

ANGUS JOURNAL 2019

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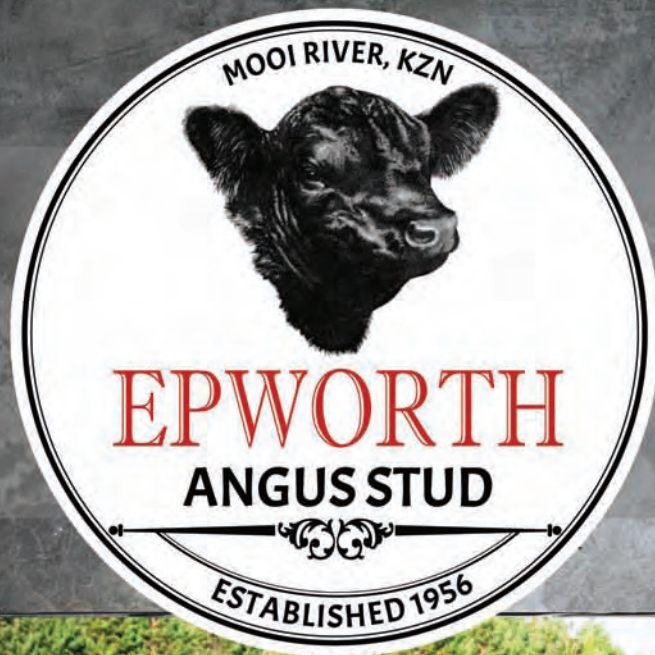
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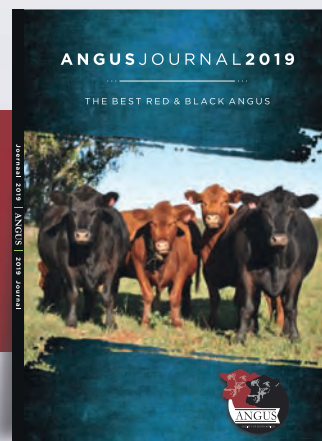
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Vroulike diere uit die LOUMOTTA stoet van Loutjie Campher, Ventersdorp. Foto geneem deur Wilru Campher



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Ons kan hulle met vrymoedigheid aanbeveel vir enige ontwerp- en drukdiens.

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Elke droogte word met reën gebreek, en in 2019 kan ons weer die Hemelse Vader dank vir Sy groot genade. Die reën waarmee die meeste van die droogte geteisterde gebiede geseën was, gee weer nuwe moed vir die landboujaar wat voorlê.

Landbou in SuidAfrika is op 'n kritieke stadium met mielieboere met oeste op hoë-risiko weens laat aanplantings, die erge daling van vleispryse, groot dele van die land wat steeds gebuk gaan onder droogte, asook uitsprake deur politici in die verkiesingsjaar.

Ons glo en vertrou dat God orals uitkoms sal gee, elke struikelblok het 'n vervaldatum!

2019 promise to be a year full of challenges and the start of a new era.

We thank John Boulle for his contribution and service to the Society and the breed for the past thirteen years and wish him well for future endeavours.

We are pleased to welcome Danie Dames as our new Breed Advisor and we believe he will have a positive impact and that he will help take the Angus breed to new heights.

We would also like to thank Linette van Niekerk for her hard work, especially during the last year. She kept the office running smoothly, while we were searching for a new breed advisor.

Angus Beef remains our biggest asset. The success of Angus Beef is the only way we can both secure and promote the future of our beloved breed. Angus beef has the quality that the consumer is looking for. It is the product of choice. We are working hard and we are optimistic to have Angus meat on the shelves, in various Woolworths food outlets stores across the country in 2019.

ELKE STRIKELBLOK HET 'N VERVALDATUM



RC Malherbe

BOODSKAP VANAF DIE VOORSITTER



The Society thanks every breeder and producer who are promoting our breed and Angus Beef, through various butcheries throughout South Africa.

Genomics must be seen as the future. It is design to assist us in making better decisions when it comes to breeding quality, stud cattle. The Angus breed will be taking part in the Genomics programme, running for the next three years. We, as members of the Angus Society, will have to work together to make a success of this project. Only by working together, will we obtain the required DNA samples to produce more accurate BLUP figures and reap the rewards of this programme.

Thank you to every council member who is willing to serve on the council and do their bit for our breed. I am confident that we will be a good team going forward in 2019. Let us work together - from provincial level - to provide support and guidance to all breeders, especially to the new breeders.

Ons weet Angusbulle is die eerste keuse vir kommersiëleboere vir 'n kruisrasbul. Kom ons oortuig hulle ook van ons grootste bate, die Anguskoei! Met uitstekende temperament, moederseienskappe, melk, groei en gewig wat die Anguskoei bied, is daar geen rede waarom ons nie kommersiële kuddes landwyd verder kan uitbrei nie. Ons is nie verniet die grootste beesras ter wêreld nie!

Kom ons pak die bul by die horings (nou nie 'n Angus bul nie) en groei en bemark ons ras in 2019. ■

Angusgroete
RC Malherbe

Kroon Angus

VAN GESLAG TOT GESLAG
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TUESDAY

3 SEPTEMBER 2019

TOP ANGUS CATTLE

*Boer saam met Kroon Angus
van geslag tot geslag.*



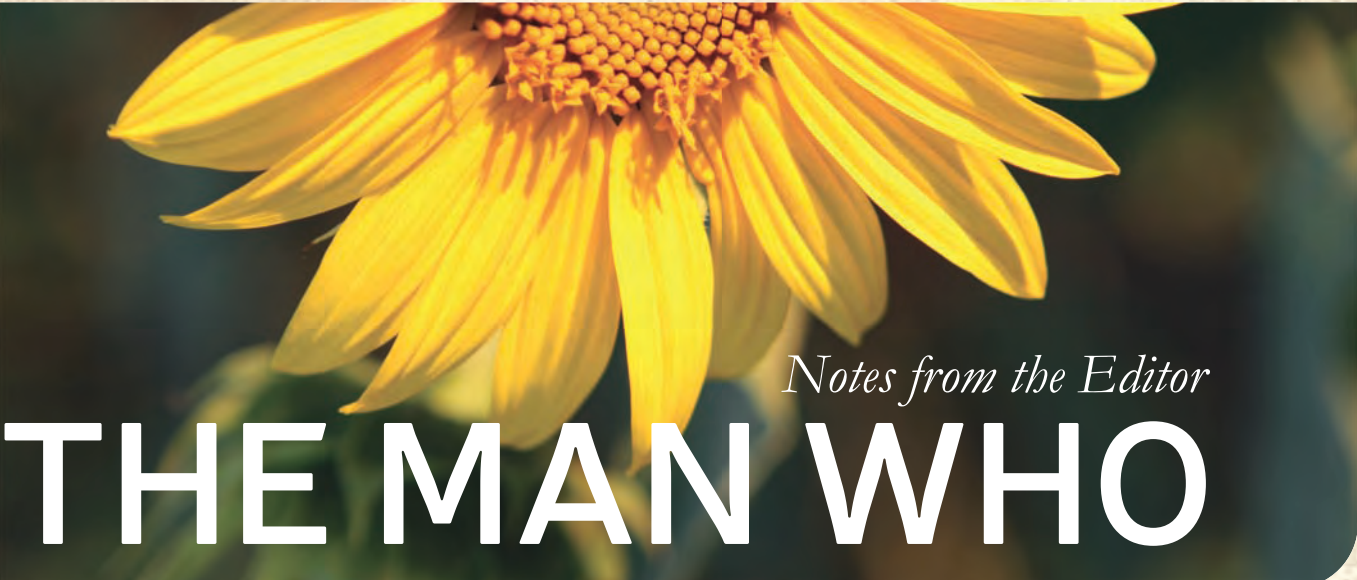
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Notes from the Editor

THE MAN WHO SOLD HOT DOGS.

(Author unknown)

There was a man who lived by the side of the road and sold hot dogs. He was hard of hearing so he had no radio. He had trouble with his eyes so he read no newspapers. But he sold good hot dogs. He put up signs on the highway telling how good they were. He stood on the side of the road and cried: "Buy a hot dog, Mister?" and people bought. He increased his meat and bun orders. He bought a bigger stove and take care of his trade. He finally got his son from college to help him out.

But then something happened. His son said: "Father, haven't you been listening to the radio? Haven't you

been reading the newspapers? There's a big depression. The European situation is terrible. The domestic situation is worse."

Thereupon the father thought: "Well, my son's been to college, he reads the papers and he listens to the radio, and he ought to know". So the father cut down on his meat and bun order, took down his advertising signs, and no longer bothered to stand on the highway to sell hot dogs. And his hot dog sales fell almost overnight. "You're right, son" the father said to the boy, "We certainly are in the middle of a great depression." By courtesy of Isowell (Pty) Ltd. – provided by Daniël Maartens (MARDAN Angus, Reddersburg)

Geen boer, besigheid of diensnemer in die landboubedryf, is onaangeraak deur die voordurende droogtes, politieke onsekerhede en teisterende veesiektes nie. Dis baie maklik om teen die "slippery slope of depression" meegevoer te word, en dan fokus van ons doelwitte te verloor.

Vanuit die Kantoor was die 2017 en 2018 periodes vol uitdagings! Verandering en aanpassing het nuwe wagwoorde geword. Met die aanstelling van Danie Dames kan ons ietwat versigtig, maar baie optimisties uitsien na die verkoop van baie "hot dogs"!

Te midde van soms neerdrukkende omstandighede, met almal wat swaar dra aan hul eie werkslading – is daar altyd sterretjies wat helder skitter, gevul met hulp en toewyding.

Baie dankie vir ieder en elk wat hierdie 2019 Angus Joernaal moontlik gemaak het. Dankie vir die ondersteuning met die koop van advertensieruimte, die skrywers van artikels en elkeen wat 'n foto gestuur het, vir die gebruik in hierdie joernaal.



Linette van Niekerk

SYFERPAN

Engus

Contact: Lawrence at 072 402 2028



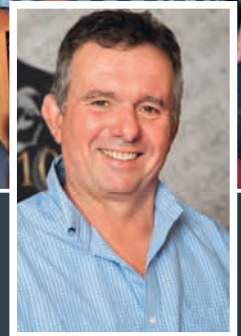
Tough Veld Adapted Bulls and Females available at our Sale on
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ANGUS Raad | Council 2018/2019



From left to right: Kevin Culverwell, RC Malherbe (Voorsitter),
Basie Bezuidenhout (Ondervoorsitter), Issie Liebenberg

Back left to right: Russell Marriott, MJ Ernst, Jannie Kotzè,
Linette van Niekerk (SA Angus), Kevin Miles, Douglas Fletcher



Andrew Masterson
– ex officio



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All articles in this journal will be
available on the website as well.

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ook op die webwerf beskikbaar wees.





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JONKERSHOEK

RED ANGUS STUD

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15 Oktober 2019

Finding the Genes **that affect Meat Quality Traits**

Helena Theron, SA Stud Book

Meat Quality traits can be broadly defined to include various carcass traits that are economically important to producers right through to palatability traits which are important for consumers. Carcass traits have been genetically improved through conventional beef cattle breed improvement programs which use pedigree and performance records to estimate EBVs. It is important for performance testing and selection to be able to accurately measure carcass traits on a live animal. Real-time ultrasound imaging is used on live animals to measure Eye Muscle Area (EMA), Back Fat and Marbling, but it cannot for example measure tenderness, which is an important meat quality trait for consumer satisfaction. Tenderness can only be obtained after the animal has been slaughtered, as it is measured with a Warner-Bratzler apparatus that measure the force required to cut through a piece of meat. However, if genetic markers (SNPs) for tenderness for example can

be found on animals measured for the trait, it can be included in routine genetic evaluations and unmeasured live animals can be selected for it. GEBVs (genomic enhanced EBVs), which is the addition of genomic information (SNPs), to conventional breeding values (EBVs), is already possible and available in South Africa. Current world-wide research includes the discovery and understanding of genes that control production traits and incorporating these markers in conventional breeding value estimation.

Discovery of genes and SNPs of mostly single gene traits, like polledness or double-muscling is of importance since they can directly be used in selection. Genome wide association studies (GWAS) is one of the methods used to detect genetic variants affecting economically important traits. GWAS aims to find associations between SNPs and traits, and can be visually illustrated with a Manhattan Plot, like the one in Figure 1 of a study where 14 SNPs showed a significant association to varying degrees with the trait ADG (Average Daily Gain).



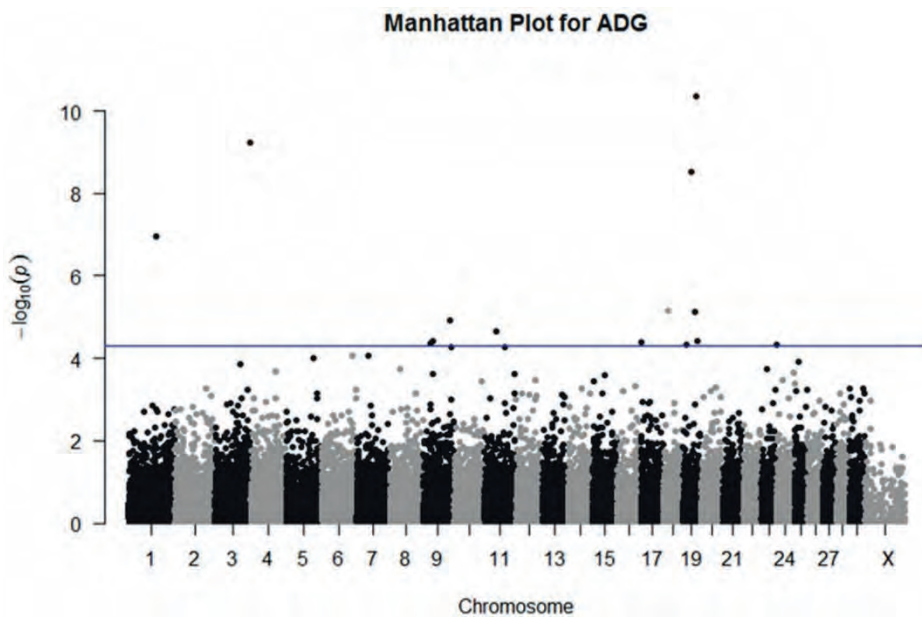


Figure 1:

A Manhattan plot of GWAS results illustrating 14 SNPs that reached significance for ADG. Each dot represents a SNP, with the X-axis showing the chromosome number on which the SNP resides and the Y-axis showing the association level. (Higgins *et al.*, 2018)

As in the example shown in Figure 1, polygenic production traits tend to be affected by many individual SNPs over many different chromosomes, but individually mostly explain only a small percentage of the genetic variance. It has also been found that specific SNPs influencing a specific trait is also not always repeatable over different studies, indicating possible population, breed and even country differences. However, methods detecting SNPs and the significance level of SNPs are also currently still being investigated and refined by researchers. Nonetheless, many interesting results have been published in the past few years. One study for example found 73 SNPs on Chromosome 6 that was mostly associated with body weight-related traits. Markers that significantly affected multiple traits sometimes impacted them in the same direction, sometimes in opposite directions, like 'positive' and 'negative' genes. Researchers also found that pairs of traits with low genetic correlations, seems to be controlled by different groups of SNPs.

It is challenging to interpret complex concepts like 'Meat Quality' by using many single component traits. A recent study on meat quality combined phenotypic measurements of 23 traits including carcass traits, components of meat quality, and mineral and peptide concentrations with 54 000 SNP genotypes of 2110 Angus cattle to derive an annotated gene network associated with meat quality, shown in Figure 2. These results provide novel information regarding biological mechanisms and genes that lead to complex phenotypes.

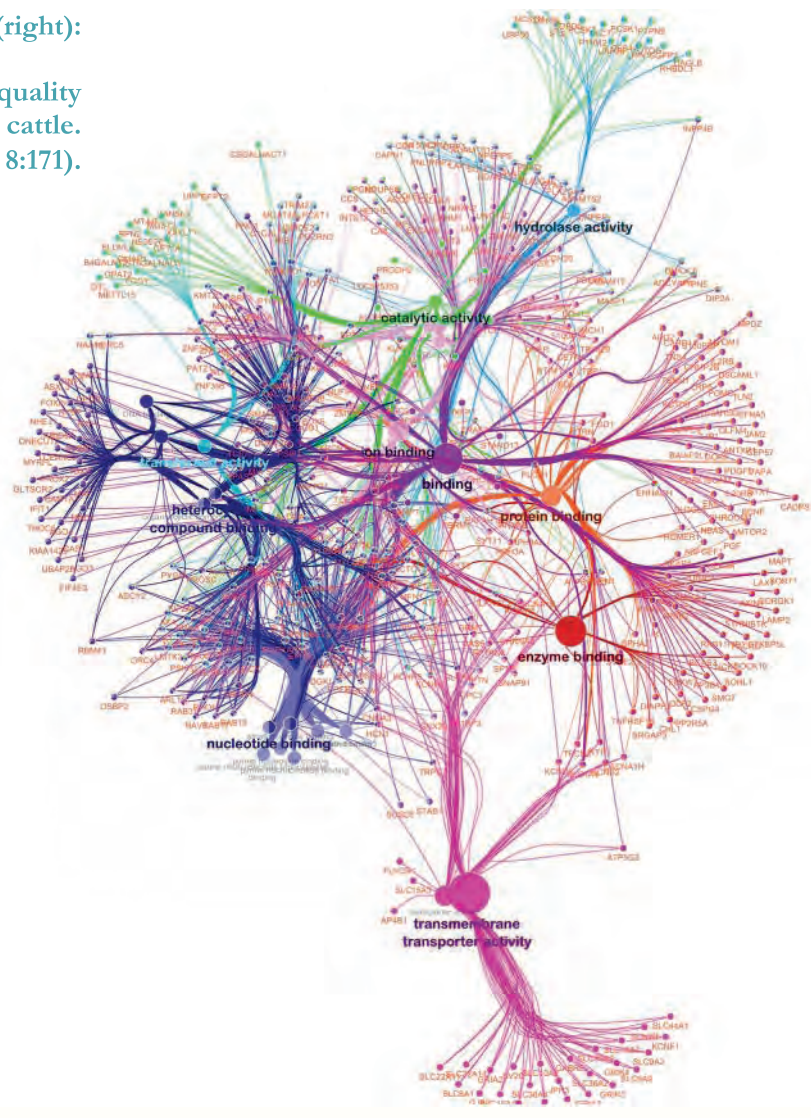
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One study for example found 73 SNPs on Chromosome 6 that was mostly associated with body weight-related traits.

Figure 2 (right):

Functionally grouped network for meat quality complex in Angus cattle.
(Matteescu *et al.*, 2017. *Frontier Genetics* 2017, 8:171).

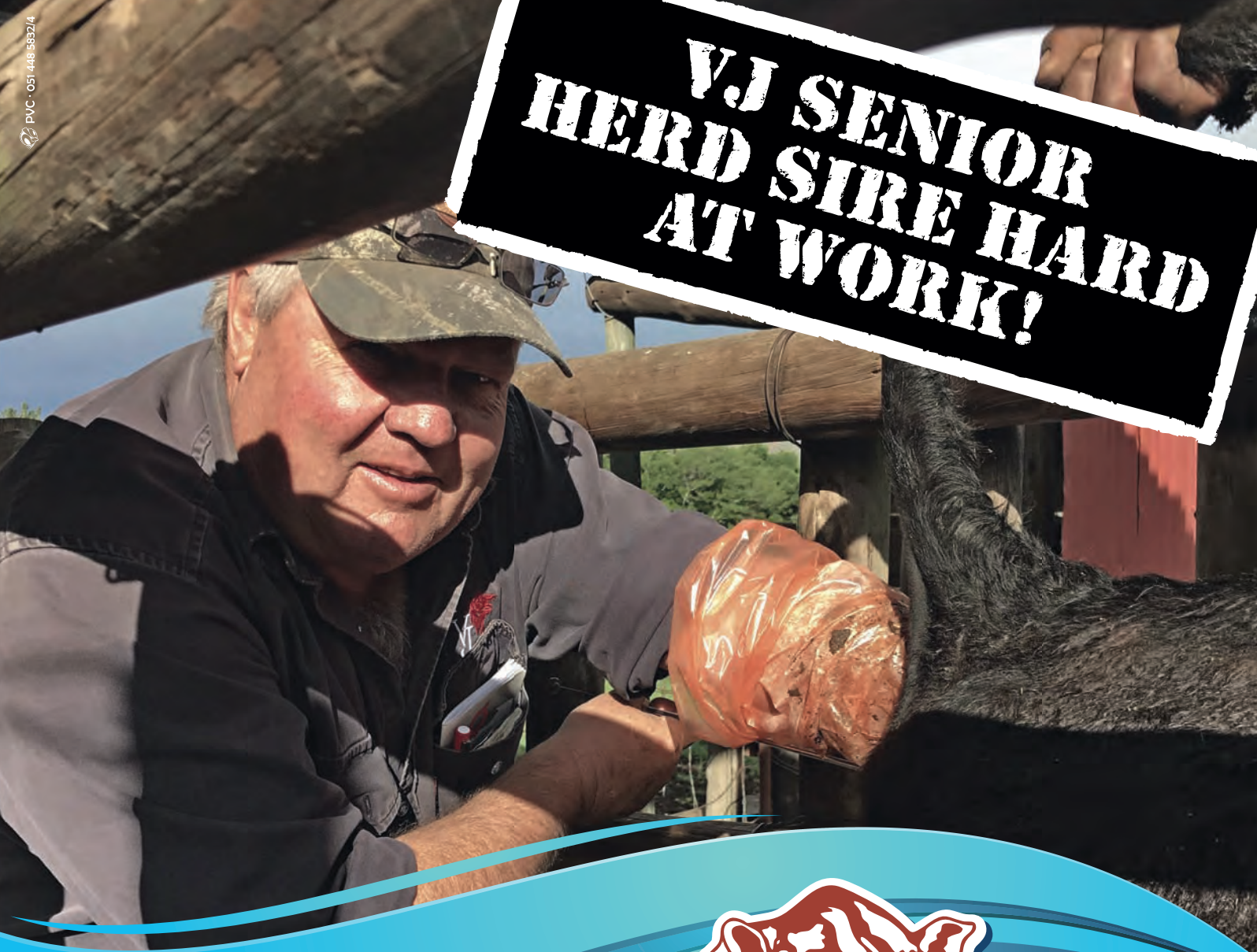
Genotyping of especially breeding bulls is becoming a routine for many breeders. Genotypes, phenotypes and pedigree information are incorporated to estimate GEBVs (genomic estimated breeding values), which is more accurate than conventional EBVs, as more information is used. Genomic assisted breeding programmes facilitate the rapid and cost effective selection of more efficient beef cattle. Selection programs that incorporate either specific markers (for example for growth, feed efficiency or carcass traits) or a large number of markers (covering the whole genome) in genomic selection have been reported to result in a 32% improvement in accuracy compared to parental average breeding values. However, while genotyping are becoming routine for genomic selection purposes, this is still only cost effective at the seed stock level. Research is also underway into the development of targeted panels that will be smaller and cheaper, and which could be applied more broadly for example to influence feeding and management considerations. These commercial chips could also add value through traceability, genetic origin, and parentage discovery.



