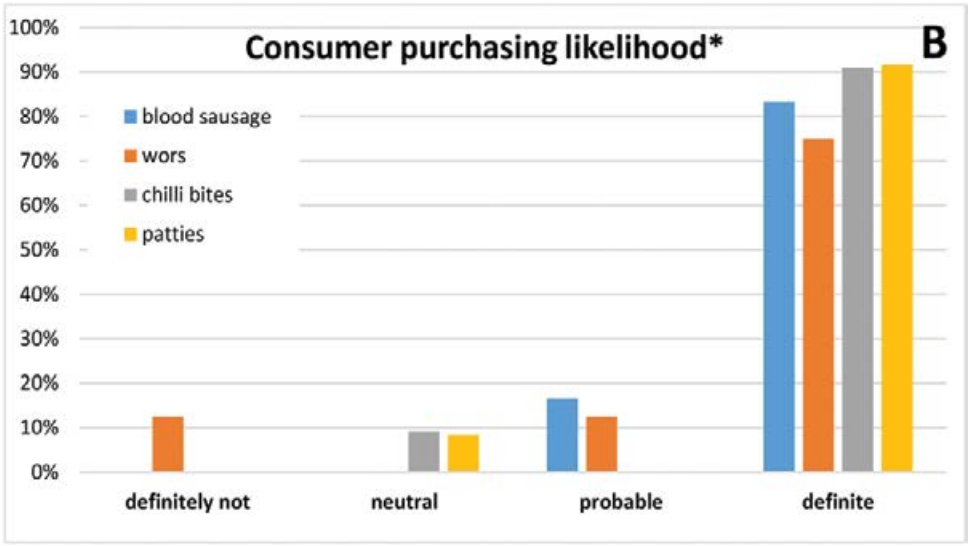
Volunteers were asked to rate their intent to purchase these goat meat products, if they were readily available for sale in retail shops, on a scale from 1 to 5 (1 being definitely not and 5 a definite consideration of purchase).

Almost 95% of consumers evaluated in the survey showed a willingness to buy processed goat meat products (scored 4 or 5), where 85% of consumers would definitely consider purchasing the goat meat products (scored 5).

Only a single consumer was averse to the goat meat products and would definitely not consider buying them, with the remaining 3.6% of responses

being neutral in terms of a purchasing decision. Almost half of the consumers enjoyed the taste or flavour of these goat meat products and almost 80% of consumers enjoyed the eating experience. Within this group, 7.2% preferred the products produced using goat meat to the more readily available beef, pork or mutton products they are usually able to buy in store. Consumers particularly favoured chilli bites produced from goat meat, especially the balance of spices used and they expressed a preference for the indigenous meat compared to beef. Another favourite was the meat patties that were also preferred to burger patties produced from beef. Both the chilli bites and patties showed a >90% strong purchasing preference, where the non-committal responses (the rest of the respondents) were consumers that would not normally purchase these meat products, rather than suggesting goat meat to be an inferior product.





**Percentage of respondents (consumers) and their willingness to purchase processed meat products produced from goat, instead of the more readily available beef products for sale in retail stores. There were no consumers that scored the products 2, which translates to a consumer that would probably not consider purchasing the product.*

A) Results combined for all products. B) Results for each goat meat product

The wors produced from goat meat was the product that consumers were least likely to buy, but there was still 87.5% of consumers that would consider purchasing the wors. Rather than a negative reflection on the wors produced from goat meat, these responses could reflect a market that already contains a large diversity of different types of wors produced using signature spices, of diverse fat content and offers variety in meats. Although the percentage of consumers that would definitely purchase blood sausage was only 83%, there were no neutral or negative purchasers. The remaining 17% of consumers would probably consider purchase and two-thirds of respondents gave positive comments on the taste and flavour of the product, with a further 20.8% of consumers having an enjoyable eating experience. Negative feedback on the flavour of blood sausage produced using goat meat, were specific to particular flavours that can result in aversion in consumers (garlic and liver), rather than a direct negative reflection on the goat meat itself.

