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Developing a Dollar Index for Brahmans in the Northern Territory Live Export Trade

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Abstract

The Northern Selection Index Project developed a custom Selection Index for the northern live export industry and also identified barriers to adoption of genetic technologies such as Breedplan and BreedObject™ in genetic improvement programs.

Through producer workshops and property visits data was collected which contributed to the development of the draft Northern Selection Index. At the same time barriers to use of these technologies were discussed. These included a lack of understanding of the importance of various Estimated Breeding Values for the northern production environment and also a lack of available data. By creating an Index tailored to the northern production systems it is hoped the first barrier will be overcome.

Educating producers of the value of these tools will ensure they are more likely to seek this information, and thus create an industry demand which will enable seedstock producers to value the importance of this information and make it more readily available to their clients.

Executive Summary

The uptake of objective genetic tools in the Katherine region is poor, however anecdotal evidence suggests that there is a growing emphasis on selection for growth characteristics. This is much easier to select for visually and leads to increased mature cow size, at the expense of fertility.

This project had the key objectives of providing training in and promoting the use of objective technologies for genetic selection, creating a $Index which reduces the confusion of sire selection based on multiple individual EBV traits, and identifying some of the current barriers to adoption of genetic technologies by producers in the Katherine region.

An initial workshop was held which allowed training for attendees in EBV and Selection Index theory. This ensured participants were sufficiently skilled to undertake the process of providing input into the parameters required to generate a Northern Live Export $Index for Brahmans. Evaluation showed participants were generally enthusiastic about the potential for EBVs and $Index to improve the profitability of their business and indicated their intention to use the technology for future decisions relating to improving the genetics of their herds.

Further individual consultation was made during a number of one to one property visits to increase the number of producers involved in providing data. Based on the workshop and individual consultation, a $Index was generated that was presented to members of the Katherine Pastoral Industry Advisory Committee (KPIAC) for approval. The committee felt the index did not sufficiently represent the requirement for emphasis on fertility. Soon after this feedback from the committee, the Indonesian market enforced the 350kg weight limit on all live exports and another round of consultation was required to incorporate these changed parameters into the index.

The final consultative process involved re-presentation of the proposed $Index to KPIAC at an industry workshop which also included training sessions around the benefits of and how to use EBVs and $Indexes. The committee endorsed the $Index and subsequently it has been posted for use by industry on the Breedplan website.

Throughout the duration of the project a number of extension methods were employed to promote both the project and the use of objective genetic tools. In addition to the workshops and individual property visits, field day presentations, poster presentations at industry events, Rural Review and Frontier articles and interviews on ABC radio were conducted.

Generally, it was found when producers received some training and information around the benefits and use of EBVs and Selection Index they tended to be enthusiastic about their potential to improve the performance of their herd. The key barrier to increased uptake was identified as the lack of bulls with objective information available.

A key recommendation from KPIAC has been to widen the promotion of this project and to enable more producers in the region to benefit from the training provided at workshops similar to those conducted through this project. Leftover funds from this project have been requested to be retained to conduct these workshops in 2011-2012 to capitalise on the momentum in interest objective genetic tools created through the current project.

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1 Background

The decisions made on bull selection today will impact on herd profitability for at least the next 12 years. Australia's national beef recording scheme, BREEDPLAN, is utilised widely in *Bos taurus* breeds in southern states as a tool for seedstock selection. BREEDPLAN outputs are EBVs and dollar indices. These describe the genetic merit of an animal for a number of production traits, independent of the environment in which they are raised.

The use of EBVs is not widely accepted in the extensive production systems of the Northern Territory. The most recent survey of the NT Pastoral Industry reported that 35% of Top End producers used EBVs in bull selection, 22% in the Katherine Region, and 65% in the Barkly Region (65%) (Oxley *et al* 2006). The survey also showed that Brahman is the predominant breed (Top End 64%, Katherine 97%, Barkly 71%). In relation to acquisition of replacement sires, 60% of NT commercial breeders source some of their replacement herd bulls from studs in Queensland while 31% buy bulls bred in the NT. In addition, 24% of Northern Territory producers breed some of their own bulls.

A major reason for the low level of objective bull selection appears to be the lack of an agreed basis on which the NT industry should be selecting. The NT's harsh semi-arid environment and store markets favour the use of resilient animals without an over-emphasis on any one production trait. This suggests that the first step should be the creation of a Selection Index ($Index) for Brahman cattle in NT production systems.

$Index balance the potential to make change via genetics with the relative economic importance of each trait. An animal's $Index value gives an indication of their genetic potential to produce progeny to suit the market and environment for which the selection index has been developed. Use of a selection index avoids single trait selection, where antagonisms between traits can actually lead to production losses. Currently, only a Jap Ox $Index has been developed for use for selection of Brahman cattle. This index is targeted at the grass-fed Jap Ox production system, turning off a 600kg (325kg carcass weight) steer at 32 months and producing replacement females.

It was proposed that a $Index for the Brahman breed be developed, based on optimal production in northern grazing systems and market suitability for the northern live export market. By developing the Northern Live Export $Index in a producer workshop, an insight was gained as to the current barriers to the level of use of EBVs by NT producers. This workshop was designed as an opportunity to give some key Northern Territory cattlemen ownership of the index, and create producer advocates for the indexing system. Additionally, it was anticipated that by setting breeding objectives for commercial production in the North and recording the Northern Live Export $Index with the Australian Brahman Breeders Association (ABBA), pressure may be placed on stud breeders to provide seedstock which meet the northern commercial beef industry requirements.

2 Project Objectives

1. Conduct a $Index development workshop for at least 15 producers in the Katherine region and identify the barriers to adoption of Breedplan data in the NT.

2. Develop a Northern $Index in conjunction with Breedlink, TBTS and AGBU, which weights selection for traits in Brahman cattle that are aimed at market suitability, environmental

adaptability, survivability and overall herd profitability in the tropical and subtropical regions of northern Australia.

3. List the Northern $Index with ABBA and BreedObject™ websites.

4. Develop a genetics extension kit ($Index Agnote + Posters) to be used in the Top End, Katherine and Barkly regions explaining the new index to be used for selection of bulls suited for the live export production system in the tropics and subtropics.

3 Methodology

This project aimed to take an extension based approach to the development of the Selection Index model. Through consultation with a wide range of producers through both workshops and one to one interviews a comprehensive picture of the production system in the region was gained. This consultation had the dual purpose of data collection and also providing ownership of the output with local producers.

3.1 Development

Identify a minimum 15 producers to participate in the workshop.

One and a half (1.5) day producer workshop, delivered by Don Nicol (BreedLink Pty.Ltd), Christian Duff (TBTS) and Sarah Streeter (NTDoR).

Day 1 Genetics short-course tailored for extensive northern Australia production systems

Day 2: Workshop development of North Live Export $Index.

Technical development of $Index (DPIFM, BreedLink and AGBU input)

3.2 Review

Technical review of Northern Live Export $Index by AGBU, TBTS and ABBA.

Review of Northern Live Export $Index by producers (workshop participants) and KPIAC members.

3.3 Extension

Northern Live Export $Index incorporated into BreedObject™ and Australian Brahman Breeders BREEDPLAN database.

Develop genetic extension kit ($Index factsheets, frontier article, poster, Rural Review articles).

Presentation at Northern Live Export $Index at 2010 Victoria River Research Station field day.

4 Results

4.1 Katherine workshop

The Northern Selection Index Project Producer Workshop was held in Katherine on 11 and 12 March 2009. Six producers attended this workshop.

After an initial welcome and outline of the project goals, the workshop participants completed a questionnaire which outlined their production system and their understanding of objective genetic selection tools.

Half the group was station owner/managers and the other half were company managers. All properties except one were breeder/grower operations with the other being a fattening operation. There was an even spread of pure Brahman herds and crossbreeding systems and in many cases a single property was using both breeding systems. Two properties were within the 2,000–5,000 head range, three 5000–10,000 head and one 15,000–30,000 head and all properties sold solely to the live export trade. Most producers purchased a small number of bulls from studs, and used these bulls to breed bulls for use in their herds. There was an even distribution between producers who chose to use livestock agents to select bulls or those who did not. Most producers had heard of Estimated Breeding Values (EBVs), but only a third had used this information when buying bulls. A third of producers had not heard of Selection Indexes, another third had but had not used them to make bull buying decisions and the final third had used Selection Indexes to make decisions.

Identification of the barriers to adoption of these tools (EBVs and Selection Indexes) was then undertaken. Participants were asked to rank their response from 1 (strongly disagree) to 5 (strongly agree) for a range of questions (Figure 1). From the responses, it can be seen that with education on these selection tools and if this information becomes more widely available to producers there is likely to be little barrier to adoption. There was also strong support for the development of a Selection Index for the northern production environment given the confusion about important traits.

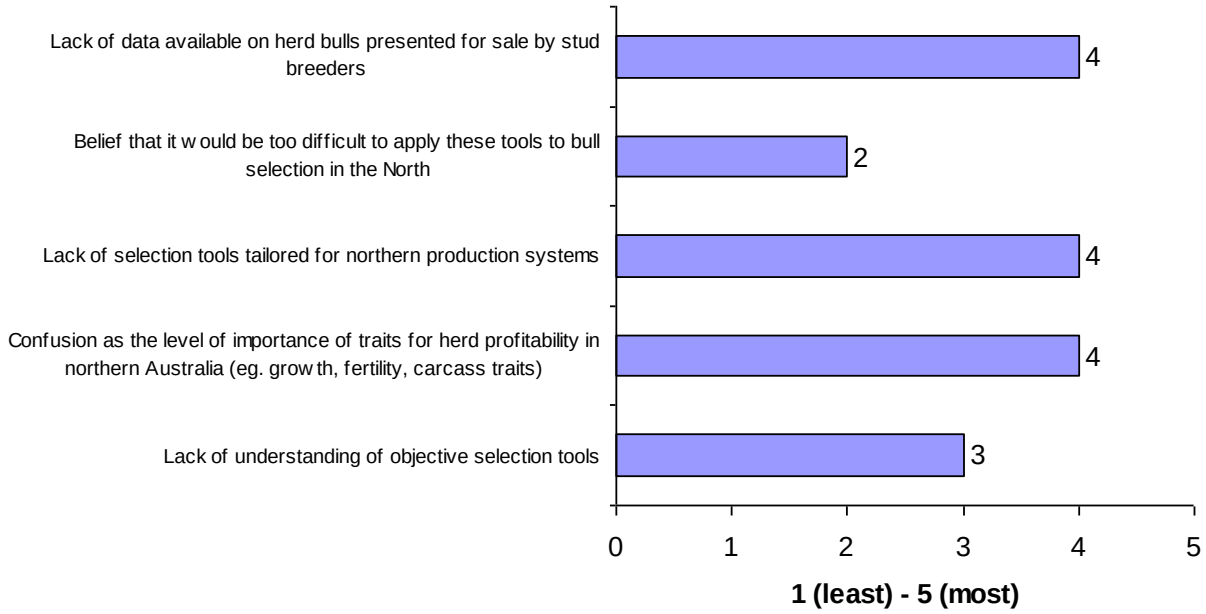

Figure 1. Perception of barriers to adoption of objective selection tools (EBVs and Selection Indexes) by NT producers.

