

“Africa, potential food basket of the world: Nurturing the next generation of researchers and entrepreneurs”



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Effectiveness of three therapeutic treatments in eliminating plant viruses from *in-vitro* white yam (*Dioscorea rotundata* Poir.) accessions

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Abstract

Despite its potential for food security and poverty alleviation, yam production is hindered by many challenges such as lack of adapted varieties, low planting material availability, pest and diseases. This latter constraint is mainly due to viruses which cause huge yield loss. One of the reliable solutions is the development of virus cleaning methods for infected germplasm in order to promote use of yam genetic resources through exchange and distribution for research and breeding. The objective of this work was to test different virus cleaning methods in yam, in association with meristem regeneration as a sanitation method. The virus elimination effectiveness of three different therapeutic methods (with various parameters) was tested on three different infected accessions (TDr 4151, TDr 1808 and TDr 1479) of *Dioscorea rotundata* infected with Yam mosaic virus (YMV) and *Dioscorea alata* bacilliform virus (DaBV). Chemotherapy (with Ribavarin[®] at 10, 20, 25 and 30 mg/L), thermotherapy (36 °C, 38 °C and 40 °C) and cryotherapy (droplet-vitrification and encapsulation-dehydration methods) were applied on 10 meristems excised from each of the accessions and cultured under regeneration conditions. The regenerated plantlets obtained after the therapies were indexed to determine their virus status. Some of the cleaning treatments levels did not support yam meristem regeneration whilst other gave promising results in terms of both meristem regeneration and virus cleaning. Chemotherapy using Ribavarin at 10 mg/L, heat treatment at 36 °C and droplet-vitrification cryopreservation method gave very promising results, compared to the control. These results merit further exploration, especially when associated together, to design a reproducible and reliable method to resolve this big challenge to the fulfillment of yam's potential.

Key words: *Dioscorea rotundata*, chemotherapy, thermotherapy, cryotherapy, Yam mosaic virus and *Dioscorea alata* bacilliform virus.

Land-Income-Nutrition Nexus: Implication for Food Security of Farm Families in Oyo State Nigeria.

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Abstract

The produce cultivated by farm families are consumed and sold in the market to generate cash which is used to meet other household needs. But then, the farm families also have to make food purchases at higher prices to supplement the short fall that may have occurred over time. This presents a Land-Income-Nutrition cycle; the study investigates the interplay of this nexus with socio-economic characteristics of the farm families. A multi-stage random sampling technique was used to select a total of 74 farm families from villages. The data collected were analyzed using descriptive statistics and multiple regression analysis. The results showed that farming and related activities (poultry production) are the major sources of income. Land use in the area consists mainly of sole cropping, mixed cropping, crop rotation. Average monthly income from farming is N27, 135.00 and N17, 454.04 is spent on food monthly. The per capita calorie intake shows a short fall of 1353.33Kcal less than the international recommendations. The regression analysis shows that family size, income, food expenditure and source of farm land influence the daily calorie intake of farm families. Improved market access through good roads and improved post-harvest technology are recommended.

Keywords: Land, Income, Nutrition, Farm-families

Assessment of rural market participation among farming households in Kwara state, Nigeria

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Abstract

Farming households do participate in the rural markets to commercialize their farm produce. Rural market participation thus improves welfare of the rural poor. Inadequate knowledge about the factors affecting the decision whether or not to participate and the intensity of non-participation in rural markets among poor farmers may hinder effective planning for welfare of rural farming households. The study therefore determined the level of market participation among rural farming households, the determinants of market participation among farming households and the factor affecting the intensity of non-participation in rural markets. 160 farming households were randomly selected across eight rural communities in Kwara State. Data collected were analyzed using descriptive statistics and double hurdle model comprising Probit and Tobit models. The results of the study revealed that 58 percent of the respondents participated in rural markets. The decision to participate in the markets is determined by educational status, access to credit, market information access, commodities prices and market surplus. The study further revealed that educational status, access to credit, market information access, commodities prices and market surplus reduced the intensity of non participation in rural markets by 69%, 100%, 2.2%, 0.09% and 0.04 % among the rural households respectively. On the other hand, household size increased the intensity of non-participation in rural markets by 3% among the households. It was recommended that, farmers should participate in commercializing their products in rural markets and be encouraged to form cooperative to ease their access to credit and market information. Besides, there is the need for awareness on the significance of family planning to improve market participation among farmers.

Key words: Market participation, Farming households, Market surplus, Sale index and Double hurdle model

FERMENTATION AND SPOILAGE OF SWEET ORANGE JUICE (*Citrus sinensis*).

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ABSTRACT.

Orange juice is one of the most important fruit juices. They are popular drinks as they contain antioxidants, vitamins, and minerals that are essential for human beings, and plays important roles in prevention of heart diseases, cancer and diabetes. They contain essential nutrients which support the growth of acid tolerant bacteria, yeasts and moulds. Sweet Oranges production was a highly lucrative business in the early 1960s and 1970s but its production is faced with enormous problems which include pre-harvest and postharvest losses, usually caused by bacteria, fungal and viral particles. This paper examines the roles of various mould and yeast during the fermentation and spoilages of sweet oranges. *Saccharomyces cerevisiae*, *Schizosaccharomyces pombe* as well as *Pichia* species were the yeasts isolated and identified from the fermenting juice. However, *Aspergillus flavus* was the only mould associated with the spoilage of the juice. A gradual decrease in pH was observed with increasing incubation period. The organoleptic assessment of the orange juice revealed that fresh juice had mean sensory values of 7.1, 7.8, 6.1, 6.5 and 5.5 for aroma, taste, flavor, colour and texture respectively. Making fresh orange juice a palatable and highly nutritious fruit drink.

Key words: *Saccharomyces cerevisiae*, *Schizosaccharomyces pombe*, *Pichia* species, *Aspergillus flavus*, orange juice

PROFITABILITY AND MARKETING EFFICIENCY OF WATERMELON IN AKURE METROPOLIS AREA OF ONDO STATE

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Abstract

The study examined the profitability and marketing efficiency of watermelon marketing in Akure Metropolis of Ondo state, Nigeria. Primary data were used for this study. Data were collected from fifty (50) randomly selected watermelon marketers with the aid of well-structured questionnaire complemented with interviewing method. The study revealed among others that watermelon marketing is a new enterprise with 80% of the respondents less than 5 years of marketing experience, majority (80.0%) of the respondents were still very young and were within the active labour force age of 18 to 45; 96% of the respondents attained a level of education or another; The profitability analysis explained that watermelon marketing was profitable with a return of N90, 480.9 per month in the study area. This study revealed that watermelon marketing in the study area is inefficient (0.475) and the estimated percentage marketing margin at 36.1%. Income level and level of education of the respondents were statistically analyzed to be factors affecting profitability of watermelon positively in the study area. Problems mainly encounter by respondents include: fruit spoilage, inadequate storage facilities, bad roads and high farm gate price.

Keywords: Watermelon, marketing, profitability, marketing margin, marketing efficiency

ACHIEVING FOOD SECURITY IN NIGERIA, HOW FAR HAVE THE VARIOUS AGRICULTURAL POLICIES HELPED?

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Abstract

At the heartbeat of any serious government both in the developed and emerging economies lies achieving food security in its totality. Food security essentially entails achieving food availability, food accessibility and food adequacy both in the appropriate quality and quantity to service the need of every individual in a nation. Literature has shown that over one billion people are faced with food insecurity problem worldwide with Africa having over six hundred million of her people faced with undernourishment, and Nigeria scoring more the 15 points in the Global Hunger Index scores. This points to the persistent danger of facing food insecurity on the continent as a whole and, Nigeria in particular. Government at various levels at different time in Nigeria have put in place various policies and programmes that aimed at combating food crisis and achieving food security, some of these policies includes Green Revolution, Operation Feed the Nation, establishment of River Basins, Commodity and Grain Boards, Agricultural Development Programmes, Public – Private participation initiatives, Fadama Projects, among others. The questions are: do these policies and programmes substantively increase food security in Nigeria? What policy or programmes helped achieve increase in food production in Nigeria? Answering these questions is important to virtually all the stakeholders in the economy especially the policy makers and practitioners. For policy makers on the one hand, the answers will identify the most effective way(s) of achieving food security in Nigeria which will further improve policy formulation for the practitioners. Besides, the response to the questions will aid developing strategies that will help fit into the various policies of the government in achieving food security, thus maximize the benefits embedded in them. The essence of this study is to use non-parametric statistical tool to examine the impact of the various agricultural policies and programmes in Nigeria in achieving food security. The paper also intends to contribute to the theoretical framework that will aid the formulation of effective all encompassing agricultural policies which aimed at achieving food security in Nigeria.

Key words: Economies, food security, policies

Land management practices on cassava production in Akinyele local government area Oyo state

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Abstract

Sustainable agricultural practices and food security has been major activities in reducing poverty level in a farming system especially among Nigerian farmers. The study analyzed the land management practices on cassava production in Akinyele local government area of Oyo state using descriptive and multiple regression analysis. Data for the study was collected from 90 farmers with the use of a well-structured questionnaire. The study revealed that 75.0% were male, 76.1% had one form of formal education, and 57.6% used hired labour, 77.2% practice commercial farming system, 37.0% of the farmers produce between 20-100 bags (50kg /bag) of cassava per hectare. The study also revealed that farm size 0.687 was positive and significant at 1%, extension agent visit -0.341 was negative but significant at 1%, labour used 0.144 was positively significant at 10%, while time visit -0.244 and cover crop -0.148 were also negative but significant at 5% level. R^2 was 0.664 which means 66.4% account for the level of variation in the cassava output in the study area. The major problems of farm practices identified included, inadequate extension agent visit to the farmers. The study therefore recommended that extension workers should be made available and pays more attention to the rural farmers in order to increase their production activities; cover cropping should be encouraged; while bush burning practice by farmer should be discouraged in order to sustain production.