“

Selection programs that incorporate either specific markers (for example for growth, feed efficiency or carcass traits) or a large number of markers (covering the whole genome) in genomic selection have been reported to result in a 32% improvement in accuracy compared to parental average breeding values.

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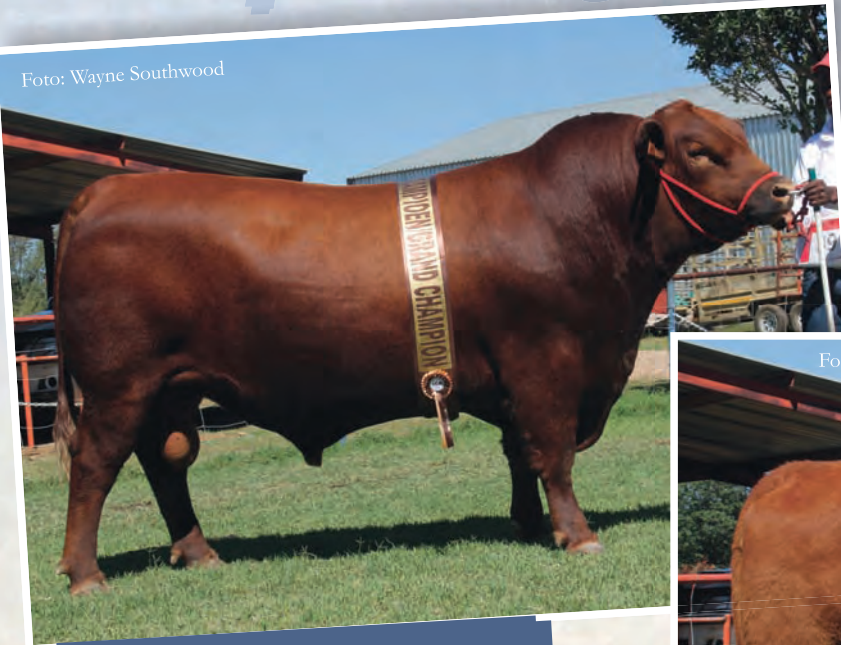


Noord-Kaap, Upington

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Vryburgskou 2018

Foto: Wayne Southwood



ROECHAMA Elegance
Junior en Groot Kampioenbul
RC Malherbe en Vennote van Herzogville.

Die Noord-Wes se streekskampioenskapskou het plaasgevind op 27 Maart 2018 tydens die Vryburgskou. Mnr Piet Delpont was die beoordelaar. Die skou is goed bygewoon deur deelnemers uit die Vrystaat en Noord-Wes.

Foto: Wayne Southwood



ROECHAMA Mielan
Junior en Grootkampioen Vroulik
RC Malherbe en Vennote van Hertzogville.

Foto: Wayne Southwood



Senior Kampioenbul, RCM14-26
RC Malherbe en Vennote, Hertzogville

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20 DRAGTIGE KOMMERSIËLE VERSE

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MELKBOSSTRAND

GPS: -33.736000 18.484722

Vanaf die N7, draai af op die M19. Ry ongeveer 5.5km,
draai links by Blaauwberg Plaas.

Vanaf die Weskus pad, draai af op die M19. Ry vir 3.8km,
draai regs by Blaauwberg Plaas.



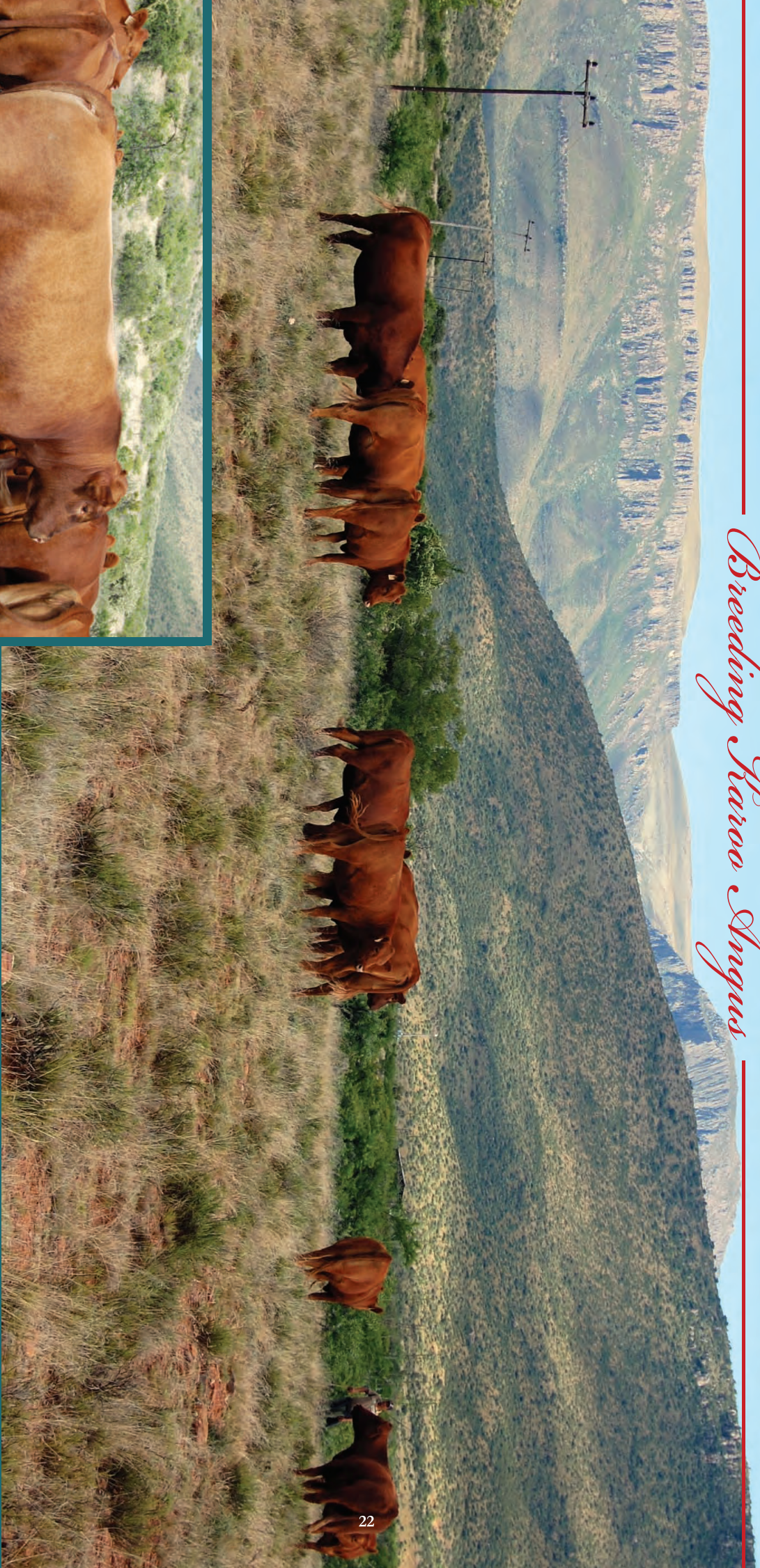
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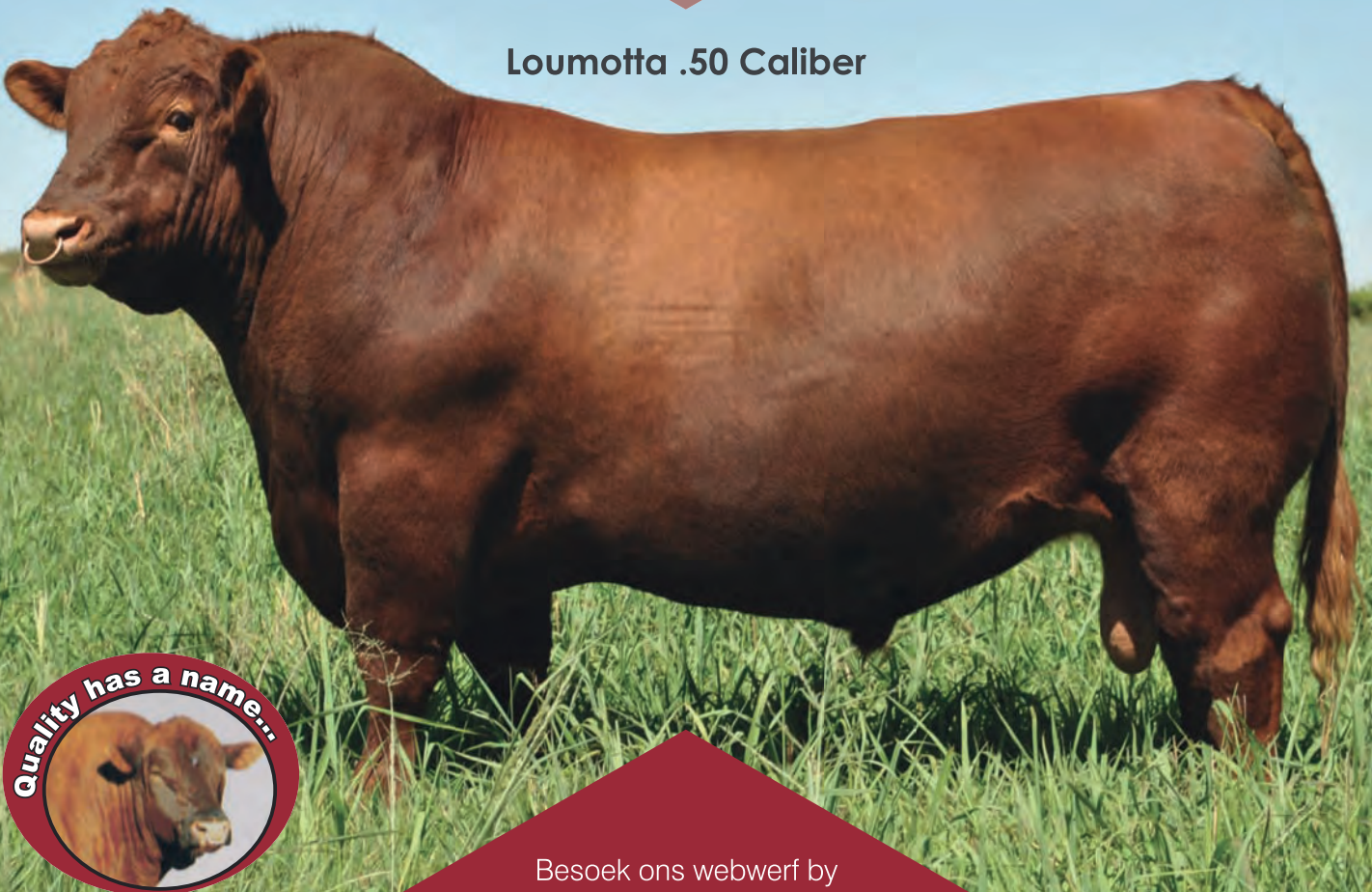
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RUVOER

Daar moet aan spesifieke minimum voedingsvereistes van 'n dier voldoen word om 'n gegewe uitset te lewer, ongeag hoe die bankbestuurder daaroor voel. Ekstensiewe veeboerderye wat ekonomies volhoubaar presteer se aanvulling is 5% - 10% van hulle totale droë materiaal inname. Baie aandag word aan die aanvullings komponent spandeer. Die oorblywende 90% - 95% is ruvoer wat deur die hulpbron voorsien word. Indien die 90% nie reg bestuur word nie gaan die waarde van die beste aanvulling verlore. Die kern van suksesvolle aanvulling is suksesvolle ruvoerbestuur.



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SELEKSIE VOORKEURE

Diere is soos mense. Voedingstof ryke ruvoer se vrywillige inname is hoër as lae voedingswaarde voere. Tabel 1 toon diere se vrywillige inname van verskillende ruvoere. Dit spreek vanself wat die netto effek is as diere min van die lae waarde ruvoer inneem. Die effek is dubbeld na die negatiewe kant, droë materiaal inname is te laag van dit wat swak is. 'n Totale voedingstof inname realiseer wat onder behoefte vir 'n spesifieke produksie stadium is.

Tabel 1: Vrywillige inname van ruvoere deur rumendiere

Ruvoertipe	Inname (% van liggaamsmassa)	
	Droog	"As is"
Raaigras	>3	>15
Lusernhooi	2,5	-
Swak kwaliteit grondbone hooi	1,4 - 1,8	-
Swak veld weiding	1,5 - 1,8	-
Voersorghums	1,8 - 2	5,4 - 6
Kuilvoer	1,8 - 2,2	5,5 - 6,5

Hierdie beginsel word goed illustreer deur die werk van Rethman (1980) wat oulandgras onderskeidelik in die blaar-, pyp- en blom stadium gesny en aan merino hammels aangebied het. Proteïen waarde het afgeneem van 15.7% na 11.3% (steeds goeie hooi).

Vrywillige inname het van 1.252 kg/dag (blaar stadium) gedaal na 0.979 kg/dag (pypstadium). Diereprestasie het afgeneem van 150 gram/dag massatoename (blaarstadium) tot 53 gram (pypstadium)

BESTUUR

Wat gebeur in 'n ekstensiewe produksiestelsel op natuurlike veld? Kirkman & Moore(1995) toon dat diere die vermoë het om 9%-10% proteïen dieet te selekteer op veld met 'n 4% - 5% proteïen (snymonster) ontleding. Die werk is met gefustileerde diere op gespaarde somerveld wat gedurende die winter benut was gedoen. Dit is van belang dat daar genoegsame materiaal gespaar was om die diere se seleksievermoë te benut.

Die implikasie van goeie vs. swak weiding word illustreer in Tabel 2 waar 'n diere van 500 kg meer as dubbeld die hoeveelheid proteïen inneem tussen die twee veldtipes. Ongeag die diere se behoefte op daardie stadium het die swak veld tipe 'n direkte ekonomiese impak om die balans aan te vul. Hoë aanvullings met lae ruvoerinnam kan lei tot sekondêre probleme wat 'n ekonomiese impak het. Buite bestek van die artikel het goeie veld beter water retensie, beter spesiesamestelling en verhoogte drakrag.

Tabel 2: Voeding implikasie van goeie vs. swak weiding op 'n 500 kg diere

	Swak weiding	Goeie weiding
Proteïen ontleding (%)	5%	8%
Droë Materiaal Inname (%)	1,5%	1,9%
Werklike Inname (Kg)	7,5	9,5
Proteïen inname (Gram/dag)	375	760

RUSPERIODES

Die toevallige tydperk wat diere nie in 'n kamp was nie kwalifiseer nie noodwendig as rusperiode nie. Gestel 'n kamp word ontlaar tot op 10 cm hoogte en gelaat vir 'n ses weke periode waarna die weiding herstel tot 'n 30 cm hoogte. Het hierdie weiding gerus of produseer? Na die “rusperiode” van ses weke is daar 300 kg materiaal meer as wat daar was, die weiding het nie gerus nie maar produseer!

Rus in weidingsterme beteken 'n lang periode vir die gras om voldoende loof te vorm wat genoegsame suikers kan produseer. Die suikers word terug gevoer na die plant se wortelstelsel en as stysel geberg om 'n groeikragtige plant te verseker. Baie wetenskaplike data is publiseer in die verband maar Figuur 1 verduidelik die effek van rus op 'n plant die beste. Die plant wat 'n somer rus ontvang het se wortelstelsel gee hom die vermoë om groeikragtig in die daaropvolgende seisoen te produseer. Die wortels (Figuur 2) van die plant wat intens benut was herstel indien die weiding weer vir 'n seisoen gerus word.



Figuur 1.



Figuur 2.

Figuur 1. Wortelstel van 'n grasplant na 'n volle groei seisoensrus

Figuur 2. Wortels van 'n plant wat intens benut was vir die groeiseisoen

Dank aan Prof. Hennie Snyman (UFS) vir die gebruik van sy foto's

Rus beteken 'n volle groeiseisoen rus van eerste reëns tot eerste ryp. Gedurende die dormante tydperk wat in aanvang neem met die eerste ryp het beweiding nie 'n betekenisvolle invloed op veld nie en kan dit benut word.

DOELWITTE

Dit is nodig dat die doelwitte wat vir die spesifieke onderneming bereik wil word duidelik uitgeklaar moet word. Die keuse van 'n veld bestuurstelsel / strategie wat gevolg wil word moet die doelwitte bereik. **Vir 'n ekstensiewe stelsel sal die volgende doelwitte van belang wees:**

- Die stelsel moet genoegsame droë materiaal vir die winter voorsien - krities
- Moet 'n hoë reproduksie tempo van die kudde kan onderhou
- Moet 'n vroeë waarskuwingstelsel hê om voortydig van ruvoertekorte te weet
- Eenvoudig wees
- Volhoubaar wees

Ongeag die mark, die ondernemer se persoonlike voor- en afkeure word die besluit van die produksiestelsel met die hulpbronsamestelling as basis geneem. Deur anders te besluit is so goed as om mielies gedurende April te plant.

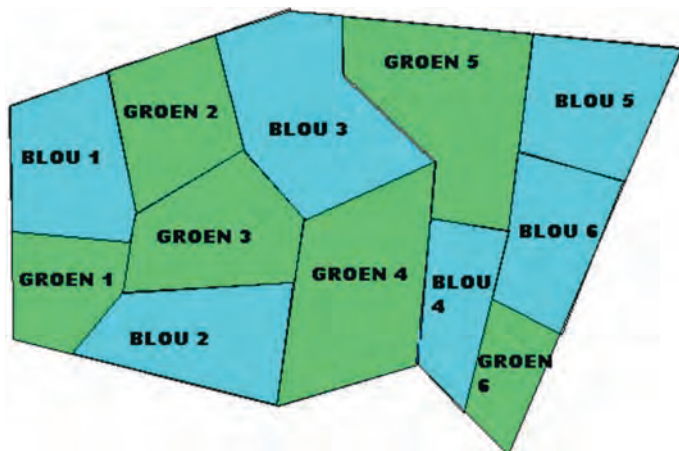
Verskillende veldtipes kom op een plaas voor weens 'n verskeidenheid van redes nl. gronddiepte, helling, mikroklimaat ensovoorts. Veldtipe verskille is die hoofrede vir die span van kampe. Eerste word veldtipes afgespan. Indien daar dan nog steeds te min kampe is vir die effektiewe bestuur van die kudde kan verdere kampe gespan word.

Die kwessie van weikapasiteit kom ook ter sprake en is 'n vloeibare syfer maar dit word as basis aanvaar dat 'n hulpbron se weikapasiteit nie oorskry mag word nie. Langdurige oorskryding van weikapasiteit sal vroeër of later negatief in die onderneming se finansiële state weerspieël

RUVOERPRODUKSIE

Die beginsel wat toegepas word om doelwitte te behaal word in Figuur 3 demonstreer. Dit is 'n beginsel en nie 'n rigiede stelsel nie. In Figuur 3 word 'n blou en groen blok of gebied voorgestel. Aan die begin van die groeiseisoen (lente) word die hele kudde konsentreer op 'n blok (blou) tot en met die eerste ryp geval het. Gestel die plaas het 'n dravermoë van 100 beeste, die totale 100 beeste word in die blou blok geplaas. Die groen blok rus vanselfsprekend vir die somermaande tot en met die eerste ryp val. Aangesien daar genoegsame kos gespaar is binne die groen blok dien dit as oorwintering vir die kudde. Die groen blok word ook bewei in die tweede seisoen se somermaande aangesien dit in seisoen 1 se somer gerus het en genoegsame reserves het. Aan die einde van seisoen 2 word die blou blok wat gedurende die somer gerus het weer as oorwinterings voer gebruik. Eenvoudig gestel is daar twee blokke wat op 'n jaarbasis roteer waarvan die wisseling gedurende die vroeë winter plaasvind. Die twee blokke het 'n homogene drakrag en albei het verteenwoordigende veld van die plaas in bv. ranteveld, vleie en leegtes. Die aantal kampe per blok is irrelevant, een blok kan bv. 5 en die ander 7 kampe hê net solank die twee blokke se dravermoë dieselfde bly. 'n Hulpbron met net twee kampe is al genoegsaam om die beginsel toe te pas. Die benuttingpatroon / kamp skuiwings van die kampe binne 'n blok word gedoen na gelang van die produsent se behoefte en voorkeure vir sy kudde. Onthou die wyse van ontblaring speel 'n baie ondergeskikte rol aan die wyse van rus – seisoensrus.

Figuur 3 . Skematiese voorstelling van hulpbronbenutting



“

Sien dit nie as 'n rigiede stelsel nie maar as 'n benadering waarvan die beginsel is dat wat benut word redelik goed benut word en wat gerus word 'n totale groeiseisoensrus ontvang.

