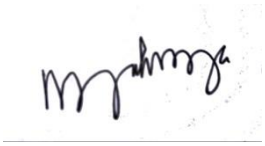
Progress Report No:	**001**
TeTFund Reference No:	**TETF/ES/DR&D/CE/NRF-2021/SETI/AFS/00087/VOL.1**
Period of Reporting:	**September 2023-February 2024 (6 months)**
Title of Research Project:	**Formulation and Evaluation of Indigenous Complementary Foods for Children (6-24 Months) in Nigeria**
Principal Researcher:	**Professor Mohammad Kuta Yahaya**
Department:	**Department of Agricultural Extension and Rural Development**
Institution:	**University of Ibadan**
Date of Starting Project:	**September, 2023**
Expected completion date:	**July, 2025 (22 Months)**

<u>Grants approved and expenditure incurred during the period of the report</u>

Total Amount Approved:	**#14,850,000.00 (Fourteen Million, Eight Hundred and Fifty Thousand Naira Only)**
Total Expenditure so far:	**#14,820,000.00**
Balance:	**#30,000**



Signature of Principal Researcher:

Signature of Chairman ICR:

Signature of Head of Department:

Signature of Head of Institution:

TEAM MEMBERS' PROFILE

Professor Mohammed Kuta Yahaya (Principal Investigator)

Professor Yahaya obtained his MSc and PhD in Agricultural Extension from the University of Ibadan. He started his teaching and research career at the University of Ibadan as an Assistant Lecturer in 1995 and now a Professor of Agricultural Extension and Development Communication in 2008.

He is the author of many research publications, high-level research articles, books, edited conference proceedings and journal articles with over 80 scholarly publications in reputable national and international outlets. He has successfully supervised over 100 undergraduate and postgraduate students with three completed PhDs and three on-going doctoral candidates. He has attended several conferences both home and abroad and has consulted for many organizations such as WORLD BANK, UNICEF and DAI on global initiatives in the area of positive deployment of communication strategies.

He is a member of many learned and professional bodies, particularly, the International Association for Media and Communication Research (IAMCR); Agricultural Extension Society of Nigeria (AESON); BOT, Rural Sociological Association of Nigeria (RuSAN).

Professor Yahaya has served and still serving his University and Nation in different capacities. Notably amongst others include; member, University of Ibadan Advancement Centre 2014 to date and member, Senate/Council Committee of Honorary Degrees and Fellowships, 2015-2018. He served his home state (Niger State) in various capacities between 2007-2015; first as Secretary to the State Government (SSG) and later as Chief of Staff and Commissioner in the Ministries of Information and Communication; and Agriculture and Rural Development with concurrent responsibility for Tertiary Education.

Professor Yahaya have done extensive works on Strategic Communication and Citizens Engagement through the application of Entertainment Education (E-E) to address developmental issues as well as reproductive health problems at the grassroots level using folk music intervention and motivational element in stage drama performances. This started with the FLD (Fund for Leadership Development) program of the John D. & Catherine T. MacArthur Foundation on using communication for social change (1999-2000). On this project he used various media (both traditional and modern) for community mobilization for safe motherhood in Bida Emirate council of Niger State. During this period, he produced jingles, handbills, posters as well handbooks like "Ignorance is a Disease: A Short Play on Reproductive Health Education" and Indigenous music for Entertainment Education: Lessons from AIDS: "BATAN NAEWUZANA" (DEADLY DISEASE). The outcome of this project

conceived his NGO; Centre for Communication and Reproductive Health Services (CCRHS) in 2001 which is still functional to date.

He is currently working with Emeka Odoemenam as a Principal Investigator for the COVID-19 Africa Rapid Grant Fund (CARGF) research award by the National Research Foundation, South Africa.

Publications in relation to the project

Yahaya M. K. (2000). *Ignorance is a Disease: A Short Play on Reproductive Health Education*: Ibadan, Stirling - Horden, 45pages.

Yahaya M. K. (2000). *Indigenous music for Entertainment Education: Lessons from AIDS: BATAN NAEWUZANA* - Stirling Horden Publishers, Ibadan, 58p.

Yahaya, M.K. (2003). *Development Communication: Lessons from Change and Social Engineering Projects*. Corporate Graphic Publishers, Ibadan 240p. ISBN 978-36756-2-1

Yahaya M. K. (2000). *Food Nutrition* in Akinbile, L. A and S. O Odebode (eds) *Home Economics*External studies programme pp.7-15.

Yahaya M. K. (2001). *Agricultural Extension Teaching Methods,* in Akinbile L. A and J. O. Oladeji (eds) *Agricultural Extension Education.* External Studies Programme pp 64-70.

Yahaya, M.K. (2005). *Mainstreaming Entertainment – Education for Agricultural Extension work,* in S.F. Adedoyin (ed) *Agricultural Extension in Nigeria*, Ilorin, AESON John Archers pp 234-244.

Yahaya, M. K. (2002). *Visual and entertainment Media Support for HIV/AIDS Prevention in Nigeria*, Proceedings of XIV International AIDS Conference 2002 Barcelona, Spain July 7-12 2002: MonduzziEditore (Eds) CD-ROM- C708L6236 pp 243-249.

Yahaya, M. K. and Olajide, B.R. (2004).*Effects of Folk Music and Community Outreach Drama Performances on HIV and AIDS Awareness in Niger State of Nigeria*. Proceedings of the Fourth International Conference on Entertainment – Education held at the Somerset Lodge, Cape Town, South Africa between September 26th-30th, 2004. Society for Edutainment Education in Africa.pp 106-122 www.e4.org

Yahaya, M.K. (2002). *Analysis of Women's Reproductive Health Situation in Bida Emirate of Niger State Nigeria.* African Journal of Reproductive Health, 6, No.1, 50-64.

Yahaya M.K and Olajide, B.R. (2002).*The Impact of Agriculture on Environmental health.* Journal of Environmental Extension 3 (1) 47-58.

Yahaya, M.K. (2002). Outreach Communication Strategy in Community Mobilisation for Reproductive Health Education in Niger State of Nigeria. *Journal of Social Sciences*. 6(3), 189-196.

Yahaya, M. K., Nabinta R. T. And Olajide B. R. (2007).Nutritional Status of Female Farmers on Agricultural Intensification in Selected Communities in Gombe State.*Journal of Human Ecology*.22, No. 4.285-289.

Yahaya, M. K., Fadairo, O. S and Abe, A O. (2009). Media Utilization for Mobilizing Women for National Programme on Immunisation (NPI) in Oyo State, *Nigerian Journal of Rural Sociology*, 9, No 1. 18-25

Yahaya, M. K., Kareem, H. T, and Onyedikachi, N. N. (2020).*Perceived effects of improved cassava varieties and technology among cassava farmers in Oyo state*.Agricultural Extension Society of Nigeria (AESON) 2020 Annual Conference, UsmanuDanfodio University, Sokoto.

On-going projects

University of Ibadan/ILO collaborative Team on "*Accelerating action for the elimination of child labour in supply chains in Africa"* (ACCEL Africa). It is a Dutch-funded regional project with a particular focus on specific supply chains, namely Cocoa, Coffee, Cotton, Gold and Tea. Building on lessons learned from over 25 years of the International Programme on the Elimination of Child Labour (IPEC) and overall ILO experience, the ACCEL Africa project. The team is working on public policy and good governance; empowerment and representation, partnership and knowledge sharing among global supply chain actors working in Africa Countries covered -Côte d'Ivoire, Egypt, Mali, Malawi, Nigeria, and Uganda. In Nigeria, ACCEL aims at the elimination of child labour in supply chains in particular in the Cocoa and Artisanal Small-Scale Gold Mining sectors of Ondo and Niger States respectively and I am the team lead for Niger State research and intervention efforts.

COVID-19 Africa Rapid Grant Fund (CARGF)

The CARGF research is funded by the National Research Foundation of South-Africa. The project which began in May 2021 and expected to be completed in November 2022 is under the Science and Journalism strand. The project is titled "Media Influence on COVID-19 Reportage in Nigerian Rural Communities" which is conceptualised with the deployment of Entertainment-Education (TV and Radio drama presentation) to debunk false news about COVID-19 particularly in rural communities of the six geopolitical zones in Nigeria. Currently, over 700 respondents have been reached with these communication tools with the involvement of media houses and science journalists. Data collection and analysis is in progress.

Research grant in the last five years

1. COVID-19 Africa Rapid Grant Fund (CARGF) - PI

Funder: National Research Foundation of South-Africa
Amount: $20,000
Date: January, 2021
Duration: May 2021-Novermber 2022 (18 months)
Title of project: Media Influence on COVID-19 Reportage in Nigerian Rural Communities

2. University of Ibadan/ILO collaborative Team on *Accelerating action for the elimination of child labour in supply chains in Africa'* (ACCEL Africa)

It is a Dutch-funded regional project with a particular focus on specific supply chains, namely Cocoa, Coffee, Cotton, Gold and Tea. The team is working on public policy and good governance; empowerment and representation, partnership and knowledge sharing among global supply chain actors working in Africa Countries covered -Côte d'Ivoire, Egypt, Mali, Malawi, Nigeria, and Uganda. I am the team lead for Niger research and intervention efforts.

