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Problems of beef breed Charolais in the Namibia.

BACHELOR THESIS

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DECLARATION

I, Magreth Katunohange hereby declare that I have worked on my thesis titled "Problems of the breed in, Namibia and the world" by myself, and all the sources have been quoted and acknowledged by means of complete references.

In Prague, January2017

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Abstract

Cattle belong to an important farm animal in many countries. Namibia is one of them, where a cattle breeding holds the most significant part in Animal Husbandry. The indigenous cattle breed can be successfully crossbred only under the adequate condition of nutrition. The studies of many materials and resources from Namibia show, the demand for high quality beef meat is arising gradually. The local breeders of cattle are not able to meet this demand at present. Charolais is one of the main BEEF breed in the world. Charolais breed is originated from

France. However, the breed has now spread all over the world and plays a vital role in our meat production therefore it is important to understand the problems that go along with the breed.We will be working with the hypothesis that lack of knowledge and crossbreeding are the main causes of the problems affecting expansion of this breed. This thesis will look and discuss at ways why breeders choose to breed or not to breed of the Charolais breed.

Key words: charolais, crossbreeds, Brahman, adaptability, communal farms, meat production

Abstrakt

Skot patří k důležitým hospodářským zvířatům v mnoha zemích. Namibie je jednou z nich, kde chov skotu hraje významnou roli v živočišné výrobě. Domácí skot lze úspěšně křížit pouze za optimálního stavu výživy.

Studie z mnoha materiálů a zdrojů z Namibie ukazují, že poptávka po vysoce kvalitnímhovězím mase stále stoupá. Místní chovatelé skotu nejsou schopni splnit tento požadavek vsoučasné době.

Skot plemene charolais patří mezi nejlepší masné plemeno na světě. Plemeno pochází z Francie, šíří se nyní po celém světě a hraje důležitou roli i v naší produkci masa. Proto je důležité porozumět problémům, tykající se tohoto plemene.

Budeme pracovat s hypotézou, že nedostatek znalostí o plemenu charolais a jeho křížení s místními plemeny jsou hlavními příčinami ovlivňující jeho rozšíření.

Dále se budeme zabývat a diskutovat o příčinách, proč by se chovatelé měli rozhodnou pro nebo proti chovu plemene Charolais .

Klíčová slova: charolais, kříženci, know-how, přizpůsobivost, společné zemědělské podniky, produkce masa

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LIST OF ACRONYMS AND ABREVIATIONS

CH	Charolais
NAMBOER	Namibian group of Auctioneers
SVO	State veterinarian office
PB	Pure breed
SB	Stud breed
CB	Crossbreed
EU	European Union
NAM	Namibia
CZ	Czech Republic
AI	Artificial insemination
EPA	Economic Partnership Agreement
NAD	Namibian Dollar
WTO	World Trade Organization
ČSCHMS	Český svaz chovatelů masného skotu/ Czech Beef Breeders Association
FMD	Food and Mouth Disease
OIE	World Organisation for Animal Health
Br	Brahman
Sm	Simmental

1.INTRODUCTION

Cattle farming is one of the basic pillars of livestock reproduction in Namibia and at times the means of livelihood. Namibia is a country of extremes where cattle farmers must carve out a living in areas ranging from arid desert land and rocky hills, to areas where invasive plants are threatening natural grazing. In addition, there are vast communal areas where cattle must compete heavily for water and grass. Cattle farming in this country is a truly extensive enterprise (Gouws, 2014).

The CH breed belongs to the most widespread beef breed in the world and in the world. Nowadays at least 70 countries on all continents breeds with the CH (Zahradkova et al., 2009). Rechnerova (2016) reported that organic farmers have a choice of four control organizations to choose from. Czech Republic was not farming with CH and managed to get the first import in 1990 from Hungary.

Charolais breed is not a home -bred Namibian or African breed for that matter as mentioned above. It's very difficult if not close to impossible to state or proof how long Namibia has been farming with the Charolais breed as most farmers do not keep record of any data. The kind of breeding strategy to be followed in Namibia and in Southern Africa in general, depends primarily on the environment and level of management. As far as environment is concerned, it is general knowledge that beef production in Namibia is practised under an unstable and hazardous production milieu (Lepen, 2000). Therefore, introducing the Charolais breed to the tropic weather conditions of the Namibian climate was not a smooth transition. This this will discuss on how the farmers made systems in crossbreeding to accommodate and make different breeds productive in the hot, dry Namibian climate. Namibia is the driest country in Africa south of the Sahel where almost the entire land surface can be classified as arid and semi-arid. More than 60% of Namibia's population live in the rural parts of the country where livestock production is the predominant economic activity to sustain a decent living for rural households (Kressirer, 1995). Beef cattle production is the most important agricultural activity in Namibia today. Gross cattle numbers vary between 1.8 and 2.5 million because of fluctuation rainfall patterns affecting the viability of beef production (Lepen, 2000). There is a vast variety of

production as the country has an enormous different between commercial and communal farming. Production is relatively high in the commercial sector and comparable with developed countries. Commercial production is based on cross breeding, using predominantly *Bos indicus* breeds and their crosses as dams. The commercial sector mainly produces beef for the export market which is crucial for Namibia's export economy whereas in the communal sector, beef cattle plays several important roles in the economy of this sector (Lepen, 2000). With all this said, Namibia has defiantly evolved in its cattle beef production thus, transporting meat to the EU. Meaning it has reached and surpassed the ambitious standards of the EU requirement. Furthermore, Namibia farmers have mastered the art of crossbreeding and have started to accept the importance of man-made opportunities like AI- artificial insemination. It has only been in the early seventies that Namibian animal scientists acknowledged the ability of the approximate 400 000 indigenous Sanga cattle in the harsh and relatively undeveloped northern parts of Namibia to survive and reproduce under conditions that have prevented many other exotic cattle breeds from prospering. Consequently, this led to the inclusion of the indigenous Sanga breed in the breed characterization studies at Omatienne Research Station in 1972 (Lepen, 2000). Research like this is the reason why the Charolais breed has not been completely tossed aside by Namibian farmers even though the breed itself has its number of sufficient problems causing farmers headaches. This thesis will discuss the major development that has come out of the Charolais breed and how famers have found a way to make the breed work, regardless of the Namibian climate that was once considered harsh or unreproductive for the Charolais. This brings us to the Namibian Brahman Breed Society and its developments. Brahman beef cattle have traditionally been selected using a classing system that relied on differences of subjectively assessed traits with the belief that these traits are either an important part of production or are related to qualitative or quantitative traits of economic importance. The traits broadly speaking were mainly aesthetic i.e. head, body condition, sex characteristics, appearance, size, hind- and forequarter, and some more functional traits like front and rear legs, scrotum, sheath form, sheath opening and udder form (Fair et al., 2012). Due to the intensive amount of dystocia and as

discussed above it vital that's its reduced and at times crossbreeding is the key. The economic importance of dystocia in terms of calf losses and subsequent impaired reproductive performance has been well documented (1, 2, 3, 4, 5). The incidence of dystocia must be minimized to improve reproductive performance and maximize profits (Price and Wiltbank, 1978). With this said the thesis will put emphasis on the importance of crossbreed and finally focus on the product of a Charolais bull and a Brahmana cow and /or vice versa, hence the Charbray. The cattle breed Charbray was originally tested in Australia in the early 1960s. At that time, the founders of the Charbray Society used Charolais and Brahman cattle to obtain the Charbray breed. This thesis will also compare the adaptability between original African/Namibian breed and the special introduced breeds like Charolais and the Charbray being recognised as a breed of its own.

OBJECTIVES OF THE THESIS

The main objective of this thesis was to study and determine whether the Charolais beef cattle has adapted to the Namibian climate.

O Determine the knowledge of Charolais in Namibia

O Establish and proof that crossbreed offspring are more suitable to the Namibian climate**.**

The focus on Namibia and CH is as follow specifically:

Emphasize the importance of quality breed thus producing quality beef.

Crossbreeds- find the optimum breed that crosses well with the CH, Determine and develop a long-term breeding strategy suited to both communal and commercial production environments via crossbreed. Determine which indigenous breeds work well when crossed with CH

Furthermore, a comparison of the different crossbreeds and suggestive methods on how we can improve pure breeds or studs to produce quality and quantity. The Charbray, as a breed of its own. Determine whether there is a possibility for communal farmers to not run away from farming with the infamous Charolais. Determine whether the climatic conditions make it impossible to farm with Charolais and how the home breeds have adjusted to the weather conditions. Have a look at how other Southern African countries breed or do not breed with the Charolais and how we can learn from them to improve the use of the Charolais. Find ways on how to minimize/ eradicate the drastic loss of calves due to dystocia and whether crossbreeding is the way to decrease muscle-grown diseases.

HYPOTHESIS

H1 Assumption is that most farmers have knowledge of the Charolais breed.

H2 This research paper predicts that the main reason of avoiding CH is dystocia.

2. LITERATURE REVIEW

2.1. The Charolais (CH) breed

2.1.1. Scientific and common names

Identification of breeds provoke controversy and naming systems can vary depending on the person. However, there is no argument that Charolais (CH) is scientifically classified as *Bos taurus* cattle more specifically it's the *Bos (primigenuis) taurus* and this physically means that they are not humped and have tight skin. However, commonly its referred to as French Charolais regarding its origin and this is significant in helping to map the origin of the gene (Capitan et al., 2009). The more common name Charolais comes from an area in France known as Charolles ,where it's believed to have originated.