Keywords: Sustainability, Land management, Cassava, Linear regression, Oyo State

Application of bio-nematicides as alternatives to synthetic nematicides for food security: Maize planted on nematode infested soil as case study.

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ABSTRACT:

The high cost, non-availability in time of need and hazardous effects of synthetic nematicides; the fear of nematodes developing resistance to synthetic nematicides and the concern of people for the environment have motivated researchers to exploit alternative measures for the control of plant parasitic nematodes. Bio-nematicidal activities were therefore assessed on the growth and yield of maize planted on nematode infested soil at the Teaching and Research Farm, Ladoke Akintola University of Technology, Ogbomoso. SUWAN -1- SRY maize variety was the test crop. The treatments which were leaves of Neem, Tithonia, Nitta and tobacco were prepared, mixed thoroughly with solutions of either black soap or *Tetrapleura tetraptera* while single application of black soap, *Tetrapleura tetraptera* and water served as different control experiments. There were 11 treatments, replicated 4 times and fitted into randomized complete block design. Nematodes encountered in the experimental site were *Meloidogyne incognita*, *Pratylenchus brachyus*, and *Xiphinema* spp. The results showed that the root damage and soil population of nematodes were significantly reduced in the plots where bio-nematicides were applied when compared with the controls. The growth and yield of maize significantly increased when compared with the controls. A research effort is on-going to find out the active ingredients in the bio-nematicides.

Keywords: Synthetic nematicides, Bio-nematicides, food safety, maize, nematodes, control

Influence of Conventional and No-Tillage on Performance of maize in a short fallow period at Samaru, Northern Guinea Savanna of Nigeria.

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Abstract

Study on the influence of conventional and no-tillage practices on performance of maize in a short fallow period was conducted at the Institute for Agricultural Research farm, Samaru, Zaria, Nigeria in the year 2010 and 2011, located at Longitude 7⁰38'164"E and Latitude 11⁰09'525"N at 667.4m asl. The main objective of this research is to ascertain the best management option for cultivating maize under short fallow period in this agro ecological zone, which farmers in this region can adopt. The treatments included no-tillage (NT) and conventional tillage (CT), comprising of fourteen (14) plots with seven (7) plots each subjected to both NT and CT. Three plants were randomly tagged in each of the treatment plot for periodic observation of the plants based on their developmental stages at 3, 6 and 9 weeks after sowing (WAS) for leaf area in (cm²), rooting depth in (cm) and plant height in (cm), while the grain yield in each of the net plot was harvested, threshed and winnowed, and was expressed in Kg ha⁻¹. Crop performance revealed that the leaf area was not significantly changed by the tillage treatments at all the periods of observation during both cropping seasons, except at 6 weeks in 2010, when crops grown under NT had significantly greater value (8.7%) than those grown under CT. For rooting depth, the crops reached similar depths under all the tillage treatments in 2010. However, the crops significantly ($P \leq 0.01$) varied in their rooting depth under the tillage treatments at 3, 6 and 9 WAS in the second year, with those grown under CT treatment having 4.5, 3.6 and 1.1%, respectively greater value compared to NT. Taller crops were found under NT management than that under CT at all the study periods. However, tillage treatment did not statistically and significantly influence maize grain yield during the two year study period, although NT treatment tended to cause greater yield increase than CT treatments.

Keywords: Conservation; management and yield.

ENCOURAGING THE CONSUMPTION OF BAMBARA GROUNDNUT (*Vigna subterranea*) PRODUCTS CAN REDUCE HIDDEN HUNGER IN NIGERIA

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ABSTRACT

Bambara Groundnut (*Vigna subterranea*), (BGN), is a low cost crop, grown by families for subsistence and as annual income. BGN varieties have recognizable morphological features such as testa colour and patterns that can be used for their identification and classification. It has been described as a complete food as it contains sufficient quantities of protein (20.5%), carbohydrate (63%) and fat (6.3%) with relatively high proportions of lysine (6.6%) and methionine (1.3%) appreciable amounts of micronutrients. BGN has antioxidant properties. Enhanced BGN utilization through the consumption of its products like 'okpa', Bambara milk, Bambara snacks e.t.c.; its inclusion in complementary feeding system in Nigeria will encourage a wider production, thus improving its economic status. Hence, it could be a potential source of nutrients to overcome malnutrition in sub – Saharan Africa.

Keywords: Bambara, legumes, consumption, malnutrition, reduction.

Genetic variability for yield and component traits in cowpea [*Vigna unguiculata* (L.) Walp]

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Abstract

The need to develop improved cowpea genotypes makes studies aimed at revealing the knowledge and magnitude of genetic control underlying the variability within cowpea germplasm essential. Eleven cowpea genotypes obtained from GLIP-IITA were evaluated for genetic variability at the Teaching and Research Farm of the Federal University of Agriculture, Abeokuta (FUNAAB) in Nigeria during the late seasons of 2011 and 2012. Data were taken on days to 50% flowering, number of pods/plant, number of seeds/pod, 100 seed weight, pod, seed and dry fodder yields. High significant genotypic effect ($P < 0.001$) was recorded for most of the traits studied indicating high level of genetic variability among. Number of pods/plants, pod, seed and dry fodder yields were high for phenotypic and genotypic coefficients of variation. High heritability values were recorded for number of pods/plant, 100 seed weight and dry fodder yield indicating that the traits were under genetic control. Genetic advance was high for seed, pod and dry fodder yield indicating that the traits could be improved through selection. All traits had high genetic advance as per cent of mean except days to 50% flowering and number of seeds/pods. Dry fodder yield alone had combined high genetic advance and heritability values indicating that this trait has high selection value and should be considered important in cowpea improvement program. IT99K-494-6 and IT98K-573-2-1 that were high for seed and pod yield; and dry fodder yield respectively, may be considered for further improvement.

Effect of period of harvest and drying conditions on the nutritional value of an Improved Variety Cowpea (*Vigna unguiculata* (L.)

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ABSTRACT

Cowpea is a legume that is extensively grown throughout Sub-Saharan Africa. Nigeria, the largest producer and consumer, accounts for 61% of production in Africa and 58% worldwide. Cowpea has a high nutritional value; hence, it contributes significantly to the alleviation of malnutrition specifically amongst the poor. Therefore, attention should be focused on maintaining the nutritional content. Also, Shattering loss and loss due to pest attack significantly reduce the quantity of cowpea that can be harvested from the field. This research work investigated the possibility of early harvest of cowpea, hence the main objective was to study the effect of period of harvest under the influence of some drying conditions on the nutritional value of an improved variety cowpea (IT 97K-56S-IS).

Cowpea samples were gotten from IITA and harvested at period of harvest of 60, 64, 68 and 72days and subjected to drying at 55, 65, 75, 85°C. Triplicate samples of cowpea grains of 200g were used for each drying experiment and drying process was monitored by weighing the samples every 10mins for the first one hour; every 30mins for the next three hours and every 1hr for the next three hours till the end of drying. The nutrients retained in the dried samples were determined by proximate analysis according to AOAC Standard and the results were subjected to analysis of variance ($p < 0.05$). The result of the proximate analysis of IT 97K-56S-IS indicates that, the carbohydrate content ranges between 61.91-64.40%; crude protein ranges between 20.74-21.17%; crude fat ranges between 0.82-1.13%; crude fibre ranges between 3.47-3.79%; ash ranges between 3.28-3.58%. It was thus concluded that there was a good retention of nutrients; drying conditions have no significant effect on the nutritional content but period of harvest have significant effect on some nutritional content of cowpea.

Keywords: Loss, Moisture content, Proximate Analysis, IT 97K-56S-IS

AQUACULTURE VALUE CHAIN: FERTILE GROUND FOR YOUTH ENTREPRENEURS

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ABSTRACT

Fish is a major source of food for human populations providing a significant portion of the protein intake in the diets of a large number of the people especially in developing countries. Nigeria is a major consumer of fish, with increasing demand for fish driven by a rising middle class and changes in the Nigerian diet and it is forecasted that expanding populations and changing eating habits will make a doubling of food output imperative in years to come. The majority of demand is met by imports, making Nigeria the largest importer of fish in Africa. This demand mainly has to be met from local food production system. Fish farming contributes to poverty alleviation as it provides employment to millions of people, both in the sector itself as well as in support services. It also generates income and as prices for most food commodities fall, fish prices are expected to rise reflecting the imbalance between demand and supply. The total contribution of fisheries to the Nigerian economy is put at ₦126,417 billion (USD629.41million) gross outputs with a capitalization of ₦78,530billion (USD390.99 million). There are attractive investment opportunities throughout the fish value chain ranging from aquaculture fish production which is growing at more than 20% per year and presents a significant opportunity with gross margins estimated near 20% to fish feed processing which is also commercially attractive given the high demand and insufficient domestic supply, with estimated gross margins near USD 1.6 million per annum and other ancillary activities. This paper critically reviews the aquaculture value chain and investment opportunity for youth entrepreneurs in Nigeria. It is noted that increased aquaculture production is required in order to maintain *per capita* fish consumption and to bridge the demand-supply gap. The support initiatives of the Federal Government under the Aquaculture and Fisheries Transformation Agenda, to attract investors are also highlighted.