BEREIK DIE BENADERING DIE DOELWITTE?

Winter droë materiaal

Genoegsame somerweiding word gespaar om winterkos te voorsien waaruit die kudde 'n goeie dieet kan selekteer en maksimum voordeel uit aanvulling verkry.

Hoë reproduksie tempo

Diereprestasie word bevoordeel vanweë jong kort veld wat gedurende die kudde se produktiewe fase beskikbaar is.

Moet 'n vroeë waarskuwingstelsel hê om voortydig van ruvoertekorte te weet

Indien die weiding gedurende Februarie in die blok wat daardie seisoen benut word opgevreet is, kan daar wel na die ander blok geskuif word. Dit is 'n vroegtydige waarskuwing dat die kos te min is en daar kan vroegtydig stappe geneem word.

Eenvoudig wees

Indelings kan gedoen word dat 'n blok verspreid oor die plaas voorkom. Die kampe binne 'n blok wat 'n seisoensrus ontvang is dus verspreid oor die plaas met kort gevreete kampe tussenin wat die risiko van brand verlaag. Geen komplekse rekordhouding nie, kampe wat binne 'n spesifieke blok is kan gemerk word met 'n kleurplaat. Die veewagter kan enige kamp binne die blou blok gedurende die seisoen gebruik.

Volhoubaar wees

Geen addisionele koste om aan te gaan op infrastruktuur nie, benut die hulpbron met huidige infrastruktuur net op 'n ander wyse. Die sekondêre effekte van goeie veld kom oor tyd na vore maar die belangrikste is dat die kudde gemaklik oorwinter met 'n vroeë waarskuwingstelsel.

WERK DIT IN DIE PRAKTYK?

Sien dit nie as 'n rigiede stelsel nie maar as 'n benadering waarvan die beginsel is dat wat benut word redelik goed benut word en wat gerus word 'n totale groeiseisoensrus ontvang. Sommige produsente het drie blokke waarvan een benut word en die ander twee as wintervoeding dien, ander gebruik

weer vyf blokke waarvan twee op 'n slag benut word in 'n rotasiestelsel. Die produserende maande word benut om genoeg kos vir die hele jaar bymekaar te maak. Waar oesreste beskikbaar is word tussen 'n kwart en derde gespaar. Vir hulpbron instandhouding wil veld minimum een keer in vier jaar 'n volle groeiseisoensrus ontvang.

Daar kan nie in een jaar na so 'n benadering beweeg word nie aangesien veld wat die vorige seisoen gewei was nie die weidruk kan hanteer nie. Identifiseer 'n paar kampe wat onderbenut was die vorige seisoen en konsentreer op hulle in seisoen 1. Daar sal op die wyse aan die einde van die seisoen 'n paar kampe wees wat baie min benut was gedurende seisoen 1. Benut hierdie kampe in seisoen 2 intens nadat hulle ook in die winter benut was. Gewoonlik vind produsente dat hul in jaar 3-4 net helfte van hul plaas benut op die wyse en die ander helfte vir wintervoeding benut.

OPSOMMING

Sien die benadering nie as 'n rigiede beweidings stelsel, niks in die natuur werk op so 'n wyse nie. Hierdie is 'n strategie van hulpbron benutting waar beide die hulpbron en die kudde se behoefte oor tyd aangespreek word. Benut die veld kort vir goeie diereprestasie. Rus die veld vir lang tydperke gedurende die groeiseisoen vir hulpbron instandhouding. Die klem van die benadering lê op die lang tydperke van rus met die wyse van benutting wat ondergeskik is hieraan. ■

“

Die produserende maande word benut om genoeg kos vir die hele jaar bymekaar te maak.

VERWYSINGS

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Rethman N (1990). Kynoch Pasture Handbook. p.57. (referred article, 1980) ISBN 0-620-31994-1

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BLOEM SHOW 2018

The provincial Angus Championship show took place on 2 May 2018, during the Bloem Show.

Andrew Masterson was the senior judge and Jaco Smit, the junior judge on the day.
The show was well supported by members from the Free State, North West and Gauteng.



MAKOYALO KD15 39, red Angus bull calf and reserve grand champion with RP Campher (manager) and Kobus Delpont (owner) and Ben Lekay (handler).



ROECHAMA Elegance RCM15 19, junior and grand champion red Angus bull.



WENSPAN JK16 19, red Angus junior female champion with Dr Johan Kahts (owner) and Johannes Ntsala (handler).



WATERVAL WAF13 080, senior champion red Angus cow with Lefa Mokhachane (handler).



ROECHAMA Milan RCM15 186, junior and grand champion Angus cow with Rex Mokwena (handler).



MARRIGOLD Nancy MGS16 07, black Angus junior and grand champion female, with Russell Marriot (owner).



MARRIGOLD T-Rock MGS16 02, black Angus bull calf and grand champion with Samuel Sitatu (handler).

Rheeboksplaat Angusstoet

*"Ons teel mediumraambeeste met lae geboortemassa
en selekteer vir gehardheid."*



Jan van Dyk

Ceres

GIELIE GELDENHUYS



Dr Frikkie Maré
Department of Agricultural
Economics, UFS



THE WATER FOOTPRINT OF SOUTH AFRICAN PRODUCED ANGUS BEEF

According to the WFN (2016), the water footprint (WF) measures the amount of water used to produce each of the foods and services people use. It can be measured for a process, product, company, country, or even globally.

By using the WF method to calculate one's total water use, the focus of saving water for sustainable use shifts from the physical consumption of freshwater (such as a shower instead of a bath because a shower uses less water) towards saving water through the food that one consumes or the products one uses. One kilogram of beef, according to the WFN (2016), has a global average WF of 15 415 litres, while a kilogram of sheep meat and chicken meat have WFs of respectively 10 412 litres and 4 325 litres.

The total WF of a product, or process, is the sum of the green, blue and grey WFs. The green WF refers to the precipitation (rain) that is stored in the soil or temporarily stays on top of the soil or vegetation and eventually evaporates or transpires through the plants and do not necessarily returns to the same catchment area. The blue WF refers to the consumptive use of fresh surface or groundwater and includes water evaporation, water incorporated in the product, water that does not return to the same catchment area, and



water that returns to the same catchment area but not in the same period. The grey WF is an indication of the degree of pollution that can be associated with a process step and is defined by Hoekstra *et al.* (2011) as “the volume of freshwater that is required to assimilate the load of pollutants based on natural background concentrations and existing ambient water quality standards”.

The WF of a kilogram of beef comprises various sources of water throughout the value chain. Spies (2011) conducted a detailed analysis of the red meat value chain in South Africa, and the complexity of the value chain with the various factors that can influence each link of the chain was clearly demonstrated. Due to the complexity of the value chain, one should be very cautious to make assumptions regarding the value chain and the estimation of the WF of beef. The WF for cattle production can, for example, differ significantly between two regions and even though each region may have the same reproduction statistics, the total WF of the beef produced from the two regions can differ. Harding, Courtney and Russo (2017) proved this point when they investigated the influence of geographical location of primary cattle production, feed production, feedlots, and abattoirs in South Africa on the blue WF of beef. They found that the blue WF for beef varied between 3 583 litres/kg carcass weight (CW) in the worst-case scenario to 353 litres/kg CW in the best-case scenario.

The estimation of the WF of beef should thus further be done according to a detailed value chain analysis (VCA) for a specific region and production system so that the WF is not over- or underestimated based on certain assumptions.

Although the WF of beef from different geographical regions had been investigated in the past, very little attention had been given to the WF of different breeds of cattle. Since the reproduction and production statistics varies between breeds, the WF of beef from different breeds will also vary. Maré (2018) conducted a study to determine the WF of beef from different cattle breeds, of which one was the Angus. The study was conducted through a bottom-up approach where the WF of each link in the value chain (primary cow-calf production, feedlot finishing, and processing (slaughter and debone) was determined for a region in the central Free State. The cow-calf enterprise was simulated with a model using the average production and reproduction statistics of the Angus, while the feedlot and processing data was gathered through actual experiments. This article do not have enough space to provide all the details of the study, but more details is available from the author. The WF for the Angus, as determined by Maré (2018) is presented in Table 1.

Table 1: WF of the Angus for the different value chain links

	Cow-Calf Production	Feedlot	Processing	Boneless Beef
	Litre/kg Weaned Calf	Litre/kg Finished Calf	Litre/kg Carcass	Litre/kg Beef
Green WF	57 613	5 967	-	86 523
Blue WF	167	165	87	495
Grey WF	0.21	392	73 343	1 172
Total WF	57 856	6 524	73 430	88 189

Source: Maré (2018)

Considering Table 1, one immediately notice that the WFs of the different value chain links do not add up to the WF of boneless beef. The reason for this is that the WF of the entire value chain are allocated to the products and by-products of the carcass according to the economic value of each and not the weight. The second realization is that the WF of a kilogram Angus beef is quite astronomical as it basically takes 88 189 litres of water to produce 1 kg of boneless beef. Earlier in this article it was mentioned that the WFN (2016) estimated the global average WF of beef on 15 415 litres/kg, so why the big difference?

In order to answer the question above, the study by Maré (2018) must be compared with other studies on the WF of beef (Table 2). When one compares the estimated blue WF of the different studies, the result for the Angus is much in line with the results of others. While the blue WF of 495 litres/kg of boneless beef in this study is larger than the weighted average for South Africa by Mekonnen and Hoekstra (2010c), it is smaller than the global weighted average by the same authors. The blue WF of the Angus is also smaller than the blue WF average of beef produced in Brazilian feedlots (Palhares *et al.*, 2017), while it is only 58 litres/kg larger than the blue WF that Harding *et al.* (2017) estimated for beef produced in South Africa.

Table 2: Comparison of Angus beef with other studies

	Maré (2018)	Mekonnen and Hoekstra (2010c)	Mekonnen and Hoekstra (2010c)	Palhares <i>et al.</i> (2017)	Harding <i>et al.</i> (2017)
Location	Free State, SA	South Africa	Global	Brazil	South Africa
Production system	Mixed	Weighted average	Weighted Average	Industrial	Mixed
Value chain links	Production to processing	Production	Production	Feedlot only	Production to processing
Approach	Bottom-up	Top-down	Top-down	Bottom-up	Top-down
Product	Boneless Angus beef	Boneless beef	Boneless beef	Boneless beef	Carcass
Total WF (l/kg)	88 189	17 387	15 415	-	-
Green WF (l/kg)	86 523	17 050	14 414	5 039	-
Blue WF (l/kg)	495	226	550	769	437
Grey WF (l/kg)	1 172	111	451	-	-

The grey WF of a kilogram of boneless Angus beef is considerably higher than that of Mekonnen and Hoekstra (2010c) for both South Africa and the rest of the world. The other two studies did not estimate the grey WF. The large difference in the grey WF between Angus beef and the study conducted by Mekonnen and Hoekstra (2010c) can be ascribed to the fact that they used a top-down approach to estimate the WF and basically worked only with production data (meat production and feed consumption). In this study, a bottom-up approach was used and the processing of the beef (slaughter and deboning) was included, and it contributed the largest part of the estimated grey WF footprint.

Even though the blue WF of Angus beef relates well to the results from other studies, and the grey WF is more than double that of studies by Mekonnen and Hoekstra (2010c), the difference in the total WF is still very large compared to previous research and therefore closer attention should be paid to the green WF. The green WF of Angus beef is basically five times larger than the estimated South African WF calculated by Mekonnen and Hoekstra (2010c). The reason for the large differences may be ascribed to the fact that Mekonnen and Hoekstra (2010c) estimated the consumption of natural grazing from the amount of beef produced by applying estimated feed conversion ratios (FCRs) in a top-down approach. In the case of this research, a more exact analysis was conducted through a bottom-up approach, where the evapotranspiration (ET) of the

required natural grazing was estimated with satellite imagery. The green WF from the natural grazing in this study may also be larger due to the fact that the total feed requirement of the herd was used to express the WF of the offtake (weaned calves and culled cows) according to the VF of each, instead of using the feed requirements for the animals that were slaughtered only. The inclusion of the green WF of natural grazing in the total WF of an animal product remains open for debate. Although it was included in the WF of Angus beef in order to provide a complete view on the WF, it must, on the other hand, be kept in mind that even in the case where no farm animals grazed on the available natural grazing, the green WF of this grazing would have remained the same. If the green WF of the natural grazing is subtracted from the WF calculations, the total WF reduces to approximately 9 000 litres/kg, while the green WF decreases to approximately 7 500 litres/kg.

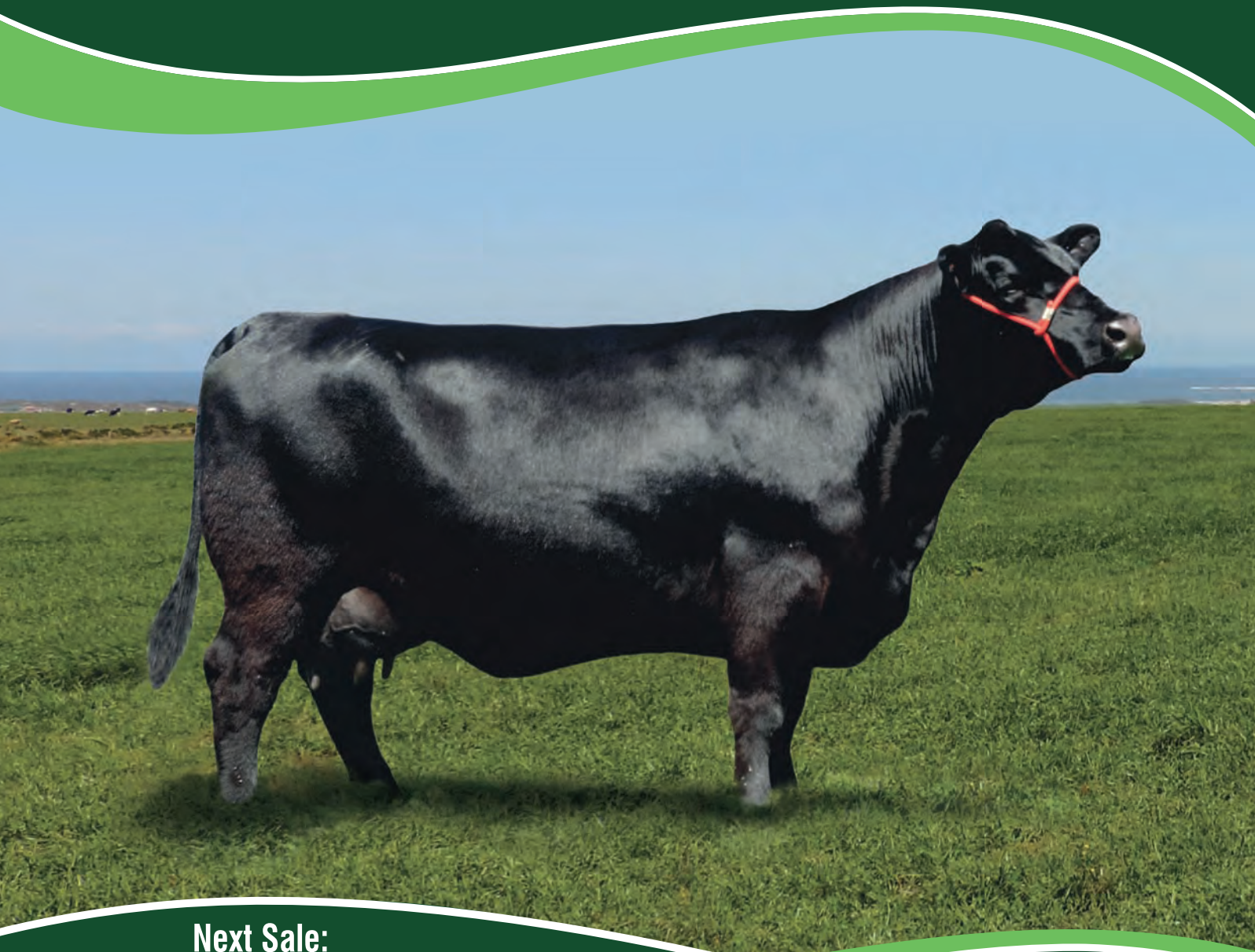
Even though the green WF of Angus beef in this study increases the total WF to levels much higher than were found in other previous studies, the blue and grey WFs relate well with previous studies when the differences in the calculation frameworks are taken into account. The estimated WF results of for Angus beef can thus be used as a WF benchmark for beef produced in the central Free State from a cow-calf production system and finished in a feedlot before being processed. ■

For more information please contact Dr Frikkie Maré at MareFA@ufs.ac.za



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TWO IN A ROW FOR ANGUS BEEF

2018 was the second consecutive year that the Angus breed took top honors in the annual ALFA Beef Challenge.

During the recent ALFA 2018 held from 18 to 20 September at the Afridome in Parys, visitors to the expo had the opportunity to blind-taste meat from five different cattle breeds. All the meat was aged and prepared in the same manner, and the public could taste and then vote for their favourite.

Angus beef is one of the best meats when it comes to marbling and tenderness.

As during the previous year's challenge, the Angus breed was represented in the challenge by Andrew Masterson of Milagro Farms & Sebastians Butchery in Humansdorp.

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TWO in a row for Angus meat

2018 was the second consecutive year that the Angus breed took top honors in the annual ALFA Beef Challenge. During the recent ALFA 2018 held from 18 to 20 September at the Afridome in Parys, visitors to the expo had the opportunity to blind-taste meat from five different cattle breeds. All the meat was aged and prepared in the same manner, and the public could taste and then vote for their favourite.

"I want to thank the breeders that supplied meat for this interesting challenge," said Albert Loubser, one of the organisers of ALFA. "We had Brahman, Afrikaner, Bonsmara, Simbra and Angus meat in this year's challenge. After the meat was sourced, it was wet-aged and prepared by the Koepel Butchery in Parys."

Angus crowned again

The winner of the challenge was announced at the prestigious ALFA gala dinner held on Thursday, 20 September. RC Malherbe of the Angus Society of South Africa, was called to the stage to accept the award on behalf of the society, after the Angus beef emerged as the clear winner for the second consecutive year.

As during the previous year's challenge, the Angus breed was represented in the challenge by Andrew Masterson of Milagro Farms, just West of Oyster Bay. "We supplied 15kg of Angus sirloin steak through Sebastians Butchery in Humansdorp," said Masterson. According to him, the repeat victory is testament not only to the value of the breed, but also the manner in which the animals are reared.

"The meat was sourced from pasture-fed Angus cattle from my commercial herd. Our herd is run on pastures all year round and the animals are also finished on pastures. We don't use growth stimulants or routine antibiotics and choose natural rearing as far as possible," he said.

According to Masterson, Angus beef is one of the best meats when it comes to marbling and tenderness. "These qualities are further enhanced by the natural and humane treatment of the cattle."



Andrew Masterson of Milagro Farms (right) being congratulated by Rudi van der Westhuizen of Samic at the 2017 ALFA gala dinner, after winning the challenge in 2017.

The people's choice

A challenge such as this is much more than just a popularity contest, explained Loubser. "Meat quality is currently one of the hottest topics in the beef industry. A lot of research is being done into meat quality and many breeders and other role-players in the industry are making claims regarding the quality of their specific breed's meat.

"There is, however, no platform on which the quality of the meat of different breeds is currently being compared and, more importantly, where the opinion of the consumer is sought." He emphasised the importance of valuing the consumer's opinion when it comes to meat quality. "The consumer is king and the consumer's opinion is the one that should be considered when taking farming decisions, both at industry and farm level."

The competition will be presented again at ALFA which will be held from 17 to 19 September 2019.

For more information, contact Albert Loubser at c: 082 562 2188 or e: albert@plaasmedia.co.za



RC Malherbe of the Angus Breeder's Society of South Africa congratulated by Dr Niel Van Zyl of ALFA at the 2018 ALFA gala dinner, after winning the challenge in 2018.



PLAAS MEDIA, 10 OCTOBER 2018



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THE BEST STEAK EVER?

PE STRYDOM

Research Team Manager, Meat
Science Section, Animal Production
Institute, ARC, Irene

The demand for more meat

The Food and Agriculture Organization predicts that the global population will increase from the current 7 billion people to 9.5 billion by the year 2050 and will need 70% more meat, milk, and eggs (FAO, 2009). While the total and per capita consumption of poultry meat enjoyed the largest growth over the past decades, beef consumption also increased by 18% (1990 to 2009).





Figure 1: The effect of increased growth rate on distribution of daily energy requirements of the average U.S steer between 1977 and 2007 due to performance enhancing technologies. Steers in 2007 grow 60 % faster, use 13 MJ less per kg beef produced and reach their slaughter weight in 124 days less than steers in 1977 (Capper, 2011)(Photo: Universal Semen Sales)

How did scientists and industry (including breeders and producers) respond to this call over the past decades? They developed and improved technologies in genetics, growth-enhancing substances (chemical compounds), nutritional formulations, feeding strategies and animal management strategies to increase the performance of the animal. Quoting Capper (2011), the USA in comparison to 1977, produced the same amount of beef in 2007 with 70% of the animals on 67% of the land with cattle consuming 81% feed and 88% of the water while producing 22% less manure and less greenhouse gasses, i.e. 18% less methane and 12% less nitrous oxide (N_2O). Although these figures are impressive with regards to sustainability of beef production, the term “sustainable production” also includes maintaining the final product's functional qualities, i.e. meat that is safe, has good nutritional value, is attractive (visual quality) with a good shelf life and, ultimately, provides eating satisfaction. Variability in eating quality were the major reasons for the decline in beef consumption in Australia and the USA during the 1980s and 1990s (Bindon and Jones, 2001; Howard et al., 2013) and therefore careless utilization of

technologies that impact negatively on eating quality will influence the consumer's attitude toward beef, even when beef becomes more affordable as a result of better technologies. For this reason, a number of branded or specialized meat programs have focused on “critical control points” (CCP's) that will guarantee good eating quality and a safe product, in most cases also accompanied by higher prices for the consumer. CCP's are defined as those factors, processes and conditions that together contribute towards the best outcomes – in this case the objective of quality safe meat. But is it realistic to have the best of both worlds, i.e. to maximize efficiency while at the same time producing the so-called “The Perfect Steak”? CCP's for The Perfect Steak range from the genetics of the animal, through the production system and ultimately the conversion of muscle to meat during the slaughter process. When all these CCP's are in favour of good eating quality requirements, only then the post mortem aging of beef will result in the best quality steak. Of course, we also have to admit that certain consumers are satisfied more easily and then not all of the above apply to the same extent (chuckle...).