The workshop then moved into a Genetics short-course for the remainder of the day, with topics on genetic improvement and factors which effect or change genetic improvement (presented by Don Nicol – Breedlink). EBVs and Selections Indices were explained by Philip Mann (TBTS) and Breedplan and BreedObject™ websites were investigated on the internet.

A final questionnaire was used to gauge what producers gained from this course. These results are presented in Figures 1–3 (Appendix I). This course was invaluable for these producers in that it allowed them to better understand how genetics impact on their herd and how they could really use these tools to make positive genetic progress. It was after this course that producers

became very interested in using EBVs and Selection Indexes when making bull buying decisions.

The second day of the workshop was spent specifically identifying the parameters which underpin the model used to develop Selection Indexes, basically identifying the key breeding objectives are and the market specifications. A range of questions were hotly discussed and debated between participants, who also included Pastoral Production research staff. Participants were able to settle on a figure for most questions and the draft Selection Index was presented at the conclusion of the workshop. Initial feedback was that it didn't look very different from the current Jap Ox Index; however refinement of some of the input parameters with relation to cost of production, cost of feed, calving difficulties and market specifications was required.

After the initial workshop it was decided that a wider range of participants needed to be involved, and during the week of the 21st-25th September Philip Mann from TBTS and Renee Golding visited a further eight industry representatives (producers, veterinarian and pastoral consultant). These visits would give producers an understanding of what the project was and what had been done to date. Participants were asked questions in regards to their production systems, if they understood EBVs and Selection Indices and if they use these when breeding or buying their bulls. Feedback from these producers was very similar to that gained from the workshop. It was also suggested by a producer that exporters should also be spoken to, and following this suggestion, contact was made with Adam Hill, CEO of the NT Live Exporter Association. Adam provided valuable feedback for the live export market specifications and future perceptions of what would be required.

An NT map showing the properties covered by our workshop and producer visits is attached in Appendix II. It encompasses approximately 53 000 square kilometres and 256 000 head of cattle. It was felt that discussions with this degree of representation provided a sound basis to develop the Northern Selection Index with, a broad understanding of the barriers to adoption of objective genetic selection technology and a clearer idea of the tools required to successfully extend these genetic selection tools to this industry.

4.2 Key profit drivers

A number of management strategies can be implemented to decrease breeder cow mortality rates, increase weaning rates and improve growth rates in the NT. Some of these strategies may or may not be practical depending on the size, current management practices and current productivity of individual properties. A number of practical management strategies were identified by the group. These can impact the 3 key profit drivers either in isolation or collectively. A table showing working of these examples is in Appendix III.

4.2.1 Reducing breeder mortality rates

The NT Pastoral Survey of 2004 showed that producers believe that the mortality rates in breeders across the board in the N.T. is 3%. There is anecdotal evidence (G. Niethe pers comm.) that the figure for the N.T. is more likely to be between 7-9%. A study is currently being undertaken to determine the actual breeder cow mortality rates at a property level. The northern beef situation analysis in 2010 (McCosker and Holmes) highlighted the relative importance of addressing breeder cow mortality rates in comparison with reproductive rates and liveweight gains. It showed that it was more than twice as important to address in most northern regions. However, this would appear to be not reflected in the economic analysis based on EBVs as demonstrated later in Figure 10 and warrants more discussion and further investigation.

Strategy A: Control mating or pregnancy testing

Control mating is a management strategy which can be used to improve all three performance indicators by ensuring that breeders calve at the most desirable time of the year. The advantages of this are three-fold; (1) cows are able to maintain good body condition and hence mortality rates are reduced, (2) cows in good body condition are more likely to cycle and become pregnant at shorter calving intervals, increasing weaning rates and (3) calves born at the optimal time of the year receive better nutrition and hence are heavier weaners. Control mating can either be achieved by bull removal or pregnancy diagnosis and segregation. It was hypothesized that by implementing control mating breeder mortality could be reduced to 1%, while weaning percentage and weights could also be increased (10% and 10kg). Other assumptions made in the analysis are:-

- Cost of pregnancy testing = $2/head
- Cost of bull segregation = no additional mustering costs, as bulls can be removed at Round 1 muster, some additional costs in returning bulls to paddocks prior to wet season, approx. = $5000.00.

4.2.2 Increasing weaning rates

Similarly, the same NT Pastoral Survey of 2004 showed that producers believed that the current weaning rate across the NT herd averaged 67%.

Strategy B: Annual fertility testing of bulls

Routinely fertility testing herd bulls is a strategy that will lift weaning rates. In the NT survey conducted in 2004, 43% of producers indicated that they fertility tested their herd bulls; however this was only on average every 3.5 years, not annually. Producers also stocked bulls at 5%; research has indicated that by using annually tested bulls this could be reduced to 3% with a hypothesized 3% increase in weaning percentage. The following assumption was made for the bull testing scenario.

- Cost for fertility testing = $50/head (minimum 100 bulls)

Strategy C: Vaccination against Vibriosis

In the NT survey conducted in 2004, 43% of producers vaccinated annually for Vibriosis. Of these 33% vaccinated bulls only and 10% vaccinated bulls and maiden heifers. Research in the N.T. has shown that by vaccinating maiden heifers calving rates can be increased by 10%. (T. Schatz pers. Comm.). The following assumption was inputted in the model.

- Cost of annual vaccination = $4.50/head

4.2.3 Increasing growth rates

An average weaning weight of 170kg was used in the modeling. This represents a mean value in normal season.

Current NT herd average for weaner steers = 0.3kg/day with urea supplement (no HGP use) (-1.0kg dry season, 110kg wet season) grazing native pastures in the VRD.

The following strategies include either relocating weaners to better pasture or using bulls of increased growth value through using EBVs.

Strategy D: Moving animals to better feed sources e.g. Douglas Daly region or flood plains.

Although this resource may be difficult to obtain, growth results are much higher. With increasing development of the floodplains this may become a more available resource. Research has shown that weaner steers (average 170kg in VRD in May) gain on average 0.4kg/day (annually) in the Douglas Daly on Improved pastures and 0.6kg/day (dry season only) on floodplains. Extra expense does need to be accounted for in the form of agistment, fly tags, drench and transport for these options.

Strategy E: Use of high growth rate EBVs to improve live weight gains.

In this scenario, a bull with a high EBV for 400d growth (+40) is compared to his current cohort of bulls as the Brahman breed average EBV for 400d, of +23 the value. In 2009 bulls with EBV values averaged $1050 more at Brahman Week sales than bulls with no EBVs. Assuming bulls are mated at 3% and work for 4 years, the figures demonstrates the point that using EBVs is profitable.

4.3 The draft northern live export $Index for Brahmans

Information provided by workshop participants, producers and other industry representatives who were visited was collated and provided the final data set used by AGBU in the computer model to generate the Northern Selection Index.

The model has had some difficulty in generating the Index, as it has only been used on southern systems, and some of our values (especially for cost of production and feed) seemed impossible for the model to cope with. Adjustments have had to be made to ‘trick’ the model. The following figures show the weightings (or importance) of various EBVs placed on both the current Jap Ox Selection Index (Figure 5) and the current draft Northern Selection Index (Figure 6). While Figures 7 and 8 show the anticipated response by using sires from each selection index.