KEYWORD: Fish, production, feed, marketing, processing

Identification of farmers' preferences for different cassava varieties and their characteristics in Edo State of Nigeria

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Abstract

In order to develop cassava varieties that will meet farmers' diverse preferences and fit into the different cropping systems, it is essential to adopt a Participatory Rural Appraisal (PRA) approach where farmers will be involved at all stages of variety development, identify agronomic traits to be improved, and help to set the breeding objectives. Most researches carried out in Research Institutes are geared towards production of improved varieties, since most are planned and executed without farmer's input. Hence this research to conduct a survey to determine farmers' perception of different cassava varieties and characteristics for preferred varieties in Edo State is to achieve a demand driven research that will generate appropriate linkage between technologies disseminated and the farmer's diverse needs. A diagnostic survey was conducted to determine farmers' perception of different cassava varieties and characteristics for preferred varieties in Edo State Nigeria. Random sampling was employed in the selection of communities, villages and Local Government Areas from the three senatorial zones of Edo State (Edo North, Edo Central, and Edo South) involved in cassava production, in all 300 farmers were interviewed. In the three senatorial zones, high yield was the most desirable trait that farmers prefer to be incorporated into cassava breeding programmes (94%) followed by disease resistant varieties (36.3%) by farmers in Edo North and Edo South while farmers in Edo central desire high starch content after high yield. In the three senatorial zones, majority (61.7%) of the respondents do nothing to control insects, pests and diseases.

Keywords: High yield, Prefer, Senatorial zones, Programme, Diagnostic

EFFECT OF ORGANIC MANURE ON THE GROWTH AND YIELD OF PEPPER (*Capsicum* spp.) VARIETIES IN BAUCHI.

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ABSTRACT

Pepper is an annual or short-lived perennial herb up to 1.5cm in height with a woody base stem. They are rich sources of vitamins and minerals. The use of animal manures in vegetables crop production has long been realized only that there is no adequate recorded information on the nutrient composition and crop responses. The application of mineral fertilizer could increase soil organic matter loss. Continues use of inorganic fertilizer causes nutrient imbalance and increase soil acidity. Therefore, there is need to consider organic manure as an alternative source of soil fertility to stabilize soil nutrient for sustainable crop production. Although pepper is an important crop for people of the developing world in general and Nigeria in particular, not much research work has been done on the crop fertilizer needs, the time to apply the fertilizer and other aspects of the crop agronomy. Hence, a field experiment was carried out to evaluate the effect of different organic manures on the growth and yield of pepper varieties with the objective to improve better productivity. The study area was in Bauchi Local Government Area of Bauchi state during the 2013 dry season. The treatments consisted two pepper varieties (*Capsicum annum* var. and *C. chinense* L.) and three different organic manures (poultry droppings, urban waste, cowdung) and control were laid in a randomized complete block design with three replications. The data collected were subjected to analysis of variance and means significant were separated by Duncan Multiple Range Test (DMRT). The result shows that plant height significantly ($P \leq 0.05$) *Capsicum annum* var. Higher than *C. chinense* L. throughout the sampling period. Number of leaves also significant ($P \leq 0.05$) at weeks four and six respectively with poultry droppings producing highest in both weeks. *Capsicum annum* var. significantly ($P \leq 0.05$) was higher in fruit length, fruit diameter and weight per hectare. Also, number of flower per plant and weight of fruit per hectare was significant ($P \leq 0.05$) with poultry droppings producing the highest yield. There was no significant difference in number of fruits per plant but poultry droppings gave the highest yield. Based on the findings, it could be concluded that poultry droppings and *Capsicum annum* var. could be recommended in Bauchi State of Nigeria.

Keywords: perennial herb, organic matter, inorganic fertilizer, soil fertility, alternative source,

The New Nigerian Agricultural policies: Efficient for food security?

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Abstract

The major problem affecting poor people in developing countries has been food insecurity, while households living in poverty have continued to be vulnerable in their situation. Nigeria, being the most populous country in Africa with an urban population growing at an exponential rate, the government's objective of achieving food self-security is a major challenge. The country shows a relatively rapid economic growth, which makes this goal not unrealistic but rather requires a great deal of effort. After the post-colonial era in Nigeria, agricultural policies and programmes have undergone changes and this has been seen to vary only in nomenclature and organizational network as they emphasize almost the same objectives like: providing food for the inhabitants of the nation (food security and sufficiency) and export excess to other countries and to provide rural dwellers and farmers with extension services, to mention a few. Despite these policies and commendable programmes with ambitious motifs, Nigeria is yet to achieve food security as they seem to lack coherence and seek one within its strategic framework. Having many singular features, it has no exception when it comes to agricultural policy in the region, caught between tremendous potentials, immense ambitions and still - insufficient concrete results. Agriculture also continues to suffer from inertia reforms associated with these policies and programme reformation that penetrate her. This study reviews several agricultural policies and programmes that were initiated in Nigeria with emphasis on the recent ones, examining objectives/goals, achievements as well as problems that hindered the optimization and realization of the dreams of the policies and programmes. Interruption in thier intervention, execution and management were also identified with recommendations proffered for future policies and programme interventions.

Keywords: Agricultural policies and programmes, Nigeria, Food security

PERFORMANCE INDICES OF BROILERS FED CASSAVA GRITS

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ABSTRACT

A seven week feeding trial was conducted to assess the performance and serum metabolites of broilers fed cassava based rations. In the dietary treatments, cassava grit was used to replace maize at 0%, 25%, 50%, 75% and 100% as the source of energy. A total of 180 birds, a week old, were randomly allotted to five (5) experimental diets, each treatment had three replicates of twelve birds each. Diet 1 was 100% maize based and served as the control diet. At seventh week of the study, two birds per replicate were selected and blood samples were collected through wing vein into plain bottle for the measurement of some serum metabolites. Parameters considered included initial weight, final weight, feed intake and Feed Conversion Ratio (FRC); and economy of production. The results of the study showed that there were significant ($p < 0.05$) difference in the feed intake of broilers fed graded level of cassava grit. While the highest feed intake (1309.06g) was obtained in broilers fed 100% maize based diet (treatment 1), the least feed intake was recorded in diet 5 (50.92g/bird/day). The values obtained for final weight and weight gain were significantly ($p < 0.05$) affected by dietary treatments. The highest final weight and weight gain were recorded in diet 1 (2430g and 50.68, respectively) while the lowest final weight and weight gain (1705g and 33.84g) were recorded in treatment 5 (100% cassava grit). The best feed conversion ratio 2.39 was noticed in broiler fed 100% cassava grit based diets (treatment 1) that was lower ($p < 0.05$) than the value obtained from birds fed diet 2. The results of this study revealed that the mortalities recorded were not due to treatment effect as the values recorded were similar ($p > 0.05$). Economy of production result favoured cassava grit based diet. In conclusion, cassava grit could successfully replace maize at 75% in the diet of broilers

Key words: Cassava grit, Broilers, Glucose, Performance and Economy of production

COLLABORATIVE PUBLIC-PRIVATE PARTNERSHIP IN AGRICULTURAL RESEARCH FINANCING: A MEANS TO SUSTAINABLE GROWTH AND DEVELOPMENT IN NIGERIA

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ABSTRACT

Collaborative PPP is a legitimate non-legal working relationship between the public sector and the private sector in any economy to meet a common objective. It can also be conceived as a goodwill gesture for providing knowledge exchange and collective leverage for the improvement of the nation, without a primary motive of profit-making. However, not without a well-crafted plan clearly spelling out direct public sector and private sector involvement.

We, therefore, consider collaborative PPP in agricultural research financing as a tool for promoting investment and adoption of technology in agricultural development as against the predominant infrastructure-oriented contractual PPP we have experience so far (e.g. Nigerian Port Authority Concessions, Lekki-Epe Road Concessions, etc.). As such, this study is based on the premise that agricultural research organizations are established as instruments for promoting agricultural development. In this sense, collaborative PPP can further enhance the attainment of development in agricultural research. In synopsis, the “Theory of Comparative Advantage” as being adopted by several papers proved that we have comparative advantage in agriculture. On this basis, “Triple Bottom Line Theory” was logically adapted in relating agricultural research financing to the public good nature of research. Also, a non-random sample of the United Nations Global Compact (UNGC) members’ account balances for a given year were collected from annual reports to derive a reasonable bottom-line commitment that private sectors should have towards agricultural research financing if to be regarded as socially responsible in Nigeria. With this, collaborative PPP in agricultural research will enhance attainment of agricultural development in Nigeria.