Roles and responsibilities as the PI

As the Principal Investigator of the research project, I am responsible for the smooth running of operations, coordinating team members, ensuring effective monitoring of activities and assigning roles and mentorship to the young researchers (Graduate students). As a Development Communication expert, my role will include; design and deployment of

effective communication strategies to the rural mothers, stakeholders' engagement and lead media campaigns in context of the project for quality research outputs.

Professor Safiya Yahaya Daniyan

Brief profile

Prof. (Mrs.) Safiya Y. Daniyan is a Professor of Microbiology at the Microbiology Department, FUT Minna. She obtained all her degrees (B.Tech.,M.Tech. and PhD) from FUT Minna in 1991, 1999 and 2011 respectively.

Since joining the Microbiology Department at FUT Minna, she has engaged in teaching a number of courses and has successfully supervised 31 undergraduate projects, 24 M.Tech. thesis and 1 completed and 4 PhD thesis.

Her main areas of research interest are Pharmaceutical Microbiology and Medicinal Plants. Over the course of her academic career, she has authored more than 40 journals and conference papers, served as reviewer for both national and international journals. She is among the 16 young rated scientists from FUT Minna in Google Scholar citation top 600 public profiles. In addition, she currently serve as the team leader, Jatropha research FUT Minna. She was the Chairperson, University Health Management Board in 2019.

Prof. S.Y. Daniyan has professional membership status with renowned professional bodies such as; the Nigerian Society for Microbiology (NSM), American Society for Microbiology (ASM), the Biotechnology Society of Nigeria (BSN) (associate member), the Nigerian Association of Teachers of Technology (NATT) (associate member), member Nigeria society for experimental biology (NISEB), and the International Federation of University Women (IFUW).

Publications related to the project

Daniyan, S. Y., and Nwokwu, O. E. (2010). Enumeration of microorganisms associated with the different stages of bread production in FUTMIN bakery, Nigeria. *International Research Journal of Pharmacy,* 2(7), 88-91. Available www.irjponline.com

Daniyan, S. Y. and De, N. B. (2011).The effect of a spice on the nutritional characteristics and microbial population of stored soybean flour.*International Journal of Biomedical and Advance Research* 2(1):6-12 www.ijbar.co.in

Daniyan, S.Y.,Abalaka, M.E., Aransiola, S.A. and Elemba O.M. (2011). Phytochemical screening, proximate analysis and mineral composition of Cassia occidentalis seed extract. *Asian Journal of Pharmaceutical and Health Sciences* 1(3), 145-147. http://www.ajphs.com

Abalaka, M.E., Adeyemo, S.O., **Daniyan, S.Y.** (2011). Production of Protein Rich Animal feed from Spent Sorghum (a waste material) by Solid State Fermentation using Candida Tropicalis and Saccharomyces cerevisiae. World Ferm.Bioeng. 1, 71-76. Available online at www.woaj.com

Abalaka M.E, **Daniyan S.Y.,**Adeyemo S.O, Okolo M.O, Abdulsalam, R. (2013). Evaluation of Locally Sourced Raw Materials for use as A Microbiological Media.*Journal of Biology and today's world,* 2(1), 1-9.www.biology.cnbjournals.com

O. O. Kolo, M. Galadima, **S. Y. Daniyan**, M. E. Abalaka and Talatu B. Saidu.(2015). Bacteremia in Children Infected with HIV/AIDS in Minna, Niger State, Nigeria.*British Microbiology Research Journal* 9(2): 1-7 , www.sciencedomain.org

O. O. Kolo, M. Galadima, **S. Y. Daniyan,** M. E. Abalaka. (2015). Respiratory Tract Infections in Children Infected with HIV/AIDS in Minna, Niger State, Nigeria.*British Microbiology Research Journal* 8(4): 554-559, www.sciencedomain.org

Daniyan S.Y. (2006). Nutrition and Safety impact of Fermentation products. Proceedings of the 2nd Annual School of Science and Science Education Conference, Federal University of Technology, Minna, Niger State, Nigeria. Held from 19th – 22nd November, 2006, 54-63.

Completed researches in relation to the project

Isolation and Antibiotic Susceptibility of Cronobactersakazaki from Used and Retailed infant formulas sold in Kaduna Metropolis (2012).

Comparative study of bacterial contamination of hands of Health Care Workers and Environment in Peadiatric ward of four General Hospitals in Niger State (2012).

Comparative study and Synergistic effect of extracts of Anacardiumoccidentale (Cashew nut) and Carica papaya (Paw-paw) roots against some microbial pathogens (2011).

Roles and responsibilities for the project

As a microbiologist, I will be responsible for antimicrobial and antibacterial screening of the complementary food ingredients. I shall also perform other laboratory analysis of the indigenous food ingredients in close conjunction with the food technologist (Dr. FolasadeAdeboyejo).

Dr. Rachel NkeonyereNwakasi(Senior lecturer)

Brief profile

Dr. Nwakwasi, Rachel Nkeonyere obtained her Bachelors (Agricultural Economics) from FUTO, and Ph.D. (Rural Sociology) from MOUA, Umudike.

She has supervised over 40 B.Tech., 5 MSc and co-supervised 3 Ph.D. students. She is presently the Vice President, Agriculture-Nutrition Community of Practice, Nigeria branch; member, Agricultural Extension Society of Nigeria (AESON), Nigerian Forum for Agricultural Advisory Services (NIFAAS), Precision Agriculture Society, USA; and research affiliate with Centre for Women, Gender and Development studies (CWGDS), FUTO.

Her research interest is on gender issues as well as rural households and development security of women and children; addressing food security and the health of rural households. She has over 50 publications to her credit in reputable peer-reviewed national and international journals as well as over 10 book chapters. She is the resource person for FAO Farmer Field School under the National Special Programme for Food Security.

Publications related to the project

Nwakwasi, R.N.,Nwachukwu, I. and Okoroma, E.O. (2021).Socioeconomic Determinants of the use of Traditional Methods of Malaria Treatment among Rural Households in South-East, Nigeria.*Journal of Community and Communication Research*, 6 Pp. (22-29)

Nwakwasi, R.N.,Umunnakwe, P.C., Anyanwu, C.P., M.N. Okeke, E.O. Onwuma and S. Nwaozuzu (2020).Urban women farmers' involvement in Potato processing in Imo State, Nigeria.*MiddleEast Journal of Agricultural Research*; 9 (4) Pp 749-757

Nwakwasi, R.N., Nwachukwu, I., Ifenkwe G.E. and Agwu, C. (2017). Rural Household Attitudes toward Traditional Method of Malaria Treatment In South-East Nigeria. *Journal of Agricultural Extension*; 21(1):26-37

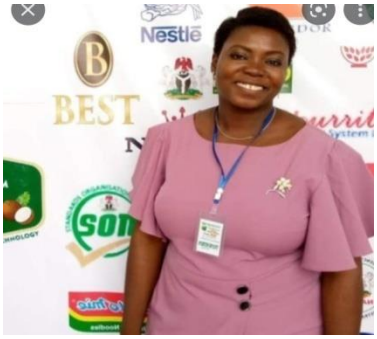
Nwakwasi, R.N.,Nwachukwu, I., Ifenkwe, G.E. and Adesope, O.M. (2015).Determinants of the Use of Orthodox Methods of Malaria Treatment among Rural Households for Enhanced Agricultural Production in South-East, Nigeria.*IOSR Journal of Agriculture and Veterinary Science* (IOSR-JAVS) 8 (7): 48-54

Ashiegbu, G.N., Ifenkwe, G.E., Adesope, O.M. and **Nwakwasi, R.N.** (2015).Determinants of Rural Women's Participation in Mother and Child Care Initiative in Ebonyi State, Nigeria.*Journal for Applied Research* (JFAR), Vol. 7(1)

Roles and responsibilities

As a rural sociologist and development practitioner, my roles and responsibilities will include; coordinating field trips and research instrument (focus group discussions, key informant interviews and questionnaire) administration with graduate/research assistants. Similarly, demonstration with the use of audio-visual aids during trainings and engagement with the rural nursing mothers.

Dr. FolasadeOlabimpeAbeboyejo (Senior Lecturer)



Brief profile

Dr. Folasade holds her Bachelors, Masters and Ph.D. degrees in Food Technology from the University of Ibadan, Nigeria. She is currently a lecturer (Lecturer I), researcher and facilitator with over 13 years of experience at leading Nigerian academic and research institutions. Dr. Folasade is a professional member and treasurer of the Nigerian Institute of Food Science and Technology, Western Chapter and also a member of the Organisation for Women in Science for the Developing World (OWSD).