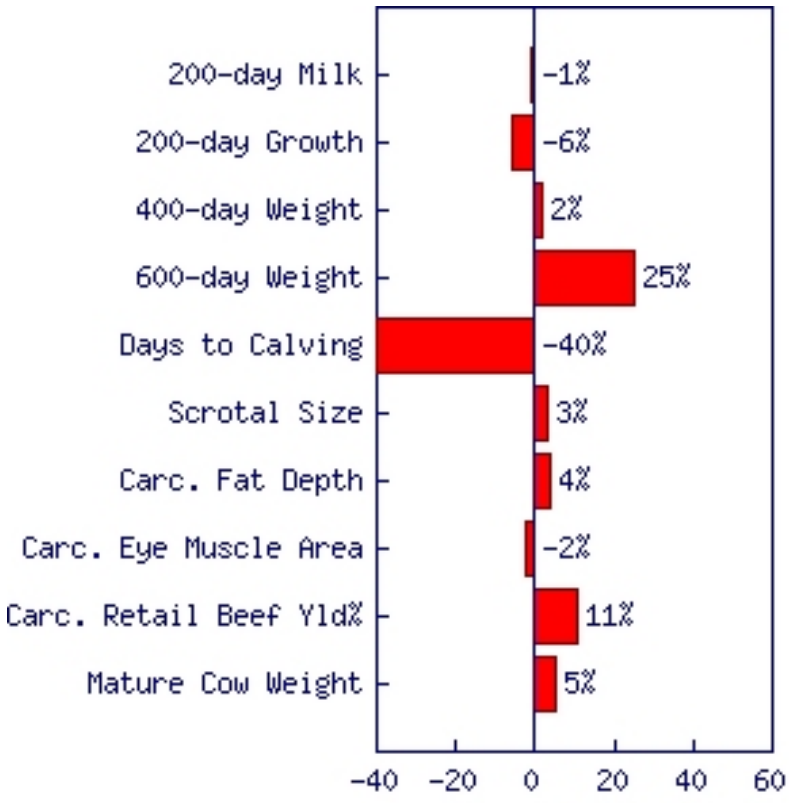

Figure 5. Jap Ox Selection Index

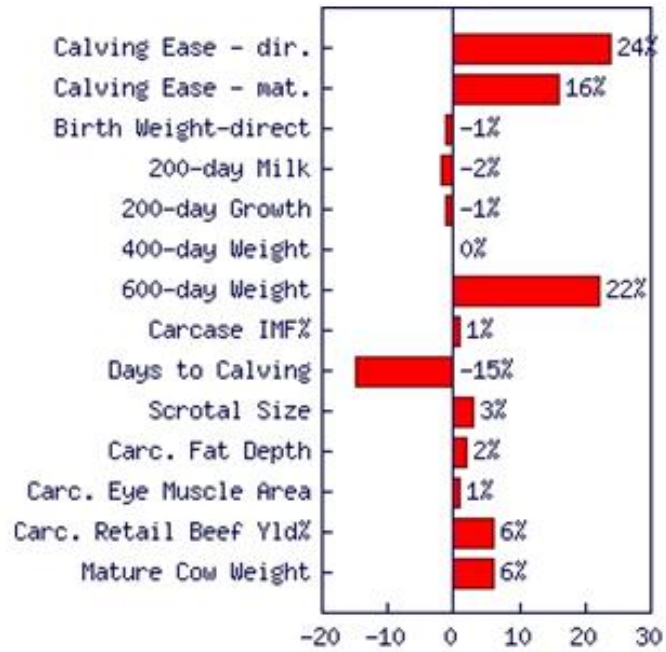

Figure 6. Draft Northern Selection Index

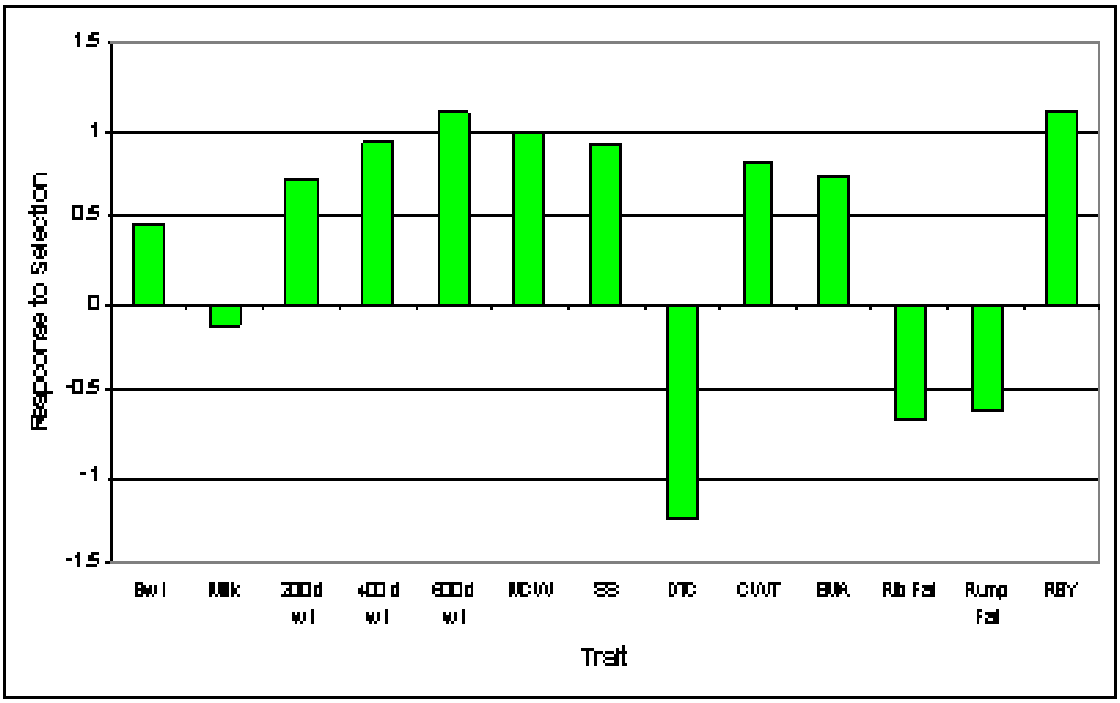

Figure 7. EBV response to selection using Jap Ox Index

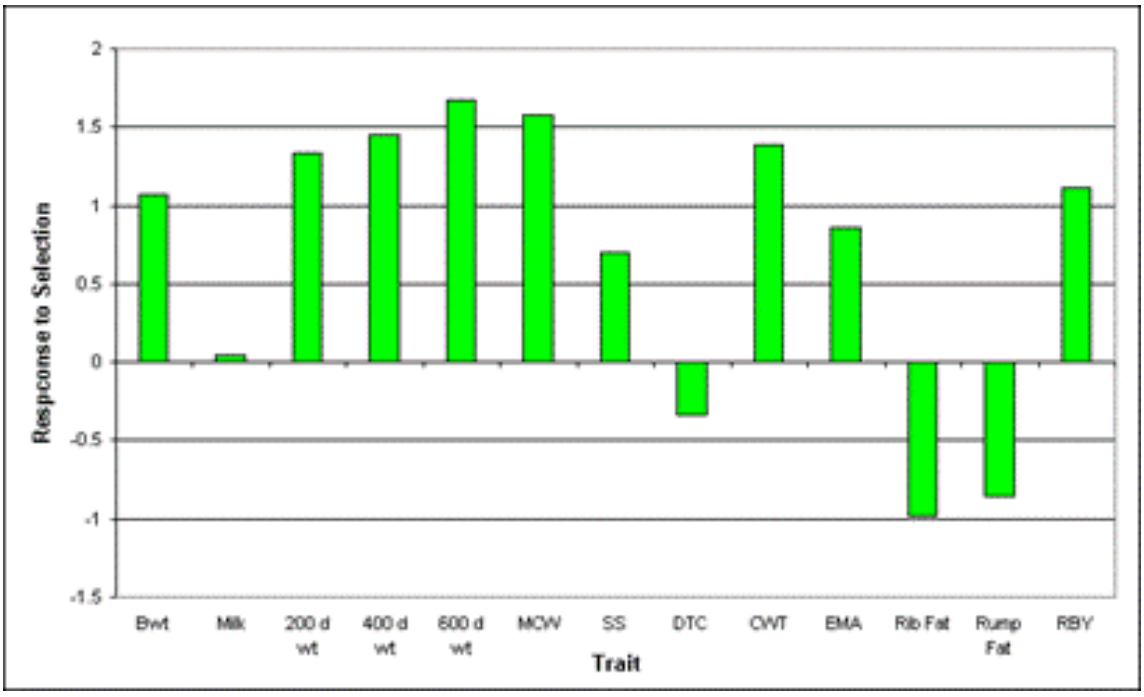

Figure 8. EBV response to selection using Northern Live Export Index.

Brahman sires were ranked on their dollar index using the newly developed northern Brahman live export index. Table 2 (Appendix IV) shows the ranking of Brahman Published sires according to the new index and also according to the Jap Ox index for Brahmans (as per the BreedObject™ website). It can be seen that some sires rank high in both indices and this was dependent on the relative importance of 600d weight and Days to Calve however most of the Belah Valley (CBV) sires which rank high in the Days to Calving EBV fell out of the new Northern live Export Index.

This Index was then presented to KPIAC in November 2009, and there was vigorous discussion around the decision of whether the Index represented what is required to maximise profitability in our environment. General consensus was that it still required some modification. Initially in the discussions, little value was put on calving ease, as calving difficulty is something that is not physically seen in the NT, as compared to smaller and more intense southern systems. However, this was modified, as it was felt that some level of dystocia could be starting to emerge, and approximate values were given. It should be noted that calving ease is not included in the Jap Ox Index at all. Inclusion of calving ease in the index skewed the relative importance of Days to Calving from 40% in the Jap ox Index to only 15% in the Northern Live Export Index. The impact of the diminishing effect of fertility in the live Export Index caused all the high fertility bulls (those branded CBV) to drop out of the list of Top Sires as can be evidenced in Appendix IV. Consequently, it was thought that less emphasis should be placed on dystocia as fertility, or the need to improve reproductive performance, is considered the most important aspect of our production system. It was therefore decided the EBVs which represented fertility traits (Days to Calving and Scrotal Size) should be more prominent in their relative importance in the selection Index. Most agreed that the 600d weight trait was our target growth (given this is the market specification end point), however there was some concern that placing emphasis on this would increase mature cow size which is detrimental to fertility.

It became apparent that this Index needed more work. Although it was thought that the answers provided by producers and which were initially fed into the model were representative of our northern production systems, it needed refinement. Perhaps the problems arose because of the difficulty experienced by the model in coping with the different inputs in the northern beef system. The decision to re-examine the index was followed shortly afterwards by the change in market conditions in cattle going to the live export market in Indonesia. A 350kg maximum weight was enforced, which meant that many of the parameters in the Northern Live Export Index needed to be adjusted.

Another round of consultation was done with producers and exporters to determine alternative turn off strategies. Individuals consulted in regards to the changed conditions included Greg Pankhurst, managing director of Agrogiri Perkasa feedlots, Indonesia, Adam Hill, CEO of NT Live Exporters Association, Dennis Brosnan, Livestock Sales Manager, Elders, Katherine, and Luke Bowen Executive Director, NTCA. This resulted in a considerable change to the parameters driving the profitability of the $Index and the resultant emphasis on EBV traits (see Figures 9 and 10). The inputs for the selection index and the amended inputs after further consultation are provided in Appendix V.