2.2 Characteristic of Charolais

Figure 1: Large built of a typical CH bull

Figure 2: CH cow and its calf in the Cz

(Source: ČSCHMS, 2006)

Figure 1 above showcase the massive built of a typical Charolais bull in the Czech Republic. Figure 2 shows a CH cow and its calf. This are the most common CH physiological attributes today.

Speaking of French breeds most of them have melanocytes in their colour. The common CH is creamy white and this presents a lower melanogenic activity. However, there are different coat colours in the CH breed alone. Sylvain et al., (2004) also observed that there is a wide range of coat colours particularly black, red and creamy

white. Coat colour also varies depending on whether an animal is pure breed or crossbred.

“Livestock populations have been subject to a variety of evolutionary forces during their histories” (Zahradkova et al., 2007). Thus, it’s difficult if not impossible to determine the original coat colour of a specific breed because of all it might have encountered during its lifetime. Gene mutation can cause red coat colour instead of the tradition white creamy colour. It’s believed that purebred CH have white noses or rather the mucous membranes are pink spotless. Natural forces that are beyond our comprehension might have affected on how the CH coat colour is today. The head is relatively small, short with a broad flat forehead, broad muzzle and strong cheeks, expressive eyes, and medium ears (Šebestová, 2016). Looking at a CH most commonly you will notice that they are not polled or not horned. It is evident that in the meat industry or any selling industry for that matter, appearances plays a very important role. It has a significant economic impact because of the value based on external looks alone before the quality or productivity of an animal is determined. Cattle might have scurs on their heads instead of horns and this is genetically determined by the phenotype that maps the polled locus (Capitan et al., 2009). CH are naturally horned but because this has so many negative connotations Like mentioned above Ch might vary in colour coat so it’s very important to focus on other physical characteristics. One of the most prominent factor other than the colour it’s the massive size of the CH. Birth weight and body weight was observed by (Simčič et al., 2006) and concluded that during grazing and depending the season this affect the CH as their size varies. CH are broad and are so much heavier than other breeds. It was observed that the CH was mainly selected for its bone and power. An adult cow can weight more than 750kg, and an adult bull 1200kg write Zahradkova et al., (2006) The excellent vigour ability confirmed by many authors both purebred bulls, heifers and in the case of commercial crossing with dairy cattle breeds (Barton et al., 2001 and 2006). Furthermore, CH have short and muscular neck that connects seamlessly with deep chest and circular ribs that are well tied to the shoulders. Gifted with flat, broad and well-muscled spine and spacious hip area. Their bodies are parallel to the ridge and limbs are strong, well-built

with strong clove hooves. The legs are slightly smooth but very broad and square (Šebestová, 2016).

2.3. Breeding standard

The Czech Beef Breeders Association (2014), states that the Charolais breed belongs to beef breeds that swells at two and the body matures at three years. As mentioned it has a medium to bulky frame with a harmonious body structure. A strong and solid skeleton form that is the foundation for the distinctive muscles, width and depth dimensions of the torso. The breed is reared as horned and non-horned form. Animals genetically polled are referred to as "P" and free corners/horned "V". Animals that are the product of the specialized program "double muscle" are classified as "DM"

Color uniform white (cream)

Head relatively small, short with wide flat forehead, wide mulch and strong cheeks, eyes sharp, middle, soft

Neck short, strongly muscled

Throat deep, round, well tied with shoulder

Back straight, wide, well-muscled, lumbar landscape spacious, bottom line

Abdomen is parallel to the back

Limbs are strong, well build

Table 1: Requirements for breeding standard

CATEGORIE	WEIGHT 120 DAYS	WEIGHT 210 DAYS	WEIGHT 365 DAYS	WEIGHT (KG)	HEIGHT IN KRIZI*
Bulls	180	290	470	X	130
Heifers	170	250	350	X	128
Heifers (up to 40months)	X	X	X	640	137
Cows (after 3. calving*)	X	X	X	710	140
Bulls (over 3 years)	X	X	X	1190	148

(Source: ČSCHMS, 2006)

The table above shows the breeding standard of the Ch breed for a specific category. For the bulls and heifers, the weights are shown after 120 days, 210days and 365 days and their heights respectively. Also, Heifers and cows and bulls are shown at specified months or calving stages with their weights and heights. This breeding standers were recorded almost 10 years ago and are still accepted.

2.4. Breeding objectives

The Czech beef breeders association have recognised that the breeding of the Charolais cattle is an effort to create an animal population of a modern type of cattle that combines excellent meat performance while maintaining good adaptability to the natural environment, good maternal qualities and skills, increase growth and meat production (Anon, 2006).

2.5. Performance traits

Heat tolerance-''The Charolais bull will still be out working in the hottest part of the day, breeding cows, while other bulls are lying around in the shade. The Charolais bulls cover more cows, in our part of the country," says Rogers (Tomas, 2017). Studies done in mch warmer or arid paces might not agree with this sentiment. Maggie reported that such muscling and body fat content minimizes tolerant for heat.

Resistance to ticks and disease- This breed is believed to be susceptible to ticks and fleas due to its furriness around the neck area. The warm temperature the fatty erea is home to disease carrying fleas. The pink musous membrane around genitals is prone to be an attractive side to fleas (Thomas, 2007).

Colour advantages- "Uniformity in the calves is another plus. Nowadays, just because a calf is black doesn't mean it is Angus. Everything has gone black. There are black Simmental, black Gelbvieh, black anything. But there is true uniformity in the calves when you use a Charolais bull; you know it's a Charolais-cross calf. They have a distinctive look, so you know what you are getting. When you buy a black calf, however, you don't know what you are getting." Black has covered up a lot of other genetics.

Temperament- Calm and docile temperament and easy to handle like most French breeds.

Excellent mothers- Nurturing and gentle mothers who are protective of their young, even though they can have very difficult births due to dystocia (Kvaplilik et al., 2007)

2.7. NAMIBIAN AGRICULTURE

Firstly, this paper will look at the geographic distribution and frequency of *Bos taurus*, the taurine allele is the most common breed, but only among the sanga breeds of the southern African region and the trypan tolerant taurine breeds of West Africa. In West Africa and in the southern Africa regions, zones of introjection were detected with breeds showing both Y chromosome alleles (Hanotte, 2000). Breeding and reproduction of CH have huge economic impact (Song-xian, 2006).

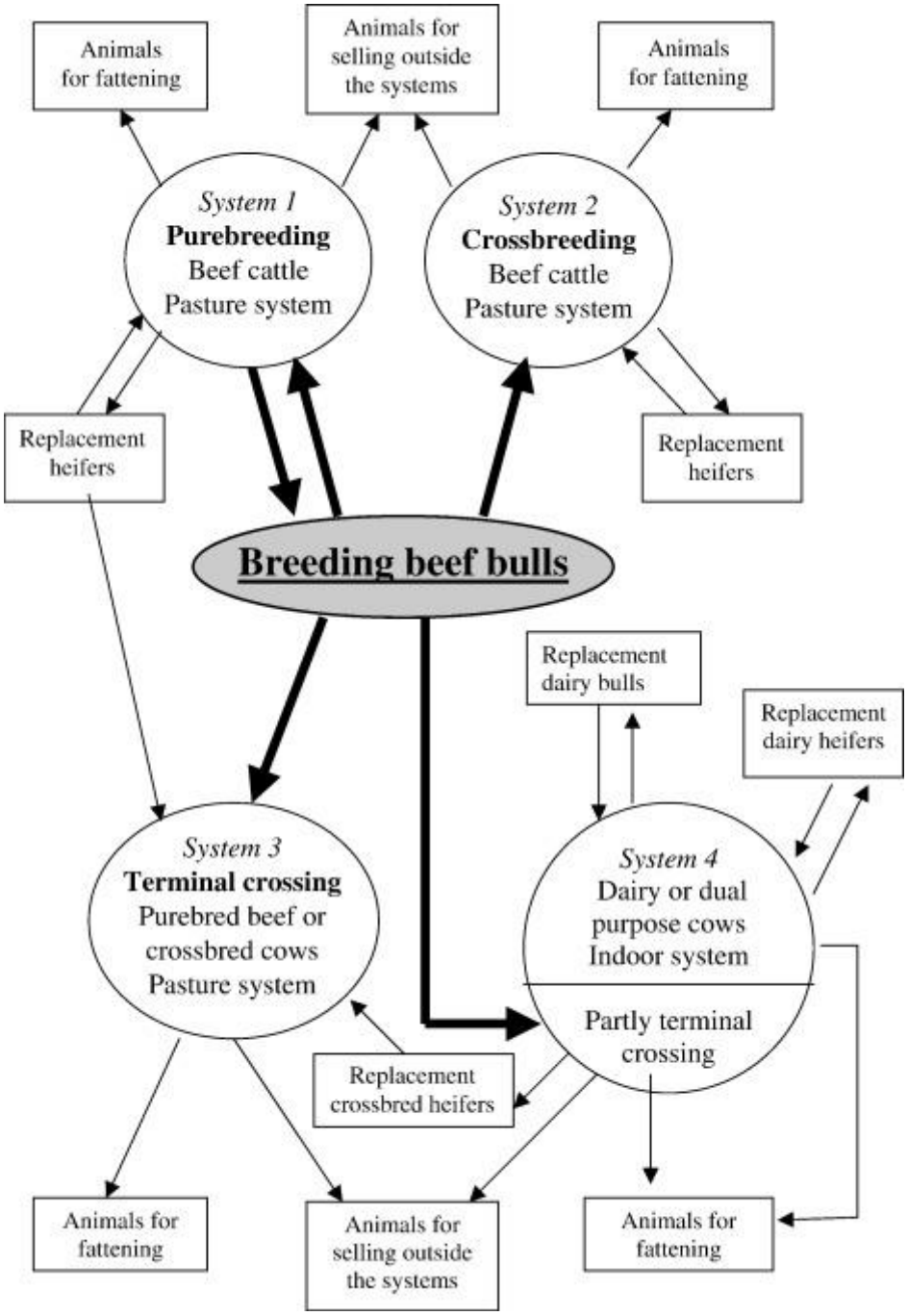

Figure 3: Definition of production and management systems.