She provides tailored capacity building in cottage food processing and value addition, working with key influencers in the food industries, government, NGOs, academia and media. She is passionate about the application of adaptable innovative technologies for reduction of post-harvest food loss and wastes as it concerns food and nutrition security.
She has supervised 12 BSc, 11 MSc and 2 MPhil/PhD students to date and published over 28 articles in local and international peer-reviewed journals, book chapters and conference proceedings.

Publications in relation to the project

Layade, A.A., Olajide-Taiwo, L.O., Oyedele, O.O., Olajide-Taiwo, F.B., Adeoye, P.O., **Adeboyejo, F.,** Igwe, C.H. (2018). Appraisal of effect of capacity building on acquisition of knowledge and skill among mango value chain actors from selected geo-political zones in Nigeria. In Proceedings, 36th Annual conference of Horticultural Society of Nigeria(HORTSON). Pp. 866-870

Aderibigbe, R., **Adeboyejo, F.,**Oluwakemi, M., Korese, J.K., and Chikpah, S. (2019). Comparative Nutritional Analysis of Paste Developed from *Tricosanthescucumerina* Linn and *Lycopersiconesculentum* L. Mill.in Nigeria. Conference on International Research on Food Security, Natural Resource Management and Rural Development organised by the Universities of Kassel and Goettingen, Germany.

Fasoyiro, S.B., Oyelakin, M.O, Alimi, J.P., Zaka, K.O., Ajani, A. O., Oduntan, A.O., Olapade, A. A. Farinde, E.A., Osunbitan, S.O., Ejigbo, E.A.,**Adeboyejo**, **F.O.,** Ilesanmi F.F. and Afolabi, M.O. (2015). Gender response and sensitization of students in Oyo state, Nigeria on career choice in S&T (case study: Food Science and Technology). *International Journal of Development Research* 5 (2): 3508-3512

Adeboyejo, F. O., Aderibigbe, O. R., Obarayi, M. T. and Sturm, B. (2020).Comparative evaluation of instant "poundo" cocoyam (*Colocasiaesculenta*) and yam (*Dioscorearotundata*) flours produced by flash and cabinet drying.*International Journal of Food Science and Technology*.https://doi.org/10.1111/ijfs.14703.

Adeyemi, P. A., Adegoke, G. O. and **Adeboyejo, F. O.** (2020). Chemical, microbiological and sensory profiles of mixed fruit wine from Banana (*Musa acuminata*), Watermelon (*Citrullus vulgaris* L.), Pineapple (*Ananascomoscus* L.) and Cucumber (*Cucumissativus*).*Acta Scientific Nutri Health* 4 (3): 01-07. 10.31080/ASNH.2020.04.0637.

Research in progress

Optimisation of inclusion levels, baking conditions and quality attributes of cookies produced from Orange-fleshed Sweet Potato and African star apple gum:
The goal of the study is to determine the influence of African star apple gum as a binder in cookies produced from gluten-free Orange-fleshed sweet potatoes, OFSP. This study is at the level of data analysis and report writing.

Functional, morphological, thermal and physicochemical characterisation of ultrasound, annealed and heat-moisture modified cassava starch:
This research focuses on the physical modification processes applied to native cassava starch and their comparative characterisation, in order to identify their functionality and versatility for application in the food industry. Cassava starch is an ingredient with exceptional functional features, exploited in the design of many foods and biodegradable materials, but limited in its native form. Chemical modification methods are no longer popularly desirable due to increased awareness of consumers on detrimental health and related issues associated with the use of chemicals. Therefore, this research seeks to provide information and contribute to knowledge that will be useful in the selection of appropriate physical modification method for cassava starch.

Air-drying characteristics and monitoring of quality parameters in orange-fleshed sweet potato (OFSP) slices during the drying process using optical non-destructive methods:
Thermal processing has been associated with challenges of development of undesirable heat-induced degradation and quality changes in OFSP. This study seeks to provide a clear understanding of the kinetics and level of retention of β-carotene, moisture, colour, and other quality parameters in OFSP during the drying process. Conventionally, these quality traits are measured by diverse methods with peculiar limitations. These methods are generally time-consuming, complex and expensive for efficient modulation and timely improvement of end product quality during the drying process. In this study, we will apply rapid non-invasive methods like Vis-Near infra-red spectroscopy to monitor quality changes as OFSP is being dried.

Grant

TWAS-DFG Postdoctoral Research Fellowship
Grantor: Leibniz Institute of Agricultural Engineering and Bio economy, Potsdam, Germany.
Amount: €4000
Date: 2021 (3 weeks)

Roles and responsibilities

As a food technologist, my roles shall include; selection and procurement of raw materials, recipe formulation, product development, product quality evaluation, packaging and shelf-life determination. I shall also be responsible for clinical and proximate analysis of food ingredients in the laboratory.

Dr. Mojisola Fauziyah Oyewole (Senior Lecturer)

Brief profile

Dr. Mojisola Fauziyah Oyewole is an academic staff of the Human Ecology unit of the Department of Agricultural Extension and Rural Development, University of Ibadan with a Bachelor of Science Degree in Home Economics from Ambrose Ali University Ekpoma, Masters and PhD Degreein Agricultural Extension and Rural Development, University of Ibadan.

Dr. Oyewole's research interest is in food and nutrition security of women and children, addressing malnutrition through the use of locally available food crops, improving nutritional qualities of plant foods to increase utilization and production and food product development. She has over 30 publications in reputable peer-reviewed national and international journals. She has supervised 40 B.Sc., 30 Masters and 1 M.Phil.Student. She has carried out so many community services within and outside the University such as organizing Moringa training workshop on Women Empowerment and Income Generating Activities for rural women of Orile-Ijaiye Community in Oyo State.

Dr.Oyewole is a member; International Federation for Home Economics (IFHE), Germany; Home Economics Research Association of Nigeria (HERAN); Home Economics Professionals Association of Nigeria (HEPAN); Agricultural Extension Society of Nigeria (AESON); Rural Sociology Association of Nigeria (RuSAN) and National Organic Agriculture of Nigeria (NOAN).

Publications in relation to the project

N.T. Meludu and **M.F. Oyewole**(2009). Towards Sustainable SweetpotatoProduction and Consumption: The Role of Confectioneries. In M. Akoroda and I. Egeonu (Eds.).*Sweetpotato in Nigeria*: Proceedings of the 1st National Sweetpotato Conference, 16- 18 September 2008, University of Ibadan. Pp. 57-60

S.A. Tijani, **M.F. Oyewole** and M.E. Uranta (2013).Seafood processing activities among Women in Ibeju- Lekki Local Government Area of Lagos State, Nigeria.In S.O. Odebode and M.M. Umukoro (Eds.).*Gender and Higher Education in Africa: Emerging issues*. Proceedings of 1st International Conference on Gender and Higher Education in Africa, 12-14March 2013. Ibadan. Pp. 349-354

Oyewole, M .F. (2013). Factors associated with the consumption of selected vitamin A rich foods in Ido Local Government Area of Oyo State. *International Journal of Home Economics.* Vol. 6 No.1: 97- 107.

Oyewole, M.F. (2014) Factors Influencing Food Consumption Patterns of the University of Ibadan Undergraduate Students, Ibadan, Oyo State. *Journal of Home Economics Research.*Vol.20:199-207

Oyewole, M. F.,Adetoro, F.T. and Meludu N.T. (2014). Level of Acceptability of Moringaoleifera Diversified Products among Rural and Urban Dwellers in Nigeria. *International Journal of Biological, Food, Veterinary and Agricultural Engineering* Vol.8 No. 12: 1331- 1337

Apata, O.C., Abimbola, A.F., and **Oyewole, M.F.** (2018). Acceptability of Selected Indigeneous Snacks by Tourist in Tourist Centres in South Western Nigeria.*Nigeria Journal of Home Economics.* Vol. 6 No.2:20-29

Oyewole, M.F..andApata, O.C.(2018). Consumers' Knowledge on Nutritional and Medicinal Values of Tender Coconut Water among Dwellers in Badagry Area of Lagos State, Nigeria.*Nigeria Journal of Home Economics.*Vol. 6 No. 2: 83-88

On-going research

Knowledge on Nutrition and Food Consumption Pattern of Postgraduate Students in theUniversity of Ibadan, Nigeria.Good food consumption pattern in terms of diverse range of food has been shown to increase energy and micronutrients intake and academic performance. Food consumption pattern among postgraduate students is yet unknown. Therefore this study is designed to examine the knowledge on nutrition and food consumption pattern of postgraduate students in the University of Ibadan. Data has been collected; analysis and discussion are on-going.

Research grant

TETFUND grant on the title: Women Empowerment and Income Generating Activities through Moringa plant for rural women of Orile-Ijaiye Community, Akinyele LGA. Oyo State
Grantor: TETFund
Amount: ₦2,000,000
Date: 2016
Duration: 2016-2017 (1 year)

Roles and responsibilities

As a human ecologist, my roles and responsibilities in the project will include recipe development, formulation and nutritional analysis of products (indigenous baby food meal). I

shall also be responsible for the home economics laboratory and coordinating activities of lab assistants.

