The role of pedigree recording in sustainable animal agriculture with special focus on indigenous breeds

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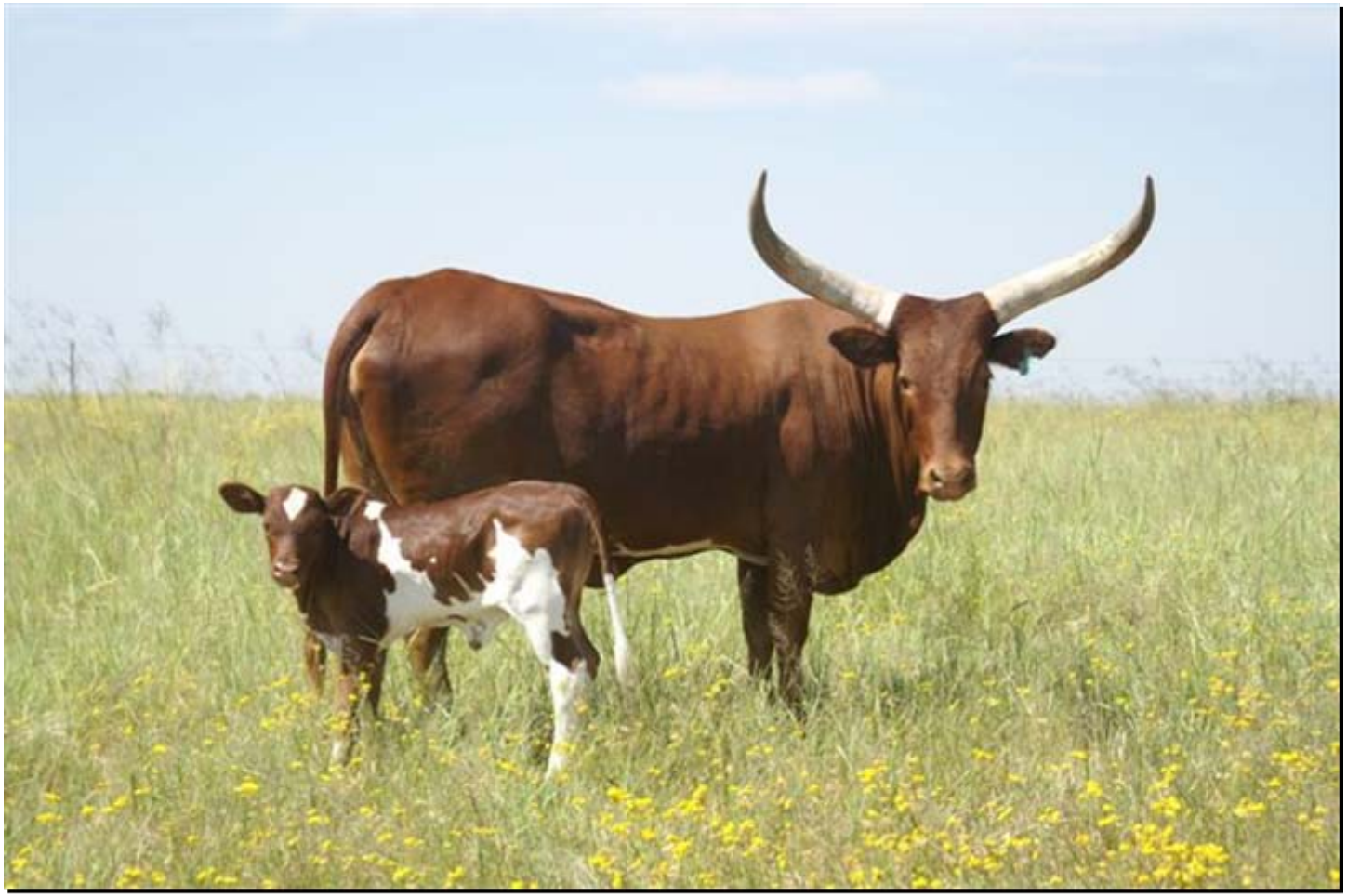
Ankole



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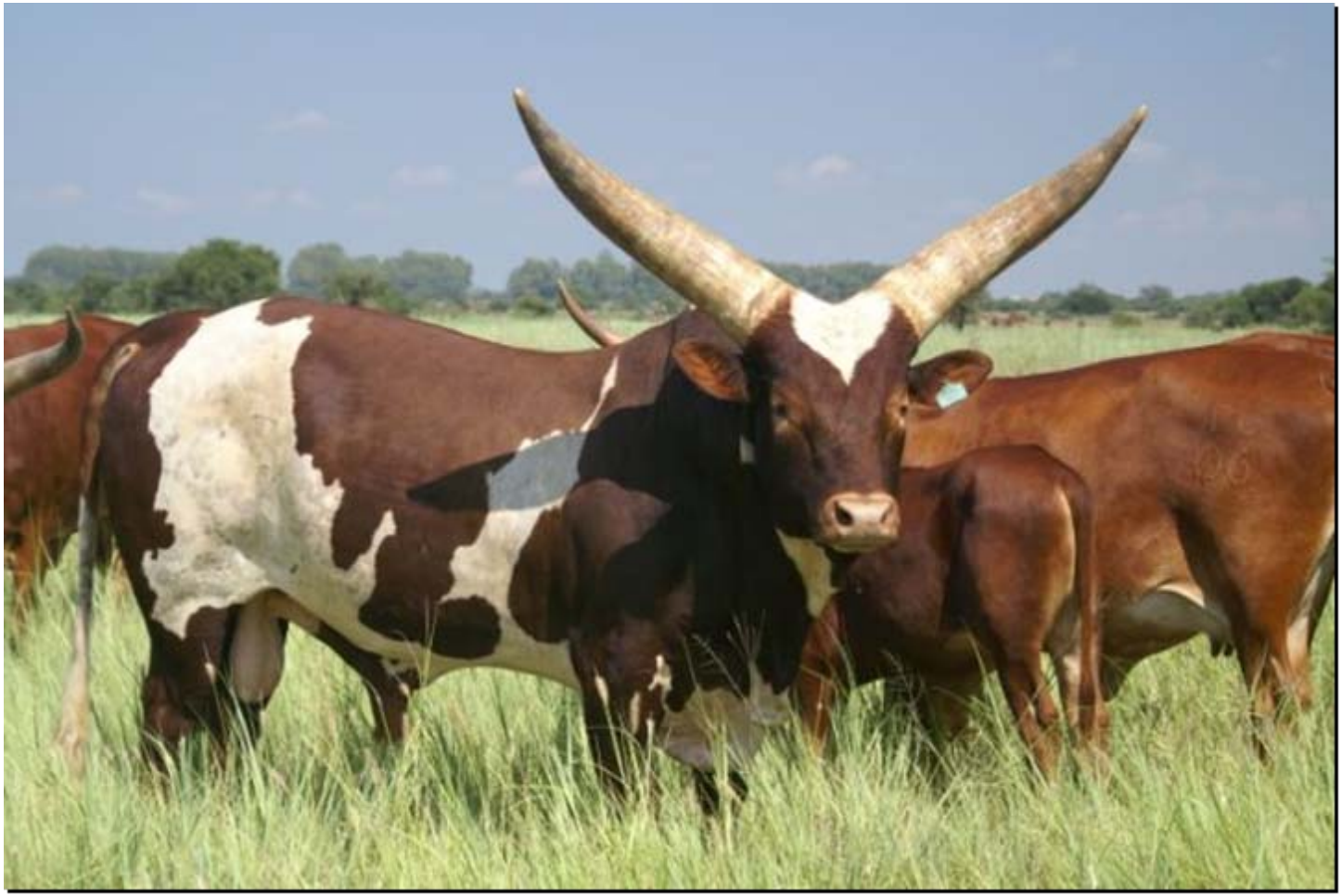

