

# The inheritance of coat colour genes in Nguni cattle



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## INTRODUCTION

Nguni cattle have diverse colour patterns and each animal has its own unique pattern. Breeders are crossbreeding Nguni cattle with solid colour breeds and are interested in the colour inheritance patterns. The Nguni cow is an excellent dam for crossbreeding and is well-known in South-Africa especially for their low production cost. Nguni cows have the ability to easily calve from large framed breeds and these offspring have a high growth rate in feedlots.

## AIM

The aim is to give guidelines to breeders for breeding solid colour calves (only red and black inheritance are considered).

## MATERIAL AND METHODS

Cattle receive colour genes from each parent. Red and black are two variants of the same gene. Black hair colour is represented as A and red hair colour as a. Both genes are represented by the same letter, because they are different variants of the same gene.

**If two pure black animals are mated with each other, all the offspring will be black.**



Red (aa) x Red (aa) = all Red (aa)



Black (AA) x Black (AA) = all Black (AA)

**If a black and a red animal are mated with each other, all the progeny will be black if the black animal is AA. If the black animal is a carrier, half of the progeny is likely to be red. This can also serve to test to see if the black animal is a carrier.**



Black (AA) x Red (aa) = all Black (Aa)



Black (Aa) x Red (aa) = Black (Aa):Red (aa)

If a pure black animal is mated with a carrier, all the progeny will be black, and although half of them will carry the red gene, it will not be visible in the progeny.

Black (AA) x Black (Aa) = all Black (Aa)



If two carriers are mated, there is a 25% chance for a red calf while half of the animals will also be carriers. These animals look completely different from their parents.

Black (Aa) x Black (Aa) =  
¼ Black (AA):½ Black(Aa):¼ Red (aa)



## RESULTS

The black colour gene is dominant over the red colour and that means that animals with a black and red gene (Aa) will appear black. An animal can only be red if the genes he received from his parents are both red genes (aa). Black animals are genetically AA or Aa, while red animals can only be aa.

If a black nguni is crossed with a red coloured breed like Angus or Sussex, all the calves will be black or half will be black and half will be red. This will depend on whether the Nguni carries the red gene or not. The white spotted patterns of the Nguni will usually not show in the calves, depending on which spotted gene the animal carries.



## DISCUSSION

The colour of the calf that is born will depend on which genes the parents carry. The dominant gene determines the colour. The white colour patterns ('spotted' genes) also present in Nguni cattle are caused by genes on other loci.

Black colour is dominant over red colour and the solid colour gene is dominant over most spotted genes.



Sussex X Nguni Cross calves