RESEARCH MENTEES

EmekaF. Odoemenam(Assistant lecturer) (MSc, Rural Sociology, Ibadan)

I shall work closely with Professor Yahaya and Dr. Nwakwasi in coordinating and disseminating research information to target respondents. I shall also lead the team for data analysis and interpretation, report writing and documentation.

Favour N. Okereke(MSc, Human Ecology, Ibadan)

I shall work closely with Dr. Adeboyejo and Dr. Oyewole in the indigenous complementary food production and formulation. I shall also be involved in data collection and analysis.

Other research mentees include…

Shehu A. Baba (PGD, FUT Minna) (CCRHS, Bida, Niger State)

Adetola T.Oyegbile (MSc, Agricultural Communication, Ibadan)

Olobo P. Alifa (MSc, Human Ecology, Ibadan)

INSTITUTE FOR ADVANCED MEDICAL RESEARCH AND TRAINING (IAMRAT)
College of Medicine, University of Ibadan.
Director Prof. IkeOluwapo O. Ajayi,
MBBS (Ib), M. CL.SC., MPH, Ph.D, MD, FMCGP, FWACP
Email: ioajayi@com.ui.edu.ng, ikeajayi2003@yahoo.com Tel: 08023268431

UI/UCH EC Registration Number: **NHREC/05/01/2008a**

NOTICE OF FULL APPROVAL AFTER FULL COMMITTEE REVIEW

Re: Formulation and evaluation of indigenous complementary foods for young children (6-24 months) in Nigeria

UI/UCH Ethics Committee assigned number: UI/EC/23/0696
Name of Principal Investigator: **Professor M. K. Yahaya**
Address of Principal Investigator: Department of Agricultural Extension, University of Ibadan, Ibadan

Date of receipt of valid application: 06/11/2023

This is to inform you that the research described in the submitted protocol, the consent forms, and other participant information materials have been reviewed and *given full approval by the UI/UCH Ethics Committee.*

This approval dates from **01/12/2023 to 30/11/2024.** Note that no participant accrual or activity related to this research may be conducted outside of these dates. *All informed consent forms used in this study must carry the* UI/UCH EC *assigned number and duration of* UI/UCH EC *approval of the study.* It is expected that you submit your annual report as well as an annual request for the project renewal to the UI/UCH EC at least four weeks before the expiration of this approval in order to avoid disruption of your research.

The National Code for Health Research Ethics requires you to comply with all institutional guidelines, rules and regulations and with the tenets of the Code including ensuring that all adverse events are reported promptly to the UI/UCH EC. *No changes are permitted in the research without prior approval by the* UI/UCH EC *except in circumstances outlined in the Code. The* UI/UCH EC *reserves the right to conduct compliance visit to your research site without previous notification.*

UI/UCH EC
01 DEC 2023
APPROVED
COLLEGE OF MEDICINE U.I.

Dr O. S. Michael
For: Chairperson, UI/UCH Research Ethics Committee
E-mail: uiuchec@gmail.com

Brief Objective of the Project:

Approximately two (2) million children all over Nigeria are suffering from severe acute malnutrition (SAM). The various causes of malnutrition and food insecurity in Nigeria are multi-faceted and have witnessed little or no improvement over the years. Some of the challenges include poverty, inadequate food nutrients, lack of access to healthcare, conflict and security issues, etc. All of these affect young children's feeding practices, which contributes to high rate of illnesses and poor nutrition among children less than 5 years. Nutrients adequacy in terms of protein, energy, vitamins, minerals and other micronutrient composition are required for optimal growth and development of young children. These nutrients which make up complementary foods for young children are components of indigenous ingredients adopted for the project.

In an attempt to contribute to solving the problem of infant malnutrition and child mortality that is prevalent mostly among the rural populace and also to reduce the importation of infant baby foods, constitute the fundamental reasons for embarking on this practically inclined research. After careful consideration of the recommended dietary allowance of the infants from age 6 months to 2 years and considering the availability of the selected locally-sourced materials (Rice, Yellow Maize, Orange fleshed sweet potato, Soybean Date fruit and Banana), Nutri-Active baby food was formulated in three different flavours:. Rice, maize and Orange Fleshed Sweet Potato (OFSP).

Complementary foods suitable for children within the age bracket of 6-24 months were developed from indigenously sourced food commodities by a team of University of Ibadan researchers led by Prof. Mohammed Kuta Yahaya of the Department of Agricultural Extension and Rural Development. The project has Dr MojisolaFauziyahOyewole of the Department of Agricultural Extension and Rural Development and Dr FolasadeOlabimpeAdeboyejo of the Department of Food Technology. Prof Safiya Y. Daniyan of Department of Microbiology, Federal University of Technology, Minna and Dr Racheal Nwakwasi, Department of Agric Extension Federal University of Technology, Owerri as co-researchers.

Soybean (*Glycine max*), a staple food item in diets, is a good source of protein and one of the richest and cheapest sources of protein. In modern times, modification on the use of soybeans has led to diverse production of soybeans products i.e. soybean meal serves as a high-protein

meat substitute in many food products, including baby foods. Soybean is a good source for weight gain.

The edible part of the date palm (*Phoenix dactylifera* L.) is rich in protein, vitamins such as B1, B2, B3 and B5, as well as A1 and C, known toimprove bone health (it contains selenium, manganese, copper and magnesium, required for healthy bones), strengthens the nervous system (potassium, sodium), rich in iron, which is great for blood purification as well, promotes digestion, improves skin health i.e. vitamins C and D as it works on the skin's elasticity, and keeps the skin smooth.

Maize (*Zea mays*) which also called corn in many countries is a delicious food known for its sweet taste, bright yellow colour and protein content. Corn is high in B-vitamins: thiamine, niacin, pantothenic acid (B5) and folate. It contains dietary fibre, minerals, magnesium and phosphorus in moderate levels.

Rice (*Oryza sativa*) is a very popular food that is ideal when weaning; from around 6 months, after babies have had their first tastes. It is a great source of carbohydrates, which provides the energy that babies need to grow and develop as well as contributing to their protein, calcium and B-vitamin intakes.

Bananas (*MusaSpp*) are great first food to introduce to babies as they are easy to digest, already soft and mushy, and packed full of vitamins and minerals. They are also packed with calcium, magnesium, zinc, and vitamins A, B6, B12, fiber and folate – which are all essential vitamins and nutrients that help babies, gain healthy weight.

Orange Fleshed Sweet Potato (*Ipomoea batatas* L.) (OFSP) is ranked the third most essential root and tuber crop after potato and cassava in the world and as an important food product among rural communities. Orange Fleshed Sweet Potato (OFSP) as well as majority of sweet potato varieties is high in carbohydrates, but peculiar to vitamins A and C. It is rich in beta carotene which is well acknowledged for young children. Therefore, these OFSP varieties could be useful to combat the widespread Vitamin A Deficiency (VAD) that results in blindness and in extreme cases, death of approximately 250,000-500,000 African children yearly. OFSP is a bio-fortification of sweet potato with the incorporation of high levels of beta-carotene. Beta-carotene is responsible for the orange colour of the root crop and is converted to Vitamin A in the body after consumption and provides additional nutritional benefits which ranges from prevention of Vitamin A deficiency, improve digestion, boosts immune system and help prevent dehydration.

All these food ingredients are within the reach of Nigerian nursing mothers. However, they may lack adequate and timely education needed for their optimal utilisation. Using effective communication strategies for nursing mothers to ensure the efficient utilisation of these natural food ingredients would enhance sustainability of the project. These local/indigenous complementary food ingredients are potentially available and easily accessible for use by nursing mothers using the right formula and proper exposition to feed their children. Such information on appropriate processing technologies ought to be disseminated by trained experts; hence, the need for trained extension personnel (development practitioners) to communicate these information through proper communication channels and strategies.

Rationale for Exposing Nursing Mothers to the use of Indigenous Complementary foods for Young Children in Nigeria

Commercial fortified complementary foods are often beyond the reach of the poor especially for Nigerian nursing mothers. The inability to afford these fortified complementary foods or nutritional inadequate composition of local/indigenous food items can lead to malnutrition (Protein-Energy Malnutrition, PEM, or Micronutrient Deficiency) in infants which causes stunted growth and underdevelopment of young children. As averred by UNICEF (2018), Nigeria is said to be the second country with the highest burden of stunted children in the world, with a national prevalence rate of 32 per cent of children under five years of age.

In order to ameliorate this situation, there is need to tap into our indigenous food ingredients which provide equivalent nutrients as those of commercial complementary foods. Indigenous food items are cultivated naturally within a local (natural) environment, country, region or geographical area and it is readily available and culturally accepted. The indigenous food items considered for the project include; soybean, date palm, maize, rice, banana and orange fleshed sweet potato (OFSP).

