RELEVANSIE VAN NETTO VOERINNAME IN DIE VLEISBEESBERYF?

LNR-DIEREPRODUKSIE-INSTITUUT1 EN UNIVERSITEIT VAN DIE VRYSTAAT2
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Die volhoubaarheid van winsgewende vleisbeesboerdery raak met die verloop van tyd meer uitdagend. Daar word dus altyd gestreef na die verlaging van insetkoste en een manier om dit te bereik is deur die seleksie vir eienskappe wat die doeltreffendheid van jou kudde sal verhoog. Voerkostes is sekerlik die grootste bydraende faktor tot die totale kostes van vleisbeesboerdery, hetsy dit die kostes is wat die voerkraal aangaan om voer te voorsien aan die diere wat op kraal gevoer word, of die boer wat weiding aan sy kudde moet voorsien deur die koop of huur van grond.

Die produksie van speenkalwers is die mees algemene produksiestelsel wat in Suid-Afrika gebruik word, dus word daar baie klem geplaas op die speenkalfprys wat die boer ontvang vanaf voerkrale. Die grootste invloed op die speenkalfprys is die koste van die voer wat die voerkraal moet aankoop of meng en die grondstof wat die grootste bydrae lewer in die voermengsel is oor die algemeen mielies. Daar word dus wipplank gery tussen die mielie- en die speenkalfprys.

Voerdoeltreffendheid word tradisioneel gemeet as die verhouding van die hoeveelheid voer gevreet in vergelyking met die gewigstoename van die dier en word uitgedruk as voeromset verhouding (voerinname/gewigstoename) of die invers naamlik doeltreffendheid van voerverbruik (gewigstoename/voerinname). Daar is verskeie beperkings wanneer die eienskap vir seleksie gebruik word, omdat dit n eienskap is wat in n verhouding uitgedruk word. Dit is dus nie duidelik hoeveel klem op beide van die eienskappe (voerinname en gewigstoename) geplaas word tydens seleksie nie, aangesien een van die eienskappe n groter bydrae kan lewer tot die uitdrukking van voeromset verhouding afhangend van die hoeveelheid variasie binne beide voerinname en gewigstoename (hoe meer variasie daar is hoe vinniger kan seleksievordering gemaak word). Voeromset is ook hoogs gekorreleerd met groeitempo en seleksie vir doeltreffendheid sal dus groeitempo in jong diere verhoog. Dit kan egter ook tot 'n betekenisvolle toename in volwasse koeigewig en 'n verhoogde voerinname van die koeikudde lei, wat 'n negatiewe effek op die totale produksiestelsel kan hê.

VRUGBAARHEID IS DIE BELANGRIKSTE EIENSKAP WAARVOOR DAAR GESELEKTEER KAN WORD, EN HET 'N RELATIEWE LAE OORERFLIKHEID; DUS IS DIE OMGEWINGSEFFEK BAIE HOOG EN HET 'N GROOT BYDRAE TOT DIE UITDRUKKING VAN ENIGE VRUGBAARHEIDSEIENSKAP.

Dit beteken dus dat groot negatiewe impakte op vrugbaarheidseienskappe verwag kan word in strawwe jare waar daar bv. n beperking van voeding is. Die diere kan dus nie voorsien aan al hul onderhoudsbenodighede nie en dus is daar ook minder energie beskikbaar vir reproduksie. Daar kan dus ook verwag word dat diere wat swakker aangepas is tot hul omgewing swakker sal presteer in terme van vrugbaarheid. Onder ekstensiewe omstandighede wat grootliks gevind word in Suid-Afrika wil jy nie noodwendig met diere sit wat te "groot" is vir hul omgewings nie. Dit beteken dat jy nie met koeie wil teel wat onder normale omstandighede gaan sukkel om te voorsien aan hul liggaamsbenodighede nie (grootter diere se voerbenodighede is hoër), om nie eens te praat van onder strawwe omstandighede, bv. jare met n ondergemiddelde reënval nie.

Netto voerinname (NVI) is die verskil tussen 'n dier se werklike inname en die verwagte (voorspelde) inname gebaseer op die dier se gewig en groeitempo oor 'n spesifieke tydperk. In teenstelling met die tradisionele doeltreffendheids-maatstawwe, is NVI feitlik ongekorreleerd (onafhanklik) met groei- en gewigseienskappe en word dus as vervanging voorgestel in die plek van voeromset verhouding.

NVI word uitgedruk as 'n afwyking vanaf die verwagte inname van die dier en dit kan 'n negatiewe of positiewe waarde hê. 'n Lae NVI waarde dui op 'n meer doeltreffende dier omdat hy minder gevreet het as wat verwag sou word en verskeie studies het gevind dat die oorerflikheid daarvan tussen 0.28 en 0.57 varieer. Daar kan dus vir NVI geselekteer word.

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Sodanige seleksie sal lei tot 'n verlaging in inname sonder dat groeitempo of koeigrootte noemenswaardig beïnvloed word en totale kuddedoeltreffendheid sal dus verbeter word.

Data wat gebruik word om NVI te bepaal is afkomstig vanaf bultoetsentrums wat soortgelyke omstandighede voorstel as wat gevind sal word in voerkrale. Dit is baie moeilik om voerinname onder veldtoestande te meet. Daar is egter n proef gedoen in Australië om te sien wat die impak van seleksie vir NVI onder voerkraalomstandghede sou wees op diere se prestasie onder veldtoestande. Daar was vir twee lyne geselekteer naamlik n hoë- en n lae NVI lyn. Daar was duidelike verskille in inname met diere van die lae NVI lyn wat minder gevreet het as die hoë NVI diere waar daar nie beperking in voerbeskikbaarheid was nie. Waar voeding beperk was het die lae NVI diere beter groei getoon as hoë NVI diere aangesien minder voeding (energie) benodig word vir onderhoud.
Moontlike redes mag vertering van die voer, proteïenomset, totale weefselmetabolisme (mitochondriale funksie, liggaamsamestelling, IGF-1 en kortisol vlakke), aktiwiteit, termoregulering en groei insluit.

Lae NVI diere is geneig om voer beter te verteer as hoë NVI diere. Die korrelasie tussen NVI en droeë materiaal vertering is in die omgewing van 0.33. Metaboliese verskille tussen hoë en lae NVI diere kan toegeskryf word aan verskille in liggaamsamestelling en metaboliese prosesse. Daar is positiewe korrelasies tussen NVI en metaboliseerbare energie vir onderhoud, sowel as tussen metaboliseerbare energie vir onderhoud en proteïenomset, wat tot 'n indirekte verwantskap tussen NVI en proteïenomset lei. Proteïen vorming in lae NVI diere is dieselfde as in hoë NVI diere, maar die afbreek van proteïen in lae NVI diere is minder, wat dus tot 'n "proteïen wins" lei

Dit bleik dat mitochondrial funksie ook 'n rol speel in NVI. Hierdie funksie word beinvloed deur beide die dier se genetika en die voer wat hy kry. Ongeveer 90% van sellulêre energie word deur aktiewe selle in die lewer, niere, spiere en brein geproduseer. Die feit dat NVI met mitochondriale funksie geassosieer word dui op 'n verwantskap met metaboliese doeltreffendheid.

Lae NVI beeste het effens minder liggaamsvet en meer liggaamsproteïen as hoë NVI beeste. Daar is verskille van tot 21% in hitteproduksie tussen lae en hoë NVI diere gerapporteer, terwyl tot 10% van die verskille in NVI in groeiende kalwers deur verskille in fisiese aktiwiteit verklaar kan word.

Die Suid-Afrikaanse voerkraalbedryf het sekere voorkeure vir minimum groeitempos en karkasgewigte, wat nie noodwendig aangespreek sal word deur slegs vir NVI te selekteer nie. Net soos NVI bereken kan word, kan Netto Daaglikse Groeitempo (NDG) ook bereken word. NDG word uitgedruk as á afwyking van die groeitempo wat verwag word gebaseer op die dier se inname. 'n Hoë NDG dier is dus 'n dier wat vinniger groei op 'n gegewe hoeveel voer as wat verwag word.

DIE OPLOSSING SAL WAARSKYNLIK WEES OM BEIDE NVI EN NDG BY SELEKSIE IN AANMERKING TE NEEM EN DIE TWEE EIENSKAPPE KAN IN 'N VEREENVOUDIGDE SELEKSIE-INDEKS INGESLUIT WORD VIR TOEKOMSTIGE GEBRUIK DEUR TELERS.

Indien daar 'n behoefte is om NVI (en NDG) te bepaal moet die individuele voerinname van die diere gemeet word. Daar is in die afgelope paar dekades reeds groot vordering gemaak in die hoender- en varkbedryf weens die feit dat beide intensiewe produksiestelsels is, met die meet van voerinname wat baie meer toeganklik is. Daar is egter baie min klem daarop gelê in die vleisbeesbedryf, wat waarskynlik toegsekryf kan word aan die hoë kostes daaraan verbonde om diere te toets. **Weens die verwagte klem wat in die toekoms op seleksie vir NVI en NDG geplaas gaan word, maak dit die volle benutting van die bultoetssentrums in Suid-Afrika soveel belangriker.**

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MARBLING

Tori R. Perkins • Senior Agricultural Communications Major • Tech University in Lubbock, Texas.

A TRAIT OF FUTURE ECONOMIC IMPORTANCE

Marbling score is a very important trait used to quantify quality grade of beef cattle in the United States carcass evaluation process. The amount of marbling or fat specs in the longissimus dorsi muscle (ribeye) as well as color, firmness and lean texture lead to the final determination of the QG. Marbling score determination occurs on the surface of the ribeye when a carcass is split between the 12th and 13th ribs. Quality grades are ultimately used to determine differences in expected eating quality among harvested cattle and their carcasses. The U.S. beef quality grade range from Standard to Prime in young 'A' maturity beef carcasses.

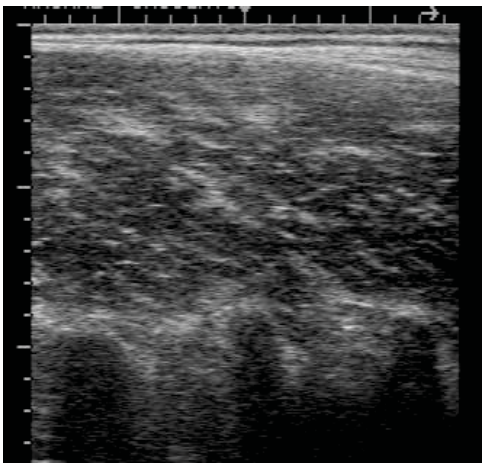
Beef carcasses are awarded a quality grade as an indicator of overall flavor, tenderness and juiciness for the consumer. The degree of marbling ranges from practically devoid in a Standard carcass to abundant in a high Prime carcass. Marbling score and ultimately quality grade have been primarily determined by an individual grader at chain speed. However, video imaging analysis (VIA) has become a mainstay for beef grading in the U.S. beef industry as it removes part of the subjectivity.

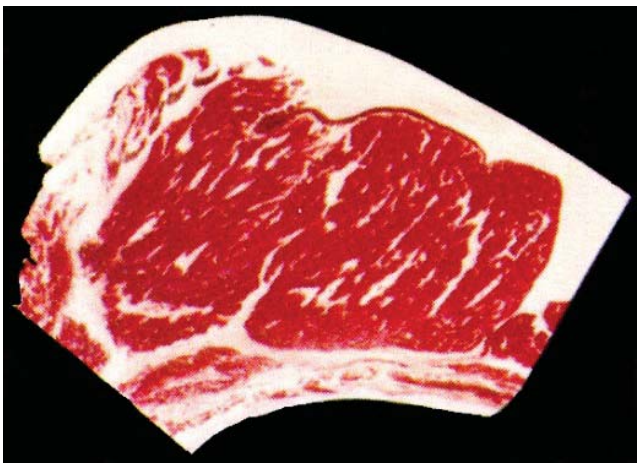
Marbling score has been one of the most highly researched carcass trait in the past twenty years. The heritability has ranged from 0.29 to 0.45 whether it has been adjusted on an age, fat thickness or weight endpoint. In general, marbling score is a considered to be a moderately heritable beef cattle trait indicating we should be able to increase or decrease the level of marbling found in future generations of cattle by proper selection. Research suggests differences in marbling ability, both within and across breeds of cattle, certainly exists. However, most agree that marbling will respond to selection in all breeds.

Some have suggested that continual selection for marbling score and/or quality may have a negative impact on the overall maternal and reproductive efficiency of a cow-herd. Some, but not many, research projects have investigated the impact of selection for marbling on beef production traits. In general, the literature suggests there is minimal relationship (some positive, some negative) between marbling and measures of growth, milk production, feedlot performance, fat deposition, reproduction or mature size.
My dad would be the first one to say that single-trait selection for marbling, and other traits for that matter, would lead to bad consequences. Simultaneous selection of multiple traits, using expected progeny differences (EPDs), would be a preferred method to advance marbling without sacrificing other economically important traits of the cow-herd. Selection for marbling should not negatively impact overall profitability of your herd if other traits are kept in balance.

Research indicates selection can be applied to beef cattle to increase marbling scores without increasing external fat deposition. From a genetic standpoint, external fat thickness is lowly correlated (near zero) to marbling score. Increased marbling potential should also be attainable without causing negative gains with other feedlot performance traits.

The International Brangus Breeders Association (IBBA) has been an industry leader in using ultrasound data to calculate carcass merit EPDs from the beginning. The IBBA has utilized ultrasound technology to determine carcass merit in seedstock cattle since 1992 based on research at Kansas State University. Ultrasound determination of ether extractable intramuscular fat (%IMF) has been used by IBBA to identify genetic potential for marbling among breeding animals. See the ultrasound and ribeye image below indicating the level of %IMF in a live Brangus animal.





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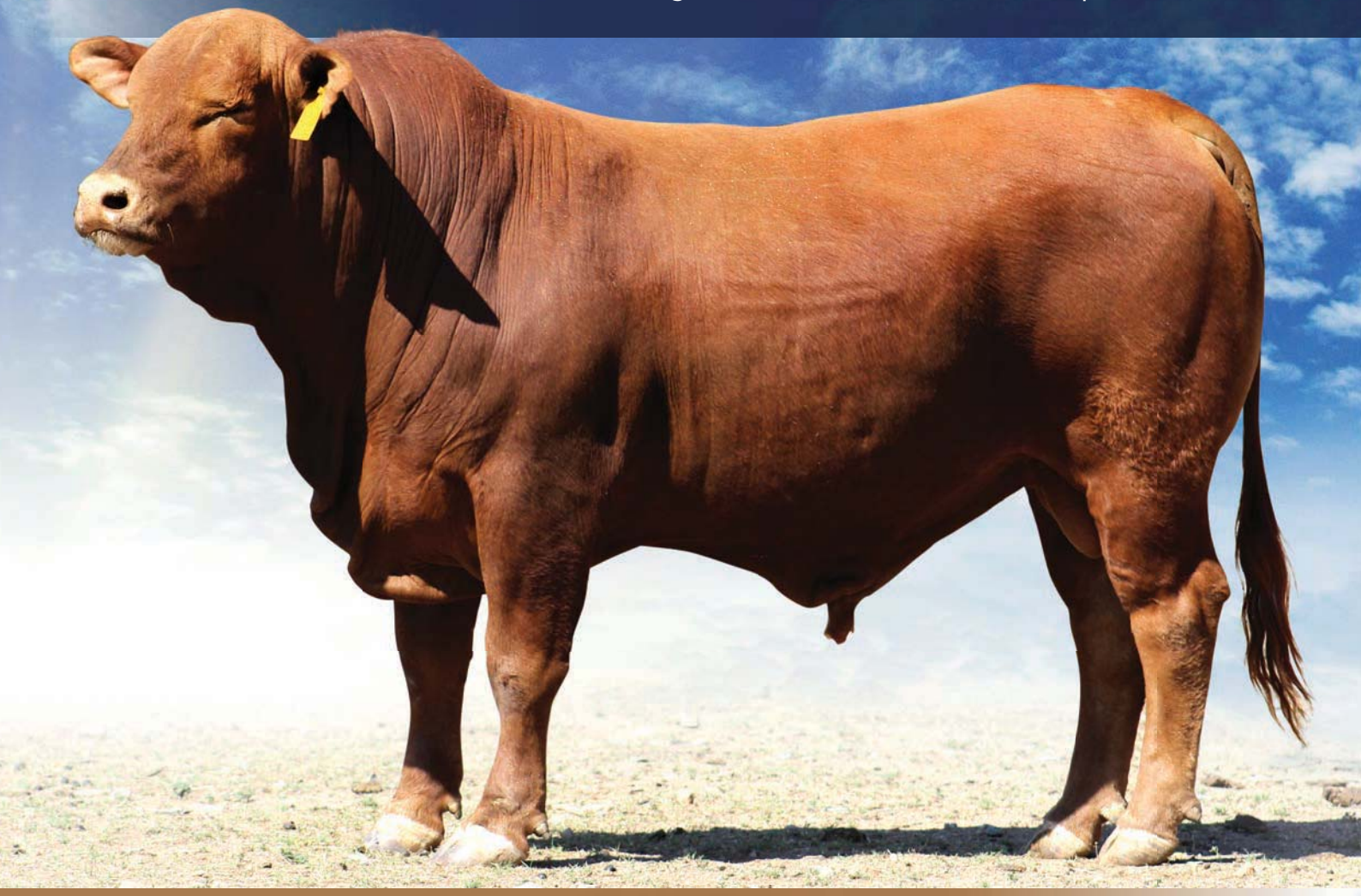

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It has just recently been published that the percentage of the fed steer and heifer slaughter cattle grading Choice has surpassed 70%. The percentage of cattle grading Prime hoovers around 5% so the combination of cattle grading choice or higher in the US in greater than 75%. This increase can be credited somewhat to the level of ultrasound data collection and selection in past twenty years in the beef industry.