(Source: Wolfova et al.,2007)

Figure 3 above shows the important production systems which can be divided in 4 main systems.

System 1: This system includes purebred beef cow-calf pasture systems producing females and males for own replacement and for other systems. Also included are both seedstock production and purebred commercial herds.

System 2: Crossbred beef cow-calf pasture systems (rotational crossing) producing their own replacement females but buying breeding bulls or their semen.

System 3: Crossbred cow-calf pasture systems (terminal crossing) importing their female replacements from dairy or dual purpose cow herds or from herds of beef dam lines and buying beef bulls or their semen for terminal crossing.

System 4: Dairy or dual purpose milking herds (indoor system) applying terminal crossing with beef bulls to part of the herd.

Arid in the west and semi-arid and sub-humid moving into the central regions is how you would identify the climate of Namibia. Mentioned several times in this study, there is no doubt that Namibia has one of the hottest climates in the world. Due to this there have been researchers and project trying to maximise water reuse for urban agriculture. Woltersdorf et al., (2006) observed that adequate sanitation, waste water treatment and irrigation infrastructure often lacks in urban areas of developing countries. Contrary to this, more than half the percentage of people are employed in the Agricultural sector (Ndinamwene et al., 2006). Most livelihoods depend on natural resources as a coping strategy. About 71 % of the income of families depend solely on Agriculture (Kamwi et al., 2015). For this reason, this study puts emphasis on the fact that it's very important to maintain and mainly improve the agricultural sector to improve productivity. Naturally, Nam has a small population that is increasing at an alarming rate due to teenage pregnancies, modern medicine and improve elderly care. Therefore, water productivity and its reuse has been a major aspect and models and infrastructure has been built to raise water productivity in by +-10%, in comparison to reusing water for agriculture it has a +29% more productivity (Woltersdorf et al., 2006). With projects like this the study is positive that water scarceness will not play a role in a disarming farmer in farming with a breed such as Charolais. With the relation

that We cannot discuss the development of an African country without asserting its comparative advantage in the production of livestock and meat products (Cabrera et al., 2010).

2.8.Namibia and exports of cattle

The Figure below shows exports of Namibian cattle back in the 90s, more than 500 000 cattle units were transported either to Butchers or to South Africa. By 1996 that's when the number of cattle units increased tremendously.

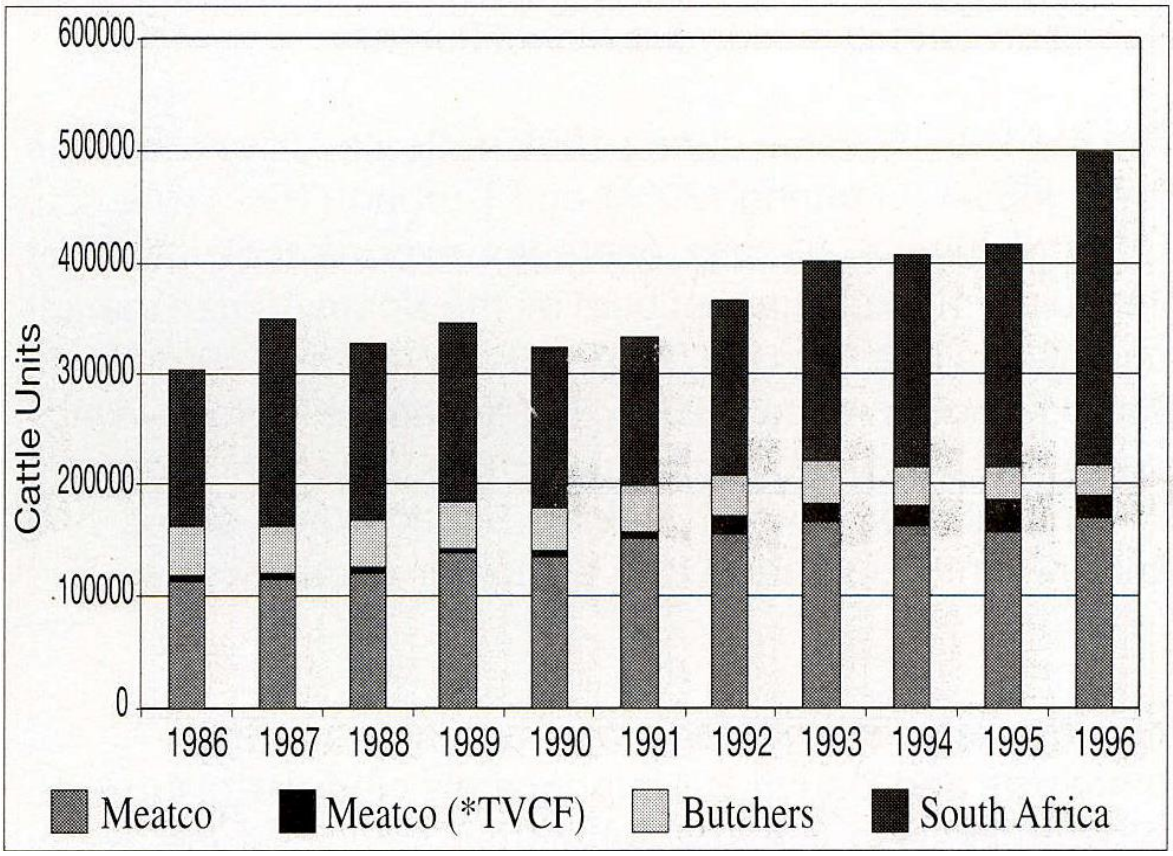

Figure 4: Local markets for Namibian export cattle.

(Source: Strydom et al., 1998)

2.9 CHALLENGES AND THREATS TO THE CATTLE/BEEF INDUSTRY

2.9.1. CLIMATE

This factor is one of the most essential part of livestock management because climatic conditions determines the productivity of animals regarding milk yield, growth rate, reproduction and productivity (Svotwa et al., 2007). The climate of Namibia is identified as very unfortunate for the agricultural sector as less than 1% is arable and the rest is considered permanent pastures, forests, woodlands and dessert (FAO, 1996). Svotwa et al., (2007) reported that cattle have reduced feed conversion efficiency when exposed to extremely hot and stressful environments and this reflects changes in the mechanisms that regulate metabolism.

Figure 5: Typical dry/hot farming area on a Namibian communal farm.

Source: Magreth

Heat stressed cattle display both behavioural and physiological changes specifically, they stop grazing, seek shade and lie on the even warmer ground with outstretched legs (Svotwa et al., 2007).

2.9.2 DISEASES

Animal disease and hygiene measure are the primary obstacles when it comes to export opportunities. Within the first 45 days of a calves' life its proven to be a drain and a possibility for *E. coli* diseases. CHEK VILLAGE VET FOR DISEASES

2.9.2.1.FMD- Foot and Mouth Disease

Namibia become the second African country to be registered as FMD free in February 1997 (OIE). It's a fatal viral disease and it disastrous. Its easily spread through air or close contact with animals.

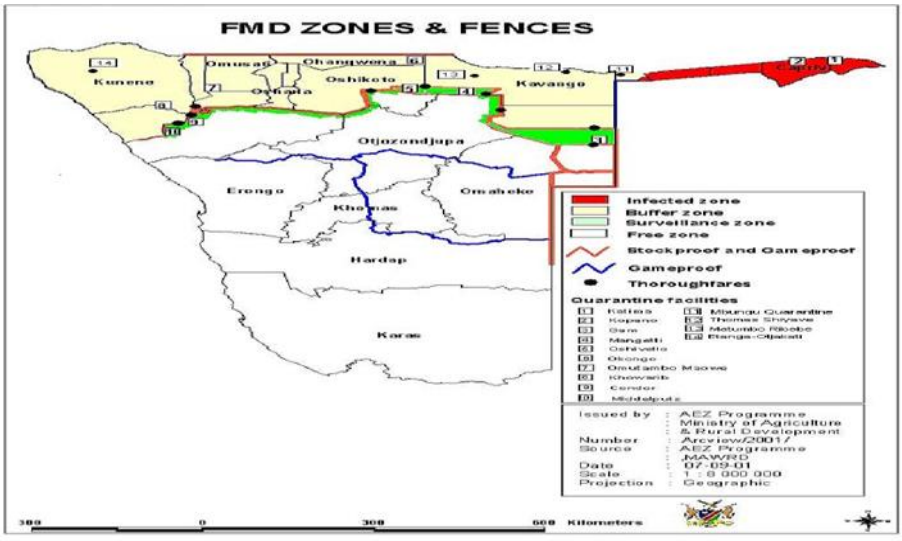

Figure 6: FMD zones and fences

(**Source:** Agricola, 1998)

The figure above represents the Namibian FMD or Veterinary condon fences (Redline).