These results show that South African consumers are not only willing to buy products that promote our heritage, but often prefer these products to the generally available products in large retail stores. Goat production could also become much more important in the future, where a changing climate could make beef production ever more unsustainable, because goats are adaptable and hardy, need much less water and can produce high quality meat on poor quality forage (including invasive species). With the potential use of less herbicides, the low carbon footprint, water conservation and health benefits associated with goat meat production, there has been a drive to promote goat meat (chevron) in South Africa, which is generally not available in the formal market, like large, urban retail stores, in many provinces. Many of the goats raised in South Africa are sold on-site, directly to the end-consumer, often for cultural or religious ceremonies. These animals are generally older, larger goats sold as live animals or whole carcasses, limiting the purchase options for consumers that desire smaller portions of goat meat, or portions from younger animals.

Many consumers expressed a desire for goat meat that take them back to their roots and culture and the meat from A class, young goats is comparable to lamb, but with known additional benefits like being less greasy, lower in cholesterol, higher in polyunsaturated fatty acids, minerals and vitamins than other ruminant meats. Reports from literature studies showed that Meat from goats have a courser muscle fibre structure and can be higher in connective tissue, making the meat more chewy and with a perceived toughness, but when prepared correctly, offers a robust flavour and delightful texture in many traditional dishes that cannot be achieved using the meat from pork, beef or lamb. By providing small-scale, rural goat farmers with the marketing capacity and infrastructure development to supply their meat to the formal sector, the desire for purchase by consumers of these heritage foods clearly exists and could generate a sustainable and profitable business model for small-scale farmers.

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The future is Red ... SANTA Red

New RTU machines for the Beef Recording and Improvement Scheme

Jurgen Hendriks
& Zelda King
ARC-Animal Production, Irene
HendriksJ@arc.agric.za

Real-time ultrasound scanning of live cattle is a valuable tool for assessing carcass traits such as marbling, fat thickness, and muscle area without the need for slaughter. This non-invasive technology allows producers to make informed breeding and management decisions to enhance meat quality and yield. By identifying animals with desirable traits early, producers can improve genetic selection, increase profitability, and optimize meat production, ultimately meeting consumer demand for high-quality beef. The ability to assess these economic traits in living animals also reduces costs associated with traditional post-slaughter evaluations.

There is a hightened interest in carcass traits from breeders; selection prioritizes carcasses with higher percentages of marketable meat and improved meat quality, reflecting processor and consumer feedback. This is especially important when producers are vertically integrated. With RTU scanning, these traits can be measured without slaughtering of the animals, making it possible to measure breeding animals. While RTU scanning isn't as precise as direct carcass measurements, they show an acceptable correlation. RTU scan accuracy depends on the scanning facility (convenience improves data quality), the technician's skill as well as the breed an animal's body condition. Lower accuracy in scan data may result from the difficulty of scanning high-fat animals or very little variation amongst animals due to them being too lean at the time of scanning. Therefore, instead of using individual phenotypic data for selection, it's better to wait for estimated breeding values (EBVs) calculated from the animal's own data and that of its relatives.

Accreditation of ultrasound scanning services rendered by the ARC:

Technicians that execute RTU scanning on live animals must adhere to ICAR standards for RTU scanning to ensure they comply to the required accuracy and repeatability.

Traits measured; sites scanned, EBV's calculated.

Breeding values are estimated using RTU data for rump and rib fat, EMA, CWT, and RBY%.

New technology equipment aquired by the NBRIS

New RTU machines arrived at the ARC-AP during November 2024. The new equipment consist of a BMW Bestscan S5 Plus Backfat Stystem with tablet, 18cm Prope and backfat pad & Blackview Pro 60 Tablet. Mr Henry Kruger the Director of MouldProd Ltd from Durbanville visited the Irene Bull Testing Centre in November 2024 for hand over and demonstration (Picture below). We are very excited to start using the machines in 2025.