Marker-Assisted Selection (MAS) is the process of using the results of DNA-marker tests to assist in the selection of individuals to become the parents in the next generation of a genetic improvement program. MAS is being used for selection in traits with EPDs in national cattle evaluation programs. Currently, DNA tests are available to the seedstock industry as well as the commercial segment measuring marbling ability. Previous DNA testing has shown beef cattle have desirable forms of genes within all populations of animals.

Single gene selection based on marker information with exclusion of EPDs has been ineffective. However, the beef industry is moving forward with evaluations that utilize both the animal's genotype alongside the phenotype to predict a genomic-enhanced EPD. Marbling is a complex trait controlled by multiple genes so the single step genomic-enhanced EPD methodology is allowing more rapid change in the trait. Currently, IBBA has more than 11,000 animals with genomic enhanced EPDs which uses ultrasound percent intramuscular fat as it's indicator trait for marbling.

Research by MacNeil and coworkers (2010) indicated a strong need to continue harvesting beef animals to collect phenotype data to accurately assess seedstock cattle based on carcass merit. They suggested progeny testing and harvesting fed cattle from known genetics is a must to get accurate enough molecular breeding values (MBVs) to rank breeding animals. They went on to further state that industries (dairy, etc.) with substantially larger databases have shown greater genetic correlations. This suggests breeding values derived solely from genomic information could eventually replace progeny testing entirely. However, this may not be practical in the beef industry as we rely on a wider range of economically relevant traits in the selection process.

TORI R. PERKINS

Tori R. Perkins, daughter of Dr. Tommy and Rhonda Perkins, was an active member in both 4-H and FFA when growing up. In her 10 plus years in the various youth programs, she exhibited market steers, beef breeding heifers, market lambs, market swine and poultry. Her early show years occurred through the 4-H program while living in the Springfield, Missouri area. She continued showing as an FFA member in La Vernia, Texas as well as participating on the junior chapter conducting team and the Meats Evaluation Team. A recent graduate of South Plains College in Levelland,Texas, Tori is currently a Senior Agricultural Communications major at Texas Tech University in Lubbock, Texas.

HAAL DIE HOOFPYN UIT BRUCELLOSE WETGEWING

BRUCELLOSE WETGEWING

DR. Trudie Prinsloo • Legalvet, Veterinary Practice • Montagu, Wes-Kaap

Bees brucellose word tans as een van die grootste bedreigings vir die nasionale kudde en voedselsekerheid in die land beskou. Vele artikels word geskryf oor die nadele wat brucellose vir kuddes inhou en die gevolge wat dit vir mense het wat daarmee besmet word, maar die wetlike aspekte word selde aangespreek en vir meeste boere is dit steeds soos 'n slagveld. In hierdie artikel word dit logies en maklik uiteengesit. Die Dieresiektes Wet, No 35 van 1984 ("die Wet") se doel is om dieresiektes en parasiete te beheer. Hierdie Wet en die Regulasies bepaal hoe dieresiektes beheer moet word. Bees brucellose (Brucella abortus) is een van die beheerde siektes in terme van die Wet. Die redes daarvoor is dat brucellose aan mense oordraagbaar kan word en ernstige siekte veroorsaak; dit versprei ook vinnig binne 'n kudde en veroorsaak groot produksie verliese.

ALGEMENE VERANTWOORDELIKHEDE VAN VEE EIENAARS

Die Wet stel sekere vereistes aan vee eienaars. Hulle moet alle redelike stappe neem om siektes en parasiete in hulle diere te voorkom en die verspreiding daarvan te verhoed. Verder is eienaars verplig om die diere te behandel indien hulle wel besmet word. As 'n eienaar vermoed dat die diere 'n beheerde siekte het, is hy verplig om dit onmiddellik aan te meld by die verantwoordelike staatsveearts. Die Regulasies bepaal verder dat 'n eienaar ook die voorkoms van 'n beheerde siekte moet bekend maak aan al sy bure en alle voornemende kopers, of kopers wat die voorafgaande 30 dae diere by hom gekoop het. Dis belangrik om daarop te let dat dit ook geld selfs al word die siekte slegs nog vermoed.

SPESIFIEKE BEPALINGS VIR BEES BRUCELLOSE

Die spesifieke bepalings vir die beheer van brucellose word in Tabel 2 van die Dieresiektes Regulasies gestipuleer. Die eerste beheermaatreël bepaal dat alle verse tussen die ouderdom van 4 en 8 maande eenmalig ingeënt moet word met 'n effektiewe entstof vir brucellose. Tans is die enigste twee entstowwe wat goedgekeur is Stam 19 en RB51. Stam 19 mag slegs in verse tussen 4 en 8 maande oud gebruik word en mag nie herhaal word nie. Opvolg inentings met RB51 is wel toelaatbaar indien die verantwoordelike staatsveearts skriftelik toestemming gee.

Diere mag slegs getoets word deur 'n beampte of deur 'n privaat veearts. Dit is nie verpligtend dat alle beeste getoets moet word nie, maar dit word aanbeveel. In spesifieke gevalle mag die Direkteur van Veeartsenydienste wel 'n eienaar verplig om sy diere te laat toets.

VERPLIGTINGE INDIEN DAAR POSITIEWE DIERE IN DIE KUDDE IS

Indien enige diere positief toets sal die betrokke laboratorium die verantwoordelike staatsveearts dadelik inlig. As 'n privaat veearts die toetse gedoen het sal hy ook ingelig word en hy kan dan die eienaar inlig indien die staatsveearts dit nie reeds gedoen het nie. Hoewel die staatsveearts die inligting eerste behoort te ontvang, bly dit steeds die eienaar (as ook die privaat veearts) se plig om die staatsveearts in te lig indien hulle nie reeds gekontak is deur die staatsveearts nie. Die staatsveearts sal die plaas onder kwarantyn te plaas, wat beteken dat geen vatbare of besmette diere sonder toestemming van die staatsveearts van die plaas verwyder mag word nie. So kwarantyn kennisgewing bevat die voorskrifte waaraan die eienaar moet voldoen en moet streng nagekom word.

Die eienaar het self ook 'n plig om alle besmette en kontak diere te isoleer en in isolasie te hou totdat die staatsveearts die isolasie skriftelik ophef. 'n Eienaar war sy beeste verskuif wetende dat daar positiewe diere is, sal dus die Wet oortree, al was hy nie deur die staatsveearts onder kwarantyn geplaas nie.

DR. TRUDIE PRINSLOO

Trudie het in 1990 as veearts gekwalifiseer. Sy het in privaat praktyk gewerk en het ook haar Honeurs en Meestersgraad gewerf. Sy het ook haar LLB gewerf en het ook voltyds as prokureur gewerk. In Maart 2015 het sy haar eie kuddesgesondheidspraktyk begin vir wild en veeboere en ook as konsultant vir veeeartse en boere met regsverwante probleme. Tans is sy in Montagu in die Wes-Kaap en haar praktyk is nou suiwer gerig op die regsaspekte van belang vir veeboere en veeartse.

Alle positiewe beeste moet gebrandmerk word met 'n "C" op hulle regter nek. Hulle mag slegs met die skriftelike toestemming van die staatsveearts óf geslag word óf verwyder word na 'n goedgekeurde abattoir. Die diere wat na 'n abattoir gaan moet deur 'n Rooikruis permit vergesel word en mag slegs na die abattoir wat op die permit aangedui is, gaan. Sulke diere mag onder geen omstandighede aan enige ander persoon of op enige ander plek verkoop word of van kant gemaak word nie. Tog het dit al menige male gebeur dat diere met "C" brandmerke op veilings aangebied is, so wees op die uitkyk daarvoor en moet onder geen omstandighede so dier of enige diere van daardie eienaar koop nie.

Indien daar enige positiewe skape, bokke, varke of honde is, moet hierdie diere vernietig word deur 'n beampte of soos deur die Direkteur bepaal word.

Die eienaar moet toegang tot diere wat in isolasie aangehou word beperk. Slegs persone wat verantwoordelik is vir die versorging van die diere en beamptes wat beheermaatreëls moet toepas, mag toegang tot sulke diere hê. Hoewel min mense hierdie maatreël streng toepas, is dit juis in 'n siekte soos brucellose baie belangrik aangesien dit na mense maklik kan besmet.

Melk van diere wat met brucellose besmet is (of vermoedelik besmet) is mag glad nie vir enige doel gebruik word tensy dit gekook, gepasteuriseer of gesteriliseer is nie.

Daar is ook 'n plig op die eienaar om die plek waar 'n besmette dier aangehou is, en die voertuig waarop so dier vervoer is, te ontsmet met 'n effektiewe middel. Enige toerusting wat potensieel besmet is moet ook op die voorgeskrewe manier ontsmet word.
Bewys van enige beheermaatreëls wat op die diere toegepas is moet deur die eienaar gehou word. Dit sluit bewys van inentings in. Indien dit deur 'n beampte of veearts gedoen word, moet die eienaar daardie persoon vra vir 'n sertifikaat waarop die besonderhede daarvan aangedui word. Indien dit deur die eienaar self gedoen is, moet hy bewys daarvan lewer deur middel van 'n beëdigde verklaring wat ook vergesel word van die leë houers en bewys van aankoop, waar die beheermaatreël die gebruik van middels insluit.

MAGTE VAN STAAT

Dis is Nasionale en Provinsiale Veeartsenydienste se mandaat om die Wet toe te pas. Hulle kan 'n eienaar verplig om sy diere te toets indien daar 'n vermoede is dat die diere besmet mag wees. Waar eienaars met verdagte of positiewe diere nie saamwerk nie, kan beamptes 'n bevelskrifte beteken op die eienaar wat hom verplig om sekere stappe binne 'n bepaalde tydperk te neem. Hulle het ook die mag om 'n perseel of voertuig te betree en inspeksies uit te voer. Indien 'n eienaar, of iemand wat namens die eienaar optree, die Wet oortree, daar kriminele klagtes gelê word teen die betrokke eienaar en persoon. In uiterse omstandighede mag beamptes selfs beheer oor 'n perseel oorneem om siekte beheer uit te oefen, terwyl die kostes steeds vir die eienaar se rekening sal wees. Die staat poog egter altyd eers om die samewerking van die eienaar te kry en sal hierdie stappe slegs neem in hoogs uitsonderlike gevalle.

VRYWILLIGE TOETS PROGRAMME/SKEMAS

Daar is tans 'n Interim handleiding vir brucellose beheer wat deur die Departement Landbou, Bosbou en Visserye opgestel is. Die voorgestelde programme in die handleiding is na vier verminder, met die akkreditasie skema wat wegval. Die rede daarvoor is dat baie min kuddes voldoen aan die streng vereistes wat daar gestel word. Aangesien hierdie nog nie gefinaliseer is nie, en vrywillig is, word dit nie verder hier bespreek nie.

SAMEVATTING

Dit is belangrik om te onthou dat die bepalings van die Wet daar is om die nasionale kudde te beskerm asook om mense teen ernstige siektes beskerm. Alle beheermaatreëls is in plek gebring om hierdie doelwitte te bereik en nie om as strafmaatreëls te dien nie. As mens net die beginsels van siekte beheer en siekte voorkoming navolg en alle nodige partye so spoedig moontlik inlig oor die teenwoordigheid van 'n beheerde siekte, behoort dit maklik te wees om binne die raamwerk van die Wet op te tree.

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WHERE HAVE WE BEEN & WHERE ARE WE NOW?

Tommy Perkins, Ph.D., PAS
EXECUTIVE VICE PRESIDENT, INTERNATIONAL BRANGUS BREEDERS ASSOCIATION

Until just recently, parent verification (PV) technology used highly polymorphic microsatellite markers called Short Tandem Repeat (STR) testing. However, most breed associations now use single nucleotide polymorphism (SNP) technology for PV. STRs work well but SNPs have shown more potential for automation, a lower genotyping error rate, and easy standardization between laboratories. It should be noted that the SNP technologies include more markers (loci) in its testing panel than traditional STR panels which increases the level of accuracy to greater than 99 percent.

Below is an example of an STR profile being used to validate parentage from a proposed sire and dam. Note that the calf received one marker from the bull and one from the cow. It is also important to see that the calf can only have markers in its profile that match the same markers in the parent's profile.

ID	ETH 10	ETH 225	ETH 3	BM 2113	BM 1824	SPS 115	TGLA 122	TGLA 227	TGLA 53
BULL	**213** / 217	**150** / 154	**115** / 117	**133** / 141	180 / **182**	**260** / 260	143 / **151**	81 / **91**	**162** / 172
CALF	**213** / **213**	**148** / **150**	**103** / **115**	**133** / **135**	**182** / **192**	**248** / **260**	**151** / **153**	**77** / **91**	**158** / **162**
COW	209 / **213**	140 / **148**	**103** / 119	125 / **135**	178 / **192**	246 / **248**	143 / **153**	**77** / 89	**158** / 160

Below is an example of a STR profile validating the correct sire in a multi-sire breeding system. Note that the calf is sired by Bull B. Bull A could not have sired the calf because the calf does not share (or have) alleles for all of the markers that can be provided by the sire. Hence, he is excluded at markers ETH 10, ETH 3 and TGLA 227.

ID	ETH 10	ETH 225	ETH 3	BM 2113	BM 1824	SPS 115	TGLA 122	TGLA 227	TGLA 53
BULL	**209 / 211**	148 / 150	**119 / 121**	133 / 141	182 / 182	246 / 248	153 / 153	**83 / 89**	158 / 160
CALF	213 / 217	150 / 154	115 / 117	133 / 141	180 / 182	260 / 260	143 / 151	81 / 91	162 / 172
COW	213 / 213	148 / 150	103 / 115	133 / 135	182 / 192	248 / 260	151 / 153	77 / 91	158 / 162

The SNP technology works in the same manner with the exception of having many more markers to validate.

TECHNOLOGY TRANSITION

IBBA has transitioned to the new SNP technology away from the old STR testing. Results from older, more widely used AI sires and donor dams from previous genomics research projects using the SNP technology were used as the starting point for IBBA's transition to SNPs. We currently have over 11,000 animals with 30K or higher testing results that have yielded genomic enhanced EPDs since early 2016.

IBBA OFFERS GENOMIC-ENHANCED EPDS

The new breeding season is in full swing in cattle country and cattlemen have been busy sorting through actual performance information, ratios, Expected Progeny Differences (EPDs), phenotypes and other available information. These bull purchasing decisions will impact the cowherd for years to come because of the replacement heifers that are kept back for long term production.
Historically, genetic evaluations have used pedigree information and performance records to generate EPDs. Even in the absence of any individual performance data, the genetic merit of an animal can be predicted based on the average breeding value of its parents by using the pedigree information. Pedigree estimated EPDs have very low accuracies and high possible change values.

With only pedigree information, full sibs and/or flush mates will have the same EPDs (based on pedigree estimates) until individual performance data is entered into the system. Performance data on the individual, as well as its progeny, collected and reported over time will improve the accuracies. Individual performance of an animal, as well as performance of its descendants, create a more accurate "genetic difference estimate" for that animal.

It takes considerable time, effort and money to collect needed performance data, the additional performance data leads to a more precise or accurate EPD for use in bull selection. It generally takes 15 to 20 additional progeny to move accuracies from a "pedigree estimate" to a more reliable 0.40-0.50 level. This can mean the lifetime production of a cow or at minimum, the first calf crop of a young sire.

GENOMIC-ENHANCED EPDS (GE-EPDS)

IBBA has chosen to incorporate DNA testing results alongside the traditional EPD methodology of using the extensive pedigree and phenotype database we have. The combination of pedigree, performance and DNA have produced better EPDs with higher accuracies. Pedigree, phenotype and genomics are included in a single step approach or GBLUP. This process yields an EPD presented in the same, easy-to-use fashion of traditional EPDs.

Ultimately, the advantage to GE-EPDs is the increase in accuracy, especially for animals that are younger and have lower accuracies in traditional genetic evaluations. Because DNA tests can be done at birth, they have the potential to increase the accuracy of genetic predictions on very young animals. GE-EPDs are just another tool in a breeder's toolbox for breed improvement strategies. They will allow Brangus seedstock suppliers and commercial bull buyers the ability to make more accurate and rapid genetic improvement.

Although most of the focus on any genetic selection process is weighted heavily to selecting the correct herd sire, genomics can play an important role in selecting the proper replacement females as well. A single DNA sample can yield improvements in EPD accuracy of a female equal to her lifetime production record. Therefore, I find it important to submit DNA for testing on all of your potential replacement females alongside your yearling bulls. The improvement in accuracy is independent of sex so it is just as important to measure the females as it is the males. A GE-EPD is just another selection tool for bull buyers to aid in proper selection. However, it can be used as an aid for in-herd culling and/or selection measures as well.

Most recently, IBBA announced the adoption of low-density (LD) testing through both GeneSeek and Zoetis for Brangus breeders. The use of LD testing is the most cost effective way to get GE-EPDs with an accuracy of 0.98-0.99 existing between the low- and high-density (HD) tests. Purebred breeders now have the ability to test a greater percentage of their cattle population because of the reduced cost between an LD ($45) and HD ($80) test while yielding virtually the same result.

SUMMARY

The use of genomics in the beef industry continues to grow in magnitude from parent verification to genetic condition testing to development of genomically enhanced EPDs.