2.9.2.2.LSD- Lumpy Skin Disease

LSD causes fever, depression, skin nodules, oedema and enlarge lymph nodes. This weakens the animals tremendously and it also causes nasal discharge. Furthermore, it causes swollen limbs and lameness, the milk production decreases. The cirus is mechanically transmitted by inset vectors (mosquitoes, flies and ticks.) (FAO, 2014).

2.9.2.3. Anthrax

It's an infection caused by the *Bacillus anthracis* **bacterium.** It's a fatal disease spread by the spores of the bacteria, there is however vaccine for this.

2.10 WELL ADJUSTED BREEDS/INDEGENOUS-

Namibia has at least more than 25 breeds of cattle and this wide variety provides farmers the option to discriminate against certain breeds.

Brahman (Br)-*Bos indicus*

Figure 7: Prominent Brahman bull at a farm in Bots

Source: Magreth Katunohange

The Brahman breed originated from the harsh climate regions of India and it's at times considered the "sacred cattle of India": Hindu faith refrain from eating meat from them, not permitted to be sold or slaughtered. It's believed to have been in Namibia since 1954 (The NamBrah, 2012). The Namibian Brahman association reported 12

fundamentals of Br, genetically versatile, and that they adapt to the Namibian conditions showing commendable hardiness amazing

Heat tolerance in contrast to this Moran, (1970) observed that cold climates that can reach freezing point should not affect the performance of this diverse cattle. Furthermore, factors that allow the Br to adapt to all those challenging climate conditions: Hair coat which are short and thick which reflects the sun's rays. The dark skin pigmentation keeps the out the sun s rays. Loose skin and sweating ability-they have sweat glands and can sweat freely through their loose skin, main contributor to their heat tolerance materially. Finally, **internal body heat** they produce less heat internal body heat in warm than normal European cattle (Goodman, 2012).

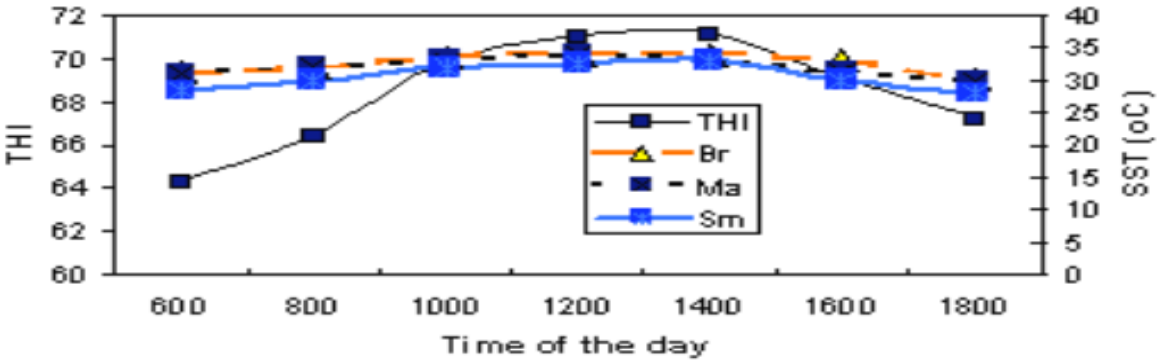

Figure 8: Comparison of brahman body temperature during the day.

(Svotwa, 2007)

Size- They are quite large bulls can weight from 1600lbs to 2200 lbs and cows 1000 to 1400 lbs and grow rapidly (Briggs et al., 1980).

Temperament-The Br disposition is considered intelligent, inquisitive and shy and it's this characteristic that require them to be treated with kind and careful handling (Cooke et al., 2009) reported negative relationship between the combined docility score and reproductive performance of beef cattle. The goal in livestock farming is to maximise performance and considering that Namibia has mainly communal farming the handling of Br with kindness can be quite challenging. Mainly because this animal

graze freely in an open unfenced area and share drinking ponds with other animals and thus having contact with other farmers who might not necessity treat them with the necessary kindness due to the water completion in most areas.

Resistance to ticks and disease again due to their thick skin texture, a short dense hair coat and the ability to jerk their hides when irritated and the secretion of sebum which is extremely effective in in repelling insects and pests. **Excellent mothers** their calves are small to medium and they have abundance milk for calf, high weight at weaning, live longer, produce calf at 15yrs Br also have great qualities like avid forages, good browser and make effective use of available forage and good walkers. Regarding the growth of the weaners and steers it's held to a high regard as well. Carcass quality and high yielding carcass with low fat (Namibian Brahman Breeder's Society, 2012).

Bonsmara- *Bos taurus*

Well adapted to climate, very fertile, breed small calf, high quality meat, calm temparent-handle with ease, suitable 4 crossbreeding

Afrikaner- Bos primigenius

Also known as Africander-suiteble 4 crosssbreed with exotic breeds, resistant to endemic diseases-redwater, heartwater, gallsickness, react well to extensive feeding, extensive grazing area, hair discourages tick attacks, meat-high quality,tender,succulent.

Simmentaler-***Bos taurus***

Adabts easily to varied conditions, high beef yields, body produce a well-fleshed carcass of solid red meat minimum waste fat, improve quality of meat with white fat n excellent marbling, improves milk yield (FAO, 2017).

Nguni cattle-Bos taurus

Fertility n resistance to disease, heat tolerant, long productive lives, cows produce more than 10 calves, excellent resistant to ticks and immunity to tickborne diseases, disease and mortality low, fatten well on natural grazing as in feedlot, good temperamental n mothering ability (OIE, 2012).

3. METHODS AND MATERIALS

3.1 DATA COLLECTION METHODS

3.1.1. Personal interview

For this study, it was very important to establish a personal connection with the farmers because most farmers are very hesitant to allow a stranger on their farms. For primary data to be adequate, an important concept was personal consultations with each farmer. Major advantage was the speaking of local languages especially in the next section of data collection. Time taken to travel to specific farms ensued the eagerness of farmers to cooperate. Also, the advantage of having been familiar with farming systems and because most of this farms are on communal fences thus they are not fenced.

3.1.2 Use of questionnaire

The main aim of questionnaire was to ensure first hand biased opinion from the farmers involved in the study. Distribution of questionnaire was done with the help of State Vet offices in the regions. Farmers recognised information distributed by the SVO as vital to their farming systems and were willing to cooperate fully.

On the contrary farmers felt the need to sugar-coat them know-ledge as fear of judgement and /or even raising inspection in their specific farms. See appendix for example of questionnaire. In this research project, through questionnaires distributed to farmers and veterinary offices. There was a total of 50 questionnaires send out, however with only 42 respondents.

3.1.3 Farm visits to identify the CH

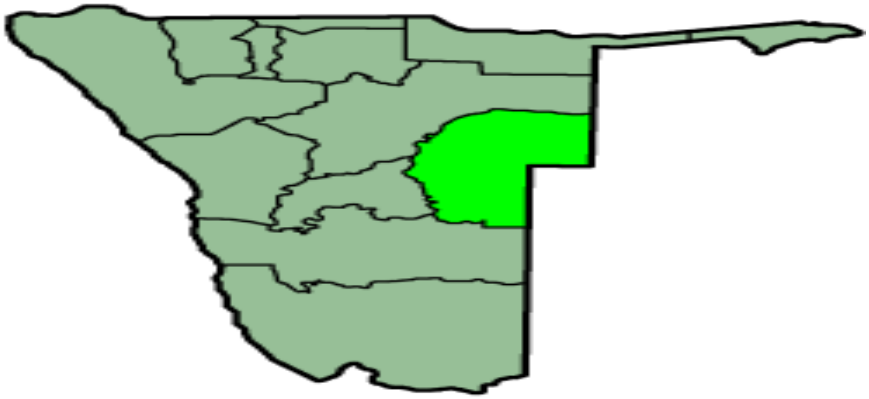

Figure 9: Omaheke region

Source: (FAO,2007)

We visited communal and private farms to try and identify the CH breeds and compare which breeds are most common.

Most of the research and data was obtained from the Namibian Award winning farmer Mr Piet Coetzee s farm, Petrusberg which is about 170km south of Windhoek in the Rehoboth district. Omitara direction of Gobabis known as the cattle country and a communal farm Dina in the dry southern area of Namibia. Most farmers are communal, thus rarely have pure stud breeds. Most animals roam freely for water and food. Therefore, there is little to no control of the interaction between animals of other owners, since having a singular water point as a meeting place. Cross breeding is almost always inevitable. I will also discuss the most common crossbreeds and the most successful. This critical situation convinced the Department of Agriculture and Rural Development to review and evaluate different breeding strategies to satisfy the following objectives:

To be a registered Charbray animal the breed must range between 25% & 75% either way between Charolais and Brahman.

On the private farm of Mr. Coetzee, Charolais are divided into 2 groups consisting of 30 cows in each group and 1 Bull in each group. They are kept separate from the

commercial cattle to avoid crossbreeds. The calves are vaccinated at 9months and are put in a separate camp.

Figure 10: Cattle sharing waters sources in a river.

Source: Anon

3.1.4 Artificial insemination project in Otjinene

This research project was also observed AI at a communal farm Tjivetera in Otjinene in the Eastern part of the country to be able to identify a compare the climate factors. In comparison, they are very different areas geographically and farm system wise. Petrusburg is a private farm that is fenced and the animals are in a very controlled area. They have no contact with other animals from neighbouring farmers and this practise is like the system in most developed countries. However, Tjivetera the animals roam freely and depend on the land and nature to provide feeding for grazing. They depend on boreholes, rivers and dams for drinking water and as mentioned above that

the Eastern part of Namibia consist mainly of the Kalahari Desert. Water sources are rather scarce and very often there a long period of drought. Therefore, it was very important for us that we use realistic conditions to obtain data for this study. Mr. Kandetu has been in the farming industry for a very long time and has at times suffered huge amounts of loss due to drought. So, when approached about his farm being used by the Namibian government for an AI project he was more than willing because he knows that he will have access to Health officials such as Veterinarians, animal health technicians and knowledgeable people always during AI project.