Hugenoot

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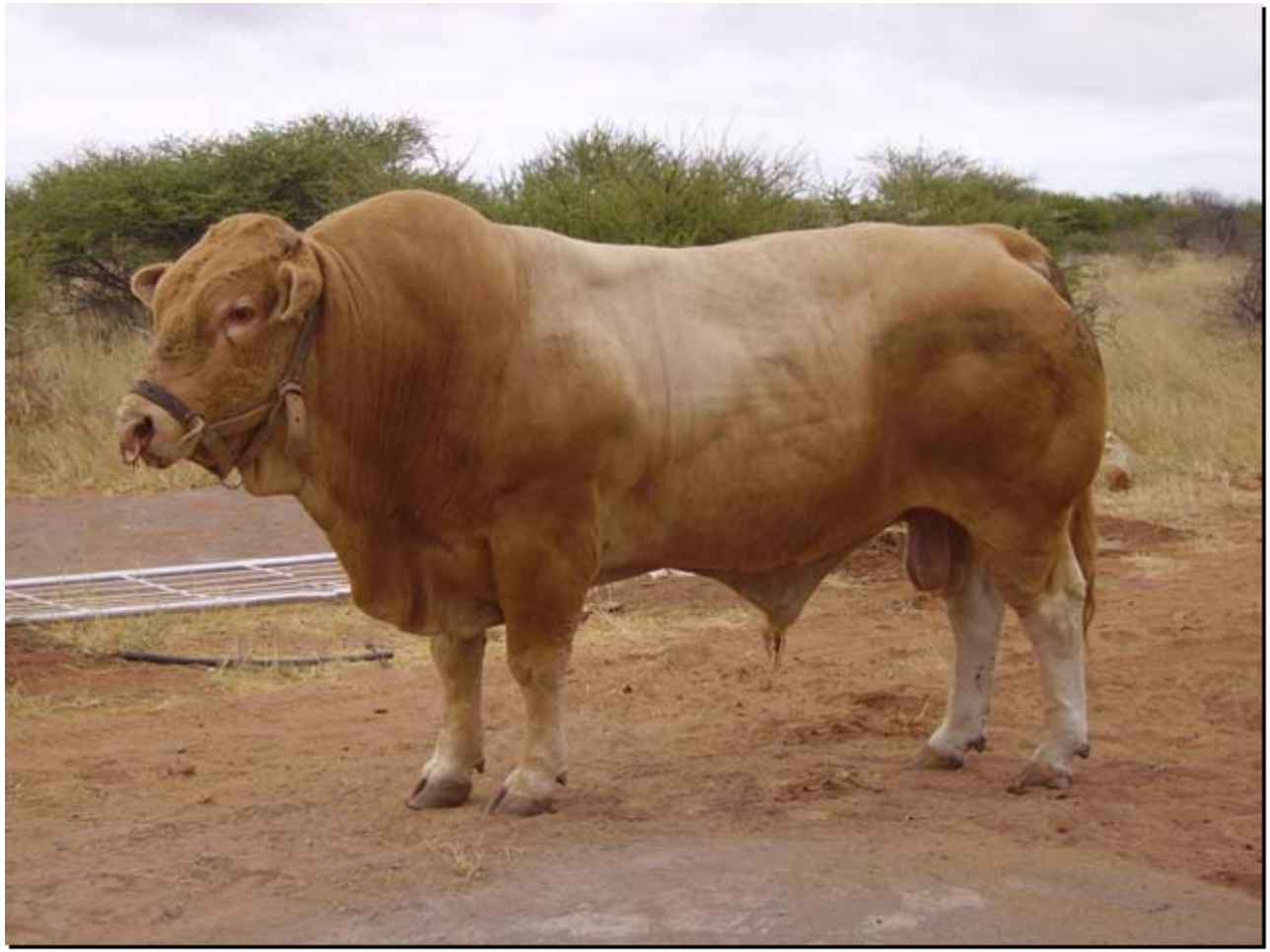

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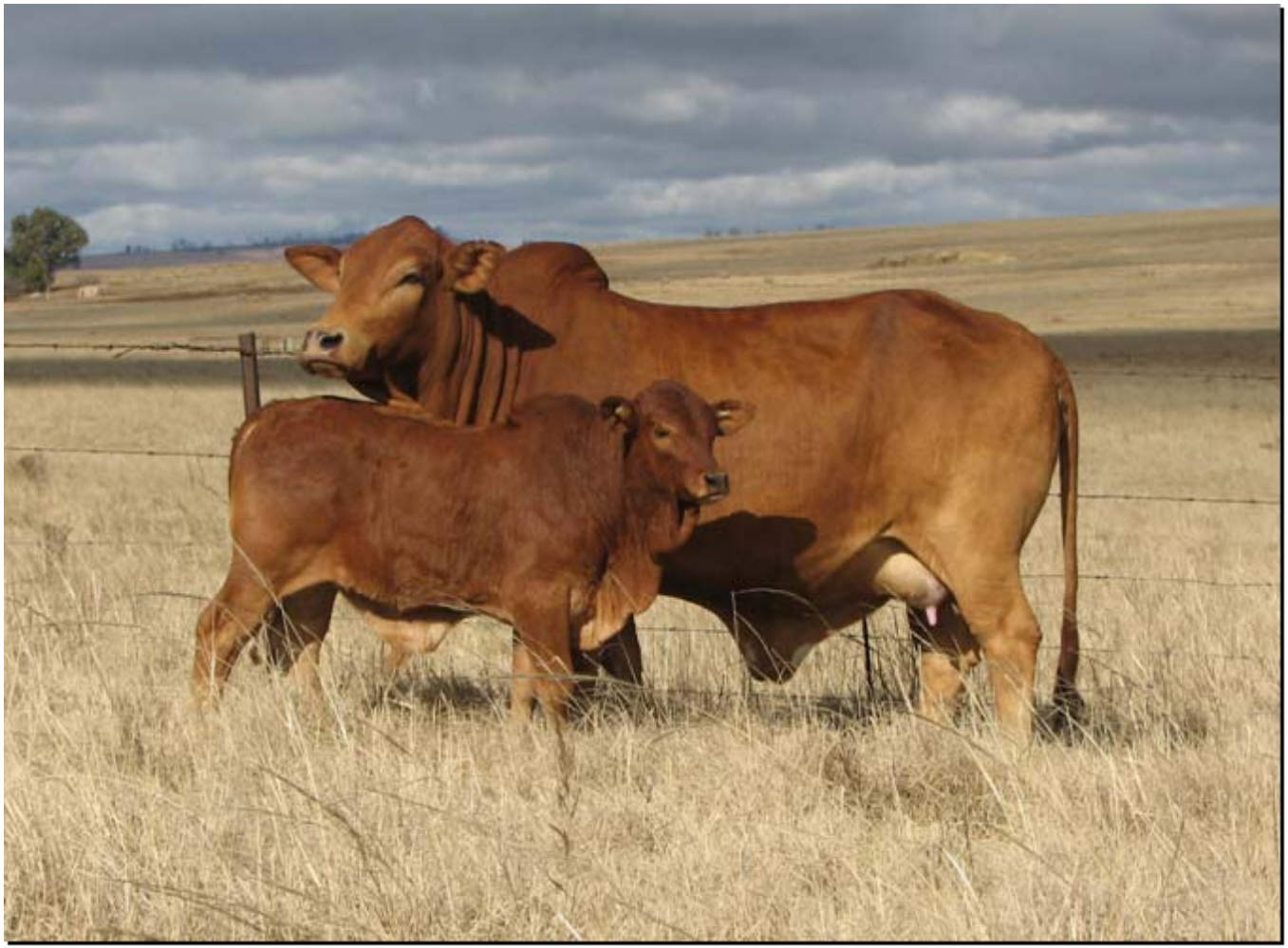