The Perfect Steak from Angus beef

It is generally accepted that Angus genetics are favorable for the “**The Perfect Steak**” challenge judged by initiatives such as Certified Angus Beef and other branded product programs in the USA and elsewhere. These programs are mainly based on the Angus' ability to lay down marbling as well as generally favorable genes for post mortem aging (tenderization). The success of such a program locally will therefore depend on CCP's in production and processing and how these interact with the genetics. **What are the production factors that need to be controlled for The Perfect Steak?**

As stated earlier, food production depends heavily on technology for maximum efficiency as driven by increasing demand for food and in particular animal protein. The South African feedlot industry is no

exception and due to small profit margins and expertise in nutritional formulations, optimal feeding strategies and the use of growth-enhancing substances are critical to success.

All commercial South African feedlots utilize dietary additives for improved ruminal energy utilization, increased ruminal organic matter and fiber digestibility and to reduce the risk of metabolic disorders. In most cases ionophores are used and studies such as Duffield *et al.* (2012) have shown that ionophores could increase growth efficiency by 6.4 %, reduce feed intake by 3% and increase weight gain by 2.5%. Anabolic implants are also utilized by all commercial feedlots in South Africa with a very few exceptions.

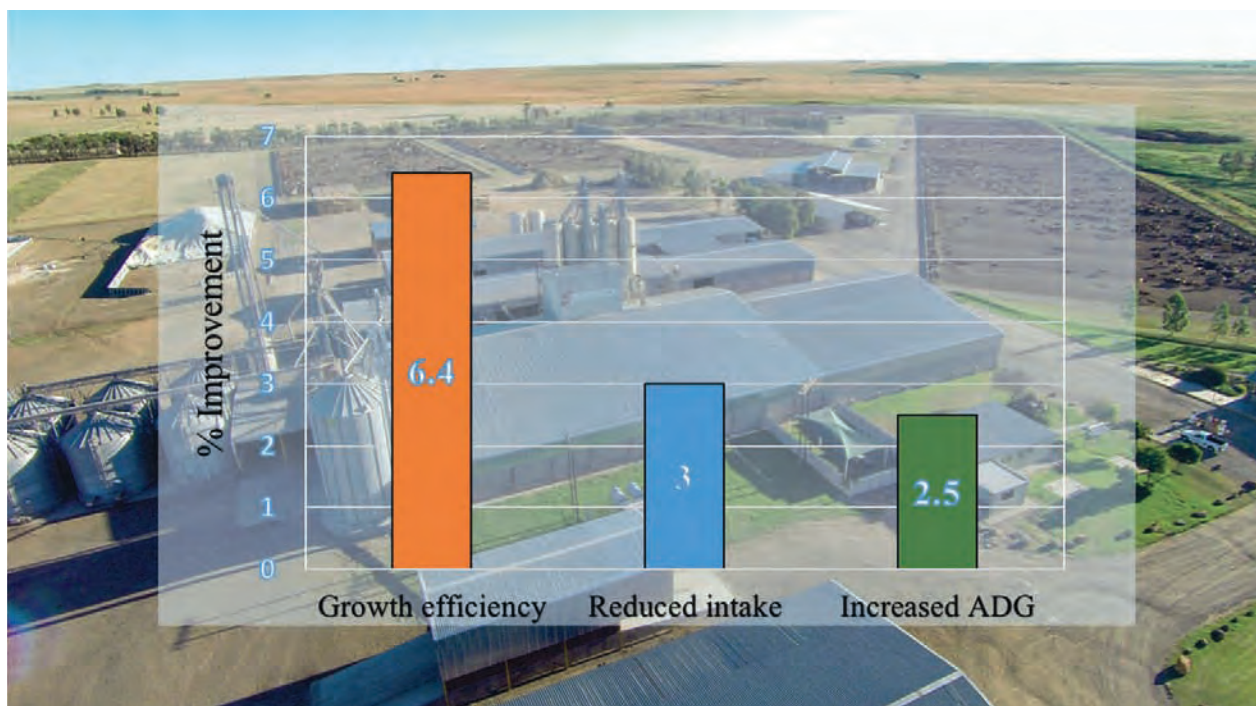


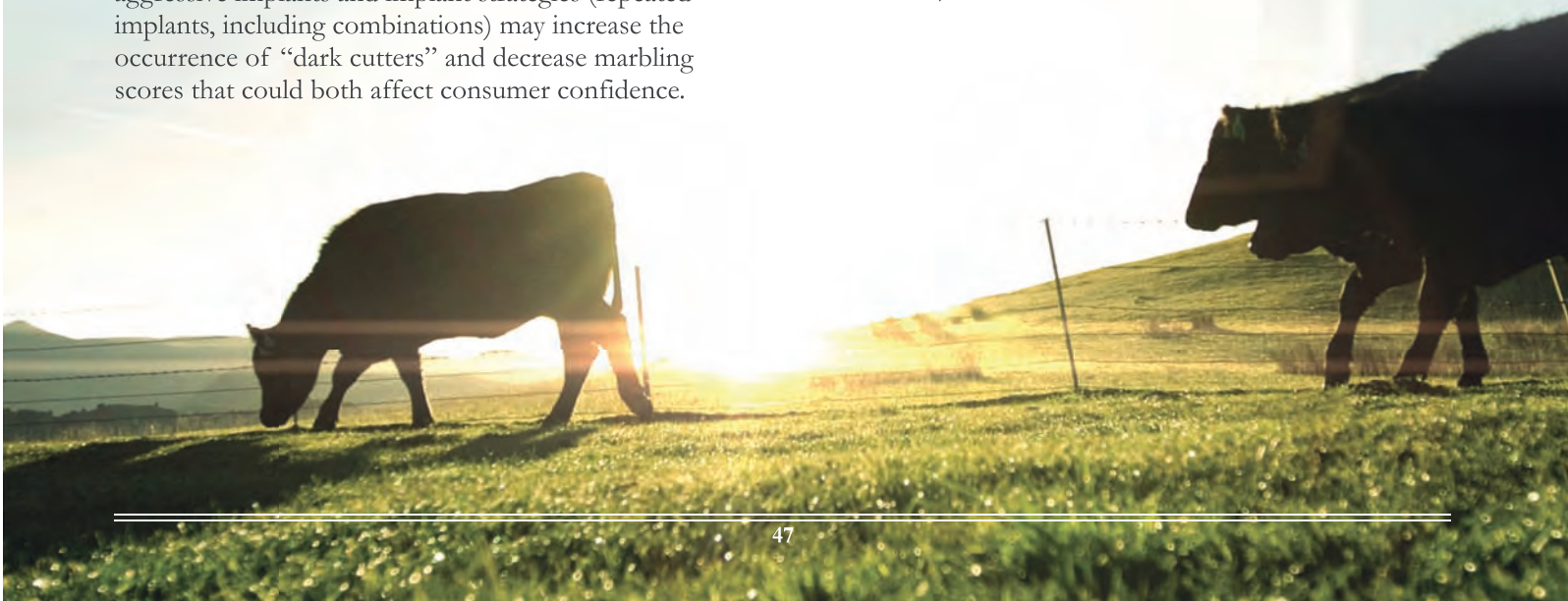
Figure 2: The positive effect of the ionophore, monensin on average daily gain and growth efficiency, mainly as a result of lower feed intake and positive adjustment of rumen microorganisms (Duffield *et al.*, 2012)(Photo of feedlots and feed factory: Sernick Group, South Africa)

Anabolic implants are growth-enhancing products containing either male (testosterone) and/or female (estrogen, progesterone) sex hormones or their derivatives (trenbolone acetate, male derivative). It is difficult to pin down exact figures for the advantages of using anabolic implants as a vast array of implant strategies are followed under different production systems. Preston (1999) summarized the benefits of implants stating an increase in average daily gain of 10 to 30%, higher growth efficiency of 5 to 15%, and reduced carcass fat of 5 to 15%. Duckett and Pratt (2014) added an increased carcass weight of 5% and ribeye area of 4%.

Beta agonists are the third component used as growth promoters by feedlots and most but not all feedlots utilize β -agonists. **β -agonists are dietary growth promoters fed to feedlot cattle for the final 20 to 40 d on feed, and in most cases, withdrawal periods of three or more days are required.** Zilpaterol hydrochloride, salbutamol and ractopamine hydrochloride are the three products most commonly used for cattle. According to Delmore *et al.* (2010) and Lean *et al.* (2014) the mean effects over a large number of studies showed an average improvements of 8 kg in body weight, 0.15 kg average daily gain, 0.1 kg/day feed intake, and 0.02 gain-to-feed-intake ratio for zilpaterol hydrochloride (Lean *et al.*, 2014). Carcass weight is increased by 15 kg. The disproportionate increase in carcass weight relative to live weight means that dressing percentage is also positively affected by 1.7% units. β -agonists' action leads indirectly to decreased lipogenesis (fat synthesis and storage) and increased lipolysis (fat mobilization and hydrolysis) accompanied by profound and rapid repartitioning of nutrients from fat to protein, in particular zilpaterol hydrochloride.

How do growth enhancing substances affect meat quality? There is no reason to believe that ionophores will affect eating quality but because these substances have antimicrobial properties, their utilization in beef production remains a sensitive issue with consumers. Ionophores are banned in all countries of the EU. Dikeman (2007) and other studies showed that aggressive implants and implant strategies (repeated implants, including combinations) may increase the occurrence of "dark cutters" and decrease marbling scores that could both affect consumer confidence.

Aggressive implants can therefore negate the marbling potential of Angus. Dark cutting or dark firm and dry meat (DFD) is unattractive to consumers, and has limited shelf life (it can therefore not be aged). Implants also have a negative effect on meat tenderness; although research reports are not in agreement as to the magnitude of the effect. Most studies agree that combination implants compared with single estrogenic implants (Hunter, 2010) and repeated implants (Dikeman, 2007) increase the risk of producing a steak with unacceptable tenderness. Extended post mortem ageing will reduce this risk, and the scale of the negative effect is probably far less than that of β -agonists, in particular zilpaterol hydrochloride. Watson (2008) quoted an average increase in shear force value of 0.27 kg and a decrease in sensory score of 5.4 units on a 100-unit scale averaged over 20 studies. Shear force is a mechanical measurement of tenderness. β -agonists have a far more negative effect on meat quality in particular meat tenderness, compared to anabolic implants. Tenderness is affected negatively because the growth-enhancing mechanism of β -agonists, such as zilpaterol hydrochloride, involve the proteolytic enzyme of the calpain system, causing higher activities of calpastatin (Strydom *et al.*, 2009, 2011) that could impair the aging ability of meat, and therefore tenderisation. Briefly, the calpain system works on the basis that the enzyme calpain is responsible for the breakdown of muscle fibre structure (cytoskeletal structure), while calpastatin acts as the inhibitor of the process. Increased activity of calpastatin means that meat will not age at the same rate and to the same extent over time as meat with a more favourable ratio of calpain to calpastatin. Both anabolic implants and β -agonists affects the proteolytic enzyme ratio negatively. Some studies showed that β agonists-induced toughness can be overcome with extended aging (Lean *et al.*, 2014) and that trained taste panels (specialised) may show the negative effect more clearly while naïve consumers may not discriminate to the same extent against β -agonists treated meat. Other slaughter technologies, such as electrical stimulation of the carcass, also seem to reduce the effect of β -agonists on tenderness, but the negative effects may prevail even after extended aging (Strydom *et al.*, 2011).



Muscles throughout the carcass are also not equally affected by zilpaterol hydrochloride, and certain muscles of the buttock are not significantly affected at all, while typical “braai” cuts like the loin and rump are. Under certain circumstances β -agonists may also cause higher incidence of dark cutters due to animals being more stress susceptible. On the other hand, β -agonists may also contribute to higher drip losses especially when slaughter and chilling conditions are not optimal. Because of decreased lipogenesis (fat synthesis and storage) and increased lipolysis (fat mobilization and hydrolysis) they may work against the marbling for which Angus beef is well known.



The cost of producing The Perfect Steak

So, considering all the negative effects of growth enhancing substances on quality and perceived quality of beef it is most likely that The Perfect Steak from Angus beef can only be achieved if these products are not used during production.

However, this will have cost implications for the producer and they will have a rightful claim for higher selling prices. What would this price differential have to be to make it worthwhile? It is difficult to pin down exact figures because the different components of input cost may vary over time and among producers and feeders. At the time of our study, we calculated a break-even price based on an A2 carcass around 300 kg produced over 140 days on feed where the feeding process included all three growth enhancing substances discussed earlier. The feed and weaner prices were constants, while performance parameters varied according to the effects of the growth enhancers.

When all growth enhancers were excluded (The Perfect Steak) in the production process, the break-even price for the producer was 18% higher than the standard commercial scenario. However, that was based on the same number of days on feed which means the carcass would now be overfat (A5) causing a carcass price reduction. However, should the producer adhere to optimum fat specifications as dictated by the market, the feed period will be less, because the animal will lay down fat sooner and the animal will be ready for slaughter sooner. A smaller (lighter) A2 carcass will be produced and the break-even price will slightly improve to 16% below the standard commercial scenario. However, lighter carcasses have other implications such as lower yield over number of feedlot cycles as well as preferred carcass weights which are normally higher within certain limits, rather than lower when penalties may apply.

Other facts to consider - processing

When the boxes for The Perfect Steak are ticked for **genetics** and **production** CCP's, then the correct pre-slaughter and slaughter practices remain as important or become even more important. Fortunately most operations driving **successful** branded beef initiatives (there are those where claims and facts do not correspond) are aware that factors such as prevention of pre-slaughter stress, and processes such as electrical stimulation of the carcass combined with controlled chilling of the carcass are just as important to producing a steak with good visual appeal (on the shelf) with minimum waste (drip loss after extended aging) and best taste and tenderness as are the genetics and production processes. The saying goes “You cannot make good wine from bad grapes” – that refers to genetics and production. However, you can also take good grapes and make bad wine when attention to detail is not applied in the slaughtering and processing stages.

When the Angus becomes too large

Without going into too much detail, a brief overview of the sensitive process of converting muscle into The Perfect Steak: **When muscle is converted to meat during the first 12 hours - the process of rigor mortis - it is essential that the correct environmental conditions are maintained. In this process, muscle energy (glycogen) is depleted and converted to lactic acid.** In practice, the efficiency of this process can be measured by following the pH (acidity of the muscle) and temperature curve (Figure 3). Under ideal conditions the pH should reach 6 (from a starting point of 7) around 20 to 25°C muscle temperature (dotted line). Meat quality is affected negatively when the carcass chills too slowly and/or the pH drops too quickly (bottom, broken line) or vice-versa (top, solid line). Because carcass weights are increasing internationally (and in some cases carcasses become fatter) it is more likely today that the carcass chills too slowly and muscle pH drops too quickly – the challenge that we face by consistently driving for larger “more efficiently” produced carcasses. Extensive research has shown that when the pH drops to below 6 while the muscle temperature is still above 35°C (high rigor temperature, or HRT), damage (denaturation) is caused to the different proteins in the muscle, which affects colour, drip loss (water binding within the muscle) and proper aging (tenderization over time).

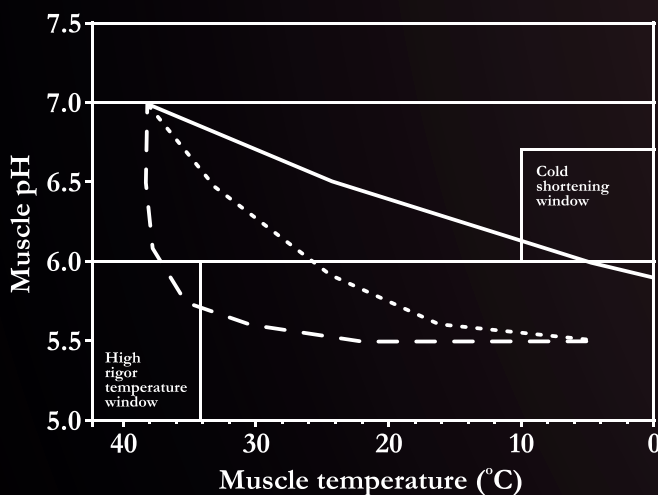


Figure 3: The pH-temperature window to optimize conversion of muscle to meat (dotted line)



Figure 4: Two-toning in the silverside muscle (Biceps femoris) due to ineffective chilling

High rigor temperatures (HRT) affect colour in two ways. Initial colour may be attractive, but due to poor protein quality, the shelf life will be short and the colour of displayed steaks will deteriorate quicker than with normal steaks, forcing the retailer to use high quality meat (such as steaks) in lower priced products such as sausages (please note this colour deterioration does not mean meat is spoiled). In other cases meat exhibits a pale colour (pork-like) or two colours (two-toning; Figure 4). The latter often occurs in large cuts like the rump and topside where the outside part of the muscle that chilled effectively exhibits normal cherry red colour while the part closer to the bone (deep muscle) appears pale due to slow chilling and protein damage. A good colour and colour shelf life is important as consumers use colour as an indication of expected quality and

freshness when making purchasing decisions. The second defect is excessive moisture loss which often ends up in vacuum bags, in other words, leads to a loss of actual value of the product (weight loss; Figure 5), but will ultimately lead to a dry unpalatable product. Finally, because the aging (tenderisation) of meat depends on the functionality of the calpain enzyme system, HRT conditions can cause pre-mature exhaustion of enzyme activity, so that aging progresses quickly initially but fails to continue to reach the best aging potential and The Perfect Steak.

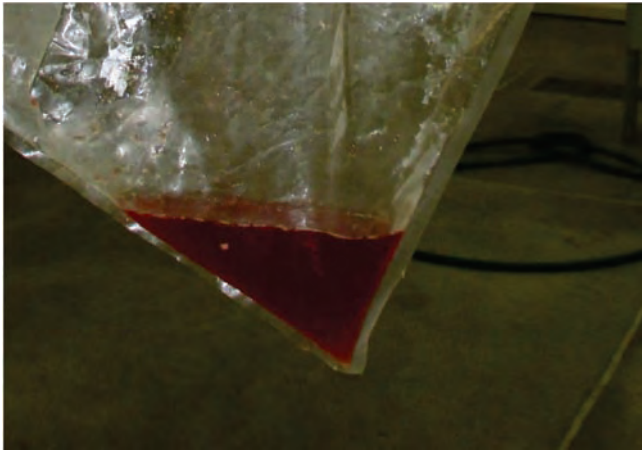


Figure 5: Excessive drip in vacuum bag as a result of poor chilling.

There are certain hurdles preventing industry to address the problem of HRT, as mentioned at the beginning of the discussion. The primary industry is focused on efficiency rather than quality and will therefore continue the trend for production of larger carcasses.

When considering that sustainable production of red meat means that increased efficiency should run parallel to affordable good quality meat, it is essential to realize that size of the animal may pose a threat to the final product quality and value. Therefore on the production side of the value chain, breeders for example, will have to consider that genetics in relation to mature size in breeding animals, weaning weights and phase C final weights is the starting point of the production of slaughter animals that may become too large for production of quality beef. Obviously, the secondary producer and processor plays an equally important role to optimize the slaughter animal's size. In this paper only one aspect of extreme size has been highlighted. While efficiency often dictates that size matters, extreme size may have detrimental effects on various aspects of animal production.

To summarise

- The Angus has the right genetic potential to produce “The Perfect Steak”.
- To achieve this goal producers/feeders will most likely have to exclude performance enhancing substances (PES).
- This will contribute to better quality but also to relatively higher production costs and therefore product prices.
- Eliminating PES will probably also contribute to smaller carcasses that will support proper harvesting and post-harvesting processes and contribute further to better quality.
- Consumer willingness-to-pay for better quality should be tested to target the right consumer segment and design a suitable promotion campaign for the effort.

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EMBRIO SPOELINGS BY BEESTE



Embrio-spoeling is die proses waartydens 'n embrio gespoel word vanuit 'n skenkerkoei en oorgeplaas word in 'n ontvanger koei, waar die embrio ontwikkeling voltooi.

Deur embrio-spoeling kan 'n geneties gevorderde koei meer kalwers jaarliks produseer as wat moontlik is met natuurlike reproduksie, wat dan die koeie se genetiese vermoë verbeter.

Wêreldwyd word In Vitro (IVF) en Invivo embrio-spoeling beskou as die vinnigste en mees ekonomiese wyse om koeigenetika te vermeerder en te bewaar, soortgelyk aan hoe die kollektering van semen, bulgenetika vermeerder. Baie telers maak gebruik van die tegniek om die top genetika in hul kudde te vermeerder.

INVIVO bevrugting, behels die proses om 'n skenkerkoei hormone (fsh) te spuit om meer oösiëte te produseer en word dan bevrug met die geselekteerde bulsemen (KI of natuurlike deking). Na bevrugting ontwikkel die oösiëte tot 'n embrio wat 6-8 dae na bevrugting gespoel word uit die skenkerkoei.

Ontvanger koeie, wat geneties van laer kwaliteit is, word voorberei en gesinkroniseer om een embrio elk te ontvang vanaf die skenkerkoei. Die embrio of fetus groei en ontwikkel in die surrogaat tot kalwing waarna sy dan die kalf grootmaak as haar eie.

