

**NSAP****47th Annual
Conference
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PROCEEDINGS**THEME
**SECURING ANIMAL
AGRICULTURE AMIDST
GLOBAL CHALLENGES**

A REVIEW OF THE ORIGIN, DISTRIBUTION ,GENETIC IMPROVEMENT AND CONSERVATION EFFORTS FOR THE WHITE FULANI, NDAMA AND MUTURU CATTLE BREEDS OF WEST AFRICA

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ABSTRACT

The study reviewed the origin, distribution, improvement and conservation efforts for the white Fulani, N'dama and Muturu cattle breeds of Nigeria. The review noted that indigenous cattle breeds were characterised by low productivity, and low heritability estimates, the review reported some genetic improvement and conservation works on the White Fulanu, Muturu and Ndama and reported genetic progress on the improvement efforts for the white Fulani breed as well as conservation efforts for the Ndama and Muturu breeds. The study also noted the depletion in the population of the Ndama and Muturu breeds, due mainly to competition for land use crop farming and animal theft and thus at risk of extinction .It was concluded that interbreeding, genetic introgression, migrations and environmental factors etc played significant roles in the evolvement and distribution of the white Fulani, Ndama, Muturu and indeed other cattle breeds in West Africa. .More research on the origin, evolution and distribution of the cattle breeds in West Africa was recommended, since they can be useful in the planning and execution of genetic improvement and conservation programmes. Aggressive conservation programmes for the Ndama and Muturu breeds is highly imperative

KEYWORDS: Genetic , Origin, Distribution, Improvement, Cattle, Breeds

INTRODUCTION

Nigerian indigenous cattle breeds have been reported to be of low productivity (Norezzine,*et al* 2019: Raji *et al*, 2006) Several attempts to improve the productivity of the Nigerian Indigenous cattle breeds such as cross breeding with exotic breeds, Artificial insemination, improved nutriiton etc have been reported. Raji *et al* 2006;). These attempts yielded less than impressive results owing to so many factors such as poor programme implementation, environmental factors socio-cultural constraints, nutritional problems etc (USAID, 2006 ; Huley 2005) The indigenous breeds of cattle have low heritability estimates, indicating that appreciable improvements can not be possible by individual selection. USAID (2006) stressed that it would be difficult to develop the dairy industry using the local breeds alone. Norezzine *et al* (2019) reported a high degree of genetic diversity and genetic progress in their study on the white Fulani breed of Nigeria .Studies by Adoligbe *et al*(2020) and Bosso *et al* (2007)reported depletion in the population of the Muturu and Ndama breeds, thus putting them at risk of extinction , making conservation efforts urgent. Ductroty *et al* (2016) reported that cattle management practices and productivity, in the last 40 years have remained largely unchanged Oladipo *et al* (2018) stated that population characteristics of selected indigenous cattle breeds have not been well documented

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Given the above scenario, further genetic study of the origins, distribution, genetic improvement and conservation of these cattle breeds may help in fashioning out genetic and productivity improvement programmes. Consequently this paper reviews the origins, evolution distribution as well as improvement and conservation efforts of the white Fulani, N'dama and Muturu breeds of cattle of West Africa' .with a view to stepping up the planning and implementation of genetic and productivity improvement as well as conservation programmes.

Origin , Distribution and Improvement of the White Fulani

The White Fulani cattle are mainly owned by the nomadic Fulani people who occupy the belt between the Sahara and the rainforest from the west of the river Senegal to the east of Lake Chad, including parts of western Senegal, Southern Mauritania, in and around the flood plains of Niger, Chad, northern Nigeria (Kano, Zaria, Borno and Bauchi States) and Cameroon. (Tawah and Rege1996) There are two schools of thought about the origin of the White Fulani cattle breed. One is that the White Fulani are truly long-horned zebus, and this assumption is due to appearance of a distinct hump in a newborn bull calf, and the characteristic nature of skull and thoracic vertebrae. The other one is that the breed resulted from interbreeding first between the short-horned zebu and the ancient Hamitic longhorn and/or shorthorn resulting in a Sanga breed, and then interbreeding these Sanga with thoracic humped zebu animals could have resulted in cattle with lyre-shaped horns including the White Fulani (Tawah and Rege 1996) .Norezzine, *et al* ,(2019) evaluated heterozygosis in cattle population and characterized the white Fulani breed by identifying DNA markers considering microsatellites, they reported a high degree of genetic diversities and thus a highly informative source of genetic analysis , they stated further that the result could be applied in dealing with the conservation and sustainable application of genetic resources in the Nigerian cattle population.