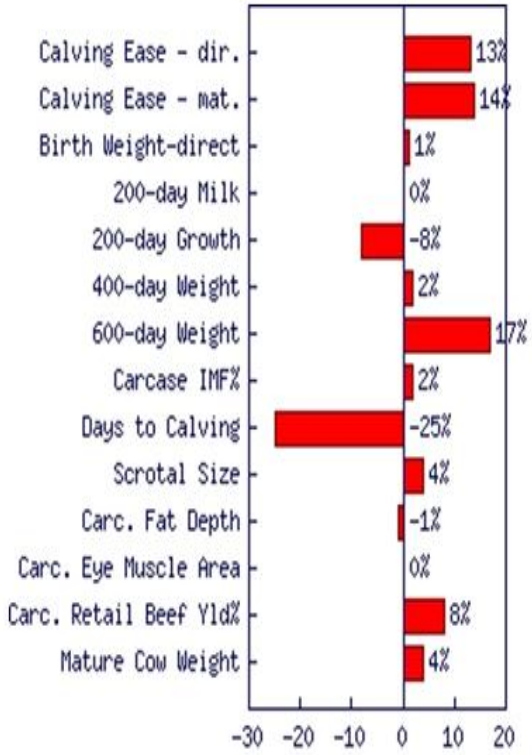

Figure 9 Revised Northern $Index of traits.

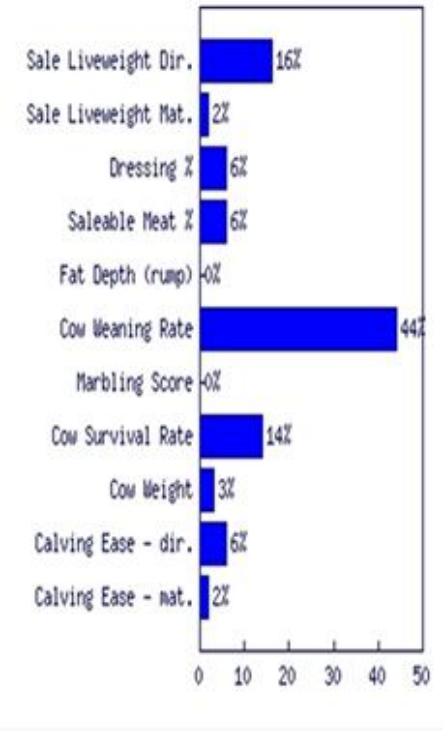

Figure 10 Revised economic importance emphasis on EBV traits .

KPIAC members were satisfied that the revised index reflected the traits of importance, particularly the greater emphasis on fertility traits, and voted unanimously to approve the index as suitable for this region.

4.4 Development and distribution of a Genetic Extension kit in the NT

A number of information tools have been developed through this project including a Poster outlining the Selection Index technology and the benefits of using the Northern Live Export Index. This poster has been displayed at Victoria River Research Field Day, Katherine Research Station Open Day, and NTCA conferences.

Other publications including articles in the Barkly Beef, Katherine Rural Review, Fact sheet handouts and an article in Frontier have also been prepared promoting Selection Indexes and the project.

4.5 Presentation of Northern $Index at Field Day

A number of activities to promote the Selection Index were undertaken at the 2010 VRRS Field Day. The key note speaker, Don Nichol of Breedlink, used his presentation to promote the benefits of objective genetic selection and the benefits that can be gained through using technology such as the Live Export Selection Index. A talk was also delivered by the project officer in conjunction with Don Nichol on the developed Live Export Index, how to interpret it and how it could be used practically by producers, and the potential benefits to their business.

This field day was attended by 80 people, including 11 producers. Producers rated both genetics presentations as being 8.5 out of 10 in regards to value to their business, and three naming bull selection and using indexes as being areas they were going to make changes in their business as a result of the field day.

A DVD was made of the day and the presentations outlined above. This is being distributed to producers in the Katherine region and a copy has been made available with this report.

This milestone also specified presenting the index at two bull sales in the NT, but as there are currently only two major sales; however one is a Droughtmaster sale and therefore an index developed for Brahman cattle is not relevant, and the other bull sale would have no bulls available with objective data, and so it was not possible to promote the index at bull sales in the NT at this time.

It was decided that it would be more appropriate to have a follow up workshop for producers and KPIAC members (in particular) to allow them to assess the revised index and also target key producers with an interest in the technology. This was held on the 26th of October, 2010, and incorporated a presentation by John Bertram and Wayne Upton on the results from the latest Beef CRC. This workshop was extremely well received by producers attending. The results of the workshop evaluation are contained in Appendix VI.

4.6 Northern $Index on the Australian Brahman Breeders Association website

The index is currently available through the BreedObject™ website, and the Brahman Breeders Association has voted to accept the index as it stands and publish the Live Export Index on their website in association with the JapOx Index.

Whilst discussion was held around the fact there is quite a lot of similarity between the two index's, it was decided it was important as an extension tool to differentiate between the two to allow producers targeting the export market to identify more closely with the index. TBTS is

currently progressing having the index published on the ABBA website, but in the meantime the published sires list ranked according to the Live Export Index are available from TBTS and NTDoR, in addition to the BreedObject™ website.

4.7 Potential adoption of Northern Live Export $Index

The workshops have given the best opportunity to sub-sample producers to evaluate potential adoption of the Live Export $Index. The best benchmark for adoption of genetic technology across the region generally is from the 2004 Pastoral Industry Survey which found only 20% of producers looked at EBVs when selecting a bull, and mostly focused on growth. This figure would serve as a good representation of the number of producers in the region with an interest in using the technology - when they have little understanding of the benefits and how the information is generated.

This project has demonstrated that producers who are exposed to a training session in the technology are very likely to signal their intention to adopt using $Index's.

The results of the survey of participants involved in Workshop 1 indicated that 75% of them intended to refer to a Northern $Index when selecting bulls (despite the fact it hadn't been created yet!) and 100% signalled their intention to use internet tools to look up bull EBVs.

At Workshop 2, when participants were exposed to the final version of the Live Export $Index, 88% (7 out of 8) producers indicated their intention to refer to the index when selecting bulls in the future. The single participant that indicated they would not use the $Index found that it did not suit his business operation as he produces crossbred weaners.

Generally, producers had a high level of enthusiasm for adopting the use of EBV and $Index technology, and felt the barriers to adoption of these tools in the north lay most significantly in the area of not being presented with sufficient numbers of bulls with objective information of the right type (i.e. fertility) by seedstock producers.

It should be kept in mind that the producers involved in these workshops do tend to be the more "progressive" producers, and an extension strategy for targeting the wider industry is the next step in moving the uptake of genetic technologies such as $Indexes forward.

5 Discussion

Undertaking this project highlighted that with training and information, commercial producers do signal their intention to adopt genetic tools. The limitations to the adoption of genetic technologies then becomes more focussed on not having access to adequate numbers of bulls supplied with objective information and on producers who have not received adequate information/training in the benefits and use of the technology.

A real opportunity exists in the NT to focus on working with commercial producers with a seedstock herd. A program that assists bull selection from seedstock stud producers and then targets female management within the stud herd would enhance selection pressure and genetic gain.

As more commercial producers become convinced of the benefits of these tools, they are more likely to place market pressure on stud breeders to provide this information. These producers are then better able to assess the financial benefits of having the information and this will potentially make them more willing to financially reward stud breeders for providing this information.

6 Conclusion/Recommendations

The actual process of developing a specific dollar index has been a valuable learning exercise for all involved. Firstly it highlighted the need to fully comprehend the programming and economics that lie behind the modelling used. Secondly it demonstrated that assigning values on some production indices such as dystocia can have massive consequences on other arguably more important traits such as fertility. These relationships need to be fully understood when undertaking the development of a new selection index. Apart from the economic impact that dystocia may have in the northern beef herd, the relative importance of other profit drivers such as breeder mortality rates should also be further investigated and researched. This will ensure that all dollar indices developed in future for tropical regions will guarantee the most genetically suitable and adapted breed for the environment. Finally, it demonstrated to producers that there are tools available which can incorporate multiple EBVs and provide a simpler approach to long-term selection within a herd.

Development of a suitable selection index for the live export trade is only the first step towards breeding better suited animals for the northern production systems. Increased awareness and adoption will rely on a carefully crafted extension program. The design of this future extension program should include further workshops to provide specific advice on the technology from expert presenters, as well as the planned Producer Demonstration Site project to demonstrate the benefits of objective bull selection. It would be useful to widen this demonstration from just one property to a number of sites across the Katherine and Top End regions.

A proposed follow up workshop is planned for 2011 and would be very similar to the program used at Workshop 2, held in October 2010 for this project. It would present a combination of recommendations for improving genetic gains through both objective bull selection and improved female management.

KPIAC participants requested a further workshop as they felt it would provide immense benefit to the wider industry and an opportunity to build awareness and interest in the use of objective genetic technology.