Bull buyers first select potential bulls on their appearance (design, feet and leg soundness, etc.), performance data (birth weight, weaning weight, etc.) and their EPDs (Expected Progeny Differences). This selection process has worked for many years but they now have the use of a new tool, GE-EPDs, to further validate their selection. Whether you are a commercial cattleman or a seedstock producer, nothing has changed except the GE-EPDs are more accurate than traditional EPDs in young animals.

Inclusion of genomics into the EPDs were made in order to reduce confusion of their use by both the seedstock producer and commercial cattlemen alike. Take advantage of GE-EPDs whether you are producing the next purebred herd sire or purchasing the next commercial herd bull. Utilizing GE-EPDs to select your next heifer bull can be done more accurately, which should reduce calving disasters in young females. Likewise, buying young bulls using GE-EPDs for growth (weaning weight, yearling weight, etc.) can improve production efficiency at a faster rate than has ever been possible before. Lastly, improving carcass merit in offspring of young sire selection using GE-EPDs for ultrasound traits can add value throughout the production chain.

DR. TOMMY PERKINS

Dr. Perkins is a graduate of West Texas A&M University where he was recognized as a Graduate of Distinction by the Department of Agriculture in 2014. He also has a doctorate degree in Animal Breeding from Texas Tech University. He served as a professor at Missouri State University and Texas State University for nearly twenty years where his professional career is most noted for excellence in the field of beef cattle ultrasound.

Perkins was elected to the Beef Improvement Federations (BIF) Board of Directors and is also serving as chairman for the End Product committee. Additionally, Perkins currently serves on the board of directors for the United States Livestock Genetics Export Association, Texas Beef Council, Beef Promotion and Research Council of Texas, and the National Pedigreed Livestock Council. He was recently elected to serve as President of the Beef Breeds Council.

Currently, Perkins is the Executive Vice President of IBBA, Chief Executive Officer of Genetic Performance Solutions and President of Brangus Productions, Inc.

GENETIC TRAITS AND RECESSIVE GENETIC DISORDERS

MANAGEMENT AND SELECTION

Dr. Munro Marx, Unistel Medical Laboratories.

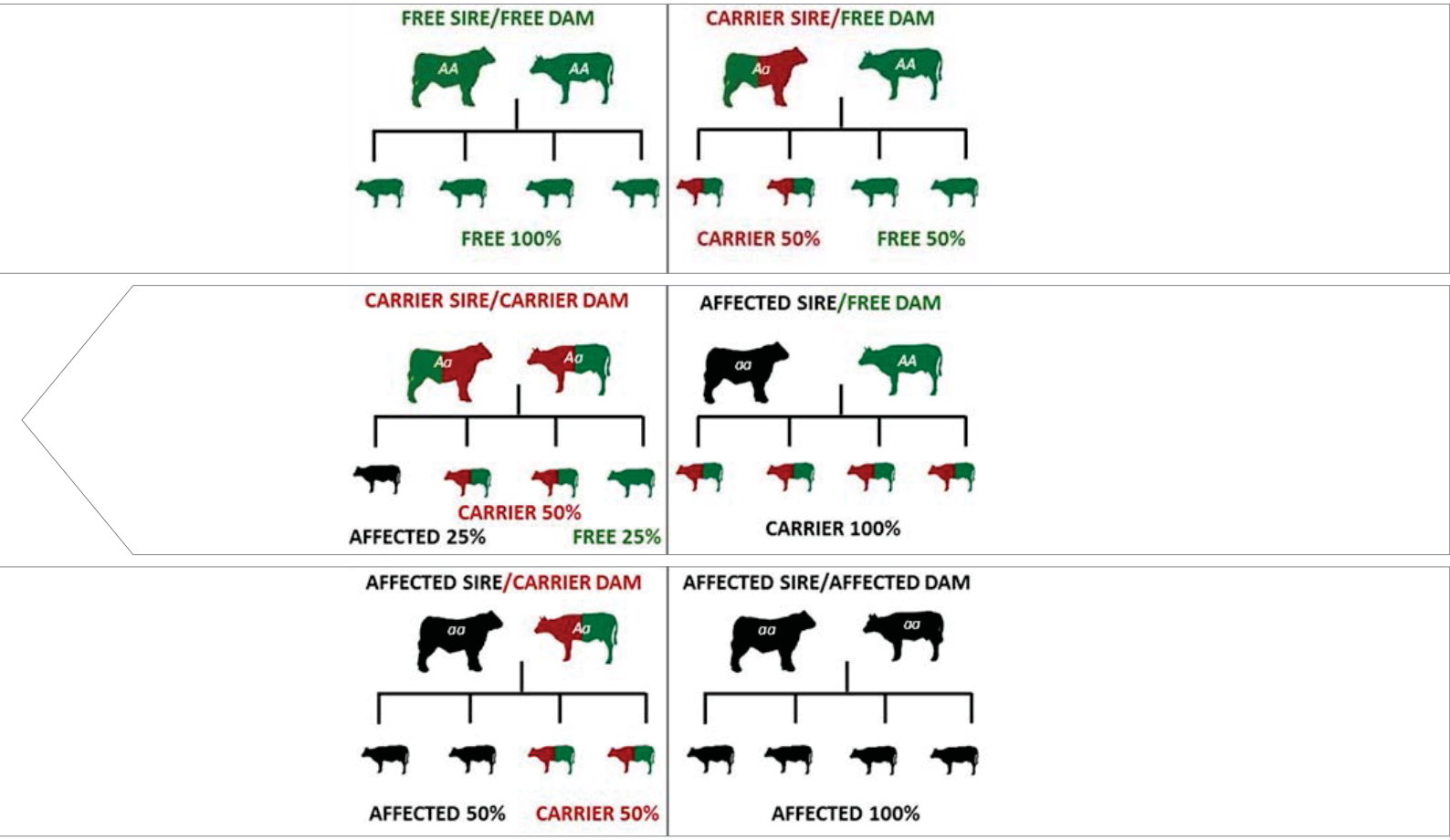
Application of DNA technology has progressed in leaps and bounds over the last decade. Integration of DNA information into genetic predictions increased the rate of genetic gains tremendously. Several genetic tests for production traits are commercially offered and can be included in selection criteria with confidence. A number of genetic disorders have also been characterised and reliable DNA tests developed.

Traditional animal breeding was mainly based on phenotype (appearance) and was fairly successful. By carefully recording economically important traits (performance testing), selection of good breeding animals improved greatly. This was improved further by including the performance of an animal's offspring into the evaluation the animal. The actual breeding merit of an animal could now be assessed. An animal's genetic merit can now be statistically predicted as an estimated breeding value (EBV). An animal's breeding value is therefore an estimate of its genetic merit, half of which will be passed on to its progeny (EPD).

The challenge for breeders is to accurately identify those individuals that have the best true breeding values. An EBV is a very powerful tool for the continuous improvement of a breed, but it has 3 major drawbacks. The first is suspect family trees. This is easily overcome by confirmation of breeding through DNA profiling. The second drawback is the time involved – proper EBVs can only be calculated after progeny is in production. To overcome this, a prediction about the future performance of an animal at birth (at least before it goes into production) is really what is needed. The third drawback is the relativity of EBVs –the performance of individual animals within a contemporary group is directly compared to the average of other animals in that group. (A contemporary group consists of animals of the same sex and age class within a herd, run under the same management conditions and treated equally.) To (at least partially) overcome this, a way of determining heritable traits in a more absolute way is required. There are currently several DNA systems based on single nucleotide polymorphisms (SNPs) that provide more direct information on the genetic merit of an animal. These can be used to evaluate an animal before it reaches production age and can be combined with EBVs to increase their predictive value. More and more specific variations in genes responsible for specific traits are discovered regularly. These will eventually reduce the relativity of current EBVs. To determine an animal's TRUE breeding value remains the Holy Grail for breeders and scientists, but we are getting closer.

Over the past five or more years, cattle breeders have been bombarded with a number of lethal recessive genetic defects. No breed or cross are spared. We have terms like, PHA, AM, CCS, CMS, Pompe's, Myostatin and many more that do not always make sense. All these acronyms and terms can be very intimidating and breeders can ask how possibly can defect free cattle be bred? How are breeding decisions made to prevent defective calves? In Southern Africa the beef industry, especially the seed stock sector, has had to deal with a number of recessive genetic defects that have been identified in most local cattle breeds. Assisted reproductive technologies including embryo transfer and artificial insemination has encouraged breeders to concentrate selection to a relatively small number of animals. Many breeders try to avoid mating half-sibs or sires to daughters. It is however not unusual for a highly rated sire to feature prominently in pedigrees a number of generations back both sides (sire and dam) of a particular individual. In such cases there is an increased risk for progeny in that herd/breed to be affected by a recessive genetic defect.

Most recessive genetic abnormalities feature either as congenital or biochemical defects. A recessive defect is caused by a change in the DNA sequence (mutation) of a gene located on one of the 29 pairs of autosomal (non-sex coding) chromosomes. Animals that inherit a single defective or mutated gene and one normal copy of the gene from their parents are called heterozygotes (carriers). These progeny are not affected by the disease but can pass the mutated gene on to half of their progeny. Animals that inherit two copies of the mutated gene (one from each parent) are homozygous for the mutated gene and will be phenotypically affected. Animals that inherited two normal copies of the gene are homozygous normal and unaffected. The following illustration depicts the different combinations and expected results of different matings.



The animals that are carriers (heterozygotes) and homozygous normal are phenotypically indistinguishable. This fact makes selection to eliminate carriers ineffective without reliable DNA testing.

In the Brangus Breed there are a few recessive genetic disorders and traits that should be taken cognisance of. These include Arthrogryposis Multiplex, ("curly calf syndrome"), Pompe's disease, Congenital Myasthenia Syndrome (CMS), Dwarfism and Myostatin mutations associated with double muscling.

· ARTHROGRYPOSIS MULTIPLEX.

Arthrogryposis Multiplex is a genetic defect of Angus cattle causing the birth of calves with severe contraction of the limb joints. Certain other non-genetic causes include lupine toxicity, Akabane virus, and Bluetongue virus.

Calves born with arthrogryposis have a permanent contracture of the joints of the front and/or hind limbs. Calves are very small and lack muscle development and additional defects like cleft palate, abnormal curvature of the spine may also be present. Calves are generally stillborn, or die shortly after birth.

Heritable forms of arthrogryposis can best be prevented by selective breeding. As the trait is recessive it is best not to breed with known carriers. Genetic testing to determine carrier status is recommended where carrier status is suspected.

Angus calf with Arthrogryposis Multiplex, or "curly calf syndrome "(http://calfology.com/library/wiki/arthrogryposis-multiplex-curly-calf-syndrome)

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- Freemartinism
- Trichomonas Foetalis
- Bulldog syndrome (Dexter)
- 1/29-Translocation (cytogenetics)
- Congenital Myasthenic Syndrome (CMS)
- Myostatin (F49L-gene)

Characteristics

- Coat Colour (Red)
- Polled
- Double Muscling

More on request

POMPE'S DISEASE

Pompe's disease is a glycogen storage disorder of Brahman cattle. The conversion of glycogen to glucose is catalyses by the enzyme acid alpha-glycosidase. A defect in the function of this enzyme causes a build-up of glycogen leading to muscle weakness throughout the body including the heart in homozygotic animals. The average life expecting of an affected calf is less than 12 months and should be culled. Pompe's disease is an autosomal recessive disorder and carriers of the disease are unaffected and perform normally. Crossing two carriers of Pompe's results in a 25% chance for an affected progeny. It is therefore important to know the status of all animals to be used for breeding purposes in a stud.

Brahman calf with Pompe's Disease. (http://calfology.com/library/wiki/arthrogryposis-multiplex-curly-calf-syndrome)

CMS

CMS is an autoimmune condition characterized by a varying and progressive muscle weakness. Progeny with two copies of the affected gene will be affected and usually do not survive for more than six months. Affected calves should be culled. Carriers (heterozygotes) have no symptoms of CMS and perform normally. By knowing the carrier status of breeding animals the disorder can be eradicated from the herd by clever selection.

DWARFISM

Chondrodysplasia (dwarfism) is a heritable defect of cattle, and has been described in multiple breeds. Unfortunately no one gene is responsible for the condition, but the end result is a failure of proper cartilage development, which causes stunting of the skeletal system. Dexter cattle, which have become famous for the incidence of "bulldog" calves and carry a single mutation in the ACAN gene. At least three types of dwarfism documented in cattle and thought to be caused different simply inherited recessive genes. Dwarfism has been reported in Angus, Hereford, Brahman, Jersey and Dexter cattle.

DWARF JERSEY

"BULLDOG" DEXTER CALF

Double muscling is an inherited condition in cattle, characterised by either hyperplasia (increase in number) or hypertrophy (enlargement) of muscle fibres. To date eight mutations in the myostatin gene have been found to be associated with the trait of double muscling. Six are described to be "disruptive" and cause an enlargement of the muscle fibre. Adverse effects on fitness (dystocia, stress susceptibility, fertility) are well documented in animals that are homozygous for these mutations. Three mutations are classified as "missense" mutations increasing the number of muscle fibres resulting in an increased muscularity, reduced external and intramuscular fat, with no change in birth weight, therefore without the associated negative effects. Carriers may spread the mutation in a population without showing symptoms themselves. Because of this, it is extremely important to identify carriers correctly to prevent spreading of a mutation.

Disruptive Variants	Associated Breed(s)
C313Y	Piedmontese
E225X	Maine-Anjou, Parthenaise
E291X	Marchigiana
mt419	Maine-Anjou, Parthenaise
mt921	Belgian Blue, South Devon, Angus
Q204X	Charolais, Blonde d'Aquitaine
Missense Variants	**Associated Breed(s)**
D192N	Maine-Anjou
F94L	Limousin
S105C	Parthenaise

Double muscled bulls and the known mutations in the myostatin genes.

In Southern Africa three mutations are prevalent namely nt821 (Belgian Blue mutation), Q204X (Charolais mutation) and F84L (Limousine mutation). Carriers may spread the mutation in a population without showing symptoms themselves. Because of this, it is extremely important to identify carriers correctly to prevent spreading of a mutation. Heterozygotes (carries) for the myostatin gene mutations according to research are expected to have an intermediate effect of about 50%.

The double muscling trait must be used wisely. There is a definite place for double muscling in the case of terminal crossbreeding for "boxed beef". Better quality carcases with a higher dressing % of more than 300 kg can be produced. However all the progeny of the terminal sire bull should be slaughtered, both bulls and heifers.

TAKE HOME MESSAGE

The ability of a cow to calve regularly and easily in the extensive environments of South Africa, Botswana and Namibia is the most important trait in beef cattle production systems and determines the profitability of the enterprise. It is therefore critically important to manage genetic defects in your herd by using DNA technology available to gain the correct knowledge and based on this knowledge, **MAKE THE CORRECT MATING AND SELECTION DECISIONS.**

DR. MUNRO MARX

Dr Munro Marx is 'n boorling van Bloemfontein waar hy skool gegaan het en aan die Universiteit van die Vrystaat gestudeer het. Daar voltooi hy voor- en nagraadse studies en verwerf 'n doktorsgraad in menslike genetika. Hy voltooi ook sy M.B.A. graad aan die Universiteit van Stellenbosch. Hy is outeur van meer as 80 artikels in joernale, vaktydskrifte en bedryfsblaaie. Hy is stigter en besturende direkteur van Unistel Geneeskundige Laboratoriums, 'n afwentelmaatskappy van die Universiteit van Stellenbosch.

BRANGUS | THE VERSATILE ACHIEVER

Farming in South Africa must be something you love because it really isn't easy. Especially these days when we are facing increasing inset costs, lack of subsidies, import competition etc. on all platforms of agriculture not just cattle breeding. South Africa is one of the countries with the largest variety of grazing areas in the world, but luckily, we have Brangus! The fact that we can farm and perform on all these different types of grazing and pasture quality says a lot about the adaptability and hardiness of the breed. Brangus is a breed that stands by its breeders through the good and bad time. Breeders trust Brangus to persevere when times are tough, as well as to achieve when the times are good.

"It is not the strongest of the species that survives, nor is it the most intelligent that survives. It is the one most adaptable to change"
Charles Darwin

HANRI VAN DER MERWE

Finale Jaar student
B.Sc. Agric, UFS en Brangus SA Teg

If the only thing we take away from Darwin is that animals need to be able to adapt, then that will be enough to maintain our breed.

Brangus breeders respect their animals for their exceptional and rapid adaptability to any environment. For a species to survive it needs to adapt and perform two functions; it needs to eat and it needs to procreate. Any freeloaders are not welcome in a herd. No matter how strong they are or how great their pedigrees may seem. The animal needs to produce offspring and if it cannot do that then it has no place on the farm.

Brangus was developed and carefully selected from two breeds, the Angus that is very successful in temperate regions and the Brahman, whose performance under tropical conditions is what still makes it a very popular breed. From Brangus, you truly get the best of both worlds; Firstly a long productive life, which means more calves from your cows and secondly the extended use of bulls with excellent genetics.

South Africa's population grows by 2% each year. The challenge is to produce more from less space. For a cattle herd to perform within the parameters you will need a breed that matures quickly and shows rapid growth without losing meat quality. Along with these quantities the breed must maintain constant maternal traits like milking production and fertility to be deemed a performer. Under these circumstances Brangus is at the top of the list.

Brangus with it's medium frame body type as well as early maturity performs better on grazing with limited nutrition and shorter grazing seasons, to give their owner quality beef production without establishing feedlots.