Die embrio oorlewing koers vanaf implantasie tot kalwing in die ontvanger wissel normaalweg van 40% tot 60%. Embrio kwaliteit is hoofsaaklik die bepalende faktor vir oorplanting sukses. Die stadium van embrio ontwikkeling speel 'n rol, sowel as kudde bestuur, omgewing, temperament en ras van die ontvanger.

Invivo embrio spoeling kan elke 4-6 weke herhaal word, met IVF wat elke 7-14 dae herhaal kan word. Dit is 'n goeie opsie om die twee prosesse te kombineer met byvoorbeeld twee siklusse IVF en een Invivo spoeling.



Wat is die verskil tussen In Vivo en In Vitro?

IN VIVO:

1. Vroeë embrio ontwikkel in die skenker koei self.
2. Bevrugting geskied d.m.v. K.I. van die skenker.
3. Drie tot ses semen strooitjies word vir slegs een koei se bevrugting gebruik.
4. Die embrio se blootstelling aan eksterne faktore is laer, dus kleiner risiko.
5. Embrios word gespoel uit die skenker koei.

IN VITRO:

1. Vroeë embrio ontwikkeling vind in 'n inkubator met 'n kunsmatige medium plaas.
2. Bevrugting geskied in die laboratorium.
3. Een semen strooitjie kan tot 5 koeie se ovums bevrug.
4. Risiko is groter a.g.v. meer hantering van die embrio en blootstelling aan eksterne faktore.
5. Oösiëte word getrek uit die skenker koei.

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DIE BESTUUR VAN TEELBULLE OM OPTIMALE KUDDE VRUGBAARHEID TE BEREIK

Prof. Dietmar Holm B.V.Sc., M.Sc., Ph.D. – spesialis veearts, beeskuddegesondheid.

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FAKTORE WAT REPRODUKSIE UITKOMSTES VAN BULLE BEÏNVLOED

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boer geneem word, tot laastens hulle voeding en ander omgewings faktore.

Genetiese vermoë vir reproduksie word self deur 'n verskeidenheid genetiese eienskappe bepaal, waarvan sommige baie direk aan reproduksie gekoppel kan word, byvoorbeeld die genetiese vermoë om grootter teelballe te ontwikkel, die genetiese vermoë om 'n sterk, gesonde hormoonstelsel te hê en die genetiese vermoë vir goeie libido. Die ander genetiese faktore wat bydrae tot reproduksie uitkomstes is aanpasbaarheid by die spesifieke omgewing (waar veral aanpasbaarheid by beperkte voeding en hoe temperature in Suider-Afrika belangrik is) en konformasie wat goeie beweeglikheid, dekkapasiteit en dekvermoë kan beïnvloed. Kliniese gesondheid van die bulle sluit algemene gesondheid in, aangesien bulle wat aan enige chroniese siektes lei, nie op hulle volle potensiaal kan presteer nie,



WENSPAN Angus se Loffy, besig om sy werk in die veld te doen.

asook meer spesifieke siektes wat reproduksie nadelig kan beïnvloed soos Trichomoniase en Vibriose.

BESTUUR VAN BULLE GEDURENDE DIE “AF SEISOEN”

Bulle word so maklik afgeskeep tydens die periode wat hulle nie vir dekking gebruik word nie, veral op plase waar beesboerdery nie die enigste of belangrikste aktiwiteit is nie. In baie gevalle word daar dan enkele weke voor die dekseisoen planne gemaak om die bulle voor te berei vir die dekseisoen, wanneer dit dikwels te laat is. Dit is belangrik om te verstaan dat die proses van ontwikkeling van 'n spermsel 60 – 65 dae lank neem en probleme wat vandag in die bul se lewe voorkom, het dus 'n effek op sy vrugbaarheid vir die volgende 2 maande. 'n Algemene fout wat gemaak word, is om bulle skielik van die veld af te haal en dan in 'n voerkraal te sit om hulle vet te kry voor die dekseisoen. Alhoewel die

bulle mooi sal lyk, gaan die versteurings wat aan die rumen gedoen is tydens die aanpassing in die voerkraal, negatiewe effekte hê. Die beperkte looparea in 'n kraal is ook nie bydraend tot fikse, gesonde bulle nie. Dit is dus verkieslik dat bulle deurlopend op 'n eenvormige, goeie manier bestuur word. Strategiese toediening van sekere suplemente soos vitamien en minerale kan wel reproduksie uitkomstes van bulle verbeter, so bv. is daar goeie bewyse dat sekere mineraal aanvullings semen produksie kan verhoog.

TEELGESKIKTHEID ONDERSOEKE EN SELEKSIE VAN BULLE.

Een van die aksies wat die grootste impak op die sukses van 'n teelseisoen in beeste kan hê, is om die bulle deur 'n veearts te laat ondersoek vir teelgeskiktheid, met die doel om bulle wat 'n risiko vir swak prestasie in die opkomende

dekseisoen het, uit die teelkudde te haal. Goeie beplanning is hier nodig, aangesien bulle verkieslik 'n maand voor die begin van die dekseisoen ondersoek moet word. Indien die ondersoek baie langer as 'n maand voor die tyd gedoen word, bestaan die moontlikheid dat iets intussen met die bul verkeerd kan loop, veral teen die einde van die dekseisoen. Aan die ander kant, indien dit slegs 'n paar dae voor die dekseisoen gedoen word en daar 'n probleem onder die bulle is, is daar nie genoeg tyd om alternatiewe te oorweeg, sonder dat die dekseisoen se begin uitgestel word nie. Die uitstel van die begin van die dekseisoen kan ernstige finansiële implikasies hê. Die ander belangrike rede waarom die ondersoek nie te laat gedoen moet word nie, is om te verseker dat daar genoeg tyd is vir 'n veearts om al die relevante laboratorium resultate terug te kry, om sodoende betyds 'n sinvolle verslag op te stel.

Dit is hier belangrik om te noem wat bedoel word met 'n **teelgeskiktheidsondersoek**. In boeretaal praat ons van 'n vrugbaarheidsondersoek, maar hierdie term is verkeerd en misleidend. **Vir 'n bul om vrugbaar te wees, moet hy 'n koei of vers kan dragtig kry. Vir 'n bul om teelgeskik te wees, moet ons bepaal of die bul as 'n geheel geskik is. Dit beteken dat die bul sy werk, met gemak en sukses, kan doen gedurende die dekseisoen in die veld. Dit behels dus heelwat meer as bloot die toets van die bul se semen.**

Die Herkouer Veeartsvereniging van Suid-Afrika (RuVASA) gebruik 'n sisteem waarin meer as 250 veeartse regoor Suid-Afrika deelneem (RuVASA Bull

Power) waarmee die teelgeskiktheid van bulle bepaal word. Hierdie sisteem is gegrond op robuuste kliniese toetse met wetenskaplike bewysde resultate en word op 'n eenvormige manier deur alle veeartste toegepas. RuVASA se nuwe kategorisering van bulle, volgens hierdie toetse, word soos volg gedoen.

Dit is onmoontlik om akkuraat te voorspel wat die uitkoms van 'n dekseisoen gaan wees op grond van slegs die teelgeskiktheid van die bulle, aangesien die dragtigheid persentasie van 'n hele klomp ander faktore afhang. Ons kyk dus eerder na die prognose vir teelgeskiktheid, gebaseer op die veearts se volledige ondersoek en daarvolgens kan ons sê dat 'n bul wat sertifiseerbaar is, met vrymoedigheid gebruik kan word.

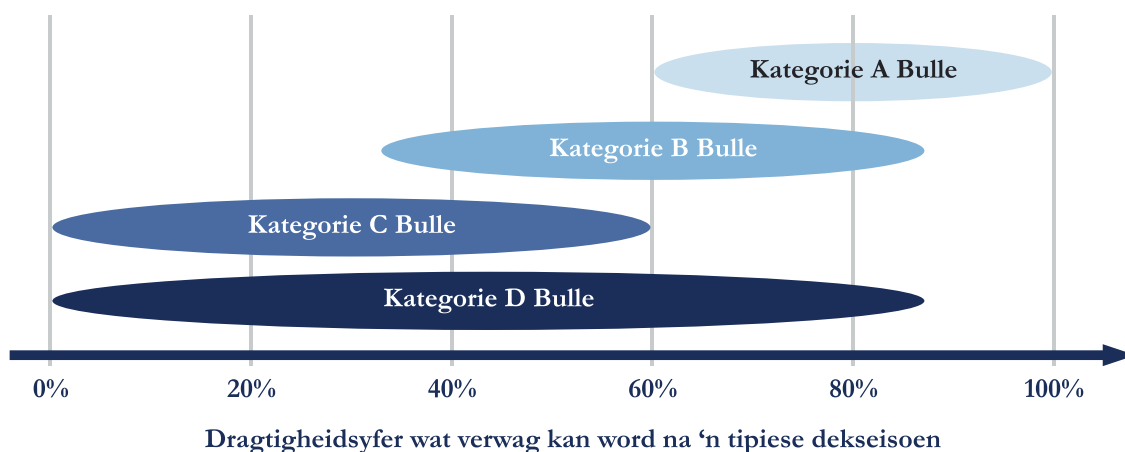
Dit is egter steeds die gebruiker van die bul se verantwoordelikheid om te kyk hoe die bul werk en om te bevestig dat hy die koeie suksesvol dek. Die volgende diagram dui aan wat die moontlike verwagting kan wees met bulle van verskillende kategorieë en bevestig onder andere dat bulle wat nie sertifiseerbaar is nie (spesifiek kategorie B) soms goed kan presteer, maar dat daar 'n risiko is met die gebruik van hierdie bulle. ■

'n bul om teelgeskik te wees, moet die bul as geheel geskik gesertifiseer word.

RuVASA

Bull Power	Betekenis	Interpretasie vir die gebruiker
Kategorie A	Hierdie bulle se teelgeskiktheid is sertifiseerbaar volgens die standaarde van RuVASA	Kan met vrymoedigheid gebruik word.
Kategorie B	Hierdie bulle is nie sertifiseerbaar nie, die prognose vir hulle teelgeskiktheid is onseker	Daar is 'n risiko met die gebruik van hierdie bulle, moet verkieslik weer ondersoek word
Kategorie C	Hierdie bulle se prognose vir Teelgeskiktheid is op die oomblik swak	Moet nie op die oomblik gebruik word nie, kan moontlik later weer oorweeg word
Kategorie D	Hierdie bulle het afwykings (reproduksie en ander) wat die prestasie van die hele kudde kan benadeel	Slagklousule

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1. NETHERWOOD Jefa RK15 064, junior champion Angus female with Alfred Nkabindi (handler) Taylor Knott (manager) and Dr Rob Kleinloog (owner).



2. EPWORTH Eddie E16 017, junior and grand champion Angus bull with Colin Emanuel (owner) Luke Lemmer (manager) and Serafin Sillero (handler).



3. NETHERWOOD Big Mama RK11 019, senior and grand champion Angus cow with Alfred Nkabindi (handler) Dr Robbie Kleinloog (owner) and Taylor Knott (manager).



(above) NETHERWOOD Zorba RK16 061, Angus bull calf champion with Fernando Craighead (handler).



EPWORTH Wholesome E15 85, reserve junior and reserve grand champion Angus bull with Kyle Wilson (handler) Colin Emanuel (owner) Luke Lemmer (manager) and Serafin Sillero (handler).



The Royal Show was held at the end of May 2018 at Pietermaritzburg, KZN. It remains one of the high lights on the agricultural calendar each year.

As always, The Royal Show was proudly supported by the local Angus breeders. The regional Angus championship was judged by Mrs. Lynette Oldfield and Mr. Douglas Fletcher.

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	Colin	082 574 9309		X
	Luke (Manager)	071 756 3833		
Glenury	Shaun	082 210 0180	X	
Invermooi	Paul (Owner)	082 771 2131	X	X
	Stephan (Manager)	082 784 1098		
Netherwood	Taylor (Manager)	072 355 2770	X	
	Rob (Owner)	082 573 7424		
Lovu	Friedel	082 774 9901	X	
Shalom	Fergus	082 786 7161		X
Tashinga	Douglas	082 413 9801	X	X
Waterfall	Mike	031 716 3500	X	X
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White Oaks Stud	Russel	082 740 4419		
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VELD-PRESTASIEGETOETSTE **BULLE**



Photo by Marijke Botha
from BODEEL Angus, Bothaville.

CONTAGIOUS ABORTION CAN BE CONTROLLED



SOPHETTE GERS

BVSc MMedVet DipACVP
Veterinary Specialist Pathologist
PathCare VetLab



Brucellosis (contagious abortion) is a chronic bacterial disease associated with abortions in cattle. Currently, there is no cure available, henceforth it is a controlled disease. The aim of this article is to provide information regarding testing and diagnosis of Brucellosis in cattle (in South Africa).

intricacies of the bacterium, the disease (including its zoonotic potential) falls outside the scope of this discussion. However, this information is freely available from various electronic and printed resources and it is worthwhile reading up on this important group of organisms (the Brucellaceae), their wide host range and the disease in man.

THE DISEASE IN CATTLE:

The Brucellaceae are Gram negative coccobacilli. They are facultative, intracellular bacteria that can infect multiple species; withstand drying and freezing and therefore can persist in the environment.

Brucella abortus is associated with cattle where it typically causes abortions in the third trimester of pregnancy when unvaccinated cattle are exposed to the infectious organism. Oral infection occurs most commonly when animals come into contact with fetal membranes of aborted fetuses or excretions from the reproductive tract of infected cows. The bacteria enter through the mucous membranes followed by systemic spread and cause inflammation of the placenta (placentitis) in pregnant cows.

Infections in non-pregnant females are usually asymptomatic.

Placentitis in the pregnant cow though, cause abortion. This can occur within 2 weeks but sometimes up to 5 months after infection.

Unprotected handling or close inspection of placentas from aborted fetuses are discouraged, because they contain high numbers of infectious bacteria. Suggested practices on how to collect and submit samples to a diagnostic laboratory is discussed under (HOW TO TEST FOR BRUCELLOSIS).

The fetus may look normal if aborted acutely after infection, or autolytic if not expelled for a period of time. In some cases the pregnancy may end with a stillborn or weak calf. Often, retained placentas and decreased milk yield follow the termination of pregnancy.

It is important to note that once a cow has aborted from *Brucella abortus* infection; subsequent gestations (pregnancies) are usually normal despite the fact that most cows will shed the organisms in milk and uterine discharges for life, following infection. This is a major source of infection for the rest of the herd, as well as humans.

People can become infected with brucellosis by various routes such as drinking unpasteurised milk from infected cows, handling infected birth material and aborted fetuses (amongst others). Symptoms are flu-like with fever, headache and body ache often reported. If treatment is not sought, it can become a chronic debilitating disease that continuously relapses.

WHY DO WE TEST CATTLE AGAINST BRUCELLOSIS?

Brucellosis is a controlled animal disease in terms of the Animal Diseases Act, that cause abortions and chronic disease in cattle, and it can also infect humans. It is therefore compulsory by law to test cattle regularly against brucellosis.



Photo by Marijke Botha
from BODEEL Angus, Bothaville.

Unprotected handling or close inspection of placentas from aborted fetuses are discouraged, because they contain high numbers of infectious bacteria.

HOW TO TEST FOR BRUCELLOSIS

Brucellosis testing may only be performed by approved and accredited laboratories. Approval in South Africa is granted by the National Department of Agriculture Forestry and Fisheries (DAFF); it is therefore important to ensure that all test results originate from authorized laboratories.

Diagnostic tests are routinely performed on blood (serum) or milk samples of mature animals or, when available on aborted fetal material.

Depending on the clinical presentation and availability of suitable specimens one may either:

- **Demonstrate the causative bacterium by means of direct impression smears and / or direct culture from (fetus / placenta / uterine discharge or milk).**
- **Demonstrate antibodies against *Brucella abortus* in serum of the cow.**

When collecting material from an abortion case; please ensure to protect yourself by wearing protective clothing and gloves. Wrap the foetus and placenta in leak-proof containers (such as plastic bags) and transport them as soon as possible at 4 degrees Celsius (on ice or refrigerated - not frozen) to an approved laboratory. Serum (a blood sample) should also be collected from the female animal that had aborted to test for antibodies against Brucellosis.

Once received at the laboratory, the bacterium can be cultured, or demonstrated by direct microscopic examination of impression smears, or on histopathology.

Antibodies in the mature animal can be demonstrated in blood (serum). One blood sample are drawn from each animal for this purpose. The two serological (blood) tests routinely employed in South Africa are the Rose Bengal (RBT) and Complement Fixation (CFT) tests.

The milk ring test (MRT) are performed on fresh (unpasteurised) milk and is used routinely as a screening test in dairy herds. (The detail of this test falls outside the scope of this article)



WHAT DO THE TESTS MEAN?

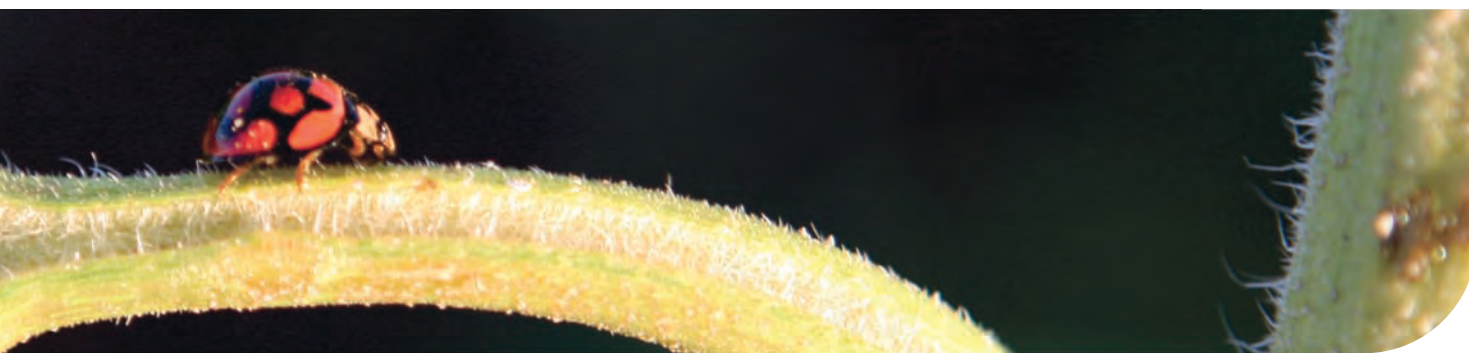
Positive culture or identification of the bacterium confirms a diagnosis of brucellosis. In such a case, the infected (positive) animal must be branded on the right hand side of the neck with a “C” and culled (by slaughter). Serological (blood) testing of the rest of herd should follow to identify additional infected animals.

Serological (blood) testing is aimed at the detection of antibodies against brucellosis.

It is important to keep in mind that antibodies against the S19 vaccine cannot readily be distinguished from antibodies against naturally infecting *Brucella abortus*. Hence the reason for heifers to be vaccinated at a young age (4-9 months) and the recommendation for blood testing only from 18 months onwards. This ensures that the antibody levels elicited by vaccination have dropped below the detection limit by the time that the heifer is tested for the first time.

The second, equally important matter regarding serological testing for antibodies is that these results should always be considered on a herd basis. A brucellosis blood test result from an individual animal should always be considered in the context of the herd or group it originates from.

*It is important to keep in mind that antibodies against the S19 vaccine cannot readily be distinguished from antibodies against naturally infecting *Brucella abortus*.*



Both photos by Marijke Botha
from BODEEL Angus, Bothaville.

WHEN TO TEST

All female cattle and all bulls over the age of 18 months are to be tested by serology (blood testing). By excluding animals below the age of 18 months from the serological tests, one avoids the detection of antibodies to the S19 vaccine. It is also important to realise that non pregnant heifers will not show positive even if they are infected. This is because of a unique phenomenon called – latent (hidden) period of infectivity. These individuals will only develop detectable antibodies after they aborted.

HOW TO PREVENT BRUCELLOSIS

Brucellosis control and prevention can only be achieved by a strategy of routine vaccination and testing. Rigorous segregation and culling (slaughter) of positive animals should be continued until the herd is declared free from infection. Two vaccines against brucellosis are commercially available in South Africa, namely:

“RB51®” (MSD Animal Health).

“BRUCELLA S19” (Onderstepoort Biological Products)

Both vaccines contain live attenuated (weakened) *Brucella abortus* organisms and will offer protection against infection.

Individual identification of all animals are fundamental to a testing-and-culling strategy. The implication of incorrectly identified animals becomes clear when miss-identified animals are culled and the infected individual persists in the herd and perpetuates the infection.

CONCLUSION:

In conclusion; Brucellosis is an important controlled disease of cattle that can only be prevented and controlled by vaccination, regular testing and culling of positive animals. In addition, accurate identification of animals and biosecurity measures are central in the eradication and control of this disease.



The BODEEL Angus herd is tested on an annual bases for Brucella.

They also have a closed cow herd, with only tested bulls being bought in.

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Taking of a Hair Sample for Genomic Testing



Hair is the most common form of DNA samples sent to SA Stud Book for genomic analyses. It is very important that the sample is taken correctly to ensure that sufficient DNA is present in the sample and results can therefore be obtained. It is important to note that the DNA is not contained in the hair shaft itself, but in the follicle or root bulb. It is vital that the root bulb is present in the hair sample as this is the part of the sample from which the DNA will be extracted.

Collection of hair on extremely young animals may be problematic as the hair follicles are small and still developing. It is recommended that animals should preferably be 60 days of age (2 months) before hair samples are collected.

Hair has several advantages over other types of DNA samples, including a lower cost of sample collection and easier long-term storage of samples at room temperature. One strategy, becoming increasingly common, is the collection of hair samples on all calves at marking/weaning, whereby the hair sample of each animal is placed in an individual paper envelope and stored in a cool, dry place (filing cabinet) for use when DNA testing is required.

