

## CROSSBREEDING FOR BEEF IN GHANA AND NIGERIA

### Croissement pour la viande dans Ghana and Nigerie

### Cruzamiento para carne en el vacuno de Ghana y Nigeria

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Livestock improvement programmes should consider not only the animal but also its environment. So it is intended, albeit very briefly, to look at certain ecologic zones in both Nigeria and Ghana in which crossbreeding is most likely to succeed, to examine the cattle living at present in this ecologic niche, briefly discuss efforts made so far at its improvement through crossbreeding along with some comments as to causes why they are succeeding or failing, and finally to make suggestions for improvement. On account of the time constraint this discussion will necessarily be sketchy.

Figure 1 shows the vegetation map of West Africa. The Tropical Rain Forest exists in the South Western part of Ghana and in Nigeria stretches across the southern part of the country immediately above the mangrove swamps of the coast. This zone is hot and humid with very high rainfall (> 178 cm) and high temperatures (70-80 °F) throughout the year. The rain occurs between March and December. Plant growth is very vigorous and tall trees which are either evergreen or deciduous abound along with thick undergrowth. Three crops like cocoa, oil-palm and rubber are found in this zone. The area is thickly populated with settled agriculturalists who practice shifting cultivation. Traditionally, they are not pastoralists. In order to farm in this area, the forest has first to be cleared but once farmed the land is rarely allowed to revert to forest; rather, prolonged cultivation leads to dominance of the grass species. There are few virgin forests, most having been opened up for farming. Some bush grazing does occur, but more important is that productive improved pastures can and have been established in Research Stations owned by the Government or Universities throughout the area (McILROY, 1962).

In Nigeria immediately to the north of the forest zone and in Ghana in the

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rest of the country (except the Accra plains) is the Guinea Savanna. We shall be more concerned with the Southern part of this Savannah known in Nigeria as the Southern Guinea Savanna and with corresponding areas in Ghana. This area has lower rainfall between 102-152 cm which occur between April-November. Trees are neither as tall nor as close as in the previous zone and are interspersed among tall grasses and other herbaceous plants. Periodic bush burning is practiced and is useful both in maintaining this type of vegetation as well as in encouraging regeneration of the grasses. Numerous streams traverse this area along whose banks the vegetation is a little greener and thicker. There are more cattle in this area compared to the previous. Other ecologic zones exist in both countries but will not be dealt with in this paper.

Africa is the home of the tsetse fly, *Glossina Sp.*, which transmits trypanosomes which in turn cause the deadly cattle disease of nagana or trypanosomiasis. No area of Ghana is free from this fly and in Nigeria only the Northern Sahelian zone is free. This fly is one of the most important factors influencing the distribution of cattle in all West Africa. CASWELL (1962) has written about this fly. He claims about 20 species have been recorded in Africa each existing in its own (fly belt) which is determined by vegetation, though overlaps do occur. The *Glossina pallicera* is confined to the Rain Forest of West Africa, the *G. palpalis* has a range extending from the forest to the savanna, while the *G. morsitans* is found in the savanna. About their live history, he records that the female fly deposit fully grown larvae in damp shaded place under trees or along banks of streams. These larvae pupate in about an hour. Adults will emerge 17 days later but emergence may be delayed as long as three months, if dry conditions prevail.

Thus conditions in the Rain Forest and the Southern Guinea savanna are ideal for the tsetse fly. The flies know this, judging from their concentration in these areas with consequent reduction of the cattle population, except for those which have resistance to the diseases they transmit.

Such cattle are the West African Dwarf shorthorn, the Ndama, and crosses between these and the Zebu e.g. Keteku found around Ilorin, Nigeria or the West African Shorthorn of Ghana. The Ndama is not indigenous to either Ghana or Nigeria but is found in the Fouta Djallon area of West Africa, that is, in the

TABLE 1  
WEIGHT AND HEIGHT AT WITHERS OF LOCAL CATTLE BREEDS

Trait	Breeds			
	Dwarf Shorthorn *	Ndama *	Keteku *	West African Shorthorn <sup>1</sup>
Birth wt. (Kg) ... ..	12	18	21	15
Ht at withers (cm) ... ..	100	108	114	109
Adult wt. (Kg):				
Female ... ..	203	263	295	243
Male ... ..	229	352	330	308

\* OYENUGA (1967).

<sup>1</sup> NGERE and CAMERON (1972).

same ecologic zone as the Dwarf shorthorn and it has been no problem introducing it to these two countries where they are performing satisfactorily.

Table 1 shows data from OYENUGA (1962), NGERE and CAMERON (1972) which give an indication of size of these cattle.

The time required to achieve adult weight is about 5 years for all the breeds. Though small, the humpless Dwarf shorthorn has good beef conformation: it is deep bodied with well sprung ribs giving it a back that is level and broad with well developed musculature. In addition to possessing a high degree of resistance to its local strain of trypanosomes it can resist the effects of biting flies and ticks, and diseases, transmitted by the later. It is quite fertile and regular annual calves have been obtained in a long reproductive life starting with first calving at 3 1/2 years and going on to over 16 years. The animal is not milked and does not appear to produce much either. Although the Ndama is similar in conformation to the Dwarf shorthorn, it is bigger. Its resistance to trypanosomiasis is not only to the local strain as in the Dwarf shorthorn but extends to other strains as evidenced by its satisfactory performance outside its natural area. It is also fertile but has negligible milk yield. No resistance to ticks has been recorded. The Keteku and West African shorthorn come in between these two in their resistance to trypanosomiasis and their size and beef conformation are comparable to the Ndama.