For a healthy agricultural sector as well as an improving breed the key is sustainability. Finding the balance between profit and the sustainability of your pastures is important. Brangus with its shorter growth period means less pressure on pastures and less profit compromise.

Success is not something that should be measured only in performance but also consistency. Would Rodger Federer be famous if he only won one grand slam? No, Brangus not only performs but is consistent in its performance across the country.

Brangus shows consistent birth weight averages in their respective provinces, including Kwazulu-Natal (Swartberg area), Mpumalanga (Ermelo), Northern Cape (Kimberley) and Free State (Tweespruit). With the greatest difference between birth weight averages only 15 kg.

Brangus also show rapid maturity and good weaning weight averages. With the highest average in the Mpumalanga province and the Northern Cape respectively it goes to show how Brangus not only achieves in areas with good grazing, but also in areas with more arid grazing.

The Brangus cow is the Pride of the Brangus breed. Its excellent maternal instincts combined with the rapid growth capacity of the sires gives you cows weaning half their weight across all provinces.

WHY YOU NEED TO FOCUS ON GROWTH TRAITS AS WELL AS MATERNAL TRAITS.

Brangus not only focusses on improving growth EBV's but also on sustaining stable milk EBV's. Sustaining stable milk production and milk EBV's is extremely important. In the first stage of life most of the nutrition a calf receives is deposited into the growth and strengthening of bones. This is the foundation for the performance of the animal for the rest of its life; without decent nutrition from day one a wiener can't gain weight and a heifer can't raise a calf. Smaller framed animals have a lighter mature weight, but mature earlier, Brangus is better adapted to areas with limited grazing and shorter grazing seasons to provide optimal nutrition for their calves.

LEACHMAN'S PRINCIPLES

BREEDING FOR PROFIT

Charné Josling completed her MSc Agric. in Animal Science at the University of the Free State and is enrolled for her PhD. In 2013 Charné started her career in the industry where she held the position of Technical Advisor at the Brangus Breeders Society and thereafter at Wildlife Stud Services (WS2). She is currently appointed as a lecturer at the University of the Free State.

CHARNÉ JOSLING

It is always an exciting time to buy a new bakkie. During this time a proper investigation is done on the available brands, comparing prices, fuel consumption, loading capacity, luxury features, ground clearance, off-road capabilities and overall appearance to determine the best fit for your needs. Why not apply the same principles when evaluating your cattle's performance or when buying in a new breeding bull? Renowned cattle breeder, Lee Leachman recognised the value of using scientifically based selection methods early on and as a result became one of the most successful cattle breeders in America today. The purpose of this article is to discuss the traits to consider, available selection tools (based on Leachman's principles) and pitfalls to avoid with the aim of breeding more profitable cattle.

TRAITS AND FACTORS TO CONSIDER

The first step in any animal evaluation program is to collect complete data records on important traits/factors that affect the performance of the herd. For beef cattle the following traits/factors are the main performance drivers:

- **WEIGHT TRAITS**
  Measures growth potential to improve meat production per hectare.
- **REPRODUCTION**
  Include various traits such as age at first calf, days to conception and longevity which affects the efficiency of a beef enterprise.
- **CARCASS MERIT**
  The ideal carcass weights and quality are mainly determined by market demand. Superior performance for carcass traits achieves premiums which improve profits.
- **ADAPTIBILITY**
  Genetic variation increases an animal's ability to adapt and maintain performance under challenging environmental conditions.
- **STRUCTURE**
  Include the structural traits for evaluating the functionality of animals.

SELECTION TOOLS

- **ESTIMATED BREEDING VALUES (EBV'S)**

The herd data that is recorded are analysed to calculate EBV's. Selection based on EBV's is nine times more accurate compared to simple weights and ratios. Using EBV's as a selection tool will result in fast genetic progress for the traits that are selected. Care should however be taken to rely on EBVs with low accuracies (below 50%). The accuracy value (published for each EBV) provides a measure of the stability of the EBV and gives an indication of the amount of information that has been used in the calculation of the EBV. For EBVs of medium accuracy the accuracy values are between 50% – 74%.

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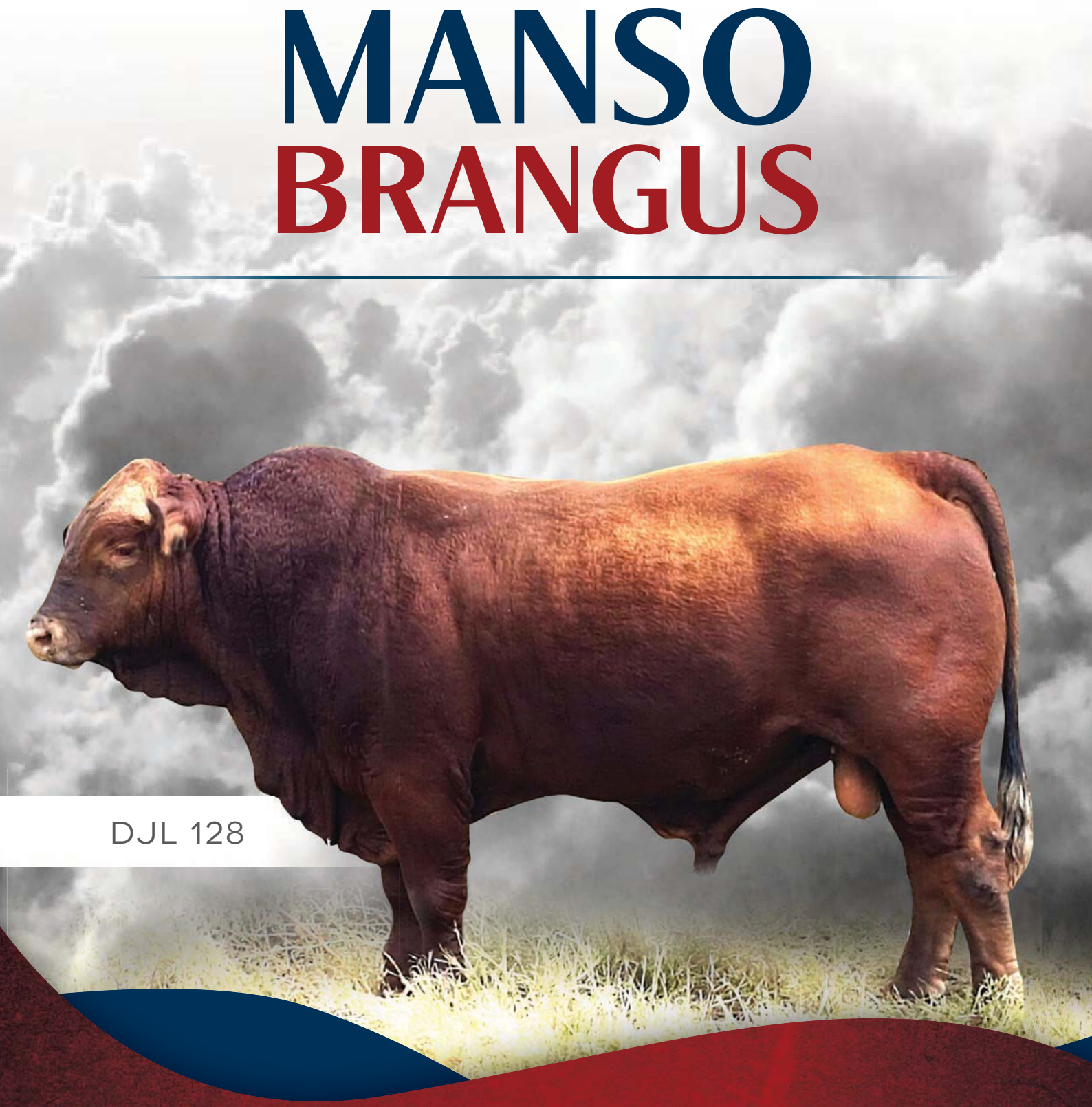

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Medium to highly accurate EBVs will have accuracy values of 75% – 90% and highly accurate EBVs have accuracy values above 90%. The most important consideration in achieving high EBV accuracies is complete records for the whole herd. Incomplete records or selective performance recording (record only best animals) will result in animals that look good on paper, but the actual performance won't live up to the expectation because of the low accuracies of the EBV's. The end result is slow or no long term genetic progress.

• DNA RECORDS

Together with complete records, the correctness of pedigrees forms the foundation of accurate EBV's and also allows for proper planning of mating combinations that will improve performance of the offspring. In this regard, DNA verified pedigrees are the gold standard.

In addition, DNA records on the occurrence of genetic defects in a herd will help manage and eliminate defects that can negatively affect the herd's performance. It is especially important to test the breeding bulls.

• SELECTION INDEXES

Estimated breeding values measure output, but they usually don't measure the cost of production. The core of Leachman's breeding principles is identifying the traits and performance levels that will give the highest returns. Instead of selecting for individual traits at a time, Leachman recommends combining traits into multiple trait selection indexes that will maximise efficiency of production as well as profit, while also keeping the market demands in mind. On the other hand, avoid selection for conflicting traits when developing selection indexes. When considering efficiency of production using weaning weight : cow weight ratio as an example it is clearly illustrated in Figure 1 that cows with the highest EBV's for mature weight are not necessarily the most profitable animals!

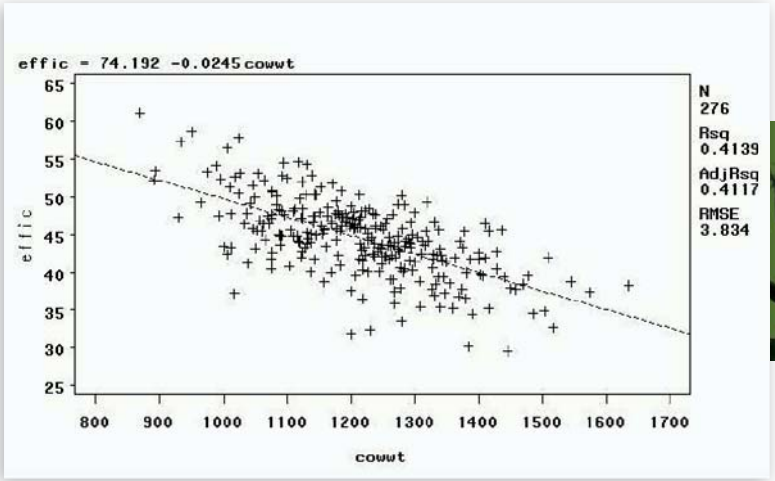


FIGURE 1
Percentage of weight weaned vs. cow weight (pounds)

• VISUAL EVALUATION

Animals should undergo a visual evaluation before entering the breeding herd to ensure that the animals are functional. Cull animals with obvious defects such as albinism, dwarfism, limb and head defects. This prevents genetic and structural defects to become fixed in the breeding herd.

PITFALLS

When animals have superior breeding values (e.g. weaning weight) and high accuracies, but they do not breed as expected it is important to identify and rectify the possible causes. When considering the basic genetic model for quantitative traits (Figure 2), it is clear that the main factors (besides the breeding value) affecting the expected animal performance is related to mating combinations (gene combination values that result in inbreeding depression) and the environment.

$$P = \mu + G + E$$
$$= BV + GCV$$

FIGURE 2: Basic genetic model for quantitative traits.

WHERE:

P = Phenotypic value

The phenotypic value or performance of an individual animal for a trait (e.g. weaning weight)

μ = Population average
the population average for the trait

G = Genotypic effect (GCV + BV)
The effect of an individual's genes, single (BV) and in combination (GCV), on its performance for a trait. The genotypic value represents the overall effect of an indiviaual's genes on the phenotype.

E = Environmental effect
The effect that external (non-genetic) factors (e.g. nutrition) have on animal performance.

BV = Breeding value
The value of an individual as a (genetic) parent, in other words as a contributor of genes to the next generation. The breeding value represents the part of the genotypic value that can be transmitted from parent to offspring (heritable genetic effect). The breeding value is calculated from the sum of the independent gene effects. These gene effects are independent of the effects of the other gene at the same locus (dominance) or other loci (epistasis), because parents transmit a sample half of their genes to their offspring (not gene pairs) and they do not transmit intact combinations of genes.

GCV = Gene combination value
The part of an individual's genotypic value for a trait that is due to gene combination effects – dominance and epistasis. Because individual genes and not gene combinations survive segregation and independent assortment during meiosis, gene combination value cannot be transmitted from parent to offspring (non-heritable genetic effect).

MATING CHOICES AND ENVIRONMENTAL EFFECTS (E.G. NUTRITION)

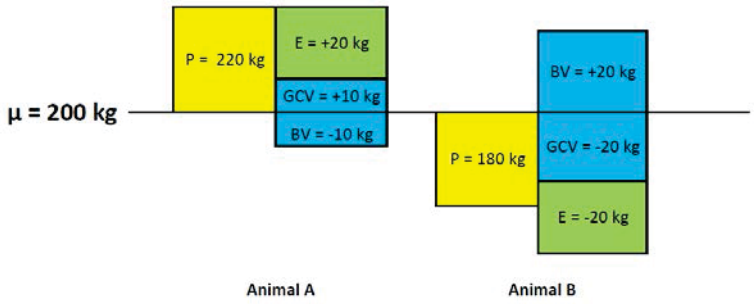


FIGURE 3:

Schematic representation of the contributions of the breeding value (BV), non-heritable gene combination value (GCV) and environmental effect (E) to the weaning weight (P) of two calves (A & B).

The combined genetic and environmental effects are illustrated in Figure 3 where the weaning weight performance of two calves (Calf A and B) are compared.

In this example Calf A performs the best in terms of weaning weight (P = 220 kg), but much of the superiority is due to factors (environment and gene combinations) that cannot be transmitted to the offspring (BV = -10 kg). On the other hand, Calf B performs below average for weaning weight (P = 180 kg) but are by far a more superior breeding animal, because this calf will transmit positive genes for growth (BV = +20) to its offspring. Calf B did not achieve full genetic potential as a result of a difficult environment (E = -20 kg) and poor mating combinations in the pedigree (GCV = -20 kg), but still possess positive growth genes to pass on to the next generation.

- Rectifying the situation so that the figures line up with the picture in front of you: Maintain adequate levels of genetic variation. According to Leachman, maintaining high levels of genetic variation can add 23% more kilograms per cow exposed resulting from a better gene combination value (hybrid vigour). Furthermore, it is evident that a proper nutritional program will also help animals to achieve their full genetic potential.

CONCLUSION

With rising input costs the profit margins of beef enterprises are declining.

PRESSURE TO INCREASE MEAT PRODUCTION PER HECTARE IS AMPLIFIED BY THE CHALLENGE TO FEED THE GROWING HUMAN POPULATION WORLDWIDE.

It is therefore of utmost importance to use all the selection tools available in order to breed genetically superior animals that are capable of producing under challenging environmental conditions at a maximum efficiency in order to realise the highest returns.

CONTRIBUTIONS OF THE BRANGUS BREED TO A PROFITABLE BEEF ENTERPRISE

1. An upgrading system that ensures adequate levels of genetic variation.
2. Efficient cows: medium frame cows with a high weaning weight : cow weight ratio and exceptional maternal qualities.
3. Contributes to various positive qualities in crossbreeding systems, including: polledness, adaption and excellent meat quality.

SELECTING A REPLACEMENT BULL

USING ALL THE TOOLS AVAILABLE TO YOU

CENTRAL CLUB FARMERS DAYS

The day was hosted by Mount Olive Genetics at Swinburne and included guest speakers from both "Veld Bull SA", Agricultural Research Council and the Brangus Breed Society of SA. Presentations included theoretical lectures, which were followed by practical demonstrations on concluding a Veld Bull Test, Ultrasonic Scanning and Bull Selection.

PHYSICAL: VISUAL SELECTION	DNA: MYOSTATIN STATUS	PEDIGREE: PARENTAGE VERIFIED
1	Clear	Yes
2	Clear	Sire
3	Clear	Yes
4	Clear	Sire
5	Clear	Sire
6	NT821 Carrier	Yes
7	Clear	Yes
8	Clear	Yes

FIGURE 1.

CHRISTOPHER SPARKS

Is an Architect and Project Manager by profession and a stud breeder by passion. A graduate of the University of Port Elizabeth; he is Managing Director of a 53-year-old architectural practice and has been involved in stud breeding since 2000. He has served on the management of the Freestate Institute of Architects, as President of the Brangus Breed Society and as Chairman of the LRF (Livestock Registering Federation). Mount Olive Genetics has a "4.5 Star Breedplan Completeness of Performance" status and has been honoured with several awards over the years.

Eight pre-selected long-weaner bulls were paraded in the ring and each was openly discussed on physical appearance and then placed in order of preference from No.1 to 8. We were now about to depart on a voyage of discovery through the peeling away of layers to unveil the true identity and breeding potential of each bull. These bulls were listed in order of preference and allocated a colour to each as illustrated (Figure 1). DNA results done earlier for both myostatin status and parentage verification had been ascertained. Bull number 6 proved to be a NT821 Carrier making him suitable as a "terminal sire" but would not be considered for breeding replacement heifers. DNA tests have been done in this herd since 2011, including all herd sires. Parentage verification ensures both accuracy of pedigree and better EBV's which are critical when considering a replacement bull.

Physical: Visual Selection	DNA: Myostatin Status	Pedigree: Parentage Verified	Economic Index: Veldbull Test Results Pelvic / Muscle Measurements
1	Clear	Yes	120
2	Clear	Sire	114
3	Clear	Yes	112
4	Clear	Sire	103
5	Clear	Sire	102
6	NT821 Carrier	Yes	101
7	Clear	Yes	99
8	Clear	Yes	94

FIGURE 2.