Key words: Public Private Sector, comparative advantage

Influence of Different Concentration of Lead (Pb) on the Growth of Pepper (*Capsicum frutescens*)

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Abstract

Pepper (*Capsicum frutescens*), a genus of flowering plants from family Solanaceae is widely cultivated in the western part of Nigeria. It has been used as medicine for centuries as an anticancer, heart stimulant in improving stomach ulcer condition. A pot experiment was carried out beside the greenhouse of the Department of Crop Protection and Environmental Biology University of Ibadan screen house to determine the effect of Lead (Pb) on the growth of pepper (*Capsicum frutescens*) Twenty pot were used and each pot were filled with 5kg of soil, The experimental design was a Complete Randomized Design with five treatments and four replicates. The treatments consisted of application of lead (II) nitrate $Pb(NO_3)_2$ at different concentration at 0ppm, (control), 1000ppm, 2000ppm, 3000ppm, and 4000ppm which were applied at 4weeks after planting. Analysis for the lead concentration of the plants in each replicate was carried out after the plants were uprooted and their leaves, stems and roots separated. The result showed a decrease in the morphological parameters such as plant's height, dry weights and number of leaves. Significant difference was observed in the number of leaves, plant height and control plant recording the highest value. There was also an increase in the uptake and localization of lead in the plant with increase in the contamination. Root of pepper was found to accumulate a significant greater concentration of lead compare to stems and leaves in this order; roots > stems > leaves. The mean values of root are: 0ppm (0.020), 1000ppm (0.117), 2000ppm (0.190), 3000ppm (0.260) and 4000ppm (0.330); stems 0ppm (0.003), 1000ppm (0.060), 2000ppm (0.097), 3000ppm (0.130) and 4000ppm (0.183); leaves 0ppm (0), 1000ppm (0.023), 2000ppm (0.050), 3000ppm (0.067) and 4000ppm (0.080). Also soil contaminated by lead (Pb) has toxic effects on plant morphological and biochemical parameters. It leads to substantial losses in dry matter and also decreases the growth, photosynthetic pigments and numbers of leaves Lead as a heavy metal has detrimental effect on yield and biomass characteristic of pepper growth and development due to changes of metabolism physiology.

Key Words – Photosynthetic, morphological, metabolism, anticancer, stimulant

The Value Chain involved in Value Addition to Some Non Timber Forest Products in Nigeria

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Abstract

A value chain is composed of activities and services that bring a product from conception to end use in a particular industry, in Agriculture; such value chain includes harvesting, drying and storage. Basically, in Agriculture the value chain acts in improving the quality of the freshly harvested product by adding value to it thus increasing the shelf life and making it available throughout the year. Value adding in food production focuses in particular on safety and quality of the product having a focus of meeting a particular demand of a target group. This paper shows some value chain involved in adding value to some Non Timber Forest Products (NTFPs) namely: Shea butter from *Vitellaria paradoxa*; Moringa leave powder and Moringa oil from *Moringa oleifera* and Bitter kola powder from *Garcinia kola* which presently can be a means of livelihood sustenance for this present age youth. The cost benefit ratio is estimated showing the realised profits along the chain since an alternative way of presenting value chain is by analysing the distribution of gains along the chain. From the analysis of the cost benefit ratio, it was realised that there is always enough profit that can be generated with input on a small scale level. Accumulation of the profits realised along the chain can subsequently be reinvested into the production chain, thus sustaining the business and on the long run help sustain the livelihood of the individual involved in the processing. It concludes with a review of some barriers to selling NTFPs as seen in a study conducted in Mexico and Bolivia and suggests means of managing such among Nigerian youths.

Key Words: Agriculture value chain, Cost Benefit Ratio, *Vitellaria paradoxa*, *Garcinia kola* and *Moringa oleifera*

Fortification of “Ogi” With Iron, Iodine and Vitamin A Premix

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Abstract

The most common widespread nutritional deficiencies in the world today are vitamin A, iron and iodine deficiencies – a condition that leads to death and disability on a vast scale particularly among children and women of child-bearing age. Fortification has been recognized as an important strategy to improve the health and nutritional status of people therefore combating against micronutrient deficiency. Hence, the objective of the study was to determine the effect of fortification on the proximate and functional properties of ‘ogi’, a fermented product from maize that is widely consumed on a daily basis and in many forms.

Two varieties (yellow and white) were used in this study. ‘Ogi’ flours were prepared from fresh and dried, yellow and white maize using the traditional processing method of ‘ogi’ and the paste was further oven dried and milled into flour. The ‘ogi’ flours were fortified with vitamin A, iron and iodine premix. Proximate, mineral, functional and sensory properties were conducted on fortified and unfortified ‘ogi’ flours. The carbohydrate, protein, fat, crude fiber, ash and energy ranged between 74.50 to 77.27%, 9.71 to 10.48%, 4.12 to 4.37%, 0.91 to 1.45%, 3.11 to 3.57% and 379.14 to 387.00 Kcal respectively. Pasting and viscosity characteristic were not significantly affected by fortification. The apparent gelatinization temperature of ‘ogi’ flours varied from 67.5 – 79.5°C. The peak viscosity ranged from 280 – 540 B.U. vitamin A and minerals such as cobalt, iron, iodine, manganese, chromium, calcium and copper increased significantly in all the fortified samples while zinc was not significantly different. Sensory evaluation revealed that the foods were well accepted and the appealing factors were flavour, taste, colour, texture and overall acceptability. Fortification of ‘ogi’ using premix of vitamin A, Iron and Iodine can be used for large scale production of ‘ogi’ to contribute a significant reduction in malnutrition and micronutrient deficiencies, increase food security and food safety by improving food preparation and handling practice.

Key words: Vitamin A, iron, Iodine, Fortification, ‘Ogi’

EXPLOITING DETERIORATING AGRICULTURAL PRODUCT INTO USEFUL PRODUCT (A CASE STUDY OF OVER RIPE PLANTAIN

Plantago lanceolata)

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ABSTRACT

“Agadagidi wine” a locally fermented plantain drink is an alcoholic beverage produced from over ripped plantain. Over ripe plantain were soaked in water and labeled, A 5g into 2 litres of water, B 1g into 1 litre of water, C 1g blended into 1 litre of water, D 1g into 3litres of water and E 5g blended in 2litre sterilized water respectively. These were allowed to undergo fermentation for four days. Organoleptic analysis confirms sample A to be the well accepted. Physicochemical analysis shows the pH of sample A, B, C, D and E to range from 3.80, 3.40, 4.20, 4.90 and 3.90 respectively. Titrable acidity cm³/ml ranges from 0.27, 0.26, 0.25, 0.24 and 0.23 respectively. Alcoholic content 5.00%, 3.98%, 1.77%, 1.20% and 7.30% respectively. Microbial viable count of bacteria and fungi of these sample A, B, C, D and E were too numerous to count. The bacteria isolated and confirmed using biochemical method were bacillus species and Lactobacillus species. The yeast isolated were Saccharomycetes cerevisiae species and Torulopsis delbruecki. Proximate analysis shows moisture content to be highest in sample B 92.88, Ash content were 0.36 in samples A and B which were the highest. Highest values of volatile content were 0.10 in samples C and D which is the highest. Fats and protein content were highest in sample B having 1.34 and 0.59 respectively. Mineral content e.g. Calcium Magnesium, Potassium, Lead and Sodium were having the same values in all the samples and the values were 9, 12, 0.184, 1.87 and 0.045 respectively. The health benefits of “agadagidi” plantain wine is that the fruit contains a good amount of health benefiting anti-oxidant, mineral and vitamins and rich in calories but in low fat. The fruit contains good amount of soluble dietary that help the normal bowel movement thereby reducing constipation problem and it is a very rich source of potassium which help control heart rate and blood pressure, countering bad effects of sodium. Plantain wine is very easy to produce and good compete with the market with other wines because of its flavour and aroma, it has a lot of nutritional benefits, market demands are high.

KEY WORDS: Over ripped plantain, Agadagidi wine,

PERCEPTION OF CORP MEMBERS TOWARDS SELF-EMPLOYMENT ALONG THE AGRICULTURAL VALUE CHAIN IN OYO STATE, NIGERIA.

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ABSTRACT

Agricultural value chain as a choice of self-employment has the highest potential to check the progressively increasing rate of unemployment and poverty in Nigeria especially among young graduates. This study was conducted to determine the perception of Corps Members towards Agriculture related business as an option for self-employment. The research described selected socio-economic characteristics of respondents (corps members) in the study area; ascertained their perception towards agribusiness and level of training in agribusiness; identified the factors influencing their interest in agribusiness and also the constraints that hinder them from going into agribusiness. A multi-stage sampling technique was employed and a total of 120 respondents were selected for the study. The study used primary data obtained with the aid of well-structured questionnaire for its analysis. Result indicated that 83.3% of the respondents were interested in agribusiness as an option for self-employment. 51% of the respondents have been involved in one form of agribusiness or another. Regarding level of training, 85.8% of the respondents agreed that there is a need for special training before going into agribusiness and only 45.8% of the respondents have gone through training on agribusiness. Livestock and poultry (40%), Crop production (30%) and fishery and aquaculture (21%) had the highest preference on choice of agribusiness Corp members will prefer to embark on. However, lack of access to land and credit facilities were identified as the factors that hinder them from going into agribusiness. It is therefore recommended that the government should put more effort towards training and empowerment of Corp members and also to remodel the NYSC scheme to focus more on educating the youths towards the need for entrepreneurship in Nigeria especially in agriculture. The 1978 land use decree is a good government policy which should be fully implemented. Lending institutions should also be established to grant soft loans to graduates who are willing to go into businesses along the agricultural value chain.