Jurgen Hendriks, Melville Ferreira, Thokozani Ndonga, Henry Kruger & Dr Ben Greyling

Centralised growth testing and Schedules at ARC test centres for 2025

Melville Ferreira
& Zelda King
ARC-Animal Production, Armoedsvlakte, Vryburg
FerreiraM@arc.agric.za

Centralised growth testing, also commonly known as Phase C testing, is the performance testing of young potential breeding bulls mainly for post wean growth and feed efficiency under feedlot conditions. To participate in Phase C tests, it is recommended that breeders test at least three bulls per weaning group (together) in a Phase C1 or C2 test. Animals will be tested in contemporary groups to ensure that comparisons are made between animals, which have been managed under similar conditions. A contemporary group is defined as animals managed under similar conditions from birth to the starting date of the test. It is also highly recommended that these bulls be the progeny of at least two sires of which at least one sire is a linked sire, in other words a sire of which one or more progeny has already been tested previously. Bull calves shall be tested under standardised conditions for a period of 84 days following an adaptation period of 28 days.

Twelve tests per year shall take place at ARC-owned testing centres with test dates determined by the general manager (see tables below). Test dates at private centres shall be determined by the organisations concerned, in consultation with the general manager. The same standard ration shall be fed to all bulls tested at a testing centre. A series of body measurements (shoulder/hip height, body length, skin thickness and scrotal circumference) shall also be recorded at the end of a test. Real time ultrasound (RTU) measurements of certain carcass traits (eye muscle area and subcutaneous fat thickness) will also be recorded. A qualified breed inspector will adjudicate the animal's functional efficiency at the end of the test. Each owner and breed society shall be issued with a final report at the end of test. Final results shall include average daily gain over 84 days (ADG) and an index, average daily gain per day of age ADA (without index), feed conversion ratio (FCR) and an index and various body measurements with an evaluation of functional appearance scores.

Animals that are assessed for residual feed intake (RFI), are also tested at the these test centres and also fall into the test date categories for the respective test centres of the ARC (see tables below). The rules, guidelines and specifications for these tests are in accordance with the "Summarised protocol, requirements and guidelines for Central Standardised Growth and Feed Efficiency Testing" of the ARC and can be accessed from either the ARC or the respective breed societies that participate in the BGP. These protocols amongst others stipulate the age, weight ranges and size of contemporary groups of the animals to be tested.

CEDARA PHASE C BULL TESTING CENTRE

TEST NO.	APPLICATION CLOSE	BIRTH DATE RANGE			BULLS ARRIVE	BEGIN ADAPTATION	BEGIN TEST	END TEST	BULLS DEPART
1	16-Dec-24	24-Apr-24	-	1-Aug-24	29-Dec-24	30-Dec-24	27-Jan-25	21-Apr-25	28-Apr-25
2	20-Jan-25	29-May-24	-	5-Sep-24	2-Feb-25	3-Feb-25	3-Mar-25	26-May-25	2-Jun-25
3	17-Feb-25	26-Jun-24	-	3-Oct-24	2-Mar-25	3-Mar-25	31-Mar-25	23-Jun-25	30-Jun-25
4	17-Mar-25	24-Jul-24	-	31-Oct-24	30-Mar-25	31-Mar-25	28-Apr-25	21-Jul-25	28-Jul-25
5	15-Apr-25	22-Aug-24	-	29-Nov-24	28-Apr-25	29-Apr-25	27-May-25	19-Aug-25	26-Aug-25
6	19-May-25	25-Sep-24	-	2-Jan-25	1-Jun-25	2-Jun-25	30-Jun-25	22-Sep-25	29-Sep-25
7	16-Jun-25	23-Oct-24	-	30-Jan-25	29-Jun-25	30-Jun-25	28-Jul-25	20-Oct-25	27-Oct-25
8	14-Jul-25	20-Nov-24	-	27-Feb-25	27-Jul-25	28-Jul-25	25-Aug-25	17-Nov-25	24-Nov-25
9	18-Aug-25	25-Dec-24	-	3-Apr-25	31-Aug-25	1-Sep-25	29-Sep-25	22-Dec-25	5-Jan-26
10	15-Sep-25	22-Jan-25	-	1-May-25	28-Sep-25	29-Sep-25	27-Oct-25	19-Jan-26	26-Jan-26
11	20-Oct-25	26-Feb-25	-	5-Jun-25	2-Nov-25	3-Nov-25	1-Dec-25	23-Feb-26	2-Mar-26
12	16-Nov-25	25-Mar-25	-	2-Jul-25	29-Nov-25	30-Nov-25	28-Dec-25	22-Mar-26	29-Mar-26