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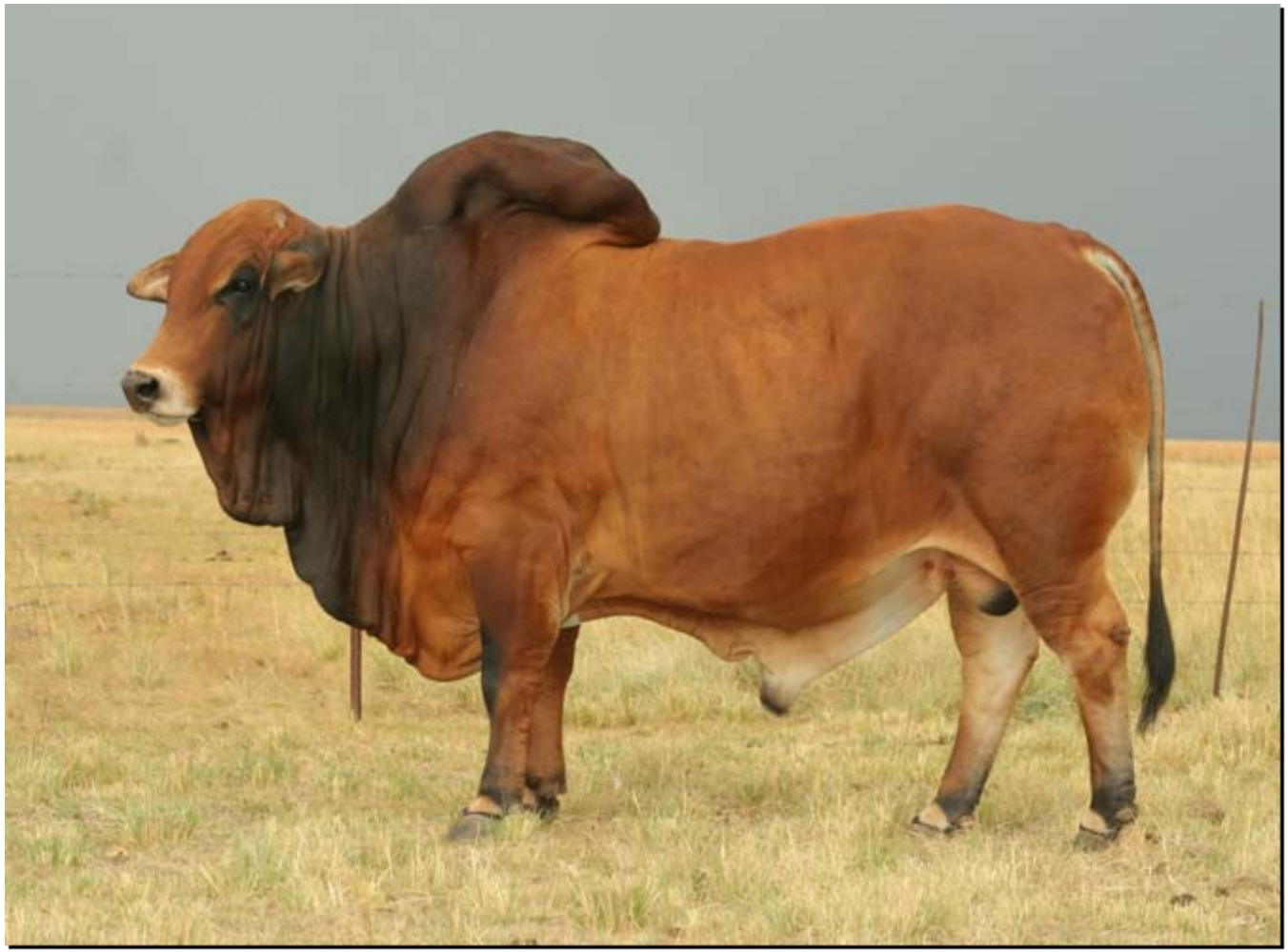