When these facts on the animal and its environment are put together, the following conclusions become inevitable:

1. Improved productive pastures can be established more easily in these two zones than in any other ecologic zones in West Africa. This is because:

- a) Except for the swamp these zones have the shortest dry season so the problem of supplementary feeding during this season will be least.
- b) It might be easier to meet the dry season water shortage in these zones than elsewhere.
- c) With the more rapid growth during the rainy season it is possible through skillful management to conserve enough forage in the form of silage and hay for the dry season feeding. And in fact some of the improved pastures that have drought resistant grass species remain green almost through the dry season.

2. In this more densely populated areas land is more valuable and extensive grazing is not likely to continue with increasing population.

3. The high human population and low cattle density implies good market for beef.

4. The available cattle breeds though adapted to its present local environment cannot perform adequately to offset the high cost of developing improved grasslands in these zones and within breed selection might be too slow.

Therefore crossbreeding is feasible. A breed should be evolved that will possibly combine the resistance to trypanosomiasis and other local diseases with those for high growth rate, high liveweight, better milk yield of the dam, and early maturity when improved environment is provided.

This need has been recognised over the years. So unimproved unselected zebus coming from zones north of these two have bred the local cattle. The result have

not been spectacular, the zebu themselves being about just as unproductive though bigger. More recently trial crosses with imported temperate breeds have been carried out in Government experimental farms and University Research Stations in both Ghana and Nigeria. Many breeds have been tried and include: the Angus, Hereford, Charolais, Brahman, Santa Gertrudis, Red Poll, Jersey, Holstein and Brown Swiss.

#### RESULTS AND DISCUSSION

All efforts made so far in both countries have been on small scale experimental basis, as a results clear answer have not been offered to relevant questions concerning breed development: which of the imported breeds is best in crosses, what percent imported «blood» is most satisfactory for the ecologic zones, what level of change in the environment is necessary and what are the comparative costs and returns of crossbreeding? Yet useful information have been collected.

Table 2 shows comparative liveweights in Ghana of the local and  $F_1$  generation hybrids under semi-intensive i.e. no supplement during dry season and grazing throughout the year on fenced but unimproved natural grassland. It was shown in this study that better liveweight gains are still possible with better feeding.

TABLE 2  
WEIGHT (KG) OF LOCAL AND  $F_1$  GENERATION HYBRIDS AT UNIVERSITY OF GHANA FARM, Kpong<sup>1</sup>

Breed	Age (years)		
	< 2 1/2	< 3 1/2	< 4 1/2
West African Shorthorn (WAS) ... ..	184	246	293
Ndama ... ..	242	277	292
Santa × WAS ... ..	263	332	457
Red Poll × WAS ... ..	286	352	434

<sup>1</sup> NGERE and CAMERON (1972).

The crossbreds showed, as expected, increased susceptibility to trypanosomiasis as compared to the local but Veterinary attention was available and very few animals were lost.

This result is typical of data from other Research Stations in the area, although in some cases disappointing result have been obtained. At Fashola Ranch in Western Nigeria, for example, ADENIYI (1973) reports that all crosses of Ndama with Angus were wiped out by streptotrichosis—a skin disease of cattle in this area. Other crosses with Hereford, Charolais, Santa Gertrudis, Brahman and Jersey at this ranch did not fare much better. It is here being suggested that these animals were lost because of the extensive system of management adopted—in this case ranching. When managed extensively these animals succumb rapidly

to a variety of diseases: Streptotrichosis, trypanosomiasis, rinderpest, and foot-and-mouth, to name a few.

There is some indication from the results, although data is too small to make incontrovertible statements, that some breeds do better in crosses than others. But generally there is still need to undertake, on a larger basis than has been done, trial crosses aimed at identifying the best breed for crossing purposes.

In conclusion, it may be said that Ghana, at present, does not have enough beef to meet local demand and a similar situation might soon develop in Nigeria. So it is urgent to continue efforts aimed at developing a suitable hybrid capable of making good use of improved pastures that can be developed in the Rain forest/Southern Guinea Savanna Zones. And because breed development takes a long time, it is urgent that a start be made now rather than wait for improved husbandry conditions throughout the area, as has been suggested in some quarters. Husbandry condition and grazing land in these zones will certainly improve in 25 years and with serious concerted effort a breed could be available at that time to make full use of such improvements.

#### RESUME

On a passé revue, du point de vue de l'élevage de la Rain Forest et de la Southern Guinea Savanna existentes en Nigérie et Ghana. Il y a des raisons pour démontrer l'utilité du croisement pour augmenter la productivité du West African Dwarf Shorthorn ou la race Ndama; elles sont des races locales dans cette zone. Les résultats des épreuves de croisement des deux races avec du bétail importé des zones tempérées sont discutés; on fait des suggestions pour l'amélioration des programmes futures avec de croisement.

#### RESUMEN

Se hace un resumen, desde el punto de vista ganadero, de la Rain Forest y de la Southern Guinea Savanna tal como existen en Nigeria y Ghana. Existen razones para apoyar que el cruzamiento puede ser empleado útilmente para aumentar la productividad del West African Dwarf Shorthorn o la raza Ndama, de los cuales ambos son razas locales en estas áreas. Los resultados de las pruebas de cruces de estas dos razas con ganado vacuno importado de zonas templadas se discuten brevemente. Se hacen sugerencias para la mejora en programas futuros con cruzamiento.

#### SUMMARY

An examination, from cattle breeding point of view, is made of the Rain Forest and Southern Guinea Savanna as occurs in Nigeria and Ghana. Reasons are adduced to show that crossbreeding can be usefully employed to increase productivity of the West African Dwarf Shorthorn or the Ndama both of which are

cattle breeds local to these areas. The results from trial crosses involving these two breeds and imported temperate cattle are briefly discussed. Suggestions are made for improvement in future programmes with crossbreeding.

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