6.1 Appendix I. Workshop 1 Feedback

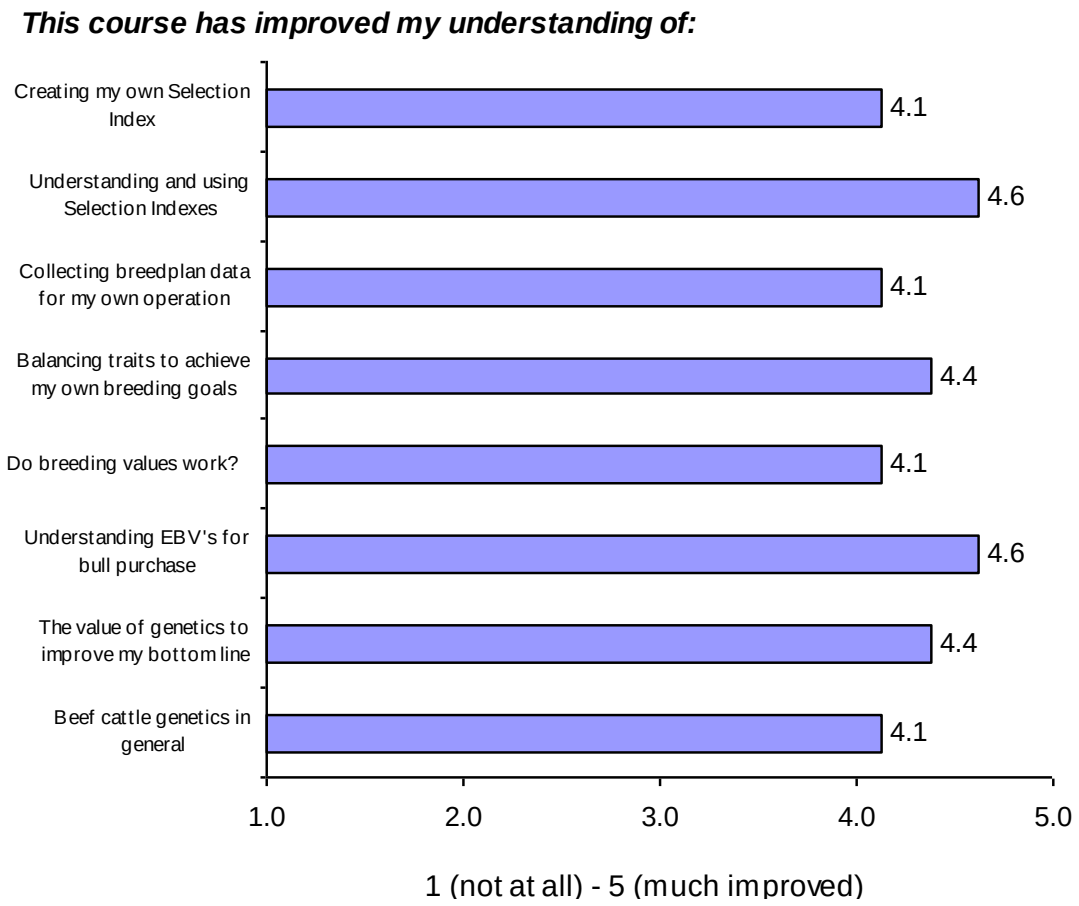

Figure 1. Participants improved understanding.

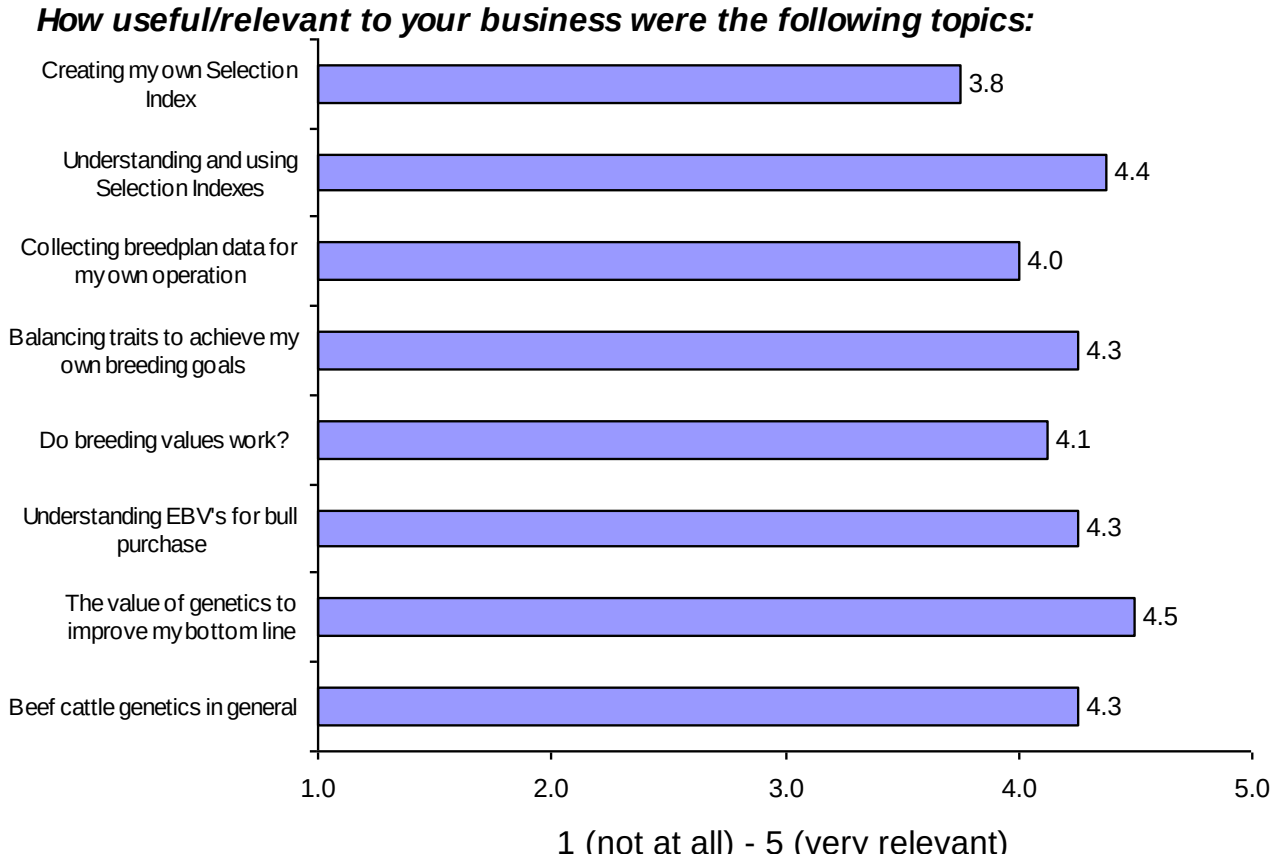

Figure 2. Participant's usefulness or relevance of information to your business.

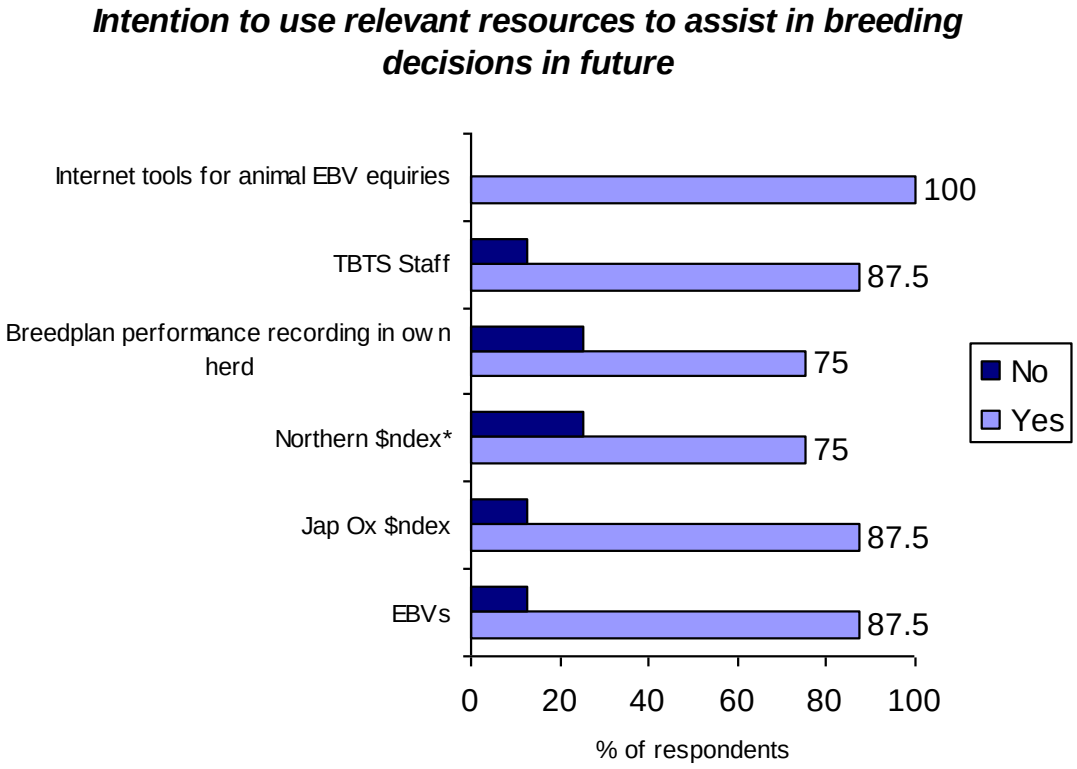

Figure 3. Participant's intention to use this information for decision making in the future.

6.2 Appendix II. NT pastoral map showing properties which have provided information to this project

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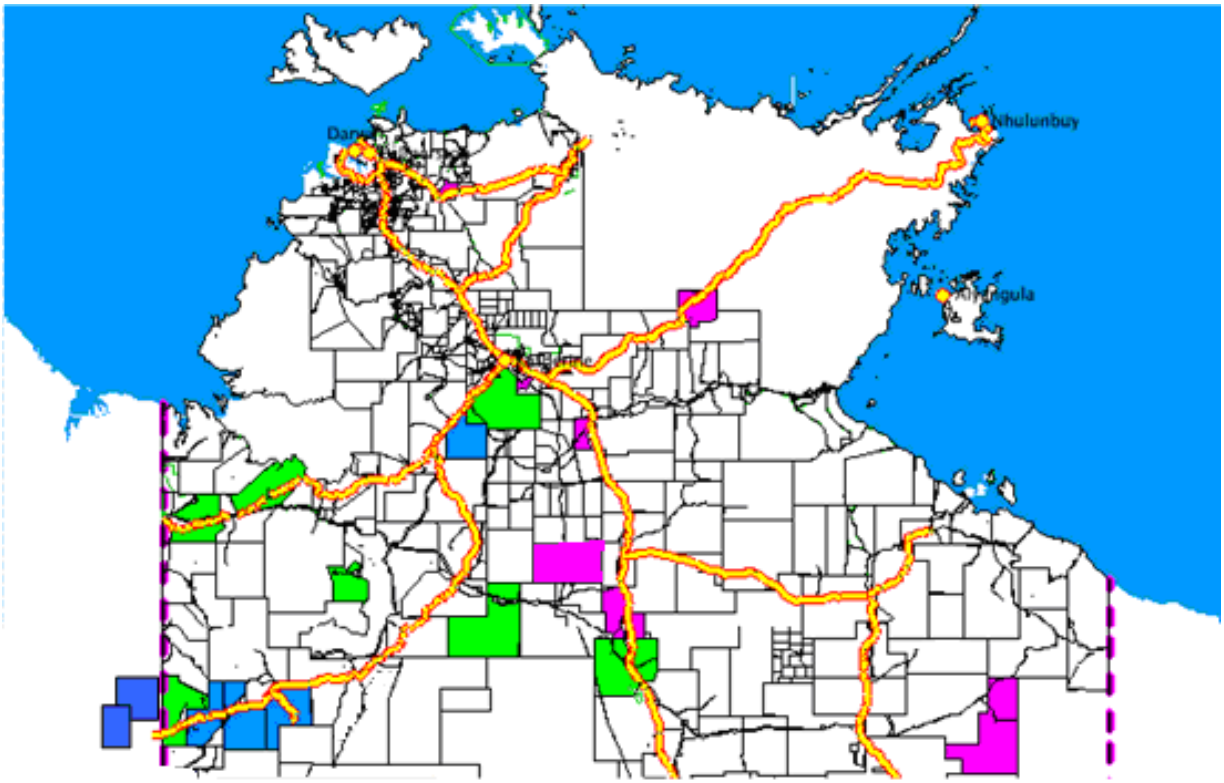


