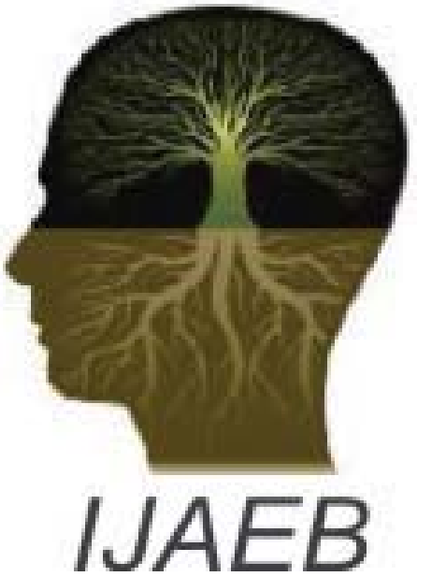
PRINT ISSN. : 0974-1712
ONLINE ISSN.: 2230-732X

INTERNATIONAL JOURNAL OF AGRICULTURE, ENVIRONMENT AND BIOTECHNOLGY

Vol. 7, No. 2, June 2014

Editor-In-Chief
Amitava Rakshit, PhD (IIT, Kharagpur)
amitavabhu@gmail.com



NEW DELHI PUBLISHERS
90, Sainik Vihar, Near Lakshmi Narayan Mandir, Mohan Garden,
New Delhi – 110059 (India)
Email: ndpublishers@rediffmail.com Website: www.ndpublisher.in
Phone: 91-11-25372232 Mobile: 9971676330, 9582248909

About the Journal

The Journal is an International reviewed publication focused to disseminate theoretical or experimental novel information contributing to the understanding and development of agriculture, environment and biotechnology. The Journal recognizes the multidisciplinary nature of its scope and encourages graduate students, scientists, research scholars and government and non-government organizations employees the submission of research material from all of the disciplines involved in agriculture, environment and biotechnology. Contributions are welcomed in relation to the study of particular components of the agriculture (*e.g*., plant and animal), environment (*i.e*., soil, water, meteorological and climate) as well as biotechnology (*e.g*., crop and animal biotechnology) resulting interactions and their relationship/impact on society and environment at a local, regional or international level. Agriculture and environment interactions from the perspective of sustainable development and natural resources management studies are also welcomed. The journal is also focused to enhance the communication between the science community and biotechnological aspects for the well of human being.

International Journal of Agriculture, Environment and Biotechnology, quarterly journal, publishing original research papers, short communications and review papers on topics which include:

• Environment • Botany • Seed Science & Technology • Plant Physiology • Horticulture • Genetics and Plant Breeding • Soil Science • Agronomy • Entomology • Microbiology • Biotechnology • Agricultural Economics • Agricultural Engineering • Animal Science

Kindly Send:

Demand Draft/Cheques in favour of **NEW DELHI PUBLISHERS** Payable at New Delhi

Please Contact:

wwww.indianjournal.com

Authors can submit their scientific articles/research papers and review articles in **Electronic Media** in MS Office Compatible software to **Email: ndpublishers@redifmail.com/gmail.com / amitavabhu@gmail.com**

You can also submit your research manuscript online www.ndpublisher.in

NAAS RATING 4.1

Abstracting and Indexing

IJAEB (International journal of Agriculture, Environment and Biotechnology) is abstracted and indexed in following organizations.

- Connacyt, Mexico
- AGRICOLA
- Index Copernicus
- EBSCO Host Academic Complete Solution
- CAB International
- EBSCO Database
- Indian Citation Index
- Ulrichs Web Agriculture

EDITORIAL BOARD IJAEB – 2014

ADVISORY BOARD

EDITOR-IN-CHIEF

ASSOCIATE CHIEF EDITORS

PUBLISHER AND EXECUTIVE SECRETARY

TECHNICAL EDITORS

REGIONAL EDITORS

EDITORIAL MEMBERS

Contents

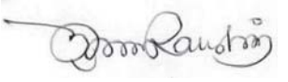
International Journal of Agriculture, Environment & Biotechnology
Vol. 7, No. 2, 191-414: June 2014

Dr. Amitava Rakshit *TWAS Nxt Fellow, Biovision Nxt Fellow(France)*
Faculty, Department of Soil Science & Agricultural Chemistry
Institute of Agricultural Sciences, Varanasi – 221 005, INDIA
Email:amitavabhu@gmail.com
Voice: +91-542-2307120 (O) ; +91-9450346890 (M) , **Fax**: +91-542-2368465