HANDY TIPS WHEN COLLECTING HAIR SAMPLES

- Hair samples should be collected from the switch of the tail, by selecting at least 40 hairs (approximately the size of a thick pencil) that are dry and free of any foreign matter (e.g. manure, dirt), and pulling the hairs “up and away” from the tail switch, making sure the roots are still attached. Pliers can be used if a better grip is needed.
- When collecting hair samples, place the hair sample in a paper envelope. Use a separate paper envelope for each animal. Check the identification number of the animal and record the number on the envelope. Also record the full registration number. The envelopes can be prepared beforehand but ensure that the hair of the animal goes into the correct envelope.
- Take care during the collection process to prevent cross-contamination of samples. Wash hands between the collection of different hair samples to ensure that hands are clean. Also ensure that the work bench is clean and do not cause cross-contamination between different samples.
- Place samples and completed paperwork in a sturdy postage bag or box. Send samples by registered mail or courier to SA Stud Book or society.



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Die neem van Haarmonsters vir Genomiese Ontledings

Suretha Francis



Hare is die mees algemene vorm van DNS monster wat na SA Stamboek gestuur word vir genomiese ontledings. Dit is van groot belang dat die monster reg geneem word sodat voldoende DNS in die monster teenwoordig sal wees. Dit verseker dat die DNS-kode met voldoende akkuraatheid vasgestel sal kan word. Dit is belangrik om daarop te let dat die DNS nie in die haarskag self voorkom nie, maar in die follikel of haarwortels. Dit is noodsaaklik dat die haarwortels/haarfollikels wel in die haarmonster voorkom, aangesien dit die deel van die monster is waaruit die DNS gehaal gaan word.

Versameling van hare op jong diere kan soms problematies wees aangesien die haarfollikels klein en onderontwikkeld is. Daar word dus aanbeveel dat diere verkieslik 60 dae oud moet wees (2 maande) voordat haarmonsters geneem word.

Hare het verskeie voordele bo ander tipes DNS-monsters, insluitend 'n laer koste van monsterversameling en makliker langtermyn berging van monsters by kamertemperatuur. Een strategie wat toenemend algemeen word, is die versameling van haarmonsters op alle kalwers by merk / speen, waarna die haarmonster van elke dier in 'n individuele papier koevert geplaas en op 'n koel, droë plek (bv. liasseringskas) gestoor word vir toekomstige gebruik wanneer DNS-tipering benodig word.

Dit is ook goeie praktyk om twee stelle monsters te neem, veral as een gebruik word vir tipering (ouerskappe met konvensionele DNS en/of genomies).

HANDIGE WENKE VIR DIE NEEM VAN HAARMONSTERS VIR GENOMIESE ONTLEDING

- Haarmonsters moet van die stert geneem word deur 40 hare (ongeveer die grootte van 'n dik potlood) te kies wat droog en vry van enige vreemde stowwe (soos mis en plantmateriaal) is. Indien nodig, kan die hare voor die neem van die monster geborsel word om die vreemde materiaal uit die hare te verwyder. Pluk die hare "op en weg" van die stert om seker te maak dat die wortels nog steeds aangeheg is. 'n Tangetjie kan ook gebruik word as 'n beter greep nodig is.
- Plaas die haarmonster in 'n papier koevert wat korrek gemerk is. Gebruik 'n afsonderlike koevert vir elke dier. Kontroleer die ID nommer van die dier en skryf die nommer op die koevert. Die volle registrasie nommer kan later opgeskryf word, of die koevert kan voor die tyd met die nodige inligting gemerk word. Maak doodseker dat die regte dier se haarmonster in die regte genommerde koevert geplaas word.
- Wees bedag op kruisbesmetting gedurende die neem van DNS monster. Verseker ook dat, indien daar op 'n werksblad gewerk word, geen ander hare op die oppervlakte is nie, om sodoende kruiskontaminasie te voorkom. Was hande tussen die versameling van elke haarmonster om te verseker dat die hande skoon is en nie kruiskontaminasie veroorsaak nie.
- Plaas monsters en voltooië papierwerk in 'n stewige koevert of kartonhouer en stuur per geregistreerde pos na SA Stamboek of genootskap.

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DOUBLE MUSCLING IN BEEF CATTLE

Helena Theron, SA Stud Book



Figure 1: Belgian Blue with extreme double muscling and Limousin bull with less extreme double muscling.



One of the selection goals in specialized beef cattle breeds is to improve carcass quality. Consumers prefer meat with less fat because it is perceived to be healthier with regard to coronary heart diseases. Producers and butchers require a higher meat yield and a smaller fifth quarter, which result in more edible meat cuts. Double-muscled (DM) animals provide this type of meat. Myostatin is a protein that stops muscle growth in young animals. Mutations of the myostatin gene (MSTN) causes myostatin to be partially or completely inactive, which then causes muscles to keep on growing, resulting in certain identifiable characteristics known as the double muscling syndrome. It is present in many mammalian species, from mice to dogs and horses and even in humans.

Characteristics of the Double Muscling (DM) syndrome

The meat is very lean with an almost total absence of marbling: DM animals have very lean carcasses. Due to a higher lean meat content in the carcass combined with a lower fat and bone content, DM animals have a very high dressing percentage, with an average of 67% in bulls. Muscle enlargement varies and ranges between 8 to 51% in the forequarters and 9 to 34% in the hindquarters. The meat is perceived to be

healthier due to reduced saturated fatty acids, although the low marbling may reduce meat flavour. A lower collagen content makes it mostly more tender, although meat tenderness, colour and juiciness are not always improved, due to a more glycolytic metabolism. Due to the low concentration of myoglobin, meat of DM cattle tends to have a lighter colour. Special slaughter conditions are also necessary to maintain a high meat quality and to prevent cold shortening and meat toughening. The maturation rate of the meat is also faster.



Figure 2: Left: Meat from 'normal' cattle has more marbling and fat. Middle: Meat from a carrier animal with a medium lean-to-fat ratio and less marbling. Right: Meat from a DM animal which has almost no marbling and fat. (Photos: M.A.R.C., USA).

Fine thin bone structure and mobility problems:

DM animals have smaller limb bones and a decrease in bone weight of about 3 - 10%. This causes poor rear leg structure and difficulty of movement.

Small internal organs: Vital organs like the heart, liver, lungs, digestive tract and skin of DM animals are smaller than those of normal animals. Their lungs are 20 - 25% smaller, making them more prone to respiratory diseases.

Lack of performance on feed: A consequence of the smaller digestive tract is reduced feed intake capacity, necessitating a high energy diet with a high nutrient density. The reduced feed intake capacity also means that DM animals are incapable of efficiently using low quality feeds.

Calving Difficulties (Dystocia): Due to under-development of the hip bone, pelvic openings of DM dams are smaller, and in addition calves are larger and heavier at birth due to the double muscling. This combination increases the incidence of dystocia and calf mortality in DM cows carrying certain mutations, which is why these breeders do planned caesarean sections. DM cows have numerous other fertility issues as well.

Lower male fertility: DM males have smaller testes and significantly poorer semen quality.

Health issues and lower robustness: DM animals are more susceptible to respiratory disease, lameness, nutritional stress, heat stress and dystocia.

Welfare issues: DM animals need special care, such as appropriate nutrition to reduce nutritional stress, proper confinement to reduce respiratory disease and locomotion problems, shade during summer grazing to reduce heat stress, or elective use of caesarean section to reduce calf loss as a consequence of dystocia.

What causes Double Muscling?

The Myostatin (MSTN) gene mutates reasonably easy and around 20 mutations of the cattle Myostatin gene have already been identified. Most of these mutations don't have any visible effect, as parts of the gene are inactive. However, some mutations have a large effect and are therefore economically important. Nine mutations are currently active in bovine populations and are included in routine DNA testing. Some of these mutations are very breed specific, while others are common across species. Some breeds have only one mutation, but more than one mutation is present in many breeds.



Figure 3: Belgian Blue cow with caesarean section scar. (Photo: Wikipedia)

Advantages of double muscling

- Mainly the production of lean red meat.
- Very high dressing percentages due to more meat, less bone and fat and smaller internal organs.
- In Europe there is a market for DM meat.

Disadvantages of double muscling

- Double-muscled animals are generally dysfunctional in most environments.
- Many health issues require specialized care.
- Lack of performance on feed make them unsuitable for finishing in feedlots.
- Males and females have many fertility issues as well as calving difficulties and a low survival rate.
- Meat needs special treatment and may also be too lean for the local market. (Not suitable for a braai!)

Inheritance of Double Muscling

These mutations are mostly recessive, meaning an animal needs 2 copies of the defective gene to show the syndrome. It seems that the expression of the MSTN mutation genes differ between breeds, due to the influence of other genes already present, probably there due to breeder selection. For example, Belgian Blue cattle share the same myostatin mutation (nt821) with many other breeds, but only Belgian Blues show extreme double muscling due to breeders that actively selected for it.

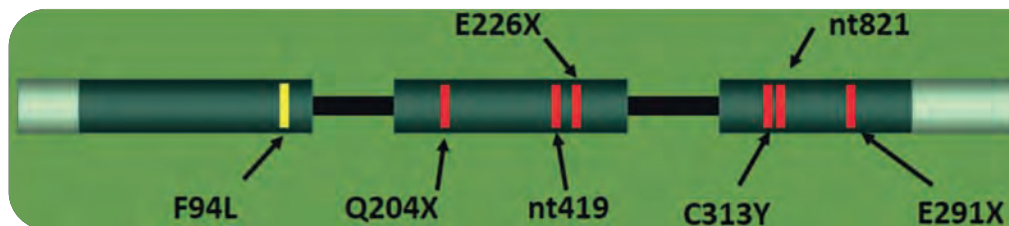


Figure 4: Positions of the mutations on the Myostatin gene.

Sometimes the heterozygote or carrier animal shows absolutely no sign of the gene, and sometimes some effects are present in the carrier animal, to different degrees. The most common mutations are nt821, Q204X and F94L. nt821 and Q204X are detrimental genes, as symptoms tend to be more severe. F94L is not so severe and is known as the 'profit gene', as animals carrying two alleles of this mutation have higher meat quality and no negative effects like dystocia, lowered fertility and longevity. F94L is common in the Limousin breed.

Where did it originate and why is it so wide-spread?

Double muscling was first reported in Shorthorn cattle in the early 1800's. It is currently thought that the founder mutation (nt821) spread from an epicentre localised in the Friesian or Black Pied breed, long before the Friesian's specialisation into milk production. The frequency of DM animals has increased especially in European countries. Some breeds in Europe (especially France, Belgium and UK) are actively selecting for double muscling in their cattle, as Europe has a suckler industry and Europeans prefer meat with less marbling and more unsaturated fatty acids for health reasons. There is therefore a market in Europe for meat of double muscled animals. As cattle in Europe are farmed intensively, dystocia of double muscled cows can be prevented by scheduled caesarean sections. With smaller herds, the required specialized husbandry and feeding practices are also possible.

This is generally not feasible in larger extensively farmed beef cattle herds in South Africa, as in the US, Canada and Australia, and as a result double muscled animals are unwanted in these countries. However, selection for an increased meatiness in beef cattle has probably resulted in an increase of carrier double-muscled (DM) animals in these countries. If breeders select for well-muscled animals, they might inadvertently select for carrier DM. There are scientific indications that heterozygotes might have an advantage in meat quality and quantity, and therefore have a selection advantage. However, breeders should not over-react and regard every well-muscled animal as double muscled. Animals need to be tested to determine their DM status.



CONCLUSION

Double muscled animals may have a high meat production, but has a myriad of other problems making them highly unsuitable for South African conditions. Despite this, DM calves are being born in many beef cattle breeds and herds across the world and in South Africa as well, which may indicate that the heterozygote or carrier animal has some advantage. However, breeding animals can be tested for their DM status and the birth of DM animals can thus be prevented. ■

Source:

Fiems, L.O. , Animals 2012, 2, 472-506.

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Double-Muscling in South African Beef Cattle Herds: Practical Issues

Helena Theron, SA Stud Book



Figure 1: South African bull showing double-muscling
(Photo: Dolf Cloete; SA Stud Book)

“The market will dictate that clean bulls will sell for a premium or that only clean bulls will be sold in the near future”

Double muscling (DM) are present in some South African breeds and herds, with many double muscled calves being born to the surprise of the breeder. The extent of the gene in South Africa is currently being investigated by the University of Pretoria with funding from the BGP (Beef Genomics Project). As breed differences seems to influence the expression of the different mutations, especially in carrier animals, more information and research are needed.

Double muscling may be identified by observation, but it is not always clear-cut, especially with regards to identifying carriers. The only sure way to determine an animal's Myostatin status, as well as the mutation involved, is with a DNA test, which is available from SA Stud Book.

Phenotypic traits of DM animals

- Extreme muscle definition (a single muscle line in the rump does not mean DM!).
- Large round “bubble butt” well above the hock; extreme sloping pelvis and high tail set. They often have a dirty rump (which is probably why Belgian Blues are shaved).
- Fine, thin bones; straight legs in profile; reversed or slipped knee-joint; stiff restricted rear movement.
- Pencil gut' (small internal organs)
- Under-developed scrotum.

Some double muscled (DM) calves have been born in my herd: What does it mean?

You have carrier cows of at least one of the DM genes (See Table 1) in your herd, and the sire of the DM calf is a carrier as well. Even if you have not had any DM calves born in your herd to date (yet), it does not mean that you don't have carriers, or that you inadvertently might breed some in future.

How did the DM gene(s) get into my herd?!

You have most probably inadvertently been using carrier bull(s). **Half of a carrier bull's calves will be carriers as well therefore approximately half of his daughters kept as replacement cows will also be carriers.** The gene is as a result now hidden in your herd. If you now use another carrier bull on one of your carrier cows, you only have a 25% chance of

having an affected calf, so the gene can stay hidden for a long time. The more carrier cows you have, the more likely that DM calves will be born if you use a carrier bull. Furthermore, using a carrier bull on a carrier cow also has a 50% chance of breeding some more carrier animals. Any of the carrier sons that you sell to other stud herds, will cause the DM gene to spread to that herd as well. **There is also the chance that you may breed cows carrying more than one DM gene by inadvertently using bulls carrying different Myostatin mutations** (See Table 1).

Table 1: Characteristics of the Myostatin mutations that Weatherby's Lab is currently testing.

Mutation	Double Muscled Animals (2)	Carrier Animals (1)
nt821 'nt Gene'	Animals are extremely heavily muscled in appearance, including abnormally large, wide and rounded rump and thighs with prominent creases between muscle groups. There is usually little covering fat, and bones are thin. Birth weights are heavier.	Recessive gene: Carrier looks normal.
Q204X 'Q Gene'	Animals have a larger loin depth, reduced fat cover and greater meat tenderness. Heavier birth weights increases the risk of difficult calving. Females have slightly reduced milking ability.	Partially dominant: Carriers may show some signs.
F94L 'F Gene'	Animals show increased muscle mass without increased calving difficulties, lowered fertility or longevity. Meat is more tender with reduced fat and higher proportions of polyunsaturated fats. Very common in Limousin cattle.	Partially dominant: Carriers may show some signs.
Other	E226X E291X C313Y nt419: Rare, causes double muscling, heavy birth weights, increased calving problems and tender meat.	Recessive
Other	S105C D182N: Rare, causes increase in muscularity and reduce fat and marbling, with no change in birth weight.	Recessive

What do I do now? Do I have to test my whole herd?

Not necessarily. As a start, you need to use only clean bulls, i.e. bulls that have been proven by a DNA test to not carry any DM genes. In fact, the Myostatin status of all breeding bulls should be known: he has either a valid DNA test or both his parents have tested clean. Using a clean bull on a carrier cow will not result in a DM calf, but has a 50% chance of a carrier calf. All breeding stock, especially bull calves that you sell as breeding animals, will therefore also have to be tested, unless the dam is proven clean.



Where and how can I test for Myostatin status?

The Myostatin test can be in done on hair samples together with the genomics test. Contact Elsa at Stud Book (elsa@studbook.co.za) in this regard. Samples should be clearly marked for "Myostatin" or "Double Muscling" testing. The results will be kept confidential and will only be published if the breeder gives written permission to SA Stud Book. It is also in the interest of all to record the test results on Logix.

Myostatin gene mutations

Three mutations are most frequently found in tested animals across all breeds. However, the Stud Book genomics tests through the Weatherby's Lab in Ireland currently tests for nine mutations. The results are presented to breeders as a 0, 1 or 2.

- 0:** The mutation is not present in the animal. **If it is 0 for all 9 mutations, it is regarded as Clean.**
- 1:** Carrier of the specific mutation, received from either the sire or the dam.
- 2:** Double muscled animal. Both parents are carriers. ■



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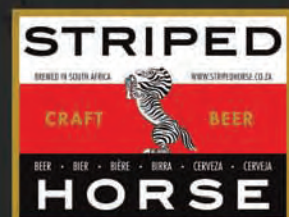


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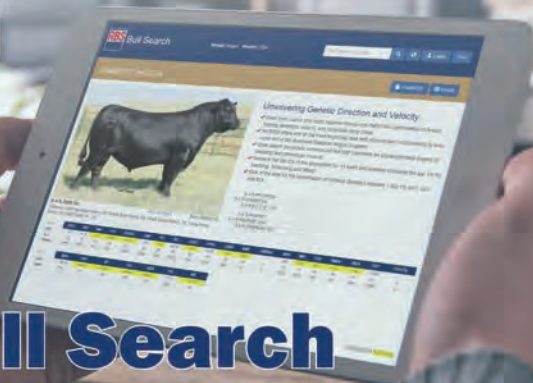
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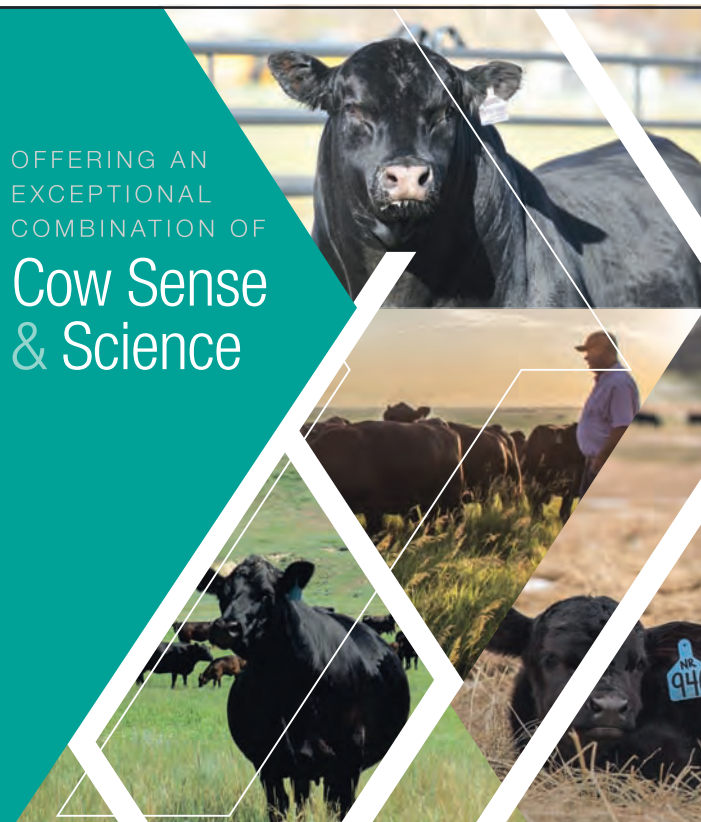
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TOP FIVE SELECTION TIPS



Japie van der Westhuizen
SA Stud Book



1 UNDERSTAND WHAT SELECTION MEANS

A simple definition for selection would be: “Selecting the right animals as parents for the next generation”. It is well known that the variation observed or recorded for any trait is the result of genetic differences among animals for the trait and the affect of the environment on its expression. It is furthermore known that not all genetic differences among selection candidates, even if known, will be transferrable to their offspring. To be successful in identifying suitable parents for the next generation, it is important that the choice must be

based on the transferrable genetic differences among the available animals for the traits of importance. Selecting on this basis will result in offspring with desirable genetic merit that outperform their contemporaries. Normally selection for males (bulls and rams) will be based on “positive selection”, meaning that the impact will be big as they will produce many progeny per year and over their lifetime. On the other hand, selection of females (heifers, cows and ewes) are usually associated of getting rid of the bottom end, therefore culling undesirable animals or “negative selection”. Due to the properties of these practices, selection progress will largely be dependant on male selection, but also with most suitable males born from top females (dams of sires) for sex limited traits that are only measurable among females (like calving ease, pre-wean maternal ability, female fertility [and fecundity in small stock] and productive herd life).

2. SELECTION IS WORTHLESS WITHOUT A SENSIBLE OBJECTIVE

Successful selection must start with an overarching objective and very clear achievable and realistic goals. Goals can be medium term (sometimes even short term) but the objective must be sustainable over the long term. Such a typical overarching objective should be described in monetary terms and must be linked to profit, taking product quantity and quality into consideration as well as inputs needed for the production thereof. Limitations of resources and their realistic availabilities as well as the market segment aimed at, should be considered. An objective should also not be chopped and changed. The challenge still is to clearly write down an own objective as well as each selection goal. Goals will enable breeders and commercial producers to have very clear ways to identify those animals to select as parents for the next generation. Breeding goals that only consider single traits, and neglecting the spread in the genetic merit among possible selection candidates, and also not considering the interaction (genetic correlations) among these traits, will result in a selection dead end.

3. SELECTION CANDIDATES CAN ONLY BE CONSIDERED AS PARENTS OF THE NEXT GENERATION WHEN THE PERFORMANCE OF THEIR PROGENY CAN ACCURATELY BE PREDICTED.