Veld Bull Tests (Figure 2) are important in identifying the animals that do well on grass. Mount Olive Genetics have been testing bulls for growth on the veld since 2009. Once the "Economic Index" comes into play there is a shuffle in the ranking sequence of the bulls. Replacement bulls that do well on grass should produce replacement heifers that in turn become producing cows with low maintenance requirements. European based breeds that do well on the veld generally do well in the feedlots also, while the contrary is not necessarily true.

Physical: Visual Selection	DNA Myostatin Status	Pedigree Parentage Verified	Economic Index: Veldbull Test Results Pelvic / Muscle Measurements	EBV'S	(Accuracy dependant on correct parentage)					
				Birth Weight	200 Day Weight	400 Day Weight	600 Day Weight	Milk	Scrotum Size	Raw Scrotum Size
				1.3	12	18	24	3	0.3	
1	Clear	Yes	120	1.5	17	23	33	3	1.3	38cm
				74%	64%	58%	65%	35%	68%	
2	Clear	Sire	114	1.5	15	25	30	-	1.9	40cm
				74%	63%	58%	65%		68%	
3	Clear	Yes	112	1.6	13	20	27	-	-	36cm
				72%	54%	49%	50%			
4	Clear	Sire	103	0.8	7	10	11		0.3	34cm
				74%	57%	51%	59%		57%	
5	Clear	Sire	102	-0.6	19	22	29	7	-0.4	33cm
				76%	67%	63%	68%	43%	68%	
6	NT821 Carrier	Yes	101	-1.7	6	12	14	-	0.4	34cm
				71%	60%	54%	62%	-	67%	
7	Clear	Yes	99	3.2	19	27	38	-	-0.1	33cm
				74%	61%	54%	63%	-	66%	
8	Clear	Yes	94							34cm

FIGURE 3.

In the next step, the usual EBV's (Figure 3) came into play, resulting in a further shuffle in the ranking sequence of the bulls. This ranking is of course dictated by the traits of choice by Mount Olive Genetics. Each breeder will have his own set of criteria which he is searching for in a bull. For the purposes of this exercise we were in search of an acceptable BW, above average growth and scrotal size. It should be noted that EBV's are only as accurate as the quality of the data collection from many animals and over a long period of time (it is a numbers game).

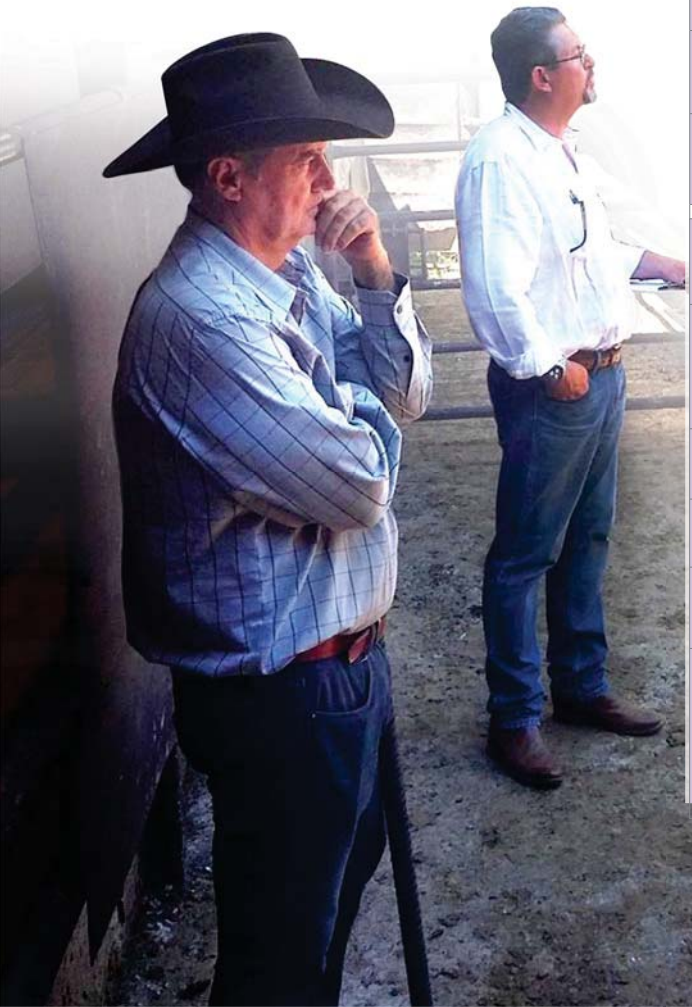
The verification of parentage further increases the reliability of the EBV's. It is understandable that using the wrong parent would obviously bring the wrong family data into play. It is also dangerous to select on raw data as the last columns clearly indicate. Physical (raw) scrotal measurement may be the same for 2 bulls, but can result in a very different EBV (heritability probability) for each of them

FIGURE 4.

2015 Bull Evaluation Sheet (Ranking 1 - 8):

No.	Physical	DNA	Pedigree	Economic Index	EBV'S							Carcass Traits:					
	Visual Selection	Myostatin Status	Parentage Verified	Veldbull Test Results Pelvic / Muscle Measurements	(Accuracy dependant on correct parentage)							Raw EMA	EMA (Eye Muscle Area)	Rib Fat	Rump Fat	Retail Yield	IMF Intramuscular (Fat)
					Birth Weight	200 Day Weight	400 Day Weight	600 Day Weight	Milk	Scrotum Size	Raw Scrotum Size						
					1.3	12	18	24	3	0.3			0.1	-01	0.0	0.2	0.0
1	DD1537	Clear	Yes	120	1.5	17	23	33	3	1.3	38cm	66cm²	1.1	0.5	0.7	0.4	0.1
					74%	64%	58%	65%	35%	68%			32%	39%	39%	30%	27%
2	DD1542	Clear	Sire	114	1.5	15	25	30	-	1.9	40cm	69cm²	0.0	0.1	0.2	0.3	-0.3
					74%	63%	58%	65%		68%			39%	48%	48%	38%	35%
3	DD158	Clear	Yes	112	1.6	13	20	27	-	-	36cm	74cm²	1.6	-0.2	-0.2	0.9	-0.4
					72%	54%	49%	50%					34%	42%	42%	32%	29%
4	DD1563	Clear	Sire	103	0.8	7	10	11	-	0.3	34cm	63cm²	0.2	-1.0	-1.2	0.9	-0.5
					74%	57%	51%	59%	-	57%			38%	45%	45%	36%	33%
5	FG1556	Clear	Sire	102	- 0.6	19	22	29	7	-0.4	33cm	63cm²	-0.3	0.2	0.4	0.1	0.0
					76%	67%	63%	68%	43%	68%			38%	47%	47%	37%	34%
6	DD1564	NT821 Carrier	Yes	101	-1.7	6	12	14	-	0.4	34cm	64cm²	-0.6	-1.7	-2.1	0.8	0.0
					71%	60%	54%	62%		67%			36%	44%	44%	34%	30%
7	DD159	Clear	Yes	99	3.2	19	27	38	-	-0.1	33cm	76cm²	-	-	-	-	-
					74%	61%	54%	63%		66%							
8	DD1582	Clear	Yes	94							34cm	68cm²					

In this herd measuring the carcass traits of all long-weaner bulls and heifers date back to 2011. The balance between EMA (Eye-muscle Area), IMF (Intra-muscular Fat), Rump Fat and Rib Fat were aimed for. Retail Yield (Carcass bone/meat ratio) is a factor to consider for future de-boning plants. Once the carcass trait EBV's (Figure 4) are revealed; the picture changes once more with a shuffle in sequence. Again one should be cautious of raw EMA data as is revealed when comparing the EBV's of the two bulls measuring 63cm^3. With all the layers peeled away one has the full picture. Bull No.7 would probably be the bull best suited to fulfill the criteria as set out for this herd; while the picture of Bull No.1 fades as we find out more about him. Many buyers make the mistake of choosing their bulls based on physical attributes (raw data) only, and then later wonder why the beefy bull they bought, at huge expense, can't breed the calves they were expecting. This exercise hopefully explains the WHY!



AI CATALOGUE

DAKAR
VL1142

WELL BALANCED

IDEAL SHEATH

PEDIGREE:

CX CHIEF ADVANCE 143/L
CX HOME RUN 135F/K
MS HS 135F/K
SMITH-BRANG SB 09 438
DELTAQUE 00 495
SMITH-BRANG SA 05 134
V5 9860 MOTIVATOR
LABOR 11 42 DAKAR
KATRUMA PC 106 93
DELTAQUE 98 291
DELTAQUE 96 153 QUEEN
SMITH-BRANG SB 09 527
T-X BEN 00 33
SMITH BRANGUS 04 35
ISAWIL CM 97 60

MARCH 2017 • SOUTH AFRICAN BRANGUS GROUP BREEDPLAN EBVS

	Gestation Length (days)	Birth Wt. (kg)	200 Day Wt. (kg)	400 Day Wt. (kg)	600 Day Wt. (kg)	Mat Day Wt. (kg)	Milk (kg)	Scrotal Size (cm)	Days To Calving (days)	Carcase Wt. (kg)	Eye Muscle Area (sq cm)	Rib Fat (mm)	Rump Fat (mm)	Retail Beef Yield (%)	IMF %
EBV	-	-1.4	+11	+17	+18	-	+2	-	-	-	-	-	-	-	-
Acc		76 %	74 %	66 %	65 %	-	44%	-	-	-	-	-	-	-	-
BREED AVG. EBVS FOR 2012 BORN CALVES															
EBV	-0.5	+1.3	+12	+18	+24	+26	+3	+0.3	-0.9	+14	+0.1	-0.1	+0.0	+0.2	+0.0

Traits Observed: BTW, 200WT, 400WT, 600WT * Statistics: Number of Herds: 2, Progeny Analysed: 18

HAMMER
P 124

Well balanced

Medium Frame

Ideal sheath

Structurally very correct

Descendant of Sundance

PEDIGREE:

MR CENTER RANCH 55 J2
FERTILITAS 04 53
BAUMEISTER BM 97 15
FERTILITAS 06 102
ELANDSPRUIT 97 03
ELANDSPRUIT 00 210
LETUKA SC 92 61
PRESTIGE P 12 004
SUNDANCE OF BRINKS 392G9
SUNDANCE
BULLBRAN K27 99 ELF
AVENANT A 08 25 S
STERKSPOOR 03 711
AVENANT A 06 S0 S
AVENANT A 02 611

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	Gestation Length (days)	Birth Wt. (kg)	200 Day Wt. (kg)	400 Day Wt. (kg)	600 Day Wt. (kg)	Mat Day Wt. (kg)	Milk (kg)	Scrotal Size (cm)	Days To Calving (days)	Carcase Wt. (kg)	Eye Muscle Area (sq cm)	Rib Fat (mm)	Rump Fat (mm)	Retail Beef Yield (%)	IMF %
EBV	-	-0.7	+ 9	+ 11	+ 11	-	+5	-	-	-	-	-	-	-	-
Acc		74 %	73 %	63 %	64 %	-	41%	-	-	-	-	-	-	-	-
BREED AVG. EBVS FOR 2012 BORN CALVES															
EBV	-0.5	+1.3	+12	+18	+24	+26	+3	+0.3	-0.9	+14	+0.1	-0.1	+0.0	+0.2	+0.0

Traits Observed: BWT,200WT, 600WT (x2) * Statistics: Number of Herds: 3, Progeny Analysed: 15

CRV

XSEED

BETTER COWS | BETTER LIFE
WWW.XSEED.CO.ZA

WE'VE GOT YOUR GENETIC NEEDS COVERED

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- E-mail: roy@xseed.co.za

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- Cell: 082 281 0629
- E-mail: admin@xseed.co.za

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  nkuna.joel@gmail.com

BILLY BOY

RCM 12 37

Excellent constitution • Excellent depth • Exceptional width Good walking ability • Combination of good figures and body length • Only AI sire from Sonny Bill bloodline

PEDIGREE:

DELTAQUE 00495
SMITH-BRANG SB 05145
MAIZE VALLEY MV 2098 F3
ROECHAMA SONNY BILL 0834
ROECHAMA 99131
ROECHAMA 0563

ROECHAMA 0180
ROECHAMA 12 37 BILLY BOY
ROECHAMA 9630
ROECHAMA 99131
ROECHAMA RCM 9521
ROECHAMA 07 14
ROECHAMA 9610
ROECHAMA 0162
ROECHAMA RCM 9113

MARCH 2017 • SOUTH AFRICAN BRANGUS GROUP BREEDPLAN EBVS

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EBV	-	+0.6	+15	+19	+27	+30	+2	-	-	-	-	-	-	-	-
Acc		93 %	86 %	74 %	75 %	61 %	48%	-	-	-	-	-	-	-	-
BREED AVG. EBVS FOR 2012 BORN CALVES															
EBV	-0.5	+1.3	+12	+18	+24	+26	+3	+0.3	-0.9	+14	+0.1	-0.1	+0.0	+0.2	+0.0

Traits Observed: BTW, 200WT * Statistics: Number of Herds: 7, Progeny Analysed 111

APOLLO

BM11159

Excellent constitution • Combination of good figures and body length
Trait leader 200, 400, en 600WT • Broad Calves

PEDIGREE:

CR COPPER 9T6/9
EL-CID 52/U5
MISS 4-J 52/2
BAUMEISTER 08 136 VOORBLAD
KATRUMA PC3787
HARMONY HA98385

HARMONY 92213
BAUMEISTER BM11159
DELTAQUE 01590
STERKSPOOR 04723 STRETCHER
STERKSPOOR 02580
BAUMEISTER BM07161
ELANDSPRUIT 00511
ROSE 0460
ROSEWALL 0142

MARCH 2017 • SOUTH AFRICAN BRANGUS GROUP BREEDPLAN EBVS

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EBV	-	+4.7	+20	+31	+47	+45	0	+0.6	-	+22	-	-	-	-	-
Acc		92 %	86 %	79 %	79 %	64 %	42%	70%	-	63 %	-	-	-	-	-
BREED AVG. EBVS FOR 2012 BORN CALVES															
EBV	-0.5	+1.3	+12	+18	+24	+26	+3	+0.3	-0.9	+14	+0.1	-0.1	+0.0	+0.2	+0.0

Traits Observed: BWT, 200WT, 400WT, 600WT, SS * Statistics: Number of Herds: 3, Progeny Analysed 71

TARZAN

NVW 12303

Excellent Constitution • Combination of good figures and body lenght • Medium frame bull

PEDIGREE:

STERKSPOOR 00438 POPEYE
STERKSPOOR L05808
L 96222
LABRAN 0942
LABRAN 0021

WYKING NVW 12303
T-X 98 73
LABRAN 0260
LABRAN J 17
WYKING 05303
WYKING 0341

MARCH 2017 • SOUTH AFRICAN BRANGUS GROUP BREEDPLAN EBVS

	Gestation Length (days)	Birth Wt. (kg)	200 Day Wt. (kg)	400 Day Wt. (kg)	600 Day Wt. (kg)	Mat Day Wt. (kg)	Milk (kg)	Scrotal Size (cm)	Days To Calving (days)	Carcase Wt. (kg)	Eye Muscle Area (sq cm)	Rib Fat (mm)	Rump Fat (mm)	Retail Beef Yield (%)	IMF %
EBV	-	-1.1	+17	+23	+28	-	-	-	-	-	-	-	-	-	-
Acc	-	86 %	74 %	62 %	64%	-	-	-	-	-	-	-	-	-	-
BREED AVG. EBVS FOR 2012 BORN CALVES															
EBV	-0.5	+1.3	+12	+18	+24	+26	+3	+0.3	-0.9	+14	+0.1	-0.1	+0.0	+0.2	+0.0

Traits Observed: BTW, 200WT, 400WT, 600WT * Statistics: Number of Herds: 2, Progeny Analysed: 18

EPIGENETICS

ANOTHER KEY TO THE EQUATION

Epigenetics, meaning "above" genetics, is referring to the changes in the way in which the genes are "read" for the synthesis of specific proteins to express the phenotype. Epigenetics can become a very important part of our selection process but the determining factors as well as the implications of environmental and nutritional epigenetics are not taken into account in modern selection methods. The environment has a very large effect on phenotypic alterations without altering the DNA itself, as well as causative effects of various genetic diseases. Epigenetic changes can happen due to any amount of exposure as well as exposure at certain stages of development. Epigenetics should become an integral part of our selection process, especially in the changing environment in which we produce livestock in today, embracing epigenetics, as a part of your selection process will benefit you as farmer in terms of productivity as well as economically feasible production. The phenotype of an individual is a result of genotype and environmental interaction. This is a combination of the physical appearance of the individual and its behaviour. This means that strict selection for a specific trait in one environment may differ from another environment. Conventional breeding techniques overlooked the importance of epigenetics. Although most of the mechanisms of epigenetic inheritance are yet to be known; some inheritance patterns are easier to understand when considering the epigenetic changes that may occur.