6.3 Appendix III. Bcowplus analysis of 5 strategies to address 3 Key Performance Indicators

Table 1. Summary of Breedcow Economic analysis of different Strategies

	GM/AE prior to Strategy implementation	GM/AE with Strategy implementation	Difference in GM/AE	Ease and practicality of implementation
Strategy A – reducing breeder mortality				
• control mating	$92.20	$117.28	$25.08	☆☆☆
• pregnancy test & segregation	$92.20	$113.67	$21.47	☆☆☆
Strategy B – increasing weaning rates				
• annual fertility testing bulls	$92.20	$98.27	$6.07	☆☆☆☆
• annual vaccination against vibriosis	$92.20	$108.15	$15.95	☆☆☆☆☆
Strategy C – increasing growth rates of sale cattle				
• moving animals to better nutrition				
Improved pastures	$78.51 (May sale)	$91.32	$3.81	☆☆
Flood plains	$72.71 (Nov sale)	$85.07	$12.36	☆☆
• utilising higher quality bulls (those with EBVs)	$93.60	$98.02	$4.42	☆☆☆☆

Ease and practicality star rating where: ☆= very difficult and not practical, ☆☆☆☆☆ = easy and very practical

Additional comments for each strategy:

Strategy A: A secure paddock would be required for bulls from Round 1 until Christmas. Cleanskin animals could be a problem and would need to be managed. Empty females could be sold and replaced with PTIC females; economics of doing this would be dependent on market price and availability.

Strategy B: This would be easy. A vet would need to be arranged to test the bulls at Muster (preferably Round 1). A good vet crush would be required.

Strategy C: This would be very easy to implement, along with normal botulism vaccination at muster.

Strategy D: Gaining access to these recourses could be difficult, but if possible this is a good option. Steers sent to the floodplains must be at a minimum of 150kg to make sale weight by November.

Strategy E: This assumes that environment (nutrition) is not limiting growth potential.

6.4 Appendix IV. BreedObject rankings – Jap Ox versus the initial Northern Live Export Index

Table 2. Ranking of top 10 Brahman Published sires according to each Index (after the initial workshop and Index development) as per the BreedObject™ website.

Sire name	Jap Ox $ value
CBV Impact	+65
Lancefield Buster Manso	+59
Waverley Dreamtime	+58
Lanes Creek Red Rancher	+58
CBV Amazonas XL	+57
CBV Tom Radakovit	+56
CBV Compass XL	+56
CBV Compass Excel	+55
CBV Tom Ruxton	+54
CBV Tom Precose	+53
Brahman Breed average	+19

Sire name	Northern Export $ value
Lancefield Buster Manso	+60
Lanes Creek Red Rancher	
JJ Wise Didor	+53
Kandoona Bradman	
Elrose Significance	+52
Lancefield M High Tech	
Lancefield Significant	+50
JDH Karu Manso	+49
JDH Baxter Manso	+48
Roxborough Charlie	

6.5 Appendix V. BreedObject establishment questionnaire

Question	Original final answers	Post 350kg import protocol changes
Questionnaire		
Breeding Function		
The breeding role of animals	Straight	
Breed Type of Cow (or mate)		
Breed type of cow or mate	Own	
Time Horizon & Interest rate		
Economic Time Horizon (years)	20	
Real Rate of Interest (%)	7	
Source of Cost Estimates		
How cost estimates are to be supplied	Addendum	
Options for Costing Feed		
Reduce Cow Herd Size	Y	
Buy/Conserve Feed	Y	
Agistment for Cows	N	
Sale Method Options		
Sale Method for Normal Sale Animals	Direct	
Sale Method for Cows	Direct	
Herd Structure		
No. of cows and heifers joined (head)	9999	
% Death Rate of Cows	4	4
% Death Rate of Young Animals	5	
% Culling rate (affected this year, in theory not in future years?)	20	20
Age of heifers at 1st calving (years)	3	
No. of joined cow age groups (joinings)	7	
Age of bulls when 1st progeny born (years)	3	
Max no. of cows possible per bull	25	33
Average bull weight (Kg)	600	
Expected Calving Ease		
% of heifers assisted at calving	7	
% of cows assisted at calving	2	
% calf deaths for assisted heifers	60	
% calf deaths for assisted cows	50	
% heifer deaths at assisted calving	60	
% cow deaths at assisted calving	50	
% assisted cows that don't rebreed	70	
Birth weight (Kg)	30	
Joining		
Month of start of joining	Jan	
Month of end of joining	Apr	
Weaning		
Age at weaning (months)	6	
Annual Period of Limited Feed		
Start of period of limited feed	May	
End of period of limited feed	Nov	
Feedlot Period		

Question	Original final answers	Post 350kg import protocol changes
Days steers to be in feedlot (if any)(av 1.4kg/day)	90	120
Days heifers to be in feedlot (if any)	70	100
Normal Sale		
Normal sale age (months)	35	26
Number Weaned	67%	
No. weaned at 1st weaning	4355	
No. weaned at 2nd weaning	2345	
No. weaned at 3rd weaning	0	
Cow Feed		
Average cow weight at joining (Kg)	400	
Cow wt change over lim.feed period (Kg)	-60	
Price of suppl. cow feed ($/tonne) Still to determine if actual supplement cost(urea etc) should be included here	40	26.50
Quality of cow suppl.feed (MJ/KgDM)	7	
Young Animal Feed		
Rate of gain in lim.feed period relative to surplus feed period	.01	
Price of supp. young feed at pasture ($/tonne)	50	26.50
Quality of supp. young feed at pasture (MJ/KgDM) Still to determine if actual supplement cost(urea etc) should be included here	7	
Price of feedlot feed ($/tonne)($190 would include yardage)	190	175
Quality of feedlot feed (MJ/KgDM)	10	
Feedlot entry weight (Kg)	330	300
Weights at Normal Sale		
Live weight of normal sale steers (Kg)	330	300
Live weight of normal sale heifers (Kg)	280	280
Carc. weight of normal sale steers (Kg)		
Carc. weight of normal sale heifers (Kg)		
Prices at Normal Sale		
Sale price for sale steers (live) (c/Kg) 85% feeders @ $1.90, 15% heavies @ $1.40(net of selling costs $1/kg) Was wondering if we could put in net price for heavies rather than confusing the selling costs of the main sale group?	1.70	1.90
Sale price for sale heifers (live) (c/Kg)	1.50	1.75
Sale price for sale steers (carc) (c/Kg)		
Sale price for sale heifers (carc) (c/Kg)		
Fat Depth		
Average fat depth (rump) (mm)	12	10
Penalty if below min. fat specification (c/Kg carcass)	1	
Percent of steers below minimum fat	0	
Percent of heifers below minimum fat	0	
Marbling		
Marbling EV method	Old	
Own marbling performance	Unknown	
Treat marbling in heifers	Ignore	
Steer Marbling		

Question	Original final answers	Post 350kg import protocol changes
Premium/discount between 0 & 1 (c/Kg carcass)		
Premium/discount between 1 & 2 (c/Kg carcass)		
Premium/discount between 2 & 3 (c/Kg carcass)		
Premium/discount between 3 & 4 (c/Kg carcass)		
Premium/discount between 4 & 5 (c/Kg carcass)		
Premium/discount between 5 & 6 (c/Kg carcass)		
Cull Cows (other than CFA)		
Av. sale wt. of cows (Kg)	415	415
Av. price for surplus cows (c/Kg-live)	125	1.1
Cows Assisted at Calving		
Av. price for assisted cows culled (c/Kg-live)	125	
Cull-for-Age Cows		
Av. sale wt. of cull for age cows (Kg)	425	425
Av. price for cull-for-age cows (c/Kg-live) Assume 80% cows go to abattoirs down south. The 20% live ex assume .95c	125	.95
Costs Addendum		
Average Cost of Labour		
Average cost of labour ($/h/man)	16.5	
Cost of Marking and Weaning		
Cost vaccinations ($/head)	1.00	
Cost of ear tags etc. ($/head)	4.00	
Special feed cost for new weaners ($/head)	30	
Mob size for commercial weaners (head)	999	
Labour at marking (man-hrs)	150	
Labour at weaning (man-hrs)	100	
Normal Sales: Costs for Management		
Cost of broad spectrum drench ($/head)	1.35	
Cost of fluke control ($/head)		
Cost of lice and tick control ($/head)		
Other veterinary costs etc ($/head)	6.1	
Mob size for normal sale animals (head)	500	
Labour for management (man-hrs)	60	
Labour for routine supervision (man-hrs)	5	
Normal Sales: Costs for Marketing		
Transport costs ($/head) (in theory decrease for the livex as smaller, but small proportion have big increase going down south-will be answered by decision in price/kg)	30	28
Transaction levy ($/head)	5	5
Costs of any other marketing ($/head)	15	15
Labour for normal marketing (man-hrs)		
Costs for Replacement Females		
Cost of any special feed ($/head)		
Cost of broad spectrum drench ($/head)	5.27	
Cost of fluke control ($/head)		
Cost of lice and tick control ($/head)		
Other veterinary costs etc ($/head)		
Mob size for replacement females (head)	500	

