

# **BACK TO EDEN: INDIGENEITY IN THE QUEST FOR FOOD SECURITY IN SUB-SAHARAN AFRICA**

by

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*Inaugural lecture delivered at the University of Ibadan on Thursday, 15 July 2021.*

## **ABSTRACT**

Food insecurity exists when people do not have adequate physical, social, and economic access to food. There were 237 million undernourished people in sub-Saharan Africa in 2018 which continues to increase especially in West Africa. Nutritional quality of available food is poor as it is often rich in starch with little or no protein source. Prioritizing animal agriculture to improve quality of nutrition is therefore imperative. Looking inwards and working with nature is a dimension that African leaders should explore to solve the challenge of food insecurity, thus the title 'Back to Eden' for the purpose of this lecture.

I have studied some biological factors that are responsible for the adaptation of some food animals to the harsh and pathogen-laden climatic environment of Africa. I have investigated aspects of disease tolerance and immunocompetence in turkeys and ducks in comparison to chickens via studies on the pathogenesis of infectious bursal disease and delayed footpad reaction. With regards to the use of natural products at enhancing poultry production in Africa, I have investigated the potentials of the fruit-pulp and rootbark of the African Baobab tree (*Adansonia digitata* L.), *Saccharomyces cerevisiae*, and Garlic (*Allium sativum* L.).

Higher levels of Zn and Mn ( $p < 0.05$ ) were found in erythrocytes of trypanotolerant Keteku than in those of trypanosusceptible White Fulani cattle which probably renders the later less liable to lysis by trypanosome organism. I found that turkeys and ducks are more tolerant to diseases in comparison to chickens due to superior cellular immunity. There was serological evidence of viral infections in Nigerian indigenous chickens without concomitant clinical disease, an indication of disease tolerant trait which was confirmed by higher concentrations of IFN $\gamma$ , complement and natural antibodies as well as higher values for delayed footpad reaction. Fruit-pulp extract of *Adansonia digitata* L. showed growth promoting effect with no toxicity in broilers at 125 -250 mg/kg body weight while methanolic rootbark extract showed antiviral activities which could be exploited in the institutionalization of biosecurity on poultry farms via its use as a disinfectant. The inclusion of organic source of Zn and Se in broiler feed resulted in higher weekly average body weights, relatively bigger bursae of Fabricius and enhanced antibody response to Newcastle disease vaccination. Garlic in feed of chickens enhanced vaccinal immune response and increased serum IFN $\gamma$  concentration, increased villi length and width as well as cryptal depth of the jejunum with consequent increase in carcass yield. Also, it decreased the amount of fat in the skin while increasing collagen in the dermis-hypodermis layer, exhibited antimicrobial effect *in-vivo* on *Salmonella gallinarum* and *Eimeria tenella* and prolonged the shelf-life of table eggs at room temperature via its transovarial effect.

In addition, it improved livability of chickens and ameliorated hepatotoxicity and nephrotoxicity.

Thus, focus on Africa's indigenous breeds of food animals and poultry for enhanced production and use of natural products in poultry production holds great potentials as tools in tackling food insecurity. I recommend that inventions towards enhanced productivity should be disseminated and adopted, research funding into the use of natural products as growth promoters for livestock and poultry production be improved and that African political leadership should sincerely commit to reducing food and nutrition insecurity by strategizing the agricultural sector, inclusive of animal agriculture.