4. RESULTS

The analysis and statistical evaluation of the results found in this research will be discussed in this chapter. Data processing was done by excel and the data analysis - descriptive statistics were the results proven by pie charts and graphs**.** Out of the 50 questionnaires send out, we got 42 respondents as mentioned above.

1. Do you know what Charolais beef cattle are? If yes, proceed to next question. If no, please jump to question number 3.

- ❖ Yes ( )
- ❖ No ( )

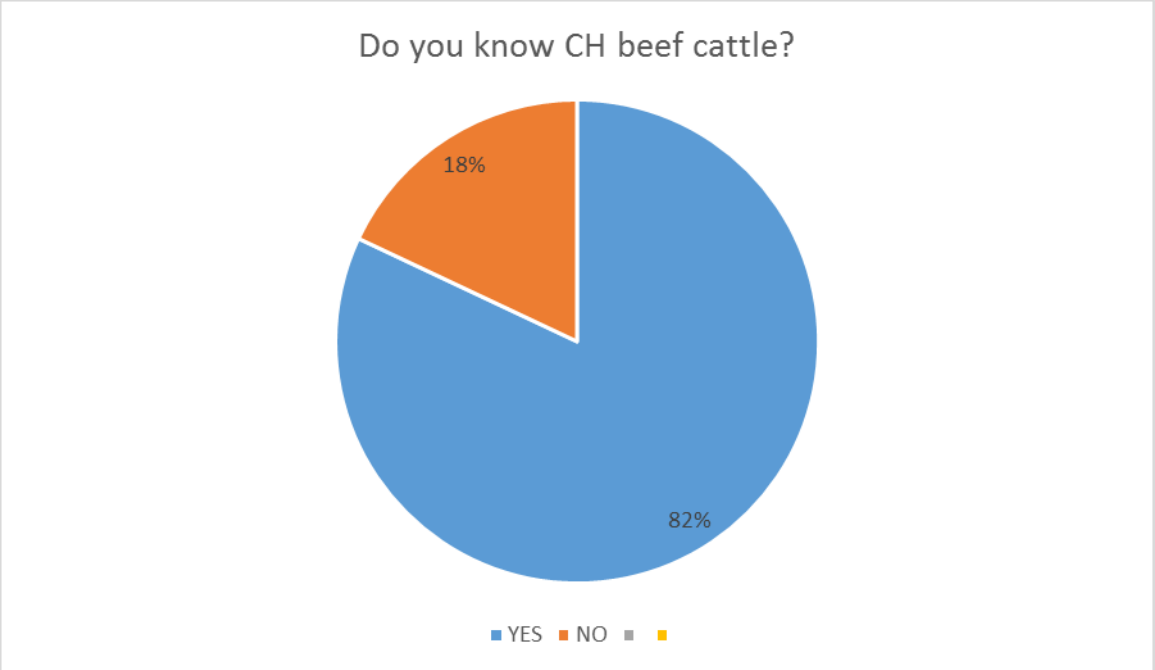

Figure 11: Farmers knowledge of the CH breed.

The figure above shows that 82% of the population have knowledge of the CH breed and its does not specify whether it's on own farms or not. The observations reveal that only 18% had no knowledge of the CH breed.

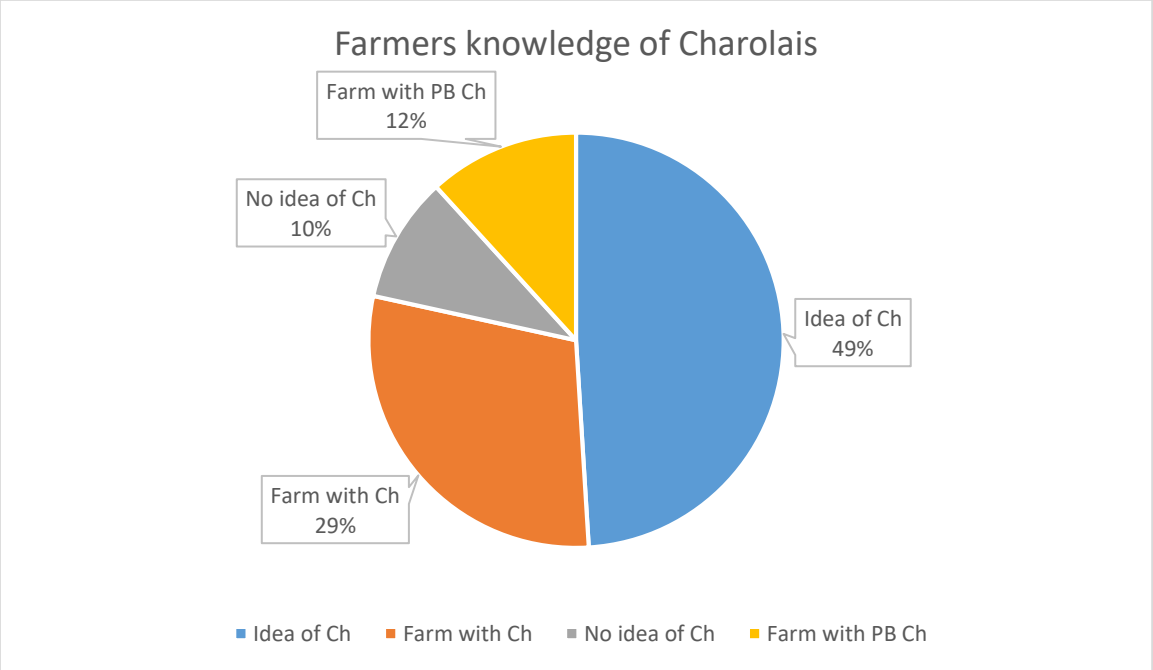

Figure 12: Farmers knowledge of the Charolais, interview.

The figure above shows the number of people who had any knowledge of the CH, almost 50% had an idea even if they were not farming with it.

2. Please kindly select on which of the farming systems below did you first encountered Charolais cattle?

- ❖ My own farm ( )
- ❖ Private farm ( )
- ❖ Communal farm ( )
- ❖ At an auction/ show ( )

3. In your opinion do Namibian farmers farm with Charolais but only for Private farmers (Stud breed).

- ❖ Agree ( )
- ❖ Strongly agree ( )

- ❖ Disagree ( )
- ❖ Strongly disagree ( )

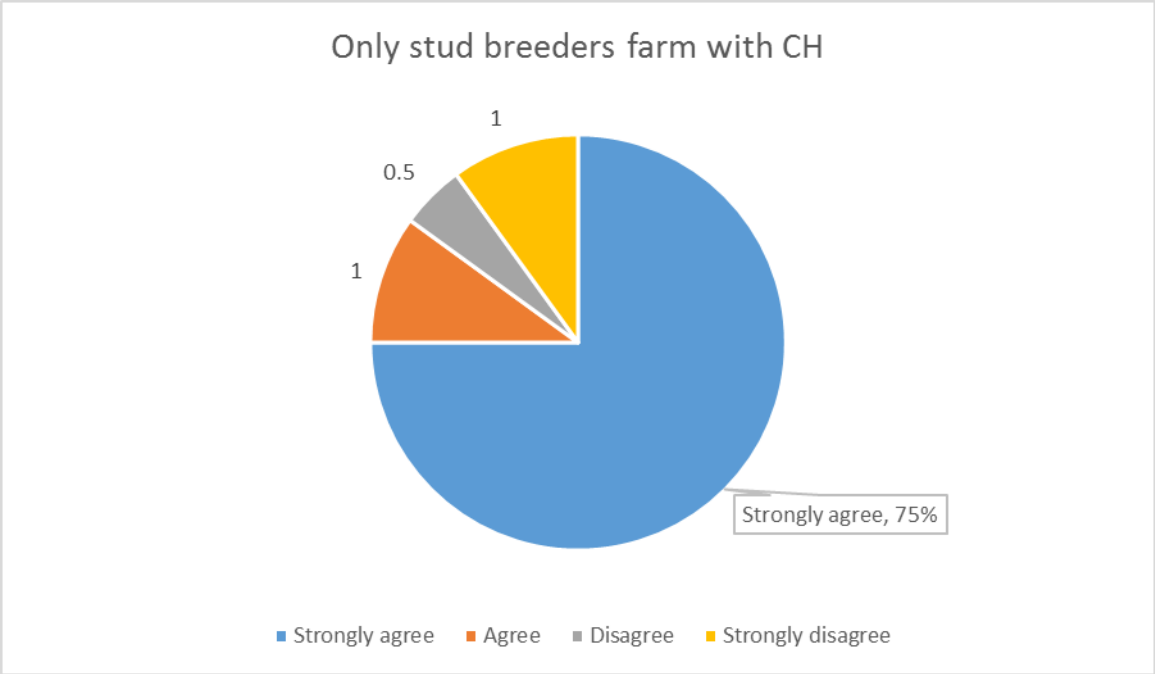

Figure 13: Only stud breeders farm with CH

Figure 13 observes that the majority of questionees strongly agreed, 75% that the CH breed is farmed by private farmers and only a total of 25% thought otherwise.