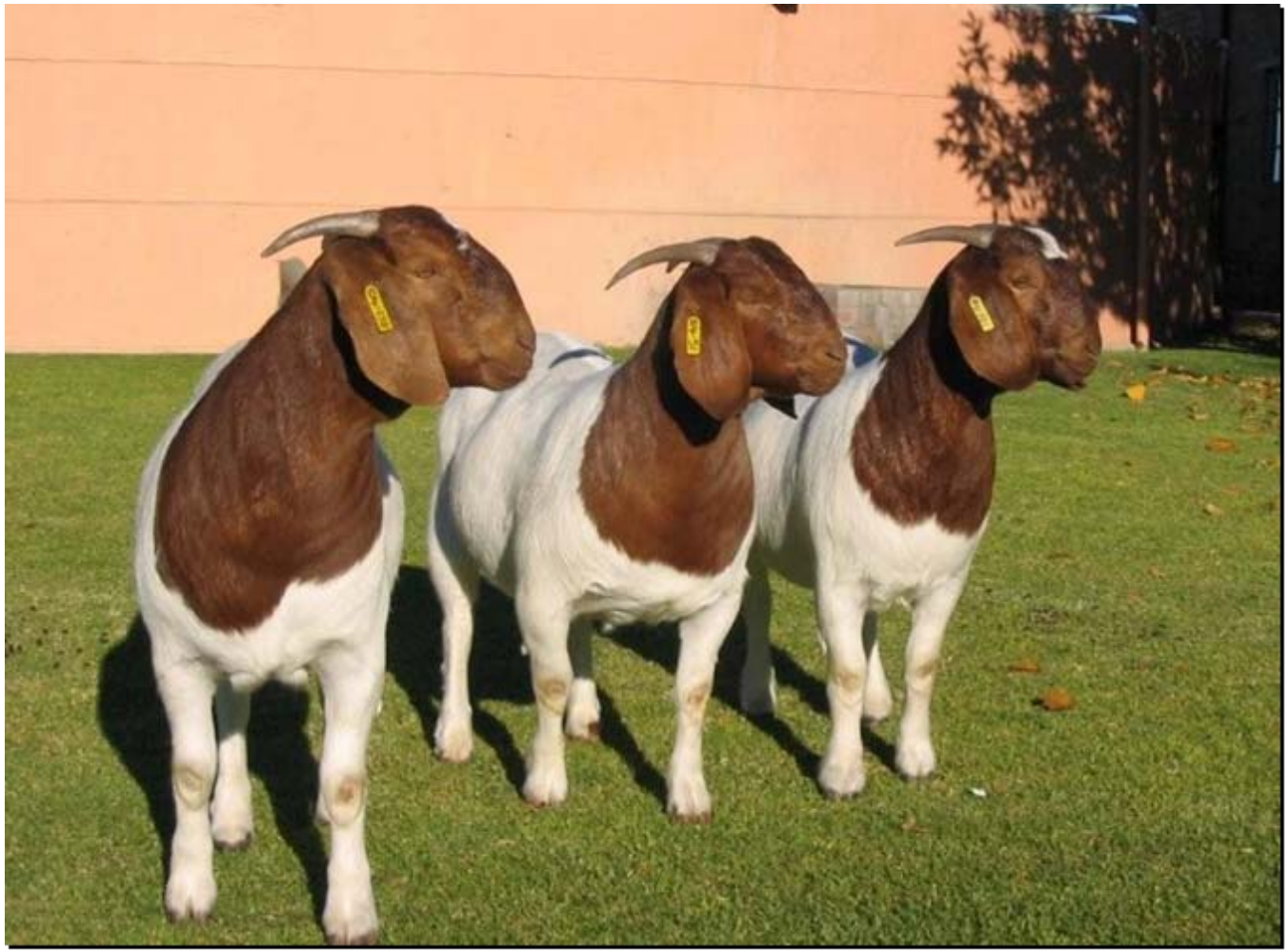
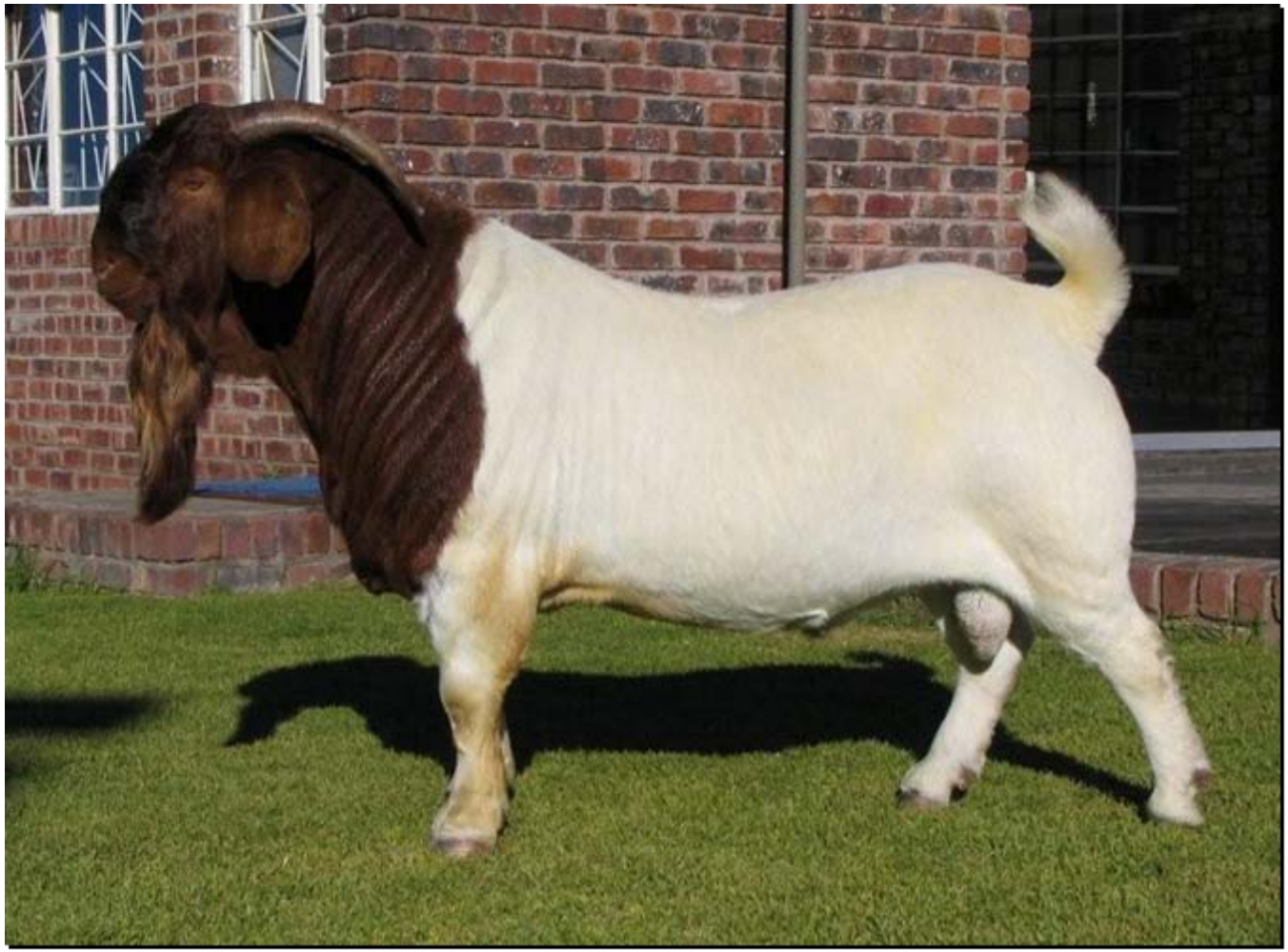