Question	Original final answers	Post 350kg import protocol changes
Labour for management (man-hrs)	30	
Labour for routine supervision (man-hrs)	5	
Cows: Costs for Management & Marketing		
Cost of broad spectrum drench ($/head)		
Cost of fluke control ($/head)		
Cost of lice and tick control ($/head)		
Other veterinary costs etc ($/head)		
Mob size for cows (head)	999	
Labour for management (man-hrs)	80	
Labour for routine supervision (man-hrs)	5	
Transport costs ($/head) For 1500km journey	25	88
Transaction levy ($/head)	5	5
Costs of any other marketing ($/head)	15	50
Labour for marketing aged cows (man-hrs)	12	18
Cows: Costs for Breeding & Calving		
Average purchase price of bulls ($/head)	3500	
Average sale price of CFA bulls ($/head)	800	
Overall bull percentage (%)	4	3
No. years bull used for breeding (years)	5	
Death rate of breeding bulls (%)	2	
Cost of pregnancy testing ($/cow)	2	
Labour for joining (man-hrs)	4	
Labour per assisted calving (man-hrs)		
Length of main calving period (days)	90	
Length of remaining calving period (days)	270	
Heifer inspections (main period) (hrs/day)	0	
Heifer inspections (remainder) (hrs/day)	0	
Cow inspections (main period) (hrs/day)	0	
Cow inspections (remainder) (hrs/day)	0	

6.6 Appendix VI. Exit questionnaire from second genetics workshop

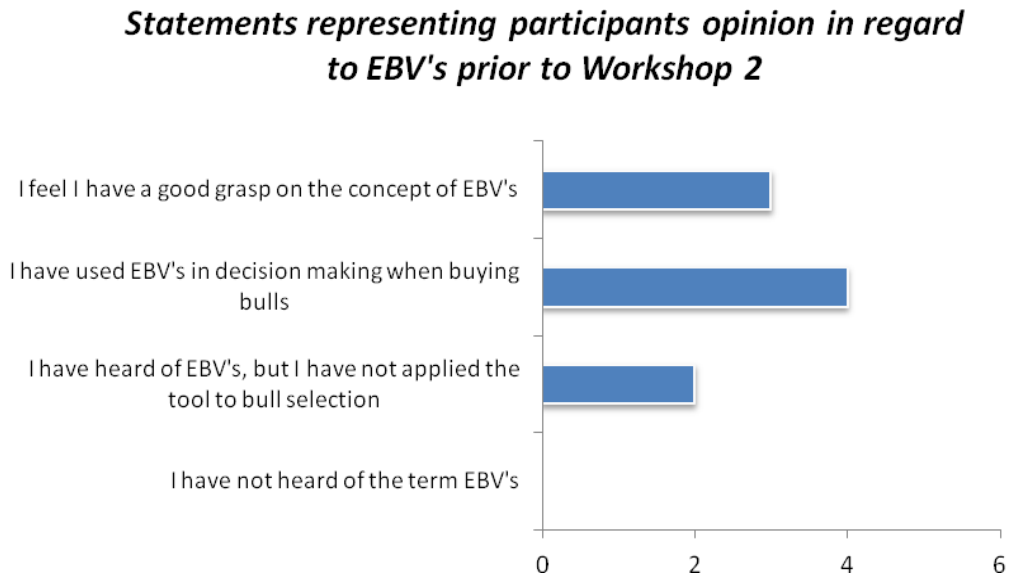


Figure 1. Participant opinions of EBVs prior to Workshop 2.

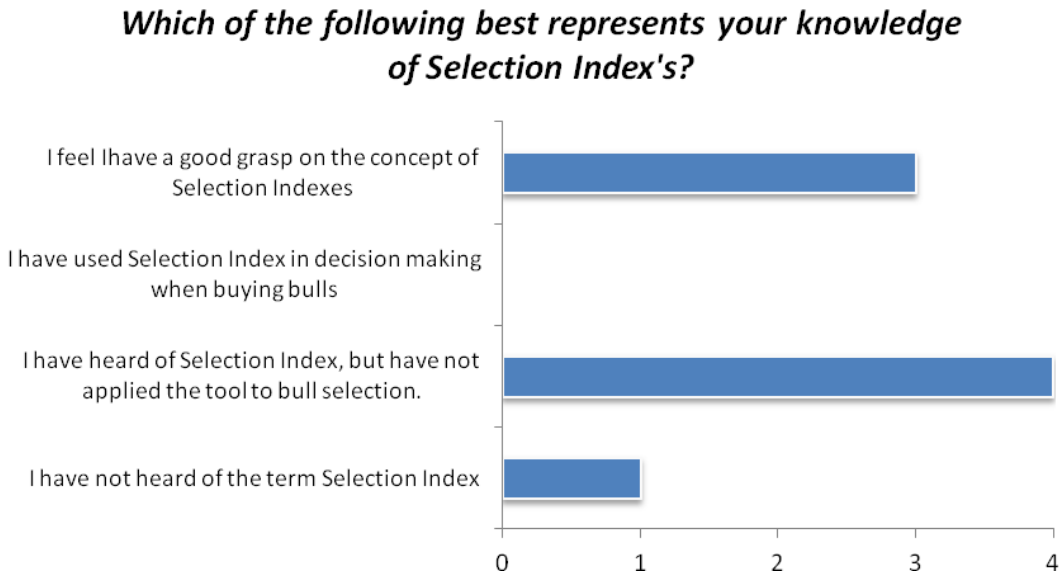


Figure 2. Participant's previous understanding of the Selection Index.

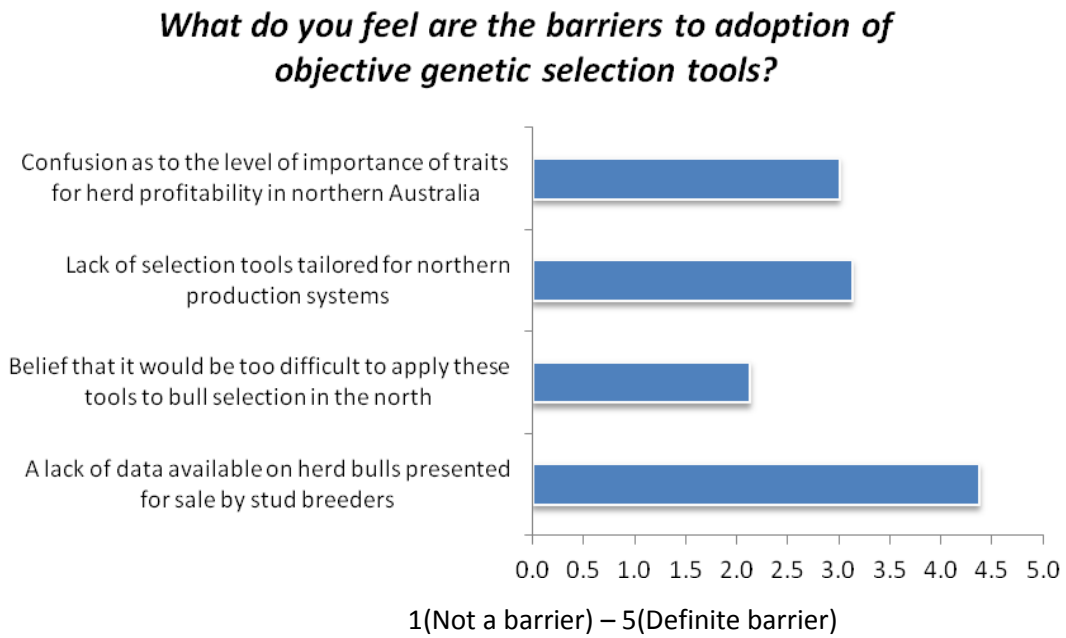


Figure 3. Participant opinions as to the reason why Selection Indexes aren't utilised in the Northern Territory.

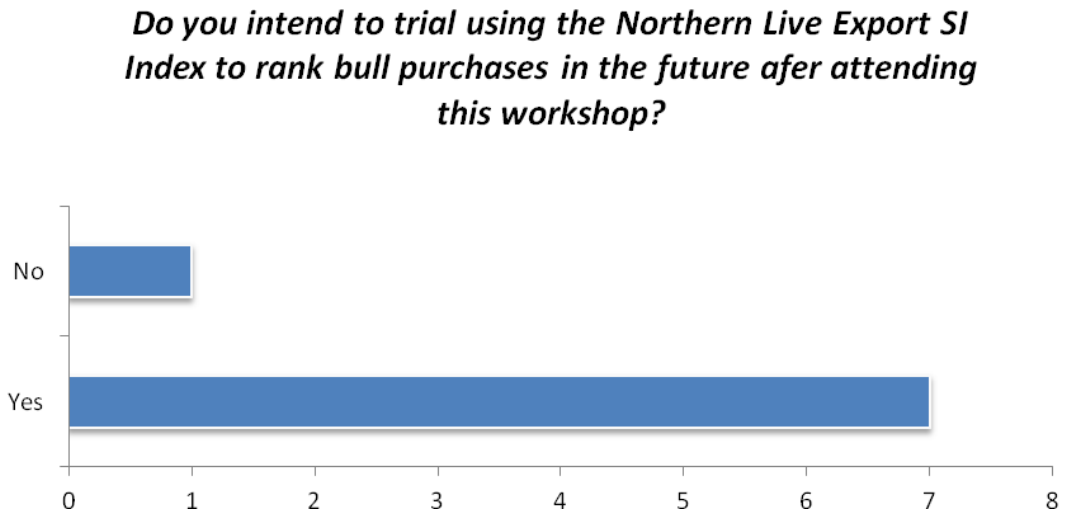


Figure 4. All but 1 participant intend to use the Northern Live Export Selection Index after attending the workshop. The single participant that indicated they would not use the Index found that it did not suit his business operation as he produces crossbred weaners.

