

EXPLOITING LOCAL POTENTIALS FOR INCREASED DAIRY PRODUCTION IN NIGERIA

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ABSTRACT

Commercial milk production in Nigeria has remained underdeveloped due to a complex of factors relating to the animal, environment, infrastructure, socio-economic climate and government policies. While the challenges facing this sector are real and daunting, the array of natural resources available in the country suggests great possibilities for commercial milk production. Nigeria has a population of 173 million people with a high demand for milk and its products. This provides incentive for investment into local milk production. Although milk yield from indigenous cattle is low (2 L/day), their ability to survive in the harsh tropical environment suggests a need to crossbreed with highly productive dairy breeds (> 25 L/day). The abundant feed resources in different parts of the country also indicate that nutritional needs of these animals can be met at reasonable cost. In this paper, attempt is made to discuss the major problems encountered in the dairy sector and local possibilities for surmounting them.

Keywords: cattle breeds, feed resources, management systems, milk production, tropical environment.

INTRODUCTION

Dairy production depends on livestock breeds of proven genetic capabilities, adequate supply of feed and forage, sound management practices, adequate capacity to process and market milk products among other things. With a human population estimated at 173 million and land mass of 923,770 sq km (World Bank, 2013), Nigeria is endowed with sufficient human and natural resources to sustain dairy production on a commercial basis. Local milk production was estimated at 591,470 tonnes while demand for milk was estimated at 1.7 million tonnes, leaving a deficit of about 1.2 million tonnes which is currently filled by importation (Rhodes, 2014). The volatility in price of milk powder, hostile exchange rates and irregular government policies makes importation unreliable in the long run. The huge demand for milk and low domestic supply provides an incentive for investing in advanced technologies to increase local milk production. Livestock population was estimated at 13.9 million cattle, 22.1 million sheep and 34.5 million goats (Lawal-Adebowale, 2012). Although the livestock population is dominated by indigenous breeds whose productive capacity for milk is considered low, their large population ensures that some milk is available for local consumption. The climate in Nigeria varies from hot and humid in the south to hot and dry in the extreme north. There are two distinct seasons;

wet and dry. During the wet season, forage is abundant for livestock and milk yield is at peak but during the dry season, forage is scarce and milk yield drops. The vegetation varies from forests in the south to savannahs in the north with peculiar opportunities and challenges to dairy production. The wide range of feed resources available in each region assents to a robust potential for dairy production. The challenges to dairy production in Nigeria generally include: low genetic base for milk production among indigenous breeds, inadequate feed supply, harsh environmental conditions, poor management systems, inadequate milk processing facilities, primitive markets, poor access to capital by farmers, etc.

Breeds of Cattle

Milk production from cattle is highly dependent on the genetic capacity of the cow (Berman, 2011). Standard dairy breeds were developed through decades of systematic selection for increased milk production among native cattle populations in temperate regions. This resulted in the emergence of specialized dairy cattle with high milk yields and efficient reproductive capacity. Traits such as fast growth rate, early maturity, long lactation, short calving interval and good milk-letdown reflex were incorporated into the genotype. In Nigeria no deliberate effort was made to develop specialized dairy cattle among the indigenous breeds which are

predominantly Zebu. While these animals are adapted to the hot and tick -infested environment, their productive capacity is extremely low. The adaptive traits of Zebu cattle are associated with small body size, low metabolic rates, reduced milk yields and poor reproductive performance (Hansen, 2004; Berman, 2011). Typical milk yield from indigenous cattle is less than 2 L/day and lactation length less than 100 days compared to over 25 L/day and lactation length of 305 days in the exotic dairy cow (Bayemi *et al.*, 2005; AHDB, 2016). The ability of indigenous cattle to thrive in the harsh tropical environment seems to have developed at the expense of their productive capacity. Local cows can be bred to exotic dairy bulls to optimize high milk yields with local adaptation. However, when direct introduction of exotic cattle is preferred, care must be taken to match their genetic capacity with a high plane of nutrition and management. A more practical approach would be to systematically upgrade local cows to exotic genotype over a period of time. This would afford farmers time to upgrade their management practices.