Boer Goat



Boer Goat



Savannah Goat

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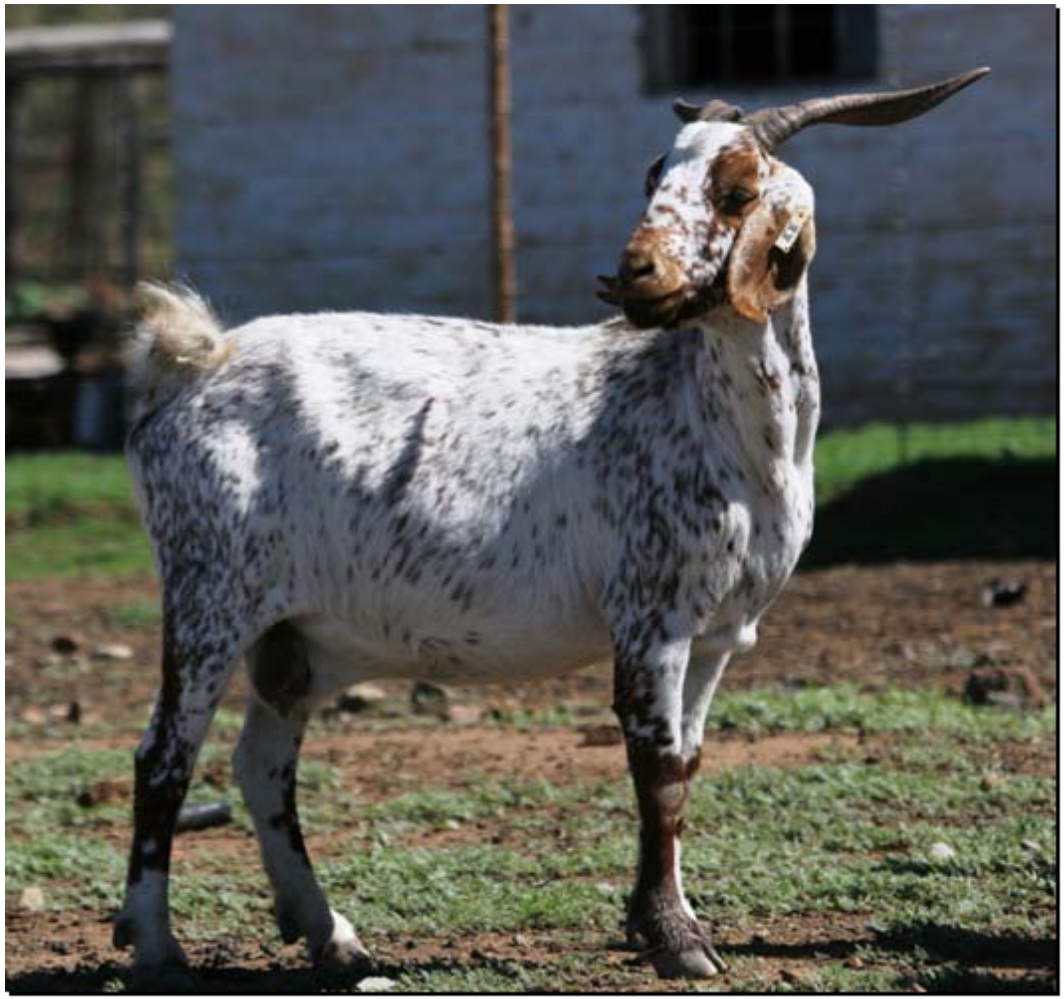
Indigenous Veld Goat



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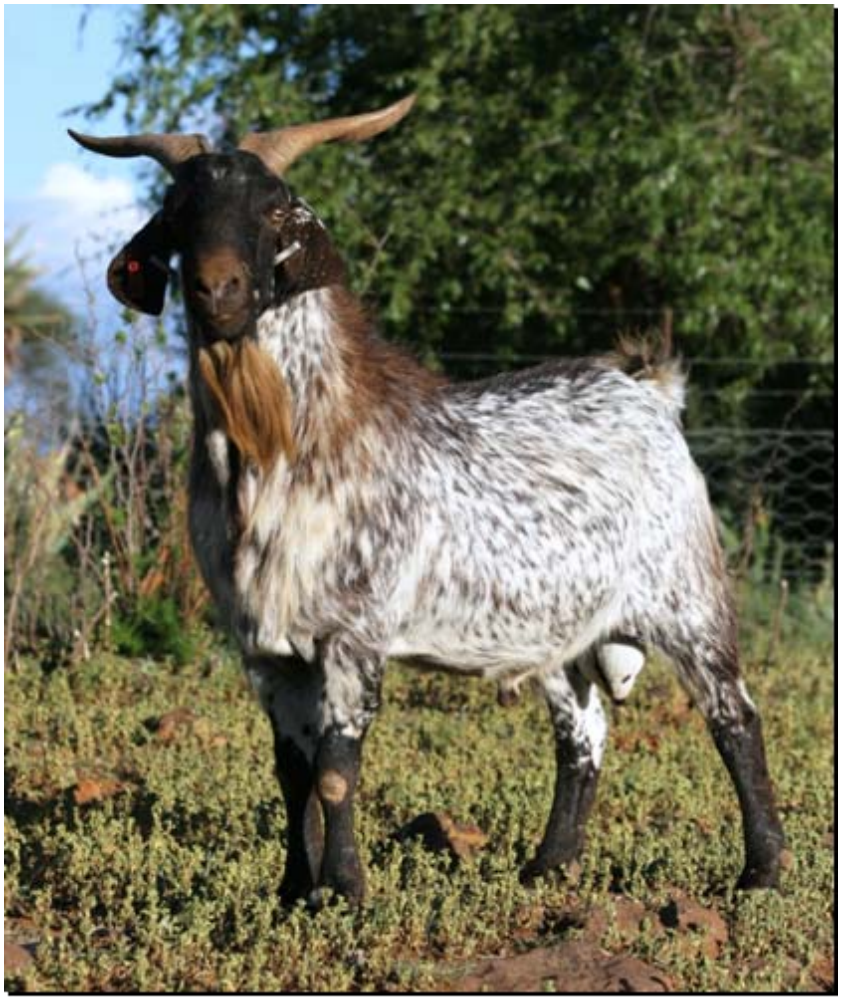