The project therefore brings to fore, a **nexus between good nutrition and effective communication patterns for acceptability of the intervention.**

The broad objective of the research project is to formulate and evaluate complementary food for young children using indigenous food items. Specifically, to;

1. Identify the various ages at which complementary foods are being introduced to young children in Nigeria.

2. Identify other food items that are introduced to young children aside commercial fortified complementary foods.
3. Develop communication strategies for the effective and efficient utilisation of indigenous complementary food items.
4. Examine the knowledge of nursing mothers on the benefits of indigenous food items used in the formulation of the complementary food.
5. Formulate recipes, develop and package indigenous complementary food products using selected food crops
6. Carry out quality evaluation and consumer acceptability of the developed complementary foods and training of nursing mothers on how to prepare the nutritious foods themselves using local ingredients

The research project provided answers to the following research questions:

1. What are the various ages at which complementary foods are introduced to young children in Nigeria?
2. What other food items are being introduced to young children aside commercial fortified complementary foods?
3. Which communication strategies would be appropriate for dissemination of these research outputs?
4. What is the state of knowledge of nursing mothers on the benefits of indigenous food items used in the formulation of the complementary food?
5. What indigenous recipes appropriate for complementary food formulation?
6. What are the production and evaluation criteria for developing these complementary foods?

NutriActive: The newly developed complementary foods

NutriActive: Nutritious food palatable for an active and healthy baby

Professor Mohammed Kuta Yahaya - The Project Principal Investigator

Work done so far and results achieved:

1. Recipe formulation for the products based on the Recommended Dietary Allowance for children within the target age range
2. Fabrication of a single screw extruder machine
3. Ethical approval applied for and received from IMRAT, UCH, Ibadan to conduct sensory evaluation on children
4. Product development of the complementary food, NutriActive(in 3 variants: maize-, rice-, and orange-fleshed sweet potato-based)
5. Product quality evaluation (nutritional, microbilogical, micronutrients, antinutritional factors)
6. Package design and production
7. Acquisition of process and analytical equipment and tools, raw materials, other inputs
8. Development of questionnaires, interview guides, KII, flyers, banners and other communication tools
9. Production of jingles, flyers, banners, roll-up (In English and local languages including Yoruba, Igbo, Ijaw and Hausa languages)
10. Field trips and visits (to selected primary health care centres in 5 states - Oyo, Imo, Bayelsa, Niger and Sokoto states)
11. Sensory evaluation and consumer acceptability studies at these locations
12. Nutrition training and assessment

Challenges/difficulties experienced in implementing the project:

1. Security scare and associated challenges with interstate travels
2. Electrical power outages slowing down the processing of products. Team therefore had to rely of diesel-powered generators for the work
3. Higher costs of raw materials, packaging materials, tools and equipment than what was initially budgeted for, necessitating budget cost, reduction in the number of proposed visits,
4. Apathy of some of the respondents to try out the new products, believing it is related to vaccination for sterilization
5. Illiteracy of some of the rural nursing mothers, necessitating the use of local translators

Estimated time of project completion:the original target date is July, 2025. However, the speed of work in progress will result in earlier completion date and gives room for expansion and addressing the professional content in delivery.

Status of Activities in the Work Plan (completed; on-going; yet to start):

Goal: Acquisition of project equipment, processing tools, preparation of interview guides						
Key Action Steps	**Expected completion date (month/year)**	**Expected Outcome**	**Data Source and Evaluation Methodology**	**Person/Area Responsible**	**Comment**	**Status of work**
Project account opening	September 30, 2023	Project account with FBN		Dr Adeboyejo and Dr Oyewole	Approval from Prof Yahaya	Completed
1. Fabrication/Procurement of equipment a. Single screw extruder b. Rapid moisture analyser c. Pulveriser MQW03 model d. Spectrophotometer UV5Bio e. Electric heating constant Temperature Incubator	December 31, 2023	Installed equipment in processing space and laboratory	Fully functional and operational equipment	Prof Yahaya, Dr Oyewole and Dr Adeboyejo	Prices unstable due to dollar fluctuations	Completed
2. Procurement of chemicals and consumables a. Potato dextrose agar (2kg) b. Nutrient agar (2kg) c. Ethanol (98%) (5L) d. Ascorbic acid standards (2g) e. β-carotene standards (2g) f. 2,6 dichloroindophenol(2L) g. Sodium hydroxide (5L)	October 31, 2023	All reagents procured and ready for use in the laboratory	All reagents must be with extended expiry dates	Dr Adeboyejo	The volumes or quantity quoted have been reduced	Completed

h. Acetone (2L) i. Petroleum ether (2L) j. FolinCiocalteu reagent (1L) k. N-Hexane (2.5L) l. Potassium Hydroxide (500g)						
3. Procurement of: a. Video camera (3) b. Stationaries c. Printer	October 30, 2023		Materials bought and tested ok	Emeka Odoemena		Completed
4. Acquisition of multiple-user licensed experimental design, data collection and analytical softwares a. DesignExpert® (version 11.0 or 13.0) b. NVivo c. SSPS (version 25)	October 31, 2023		Software with multiple users operational licence	Emeka Odoemena	Crack version acquired for use due to insufficient funds	Not done
5. Sourcing of raw materials and packaging materials a. Packaging materials • Laminate pouches (3000 pieces (1000 pieces)) • Packaging materials - paperboard cartons (3000 pieces (1000 pieces))	October 31, 2023 October 31, 2023	Dirt-free, ready-to-use raw materials bought		Dr Adeboyejo, Dr Oyewole, Favour Okereke, Olobo Alifa		Completed Completed
b. Raw materials • Maize (3 bags of 50kg each)	September 30, 2023	Order for the premix made	Material quality and			Completed

• Soybean (3 bags of 50kg each) • Rice (5 bags of 50kg each) • Orange fleshed sweet potatoes (150kg roots) • Date palm (50kg) • Vitamin/mineral premix (1kg) • Banana (20kg)	October 15, 2023	and sample received	quantity audited			
6. Recipe formulation, product development, processing and packaging	October 31, 2023	Processed, packaged and labelled products in 50g sachets		Dr Adeboyejo, Dr Oyewole, Favour Okereke, Olobo Alifa	5067 sachets of the complementary foods,NutriActiveproduced	Completed
7. Product quality analysis a. Antioxidant properties (flavonoid, b-carotene, total phenolic compounds, total antioxidant activities, vitamin C, vitamin A).	February, 2023			Dr Adeboyejo, Prof Safiya Daniya and research students	Analysis done by specialization area using standard procedures	On-going
b. Anti-nutritional factors (phytate, tannins, saponins, oxalates). c. Mineral contents (Mg, K, Na, Ca, Fe, Mn, Zn).						
d. Microbiological properties (total fungal and bacterial	December 15,				Animal study not done	On-going

counts, E.coli). e. Animal study using 40 weaning wistar rats at 21 days old.	2023					
8. Development of relevant jingles, videography, photography and publicity adverts	October 20, 2023			EmekaOdoemena and AdetolaOyegbile		Completed
9. Application and acquisition of ethical approval for consumer acceptability study from IAMRAT, UCH, Ibadan	December, 2023			Dr Adeboyejo		Completed
10. Preparation and printing of questionnaires, interview guides, KII, flyers, banners and other communication tools based on research questions and objectives	October 20, 2023	Standard paper questionnaires and goggle forms prepared	Standard paper questionnaires and goggle forms vetted, approved and ready for use	Emeka Odoemena and Adetola Oyegbile		Completed
11. Identification of exact local government, wards, PHCs to be visited in target states	October 5, 2023			**Oyo/Kwara**: Dr Oyewole, Dr Adeboyejo, FavourOkereke **Imo/Bayelsa**: EmekaOdoemena, Dr Racheal Nwakasi **Niger/Sokoto**: Prof Safiya Daniya, Shehu Baba		Completed

12. Identification of focal persons (matrons or senior nurse in all PHCs	October 5, 2023			All by region		Completed
13. Preparation of letters to state ministries of health for letters of approval to PHCs	September 28, 2023			EmekaOdoemena, all research assistants and students, Dr Oyewole, Dr Adeboyejo		Completed
14. Field visits, administration of questionnaire, FGD, KII, sensory evaluation and consumer acceptability of developed products	**December, 2024**			EmekaOdoemena, all research assistants and students, Dr Oyewole, Dr Adeboyejo		On-going
15. Data entry, enumeration and analysis	**December, 2024**			EmekaOdoemena, all research assistants and students	By area of specialization	On-going
16. Manuscript writing, patent preparation and coordination	**December, 2024**			EmekaOdoemena, Dr Oyewole, Dr Adeboyejo	By area of specialisation	On-going
17. Post assessment visit	**June, 2024**		I77	EmekaOdoemena. Dr Oyewole, Dr Adeboyejo		Not done
18. Production of video documentary	**December, 2024**			EmekaOdoemena, all research assistants Dr Oyewole, Dr Adeboyejo		On-going

NB: Activities highlighted in yellow were not done at all to cut down on cost of project execution

Courtesy Visit to the Vice- Chancellor, University of Ibadan.