Key words: Agribusiness, Constraints, NYSC, Self employment

DEVELOPING A ‘BUSINESS MODEL APPROACH’ TO THE ADOPTION OF TWO-WHEEL TRACTORS BY YOUTH FARMERS IN NIGERIA

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Abstract

Nigerian farmers still rely on muscle power for their operations, yet farm labour apart from the drudgery associated with it is becoming scarce and more expensive due to the incidence of ageing farmers and the negative impact of rural-urban migration on farming communities. The rural youths migrate to urban centres in search of alternative and more attractive urban-based jobs. Yet if they were to remain in the rural areas and engage in farming activities, they lack access to tools which they could apply to their operations to reduce drudgery.

We therefore face an urgent need to promote the use of mechanisation to increase the potential for increased agricultural production especially in order to meet the emerging industrial market. The two wheel tractor (2-WT) stands out as a veritable tool to achieve this goal because from past experience, large scale, mainly government-run mechanisation schemes using four wheel tractors, have proved unsustainable in many cases. Due to the size of 2-WTs, they become an economic alternative for small scale farming as they are adaptable to farmer owner-operator type of management on small farms and can make agriculture more attractive to youth entrepreneurs in Nigeria. Weaknesses in technology market systems inhibit the adoption of new and innovative agricultural technologies due to capital constraints by smallholders. It has however been established that market systems offer the most effective means of replicating, disseminating and ensuring the uptake of new technologies. Hence this paper proposes a ‘business model approach’ incorporating a capacity building component to the introduction and adoption of two wheel tractors for youth farmers in Nigeria, while demonstrating the potential efficiency level of such an intervention.

Key words: Youth farmers, two wheel tractor and technology

Preliminary studies on the level of mushroom consumption among the residents of Benin City Edo State

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ABSTRACT

The survey was carried out to ascertain the level of mushroom consumption among the residents of Benin City, Edo State, Nigeria. A total of 1,056 respondents which comprised of farmers, market women, consumers and the academia, were selected through multistage random sampling and interviewed alongside with personal communication using a structured questionnaire. Data collected were mainly on the respondent's knowledge of mushroom. Data were analyzed using descriptive statistics. Results showed that 530 respondents (50.7%) have good knowledge of mushroom, while 452 respondents (37.0%) were found not to have any ideal of the mushroom while 63 respondents (12.3%) are still in doubt on the fungus. Furthermore, 241 respondents (23.1%) confirmed they have eaten mushroom either whole as diet, as supplements inform of spices or as canned food bought from the supermarket. Many respondents, 804 (76.9%) have not come across mushroom in any form and have not eaten it.

The 21 farmers who had no knowledge of mushroom were young individuals who took to farming with the assistance of the State Government through its empowerment programme. Unlike the farmers, 7 out of the respondents from the academia admitted they were not brought up in the village and were not exposed to local farm produce. On the whole, mushroom consumption was found to be low in the study area, despite the positive aspect of mushroom both as food and medicine.

Key word: Mushroom, consumption, food, residents, Benin City.

PRODUCTIVE POTENTIAL OF JAPANESE QUAILS (*Cortunix japonica*) (linn) FED *Moringa oleifera* (lam) LEAF MEAL-BASED DIETS

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ABSTRACT

The study evaluated the zoo – technical performance, hematological characteristics, serum biochemistry and apparent nutrient digestibility of quail keets fed with *Moringa oleifera* leaf meal (MOLM) as a replacement for soya bean meal at 0, 25 and 50% in the experimental diets. Forty-five quail keets with an average weight (82.40 – 83.30g) were allotted into three treatment groups, replicated three times and constituting five quail keets per unit for the experiment. The experiment was carried out in a completely randomized design (CRD) for eight weeks. Parameters assessed were the (PVC, RBC, WBC, Glucose, Albumin, Total protein and Urea), growth performance characteristics in terms of weight gain, total weight gain, average daily weight gain, feed efficiency, cost of feed, cost of feed per bird and apparent nutrient digestibility of the birds. The data obtained were subjected to Analysis of Variance (ANOVA). There was significant difference ($p < 0.05$) in the final weight, total weight gain, feed efficiency and cost of feed. There were positive improvement in the values of the various blood sample assessed for the white blood cell, total protein, albumin and glucose. Also there was significant difference ($p < 0.05$) in the nutrient digestibility (crude protein, crude fiber, NFE, ether extract and ash). The inclusion of *moringa oleifera* leaf meal at 50% in the diet of quail bird can be recommended since it did not have any form of ill-effect or deliterious effect on the birds and they are readily available.

Key words: Quail, *Moringa oleifera*, Hematological characteristics, Serum biochemistry, nutrient, digestibility.

POTENTIALS OF *Moringa oleifera* SUSTAINABLE PRODUCTIVITY IN AGROFORESTRY SYSTEM

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Abstract

Agroforestry is a judicious land use system in which trees are incorporated with crops and/or livestock on the same piece of land in a rotational or spatial arrangement resulting in multiple benefit including diversified income sources, increased biological production, better water quality, and improved habitat for both humans and wildlife. The system exploits biological and economical synergies to produce better land management, higher productivity and more stable local incomes for farmers, reduced risks and create positive environmental and social impacts. *Moringa oleifera* is a multipurpose tree which nutritional and medicinal values have been highly elucidated. However, there is a dearth of information on its potentials and utilization for increased agricultural productivity in the agroforestry. *Moringa oleifera* tree is a legume, fixes atmospheric nitrogen, the leaf extract contains a growth hormone zeatin, (a cytokinin) and it's a high valuable protein source. This paper therefore reviews and creates the awareness of the potentials of *Moringa oleifera* for increased agronomic productivity, soil nutrient status enhancement and as a substitute for protein supplement in livestock and fish feeds in animal husbandry and aquaculture respectively. Further researches are needed for sustained assessment of nutritive values of *Moringa oleifera* Lam to find out the best ways of utilizing it as protein source in livestock and fish feeds and also as fertilizer and organic manure for higher productivity.

Key words: Tree crop, crop productivity, livestock, aquaculture

GOVERNANCE STRUCTURES ALONG CASSAVA VALUE CHAIN IN OYO

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ABSTRACT

Nigeria is the largest producer of cassava in the world with average annual products of about 35 million metric tons over the last five years. While cassava production is increasing at 3 per cent every year, the country continue to import various industrial products that can be made from the crop. This paradox is associated with how cassava is produced, processed and marketed in Nigeria. Therefore this paper sought to contribute to increase understanding of how individual cassava farmers, processors and marketers along the value chain act in the price formation, their relationship with each other along the chain, their respective gross margin values and the influence of identified governance structures on their profitability. Descriptive statistics such as frequency distribution and percentages were used to examine the socio economic characteristics of respondents, identify the predominant governance structures and coordination along the value chain. While a linear regression model was used to estimate the influence of identified governance structures on profitability. The result showed that among several products (cassava chips, pellets, HQCF, grits, livestock feeds, ethanol and industrial starch/syrup) that cassava tuber can be processed to; only fresh tubers were traded in large quantities while Gari was the main product. This indicated that cassava value addition is much limited in this area and suggested lack of awareness of potential alternative products in which cassava can be processed to. Also, gross margin analysis revealed that cassava processors make more profits as enhanced through value addition. Therefore farmers' participation in profitable cassava value chain, strengthening the coordination between actors along the chain, using improved cassava varieties, introduction of various processing technologies and stable markets were recommended.

Key words: Cassava, Value chain, Strands, Gross margin, Farmers, Processors, Marketers.

PRODUCTION AND EVALUATION OF JAM FROM PARKIA (*Parkia biglobosa*) AND PINEAPPLE (*Ananas comosus*) PULP BLENDS

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Abstract

Parkia biglobosa, commonly known as locust bean tree is a perennial tree legume which belongs to the sub family *Mimosoideae* and family *Leguminosae*. It is found in a wide range of environments in Africa and is primarily grown for its pods that contain both sweet yellow pulp and valuable seeds. It is one of the underutilized crops as the sweet yellow pulp is usually washed away and only the seeds are crushed and fermented and this constitutes an important economic advantage for many Africans. Earlier investigations have mentioned the nutritive value of *Parkia*. The main objective of this work is to reduce post harvest wastage of the pulp and improve its utilization. Pineapple pulp was blended to improve its flavor, nutrients quality and general acceptability. Jam was produced from *Parkia* pulp and Pineapple pulp in ratios 30:70, 70:30, 50:50, 100:0 and 0:100 respectively. The chemical composition and sensory properties of the jam was evaluated using standard methods. Carbohydrate composition of the jam ranged from $95.77^{cd} \pm 1.09$ to $84.42^{cd} \pm 2.00$, there was a significant difference at $P \leq 0.05$ for the protein content which ranged from $0.29^a \pm 0.06$ to $0.23^a \pm 0.09$; the protein content was low as it generally obtains for fruits. Ash content ranged from $0.43^a \pm 0.33$ to $0.12^a \pm 0.06$. Reducing sugar ranged from $8.06^a \pm 1.16$ to $18.66^a \pm 1.39$ with jam in the ratio 50:50 having the highest and 100:0 the lowest value. Total titratable acidity was not significantly different at $P \leq 0.05$ and the value ranged from $0.05^b \pm 0.01$ to $0.07^b \pm 0.01$. Vitamin C, Calcium, Potassium and Sodium ranged from $9.18^a \pm 0.93$, to $11.10^a \pm 0.27$ mg/100ml, $2.58^d \pm 0.03$ to $5.61^c \pm 0.05$ mg/kg, $4.34^c \pm 0.01$ to $30.22^c \pm 0.01$ mg/kg, and $8.67^a \pm 0.04$ to $23.22^c \pm 0.01$ respectively. The pH of the samples ranged from $4.72^a \pm 0.03$ to $5.13^{ab} \pm 0.04$ and obrix was between 40 and 55, the viscosity of the samples was between 5265.37 and 9344.18. Sensory evaluation showed that sample with ratio 50:50 had good aroma, spreadability, colour, taste, texture and overall acceptability. It is therefore concluded that *Parkia biglobosa* pulp can be used for the production of good quality jam either solely or in combination with other fruits, this will proffer solution to post harvest wastage of the pulp and increase its potential utilization, it has an added advantage when combined with pineapple pulp as the acceptability of the jam is increased.

