

## Climate smart animal agriculture The importance of adapted breeds of cattle in sustainable veld – livestock farming systems



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## THE IMPACT OF CLIMATE CHANGE ON EXTENSIVE ANIMAL AGRICULTURE IN SOUTHERN AFRICA

- RISING TEMPERATURES
- LESS RAINFALL
- A GRADUAL MOVE FROM A GRASSLAND TO A WOODLAND BIOME
- INCREASED ULTRA VIOLET RADIATION
- INCREASE IN ANIMAL DISEASES AND PARASITES

## Climate smart agriculture

A term used by the Food and Agriculture Organisation of the United Nations (FAO) and other partners

Agriculture that sustainably increases productivity , resilience (adaptation) reduces /removes greenhouse gases (mitigation) and enhances the achievement of national food security and development goals”.

## Climate smart animal agriculture

Farming systems based on sound animal and veld husbandry principles that take Current and projected climatic and vegetation conditions into consideration to ensure long term sustainability.

This includes:

Farming with indigenous, locally developed and locally adapted breeds and species capable of surviving and producing under conditions such as higher temperatures, less rainfall , an increase in animal diseases and parasites and changes in the natural vegetation.

## Are cows climate killers ?

- Domestic ruminants and cattle in particular ‘burp’ methane into the atmosphere and the worlds 1,3 billion cows ( Cow for every five humans ) produce about 300 000 billion liters of methane annually.
- As methane is 25 times more harmful to climate than carbon dioxide, they have been labelled as climate killers by the media, farmers and even some scientists
- Initial work did show that cattle on natural rangeland and planted pastures contribute more to global warming than their counterparts in intensive farming systems.
- This was not entirely true as a number of factors were not taken into consideration and recent work has shown that grazing ruminants in sustainable farming systems are, in fact, contributing to the storage of greenhouse carbon and the improvement of the soil.
- Effectively, such ruminants provide milk and meat from grass while contributing to soil fertility and the mitigation of climate change.

## Are cows climate killers ?

Nitrous oxide ( N<sub>2</sub>O) is the largest agricultural threat to the environment and fertilisers for planted pastures and feed crops pose a far bigger threat than the methane emissions of domestic ruminants on natural rangeland.

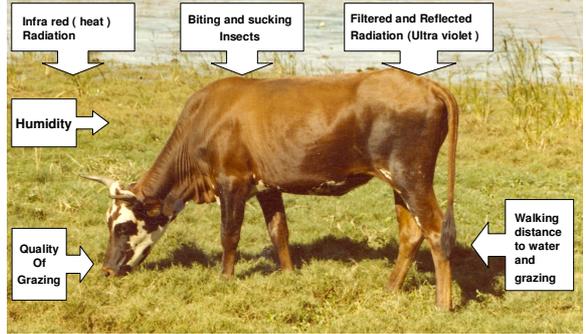
- grazing practices play a significant role in [soaking up CO2](#).
- Simple changes in grazing practices could soak up millions of tons of carbon a year, helping fight climate change, improving farm productivity and earning farmers carbon credits.
- By [changing up grazing practices worldwide](#), between 1.3 and 2 billion tons of CO2 could be stored by 2030.



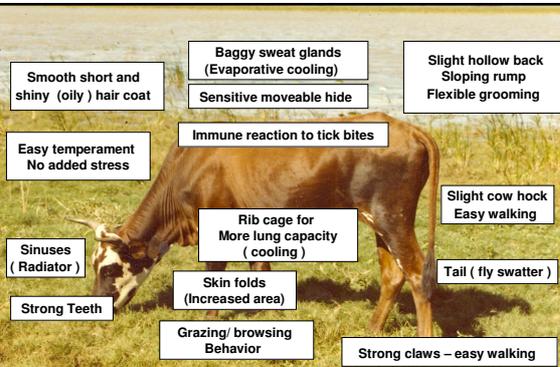
Using adapted breeds adds further advantages that should be quantified With climate smart animal agriculture in mind.