EDITORIAL

At the national level, both in developed and under developed agrarian segments, family farming is the predominant form of agriculture in the food production sector. Within this framework, the development of viable modalities of family farming is essential for the achievement of sustainable development in agricultural, forestry, and fishery production systems. Helping farming families increase production in a sustainable way, and sell more crops, is the most effective way to reduce hunger and poverty over the long term. When farmers grow more food and earn more income, they are better able feed to their families, send their children to school, provide for their family's health, and invest in their farms. This makes their communities economically stronger and more stable. Helping farmers improve their yields requires a comprehensive approach that includes the use of seeds that are more resistant to disease, drought, and flooding. Looking at these strong points United Nations declare 2014 as the International Year of Family Farming with a strong motive to raise the profile of family farming and small holder farming by focusing world attention on its important role in alleviating hunger and poverty, providing food security and nutrition, improving livelihoods, managing natural resources, protecting the environment, and allowing a sustainable development particularly in rural areas. As a matter of fact practicing this family and the farm are linked, co-evolve and combine economic, environmental, social and cultural functions. As agriculture continues to play an important role in most non-industrial economies like India, the concept definitely going to add more vibrancy in this sector.

Sincerely



Amitava Rakshit, PhD
Institute of Agricultural Sciences, BHU,Varanasi, India

International Journal of Agriculture, Environment & Biotechnology
Citation: IJAEB: 7(2): 381-390 June 2014
DOI: 10.5958/2230-732X.2014.00259.9

Agricultural Economics

Emerging Agribusiness Enterprises: the Need for Food Safety Policy in Nigeria

G.T Adigun

Department of Agricultural Economics and Extension, Landmark University, Omu-Aran, Kwara State, NIGERIA

Email: adigtoyin2002@yahoo.co.uk

Paper No. 223 Received: March 09, 2014 Accepted: April 17, 2014 Published: May 28, 2014

Abstract

Quality standards are usually related to improving the safety of food products suitable for consumption in accordance to specifications by food regulatory bodies. This study noted that although steps have been taken in Nigeria to address an aspect of food security (increasing food production to prevent hunger) in the issue of food safety, another aspect of food security, received only little attention. Findings of this study revealed that Educational level and amount of assets owned by respondents have direct relationships with their awareness about the need for food safety regulations. The number of years spent in school also influenced the ease of adoption of technological innovations associated with food safety regulations. The negative signs of X_1 and X_4 (age and years of experience) means due to lack of education of most of the respondents, even as they continue growing older and stay longer in business they may not see the need to spend additional money on safety measures as it does not have much meaning to them.

The paper also observed that even though Nigeria has over nine food laws, the problem lies with implementation of these laws. It, therefore, recommends that the National Agency for Food and Drugs Administration and Control (NAFDAC), the food agency in Nigeria be empowered to enable her extend surveillance and awareness-creation activities to food enterprises at the grassroots. It also needs to ensure that retail establishments, restaurants and other food vendors meet basic food safety standards as well as proper sanitary practices.

Highlights

- Education and asset ownership influenced awareness about food safety in the study area.
- Level of education enhanced the use of technological innovations associated with food safety.
- Age and number of years of food vendors in business negatively influenced their willingness to pay for food safety in the study area.

Keywords: Agribusiness enterprises, Food Safety, Willingness to pay

In most countries around the world, food safety policies are either non-existent or inadequate due to various reasons including lack of clarity, poor enforcement and monitoring. An analysis conducted by the WHO Regional Office in 2002 showed significant gaps in national food laws and inadequate linkages between strategies to ensure food safety. A study carried out by WHO in 2002 revealed that a limited number of countries had legislation that adequately tackled current and emerging food safety problems.

Enforcement of food legislation is also problematic, often resulting in insufficient consumer protection against fraudulent practices and contaminated food products, and leading to the importation and domestic production of substandard food items as well as trade rejections of food exports from the region. It was further noted that the informal sector, which is often a significant producer and distributor of fresh and processed food products for direct consumption, is often outside the scope of official control systems and remains the least controlled, except by municipal environmental hygiene authorities.

As reported by food safety and Nutrition guidelines, the administration of food safety is complicated by the fact that food safety has many facets. National food control systems within some regions often have a sectorial or fragmented structure. Compounding the problem is the patchwork of food safety laws and fragmented institutional instruments, resulting in non-uniformity of policy implementation and duplication of efforts.