Keywords: Underutilized crop, fermented, postharvest wastage, chemical composition.

NUTRITIONAL QUALITY OF MILLET- COWPEA COMPLEMENTARY DIET

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Abstract

Complementary diet is usually given to infants between the ages of 6 months to 2 years. Most complementary diets are usually developed from maize. The nutritional quality of many complementary diets available may not be enough to meet the nutrition recommended daily need of the infant hence a combination of millet and cowpea to give a nutritious, cheap and affordable complimentary diet. This study aimed at developing and evaluating complementary diet from a blend of malted, underutilised cereal source, millet and cowpea for infants. The blend was formulated in various ratio; Sample A – Malted millet 100%, Sample B – Unmalted millet 100%, Sample C – Malted millet : precooked cowpea (80:20), Sample D – Malted millet : precooked cowpea(70:30), Sample E – Unmalted millet : precooked cowpea (80:20), Sample F – Unmalted millet : precooked cowpea(70:30). The proximate composition, functional properties, nutritional quality as well as its sensory properties were evaluated by standard procedures. The proximate composition showed that the moisture content of the blends ranged between 5.0% - 8.30%, carbohydrate content, 53.07% - 55.07% and crude protein, 13.02% -14.98%. Calcium content ranged between 6.01% – 7.24%, Potassium content, 8.20% - 12.74%, Magnesium content, 18.24% - 31.14% and Iron content, 14.20% -18.69%. The functional properties of the samples showed that samples had significant low bulk density. Solubility index ranged between 17.30 – 11.20. The pasting characteristics showed the malted complementary diets, samples A, C, D had very low peak viscosity (43.50, 37.50 and 42.50), holding strength (22.00, 20.00 and 21.50), low final viscosity (96.00, 49.50 and 49.50) as compared to the unmalted samples. No significant difference was recorded in the appearance of the samples. The overall quality of the malted formulated diets were more accepted than the unmalted samples in terms of colour, taste, texture, appearance and flavor. The inclusion of cowpea increased the nutritional quality of the blend. Swelling power of the malted complementary blend was low which contributed to the low viscosity value and in turn is appropriate for complimentary diets for infants.

This research work revealed that millet can be utilized in the production of complementary diet in industries by malting and enriching it with cowpea flour at a presumable cheaper cost.

Key words: complementary diets, malted and unmalted millet, nutritional quality

Assessing Agricultural and Food Policies for Efficient Food Security in Nigeria.

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Abstract

Achieving an efficient food security is no doubt a fundamental issue whose influence on a nation's economy and the quality of life of its populace cannot be overemphasized. A nation is food insecure when it is unable to meet the nutrition of its inhabitants. A nation is food secured when qualitative food is available, accessible and affordable by the vast majority of its populace. Nigeria is arguably the most populated black nation on earth, blessed with rich natural resources as well as boasting Africa's largest economy, yet, Nigeria is food insecure. With the bimodal rainfall pattern associated with the diverse ecology of the nation, its agricultural potentials cannot be overemphasized. Past government policies on agriculture and food has reportedly failed to uplift the nation from the long insatiable list of food insecure nations. This is evident in its inclusion as one of the key objectives of the government's vision 20:2020. The review then opined that re-assessing some of the food and agricultural policies of the nation as well as establishing new policies that seeks to tie up the loose ends of the previous policies, will help ensure efficient food production, accessibility and affordability. Researcher, however devised that for the nation to attain its potentials as "the food basket of the continent" as well as establish Nigeria as a food secure nation in the wake of its brunt population increase, the following suggested lapses should be incorporated in the existing policies and/or establishment of new policies that will (i) give preference to rural women (ii) ensure equitable distribution of agricultural inputs and infrastructure (iii) encourage organic farming (iv) prohibit farming practices that will degrade the environment for sustainability (v) promote bottom-up approach in Agricultural researches (vi) reduce pre and post-harvest losses (vii) integrate biotechnology in food production as well as (viii) stabilize farm gate prices and market prices of agricultural produce.

Keywords: Food security, population increase, government policy

PHYSICOCHEMICAL, FUNCTIONAL AND MICROBIOLOGICAL PROPERTIES OF DRIED FERMENTED AFRICAN LOCUST BEAN (*Parkia biglobosa*) POWDER

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ABSTRACT

African locust bean (*Parkia biglobosa*) is a protein-rich leguminous seed which is a potential source of vegetable protein for human food and livestock feed. The utilization of this seed may be increased through value addition into a dehydrated functional food ingredient. The African locust bean was processed by depulping, dehulling, followed by boiling under pressure for varying hours of 1 hour, 2 hours, 3 hours, 4 hours and 5 hours. This was followed by fermentation for 72 hours and drying at 65 °C. The fresh fermented locust bean seeds and the dried fermented locust bean seeds were analyzed for physicochemical, functional and microbiological properties using standard methods. The results showed that for wet and dry samples the percentage moisture content ranged from 60.80 to 67.20 % and 10.51 % to 15.12 %, the crude protein were in range of 16.17 to 13.67 % and 28.27 to 31.73 %, the crude fat: 11.45 to 19.77 % and 35.32 to 49.72 %, the ash content 0.07 to 0.57 % and 1.95 and 2.92 %; and the crude fibre, 1.22 to 3.82 % and 5.11 to 7.57 % respectively. Sample A (samples boiled under pressure for 1 hour) showed significant difference from other samples in terms of crude protein and ash content. The result showed that fermented African locust bean, both the wet and powder samples are a potentially good source of macro and micro nutrients from their chemical composition. Boiling under pressure is a means of upgrading the process of making 'iru' by helping to reduce the processing time. The dehydration of the wet fermented locust beans increased the storage life of the product as a result of lowered moisture content and reduced biochemical and microbial activities. The powdered samples had excellent functional properties in terms of emulsifying capacity, stability, water absorption capacity, oil absorption capacity and dispersibility; this may be considered for application in other food systems.

Assessment of rural market participation among farming households in Kwara state, Nigeria

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Abstract: Farming households do participate in the rural markets to commercialize their farm produce. Rural market participation thus improves welfare of the rural poor through the exchange of agricultural based goods for money. Inadequate knowledge about the factors affecting the decision whether or not farmer engages in rural market and the lack of information about intensity of non-participation of farmers in rural markets may hinder effective planning for welfare of rural farming households. The study therefore determined the level of market participation among rural farming households, the determinants of decision to market participation among farming households and the factor affecting the intensity of non-participation of farmers in rural markets. Governments and non-governmental bodies often placed attention on policies directed at increasing food production as this study disclosed socioeconomic factors that could stimulate or hinder farmers' interest in achieving the goal. Multistage sampling technique was used for the study where 160 farming households were randomly selected across selected eight rural communities under ADP zones in Kwara State. Data were collected through personal interview using structured questionnaires. Data were analyzed using descriptive statistics and double hurdle model comprising Probit and Tobit models. The results of the study revealed that 58 percent of the respondents participated in rural markets. The decision to participate in the markets is determined by educational status ($p < 0.01$), access to credit ($p < 0.01$), market information access ($p < 0.05$), commodities prices ($p < 0.05$) and market surplus ($p < 0.01$). The study further revealed that educational status, access to credit, market information access, commodities prices and market surplus reduced the intensity of non-participation in rural markets by 69%, 100%, 2.2%, 0.09% and 0.04 % among the rural households respectively. Household size increased the intensity of non-participation in rural markets by 3% among the households. Farmers should participate in commercializing their products in rural markets and be encouraged to form cooperative to ease their access to credit and market information. There is the need for awareness on the significance of family planning to improve market participation among farmers.