4. Charolais is a massive breed and this causes infertility issues and loss of calves during birth. This is the main reason Farmers are hesitant to farm with the this breed. (Dystocia).

- ❖ Strongly Agree ( )
- ❖ Agree ( )
- ❖ Disagree ( )
- ❖ Strongly disagree ( )

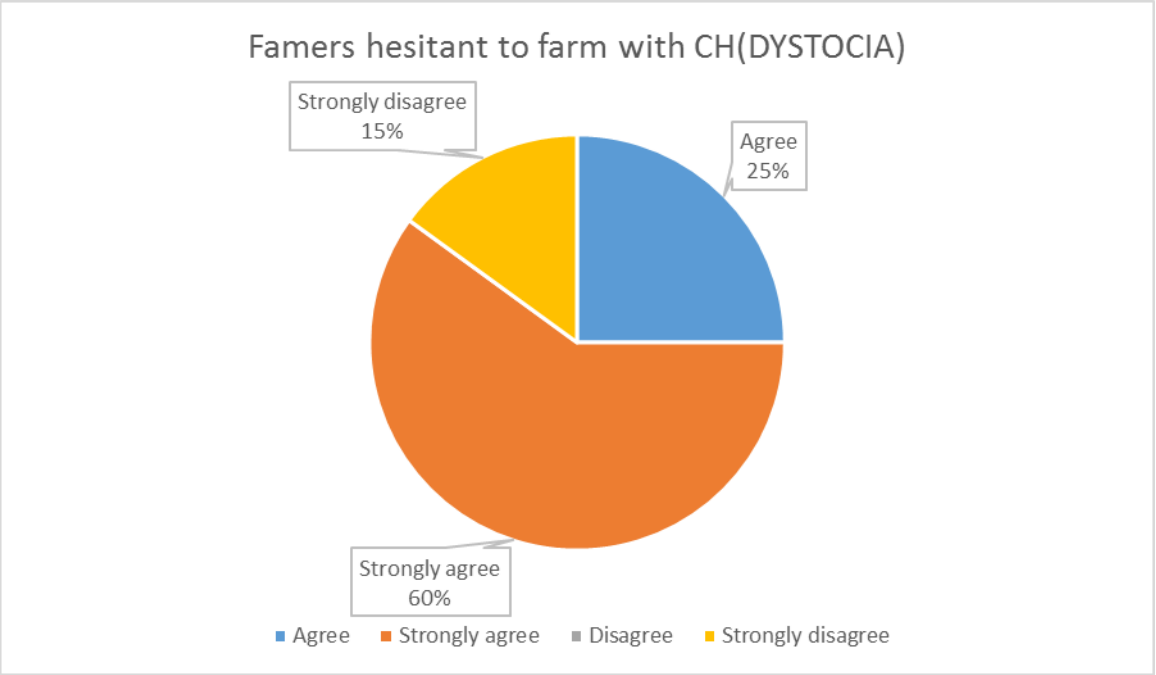

Figure 14: Farmers hesitant to farm with CH (DYSTOCIA).

Figure 14 shows that more than 50% strongly agree that Dystocia is the reason farmers are hesitant to farm with the CH breed and 15% strongly disagree that this is the reason for hesitancy. However, 25% merely agreed that this is the reason that they are hesitant to farm with CH breed.

5. Namibia depend on international beef trade to improve productivity. (Complementary).

- ❖ Strongly Agree ( )
- ❖ Agree ( )
- ❖ Disagree ( )
- ❖ Strongly disagree ( )

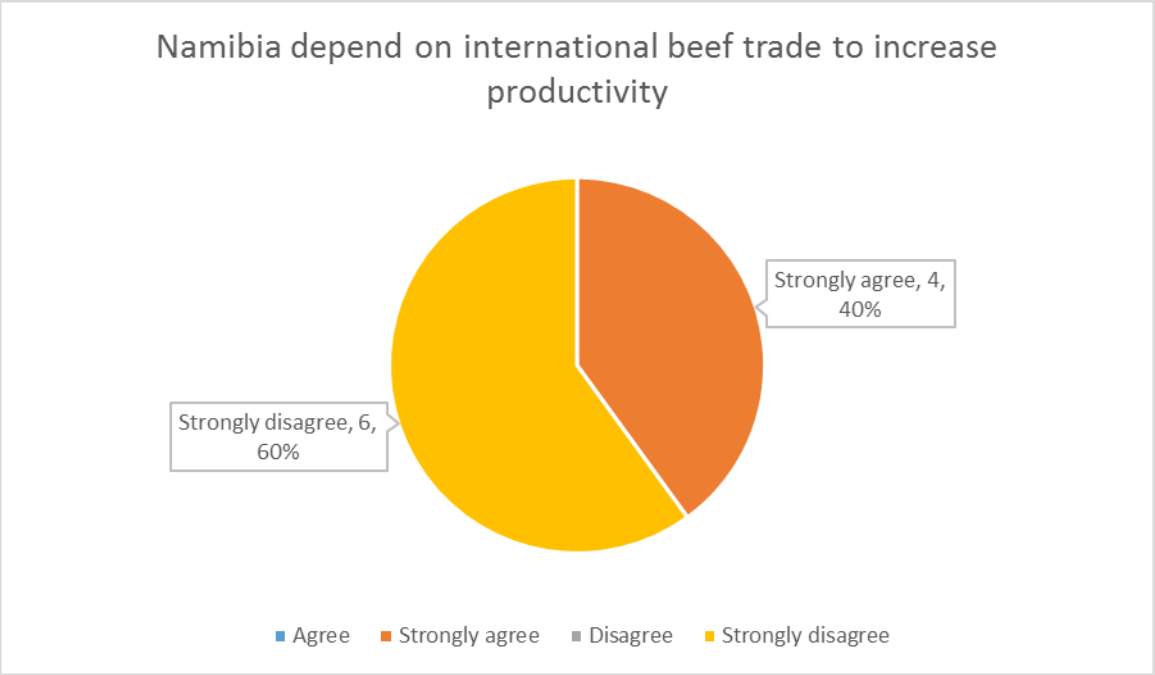

Figure 15: Namibia depend on international beef trade to increase productivity.

To increase productivity Namibia depends on international beef trade shown in Figure 15, and its observed that 60% strongly agrees with this notion. On the other hand 40% strongly agrees that Namibia is indeed depended on international beef trade to increase productivity.

6. In my view, the main reason there is minimum CH farming is (Attracting attention):

- ❖ Climate (adaptability) ( )
- ❖ Breeding cost (transportation, supplements) ( )
- ❖ Infertility issues/Veterinary inspections ( )
- ❖ No opportunity/don't have know-how ( )

The figure below explains and confirms the hypothesis that the Brahman breed is best suited for the hot climatic environments. Br was compared with the Ma and Sm and it's the only breed that displayed constant heat regulation and could maintain a consistent body temperature. Even though the Br alone can maintain the beef

productivity it however cannot improve it thus bring me to the next result. They need to be cross bred with CH to produce optimum beef quality and thus improving the beef productive and quality. The result or the **offspring** of Ch x Br results in the **Charbray.** Some studies must recognise the Charbray as a breed on its own.

Famers take:

Shortcoming of the Charbray when it comes to farmers:

Respectively, the Charbray is a result of 2 of the heaviest breeds, the Ch and Br. Farmers are hesitant to farm with this breed:

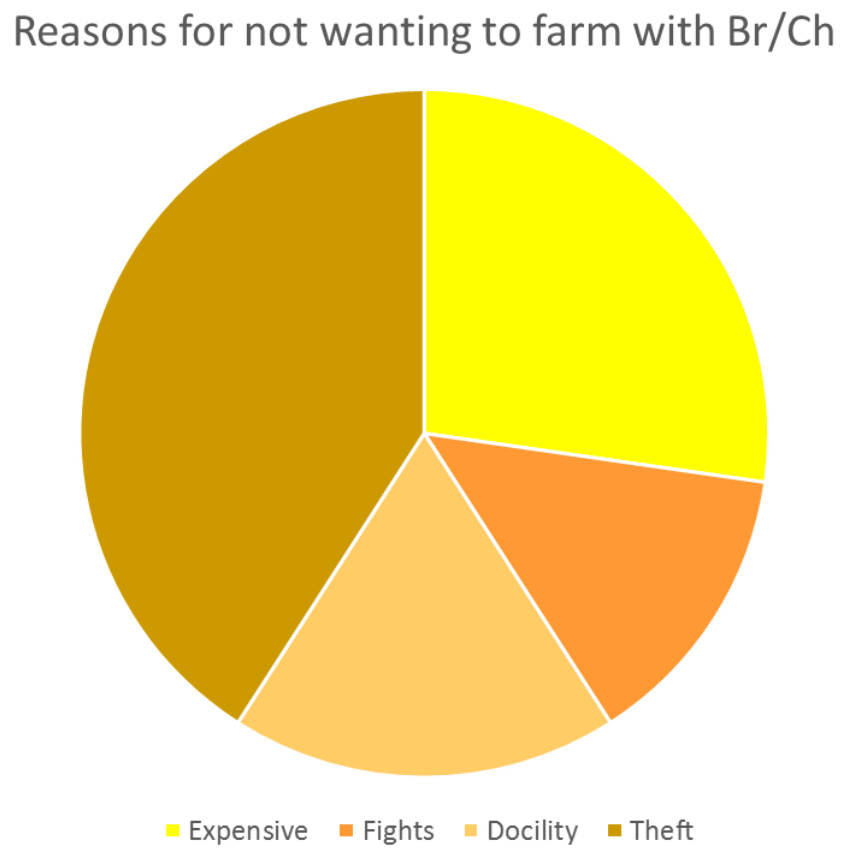

Figure 16: Reasons for not wanting to farm with CH/Br

1. **Expensive**-Require massive amounts of feeds also in transportation

2. **Fights** can occur, resulting in damaged fences and loss of livestock. - Counter argument/solution is that both the Ch and Br are considered extremely calm breeds and hornless
3. **Dangerous/Docility Br** like affection and kind handling methods-farmers don't have time for this therefore it will result in Br become docile, however if treated poorly they react in similar way and this could be quite dangerous for areas where animals can roam freely and their character can put them at risk when other farmers may treat Br poorly which is quite common in communal farming.eg. at drinking spots
4. **Theft** This animal is easily stolen referring to their docility.