6.7 Appendix VII. Workshop 2 Participant Profile

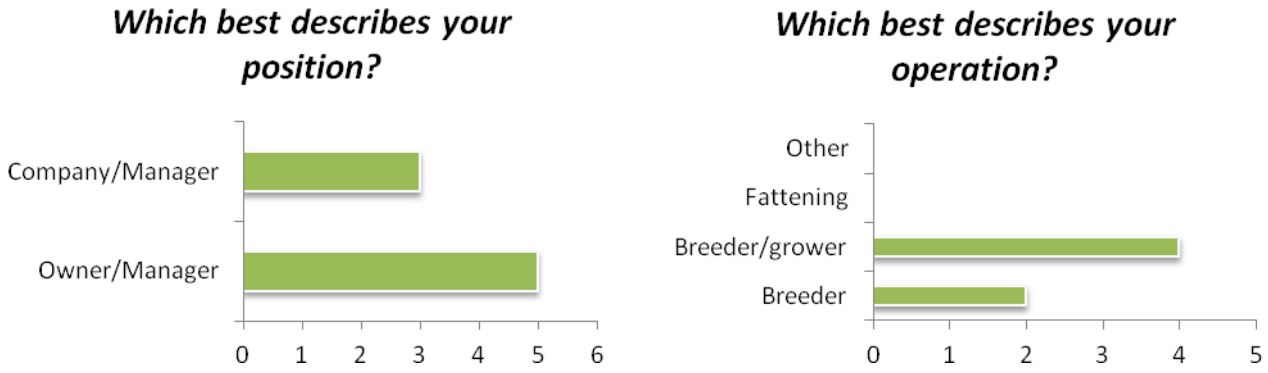


Figure 1. Description of participant's position in the business and the type of operation.

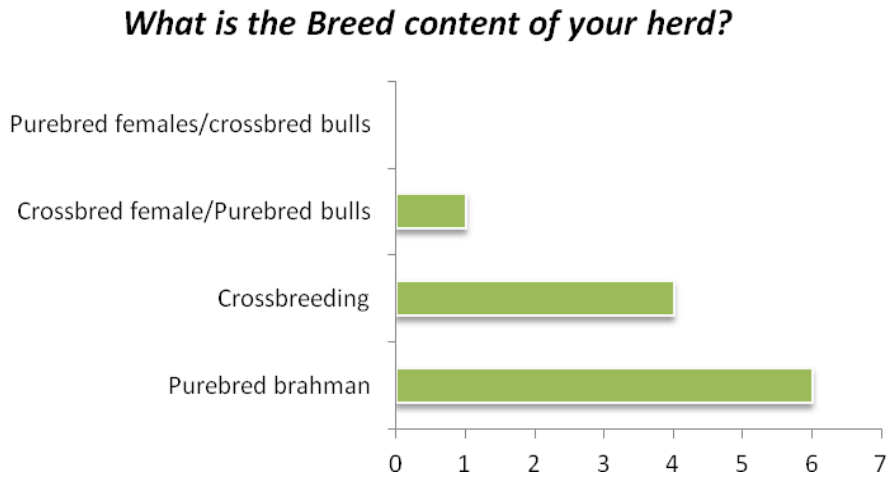


Figure 2. The breed content of the herds run by the participants.

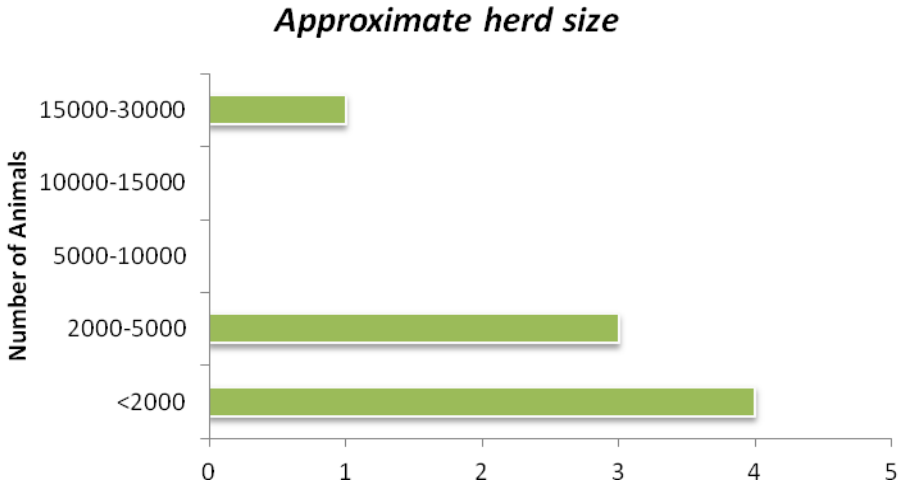


Figure 3. The approximate numbers of cattle run on the participating properties.

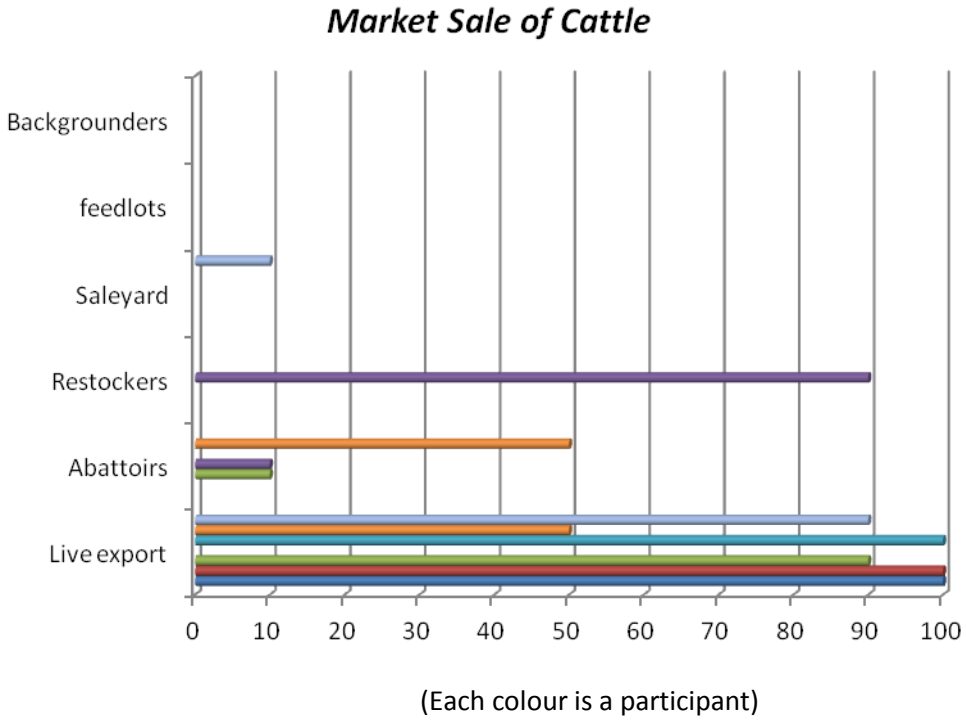
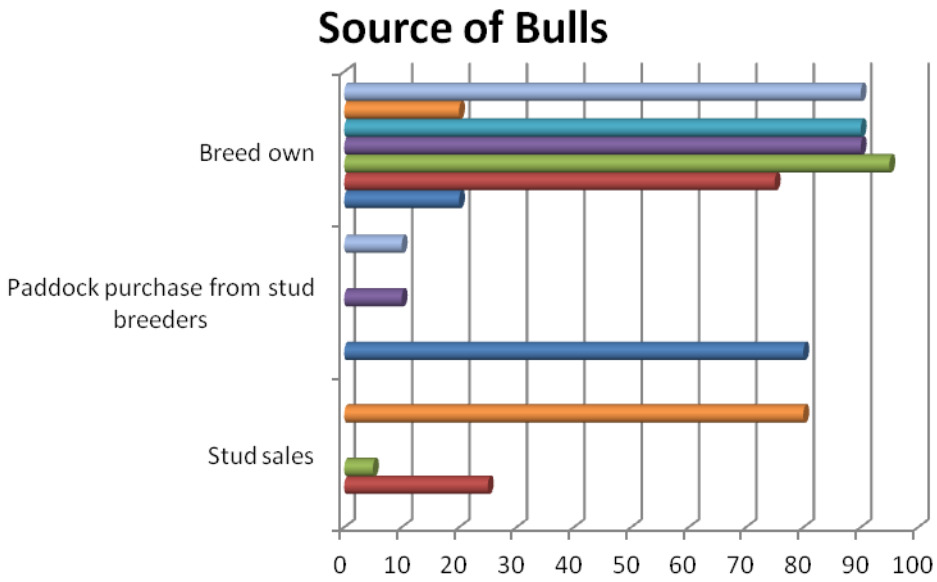


Figure 4. The percentage of sales made by the participants to different markets.



(Each colour is a participant)

Figure 5. The percentage of bulls sourced from each market.

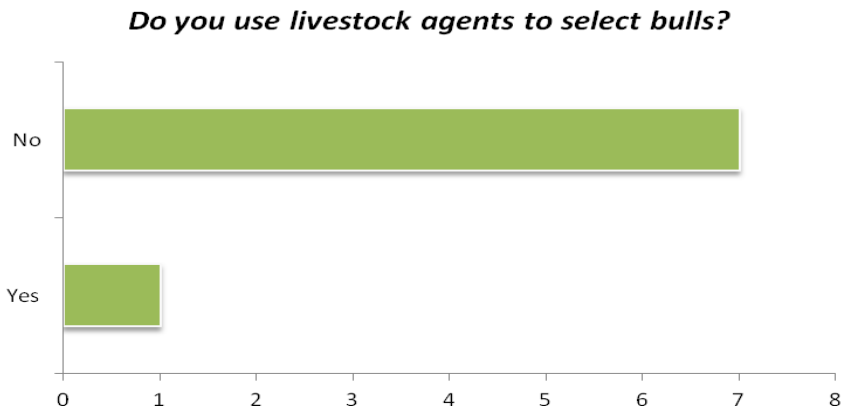


Figure 6. The number of participants who use livestock agents to select bulls.