Key words: Farmers, Market surplus, Household size, Welfare and Double hurdle model

HAEMATOLOGICAL AND REPRODUCTIVE PERFORMANCE OF RABBIT DOES (*Oryctolagus cuniculus*) FED GRADED LEVELS OF MELON SEED HUSK MEAL TREATED WITH OR WITHOUT MAXIGRAIN®

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ABSTRACT

This study was designed to determine the effect of varying levels of melon seed husk meals (MSHM) supplemented with or without Maxigrain® enzyme on haematological parameters and reproductive performance of rabbits. Forty five (45) female growing rabbits with initial body weight of between 927.78 – 943.33 g were randomly assigned into five (5) dietary treatments groups designated as T1, T2, T3, T4, and T5 with nine rabbits per treatment and three per replicate in a completely randomized design (CRD) with a factorial arrangement having two levels of melon seed husk meal (10 % and 20 %), two levels of Maxigrain® enzyme (with or without) and control (0 % MSHM and 0 % maxigrain®). The study lasted for a period of 28 weeks. Neutrophils were significantly ($P < 0.05$) higher (52.33%) for rabbits fed diets with 0 % MSHM which was statistically comparable to 20 % inclusion (50.33 %) while eosinophils and monocytes values were significantly ($P < 0.05$) higher for rabbits fed 20 % MSHM but without maxigrain® enzyme addition. Varying levels of MSHM inclusion had no significant effect ($P > 0.05$) on kidney function analysis, but creatinine was significantly influenced when treated with maxigrain® enzyme such that rabbits fed diets with enzyme had higher creatinine values (60.58 vs 54.81 mmol/l). On the liver function analysis, varying levels of melon seed husk meal inclusion had significant effect ($P < 0.05$) on total bilirubin, total protein, acid phosphate, SGOT/AST and SGPT/ALT such that animals fed 0 % MSHM produced the highest bilirubin (4.80 mmol/l) and SGOT/AST (27.70 mmol/l), while those fed 10 % had the highest SGPT/ALT values (23.22 iu/dl). Also animals on 20 % MSHM inclusion had the highest values for total protein (63.32g/dl) and acid phosphate (1.45 iu/l) compared to other levels. Addition of maxigrain® enzyme had significant effect ($P < 0.05$) only on the total protein (61.64 g/l) which was observed to be highest when treated with the enzyme compared to that without (44.20 g/dl). Result of reproductive performance showed no significant difference ($P > 0.05$) for all the parameters measured. It is concluded that melon seed husk meal can be incorporated into rabbit feed whether or not it is treated with Maxigrain®.

Keywords: kidney function, liver function, reproduction, Maxigrain®.

Re-Assessing Agriculture Policies in Africa

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Abstract

The decline in African agriculture and food and nutrition security in the 1990s and 2000s became so pronounced that African leaders had to come together to stem the fall. It is against this background that the Comprehensive Africa Agriculture Development Program (CAADP) was initiated in 2003 by African heads of state and government. CAADP aims at changing the way African agriculture policies and programs are formulated, implemented and reviewed. This involves improving agriculture governance systems as well. CAADP recommends key thematic pillars which each country is advised to follow in drawing up national agriculture investment plans (NAIPs). Under CAADP, each country is aided by the African Union and Regional Economic Communities to follow a peer reviewed process to develop investment plans that can feasibly meet the country's growth and poverty reduction targets. Two targets were also generally agreed on in order to stimulate agriculture sector growth and food and nutrition security improvement: allocation of 10% of national budgetary resources to agriculture and 6% growth of the agriculture sector at the minimum. The Regional Strategic Analysis and Knowledge Support System (ReSAKSS) supported countries and regional economic communities in stock-taking and modeling activities which defined specific targets on agriculture funding and growth required by individual countries to meet the objectives and goals of CAADP. However, in the 2003 – 2010 periods the share of agriculture in total expenditure averaged 4% while the sector's growth rate averaged 5% in the 2003 – 2012 periods. In reviewing the performance of the continent on agriculture in 2014, the African heads of state and government recommitted in Malabo to the 10% target and became more specific on outcomes expected in the 2015 – 2025 period. This is known as the MALABO declaration. The declaration aimed at ending hunger in Africa by 2025 and halving Africa's poverty level by 2025. In the declaration, specific targets were set for reducing post-harvest losses number of stunted and underweight children and youth unemployment. The heads of state and government also committed to at least doubling agriculture productivity by 2025, tripling intra-African trade in agriculture, increasing social protection for the vulnerable and reaffirmed the minimum 6% agriculture growth target. These targets generally indicate what may be termed the priority policy areas for African Agriculture in the quest for growth and improved food and security nutrition in the 2015 – 2025 periods. The targets also call for improved monitoring and evaluation including strategic studies which can

inform on how to better achieve these targets. The declaration also calls for stronger and clearer mutually accountability systems which will improve agriculture sector governance. These systems will also require better monitoring and evaluation which will guide periodic reviews at sub-national, national, regional and continental levels regarding performance in meeting the commitments in the Malabo declaration.

SOIL NEMATODE AND EFFECT ON COWPEA (*Vigna unguiculata*)

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ABSTRACT

Soil samples were taken from a garden soil on different spots and labeled A, B, C, D and E. 20g of these samples were put on a serviette paper inside a sieve with small pores. 200ml of water were put into the trays and the sieve containing the soil samples were put in the tray. These were left for 24hours. The water from the trays was put in bottles, shaken and 10ml were put into test tubes and centrifuged at 500 rpm for 5 minutes. The filtrates were decanted and the sediments were tapped and mix. A drop of each samples were examined under the microscope. All the samples were confirmed to be infested with nematode, especially root knot nematode (*Meloidogyne species*). Sample E was treated with heat at 45⁰C for 10 minutes at 3 different occasions to kill nematodes present. Cowpea were planted on untreated soil samples A, B, C and D and the heat treated sample E. These were wet and observed for growth. The growth pattern in terms of stem length of cowpea and number of foliage leaf were higher on sample E compared to all the untreated soil samples whose growth in terms of stem length of cowpea and number of foliage leaf was much lower. This confirms that nematode has a side effect in contributing to poor growth of cowpea especially in terms of the length and number of foliage leaf, which definitely will affect final crop yield.

KEYWORDS: Garden soil, Nematodes, Cowpea, Growth rate, Number of foliage leaves

Genetic analysis of cowpea [*Vigna unguiculata* (L.) Walp] resistance to thrips (*Megalurothrips sjostedsti* Trybom)

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ABSTRACT

Cowpea is a food legume that constitutes a major source of protein consumed by many households in sub-Saharan Africa. However, its production is limited by various biotic and abiotic stresses, of which flower bud thrips causes seventy-percent yield loss. This study was designed to assess the variability for thrips resistance among the cowpea germplasm, identify genotypes that were resistant to flower bud thrips, and determine the modes of inheritance of genes that conferred resistance to thrips in cowpea. 12-cowpea lines were used in crosses in the screen house at IITA, Ibadan. The crosses were accomplished using North Carolina design II. 48 families of F₁ populations generated were evaluated with the parental lines. VITA7, a spreader-line was first planted to boost thrips population before planting cowpea test-lines. The thrips population was allowed to build up naturally to high, uniformly distributed levels before F₁ populations reached anthesis. VITA7 was uprooted at 35 days after planting and laid in-between the plots from where thrips migrated to the populations. Visual ratings for thrips damage on plants were recorded from five randomly tagged cowpea stands in each plot at 40 DAP for three weeks on a scale of 1-9, where 1= slight to no visible damage; and 9 = heavily damaged. Thrips population was estimated on each family. Data on number of peduncles, and number of pods were taken similarly. All data obtained were subjected to analysis of variance using random model by SAS 9.2. Significant variation was observed among the cowpea germplasm, inbred-lines and F₁s evaluated. Out of the 43 crosses, dominant genes controlled resistance in sixteen crosses whereas recessive controlled resistance in 27 crosses. General combining ability (GCA) accounted for 68.82–80.07 % of the total variation among hybrids for all traits while specific combining ability (SCA) explained < 50 % of the total variation. Additive and non-additive mean squares were significant for all the traits. Narrow sense heritability estimates ranged from 63.92% (peduncle/plant) to 7.53% (days to flower). The germplasm used in this study were invaluable sources of genetic variability for the development of new genotypes with enhanced resistance to thrips. TVNu72, TVNu1249, NGT65B, TVu945 and TVu2723 were identified as thrips resistant lines. Estimates of GCA and SCA variance components revealed that

additive gene action largely controlled the inheritance of yield components and other traits under thrips infestation and moderately heritable.

Keywords: North Carolina Design II, gene actions, inheritance, and combining ability

PHYTOCHEMICAL SCREENING AND ANTIBACTERIA ACTIVITIES OF Moringa oleifera SEED EXTRACT

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Abstract

Moringa oleifera possesses high nutritional value and has been used in folklore medicine to treat various ailments related to pain and inflammation. This study aimed to screen for phytochemicals and antibacterial activities in the crude extract of moringa oleifera. The extract was gotten by adding 500ml of hexane to 120g of the powdered seed of Moringa and 400ml of methanol was added to hexane recovery sample of Moringa seed. The microorganism used was Escherichia coli, staphylococcus aureus, shigella dysenteric and salmonella typhi. The extracts were screened for the phytochemicals and antibacterial activities were conducted by disc diffusion method. The phytochemicals screening shows the presences of alkaloids, Glycoside, flavonoids and Saponin in both the hexane and methanolic extracts of moringa oleifera seed; the antibacterial assay results revealed that moringa oleifera seed methanolic extract exhibited broad spectrum activity against the tested organism which is Escherichia Coli, staphylococcus aureus, and shigella dysentriac while the moringa seed hexane extract has no activities against the tested organism. These studies have made it possible that the pathogenic bacteria used in this work can cure or prevent diseases related to the microorganism use.

Key Words - Moringa oleifera, Phytochemical screening, methanolic, assay, alkaloids

Poverty among Cassava Farmers in Oyo State, Nigeria: Characteristics and Drivers.