Cattle Feeds

Full expression of the genetic potential of the milking animal cannot be achieved without adequate and qualitative nutrition. This is aptly captured by the aphorism, 'You are what you eat' (Chinese proverb). Although Nigeria has enough resources to produce the required feed for dairy cattle, in reality these animals are undernourished due to low productivity and poor quality of native pastures (Olorunnisomo and Adewumi, 2015). The nutrition of these animals is further compromised by the scarcity of feeds during the dry season. In order to meet the nutrient demand by dairy cattle on a year-round basis, a feed calendar should be put in place to harness available feed resources into an annual feeding plan. Available feeds in Nigeria can be categorized into: pasture and fodder species (mainly grasses or legumes), concentrate feeds, crop residues and agro-industrial byproducts (Table 1). Excess forage or crop residue generated during the wet season can be preserved for dry season feeding using hay or silage technology. The most efficient feed management will combine several of the listed

feed resources for year-round feeding of dairy animals.

Management Systems

Apart from nutrition, the performance of dairy cattle is also affected by the management system adopted. The common system adopted in Nigeria is the extensive management system, where cattle are sustained on low quality pastures and natural sources of water like rivers and streams. Capital investment is minimal with little or no housing provided and veterinary care limited to critical health challenges. Mating among animals is usually indiscriminate with high incidence of inbreeding (Lawal-Adebawale, 2012). While production inputs in this system is low, milk output is also extremely low. Intensive dairy farming is not common in Nigeria and is limited to a few elite farms, research institutes, universities and government owned farms. The intensive system of management involves capital investment into housing facilities, good nutrition, sound health and breeding programmes. The expected milk output should offset the costs and provide profit to the farmer. In between the two extremes are several shades of semi-intensive systems targeted at maximizing milk yields with low capital investments. Given the present economic realities, semi-intensive systems may be more practical for dairy farming in Nigeria. The appropriate system must include housing facilities that minimizes heat stress, enhance cow comfort and ease of operation; breeding/mating systems to maximize genetic gains in subsequent generations; and health management focused on preventive rather than curative measures.

Processing and marketing of milk products

Milk is a highly perishable product due to its high moisture and nutrient content; hence adequate processing facilities must be in place to extend its shelf-life and enhance consumer preference. The lack of processing facilities and poor infrastructures in Nigeria has caused local milk markets to be essentially primitive since milk must be consumed within hours of its production. The large human population in Nigeria and the high demand for milk already provides a strong incentive for investing into dairy production and processing. However, the government needs to further enhance the local value chain for milk by improving on infrastructures, creating incentives for

emergence milk processing plants and developing blueprints for strong and organized milk markets in Nigeria.

CONCLUSIONS

Nigeria has sufficient human and natural resources to make commercial dairy production thrive. However, the myriad of problems facing the dairy industry has dwarfed its potential in the country. With appropriate government incentives, political will and enlightenment programmes, the economic potentials in this sector can be unleashed to provide strong livelihoods and a new era of prosperity to the Nigerian populace.

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Table 1. Some examples of available feed resources in Nigeria

Pasture/Fodder	Concentrate	Crop residues	Agro-industrial byproducts
Grasses	Cereal grains	Stovers/straws	Cassava peels
- Panicum	- Maize	- Maize	Wheat bran
- Pennisetum	- Sorghum	- Sorghum	Corn bran
- Andropogon	- Millet	- Millet	Rice bran
- Cynodon		- Rice	Brewer's spent grain
- Setaria			
- Bracharia			
Legumes	Oilseed cakes	Haulms	Fruit pulps
- Centrosema	- Soyabean	- Cowpea	- Citrus
- Calopogonium	- Groundnut	- Groundnut	- Pineapple
- Pueraria	- Coconut	- Soyabean	- Mango
- Stylosanthes	- Palm kernel		
- Gliricidia	- Cotton seed		
- Leucaena			
- Pigeon pea			
Cereals	Root meals	Husks	Oil seed cakes Poultry litter
- Maize	- Cassava	- Maize	
- Sorghum	- Sweet potato	- Rice	
- Millets		- Sorghum	
- Rice		- Cowpea	
Root crops	Fishmeal	Sweet potato vines Cassava tops Sugarcane tops Banana stem and leaf	
- Cassava			
- Sweet potato			
Moringa			