Contact:

JOHAN BINEDELL
TEL: 033 330 5668
Cell: 083 799 6600
E-MAIL: binedellj@arc.agric.za

ELSENBURG PHASE C BULL TESTING CENTRE

TEST NO.	APPLICATION CLOSE	BIRTH DATE RANGE			BULLS ARRIVE	BEGIN ADAPTATION	BEGIN TEST	END TEST	BULLS DEPART
1	9-Jan-25	18-May-24	-	25-Aug-24	22-Jan-25	23-Jan-25	20-Feb-25	15-May-25	22-May-25
2	29-Jan-25	7-Jun-24	-	14-Sep-24	11-Feb-25	12-Feb-25	12-Mar-25	4-Jun-25	11-Jun-25
3	3-Mar-25	10-Jul-24	-	17-Oct-24	16-Mar-25	17-Mar-25	14-Apr-25	7-Jul-25	14-Jul-25
4	24-Apr-25	31-Aug-24	-	8-Dec-24	7-May-25	8-May-25	5-Jun-25	28-Aug-25	4-Sep-25
5	10-Jul-25	16-Nov-24	-	23-Feb-25	23-Jul-25	24-Jul-25	21-Aug-25	13-Nov-25	20-Nov-25
6	11-Sep-25	18-Jan-25	-	27-Apr-25	24-Sep-25	25-Sep-25	23-Oct-25	15-Jan-26	22-Jan-26
7	27-Sep-25	3-Feb-25	-	13-May-25	10-Oct-25	11-Oct-25	8-Nov-25	31-Jan-26	7-Feb-26
8	9-Oct-25	15-Feb-25	-	25-May-25	22-Oct-25	23-Oct-25	20-Nov-25	12-Feb-26	19-Feb-26
9	30-Oct-25	8-Mar-25	-	15-Jun-25	12-Nov-25	13-Nov-25	11-Dec-25	5-Mar-26	19-Mar-26

Contact:

DELIGHT KGARI
TEL: 021 809 3327
Cell: 083 657 8578
E-MAIL: KgariR@arc.agric.za

WES - KAAP
BULTOETSSENTRUM

GLEN PHASE C BULL TESTING CENTRE

TEST NO.	APPLICATION CLOSE	BIRTH DATE RANGE			BULLS ARRIVE	BEGIN ADAPTATION	BEGIN TEST	END TEST	BULLS DEPART
1	19-Dec-24	27-Apr-24	-	4-Aug-24	2-Jan-25	2-Jan-25	30-Jan-25	24-Apr-25	1-May-25
2	16-Jan-25	25-May-24	-	1-Sep-24	29-Jan-25	30-Jan-25	27-Feb-25	22-May-25	29-May-25
3	13-Feb-25	22-Jun-24	-	29-Sep-24	26-Feb-25	27-Feb-25	27-Mar-25	19-Jun-25	26-Jun-25
4	13-Mar-25	20-Jul-24	-	27-Oct-24	26-Mar-25	27-Mar-25	24-Apr-25	17-Jul-25	24-Jul-25
5	10-Apr-25	17-Aug-24	-	24-Nov-24	23-Apr-25	24-Apr-25	22-May-25	14-Aug-25	21-Aug-25
6	8-May-25	14-Sep-24	-	22-Dec-24	21-May-25	22-May-25	19-Jun-25	11-Sep-25	18-Sep-25
7	5-Jun-25	12-Oct-24	-	19-Jan-25	18-Jun-25	19-Jun-25	17-Jul-25	9-Oct-25	16-Oct-25
8	3-Jul-25	9-Nov-24	-	16-Feb-25	16-Jul-25	17-Jul-25	14-Aug-25	6-Nov-25	20-Nov-25
9	31-Jul-25	7-Dec-24	-	16-Mar-25	13-Aug-25	14-Aug-25	11-Sep-25	4-Dec-25	18-Dec-25
10	28-Aug-25	4-Jan-25	-	13-Apr-25	10-Sep-25	11-Sep-25	9-Oct-25	1-Jan-26	8-Jan-26
11	25-Sep-25	1-Feb-25	-	11-May-25	8-Oct-25	9-Oct-25	6-Nov-25	29-Jan-26	5-Feb-26
12	23-Oct-25	1-Mar-25	-	8-Jun-25	5-Nov-25	6-Nov-25	4-Dec-25	26-Feb-26	5-Mar-26