From Left to Right: The Vice-Chancellor, University of Ibadan, Prof Kayode Adebowale FAS, mni, Prof. Mohammed Kuta Yahaya Principal Project Investigator and Dr MojisolaFauziyahOyewole.

Courtesy Visit to the Deputy Vice- Chancellor (Academics) University of Ibadan

From Left to Right: Prof. Mohammed Kuta Yahaya, Principal Project Investigator; Deputy Vice Chancellor, Prof Aderonke Bayeroju and Dr Mojisola Fauziyah Oyewole.

From left to right: Professor Kuta Yahaya,Principal Project Investigator; UI DVC RISP, Prof. Oluyemisi Bamgbose, Dr. Mojisola Oyewole and Dr FolasadeAdeboyejo

From Left to right: Prof. Victor Okoruwa, UI DAP; Principal Project Investigator, Prof. Kuta Yahaya, Prof. OluyemisiBamgbose, Dr. Mojisola Oyewole and Dr Folasade during the

TETFund NRF Award presentation ceremony at the Trenchard Hall, U.I. on 12 January, 2023.

DESCRIPTION OF WORK UNDERTAKEN

Raw material sourcing

Raw food items such as rice, maize, soybean, dates and bananas were sourced from Bodija market, Ibadan. Orange Flesh Sweet potato was collected from SEYIPOTATO Ltd, operating from the University of Ibadan teaching and research farms. Chemical reagents were sourced from Ezek Roberts Ltd while other processing tools and items were bought from local markets in and around Ibadan

Preliminary processing operations

The materials were weighted, cleaned, sorted and milled into fine powders. OFSP and banana were peeled and sliced thinly, then dried in an air-oven drier at 60^{o}C until moisture contents reached 10%. They were then milled into fine powder. All flours were used for the development of the products. These activities were carried out at the food processing laboratory of the Department of Food Technology, University of Ibadan

Product development

Based on preliminary trial formulations and evaluations, complementary foods were developed in order to promote the utilisation of the selected indigenous commodities towards reduction of malnutrition in Nigeria. Five different blends of maize, rice, orange-fleshed sweet potato-based complementary flours in combination with soybean, date, sugar and banana were formulated based on the nutritional composition of the individual flours. These formulations were done to meet the nutrient requirement of children (6 months to 2 years) in accordance with WHOstandards. Extrusion cooking was used to process the flour blends into instant complementary foods. They were then milled and packaged in High Density Polyethylene (HDPE) bags as the primary packaging and then in carton boxes as the secondary package.

Fresh Orange-fleshed Sweet Potato (OFSP) **(Peeled OFSP)**

Dried OFSP chips **Powdered Date**

Extrusion process during product development (Department of Food Technology)

Milling of extruded samples

Packaging materials design

Products packaged in High Density Polyethylene (HDPE) bags and Cartons

Product quality analysis

The developed products were evaluated for:

a. Proximate composition (Energy value, carbohydrates, protein, fats, crude fibre, ash and moisture contents)
b. Functional properties (water absorption capacity, swelling power, bulk density)
c. Antioxidant properties (Phenolic compounds, flavonoids, antioxidant capacity, carotenoids, vitamin A and C)
d. Antinutritional factors (Saponin, tannin, oxalates and phytates)
e. Microbiological evaluation (total bacterial and total fungi counts)
f. Sensory evaluation and consumer acceptability

Dr MojisolaOyewole and Dr FolasadeAdeboyejo determining moisture content of extruded products

Sensory evaluation and consumer acceptability study, training and capacity building for nursing mothers at selected Primary Health Care Centres PHCs in 5 states of Nigeria

The assessment aimed to explore, sensitize and provide insight into knowledge of nursing mothers on nutritional composition and how to formulate complementary food for the young children using indigenous commodities in the selected project implementation states including Oyo, Niger, Imo, Bayelsa and Sokoto States. Data collection from nursing mothers was done at selected Primary Health Care Centres(PHCc) at these locations; at least a minimum of one rural and one urban PHCc in each state. During these visits, sensitization and administration of questionnaires to nursing mothers with young children within the age bracket (6-24 months) to assess their knowledge about indigenous complementary foods for young children with the aid of audio-visual aids such as jingles, posters, flyers, and roll-up banners, and projectors was done. They were further provided samples of each of the developed products for evaluation and rating of the sensory parameters and acceptability using a 5-point hedonic scale in terms of taste, colour, flavour, mouthfeel and overall acceptability.

EVALUATION OF NUTRI-ACTIVE COMPLEMENTARY FOOD HELD AT THE UNIVERSITY OF IBADAN HEALTH CARE SERVICES, IBADAN NORTH LOCAL GOVERNMENT, OYO STATE

DATE: 6th DECEMBER, 2023

The University of Ibadan Management team led by the Deputy Vice Chancellor Administration - Prof. OlamakindeOlapegba launched the NutriActive baby food at the University of Ibadan Health Service Centre (Immunization Clinic Section). In attendance at the event were: Representative of the Vice Chancellor, Prof. O. T. Jeremiah, Deputy Vice Chancellor Research and Innovation Programmes (RISP): Prof. OluyemisiBamgbose, Director Research Management Office: Prof. Jegede, Director of Academic Planning: Prof. V.O. Okoruwa, Dean Faculty of Agriculture, Prof A.O.Omojola, Dean Faculty of Technology, Prof A.I. Bamgboye, Director of Teaching and Research Farm, Prof. T.O Ososoanya, Chief Matron of the University Health Centre, Mrs Omololu, Zonal Director of FRCN, Mr Dominic Mokikan, the University PRO, Mrs Akinpelu, Professors and Staff from Faculties of Agriculture and Technology, the nursing mothers and their babies and press crew from NTA and Radio Nigeria.

The following activities were carried out

1. Introduction of Guests by University PRO – Mrs Akinpelu
2. Welcome Address by Director of University of Ibadan HealthServices
3. Project highlights by Dr MojisolaFauziyahOyewole& Dr FolasadeAdeboyejo
4. Opportunities in collaborative research by Prof. M.K. Yahaya
5. Remarks by the Deans of Faculties of Agriculture and Technology
6. Goodwill Messages
7. Remarks and Launching of NutriActive baby food by the Vice Chancellor
8. Playing of jingles that was produced for effective dissemination in English and Yoruba languages
9. Sensory evaluation and consumer acceptability testing by nursing mothers and their babies
10. Responses and comments of the respondents about the various samples were recorded.
11. The remaining samples and plastic plates were shared among all the nursing mothers present.
12. Samples were also given to the staff of the primary healthcare visited as a token of appreciation.
13. Nigerian Television Authority (NTA) conducted interviews with the Vice Chancellor, Director of Research Management Office, the Principal Investigator of the project and some of the nursing mothers.
14. Group photographs were taken with the two banners.

The Principal Investigator-Prof. Mohammed Kuta Yahaya, giving his Speech on the Project

Group Photograph of the University Management, Researchers and the Nursing Mothers

The DVC Administration: Prof Olamakinde Olapegba, demonstrating the feeding of NutriActive baby food to the Mothers.

A nursing mother sharing her observation on her baby's acceptability of the products

The Director, RMO being interviewd

Cross- Section of Nursing Mothers and their babies at the Clinic

Nursing Mothers filling the questionnaire

REPORT FROM IMINI PRIMARY HEALTH CENTRE, IMINI, AFIJIO LOCAL GOVERNMENT, OYO STATE

DATE: 26th OCTOBER, 2023

The team from the Department of Agricultural Extension and Rural Development and the Department of Food Technology visited Imini PHCc to carry out assessment on the developed complementary foods while also delivering informative nutrition-based talks to the community members. These talks emphasized on the importance of exclusive breastfeeding for the first 6 months of life and on proper nutrition in early childhood for proper physical, mental and cognitive development and how Nutri Active can contribute to this. There were about 63 mothers-babies pair in attendance.

Demonstrations were conducted to show parents and caregivers how to properly feed NutriActive to their infants. This included instructions on preparation and serving. They were also asked to taste each of the five samples and feed their children too.

The following activities were carried out

1. Introduction of Guests: Dr I. O. Badiru (Department of Agricultural Extension and Rural Development)
2. Welcome Address: Dr Olufunke O. Ezekiel (Department of Food Technology)
3. Project highlights and pre-knowledge assessment: Dr Mojisola F. Oyewole (Department of Agricultural Extension and Rural Development)
4. Playing of jingles in Yoruba Language (Students from Department of Agricultural Extension and Rural Development)
5. Sensory evaluation, consumer acceptability tests by nursing mothers-babies pair: Dr Folasade O. Adeboyejo (Department of Food Technology)
6. Training on how to process and prepare nutritious complementary foods locally: Dr Folasade O. Adeboyejo (Department of Food Technology)
7. Responses and comments of the respondents
8. Distribution of Orange-fleshed sweet potato vines to nursing mothers for planting
9. Entertainment of nursing mothers and staff of the PHCc and sharing of left-over samplesto the nursing mothers present.
10. Photographs

Questionnaires were administered to assess the outcomes of the feedings. This feedback provided valuable information for evaluating the product's effectiveness and understanding the community's perceptions.