Dohne Merino

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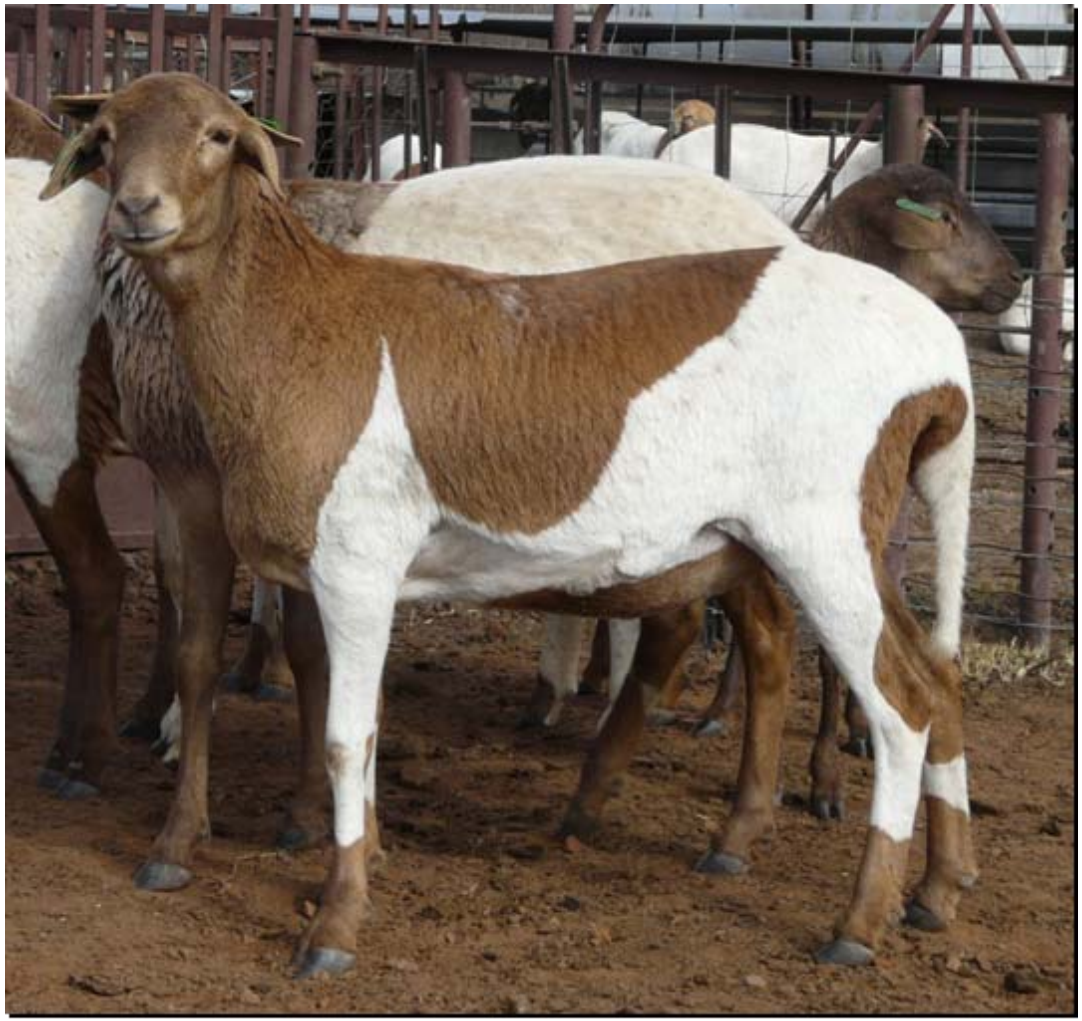
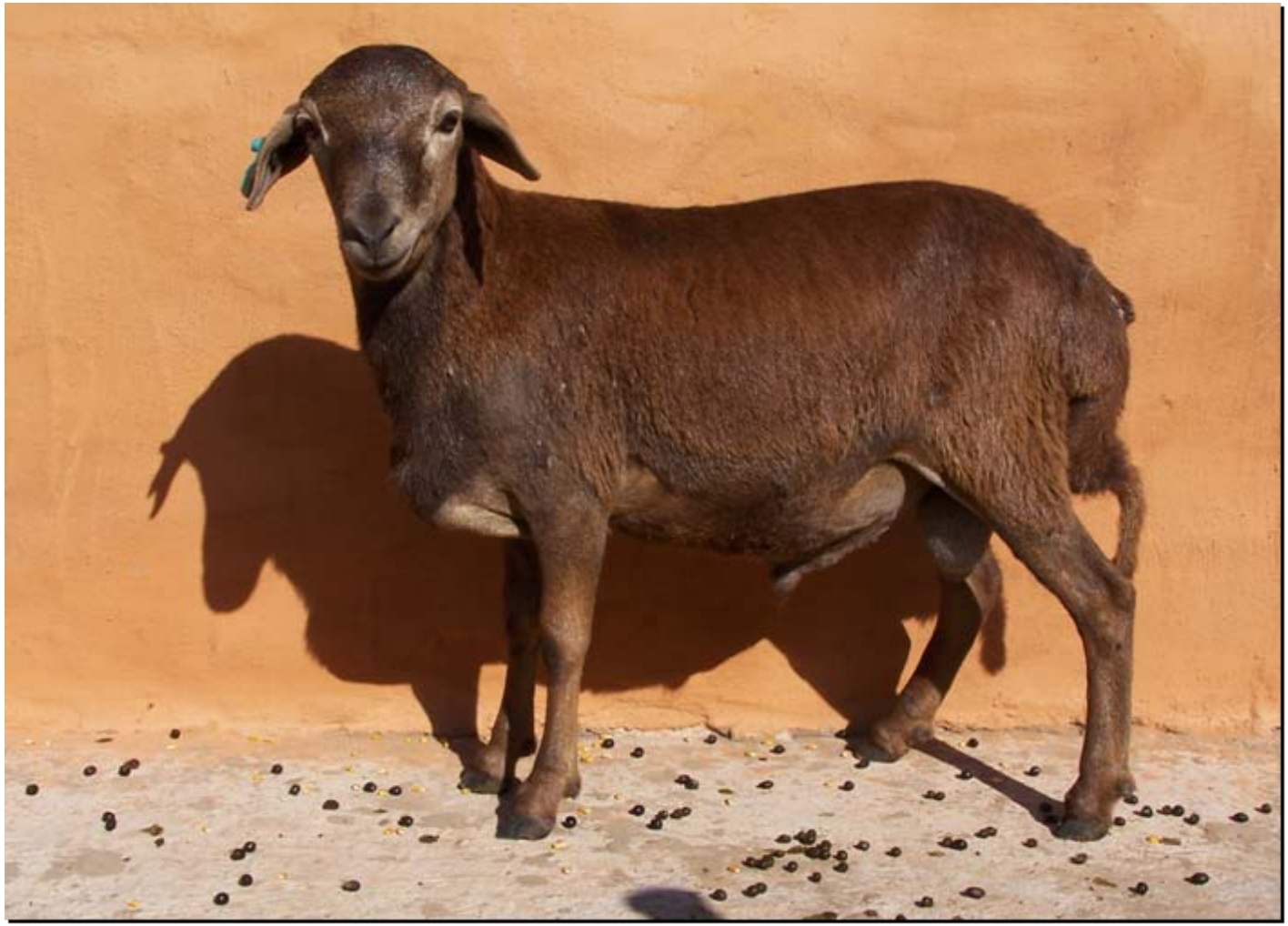
Dorper