7. How often do you eat beef or depend on beef for livelihood (beef urgency)?

- ❖ At least once a day ( )
- ❖ At least once a week ( )
- ❖ At least once a month ( )
- ❖ Never ( )

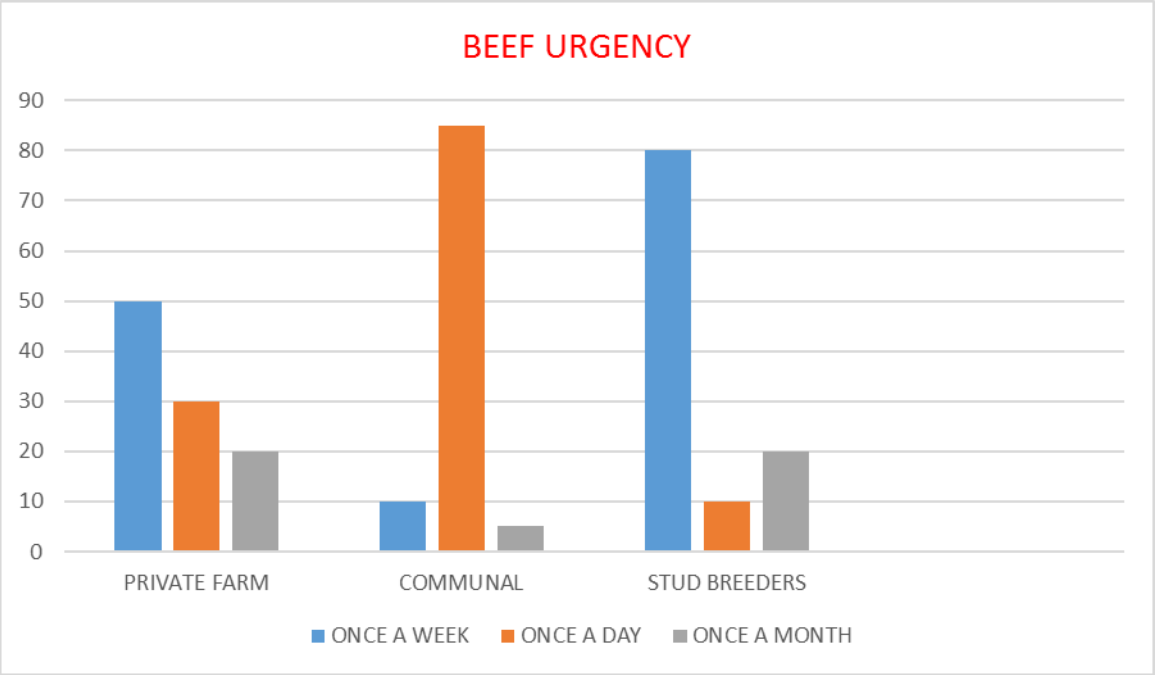

Figure 17: Beef urgency in different farming systems.

Dependency on beef livelihood is shown in Figure 17, it shows 3 farming systems about beef urgency. The first show casts private farm, which has 50% eating meat once a week, 30% eating once a day and 20% eating meat only once a month.

On the contrary, the second farming system which is communal has 85% dependency on beef, eating it beef once a day and 10% eats beef once a day but only 5% eats beef once a month.

Stud breed farming system had a the most different results showing 80% eating meat only once a week and 10% depending on beef once a day. The remaining 20% is observed to depend on meat once a month.

8. Have you ever noticed any Charolais/brahman crossbreed being used by a friend or a neighbour or even at auctions (Charbray)? If yes, proceed to next question. If no, please kindly jump to question number 10.

- ❖ Yes ( )
- ❖ No ( )

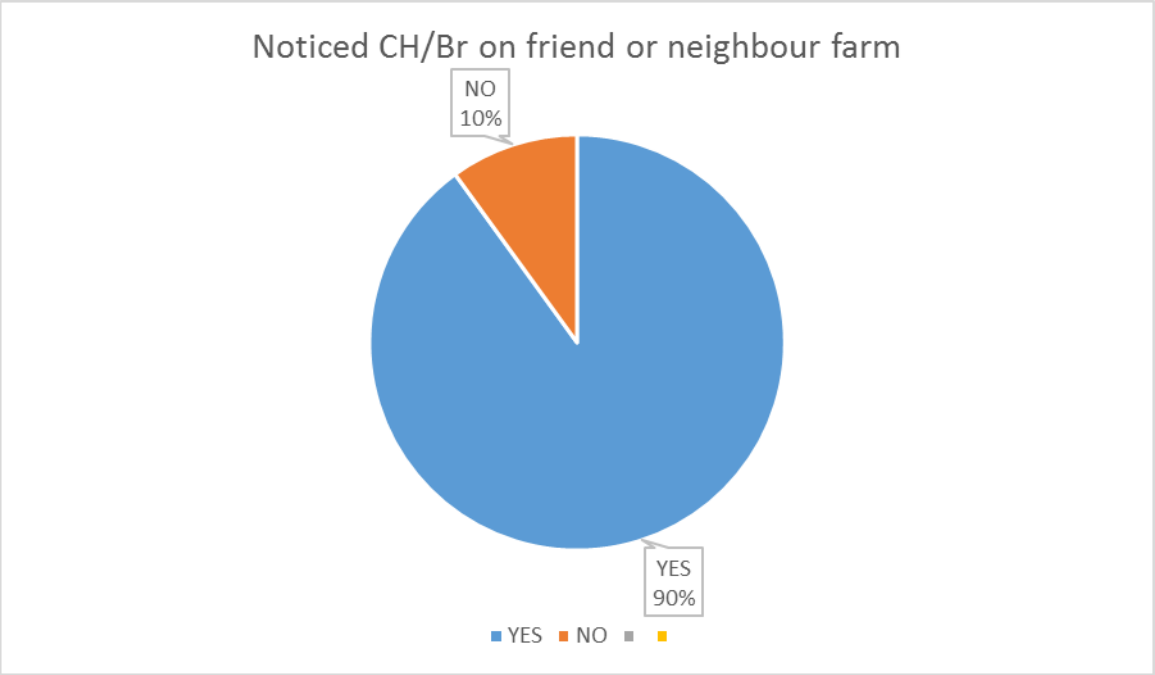

Figure 18: Noticed CH/Br on friend or neighbours farm.

Figure 18 shows the percentage of people that have noticed CH/BR on a friend or neighbours farm. The majority consisting of 90% had a positive reaction of yes, they have noticed it and the minority of 10% gave a no, stating they have not noticed the CH/Br on a friend or neighbours farm.

9. Please kindly select on which of the farming systems you noticed CH/Br (Charbray) crossbreed:

- ❖ On a private farm ( )
- ❖ On a communal farm ( )

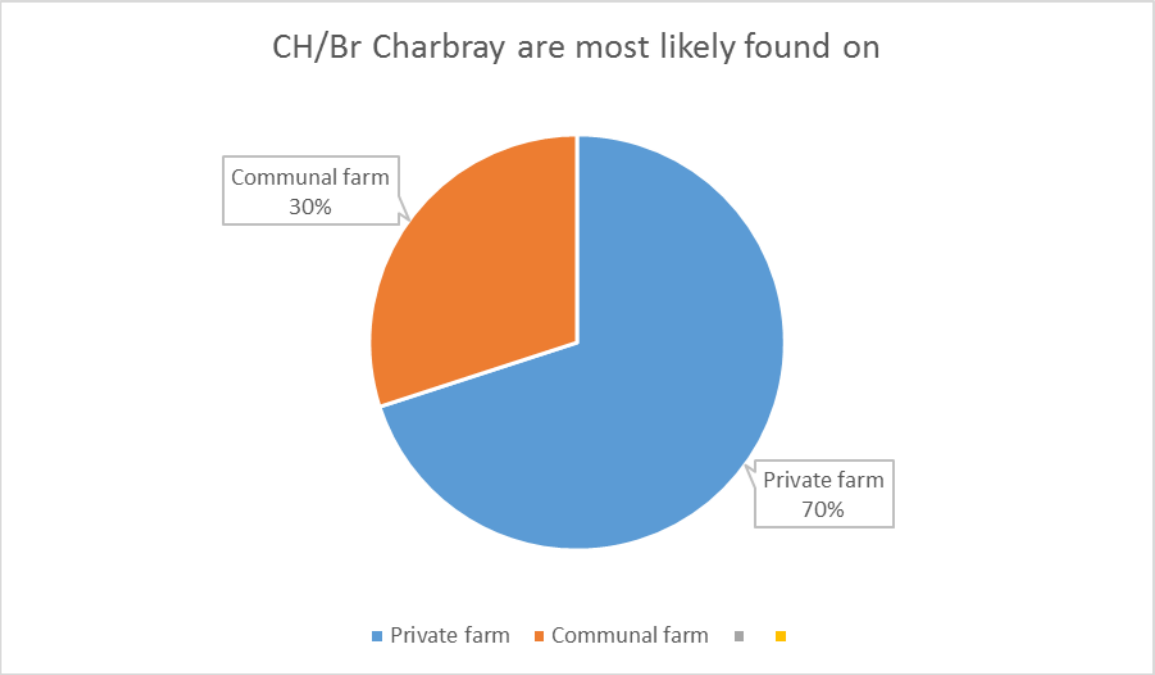

Figure 19: CH/Br Charbray are most likely found on with farms.