Outcomes

The field trip was a success in achieving its goals. The community members showed enthusiasm and interest in NutriActive. They actively participated in the nutrition talks and

expressed their willingness to incorporate the product into their children's diets. The questionnaires collected valuable data on their experiences and feedback.

Conclusion

The collaborative efforts of the Department of Agricultural Extension and Rural Development and the Department of Food Technology in introducing NutriActive as a complementary feeding solution at Imini community have the potential to make a positive impact on the nutrition and well-being of infants in the area. The positive reception from the community members indicates a promising start for this initiative.

Recommendations

Continuous education and follow-up visits are recommended to ensure that the community members are effectively using NutriActive or producing their own complementary foods as taught thereby benefiting from its nutritional advantages. This initiative can serve as a model for other communities seeking to improve child nutrition during the weaning process.


IMINI PRIMARY HEALTH CARE
CENTER IMINI
AFIJIO LOCAL GOVERNMENT
HEALTH AUTHORITY, JOBELE.
Courtesy:
IMMUNIZATION PLUS & MALARIA PROGRAM BY ACCELERATING
COVERAGE & TRANSFERRING SERVICES IMPACT PROJECT
(WORLD BANK ASSISTED)
AFIJIO LOCAL GOVERNMENT

Group photograph of the researchers and some of the nursing mothers at IMINI PHCc, Oyo State

Researchers, enumeratorsand some of the nursing mothers

FIELD REPORT ON EVALUATION OF INDIGENOUS COMPLEMENTARY FOODS FOR YOUNG CHILDREN (6-24 Months) DONE ON WEDNESDAY, 8th AND 9th NOVEMBER 2023 ATIGBOORA, IBARAPA CENTRAL LOCAL GOVERNMENT, OYO STATE, NIGERIA.

Introduction

The research team from the Department of Food Technology and the Department of Agricultural Extension and Rural Development of University of Ibadan went on a field trip to Igboora community primary health centre on the 8th and 9th November, 2023.

The team carried out community entrance by paying a courtesy visit to the paramount traditional ruler of the town, the Olu of Igboorawhere we introduced ourselves and informed the king on the sensitization, awareness and introduction of NutriActive feed which was to hold the following day 9th December, 2023. He warmly received and gave his support to the team's activities by personally making a phone call to the director of community health services in Igboora and asking him to give the team every assistance needed to carry out the tasks. The primary objective of the field trip to Igboora community was to promote, and educate the community nursing mothers about complementary feeding for children from 6 to 24 months as well as evaluate the nursing mothers' knowledge on complementary feeding using the newly developed product, NutriActive (developed from indigenous feed items). The research team was able to provide health talks on nutritious feeding practices and distribute samples of NutriActive to the community members.

The trip kicked off with training exercises with data enumerators which was conducted on the 8th December, 2023. There was in attendance over 20 Enumerators who were taught on how to gather data and information from the nursing mothers and proper note-taking and record keeping. In attendance was the village contact person (who represented the King), representative of the Head of the Primary Health center along with other nurses. Dr FolasadeAdeboyejo from the Food Technology department delivered informative health talks to the community members. These talks emphasized the importance of proper nutrition in early childhood development and how NutriActive can contribute to this.

NutriActive is a nutritionally rich product made from a combination of ingredients, including orange-fleshed sweet potato, maize, soybeans, dates, and more. It is designed to support the nutritional needs of infants during the weaning process, ensuring they receive essential nutrients for healthy growth.

Five samples of NutriActive were distributed to each participating family. This allowed them to experience the product and understand its benefits firsthand.

Demonstrations were conducted to show parents and caregivers how to properly feed NutriActive to their infants. This included instructions on preparation and serving. They were also asked to taste each of the five samples and feed their children too.Questionnaires was administered to assess the outcomes of the feedings. This feedback will be valuable for evaluating the product's effectiveness and understanding the community's perceptions.

Outcomes

The field trip to Igboora community was a success in achieving its goals. The community members showed enthusiasm and interest in NutriActive. They actively participated in the health talks and expressed their willingness to incorporate the product into their children's diets. The questionnaires collected provided valuable data on their experiences and feedback.

Conclusion

The collaborative efforts of the team in introducing NutriActive as a complementary feeding solution in Igboora community have the potential to make a positive impact on the nutrition and well-being of infants in the area. The positive reception from the communityhead and members indicates a promising start for this initiative.

Recommendations

We recommend continuing education and follow-up visits to ensure that the community members are effectively using NutriActive and benefiting from its nutritional advantages. This initiative can serve as a model for other communities seeking to improve child nutrition during the weaning process.

Dr FolasadeAdeboyejo with the Olu of Igboora, ObaJimohOlajideTitiloye

Training session with the data enumerators.

Some of the research team with the Emoji banner

Dr Adeboyejodelivering the nutrition and health talk to the nursing mothers

The research team with the Olu of Igboora community.

The newly introduced product, NutriActive

A baby enjoying NutriActive

A baby enjoying NutriActive

Team from the Department of Food Technology and Agricultural Extension and Rural Development with some of the nursing mothers.

REPORT FROM AGUDAMA-EPIEPRIMARY HEALTH CENTRE, YENAGOALOCAL GOVERNMENT, YENAGOA, BAYELSA STATE

DATE: 22nd NOVEMBER, 2023

Introduction

The field work involving the formulation and evaluation of indigenous complimentary foods for young children from age 6 to 24 months in Nigeria was also carried out in Yenagoa City, the Capital of Bayelsa State thus representing the Niger Delta Region of Nigeria.

On the 6th of November, letters of introduction were submitted to three primary health care in Yenagoa Metropolis namely: Opolo Primary Healthcare, Community Primary Healthcare, AgudamaEpie and Primary Health Centre, YenizueGene. After due followed up of the letters, only one primary healthcare accepted. The remaining two gave excuse that they have so many programmes at the moment.

The field work day activities

The field work was done on Wednesday, 22nd of November, 2023 at the Community Primary Healthcare Service, AgudamaEpie, Yenagoa. Reason for choosing that day was due to the fact that is one of their clinic days of immunization with the highest population of nursing mothers. We commenced the activities at exactly 9am by:

1. Introduction of the research team was done and our aims were explained to the audience
2. The enumerators assisted by few nurses got data from the nursing mothers to test their knowledge before the training
3. The jingle that was translated into Ijaw language being the major language in Bayelsa State was played
4. Then, the various samples were given to the respondents for sensory evaluation
5. Responds and comments of the respondents about the various samples were recorded.
6. Group photographs were taken with the two banners.
7. The remaining samples and plastic plates were shared among all the nursing mothers present.

8. Samples were also given to the staff of the primary healthcare visited as a sign of our appreciation.

In all, 120 questionnaire were administered to the nursing mothers but only 87 were retrieved and thus completed the sensory evaluation.

Challenges

1. Respondents were not interested for the group photographs dues to the fact that we took much of their time during the sensory evaluation

2. Inadequate finance in taking more care of the research team members.

3. Members of the research team were few leading to spending more time during the sensory evaluation.

In all, 120 questionnaires were administered to the nursing mothers but only 87 were retrieved and thus completed the sensory evaluation.The respondents after the sensory evaluation asked of where to get some of the samples instantly, indicating their interest and acceptability.


AGUDAMA-EPIE
PRIMARY HEALTH CARE CENTRE
YENAGOA LOCAL GOVERNMENT AREA
BAYELSA - STATE


BHCPF
NutriActive
Baby Food
complementary
food for infants
(6-24 months)

REPORT FROM OLD AIRPORT AND KPAKUNGUPRIMARY HEALTH CARE CENTRES, MINNA, NIGER STATE

DATE: 27th NOVEMBER, 2023

INTRODUCTION

Research team comprising of Lead Researcher **Prof. Mohammed Kuta Yahaya**, and other Support Researchers ably represented by Shehu Ahmed Baba undertook a courtesy visit to the Hon. Commissioner Niger State Ministry of Primary Healthcare Services – **Dr. Ibrahim Dangana** for a formal Introduction of the project and the team after sending Introductory Letter to the Ministry. The Introductory visit was preceded by an interaction on the procedures for the implementation of the task in the state. The project team thereafter interacted and selected Primary Health Centres and hence secured ethical Clearance and administrative approval for the conduct of the task. The fall out of the meeting was the modalities for securing Ethical Clearance and administrative approval for the assessments. This led to the submission of the Research Concept note and the questionnaire, submission of applications for ethical clearance and administrative approval to undertake the assessment and above all selection of PHCs for the assessment. The team and the Ministry resolved to select two PHCs that always have large turnout of nursing mothers with children in the age brackets of 6-24months and also leverage on the days of Immunization or Health talks for the intervention. In line with the above agreement, the team and the agency agreed to select one PHC from an urban area and another from a semi-urban or rural settings. The research was with the support of a well-structured questionnaire. The research questionnaire for the assessment span through the thematic focus areas /indicators scaled out below:

Section A: Nursing Mothers Background / Name and Location of PHC & Socio-economic characteristics of Respondents

Section B: Appropriate Age at which complimentary foods are introduced to infants

Section C: Knowledge on the Benefit of food item used in the formation of Complementary food

Section D: Communication Strategies used in information dissemination about complementary food

Section E: Information on Indiginous food items introduced for babies complementary food

Section F: Consumer acceptability/sensory evaluation of indigenous complementary foods

The processes and the Research assessment were conducted over a period of Five (5) days with day 1 for the Courtesy visit to the Ministry, Day 2 for the submission of Letters of Ethical Clearance and approvals as well as the selection of the PHCs for the assessment. Day 3 was for the submission of letters to the PHCs selected and orientation of the enumerators. The remaining two days (day 4&5) were used for a field visit/data collection to the selected PHCs

Criteria for Selection of LGAs and PHCs

Taking into consideration turnout / Population of Nursing Mothers to Clinics, two (2) facilities were randomly selected with one located in an urban setting and the other located in rural settings. Following the above, Old Airport Clinic in Minna was selected to represent Urban PHC while Kpakungu Clinic was selected to represent Rural and Semi-Urban PHC.