HANRI VD MERWE & EDWIN HILL

Finale Jaar studente
B.Sc. Agric, UFS en Brangus SA Teg

THE ENVIRONMENT AND EPIGENETIC CHANGES

In the current economic condition farming successfully without expanding your enterprises is nearly impossible, this means that we have cattle and other livestock on the same farm as commercial crop production, this leads to prolonged exposure to pesticides that is one of the main causes for epigenetic transgenerational changes (Feeney & Nilsson et al., 2014) mistakes like exposure of animals to toxins or chemicals, even if unintentionally, can influence the future of your herd. Because of the radical environmental changes that are happening today we need to start to shift from selecting animals simply based on visual inspection of the animals. We cannot risk including animals in our studs or even in our commercial herds and frankly investing an enormous amount of money in these animals for them to produce underachieving offspring. This emphasises the great importance of DNA testing of as many animals as possible. The completeness of the genome of a breed and domestic species, in general, is an integral part of improving breeding methods. Environmental epigenetics play an important part in the regulation of phenotypic expression as well as the cause of some diseases. The ability of the environment as well as exposure to certain stimuli at early stages of development to alter the cells of living organisms as well as the underlining development means that it has a large influence on how certain illnesses are caused. Where the environment has a permanent effect on the germ line (cells decedent from earlier cells) it can create big problems in selecting against certain illnesses and phenotypes. The greater part of environmental factors that affect the epigenome (chemicals that tell the gene what to do) cannot affect the actual DNA sequence, but can cause illnesses as well as phenotypic alterations. This confirms that it will have an important role to play in the future of etiology and genetics (Skinner, 2011)

We need to be able to select for epigenetic vulnerability just as easily as we select for any other performance trait and to do so we must first understand the molecular basis of how epigenetic changes can influence the phenotypic expression of our animals. Changes that occur due to epigenetic processes can happen due to direct exposure to a specific environment during critical stages of development of an organism. Successive generations that are not exposed to the same environment can also be affected due to epigenetic transgenerational inheritance (Skinner, 2011), meaning that it can have an effect on successive generations. Most importantly it is necessary to understand that the epigenetic pattern is formed during development, irrelevant of which stage of development, to form the different programs of gene expression in different cell types. The environment can take effect on your herd quickly or slowly depending on the generation interval, the type of exposure as well as the age of exposure.

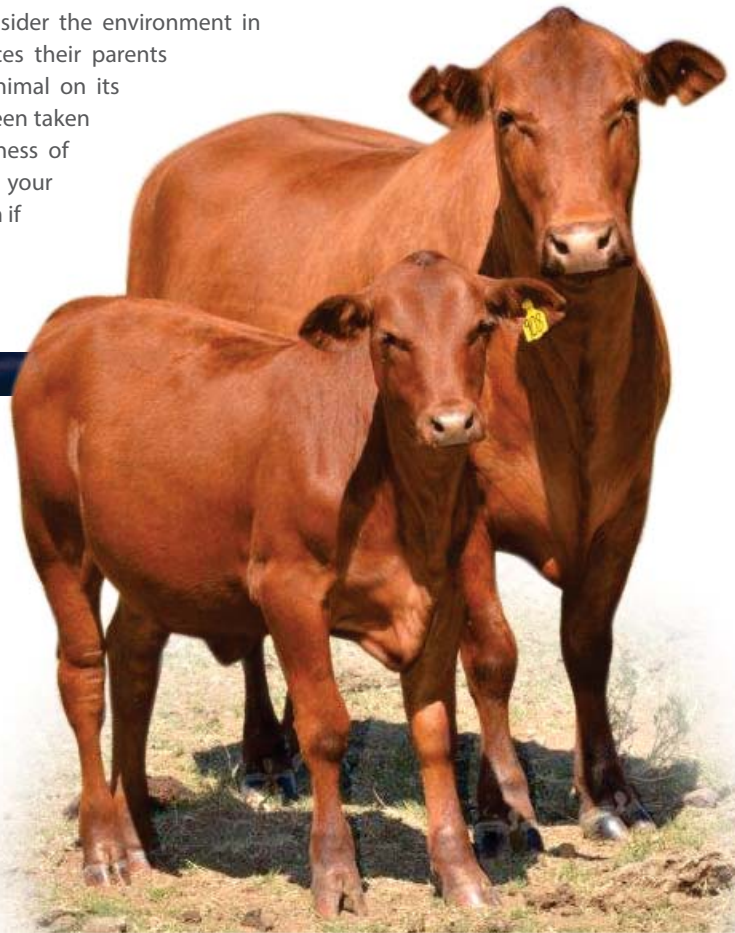
The largest impact on transgenerational changes are exposures that occurred during mid-gestation as found by Cropley & Suter in a study of coat colour of agouti mice. It can create germ line mutations causing a permanent change in the expression of performance traits and can sometimes lead to the culling of a great percentage of herds because the effect is sometimes irreversible through other traditional breeding methods, but epigenetic modifications are not limited to early stages of development. Although DNA sequences are fairly fixed epigenetic changes can occur throughout an animals' lifetime (Reik & Dean et al., 2001). So we need to take care that exposure of potentially phenotypic altering environments is avoided throughout an animals' lifetime and not only during critical development stages.

MATERNAL NUTRITION

Maternal nutrition during critical stages of gestation is considered a major environmental influence resulting in epigenetic changes. In some experiments it was found the both under nutrition and over nutrition resulted in long-term effects in the progeny. The maternal diet resulted in a delay of postnatal growth and an increase in blood pressure of the offspring. When a restriction in the protein content of the maternal diet occurred; it resulted in decreased birth weight, kidney disorders and higher than the normal blood pressure of offspring. Postnatal effects of maternal nutrition regarding growth rates, reproduction and productivity could have important consequences in the livestock industry. There is evidence that suggests maternal nutrient intake can alter skeletal muscle development, growth, and energy metabolism in the early postpartum life of livestock species. Epigenetic alterations due to the maternal diet can have a huge effect in the selection process. When using traditional selection methods it is easy to discriminate against certain animals due to their individual performance. A poorly managed herd can result in a reduction in birth weight and overall performance. Comparing results of other incidents of epigenetic changes to animal breeding it may be possible that when females are experiencing a drought when food are scares and the nutrient value of the field are low, they may produce offspring (F1) with reduced performance. It is possible that the epigenetic alterations that occurred in the F1 generation may be passed on with transgenerational inheritance resulting in a reduction in the birth weight of their offspring (F2). The nutritional and behavioural influence on the epigenome of an animal is very important when starting to select for epigenetically compromised animals. The effects of epigenetics are not limited to factors outside the breeder's control the diet of animals can have an effect on their immediate progeny and therefore further offspring (Wolff & Kodell et al., 1998).

CONCLUSION

Discrimination usually occurs due to the breeder's negligence to consider the environment in which those animals were previously kept and even the circumstances their parents had to endure. It is irrational to discriminate against an individual animal on its performance if the maternal and paternal epigenetic effects have not been taken into account. Proper management of a herd, this includes completeness of records, will ensure maximum productivity. Embracing epigenetics in your selection process will be beneficial to your herd and its productivity even if you do not alter the environment to do so. There is no need to dismiss all traditional breeding methods; we just need to add another variable to the equation.



REFERENCES

Feeney A, Nilsson E, Skinner MK, 2014. Epigenetics and transgenerational inheritance in domesticated farm animals. journal of Animal Science and Biotechnology.

Skinner MK, 2011. Environmental epigenetic transgenerational inheritance and somatic mitotic stability. Epigenetics, pp. 6:7 838-842

Reik W, Dean W, Walter J, 2001. Epigenetic reprogramming in mammalian development. Science, pp. 293(5532): 1089-93.

Wolff GL, Kodell RL, Moore SR, Cooney CA, 1998. Maternal epigenetics and methyl supplements affect agouti gene expression in Avy/a mice. FASEB J, pp. 12:949-957

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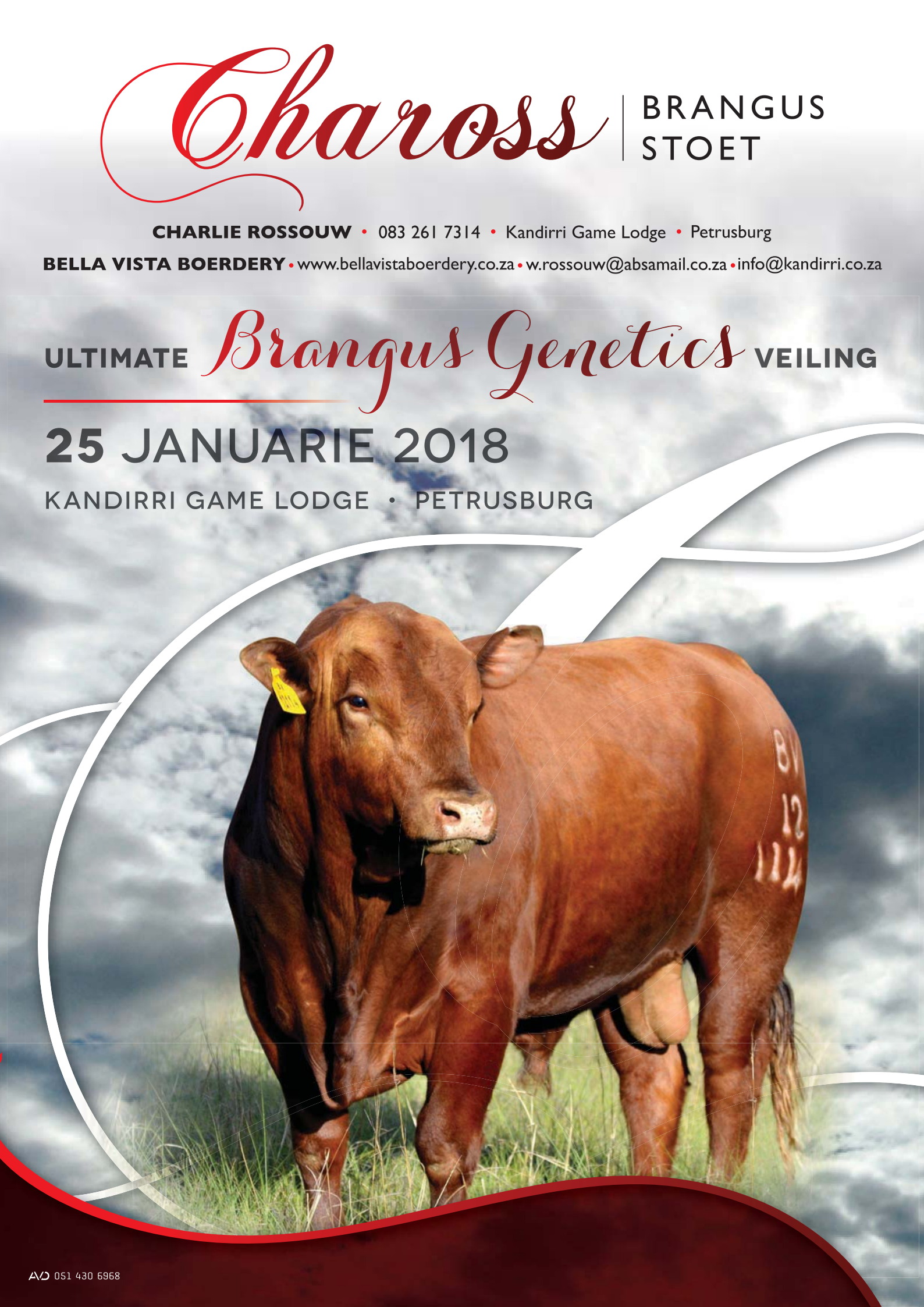

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FACTORS AFFECTING THE PRODUCTION AND REPRODUCTION PERFORMANCE OF TROPICALLY ADAPTED BEEF CATTLE IN SOUTHERN AFRICA

EXTRACTS FROM A STUDY BY DR GLEN TAYLOR FOR HIS PH.D. STUDY (UP 2006)

Dr Glen Taylor is currently the Senior Director: Research at the University of the Free State and manages research, innovation, contracts and business development for the University. He holds a PhD in Animal Science which he received with academic colours from the University of Pretoria. He is driven by the vision that entrepreneurial activities and the commercialisation of institutional IP at academic institutions needs to be cultivated. Dr Taylor has supervised numerous postgraduate students and published extensively in the field of Animal Science. He continues to supervise students at PhD level in the Business School.

The purpose of this study was to critically evaluate factors that influence the production and reproduction of beef cattle, managed extensively on natural pasture in the sub-tropical region of Southern Africa. The thesis is divided into several sections:

SUMMARY

In the **FIRST STUDY,** non-genetic influences on pre- and post-weaning growth traits of a tropically adapted beef breed in the arid sub-tropical environment of Southern Africa were investigated. Production data of Santa Gertrudis cattle for a ten-year period were analysed. The herds were managed extensively under harsh arid environmental conditions in the northern thornveld region of Namibia. The cattle were divided into summer and winter breeding seasons, which were limited to 90 days for each group. The effect of sex, herd, season, calf birth year and cow parity group on birth weight, pre-weaning average daily gain, weaning weight, yearling weight, eighteen month weight and post-weaning growth rate were analysed.

Sex was a highly significant source of variation for birth weight, weaning weight, 12 month weight, 18 month weight and significantly influenced pre and post-weaning weight gain. Bull calves were much heavier than the heifer calves at birth, weaning, yearling and eighteen months respectively and grew faster by 0.07 kg/day from birth to weaning and 0.65 kg/day from weaning to 12 months of age. The effect of season on birth weight, weaning weight, 18-month weight and pre-weaning growth rate was highly significant. Calves born in the summer season had a lower birth weight compared to calves born in the winter season. However, the summer season calves were heavier by 17.67 kg at weaning but only by 1.7 kg at 12 months of age. They grew faster by 0.16 kg/day from birth to weaning. Calf birth year significantly influenced all traits measured with no fixed trend over time for the traits. Herd effects were highly significant for birth weight and 12-month weights and significantly influenced weaning weight, 18-month weight and growth rate from weaning to 12 months of age. The effect of cow parity was not significant on birth weight, 12-month weights, 18-month weights and post-weaning growth rates, but was significant for weaning weight and pre-weaning growth rates.

SEX, HERD, SEASON OF CALVING, CALF BIRTH YEAR AND HERD X SEASON X CALF BIRTH YEAR SIGNIFICANTLY INFLUENCED GROWTH TRAITS AND SHOULD BE TAKEN INTO CONSIDERATION WHEN EVALUATING THE GENETIC MERIT OF CATTLE DURING SELECTION.

The **SECOND STUDY** was conducted to determine the associations between lifetime cow fertility and cow frame size, also between lifetime cow fertility and pre-weaning as well as post-weaning calf growth in tropically adapted cattle. A total of 2 506 Santa Gertrudis cows were divided according to their average lifetime calving interval (CI) into short calving interval (SCI, < 400 days, n = 914 cows) and long calving interval (LCI, > 400 days, n = 1 592 cows) groups. Calves were weighed at weaning at approximately 7 months of age. Hip height of cows and pre-weaning gain of calves of the SCI cows (135 cm and 1.01 kg/day) were significantly ($p < 0.05$) lower than those of the LCI cows (141 cm and 1.25 kg/day). Calves from SCI cows were born significantly earlier in the calving season than calves from LCI cows as measured by age at weaning (221 versus 189 days). As a result of compensatory growth there was no significant difference for yearling weight between progeny of SCI and LCI cows (348 kg versus 349 kg).

IT IS CONCLUDED THAT SCI COWS ARE SMALLER IN SIZE, WITH SIGNIFICANTLY LIGHTER CALVES AT WEANING. A NEGATIVE CORRELATION EXISTS BETWEEN FERTILITY AND PRE-WEANING CALF GROWTH. HIGH POST-WEANING CALF GROWTH IS COMPATIBLE WITH HIGH COW FERTILITY.

In the THIRD STUDY, the effects of heifer frame size (FS) on their subsequent performance and the pre-weaning growth of their calves were evaluated using records collected from 1989 to 1998 from the Waterburg Estates at Otjiwarongo, Namibia. Based on hip height at 18 months of age, heifers were assigned to three different frame size (FS) groups: small (< 124 cm), medium (125 to 135 cm), or large (>136 cm).

Calving rate (CR), calving date (CD), calf survival rate (CSR), reproductive efficiency (SANDEX), weaning rate (WR), birth weight (BW), weaning weight (WWT), pre-weaning ADG (P-ADG), and kilograms of calf produced per cow bred (KCB) were collected from first –(n = 830), second (n = 623) and third and greater-parity (n = 571) cows. Frame size of heifers significantly influenced their calving rate as second-parity cows with small and medium FS cows having higher CR than large FS cows. In spite of heavy culling of cows that had large FS as heifers, calving rates of second parity cows in this category were 41% less than that of second parity cows that had small and medium FS as heifers. In third or greater-parity cows, CR was greater for small FS than for medium and large FS. CSR was similar for heifers with a small, medium and large FS for the first, second and third and greater parity groups. Weaning rates of large FS (34.2 ± 11.27), second-parity cows were less than those of small (82.9 ± 5.58) and medium (79.0 ± 4.67) FS animals. Among all parity groups, BW of calves born to large FS were significantly higher than those of small and medium FS cows. Calves weaned by small FS animals as first parity cows, had lower WWT than those weaned by medium and larger FS, but large FS weaned heavier calves than small and medium FS in the third and greater-parity group. In first parity cows, calves of large FS had greater P-ADG than those from small FS, but in second parity cows the calves from medium FS out performed those of small and large FS, while calves from third and greater parity cows of medium and larger FS had greater P-ADG than cows with a small FS. Male calves were heavier at birth, at weaning and grew faster (P-ADG) than their female counterparts. KCB was similar among small and medium FS cows, but both tended to be greater than KCB of large FS cows and as second parity cows the small and medium FS cows had an even greater advantage over the large FS animals. Small and medium FS females calved earlier, and had greater calving rates and weaning rates, as well as greater kilogram of calf produced per cow exposed than the large FS females. The performance (fertility and the growth performance of their calves to weaning) traits of the large FS were generally similar to those of smaller cows in the third and greater parity group. The reproductive efficiency (SANDEX) of large FS at first, second, third and greater parity were lower compared to the small and medium FS, due to the later calving dates.