Contact:

NELLY CHABALALA
TEL: 051 861 1192
Cell: 071 266 1971
E-MAIL: chabalalan@arc.agric.za

IRENE PHASE C BULL TESTING CENTRE

TEST NO.	APPLICATION CLOSE	BIRTH DATE RANGE	BULLS ARRIVE	BEGIN ADAPTATION	BEGIN TEST	END TEST	BULLS DEPART
1	5-Nov-24	14-Mar-24 - 21-Jun-24	18-Nov-24	19-Nov-24	17-Dec-24	11-Mar-25	18-Mar-25
2	9-Jan-25	18-May-24 - 25-Aug-24	22-Jan-25	23-Jan-25	20-Feb-25	15-May-25	22-May-25
3	28-Jan-25	6-Jun-24 - 13-Sep-24	10-Feb-25	11-Feb-25	11-Mar-25	3-Jun-25	10-Jun-25
4	6-Mar-25	13-Jul-24 - 20-Oct-24	19-Mar-25	20-Mar-25	17-Apr-25	10-Jul-25	17-Jul-25
5	8-Apr-25	15-Aug-24 - 22-Nov-24	21-Apr-25	22-Apr-25	20-May-25	12-Aug-25	19-Aug-25
6	15-May-25	21-Sep-24 - 29-Dec-24	28-May-25	29-May-25	26-Jun-25	18-Sep-25	25-Sep-25
7	17-Jun-25	24-Oct-24 - 31-Jan-25	30-Jun-25	1-Jul-25	29-Jul-25	21-Oct-25	28-Oct-25
8	10-Jul-25	16-Nov-24 - 23-Feb-25	23-Jul-25	24-Jul-25	21-Aug-25	13-Nov-25	20-Nov-25
9	12-Aug-25	19-Dec-24 - 28-Mar-25	25-Aug-25	26-Aug-25	23-Sep-25	16-Dec-25	30-Dec-25
10	18-Sep-25	25-Jan-25 - 4-May-25	1-Oct-25	2-Oct-25	30-Oct-25	22-Jan-26	29-Jan-26
11	7-Oct-25	13-Feb-25 - 23-May-25	20-Oct-25	21-Oct-25	18-Nov-25	10-Feb-26	17-Feb-26

Contact:

JURGEN HENDRIKS
TEL: 012 672 9260
Cell: 084 304 3904
E-MAIL: hendriksj@arc.agric.za