Dorper

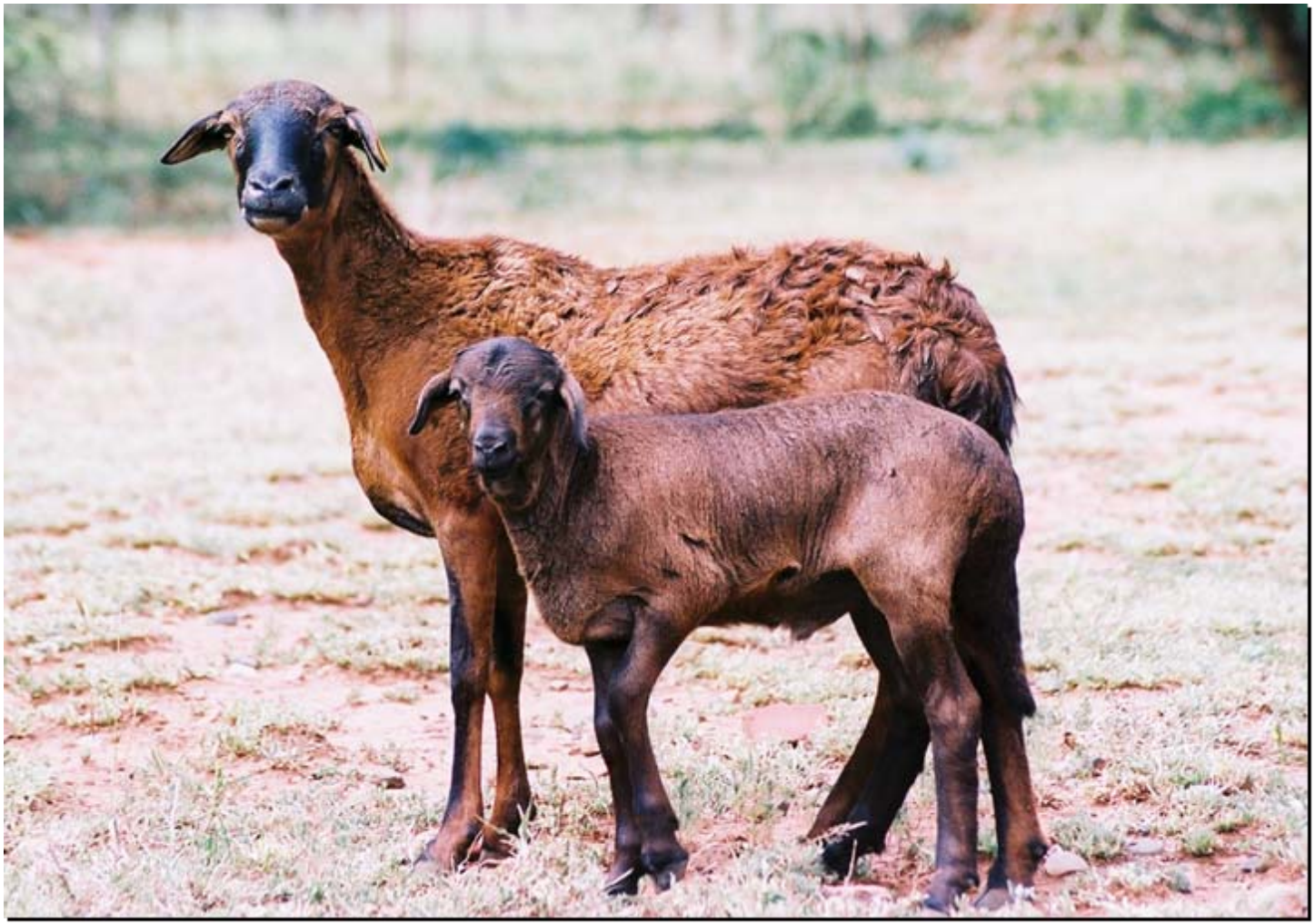
Bapedi Sheep



Bapedi Sheep



Zulu Sheep



Some threats to animal agriculture –

- Pressure on land use
- Global warming

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The challenge –

- Improve specific adaptation of animals
- Improve rate / level of production and efficiency

Indigenous breeds will play a vital role in future animal agriculture

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Indigenous breeds will play a vital role in future animal agriculture

Animal agriculture in Southern Africa

- Dualistic in nature

  Commercial production
  - Commercial producers
  - Seedstock producers

  Highly dependant on all aspects of animal recording & improvement

  Users pay for all services

- Informal livestock keeping

  Virtually no animal identification and recording / formal animal improvement

  Resource poor owners

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Dilemma –

- Rich heritage in indigenous animal resources
  - Special qualities
  - Need to be utilised
- Usefulness of indigenous breeds are threatened because of low levels of basic animal recording
  - Government and industry interventions are needed

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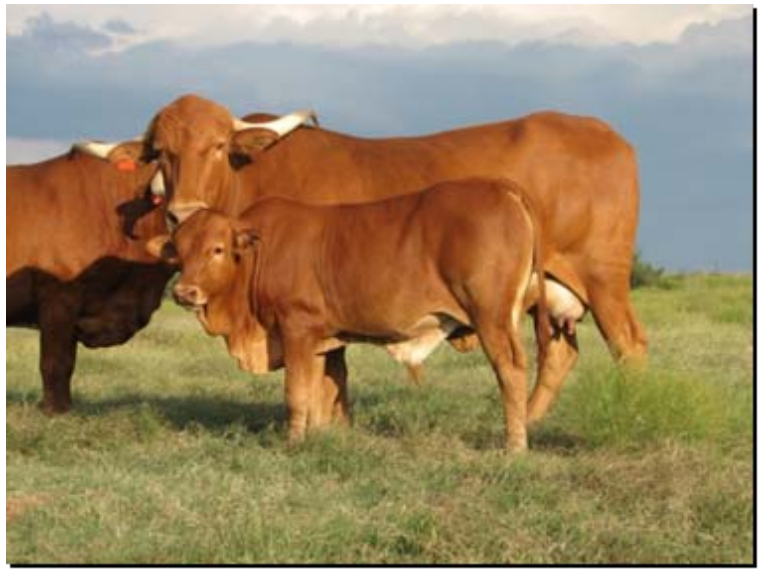
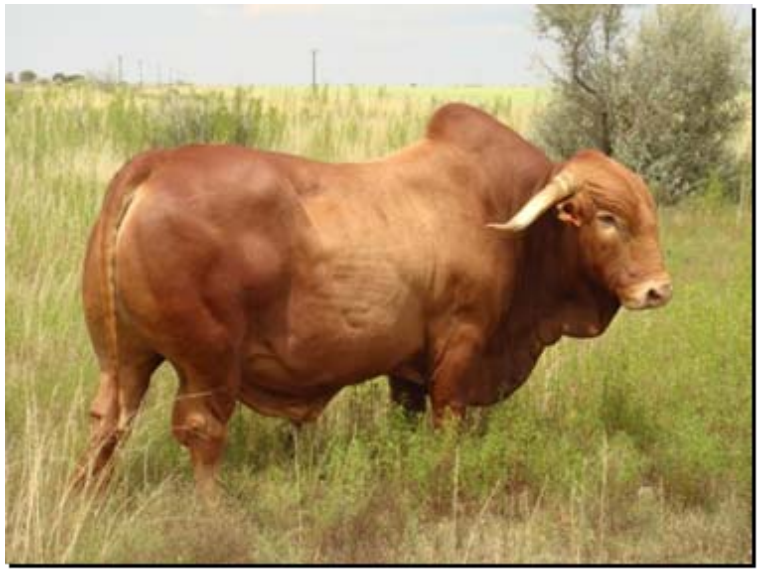
The use of pedigree- and ownership information

Example: Four South African indigenous beef cattle breeds

- Afrikaner (AFR)





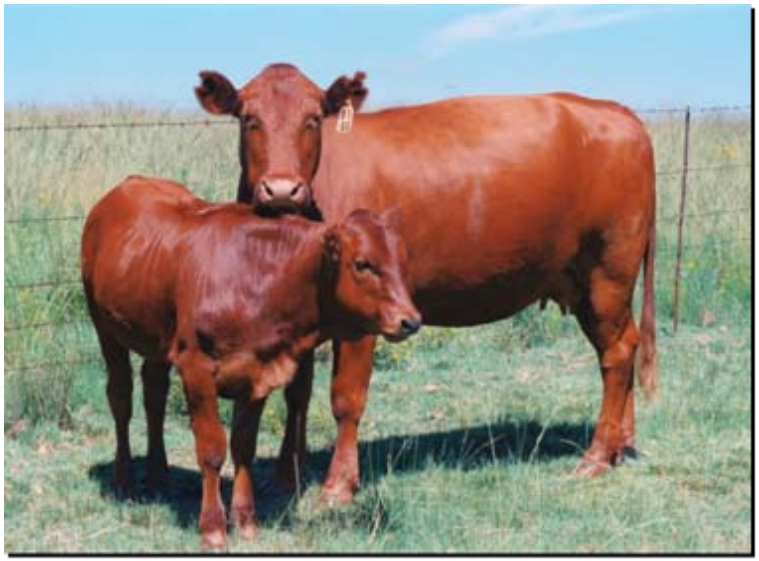
  - Started recording 1907
  - Breeders' society formed 1912

Once the most numerous cattle breed in South Africa

The use of pedigree- and ownership information

Example: Four South African indigenous beef cattle breeds

- Bonsmara (BON)