In Figure 19 the researcher shows that 70% of CH/Br Charbray are mostly likely found on private farms and only 30% found on communal farms.

10. Given a choice which process would you prefer to breed with Charolais?

- ❖ Artificial Insemination (Sperm bank, pure breed.) ( )
- ❖ Crossbreeding (Sharing bulls, breeding with indigenous breed) ( )

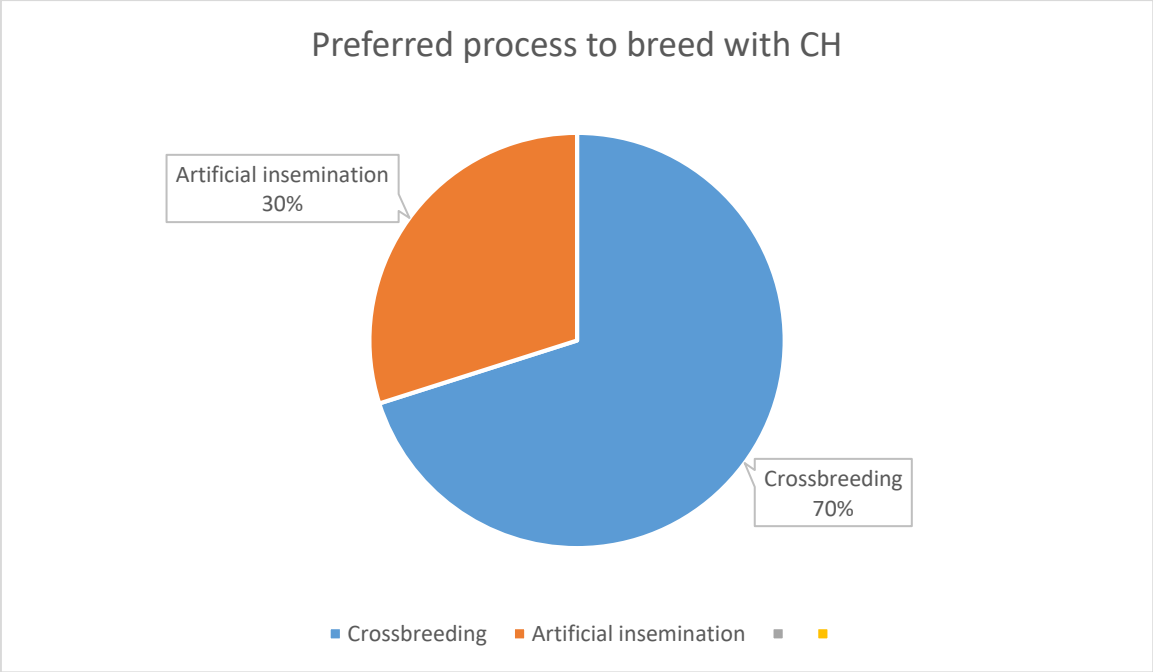

Figure 20: Preferred process to breed with CH.

The above figure showed that more than 70% of the people preferred to farm with CH using any crossbreeding methods than AI which only 30% found favourable.

5.DISCUSSION

5.1. Growth capacity and climate

According to Kvaplik et al., (2006) winter is the most common way of breeding with meat cows. During this period, the animals are fed in a wintering place with canned fodder and the breeder can influence the intensity of the feed and create the option of an easy birth. However, in this research paper it was proven that most farmers are on communal land and their graze freely thus the breeder has little control over their feeds. Furthermore, Namibia has been described as a hot climatic country, seeming not ideal for breeding of meat cows. In accordance to the birth weight Stadnik et al., (2008) states that the use of proven bulls in insemination or crossbreeding bring better offspring growth capacity , because descendants from artificial insemination have a lower birth weight and at the same time they have a higher live weight of 120, 210 and 365 days of age. This agrees with the results because as stated the bulls used in crossbreeds have not been proven to be of quality. According to the results of the this research project 60% of the population tested strongly agreed that due to dystocia they were very hesitant to farm with the CH breed. Therefore they don't wish to risk losing livestock due to this issue and this concedes with Eriksson et al., (2004) statement that it is important to minimize the incidence of difficult birth to avoid economic losses or disturbances to animal welfare. The progression of delivery depends on the factors affecting the weight and body structure of the calf and on the ability of the mother to give birth. This brings me to the next point of highlighting the advantages of crossbreeding and their hybrid.

The breed is characterized by a high intensity in maximum slaughter weight, good muscles and low in fat, but especially in purebred and crossbreeding (Zahradkova et al., 2009).

When referring to the maternal qualities it is very challenging because during the winter months, gestation is extremely risky and Adamcova (2012) reported that that's when the highest loss of calves takes place

5.2. The Charbray offspring

Research conducted by the Charolais Society in Australia shows that there is considerable variation in the birth weight of Charolais and Brahman cross progeny. The average birth weight across the offspring of 17 bull was 33 kg. Brahman cows can reduce the weight of their calves relative to other breeds. Presumably the birth weight was much lower than in this study because it was done in a different level of farming in regards to the know-how of farmers and their accessibility to technological improvements. This is contradictory to the results shown in this study in the sense that farmers tend to use Brahman bulls and Charolais cow.

Breeding indigenous cows to terminal sires may facilitate production of calves in the emerging sector that better meet commercial feedlot requirements. (MacNeil and Matjunda, 2007)

Beef cattle farming is an important component of sustainable agriculture in much of Europe. Maintenance of rural landscape was one factor favoring the maintenance of a wide spectrum of beef breeds, while improving carcass and meat quality of slaughter animals produced in dairy farming systems is a second important utilisation of beef bulls (Wolfova et al., 2005).

CONCLUSION

This study was aimed to find any indication whether the Charolais (*Bos taurus*) beef cattle has adapted to the very hot and arid Namibian climate and whether we can improve its adaptability hence increasing productivity.

Observations were done on a private farms Petrusberg and Omitara and communal villages in the Omaheke region of Namibia.

Based on the results in the research paper, we can presume that the Charolais breed is indeed adapted to the hot Namibian climate because more than 50% of the Namibian farmers have the breed on their respective farms, whether they are aware of it or not. When research was finalised it was proven clear that Ch breed is an important breed in this country in respective areas. Stud breeders and private farmers have the facilities to identify specific breeds and thus accommodate it with the necessary requirements to increase productivity. This explains why 75% of the results showed that mainly it's the private farmers (stud breeders) that farm with CH.

Furthermore, the study also documented the main cattle breeds in Namibia and their adaptability in comparison with Ch and highlighted the offspring of the Charolais and the Brahman, the Charbray. Analysis of existing Charbrays shows: very promising future because they have inherited great qualities from *Bos taurus* and *Bos indicus.* Based on our results, there were observed behaviour advantages between the Charolais cattle, Brahman cattle and the Charbray cattle which showed an excellent ability of heat tolerance. However, if we consider Figure 13 we can that there are many other reason like fighting, docility, theft on why the farmers are not eager to farm with Charolais and Brahman. This issue were observed to be factors of their size and the damage it can do to their fences.

The study showed the percentage of people depending on beef cattle for livelihood and this is shown in Figure 14, observation proving that more than 80% of farmers on communal farms solely depend on beef production. This stretches the importance of maintaining and improving quality breeds to provide quality beef.

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(Estimation of Genetic Parameters of Type Traits for Namibian Brahman Beef Cattle M. D. Fair1, F. W. C. Neser1 and J. B. van Wyk, 2012)

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Discriminating among cattle breeds using genetic markers

S C Blott1,2, J L Williams1 and C S Haley11Roslin Institute (Edinburgh), Roslin, Midlothian EH25 9PS, Uk Correspondence: C S Haley, E-mail: chris.haley@bbsrc.ac.uk 2Present address: Department of Genetics, Faculty of Veterinary Medicine, University of Liège, 20 Boulevard de Colonster, 4000-Liège, Belgium. Received 22 April 1998; Accepted 25 January 1999

The scurs inheritance: new insights from the French Charolais breed. Aurélien Capitan,1,2 Cécile Grohs,1 Mathieu Gautier,1 and André Eggen corresponding author1 Author information ► Article notes ► Copyright and License information

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Inference of population structure of purebred dairy and beef cattle using high-density genotype data M. M. Kelleher1,2, D. P. Berry1†, J. F. Kearney3, S. McParland1, F. Buckley1 and D. C. Purfield11Animal & Grassland Research and Innovation Centre, Teagasc, Moorepark, Co. Cork, Ireland; 2 School of Agriculture, Food Science, University College Dublin, Belfield, Dublin 4, Ireland; 3 Irish Cattle Breeding Federation, Bandon, Co. Cork, Ireland (Received 17 April 2015; Accepted 6 April 2016; First published online 22 June 2016)

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