Origin , Distribution and Conservation Studies on the Ndama Breed

The N'Dama, , is a humpless Longhorn (*Bos Taurus longifrons*). Until recently, Humpless (*Bos taurus*) Hametic cattle breeds were believed to have descended from the first domesticated cattle populations of the Humpless Hamitic Longhorn cattle in the region's so-called the 'Fertile Crescent' possibly around 9000 BC (Payne and Hodges 1997). These were said to be the first cattle to be introduced to Africa via the land connection with Asia by nomadic people and have spread to the west and south of Egypt Archaeological findings, however, have led to the new theory that there was an African centre of domestication in the Sahara from southern Libya and north-western Niger to southern Egypt (MacDonald 2000). Further genetic studies have also suggested that the present-day humpless cattle populations are so divergent from similar cattle populations of Europe that separate domestication could have occurred in Africa (Bradley and Loftus 2000). This was supported by the genetic evidence from Hanotte *et al*. (2002), which also indicated an exogenous but minor genetic influence of non-African origin from Europe and/or Near East in the breeds of north and northeast of Africa as well as localised areas of Southern Africa. These African Taurine cattle were also influenced by a slow genetic introgression by the zebu cattle (*Bos indicus*) of Asian origin. There is now convincing genetic and archaeological evidences for the domestication within Africa of these African taurine cattle breeds. Presently, the Humpless Longhorn cattle are represented by two breeds the N'Dama and the Kuri, though the two breeds are quite distinct in their morphology (Rege and Tawah, 1999). N'Dama cattle are believed to have originated from the Fouta Djallon plateau in Guinea, and are now found in the whole of coastal West and Central Africa: . Bosso *et al* (2007),carried out a participatory rural appraisal study using a bio- economic model of utilizing all known biological and economic relationships with a view to determining the overall breeding goal of the farmers, they reported encouraging result in the Ndama genetic improvement programmes in the Gambia which played an important role in the conservation and utilization of the Ndama cattle , the programme significantly influenced the utilization and development of the Ndama breed

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Origin , Distribution, Genetic Improvement and Conservation of the Muturu Breed.

Since the second half of the first millennium B.C. Muturu cattle were the most widespread breed in Nigeria until the Fulani invasion, which started in 1820 (Felius 1995). The breed is a variety of West African Shorthorn. Generally, two types of Muturu cattle have been identified: a larger Savannah-type and a Dwarf-Forest type, which appears to have evolved through adaptation to the humid forest environment. Most of the Muturu cattle of Nigeria belong to the Savannah type, spread over Benue , plateau, and smaller numbers are found further to the Southwest in Oyo and Kwara. This breed is also found in Southeastern coastal area of Ghana. The distinction between the strains of the breed is not yet clear, however, DAGRIS (2005) classified the Muturu cattle breed into four separate cattle populations. Adoligbe *et al* (2020), conducted an explanatory survey to understand breeding practices and breeding objectives as well as constraints as a first step towards developing breeding strategies for the conservation of the Muturu in Queme, a small holder farming area of South Benin, using an electronic animal genetic research characterization inventory and monitoring tool. They reported the depletion in the number of Muturu cattle to be largely due to competition for land use for crop cultivation and also animal theft. They recommended that a participatory management scheme be designed and implemented for *in situ* conservation of the Muturu cattle breed in Benin.

CONCLUSION AND RECOMMENDATIONS

Interbreeding, genetic introgression, migrations, environmental factors etc played significant roles in the origin, evolution, distribution of the White Fulani, Ndama, Muturu and indeed other breeds of cattle in West Africa. The Muturu and Ndama breeds are at risk of extinction, thus requiring aggressive conservation efforts. More genetic improvement efforts on the White Fulani , Muturu and Ndama breeds is imperative.

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