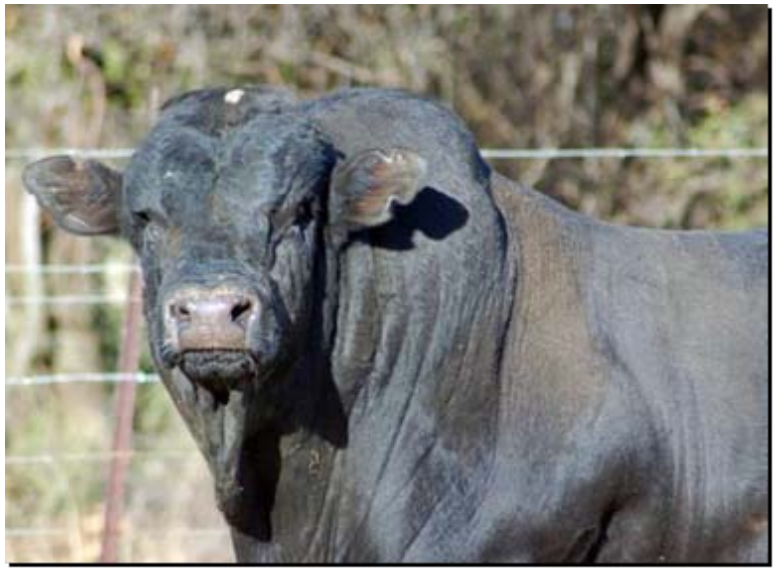
  - Started recording 1940's
  - Breeders' society formed 1968

Currently the most numerous cattle breed in South Africa

The use of pedigree- and ownership information

Example: Four South African indigenous beef cattle breeds

- Drakensberger (DRB)

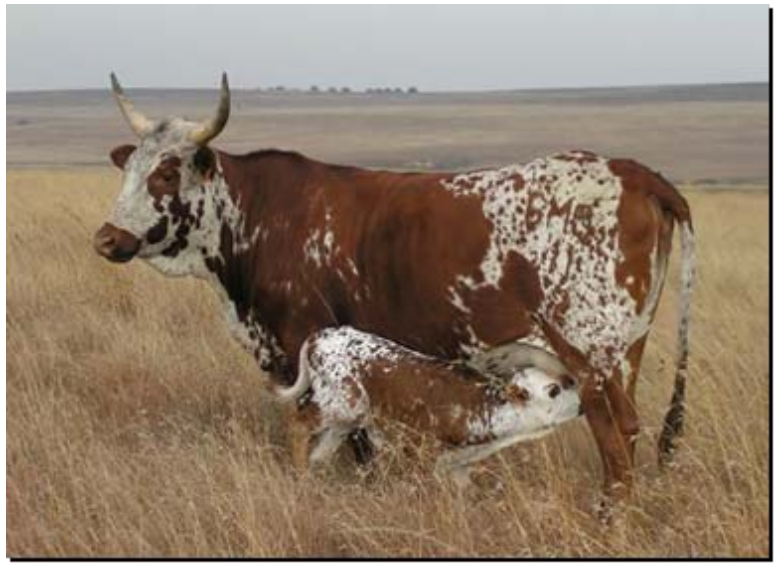


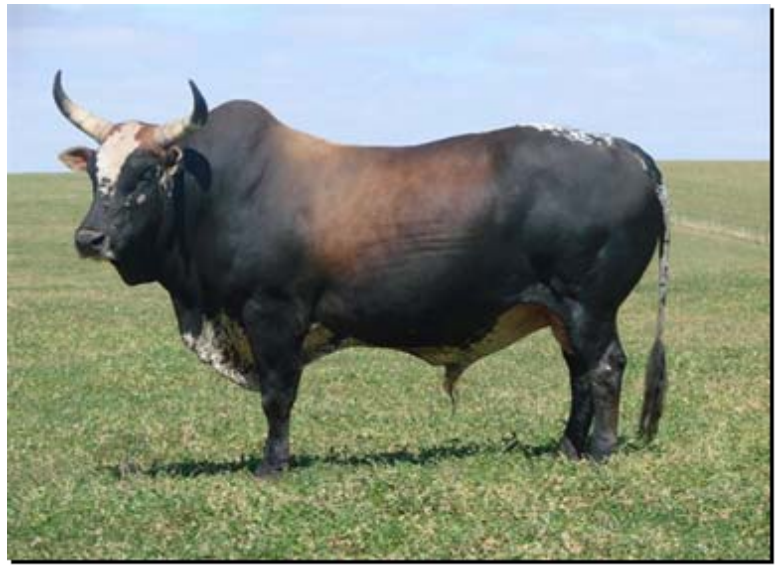
  - Started recording 1947
  - Breeders' society formed 1947

The use of pedigree- and ownership information

Example: Four South African indigenous beef cattle breeds

- Nguni (NGI)





  - Started recording 1950's
  - Breeders' society formed 1986

The use of pedigree- and ownership information

Census statistics –

Census statistics, as in July 2008.

Breed	Registered herds	Perf. Rec. herds	Registered animals	Perf. Rec. animals
AFR	74	52	11 885	10 505
BON	350	332	99 642	97 235
DRB	73	71	13 538	13 355
NGI	441	95	53 265	19 307

The use of pedigree- and ownership information

Average performance –

Average performance, as in 2007/2008.

Breed	Birth weight (kg)	Weaning weight (kg)	Cow weight @ weaning (kg)	Weaning weight ratio
AFR	31.3	195	478	43.2
BON	35.3	218	508	44.1
DRB	34.6	204	499	43.3
NGI	25.1	158	366	44.9

The use of pedigree- and ownership information

Analysis of breeding structure –

- Based on pedigree & ownership data
- Functional stratification of breed
  - Breeders
  - Multipliers
- Population statistics

Animals born 1 July 2006 tot 30 June 2008

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Analysis of breeding structure –

Stratification

Breed	Breeders		Multipliers	
	Herds	Animals	Herds	Animals
AFR	51.9	69.3	48.1	30.7
BON	49.2	64.9	50.8	35.1
DRB	50.0	66.0	50.0	34.0
NGI	51.7	77.1	48.3	22.9

The use of pedigree- and ownership information

Analysis of breeding structure –

Number of animals, herds and average number of births.

Breed	Number of animals born	Number of herds	Average births / year
AFR	4 999	52	48.07
BON	49 688	250	99.38
DRB	7 232	64	56.50
NGI	26 447	259	51.06

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The use of pedigree- and ownership information

Analysis of breeding structure –

Effective number of herds supplying male ancestors.

Breed	H_s	H_{ss}	H_{sss}
AFR	16.64	11.14	15.04
BON	52.63	22.37	20.12
DRB	14.95	13.83	14.43
NGI	42.19	42.37	49.02

The use of pedigree- and ownership information

Analysis of breeding structure –

Effective number of herds supplying male ancestors.

Breed	H_s	H_{ss}	H_{sss}	H_s/1000
AFR	16.64	11.14	15.04	3.33
BON	52.63	22.37	20.12	1.06
DRB	14.95	13.83	14.43	2.07
NGI	42.19	42.37	49.02	1.60

The use of pedigree- and ownership information

Analysis of breeding structure –

Average completeness of pedigree information in the parental generation.

Breed	Average completeness of pedigrees (%)
AFR	99.95
BON	98.23
DRB	97.44
NGI	89.12

Conclusive remarks

- Modern techniques of animal- and performance recording are vital for effective genetic change in populations
- These techniques cannot be used if animals are not –
  - identified
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