THEREFORE, SELECTING CATTLE FOR THE HOT AND DRY CLIMATIC REGIONS OF SOUTHERN AFRICA, UNDER EXTENSIVE MANAGEMENT CONDITIONS AND WITH LIMITED SUPPLEMENTARY FEEDING, THE RECOMMENDED COW FRAME SIZE SHOULD BE A MEDIUM FRAME. THESE ANIMALS HAVE SIMILAR LEVELS OF FERTILITY COMPARED TO SMALL FRAMED COWS, BUT WITH SIMILAR OR EVEN BETTER GROWTH PERFORMANCES THAN LARGE FRAMED COWS.

In the **FOURTH STUDY,** the objective was to determine the effect of traits such asage, sex, body weight, body length and height, body condition score (BCS),coat score (CS), skin thickness and average skin surface temperature on tick burdens of a tropically adapted beef breed. Measurements were taken for a period ofeight months from April to December. All animals were managed extensivelyon natural and cultivated. Female animals had significantly greater tick infestation compared to male animals . Age was a significant factor with the younger animals below two years having more ticks than those of two years and older . A significant negative correlation was reported between the infestation of ticks on the animals and the age of the animal. Animals with an average body weight below 250kg had 42% more ticks compared to animals with a body weight above 250kg. Age of the animal and weight were highly correlated while the correlation between the number of ticks per cow and the mean weight was negatively correlated. Skin surface temperature significantly influenced tick infestation on the animals . The degree of infestation increased as body surface temperature exceeded 30° Celsius. Coat score, skin thickness, body condition score and inter calving period did not significantly influence tick infestation on the animals. The infestation of ticks on the animals was significantly influenced by body height and body . Animals smaller than a 130cm in height had a significantly greater tick infestation compared to animals taller than 130cm .This trend was also observed for body length. Animals with a body length shorter than 145cm had a greater average tick infestation compared to animals longer than 145cm, indicating a 44% greater tick infestation for the shorter animals.

THE SELECTION OF CATTLE FOR ADAPTABILITY AND THUS INCREASED PRODUCTION UNDER TROPICAL CONDITIONS, THROUGH RESISTANCE TO TICKS SHOULD BE FOR ANIMALS OF MEDIUM FRAME SIZES HAVING SMOOTHER COATS THAT ARE ABLE TO DISSIPATE HEAT EFFECTIVELY.

In the **FIFTH STUDY,** the relationship between growth parameters, scrotal circumference and sheath area in tropically adapted beef bulls was investigated. The relationship between growth parameters such as initial weight at the start of the trial, average daily gain for the trial period (ADG), average daily gain per day of age (ADA), feed conversion ratio (FCR), final weight at the end of the trial, scrotal circumference (SC) and age and sheath area in Santa Gertrudis bulls were examined. To investigate the relationship between growth parameters and scrotal circumference, growth test data of 97 on-station performance tested bulls were used while growth results of 55 bulls tested under semi-intensive conditions were used to investigate the relationship of sheath area with growth performance. Bulls were divided into two groups according to their average sheath area (470 cm2). 28 Bulls were assigned to the small sheath group (SSA) below 470 cm2 while 27 bulls were assigned to the large sheath group (LSA) above 470 cm2. The LSA group possessed a 15% (66 kg) heavier final weight than that of the SSA group. The LSA group had a 64% (241 cm2) larger sheath area (378 ± 60 vs 619 ± 161 cm2) than the SSA group. A significant phenotypic correlation between ADG (r = 0.31) and sheath area was found. The correlations between sheath area and initial weight (r = 0.42,) and between sheath area and final weight (r= 0.45,) were also highly significant. A highly significant correlation was observed between initial weight and SC and between final weight and SC, while significant correlations were also observed between SC and age and between SC and ADA for bulls tested intensively on station.

IT APPEARS THAT SC AND FASTER GROWTH RATE ARE COMPATIBLE IN YOUNG BULLS. IN ADDITION, GIVING CAREFUL ATTENTION TO SHEATH AREA IN BULLS, SELECTED AS YEARLINGS IS POSSIBLE WITHOUT NECESSARILY SACRIFICING GROWTH PERFORMANCE.

In the **SIXTH STUDY,** associations among growth and quantitative testicular traits of tropically adapted yearling bulls fed different dietary energy levels were investigated. High energy (HE), medium energy (ME) and low energy (LE) diets were fed to young bulls post-weaning and the subsequent effects on scrotal circumference (SC), average daily gain over an 84 day performance test trial period (ADG), average daily gain per day of age (ADA), body condition score (BCS), testicular histology and seminal traits were examined. Bulls fed the HE diet were significantly heavier and had a greater ADA, with the HE bulls (999.1 ± 7.13 g) out-performing the ME (804.1 ± 12.61g) and LE (713.2 ± 12.95 g) bulls in terms of growth rate over the duration of the experimental period. Diet influenced BCS with the HE bulls (3.9 ± 0.05) having more body fat compared to the ME (3.3 ± 0.06) and LE (3.0 ± 0.08) bulls with the same effect observed in the carcass dressing percentage of the bulls fed different levels of energy. SC did not differ significantly between HE, ME and LE fed bulls. Seminal traits, such as semen concentration were significantly lower in bulls fed the HE diet (1.3 ± 0.134) compared to those fed the ME diet (2.4 ± 0.18) and LE diet (2.6 ± 0.16). Similarly, linear movement of sperm was also affected by diet and movement was slower in bulls fed the HE diet (1.7 ± 0.30) compared to bulls fed the ME diet (2.2 ± 0.31) and LE diet (3.1 ± 0.23). The percentage total major and total minor sperm defects were also greater in the HE fed bulls (27.1 ± 6.82 and 7.4 ± 0.91% compared to 9.7 ± 1.45 and 5.5 ± 0.87% for the ME fed bulls and 5.4 ± 1.26 and 3.9 ± 6.58% for the LE fed bulls). Dietary energy level significantly influenced the percentage inactive seminiferous tubuli, with bulls fed the HE diet having 35% more seminiferous tubules classified as inactive compared to those bulls fed ME and LE diets. Scrotal fat deposits were higher in bulls fed the HE diet (243.4 ± 21.59 g) compared to those fed the ME (110.0 ± 12.1 g) and LE (88.4 ± 9.65 g) diets. Correlation coefficients between SC and growth traits were generally favourable for the different dietary treatments. Correlations between live weight and SC were 0.51, 0.45 and 0.52 for the HE, ME and LE groups respectively. A negative association was observed between BCS and progressive sperm motility in bulls fed the HE diet (r = -0.54,). The percentage major seminal defects was negatively correlated with live weight in bulls fed the LE diet (r = -0.46,) and ME diet (r = -0.40,), while this characteristic was negatively correlated with mass movement of sperm (r = -0.63;) and percentage live sperm (r = -0.60;) in HE fed bulls.

THE PRESENT RESULTS SUGGEST THAT FEEDING HE DIETS TO YOUNG BULLS INFLUENCED THEIR TESTICULAR DEVELOPMENT AND REDUCED THEIR REPRODUCTIVE POTENTIAL.

In the **SEVENTH AND LAST STUDY,** the relationship between scrotal circumference, quantitative testicular traits and growth performance in tropically adapted yearling beef bulls differing in age was investigated. The bulls were fed a high energy diet and the effect on average daily gain (ADG), average daily gain per day of age (ADA), body condition score (BCS), feed conversion efficiency (FCE), scrotal circumference (SC), seminal traits and testicular histology were examined in bulls . The high energy diet contained not less than 11 MJ ME / kg DM and 13.8% CP. Bulls were fed the HE diet from an average starting age of either 210 (YB; n = 17) or 257 days (OB; n = 17) for a total of 112 days. Despite the age difference, growth and carcass traits were similar for the bulls irrespective of starting age. Scrotal weight, scrotal skin weight and scrotal skin thickness were greater in the YB (2223.4 ± 11.68g; 576.6 ± 25.17g and 4.5 ± 0.15mm) compared to that of the older group (1010.15 ± 50.10g; 255.9 ± 13.55g and 4.0 ± 0.13mm). The weight of the epididymal / spermatic cord (WESC) was heavier in the older bulls (70.2 ± 3.53g) compared to that of the younger group (47.2 ± 3.17g) with a similar trend observed when the volume of the epididymal / spermatic cord (VESC) was measured. Scrotal fat deposition was significantly increased by initial age (YB = 1164.7 ± 102.20g vs OB = 263.5 ± 27.52g). Age of the bulls also influenced the percentage inactive seminiferous tubuli, with the young bulls having 9.7% more seminiferous tubules classified as inactive compared to the older bulls. Seminal quality showed a similar trend and was generally of a lower standard than that of the group tested at an average of 369 days of age. Semen concentration and percentage linear sperm motility were the traits most affected by age. A negative correlation was evident between BCS and testis weight (r = -0.51;), testis volume (r = -0.52;) and SC of dissected testis (r = -0.49; p = 0.042) in the young bulls. Correlation coefficients between SC and testis traits such as testis weight and testis volume were high for both the groups (YB; r = 0.87 and r = 0.87 and OB; r = 0.77 and r = 0.81). The relationship between SC and scrotal fat (r = 0.85) was highly significant only in the younger group. The results suggest that when bulls are fed a high energy diet, the age at which such feeding commences is of importance as regards their subsequent fertility. The results of this study suggest that if breeders are to place emphasis on traits that are associated with reproductive fitness such as SC which is associated with semen quality, then it is prudent that these associated traits accurately represent the desired trait. Caution should be taken when interpreting SC as an indicator of reproductive fitness in young bulls when they are fed high levels of nutrition. Although SC is positively correlated with growth, under these conditions SC generally is not an acceptable indicator of reproductive fitness as bulls on the HE diet had greater SC but were also the group of bulls for which the histological examinations showed the greatest degeneration of seminiferous tubules and associated semen quality.

THE NEGATIVE ASSOCIATION BETWEEN SC AND SEMINAL TRAITS OF BULLS FED THE HE DIET IS PROBABLY DUE TO THE DETRIMENTAL EFFECTS OF EXCESSIVE FAT DEPOSITS IN THE SCROTUM AND SCROTAL TISSUE, AFFECTING NORMAL SCROTAL THERMOREGULATION MECHANISMS. THEREFORE, IT SEEMS POSSIBLE THAT FEEDING HIGH-ENERGY DIETS TO YOUNG BEEF BULLS NOT ONLY REDUCES SPERM PRODUCTION AND SEMINAL QUALITY, BUT COULD ULTIMATELY AFFECT BULL FERTILITY PERMANENTLY

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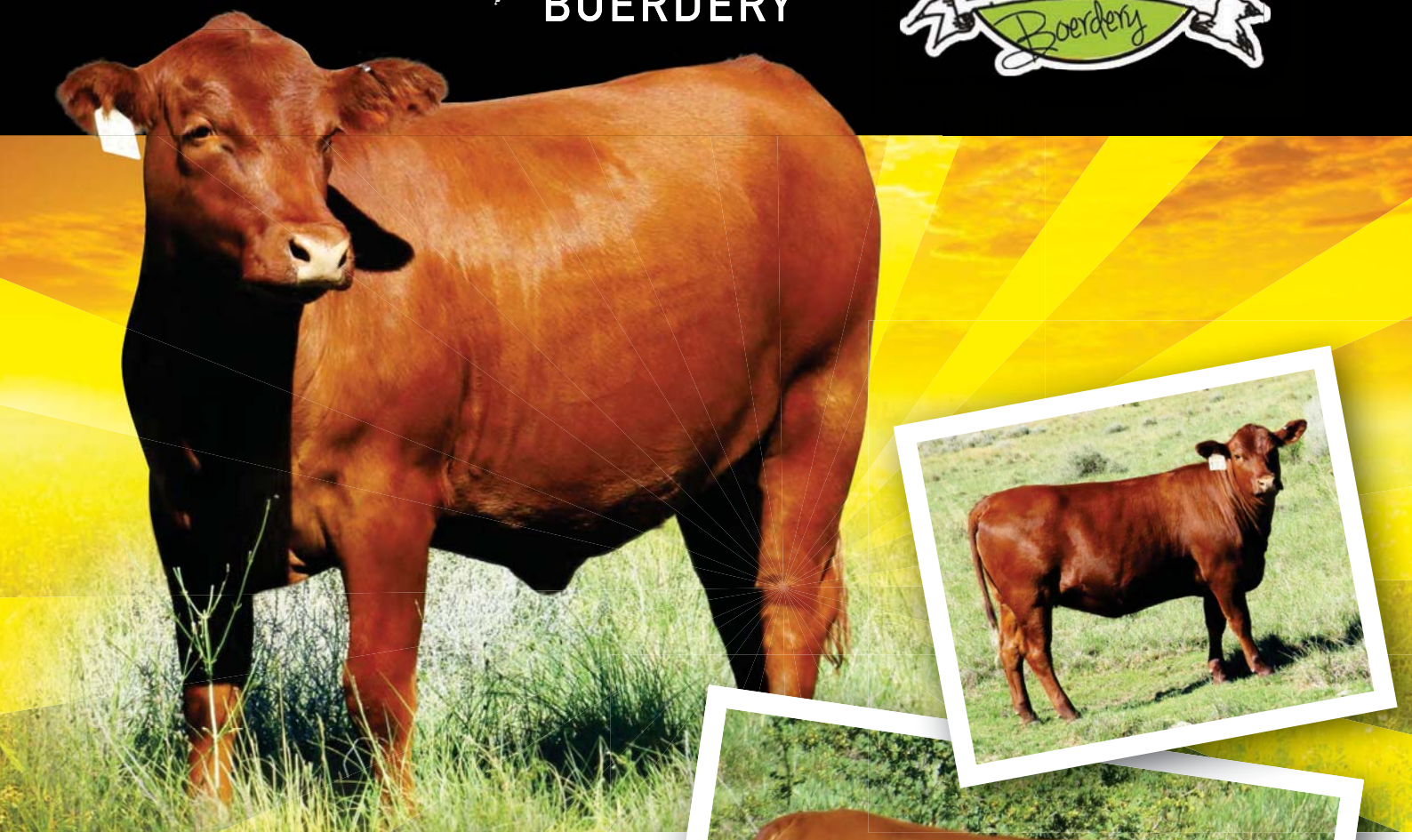

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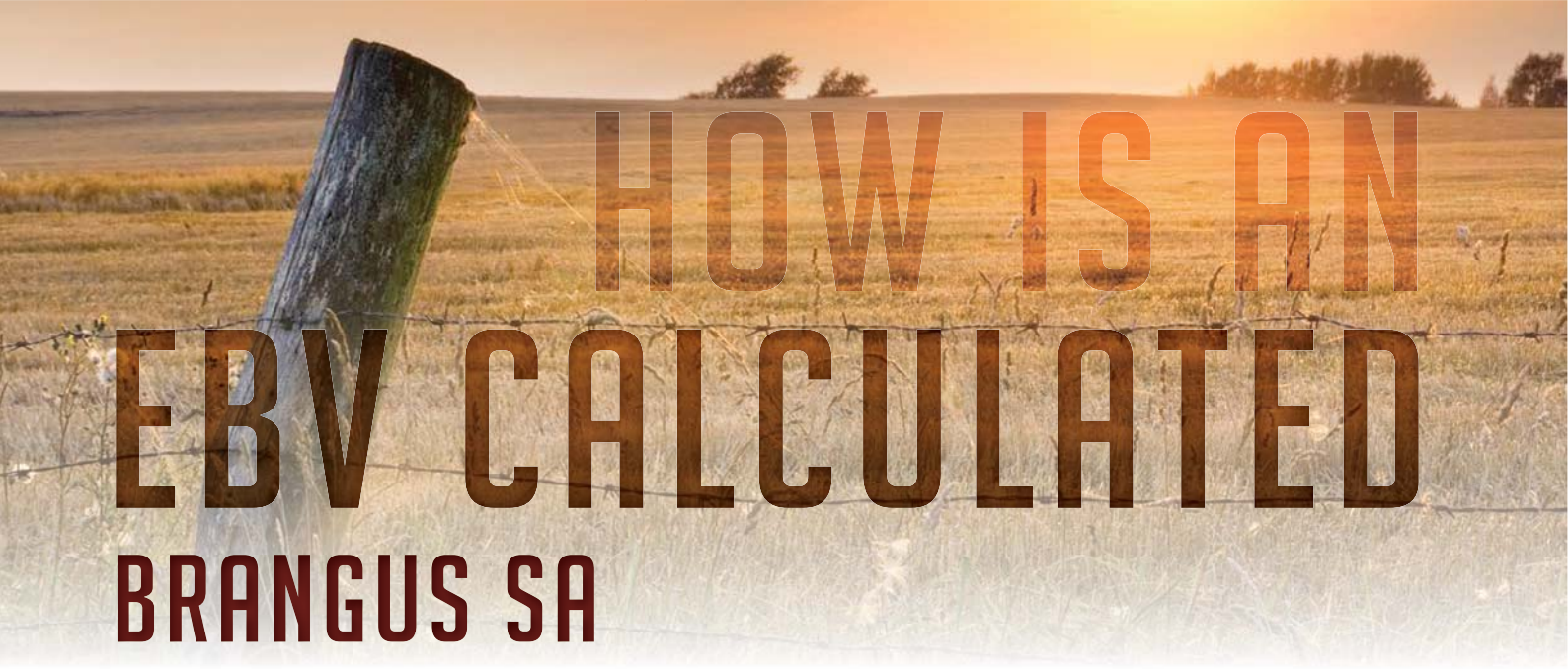
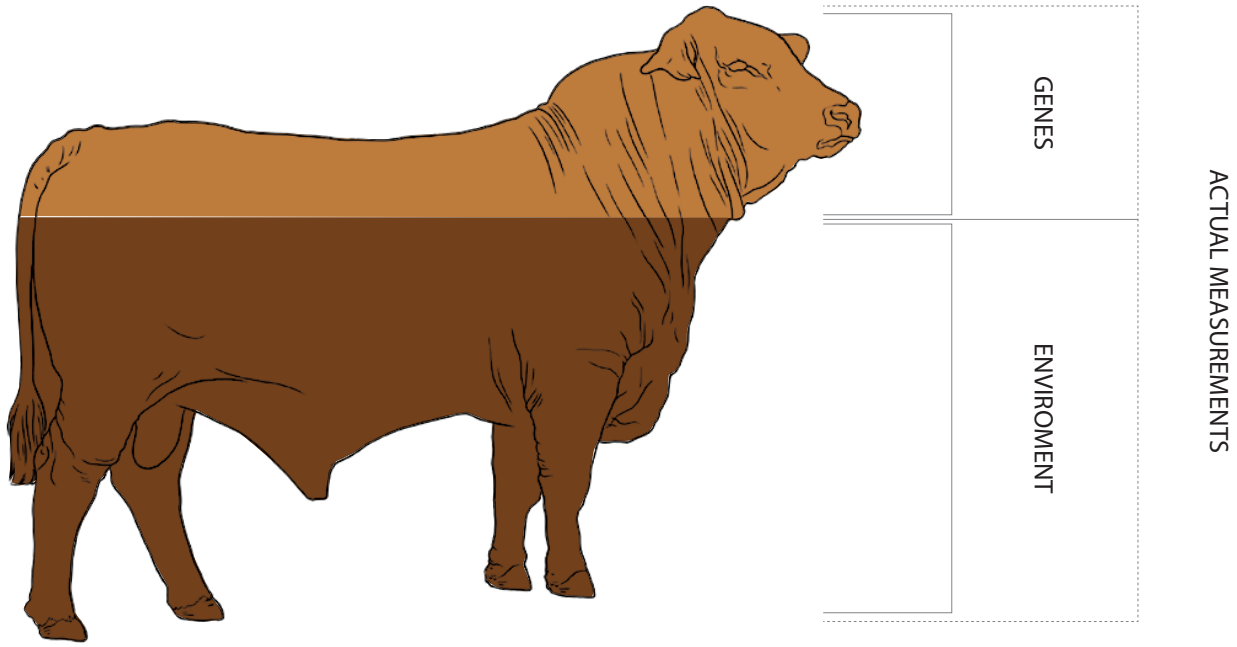