VRYBURG PHASE C BULL TESTING CENTRE

TEST NO.	APPLICATION CLOSE	BIRTH DATE RANGE	BULLS ARRIVE	BEGIN ADAPTATION	BEGIN TEST	END TEST	BULLS DEPART
1	2-Jan-25	11-May-24 - 18-Aug-24	15-Jan-25	16-Jan-25	13-Feb-25	8-May-25	15-May-25
2	30-Jan-25	8-Jun-24 - 15-Sep-24	12-Feb-25	13-Feb-25	13-Mar-25	5-Jun-25	12-Jun-25
3	27-Feb-25	6-Jul-24 - 13-Oct-24	12-Mar-25	13-Mar-25	10-Apr-25	3-Jul-25	10-Jul-25
4	27-Mar-25	3-Aug-24 - 10-Nov-24	9-Apr-25	10-Apr-25	8-May-25	31-Jul-25	7-Aug-25
5	24-Apr-25	31-Aug-24 - 8-Dec-24	7-May-25	8-May-25	5-Jun-25	28-Aug-25	4-Sep-25
6	22-May-25	28-Sep-24 - 5-Jan-25	4-Jun-25	5-Jun-25	3-Jul-25	25-Sep-25	2-Oct-25
7	19-Jun-25	26-Oct-24 - 2-Feb-25	2-Jul-25	3-Jul-25	31-Jul-25	23-Oct-25	30-Oct-25
8	17-Jul-25	23-Nov-24 - 2-Mar-25	30-Jul-25	31-Jul-25	28-Aug-25	20-Nov-25	27-Nov-25
9	14-Aug-25	21-Dec-24 - 30-Mar-25	27-Aug-25	28-Aug-25	25-Sep-25	18-Dec-25	1-Jan-26
10	11-Sep-25	18-Jan-25 - 27-Apr-25	24-Sep-25	25-Sep-25	23-Oct-25	15-Jan-26	22-Jan-26
11	9-Oct-25	15-Feb-25 - 25-May-25	22-Oct-25	23-Oct-25	20-Nov-25	12-Feb-26	19-Feb-26
12	6-Nov-25	15-Mar-25 - 22-Jun-25	19-Nov-25	20-Nov-25	18-Dec-25	12-Mar-26	19-Mar-26

Contact:

TEBOGO SERAPELWANE
TEL: 012 672 9499
Cell: 083 711 2224
E-MAIL: tebogo@arc.agric.za

ICAR

CERTIFICATE OF QUALITY
Valid up to December 2029

WE ARE DRIVEN TO INFORM AND EXPOSE TODAY'S YOUTH TO RESEARCH

17 April 2024: Ngwanamatlang Secondary School, Jane Furse, Sekhukhune, Limpopo

6 June 2024: The Future Comprehensive School, Masemola, Lebowakgomo, Limpopo

11 July 2024: Mphela A Marumo Secondary School, Apel. Sekhukhune, Limpopo

1 August 2024: Leap Science & Maths School, Jane Furse, Limpopo Kwaggafontein.

6 August 2024: Sozilani Secondary School, Mpumalanga

5 September 2024: Doxa Deo Edendale, Cullinan, Gauteng

ARC-ANIMAL PRODUCTION

ARC-Animal Production conducts fundamental and applied research with partners to generate new knowledge, develop human capital and foster innovation in agriculture through technology development and dissemination, and competitive commercialization of research results, in support of developing a prosperous agricultural sector.

Animal Nutrition

Rangeland Ecology and Management

Forage Breeding

Animal Breeding and Genetics

Germplasm Conservation and Reproductive Biotechnologies

Meat and Dairy Science

WE ALSO PROVIDE SCIENTIFIC SERVICES IN THE FOLLOWING AREAS:

- Animal Recording and Improvement through the **National Improvement Schemes** e.g.
  - National Beef Cattle Improvement Scheme
  - National Dairy Cattle Improvement Scheme
  - National Pig and Small Stock Improvement Schemes
  - Kaonafatso ya Dikgomo for smallholder farmers
- Quantitative and Qualitative **Analytical services for feed and food analysis**
- **Animal Forensic Services**
- **National Genetic Evaluation** of Livestock (e.g. BLUP Analysis)
- **Germplasm Conservation** of farm animal genetic resources
- Information dissemination through **training and capacity development**

TRAINING COURSES:

- Beef Breeding and BLUP Technology
- Beef Cattle Management
- Cattle and Pig AI
- Small Stock Management
- Introductory and Advanced Meat Processing
- Pig Production
- Poultry Production
- Dairy Production and Processing
- Range/Veld and Pasture Management

Contact details:

Una-Lou Orffer
Tel: +27 (0) 12 672 9111
Fax: +27 (0) 12 665 1563

Private Bag x2
Irene
0062

www.arc.agric.za

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