Major Activities

Some of the key activities carried out include:

1. Visit to Hon. Commissioner, Permanent Secretary and Directors PRS/Community Health all of Ministry of Primary Health Care Services for Teams Introduction
2. Selection of Facilities
3. Processing of Ethical Clearance and Administrative approval; Visit to the Chairman Ethical Committee for teams Introduction and submission of Letters for Ethical clearance and administrative approvals for the assessment
4. Orientation of enumerators and Submission of Introductory letters to PHCs Selected and fixing of dates for the assessment
5. A two-day field visit for Sensitization and questionnaire administration / data collection.

Task Implementation

6. Team Introductions and stating the overview of the Project
7. Administration of Pre-Assessment Questionnaires through Enumerators to Nursing Mothers for Pre-Knowledge assessment before the Sensitization

8. Playing of the Jingle to the audience
9. Full fledge sensitization was again given to the audience to complement the information given through jingle
10. Samples of the Complementary foods were shared to some selected participants for sensory evaluation
11. Administration of Post Assessment Questionaire

Summary of Findings

Prior to the Implementation of this project, it was observed that majority of the Nursing Mothers do not know that series of varieties of Indigenous food could be combined to produce complementary foods for young children. This is evident from the fact that majority of Nursing mothers have little knowledge of the indigenous food items that can be used to prepare complementary food. But through this intervention, there is mark improvement on level of knowledge and awareness of Nursing Mothers of varieties of indigenous food items that can be used for complementary food for young children

Nursing mothers also have little knowledge on the Nutritional benefit of Indiginous Complementary food items. This exercise has also strengthened the knowledge of the Nursing Mothers on the nutritional benefits of the indigenous complementary food items

Also through sensory evaluation for the qualities in terms of colour, taste, appearance, flavour, texture, and overall acceptability of the indigenous complementary food, majority of the mothers attested that the three based (Rice, Sweet Potato and Maize) complementary food prepared by the researchers are of good quality in-terms of colour, taste, appearance, flavor, texture and above all acceptable. This led to increased level of acceptability of nursing mothers on formulation of the complementary foods with indigenous crops. This was evident from the unanimous / Chorus answers and responses given by the Nursing mothers across the two facilities visited

Team's Introductory Visit to Hon. Commissioner, Ministry of Primary Health Care Services Niger State – Dr Ibrahim Dangana (Left)

Visit to Director, Community Health, Niger State Ministry of Primary Health Care Services – Dr. Hauwa Kolo

Entrance gate of Old Airport Clinic in Minna, Niger State

Mrs Promise Onua Setting the stage for Implementation of Project in Old Aiport Clinic Minna

One of the enumerators setting the Stage for the Task in Old Airport Clinic, Minna

Niger State Team with Lead Enumerator and the Head Nurse In-Charge of Old Airport Clinic, Minna Niger State

Cross section of nursing mothers being guided by some of the enumerators on Pre-Questionnaire filling in Old Airport Clinic in Minna, Niger State

A nursing mother pre-testing the complementary food during sensory evaluation session

Cross section of Nursing Mothers feeding their children with NutriActivecomplementary food prepared by the team

Some Nursing Mothers displaying their NutriActive foods at Old Airport Clinic after the Exercise

At Kpakungu PHCc, Minna, Niger State

Table set for the task ahead

Views of the In-Charge and the 2nd In-Charge of Kpakungu PHC guiding the Nursing Mothers on the Complementary food mixing and sensory evaluation in Niger State

Cross section of Nursing Mothers answering Post-Test Evaluation during the exercise in Niger State

Cross section of Mothers and Nursing Mothers showing the Complementary foods shared to them

Cross sections of Nursing Mothers and Young Children in Kpakungu PHC

Niger Team, the In-Charge and some Enumerators in Kpakungu Primary Health Care Centre Niger State

FIELD REPORT ON EVALUATION OF INDIGENOUS COMPLEMENTARY FOODS FOR YOUNG CHILDREN (6-24 Months)IN SOKOTO STATE, NIGERIA.

DATE:

PHCc VISITED:

1) PHC Gagi, Gagi village, Sokoto South LGA, Sokoto State.

2) PHC KofarRini (AsibitinKangiwa), Sokoto North LGA, Sokoto State.

Activities carried out at the PHCs

1) Counselling on infant malnutrition and how to prevent it

2) Training on complementary feed formulation

3) Sample tasting (baby between 6 and 24 months, and mother) and sensory evaluation

4) Data collection

5) Sharing of excess samples to the nursing mothers


GAGI
PRIMARY HEALTH CARE
SOKOTO SOUTH LOCAL GOVERNMENT
GAGI A WARD
SOKOTO


Baby Food

DATA COLLECTION REPORT ON FORMULATION AND EVALUATION OF INDIGENOUS COMPLEMENTARY FOODS FOR YOUNG CHILDREN (6-24MONTHS) IN IMO STATE, NIGERIA

Introduction

The data collection in Imo state stated on 7th December, 2023. In each of the primary health center visited, cooperation of the matron as well as other nurses was sought in order to have maximum attention of the nursing mothers.

Researchers: Dr R. N. Nwakwasi, Mr. F. E. Odoemenam, and Dr C. N. Uwandu

Number of senatorial zones covered: 3

Local Government Area covered per senatorial zone

i. Owerri zone: Owerri north LGA, Mbaitolu LGA, and Owerri west LGA

ii. Orlu zone: Ideato north LGA and Njaba LGA

iii. Okigwe zone: Onuimo LGA and Isialambano LGA

One primary health center was randomly selected from each of the chosen LGA as follows:

Osina PHC (Ideato north LGA)

Number of nursing mothers sampled: 29

Number of enumerators: 3

Umuaka PHC (Njaba LGA)

Number of nursing mothers sampled: 40

Number of enumerators: 3

Amakohia PHC (Owerri north LGA)

Number of nursing mothers sampled: 18

Number of enumerators: 3

Amaraku PHC (Isialambano LGA)

Number of nursing mothers sampled: 17

Number of enumerators: 3

Okwelle PHC (Onuimo LGA)

Number of nursing mothers sampled: 47

Number of enumerators: 3

Ihiagwa PHC (Owerri west LGA)

Number of nursing mothers sampled: 62

Number of enumerators: 3

Nwaoriubi PHC (Mbaitolu LGA)

Number of nursing mothers sampled: 20

Number of enumerators: 3

Grand total of nursing mothers sampled from all the primary health centers: 233

Conclusion

Conclusively from the two facilities visited and across the large numbers of Nursing Mothers reached with this intervention, there was an overwhelming acceptability of the indigenous complementary food by the Nursing. Through the strategy of the Sensory evaluation, Nursing

mothers all attested that the three brand based complementary food prepared by the researchers are of good quality in-terms of colour, taste, appearance, flavor and texture.

Recommendations

1. In future assessment similar to this, Research Questionnaires structured for assessment for Women population of this category should be more simplified and minimal in volume
2. There is need for full-fledged sessions or adequate sensitization sessions / trainings with Women group by extension and food production experts on how to prepare Complementary food using varying indigenous food crops
3. Adequate quantity of the pre-tested samples of the indiginous complementary food (Rice, Maize and Sweet Potato Based should be produced and circulated or place in the open market for purchase by interested persons
4. A dedicated Food Production firm should be tasked to emulate this concept and take up the production of complementary foods using varying indigenous crops and sold at a subsidized rate to Nursing Mothers
5. There is need for HCWs who inter-phase with Nursing Mothers to be trained also on this concept to further carry forth the campaign through their health talks sessions with Nursing Mothers
6. Nutritionist across States should also be encouraged to take up this concept and further sensitize and encourage Nursing Mothers to also key into this concept
7. Need for more women population should be reached with this concept
8. There should be intermittent sensitization with the jingles through Radio stations for wider coverage of the concept