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Abstract:

The significance of rural poverty is underscored by the fact that as much as 45 to 80% of national population reside in the rural areas and are dependent in agriculture in most developing countries [1, 2]. The thrust of this research is to analyse the characteristics and drivers of poverty among cassava farmers in Oyo state, Nigeria. The objective of this research include to: describe the socio-economic characteristics of the respondents; to analyze the drivers of poverty among the respondent; and to describe the poverty profile of the respondents. This research would provide qualitative data that would help government to come up with policies that would help reduce poverty among cassava farmers in Nigeria. Descriptive statistics, Probit Regression analysis, Foster, Greer and Thorbecke (FGT) poverty measures were used to analyse the data collected. The result of the descriptive statistics shows that majority of the cassava and non-cassava growers were males, with a percentage of 70.3% and 62.5% respectively. The mean age of all the respondents is about 54 years, implying that youths are not much engaged in farming in the study area. The number of years spent in schooling, household size and household assets were found to be the significant drivers of the poverty status of the respondents. The household size had a negative effect on the household's poverty status while, household asset and years of schooling had positive effect on it. The result of the FGT measures shows that poverty incidence, depth and severity are higher in the low income class than the high income class. Also, the incidence of poverty was found to be higher among non-cassava growers than the cassava growers. This study therefore recommends that youths should be encouraged to engage in farming practices in the study area. Family planning campaign programmes should be intensified in the study area. Non-cassava growers should be encouraged to go into cassava production as it had been found to reduce poverty incidence.

Keywords: per capita income, dependency ratio, household asset, life expectancy

Information and Communication Technology for Sustainable Forestry Management in Nigeria: Challenges and Opportunity

(A Case Study of Forestry Research Institute of Nigeria Ibadan, Nigeria)

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Abstract

A range of technologies for gathering, storing, retrieving, processing, analyzing and transmitting information has contributed in no small measures to the development of various sectors in Nigeria and the world at large. Information and Communication Technologies (ICTs) are the technologies used in the conveying, manipulating and storing of data by electronic means. The study assessed the challenges and opportunities of ICTs for Sustainable Forestry Management in Nigeria using Forestry Research Institute of Nigeria as the case study. The methodology employed was through systematic administration of 80 questionnaires and participatory observation, while 50 were retrieved. However, descriptive statistical and Chi-Square Test techniques were used for data analysis and interpretation. The results showed that ICT enhances research and knowledge transfer in forestry, hastens data transfer, enhances data or information gathering and storage and enhances access to internet market (72%, 66%, 72% and 60% respectively). The result on the socio-economic characteristics of the respondents revealed that age distribution of the respondents revealed that most of them are between the ages of 31 and 40 years (62%). The result of academic status shows that most of the respondents were graduates (54%). This is one of the prerequisites for average Research Institute workers. The result of the impact of adoption of ICT in enhancement of research and knowledge transfer in forestry revealed that there was a significant difference ($P < 0.05$). This shows that adequate, appropriate and prompt use of ICT in research information transfer in forestry will go a long way in adequate forest resources management in Nigeria.

Keywords: descriptive statistical, Chi-Square Test, internet market, forest resources management

A REVIEW ON CASSAVA MASH SIFTERS USED FOR GARI PRODUCTION

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Abstract

Cassava mash sifting is one of the unit operations in the processing of cassava roots into gari. The traditional method, which is extensively used in Nigeria and other developing countries, is slow, tedious, unhygienic and hazardous to the processors involved in this operation. The quality of the final product is much dependent on sifting which produces a quality gari free from fibrous roots and other contaminants and having similar sized granules. This paper reviews and appraises the developments and performance in the equipment developed by researchers and machine designers in research institutes, Universities and Polytechnics, to improve the traditional method of sifting cassava mash in cassava processing. In the development of any mechanised gari sifter, the following features have to be considered as basic requirements: Locally sourced materials to reduce the cost of production, open type hopper to allow easy loading of gari mash into the machine, and proper installation of discharge outlets for sifted and unsifted mash. It was found that the design concept of KSPI and NCAM models were based on the traditional method whereby sifting is achieved by pressing and rubbing of the cassava mash on the sifting unit. Another design concept was based on the principle of transmission of rotational motion from the shaft to the back and forth motion of the sieve. Although, most of the models investigated performed relatively well, as regards the efficiency, sifting time and output capacity of the sifters, which were on the high side. For the rural small and medium-scale processors, which are in the majority in Nigeria and developing countries, the paper recommends the adoption of some of the improved cassava sifter models. It further recommends that additional work be done on the ergonomic design of these equipment for ease in the operation of this machine.

Keywords: Sifting, traditional method, processors, equipment, models



Sterling Bank

The one-customer bank.

Profile of Sterling Bank Plc

The commitment of Sterling Bank, a leading commercial bank in Nigeria and one of the country's fastest growing banks to the growth of agriculture in Nigeria is legendary. Despite the fact that the Bank ventured into agriculture finance barely three years ago, the Bank has received a lot of accolades in the sector, where it currently ranks among the top three banks.

Sterling Bank Plc "the one-customer bank" is a full service national commercial bank in Nigeria.

In over 50 years of operations, Sterling Bank (formerly NAL Bank) has evolved from the nation's pre-eminent investment banking institution to a fully-fledged commercial bank; and completed a merger with 4 other banks – Indo-Nigeria Merchant Bank, Magnum Trust Bank, NBM Bank and Trust Bank of Africa – as part of the 2006 consolidation of the sector.

With the acquisition of the business interest of the defunct Equitorial Trust Bank in 2011, the Bank enhanced its position in the hierarchy of major players in the sector.

To demonstrate its commitment to the growth of the sector, Sterling Bank in 2014 devoted five percent of its loan portfolio to the sector with a plan to increase this to 10 percent in the coming year. The portfolio cuts across the whole agricultural value chain.

The presentation of the Award as the Best Bank in Commercial Agriculture Credit Scheme (CACs) to the Bank by President Ebele Jonathan is a testimony of its soaring pedigree in the business of agriculture finance in the country.

Sterling Bank Plc has continually restated its commitment to the strategic growth of the Agricultural Sector by providing adequate funding in alignment with the on-going reforms in the sector aimed at repositioning it as an attractive business proposition, an input provider for the manufacturing sector and a key foreign exchange earner.

The Bank remains the first bank to embrace the NIRSAL Scheme for commercial Agric lending for one of the Agric projects financed by the Bank. Apart from GES, all actors along the value chain are financed by Sterling Bank.

A firm believer in the Agricultural Transformation Agenda of the federal government, Sterling Bank has been in the forefront of the Growth Enhancement Support Scheme (GESS) since inception and has been actively involved in financing Agro dealers under the scheme to ensure that it plays its role as a reputable financial institution determined to make a mark in all sectors of the economy especially agriculture. It must be mentioned that Sterling Bank's model for the scheme (GESS) was eventually adopted by NIRSAL and it is currently being used by all Banks.

We therefore present to you ladies and gentlemen, Sterling Bank Plc, a financial institution that has scored first in the growth of the agric sector with due recognition from the Federal and State Governments as well as private and public sector operators.



Sahel Capital is a leading fund manager and advisory firm focused exclusively on the agribusiness sector. Sahel's consulting clients include development agency, international foundation, and private sector clients; and projects mandates have covered a broad range of crop value chains. Sahel is also the fund manager for the Fund for Agricultural Finance in Nigeria ("FAFIN"), a target US\$100 million private equity fund focused on SME agribusiness investment opportunities in Nigeria. FAFIN's fund sponsors include the Nigerian government via the Federal Ministry of Agriculture and Rural Development, the German government via KfW Development Bank, and the Nigeria Sovereign Investment Authority. FAFIN's First Close occurred on January 27th, 2014, with US\$34 million in capital commitments.



inqaba biotec™

Inqaba Biotechnical Industries (Pty) Ltd, trading as inqaba biotec in Sub-Saharan Africa, is a unique African Genomics company that was established in 2002, from an idea that was conceptualized in 2000. The company's head office is located in Muckleneuk, one of the oldest suburbs in Pretoria, South Africa. In 2010 the Kenyan subsidiary, Inqaba Biotec East Africa Ltd, was opened in Nairobi and has grown to become an important supplier to the life science community. Inqaba Biotec West Africa Ltd has in 2014 been registered in Nigeria and is operating from IITA Ibadan.

Inqaba biotec is a provider of services and products in life sciences and molecular diagnostics such as:

- DNA synthesis of oligonucleotides and probes
- Sanger sequencing service using two ABI 3500XL sequencer
- Next generation sequencing using Roche /454 as well as illumina sequence technology
- SNP analysis using MassArray from Sequenom (now Agena)
- Bioinformatics support
- Animal genetics services
- Training in molecular techniques and DNA analysis
- Providing the support needed for setting up molecular biology laboratories

We represent strong brands from other international Life Science companies like the molecular biology portfolio of New England Biolabs, the nucleic acid purification systems from Zymo Research, the bioinformatics software from CLC bio, the molecular diagnostics solutions from Seegene, Amresco's biochemicals and plastic consumables from Treff as well as many others, which makes us a 'one stop shop' for all your life science needs.

Please, kindly visit our website: www.inqababiotec.ng or email us at info@inqababiotec.ng