It is logical to rank all possible selection candidates from the most desirable to the least, based on how they fit into your overarching objective and goals and how progeny will perform in your herd. This is only possible when the traits forming part of the goals are measured, recorded and the genetic merit for each of them are calculated. The most efficient way is also to combine all these traits in an economic (expressed in monetary units) selection (index) value and use that ranking to determine the desirability of each possible animal as selection candidate. It therefore starts with recordings in each herd and to insist on the availability of genetic merit values for all males (and females) considered to be introduced from other herds. A bull or ram without predicted breeding values for the important traits included in one's own objective that is put up for sale is like a bakkie for sale without any specifications. Typically, a selection value will be expressed as profit per hectare for replacement females and/or profit per animal in the feedlot or finished after weaning and/or the finished product (carcass and meat properties). These genetic merit values should also be comparable with the genetic merit of the animals in your own herd. Breeding values based on a foreign population is of no value on the South African herds, for example. In most cases, each beef breed should clearly define its role in the market and accordingly define its objective and breeding goals. This will then typically be expressed in

values such as the well-known “Cow Value” (female replacement value) and/or “Growth Value” (profit value for post wean growth and market finishing). These values and the traits used in formulating them are printed in sales catalogues and are also available on www.SABeefBulls.com.

4. ONCE YOU HAVE IDENTIFIED THE MOST SUITABLE ANIMALS AS PARENTS FOR THE NEXT GENERATION, YOU SHOULD APPLY THE CORRECT MATING PLANS TO ACHIEVE YOUR GOAL EFFECTIVELY.

Mating plans reflect the thoughts going into setting up mating groups putting males and females together (or applying artificial insemination and multiple ovulation practices). The most efficient way to achieve breeding objectives is to mate “best with best” without increasing inbreeding in the progeny resulting from the planned matings. Increased levels of inbreeding result in narrowing genetic diversity that will not only slow down genetic progress but also reduce fertility and survival rates.

In some cases, certain compromises must be made, especially when corrections have to be made through corrective matings or to rectify weaknesses in a herd (such as trying to increase the genetic levels for specific traits).

5. FIGURES WITHOUT FUNCTIONALITY CAN DERAIL SELECTION PLANS.

Genetic merit based on selection objectives is useless unless the considered selection candidates are also able to fulfil their function. Males must show libido, be able to mate and have no defects. Likewise, females must be able to give birth easily, be adapted to the physical and production environment, get to the sources of nutrition and are easily manageable. Therefore, genetic merit for the traits of economic importance will have a 100% contribution in the final decisions but, likewise functional efficiency will also account for 100% before an animal is to be considered as parent for the next generation.

First published Red Meat Magazine 2018

IT IS A CONTINUOUS PROCESS

Selection never stops. Continuous selection also means continuous assessment and evaluation. Breeders and commercial producers should continuously benchmark the results of their decisions and actions. Benchmarking should include assessment against biological and market criteria. For example, no real selection progress can be possible in a cow herd, if weaning percentages drop below 80%. Profitability is compromised if no recording and benchmarking take place. Selection of more profitable animals is part of the process. ■

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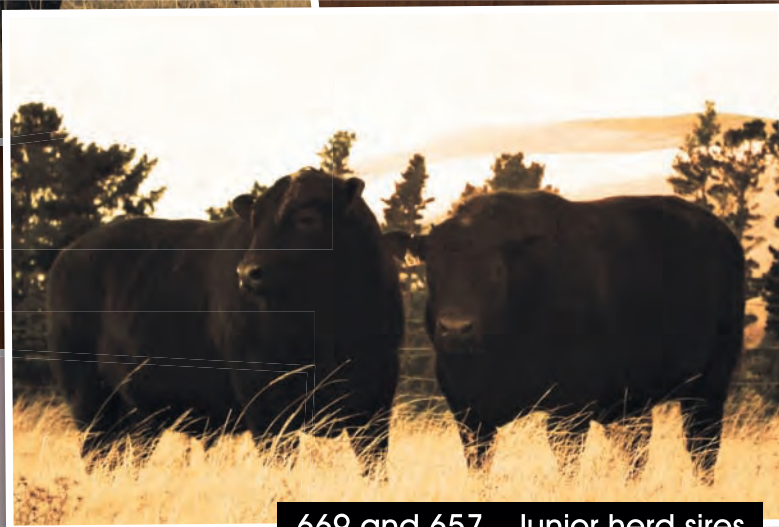


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SWARTLANDSKOU 2018

Moorreesburg

Die Swartlandskou is steeds een van die belangrikste landbouskoue op die kalender.

Die 2019 Angus Nationale Kampioenskapskou vind ook hier plaas op 12 en 13 September 2019. Rooi en Swart Angusbeeste van goeie kwaliteit is op die skou vertoon, met vertoners hoofsaaklik afkomstig van die Wes-Kaap. Hannes Muller het opgetree as senior beoordelaar en Wilhelm van Niekerk was die junior beoordelaar op die dag.



Photos by Jan van Dyk

DE PANNE DE 15-022
Swart Angus Senior en Grootkampioenbul.
Jannie Kotzé van Moorreesburg.



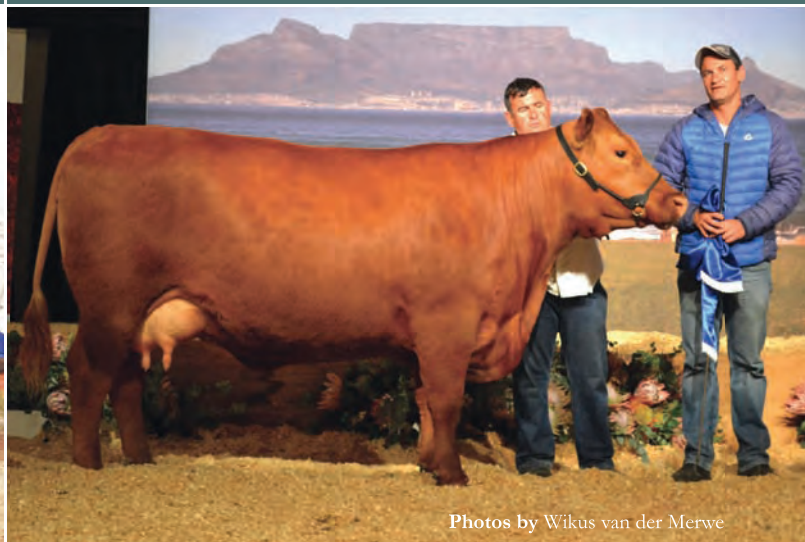
Photos by Jan van Dyk

DE PANNE Elna DE11-016
Swart Angus Senior en Grootkampioen Vroulik
Jannie Kotzé van Moorreesburg. DE PANNE Elna was ook die
wenner van die vroulike inskrywings van die interraskompetisie op
Moorreesburg in 2018.



Photos by Jan van Dyk

Rooi Angus Senior en Grootkampioenbul RCM14-066
Vertoon deur KUILEN Angus (Danie Loubser van Piketberg) en
geteel deur ROECHAMA ANGUS (RC Malherbe en Vennote van
Hertzogville).



Photos by Wikus van der Merwe

Rooi Angus Senior en Grootkampioen Vroulik
WINDMEUL Red Anny ET VB14-03
Windmeul Angus (T. Bruwer en P. Veldhoen), Agter Paarl.

VISIT BY THE ROMANIAN ANGUS SOCIETY BREED DIRECTOR

In mid May 2018 I received a call from John Boulle asking me if I could host Ioan Gociman for a farm visit as he was in Durban on holiday. I collected him and his mother from Durban to spend the day on the farm to view the cattle and my farming operation.

On the trip to the farm Ioan's mother kept taking photographs of the informal houses as these fascinated her. She is the Professor of Architecture at the University of Bucharest.

Herewith some information about the Romanian Aberdeen Angus Association:

- First Aberdeen Angus imported to Romania was a herd of 120 animals in 2008.

- Now after 10 years (2018) they have 40 000 pure bred Angus on their herd book.
- They have 750 farm members.
- This year they held the second Aberdeen Angus auction in Romania and it is the only one in East Europe.
- Their inspection teams go out to each farm twice per year to weigh all the young cattle and collect all the data for the herd book register and performance data.

For further information check their web page on www.aberdeenangus.ro.

Ioan would be very happy to have South African Angus breeders visiting them.

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Makojalo Angus, Kobus Delpport (Potchefstroom)



Black Angus Senior and Grand Champion Female:
Milagro Power 1605 (ACM14-03)
Handler: Danwill Daniels
Andrew Masterson Family Trust (Humansdorp)

SANDRINGHAM AGRI - EXPO 2018

Photos by Wikus van der Merwe

The AGRI-EXPO 2018 was held from 10 to 12 October 2018, on Sandringham Farm – Stellenbosch.

The Expo was judged by Basie Blignaut (Senior Judge) and JM Steyn (Junior Judge).

Exhibitors from the Western Cape, Eastern Cape and North West used this agricultural event to show their prime Angus stud cattle.

The AGRI-EXPO is known to be a fierce competition. Not only could the breed be proud of the cattle that were shown, the Black Angus Bull (Makojalo KD14 1377, owned by Kobus Delpport from Potchefstroom) walked away as Senior inter breed champion bull of the expo.



Red Angus Junior and Senior Champion bull:
Makojalo Loco Motive (KD16-1539)
Handler: RP Campher
Makojalo Angus, Kobus Delpport (Potchefstroom)



Red Angus Senior and Grand Champion Female:
Windmeul Red Anny 14-03 ET (VB14-03)
Handler: Fraenkie Doman
Windmeul Angus, Theuns Bruwer (Western Cape)

What are SNPs and Genetic Enhanced Breeding Values?

The world is constantly busy to try and find easier and cheaper ways in order to achieve the same goals. The estimation of BLUP breeding values means the recording and integration of both performance and pedigree information. These actions could be time consuming, costly and errors in the recording of performance and pedigree information can easily be made. Some of the most economically important traits like feed conversion efficiency are difficult to measure. Geneticists worldwide were looking for a tool to overcome the processes of performance data recording and capturing.

After the first bovine genome were sequenced researchers have discovered places on the genome where variation between cattle exist. The bovine genome exists out of almost 3 billion base pairs of which 98% of them are the same for all cattle. Only 2% of these base pairs differ between cattle from different breeds. These base pairs that were identified are called single nucleotide polymorphisms or in short SNPs. 777 000 SNPs were identified which differs statistically significant between cattle breeds. Some of these 777 000 SNPs however are not linked to production traits and they are in most cases homozygous within breeds. Commercial cost-effective SNP tests are available at over 50 000 SNPs. 50 000 SNPs are more than enough for effective genomic selection processes. At the beginning researchers were hopeful that they will find so called major SNP effects and that the SNPs alone would tell us if an animals breeding merit for different traits were positive or negative, without measuring phenotypic data. As time progressed this did not happen and researchers worldwide realised that in the era of genomics, phenotypic measurements are king. The big advantages of genomic selection or SNP technologies are multiple. With SNPs we can identify mutations or single gene expressions and therefore we can test for things like double muscling, coat colour, polledness, dwarfism, etc. Due to the large number of SNPs, relatedness can be determined at a much higher accuracy level than with the current microsatellite parentage tests. SNPs make traceability and breed identification very easy and accurate.

Genomic selection also improves and enhances the relationships among animals with available genomic or SNP profiles. In order for a breed to make use of genomic selection the breed must setup its own genomic reference population. A genomic reference population is unique per breed and population, meaning per country. A genomic reference population must consist out of animals, good and bad, with highly reliable breeding values. This means that older animals with good performance records must be included first into this reference population. Once again, this must contain animals with good and bad breeding values with high accuracy. The reason for this is that with genomic selection you need to create a correlation between the animal's physical genetic code with other animals in the breed and population with accurate breeding values. By doing that, you can determine early in an animal's life (as soon as you can get hold of genetic material of the animal) whether this animal is genetically more related to the animals in the genetic reference population with good breeding values or to the group with lower breeding values for separate traits. By adding the genomic information into the current BLUP breeding value analysis you enhance the breeding value accuracy for difficult to measure traits like milk production and fertility. In the future, genomic testing will become the preferred precision breeding tool, even in terms of animal health and resistance against some medications.

Remember, that the inclusion of genomic information will only enhance breeding value accuracy of young and/or unmeasured animals. As soon as an animal is measured for a certain trait in a well-defined contemporary group, the effect of genomic information will become very small. Phenotypes are still, at this stage, king in the era of genomics. Without phenotypic data, genomic information is worthless. ■

Dr Bobby
van der Westhuizen





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PRODUKSIEVEILING 20 AUGUSTUS 2019

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Anton en Alda Pelser

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Die Praktiese Aanwending van GENOMIKA

Bobbie van der Westhuizen
SA Stamboek

Deesdae word daar baie geskryf oor genomiese seleksie en die voordele hiervan. Maar wat beteken dit vir 'n teler? Wat kan 'n teler terug verwag en wat is die praktiese toepassing hiervan op die plaas.

Genomika verwys na die bestudering van 'n dier se genetiese samestelling. Die term genomika kan varieer van die bestudering of bepaling van 'n enkelgeen tot die bepaling van duisende merkers op die dier se genetiese kode wat variasie toon regdeur die populasie (met ander woorde die ras), tot die volle kartering van 'n dier se genetiese kode (waar die totale genetiese kode van die dier bepaal word). Hierdie tegnologie is van groot waarde vir wetenskaplikes reg oor die wêreld maar meer belangrik, dit het reeds praktiese toepassings op die plaas. Dit is die nuutste tegnologie wat groot waarde inhou vir die seleksie van toekomstige teeldiere.

Genomika word reeds op verskeie maniere gebruik in die praktiese uitvoering van diere teling en populasie dinamika van plaasdiere. Om egter munt te kan slaan uit genomika, moet daar egter eers 'n verwysingsbasis vir die spesifieke ras en populasie bestaan. Hierdie verwysingsbasis staan bekend as 'n verwysingspopulasie en dit beskryf basies die genetiese samestelling van die ras asook hoe verskillende diere se genetiese kode onderling verskil van die res van die populasie. Dit is veral belangrik om agter te kom hoe diere se genomiese inligting verskil tussen diere met goeie en swakker genetiese teelwaardes vir elke meetbare en aangetekende kenmerk in die populasie.

Met ander woorde, daar moet bepaal word hoe verwant sekere stukke genetiese kode ooreenstem en verskil tussen diere, met verskillende vlakke van prestasies. In die afwesigheid van 'n verwysingspopulasie, hou genomiese seleksie vir 'n teler, en dus vir die ras, min waarde in.





Die opstel van 'n verwysingspopulasie poog daarin om moontlike ooreenkomste en/of verskille op die fisiese genetiese kode van die dier te identifiseer, ten opsigte van verskillende produksievlakke.

Vir die opstel van 'n verwysingspopulasie is dit krities noodsaaklik om diere in te sluit waarvan die genetiese meriete van die diere (genetiese teelwaardes) reeds op 'n hoë vlak van akkuraatheid voorspel is. Dit is veilig om diere in die verwysingspopulasie op te neem waarvan die akkuraatheid van die maternale speenteelwaarde bokant die 60% vlak is, of die potensiaal het om hierdie vlakke van akkuraatheid binne die volgende jaar of twee te kan bereik.

Dit is van kardinale belang dat die verwysingspopulasie 'n verteenwoordigende steekproef of samestelling is van die huidige populasie. Die verwysingspopulasie moet dus uit geneties goeie, gemiddelde en swakker diere bestaan. **Om meer prakties te wees sal 'n verwysingspopulasie gemete diere (of diere met gemete nageslag) insluit soos bv. ou koeie op die plaas, ou bulle waarvan semenstrooitjies nog beskikbaar is en kuddebulle wat tans in gebruik is.** Daarom word daar versoek van elke kudde wat aan prestasie- toetsing deelneem (al neem die kudde slegs deel deur geboortegewig- of speengewig- en dalk 'n naspeense gewig-aantekening) om deel te neem aan die proses van die opstel van 'n verwysingspopulasie deur DNS-monsters in te samel en te laat ontleed. Hierdie biologiese materiaal moet op 'n sentrale punt gestoor word en soos befondsing

beskikbaar raak, die diere met die hoogste akkuraatheid op maternale teelwaardes genomies te laat ontleed. **Daar moet gepoog word om 'n verteenwoordigende steekproef van die populasie genomies te laat analiseer. Nie net uit een of twee familielyne nie.**

Die volgende vraag sal egter wees, hoeveel diere moet genomies geanaliseer word vir die totstandkoming van 'n genomiese verwysingspopulasie? In die literatuur is daar baie geskryf hieroor en word daar in die algemeen aanvaar dat 'n volwaardige verwysingspopulasie bestaan uit 1 000 (of 60% van die totale ras) diere met hoë akkurate teelwaardes wat verteenwoordigend is van die ras. Hierdie is slegs 'n duimreël en is daar ander faktore wat ook hier 'n rol speel. Een van die faktore is bv. hoe geneties verwant en eenvormig die populasie is, ten opsigte van homself. Indien die populasie baie eenvormig is met min genetiese diversiteit binne die ras, kan dieselfde effek verkry word met 'n kleiner verwysingspopulasie as 'n tweede ras met 'n groot verwysingspopulasie waar die genetiese variasie binne die ras meer divers is. So was genomiese seleksie deur middel van 'n sogenaamde enkelstap-metodiek, reeds wêreldwyd aan rasse beskikbaar gemaak waarvan die verwysingspopulasies aansienlik kleiner was, as die 1 000- duimreël.

Daar is verskeie maniere hoe genomiese seleksie in 'n ras geïmplimenteer kan word. **Die nuutste en mees effektiewe manier wat tans wêreldwyd gebruik word is die sogenaamde enkelstap-metode.** In die metode word die genetiese kode van die diere gebruik om te bepaal hoe verwant 'n dier geneties is aan diere in die verwysingspopulasie. Sy/haar

genetiese kode word dan vergelyk met die ander diere in die verwysingspopulasie en word daar bepaal of die diere se genetiese kode meer verwant is aan die toppresterders, die wat gemiddeld presteer of die wat onderpresteer vir elke afsonderlike kenmerk. **Dit gee dan 'n meer betroubare aanduiding van die genetiese teelvermoë van die diere (veral 'n jong of ongemete diere) as 'n teeldier.**

Tot op hede was genetiese teelwaardevoorspellings gebaseer op twee bene van inligting. Die eerste been van inligting is aangetekende stambome soos aangeteken in stamboomregisters terwyl die tweede been van inligting die prestasiemetings binne konteks van kontemporêre groepe (maw. 'n groep diere van dieselfde ouderdom wat onder dieselfde omgewings-toestande presteer het en aangeteken is) insluit. **Met genomiese seleksie word 'n derde been van inligting egter by die vorige twee gevoeg en dit is die fisiese genetiese kode van die diere.** Die byvoeging van hierdie derde gedeelte van inligting verhoog die akkuraatheid van teelwaardevoorspellings van veral jong diere, of diere waarvoor metings nie beskikbaar is nie. **Dit is belangrik om in gedagte te hou dat genomiese toetsing van diere die akkuraatheid van genetiese teelwaardevoorspellings verhoog, en nie die aantekeninge van prestasiemetings vervang nie.** Genomiese toetsing is wel 'n alternatiewe manier om ouerskappe op te los en kan tot 'n groot mate die aantekening van stambome vergemaklik en selfs vervang.

Eers sodra 'n ras in die bevoorregte posisie is waar 'n verwysingspopulasie opgebou is, kan individuele telers van die voordele van genomiese seleksie gebruik maak. Soos reeds genoem, word daar algemeen aanvaar dat 'n volwaardige verwysingspopulasie bestaan uit 1 000 (of 60% van die totale ras) diere met hoë akkurate teelwaardes wat verteenwoordigend is van die ras. Sodra 'n individuele diere nou (in die aanwesigheid van 'n verwysingspopulasie) genomies getoets word, kan die genomiese inligting aangewend word om rasegtheid te bepaal, ouerskappe te verifieer, te toets vir ongewenste (of gewenste) kenmerke wat deur enkele gene beïnvloed word, waar sulke gene reeds bekend is en toetse hiervoor ontwikkel is. **Die uiteindelige doel is egter om die akkuraatheid van voorspelling van 'n jong diere se genetiese meriete as 'n teeldier (BLUP-teelwaardes (EBV's)) te verhoog.**

Met genomiese seleksie word 'n derde been van inligting egter by die vorige twee gevoeg en dit is die fisiese genetiese kode van die diere.

Diere van 'n spesifieke ras deel almal 'n unieke gedeelte van hulle genetiese samestelling, wat uniek is tot die ras. Dit maak dit dus moontlik om 'n diere bloot op sy genetiese kode aan 'n spesifieke ras te koppel. Wanneer daar egter in fynere detail binne 'n ras gekyk word na diere wat genomies getoets is, kan verskillende lyne binne die ras ook maklik geïdentifiseer word (indien genetiese verskillende tussen lyne binne die ras bestaan). Dit is 'n belangrike aspek in konteks van die bewaring en voortbestaan van 'n ras. Indien verskillende lyne in 'n ras bestaan, is dit makliker om inteling oor 'n langer periode te kan bestuur en inteel-depressie te vermy, asook om van die voordele van uitkruising gebruik te kan maak binne die ras.

Ouerskapverifikasie bly een van die grootste voordele van genomiese toetse. Tot dusver berus ouerskaptoetse grootliks op toetse wat van mikrosatelliete gebruik maak. Die toetse het tot dusver goed gewerk binne die raamwerk van die beskikbare tegnologie. Ouerskaptoetse wat gebaseer is op mikrosatelliete werk hoofsaaklik op 'n uitsluitingsbeginsel. Met ander woorde die huidige toetse kan met groot akkuraatheid sê watter bul of bulle nie die pa van 'n bepaalde kalf kan wees nie. Hierna moet die waarskynlikheid van ander bulle as die moontlike pa dan bepaal word. Die uitdaging by ouerskapbepalings, waar gebruik gemaak word van toetse met mikrosatelliete, verhoog egter wanneer verwante bulle in meer-bulparings gebruik word en ouerskappe opgelos moet word. Die rede hiervoor is dat daar van tussen 12 tot 26 merkers op die genoom gebruik gemaak word om te bepaal watter bul of bulle nie die pa kan wees nie en watter bul se kans die grootste is om wel die kalf se pa te wees. Indien verwante bulle (bv. vol-/halfbroers of selfs 'n pa en 'n seun) in meerparings gebruik word, is die kans groot dat die mikrosatelliete op al die verwante bulle dieselfde kode dra en kan daar nie met sekerheid

onderskei word watter bul die ware vader van die kalf is nie. Gewoonlik sal die laboratorium dan die ma ook toets om nog bulle uit te skakel as die moontlike vader en, indien dit ook nie 'n bul met 'n groter kans identifiseer nie, sal die laboratorium gewoonlik die keuse van die ware vaar in die hande van die teler laat. **Met genomiese toetsing word daar van duisende merkers gebruik gemaak om ouerskappe te verifieer.**

Hierdie proses is bloot meer akkuraat as gevolg van die groter hoeveelheid merkers wat gebruik word in die verifiëringsproses.