HOW IS AN EBV CALCULATED

BRANGUS SA

AN EBV

An Estimated Breeding Value is an estimate of how a a particular animal is going to perform as a parent. Parents only pass their genes onto their offspring (that is the heritable part of what you see in the parent) and not the effects of the environment. An EBV is an estimate of only the genetic part of the difference in performance between animals. The percentage of this genetic part of the difference in performance is known as the heritability or the strength of the genetic influence in a particular trait.



HERITABILITY

The total performance is the sum of gene activity and environmental effects. Heritability estimates have been determined by scientific research and are refined continuously.

A basic within-group EBV is calculated by running a group of animals , of roughly the same age and sex, together under exactly the same conditions, deemed to be the environment, for a period of time , during which the measurements are taken on each animal. These measurements will include weights at birth, 200 days, 400 days, and 600 days of age and can include scrotal circumference, pelvis opening, fat thickness, rib eye area and others.

These measurements are adjusted by the BLUP computations to put all animals in the group on the same level playing field. For example , they have to be adjusted to the same age to give a fair comparison. The average measurement for the group is then worked out, and then the amount by which each individual within the group differs from that average. This figure is then multiplied by the heritability of the trait and this gives the EBV for a particular animal and trait.

CALCULATION OF A SIMPLE WITHIN-GROUP EBV

The adjusted 400 day weight for an animal 'no 01' is 380kgs. The average for its group is 350kgs. There is no information on its relatives. The heritability for 400 day weight is say 30% or 0.3 of the measured performance difference between animals is the result of the activiites of the genes which control 400 day weight, and will be passed onto the offspring.

400 day EBV = (380kg – 350kg) x 0.3kgs
= 30kgs x 0.3kgs
= 9kgs

This is the simplest form of an EBV using information on the animals own performance. Modern genetic evaluation systems use information on relatives and the effects of related traits to make the EBV more accurate.

REFERENCES

Breedplan Manuals and How are EBV's calculated NZ Hereford Association

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BUILDING YOUR COWTOWN

PJ BUDLER

PJ Budler is a South African born cattleman, entrepreneur and marketing specialist. He is a world renown judge who has judged 31 cattle breeds on 6 continents. He has a keen eye and has a vast knowledge of cattle. He advises and consults numerous stud and commercial breeders all over the world. PJ has a fresh and energetic approach to marketing and promotes trading of genetics between countries and continents.

He is a true friend of Brangus and is a trusted figure in the global Brangus community.

He judged the World Brangus Congress Show in 2016 and more recently Brangus at Houston 2017.

He lives in Fort Worth Texas and is married to Kay Budlerw.

FARMERS ARE INDEED A SMALL REMNANT OF PEOPLE WITH A MASSIVE MANDATE…

TO FEED THE WORLD!

I'd like to paint a picture based on what I've been blessed to see and experience in 19 countries around the world as well as to illustrate how important it is for us as pre-primary producers to become even more productive, more profitable and ultimately more prosperous.

The first gate would be GENETICS.

There are many different aids to assist us in our genetic programmes. Our breed societies, performance testing schemes, leading breeders, scientists and agricultural institutions all act as helpful tools in building our knowledge as cattlemen.

My experience has been that South Africa's registered cattle fair extremely well compared to the rest of the world as far as quality, structural soundness and efficiency are concerned. Our challenge is that we have far too many breeds and a lack of belief in the power of heterosis or hybrid vigour amongst our commercial beef producers. The challenge is for our Agricultural Media and Institutions to promote cross-breeding systems that have had global success and to report in an educative way to the industry what heterosis is, how to utilise it and to stress that re-inventing the wheel is archaic, following fads is a waste of time and that many of our existing breeds are 1 to 4 century old institutions which have proven to be fool-proof when used in structured cross-breeding programmes. In Argentina, for example, there are 50-60 million cattle. Their entire beef industry runs on 6 breeds… why do we then need 45 breeds for our 10 million cattle? They also fully understand the roles each breed needs to play… whether a bull is bred to be a terminal sire, a heat tolerant, tick resistant sire or an animal more suited to the temperate areas. Climatically, Argentina is very similar to South Africa. Scientifically, what works there ought to work here too. Phenotype, Pedigree, Performance and Breeding Values are four tools that can assist us in making the right genetic selections… history has shown that a bias towards any of these four can be dangerous… however using them proportionately can achieve rapid progress. Us as cattle producers can learn so much from the chicken and pig industries. By using science and logic these industries have created a uniform product that when produced under proven selection and management systems, is able to maximize potential productivity. So therefore blending two pure strains and then breeding the F1 offspring to a terminal sire is as simple to the chicken and pig industries as a two-times-table is to a mathematician. Universities around the world have proven the same to be true for beef cattle. Our challenge is to get our universities to publish these papers and get them to our agricultural media houses in order to make this science available to beef producers

The second gate would be HERD MANAGEMENT.

Yes, the best fertilizer a pasture can ever receive is the footprints of the farmer. Structured programmes and carefully designed systems ensure that no stone is left unturned.

Short calving-seasons, timely weaning of calves, when to calve, at what age to mate heifers, at what age to cull old cows, how many cows to mate per bull, dehorning, whether to castrate or not, and such issues are all pivotal in moving your herd into an easy to handle, efficient system. Good working facilities make it easier to work ones cattle more often which ultimately reduces issues. On a working stint in North Dakota in the United States I was left in charge of the calving barn. The first six weeks had temperatures varying between a low of -41°C and a high of -1C°. It was here that I truly learned the value of record keeping. We would draft cows close to calving into a barn every night and do shifts through the night. Every calf that was born would be tagged, weighed, given drugs for lung infection and the cow would get an udder score. Calves born on very cold nights would be dragged into a heating pen to thaw out… the next morning they were back out on the frozen winter pasture. Cows with inferior udders would be bred to terminal sires or culled. Cows that calved twins would have a twin taken away and re-attached to a cow that had lost her calf in order to keep all cows in production through the summer. This was done with 1200 registered and commercial cows by me and two brothers. This continuous interaction with the herd and accurate record keeping is one of the reasons why they managed to maintain such incredible uniformity and structural integrity in their herd. If beef producers start paying more attention to their management practices they will be less affected as profit margins tighten and the industry starts purging its less profitable producers. In the registered cattle business most of us do this already. It's our mandate to encourage such practices amongst our commercial clients.

These first two divisions were pretty much where my knowledge of a beef programme started and ended 10 years ago. I realised this all early in life and therefore felt the need get professional advice and service from people who's strengths lay in the other six divisions.

The third gate would be NUTRITION.

Whether it is licks, supplements or full blown fattening rations there are specialists waiting to assist us with programmes to suite our specific environments and requirements. I fed by trial and error and what friends and neighbours had told me for a few years which caused headaches and heartaches that I could have avoided from the start had I simply got a nutritionist to draw up a programme for me and link it to the best recommended products in our area.

The fourth gate would be VETERINARY.

I lost animals to tick borne diseases when starting out that;

a) should never have gotten sick in the first place and

b) could have been easily saved – had I sat down with a good local vet, and drawn up a veterinary programme for the herd with recommended products.

One is always grateful for using preventative measures. These measures save money, save time and save lives.

The fifth gate would be SALES & MARKETING.

Globally, farmers are generally price takers. We as pre-primary or seedstock producers have the ability to define our own reality. We also have the opportunity to research what the industry needs and then produce it instead of producing what we like and then trying to convince everybody else to buy it.

Investors are looking to invest in something other than the stock markets… we need to make our registered cattle industry more attractive than breeding buffaloes and sable antelope.

- I was in Paraguay last month where I attended a registered cattle auction which through its celebratory style, attracted investment from everyone whether a small commercial farmer, a night-club owner or a cattle-baron with 95000 cows.
- I was later told that this is simply how registered cattle sales work in South America.
- The event s tarts at 9pm with a sit down 3-course-meal, waiters bringing wine around, steaks cooked to perfection, branded with their breed's logo on. There is a DJ playing. At 11pm the lights go out and a heifer is led into the sale ring. Neon disco lights shine down on the heifer exposing the glitter sprinkled all over her… just before the auctioneer begins the DJ starts up again and a smoke machine blows smoke into the ring. Ringmen shout Ole after every bid and the crowd claps louder and louder as the bids escalate. Cattle are all sold in 10 month instalments. The seller pays a 4% commission and the buyer a 4% commission. These instalments encourage higher prices as it is far easier to pay off these high-profile cattle monthly. The final and feature lot comes in the ring at about 1:30 am. Perhaps these are some ideas worth thinking about.
- An interesting figure raised at the congress in Asuncion, Paraguay was that the average South African middle to upper class dinner/braai sees 125 grams of red-meat budgeted per person including woman and children. In Paraguay they budget 500g of beef per person including women and children. China consumes 1.5kg of red meat per person per year… it used to be 500g. Should this figure move to 2.5kg of red meat per year with their swelling middle class, it would require a new beef population the size of Brazil's just to sustain this 1kg per person growth. This is a good time to be in the cattle business.

- Keeping bull prices moderate is very important to sustaining one's market. South African farmers have a leaning towards being bush breeders or keeping their heaviest weaner every year. By keeping bulls affordable we give them less reason to do this. Once hybrid vigour kicks in they'll be prepared to pay more for good genetics. If one's sale becomes too expensive, it may be time to put more bulls on the sale. Globally the selling of F1 females on production sales is proving to be more profitable than bulls, registered females, embryos or even semen. The power of the F1 female is being realised and people are paying for the potential.

The sixth gate would be AGRI FINANCE & ECONOMICS.

When I look at a balance sheet, budget, cash flow chart, stock market etc. I get the same sensation as I would from looking inside a cars engine… I first go blank and then I get dizzy. But there are phenomenal Agricultural Financial Specialists in the Industry who can read these charts like you and I look through our cow herds… using these specialists is a life-saver to so many producers.

The seventh gate would be PASTURE DEVELOPMENT & MANAGEMENT.

Here too, using specialists can be vital in cutting costs, preventing failures and increasing profit. I once flew two pasture specialists to our Mauritian herd for a few days… it wasn't cheap, but in the first 20 minutes they identified a poisonous plant in our pasture and our losses in our imported cattle stopped as soon as we had chopped these plants out. The cost of 1 ½ heifers paid for the trip to get them there. I'll never know how much they actually saved us, but I'm guessing it's a monumental amount.

The eighth gate would be HUMAN CAPITAL.

This part of ones business is as vitally important as any of the other seven. When this division isn't functioning, even if the other seven are humming, things will never seem worth it and the fruits of ones labour won't taste very good.

The term, Human Capital, simply emphasises that there is actually a financial value that can be placed on the way in which you utilise your greatest assets; the people you live and work with. South Africa is a complicated country and I certainly don't know all the answers. What I do know though is that people function better when they are part of a team; when they understand their value, their role and their strengths. People need a purpose and need vision. What Human Capital do we as beef producers have to deal with?

- Father and Son relationships (The difference in generational ideas and accessible technology)
- Employers and Employees (Are our staff really team players, are they part of the vision, or are they just salaried workers.)
- Neighbours (Communication between neighbours and co-operating and planning together make and save money)
- Suppliers (Building goodwill and trust)
- Clients
- Green Peace and animal rights activists (Keeping communications open with these activist groups will make us better farmers and help them understand how much we really do care for our animals… this spill over eventually makes us more profitable as well)

Our farms are like an ancient city with eight gates. Each gate has a gate-keeper, who sees the world from the perspective of his specific gate. Only when the gate-keepers of each gate get together do we get the full picture.

- If we try and master and do everything on our own we not only deny someone else on our team from fulfilling their strengths, but we also make it very difficult for our operations to grow. We really can cover all our bases with help from others.
- If we would like to ultimately become more productive, more profitable and more prosperous, we need to ensure that the entire industry is too. The more people we leave behind, the more people can drag us down.
- The more we use specialists the more we ourselves become specialists in each division.
- We are all part of the same industry; we produce an animal protein called beef. Let us promote this product together… the chicken and pig produces don't politic about breeds and fads… they use science and logic and get it done!
- We as seed-stock producers are on the very point of an arrow which is fast gaining momentum… for many years beef cattle breeders have been the tail of the mouse… statistics suggest that we are set to become the head of the lion!

I will suggest the consideration of using specialists in each of these divisions to optimise success. I understand that specialists come either with large price-tag or an obligation to purchase their product, but when one uses a specialist, one eventually becomes a specialist. I also understand the inherent nature of a farmer to be a jack-of-all-trades and king of his castle.

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32ste NASIONALE BRANGUS VEILING

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2016 - 2017
VEILINGS GEMIDDELDES

BRANGUS NASIONALE VEILING 11 AUGUSTUS 2016			AVERAGE	HIGHEST PRICE
Bulle Swart | Bulls Black	6	@	R 32 000,00	R 42 000,00
Bulle Rooi | Bulls Red	52	@	R 59 846,15	R 420 000,00
Verse Rooi Oop | Heifersred Open	12	@	R 22 750,00	R 52 000,00
Verse Swart Oop | Heifers Black Open	2	@	R 16 500,00	R 21 000,00

DIAMANTLAND GROUP SALE 26 MAY 2016			AVERAGE
Bulle | Bulls	10	@	R 28 400,00
Koeie met Kalf | Cow with Calve	22	@	R 10 415,91
Koeie Dragtig | Cow Pregnant	23	@	R 9 043,48
Koeie | Cows 3 | 1	11	@	R 11 750,00
Verse | Heifers	34	@	R 6 370,59

CENTRAL BRANGUS CLUB SALE 26 MAY 2016			AVERAGE
Bulle | Bulls	16	@	R 35 125,00
Koeie met Kalf | Cow with Calve	17	@	R 22 529,41
Koeie Dragtig | Cow Pregnant	18	@	R 10 750,00
Koeie | Cows	4	@	R 8 000,00
Verse Dragtig | Heifers Pregnant	20	@	R 14 450,00
Verse | Heifers	23	@	R 7 434,78

MPUMALANGA CLUB SALE 15 JULY 2016			AVERAGE
Bulle | Bulls	11	@	R 37 727,27
Koeie met Kalf | Cow with Calve	45	@	R 13 253,33
Koeie | Cows	28	@	R 7 107,14
Verse | Heifers	77	@	R 6 610,39

BASTION GROUP SALE 18 JULIE 2016			AVERAGE
Bulle | Bulls	14	@	R 27 714,29
Koeie met Kalf | Cow with Calve	2	@	R 12 000,00

EASTERN CAPE CLUB SALE 09 SEPTEMBER 2016			AVERAGE
Bulle | Bulls	44	@	R 34 590,91
Verse | Heifers	5	@	R 7 200,00

BRANGUS GENELINK VEILING 16 SEPTEMBER 2016			AVERAGE
Bulle | Bulls	15	@	R 31 133,33
Koeie | Cows	9	@	R 14 666,67
Koeie met Kalf | Cow with Calve	2	@	R 15 000,00
Verse | Heifers	23	@	R 12 608,70