### TRAITS THAT ENABLE ADAPTED BREEDS TO SURVIVE AND BREED IN HARSH ENVIRONMENTS



Factors adding to the stress load of a grazing animal in hot and humid environments



Adaptive traits and behavior to offset these factors

### The ability to walk and graze

Bonsma (1953) compared the grazing behavior of Hereford cross (Afrikaner) and pure and observed that the pure Afrikaner cattle grazed more quietly and were less selective than the crosses – Restful non selective grazer

Unadapted animals are unable to walk ( average 4km per day ) far enough to graze and get water under less favorable conditions. Indigenous breeds such as the Afrikaner and Nguni are capable of covering longer distances ( up to 25 km )

## The ability to walk and graze

The smaller mature size of indigenous breeds such as the Nguni – added to the fact that they walk further, reduces the impact of trampling and also results in more effective distribution of dung

## Strong teeth

Animals with worn teeth are less capable of getting sufficient grass to meet their daily intake requirements for maintenance and for reproduction.

This has an impact on their productive lives and they have to be replaced more frequently as a result.

Work done by Steenkamp (1969) showed that the hardness of tooth enamel of native cattle tended to increase with advance in age rather than decrease, as was the case with exotic cattle

At Bartlow combine in KZN, cows older than 14 years had all their teeth and still performed better than the herd average – illustrating the importance of strong teeth – and Longevity

## Ability to manage the stress of biting and sucking insects

Sensitive pilo motor nervous system –  
sensitive hide that moves and disturbs insects  
insect

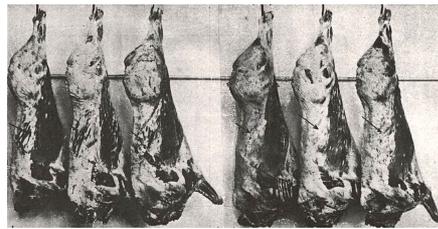
Smooth hair coat – no place to hide

Effective fly swatting tail

Tick tolerance – immune reaction to ticks

Supple body – ability to groom

## Sensitive hide



A comparison of carcasses of adapted Zulu (Nguni) cattle (A) and less adapted crossbred animals (B) (Bonsma, 1949)

## TICK INFESTATION AND THE EFFECT ON WEANING WEIGHT (SCHOLTZ ET AL., 1991)

	Heref	Bons	Nguni
Number of one-host ticks	3137	2030	431
Number of multi-host ticks	164	164	82
Difference in weaning weight between dipped and not dipped	29.5kg	17.6kg	4.4kg

## Grooming ability

- Animals are supple and can scratch
- Reach parts of the body with their horns
- Have long tails with a switch that reaches to below the hocks



### Adaptation to heat and humidity

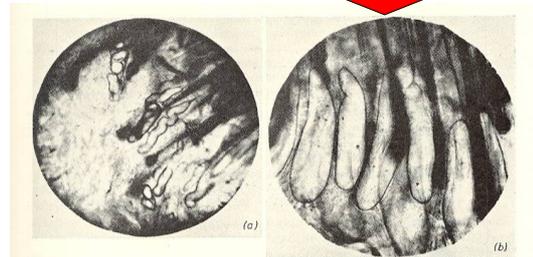
Less body exposure to direct sun rays – respiratory type

Evaporative cooling through respiration – respiratory type / less and more effective panting

Evaporative cooling through sweating

### Shape and size of sweat glands in different breeds of cattle (Yeates, 1965)

Baggy sweat glands



(From Nays, 1959, by courtesy of C.S.I.R.O.)

- Adapted animals have little to no stress load and can use their energy more effectively for reproduction
- Less feed supplements
- Less potentially harmful stock remedies
- Less impact on the resources



### COWS AND BULLS NEEDED TO PRODUCE 100 WEANERS AT DIFFERENT WEANING RATES (%) (Smith, 1993)

	Weaning rate (%)					
	40	50	60	70	80	90
Cows	250	200	167	143	125	111
Bulls (1 /25 cows)	10	8	7	6	5	5

More work needs to be done on veld based systems to quantify the measurable advantages of adapted breeds in sustainable systems as this information will help offset any negative publicity that may still exist. It could also lead to a system of carbon credits for those involved in such systems



At the end of the day, climate smart animal agriculture will ensure that the natural resources are used in a sustainable way and that more farmers will see the backsides of contented cattle on well managed veld instead of their own



Thank you / ndi a livhuwa