Afhangend van hoeveel merkers beskikbaar is, kan daar tussen 7 000 en 140 000 merkers gebruik word in die verifiëringsproses. Die proses maak dan ook ouerskapsoektogte moontlik. In sommige lande waar genomiese toetse al aan die orde van die dag is, “vervang” genomiese toetse die aanvanklike ouerskapaantekeninge. Indien 'n hele kudde genomiese getoets is, kan die kalwers wat gebore word, getoets word en kan die ouerskappe met groot akkuraatheid opgelos word met behulp van die genoom-inligting tot beskikking van genetici by Stamboek. Stamboek sal in die nabye toekoms die diere waarvan die ouerskappe met genomika geverifieer kon word op die genetiese verslae van kuddes aanbring. Dieselfde geld vir die diere waar die ouerskappe in konflik is met die beskikbare genomiese inligting.

**Met
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Sommige kenmerke of genetiese afwykings se genewerking en oorerwing is eenvoudiger as ander kenmerke. Hierdie kenmerke se genewerking staan bekend as sogenaamde enkelgeen-oorerwing. Dit is waar die uiting van 'n kenmerk berus op 'n enkelgeen. Genomika maak dit moontlik om die hoofgeen te identifiseer en dan vir die kenmerk of genetiese afwyking te kan toets net nadat die dier gebore is.



fotos verskaf deur
Anton Pelser,
ASTRO, Hendrina

Uit die wetenskap weet ons dat 'n kalf helfte van sy gene van elk van sy ouers ontvang en daarom ontvang die kalf 'n mid-ouer-teelwaarde vir elke eienskap waarvoor genetiese teelwaardes bereken word.



Hier praat ons bv. van gene wat die uiting van horings, dubbelbespierung ensovoorts beheer. Ongelukkig is die meeste ekonomies belangrike kenmerke soos kalfgemak, melkproduksie, groei, vrugbaarheid en aanpasbaarheid se genewerking baie meer kompleks en is daar 'n hele aantal gene, elk met 'n klein invloed, wat bepaal wat die genetiese meriete is vir elke dier. 'n Enkele toets om die meriete te bepaal, vir hierdie eienskappe, is dus nie moontlik nie.

Indien dit dan nou waar is dat gene vir groei, vrugbaarheid en aanpasbaarheid nie maklik kwantifiseerbaar is nie, hoe word genomika dan aangewend in die seleksie van meer winsgewende diere? **Die sleutel tot die suksesvolle gebruik van genomika in diereteling lê opgesluit in die aantekeninge van produksiemetings en die verwantskap tussen hierdie aangetekende diere met hulle genetiese kode (die kode op die genoom).** Wanneer 'n kalf gebore word, is slegs sy pa en sy ma se genetiese vermoë as teeldiere bekend. Uit die aard van die saak is sommige ouers se genetiese teelvermoë, ofte wel genetiese teelwaardes, meer akkuraat as ander waarvan produksiemetings op hulle self of hulle nageslagte ontbreek. Uit die wetenskap weet ons dat 'n kalf helfte van sy gene van elk van sy ouers ontvang en daarom ontvang die kalf 'n mid-ouer-teelwaarde vir elke eienskap waarvoor genetiese teelwaardes bereken word. Dit kom daar op neer dat alle kalwers wat uit dieselfde pa en ma gebore word aanvanklik almal dieselfde genetiese teelwaardes sal ontvang. Ons weet dan uit ondervinding dat die oorspronklike voorspelling nie 100% korrek is nie. Oor 'n groot aantal nageslag sal die gemiddelde voorspelling wel korrek wees maar dit verskil van kalf tot kalf. Kyk maar net na broers en susters in dieselfde gesin by mense. Daar is geweldige genetiese variasie tussen vol broers en susters as dit kom by uiterlike en persoonlike kenmerke. Dieselfde geld by diere. Tans word die genetiese verskille en afwykings vanaf die verwagte mid-ouer-waardes

geïdentifiseer deur meting of weging van die kalf in vergelyking met sy of haar kontemporêre tydgenote. Sodoende kan bepaal word of die kalf gelukkig was en al die positiewe gene van beide ouers geërf het en of hy dalk ongelukkig was en al die minder goeie gene in kombinasie ontvang het.

Vir baie kenmerke is dit eenvoudig en maklik om die dier voor te toets. Kenmerke soos geboortegewig, speengewig en naspeense groei is eenvoudig en relatief goedkoop om te meet en die data voor aan te teken, sodoende in die genetiese evaluasies in te sluit. Die kalf se genetiese teelwaardes sal dienoooreenkomstig verander van 'n mid-ouer-waarde af en sal 'n meer akkurate syfer gee vir die betrokke eienskappe waar produksiemetings op die dier geneem is. Die probleem is egter by die kenmerke wat laat in 'n dier se lewe meetbaar of kwantifiseerbaar is (bv. langlewendheid, dogter- en koeivrugbaarheid, melkproduksie en karkaseienskappe) asook kenmerke wat duur is om te meet (bv. voerdoeltreffendheid asook karkaseienskappe en ander “skaars” kenmerke soos ouderdom van die vers wanneer sy eerste keer ovuleer ens.). So byvoorbeeld, word 'n bul se genetiese potensiaal vir melk (speen-maternaal) eers akkuraat getoets op grond van sy dogters se kalwers se speengewigte. Dan is die bul reeds tussen 5 en 6 jaar oud. Ondervinding wys vir ons dat dit die ouderdom is wanneer 'n bul se melkteelwaarde eers akkuraat begin raak.

Met die daarstel van 'n sisteem waar genomiese inligting gebruik word om 'n meer akkurate teelwaarde-voorspelling te maak, word hoofsaaklik ouer diere, met hoë akkurate BLUP-teelwaardesyfers, se genetiese kode gekorreleer met hulle genetiese teelwaardes. Wanneer 'n jong dier, of 'n ongemete dier dus genomies getoets word, word sy fisiese genetiese kode gekorreleer met die genetiese vermoë of teelwaardes van ouer diere waarvan die genetiese kodes die meeste verwant is

Genomika, as 'n hulpmiddel in diereteling, is nog in sy kinderskoene en daar is groot verwagtinge in die toepassing van hierdie tegnologie.

aan die betrokke jong, ongemete dier. Onmiddellik “weet” BLUP of die kalf al die positiewe of negatiewe kombinasies van gene van sy ouers ontvang het. Die mid-ouer-waardes word dus onmiddellik vervang met 'n meer akkurate teelwaarde en sodoende behoort die teelwaarde meer stabiel te wees as die aanvanklike mid-ouer-waarde. As gevolg van die rede verhoog die akkuraatheid van al die dier se teelwaardes ook, mits die dier se genomiese profiel wys dat hy verwant is aan die diere wat reeds in die verwysingspopulasie ingesluit is. **Indien die dier se genetiese kode egter onverwant is aan die profiele van diere in die verwysingspopulasie, mag dit gebeur dat die dier 'n laer akkuraatheid op sy teelwaardes te wagte kan wees en sal 'n genomiese toets nie 'n verhoging tot die akkuraatheid van die dier se teelwaardes bewerkstellig nie.**

Dit gebeur ook dat, veral in die Anguspopulasie, dat diere ingevoer word vanuit ander lande en populasies, waarvan 'n teelwaarde binne konteks van die Suid-Afrikaanse populasie nie beskikbaar is nie. Sodra die dier in die ras se stamboek opgeneem word en daar geen koppelings is met ander diere in die stamboek nie, word so dier gekoppel aan 'n sogenaamde genetiese groep en kry die dier 'n gemiddelde teelwaarde van die groep waaraan die dier gekoppel is. Dus is die teelwaarde 'n groepgemiddeld en weerspieël dit nie die dier se ware teelwaarde nie. Alhoewel die prosedure 'n internasionaal aanvaarbare metode is en dit reg oor die wêreld so toegepas word, is dit natuurlik onbevredigend, veral vir die invoerder.

Die ingevoerde dier se Suid-Afrikaanse teelwaarde raak meer “korrek” ten opsigte van die plaaslike populasie, namate die dier se nageslag se produksiemetings aangeteken word en in die genetiese analise in ag geneem word. Met genomika hoef ons nie meer sulke aannames te maak nie. Ingevoerde diere wat geen koppelings met bestaande diere in die stamboek het nie, se verwantskappe met die bestaande genomiese verwysingspopulasie kan bereken word en die ingevoerde dier se genetiese kode kan vergelyk word met die van die genetiese kodes van die verwysingspopulasie en kan die bul 'n baie meer akkurate teelwaarde in konteks met die Suid-Afrikaanse populasie ontvang deur slegs sy genomiese profiel in die genetiese evaluasie in te sluit. Dit is dus van kritiese belang dat 'n bul wat bv. oorweeg word om ingevoer te word eers genomies getoets moet word en die genomiese profiel in die Suid-Afrikaanse



genetiese evaluasie ingesluit moet word om te bepaal of die genetika wat die bul dra tot voordeel van die Suid-Afrikaanse populasie sal wees al dan nie. **Nie alle diere van oor die waters is noodwendig beter as die genetika wat in Suid-Afrika geteel is nie.**

Hierdie voordeel is nie net vir ingevoerde diere nie, maar ook vir diere wat in die ras bykom deur die ras se amptelike opgraderingsprogramme. Wanneer 'n nuwe teler by 'n genootskap aansluit, is die stambome van diere gewoonlik beperk en indien die teler hierdie diere se genomiese profiele bekom, kan stamboom-beperkings deur middel van genomika gevul word en kan die jong teler se genetiese teelwaardes vinniger sin maak en aangewend word as 'n seleksie-hulpmiddel. Genomiese inligting op diere wat opgradeer word, kan ook meer akkuraat rasegtheid bepaal.

Genomika, as 'n hulpmiddel in diereteling, is nog in sy kinderskoene en daar is groot verwagtinge in die toepassing van hierdie tegnologie. Ten spyte hiervan word dit reeds met groot sukses wêreldwyd aangewend. Die impak en sukses in die toepassing van die nuwe tegnologie word wyd nagevors.

Genomika is die nuutste boublok in diereteling wat beteken dat alle nuwe tegnologie in die toekoms hierop gaan voortbou. Elke

telersgenootskap en individuele teler het die besluit, of hy of sy van hierdie tegnologie in sy of haar ras of kudde gebruik gaan maak of om eers op die kantlyn te sit en kyk of hierdie tegnologie regtig werk. Die gevaar van op die kantlyn sit, is dat die eindfluitjie dalk mag blaas voordat jy 'n kans gekry het. Die probleem is net dat die rasse en telers wat wedstryd na wedstryd speel, en van die tegnologie gebruik maak in seleksiebesluite, meer en meer wedstrydfiks raak wat dit vir die wat op die kantlyn sit moeilik maak om in pas te bly en natuurlik te kan bly kompeteer.

Genomika het gekom om te bly. ■



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THE ONE HUNDRED AND FIRST



The 101st Annual General Meeting of the SA Angus Society →

The 101st Annual General Meeting of the SA Angus Society was held in the legendary Nottingham Hotel, Nottingham Road - KZN.

The last time the AGM was held in Natal, was on 3 December 1943, 75 years ago!

The Council's decision made in 2016, to rotate the AGM to the different regions was proven fruitful, with the AGM being well attended by the local members.

Mr. Andrew Masterson's second term as Chairman came to an end at the meeting and Mr. RC Malherbe was voted the next Chairman of the SA Angus Society. Andrew Masterson will remain on the council as *ex officio* for one year.

Council member Piet Delport's term as additional council member, also ended.

The Society wishes to thank both Andrew Masterson and Piet Delport for their service to the Society and their support to the office.

Mr. Basie Bezuidenhout (representing the Western and Southern Cape) was voted Vice-Chairman and will continue representing the Western and Southern Cape, together with his duties as Vice-Chairman.

Mr. Russell Marriott (Mpumalanga, Limpopo and Gauteng) and Mr. Issie Liebenberg (Free State) are serving for the first time on the Angus Council and Mr. Douglas Fletcher was voted additional council member.

The AGM was followed by the annual prize giving dinner at Notties, hosted by the KZN Angus Club.

The sponsors for both the AGM and the prize giving dinner were **Woolworths** and **Voermol**.

Our wine sponsors for the evening were **Groote Post Wines** and **Anthonij Rupert Wines**.

The *SA Angus Society* trophy for the best commercial producer of the year 2018, went to Boschendal. Jason Carroll accepted the award on their behalf.

Andrew Masterson served his second term as Chairman. Handing out the trophies at the prize giving dinner, was one of his last acts as Chairman.

He will remain on the Council for one year as *ex officio*.

On behalf of the Society, Council and staff – we wish to thank Andrew for his leadership and service to the Angus Society. →





The annual prize giving dinner held at Nottingham Hotel – KZN, was well attended. Our wine sponsors for the evening were Groote Post Wines and Anthonij Rupert Wines. Woolworths and Voermol were the sponsors of both the AGM and the annual prize giving dinner.



The Master of Ceremonies and auctioneer of the evening, Angus Williamson, in action!



The SA Angus Trophy for commercial producer of the year 2018 was awarded to Boschendal (Western Cape). Boschendal also received this honour in 2009. Andrew Masterson handing the trophy to Jason Carroll from Bochendal.



The Angus Club was awarded the Hennie Langenhoven trophy for club of the year 2018. Martiens le Roux, RC Malherbe, JM Steyn, Philip Barnard and André Breytenbach were present at the awards dinner. They received the trophy on behalf of the Free State Club.



RC Malherbe was named personality of the year 2018. Andrew Masterson handing the Ben Oosthuizen trophy to RC Malherbe.



The 2018/2019 Pat Mossop awards were awarded to the following Angus members present: Friedel Keyser (Gold), André Breytenbach (Gold), Philip Barnard (Gold), Piet Delport (Gold), JM Steyn (Silver), Brian Angus (Silver), Kobus Delport (Silver), Chris Purdon (Silver), Klasie Loubser (Silver), Basic Blignaut (Silver)



MJ Ernst from Bona Bona (Klerksdorp, North West) received the NJ Kruger Herdenking trophy. Andrew Masterson and MJ Ernst.



To add sparkle to the evening,
our lovely ladies, supporting
their hubbies.

Vicky and Philip Barnard.

RC Malherbe received the *Ben Oosthuizen* trophy for the personality of the year 2018.

The *Hennie Langenhoven* trophy for club of the year 2018, was awarded to the Free State Club.

MJ Ernst received the *NJ Kruger Herdenking* trophy for the best young breeder for 2018.

Mr. Kevin Culverwell, long serving council member, representing KZN, was task with handing over the Pat Mossop awards.

Angus Williamson did a very good job as master of ceremonies and auctioneer for the evening.

The SA Angus Society wishes to thank every member, sponsor and friends of the Society for a successful and fun evening!



Senior bulls having a serious
discussion on a fun evening.
Kevin Culverwell and
Chris Purdon.

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Our Angus poster boys,
Donald Knott and Bob Hobson!



A dinner without
Seymour Currie?
Unthinkable!
Angus Williamson and
Seymour Currie having
a beer and a chat.



Mr Kevin Culverwell, Council member of
KZN, handing out the Pat Mossop awards
for 2017/2018.

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Johan and Heilani Streuderst
having a fun evening.

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**Trotse vennoot van
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Trompsburg, 27 Junie 2019

Veldprestasie getoets sedert 1989. Suid-Afrikaanse genitika.

AFRIGUS: BREEDING THE IDEAL BEEF CATTLE — FOR A — DRIER FUTURE

By Annelie Coleman,
Courtesy of Farmer's Weekly
23 December 2018 (shortened)



The ideal Afrigus bul is hardy, fertile and capable of covering females in trying veld conditions. The Afrigus is well known for calving ease and accelerated growth.

Photo: Martiens le Roux

The Afrigus has the potential to take beef cattle production to a new level, especially in the more extensive farming areas of South Africa. The breed has been developed to withstand and even excel under the most taxing conditions.

It is still in its infancy, however, with a small number of breeders and breeding animals. The Afrigus is essentially a combination of the Angus and Afrikaner beef cattle breeds. Other indigenous breeds, such as the Tuli, Bonsmara and Drakensberger, are also qualified for breeding the Afrigus in combination with the Angus. This combination results in a wide selection base for gene combinations suited to a host of different environments. All the breeds involved in the development of the Afrigus are known for quality and tender meat.

The objective is to combine the Angus with these African breeds to create a breed that's solid red or black, naturally polled, medium-framed and with low birthweights, as well as an even temperament, accelerated growth and hardiness.

The main aim of Afrigus breeders is to breed animals that consistently maintain a balance between the attributes of the two breeds.

This means enough of the Angus to ensure growth and fertility, and enough of the Afrikaner, or any of the other indigenous breeds, to ensure hardy, adaptable animals that are disease- and tick-resistant and can excel under extensive veld conditions.

Feet and udder structure, temperament and, of course, fertility, are important. This can only be measured through a strict selection process and detailed performance recording.

It is the Afrigus cow that is principally responsible for genetic advantages. The ideal Afrigus cow is feminine, highly fertile, produces enough milk, is well adapted to the environment and has a long reproductive life.

These animals are expected to be strong walkers and indiscriminate grazers, which is why selecting for sound feet and claws is so important.

The Afrigus weathered drought admirably and even excelled, therefore constitution and body condition are such important selection criteria. Under such stressful conditions, an animal with a weak constitution would weaken and start calving irregularly or stop calving altogether.

A breeder who selects for constitution will find that all the other requirements and selection criteria fall into place automatically. Any cattle breed can perform well with ample food, but it takes a special breed, such as the Afrigus, to perform optimally on the veld with only a salt lick. ■

Angus Sales | Veilings 2019

January	7	SA Angus Office opens			
	25	Wes - en Suid -Kaa AJV	082 333 8903	Basie Bezuidenhout	Vredenheim Estate
March	1	Hertzogville Skou	084 851 8262	RC Malherbe	
	6 & 7	Judges Seminar			
April	3 - 5	Vryburg Skou	053 927 3945	Lizet	
	26 - 28	Kaasfees Sandringham	082 333 8903	Basie Bezuidenhout	Stellenbosch
May	2	Bloemskou	084 851 8262	RC Malherbe	Bloemfontein
	14 - 17	NAMPO			Bothaville
	27 - 31	Royal Show	082 413 9801	Douglas Fletcher	Pietermartizburg
	30	Pioniers Veiling	083 327 9186	Seymour Currie	Melkbosstrand
Junie	6	Suid en Wes Kaap Klubveiling	083 455 1151	Hoffie van Blerk	Moorreesburg
	13	Rheeboksplaas Veiling	082 460 6327	Gielie Geldenhuys	Ceres
	27	Transgariep Veiling	082 773 3123	Fanie Lubbe	Trompsburg
			082 772 9472	Martiens le Roux	
			082 895 8188	Ian MacLachlan	
Julie	10	Malutveiling	082 774 6804	André Breytenbach	Clarens
	18	East Cape Angus Sale	082 326 8509	Anton Vermaak	Alexandria
	23	Midlands Angus Sale	082 774 9901	Friedel Keyser	Mooi River
	24	Makojalo and Friends Sale	083 627 8131	Kobus Delport	Potchefstroom
Augustus	6	Angus Elite Black & Red Sale	082 574 9309	Colin Emanuel	Nottingham Road
			082 573 7424	Rob Kleinloog	
	15	Aucdeen Sale	082 772 5323	Hannes Aucamp	Molteno
	20	Astro Veiling	082 804 1796	Anton Pelser	Hendrina
	20	EG Bull Sale	083 277 7933	David Louwrens	Cedarville
	21	Angus Alliance	084 851 8262	RC Malherbe	Bothaville
			072 408 5699	JM Steyn	
			082 255 3037	Loutjie Campher	
			082 926 3418	Louren Campher	
	29	Waterkloof Rooi Angus	082 577 2502	Nico Uys	Heidelberg
	29	Parker Sale	082 555 5779	Rob Parker	Humansdorp
			082 322 7788	James Parker	
September	3	Kroon Angusveiling	083 272 6338	Johannes Botha	Viljoenskoon
			082 453 9817	Johan Kahts	
			083 987 7060	Issie Liebenberg	
	4	Sid Knott Sale	082 321 0673	Donald Knott	Kei Road
	5	Syferpan Sale	072 402 2028	Lawrence Moorcroft	Queenstown
	11	VJ Sale	082 879 2744	Chris Purdon	Cathcart
	12 - 13	National Championship Show	083 651 9266	Jannie Kotzé	Moorreesburg
	17	Dunedin Sale	073 330 5579	Carl Miles	Dordrecht
	17 - 19	ALFA			Parys
	19	WAF Trust Veiling	083 290 4318	Estè Fick	Clocolan
	25	Malherbe & Roberts Veiling	084 851 8262	RC Malherbe	Hertzogville
October	4	ANGUS AGM		North West	
	10 - 12	AGRI - EXPO Sandringham	082 333 8903	Stefan Terblanche	Stellenbosch
	15	Ultimate Veiling	082 075 3541	MJ Ernst	Klerksdorp
			082 550 7847	Piet Delport	
			082 733 4762	Janke Vosloo	
	23	Andrew Masterson Sale	082 321 1462	Andrew Masterson	Humansdorp
November					
December	13	Angus office close			

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