In Nigeria, several legislative provisions have been enacted in different statutes in response to the food safety challenge. Some of these legislative provisions include: Public Health Ordinance Cap 165 of 1958; The Standards Organization of Nigeria Decree No 56 of 1971; The Food and Drugs Decree No 35 of 1974; The Animal Disease Control Decree No 10 of 1988; The Marketing of Breast Milk Substitute Decree No 41 of 1990; The National Agency for Food and Drugs Administration and Control Decree No 15 of 1993. The need to revise and harmonize existing legislation has been recognized. The national Policy on Food Hygiene and Safety was put together and launched by the Honorable Minister of Health in July 2000. The national policy is an integral part of the Nigerian Health Policy and the Abuja Health Declaration, which are both based on achieving health for all Nigerians by the year 2020. The policy seeks to stimulate and promote all government regulations concerned with food production, storage and food handling, food manufacturing/ processing/ preservation, food trade and distribution as well as food preparation. Food safety is a joint responsibility which extends along the whole food chain – farmers, fishermen, food processors, transport operators, retail etc. Food producers at all levels of production bear a responsibility for the production of safe foods. At the farm level, farmers and workers must control pesticide and other chemical inputs and recognize potential sources of microbial contaminants from water, soil, animals and humans. Fishermen must understand that the safety and quality of their catch is linked to the levels of contaminants in the harvest waters (Carnevale, 2001). The food processing and transportation industries must assess where food safety may be jeopardized at critical points in food production and transport and take appropriate measures to control these potential hazards. Retail establishments, restaurants and other food vendors must also understand how to ensure proper sanitary practices and temperature controls. The consumer's role may be the *most important* in that s (he) controls food safety at the point closet to food consumption (Carnevale, 2001).

Food safety laws and regulations are essential for providing the legal framework for establishing an effective food safety control infrastructure. Whilst also encompassing other consumer protection issues such as fraud, food law serves as a mechanism for formalizing and codifying strategies and policies for food safety. It is an important means by which food safety policies are enforced.

The purpose of food legislation like food safety policies is to ensure high level of health protection by providing controls along the food production, processing, storage and distribution chain. Food legislation serves to define what is expected as the minimum standard for a large and diverse industry. To the consumer, it defines what is safe and wholesome for consumption. To the industry, it also specifies the criteria to be met if a manufactured food is to be accepted as safe (Assuring Food Quality and Safety, 1999). It informs producers' and processors of requirements regarding production, processing methods and product standards and provides the consumer expectations of a given food (10 Point Regional Strategy for Food Safety in the South-East Asia Region, 1998).

The main objectives of a national food control system are: (i) to protect public health by reducing food borne illnesses, (ii) to protect consumers from insanitary, contaminated, unwholesome, mislabeled or adulterated food and (iii) to maintain consumer confidence in the food system which will give rise to economic development due to increased domestic and international trade in safe food.

The scope of food control systems should cover all food from the farm-to-table continuum including imported food i.e. food produced, prepared, processed, imported, exported, stored, transported, distributed and marketed within a country. Such a system should have a statutory basis and be mandatory (Omijokun, 2013).

Basic Food Laws and Enabling Regulations and the Ministries, Departments and Agencies Involved

Country	Legislation	Ministries, Departments and Agencies Involved in Enforcement
Nigeria	Counterfeit and Fake Drugs and Unwholesome Processed Food Decree, (Act No. 25 of 1999)	Federal Ministry of Health
	National Agency for Food and Drugs Administration and Control (Amendment) Decree 1999 (No. 19 of 1999)	Food and Drug Agency
	Food and Drug (Amendment) Decree 1999 (No. 21 of 1999)	Food and Drug Administration and Control (NAFDAC)
	National Agency for Food and Drug Administration and Control Decree 1993 (No..15 of 1993)	Standard Organization of Nigeria (SON)
	Public Health Ordinance Cap 164 of 1958	National Codex Committee
	The Standard Organisaton of Nigeria Decree No. 56 of 1971	Standard Organization of Nigeria (SON)
	The Animal Disease Control Decree, No. 10 of 1988	Federal Ministry of Agriculture
	The Marketing of Breastmilk Substitute Decree No. 41 of 1990	

Adapted from Table 1 contained in the paper "National Food Safety Systems in Africa"- A Situation Analysis. Prepared for the FAO/WHO Regional Conference of Food Safety for Africa, October 2005 (CAF 05/2).

Importance of Food Safety in Nigeria

In Nigeria, Food is not accessible to a large segment of the population. Food security is said to exist when all the people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and active and healthy life. Factors such as adequate food supply, education, environment and good health condition can have serious and long lasting effects on well being of an individual. In a situation where an institution or a country cannot provide adequate and well prepared food for its citizens, people tend to face a vicious cycle of malnutrition. Availability, type and quality of food play key roles in determining the nutritional status of people.

Food safety ensures that the quality of agricultural products is enhanced while performing some marketing functions or activities. It facilitates consumers' preference for agricultural production and it is also a preventive health service which has an economic value that is not comparable to the damage it may cause to an ignorant consumer. Food safety can therefore be defined as agricultural production and marketing activities which ensure that food is made available to households in an improved hygienic form and at a minimum price for maximum satisfaction. The above statement implies that safety is a facilitating factor but which is done at a cost. It is therefore a disturbing issue to determine the amount a safer food could be valued to give a commensurate value to the quality health status it can generate in a consumer.

Food safety is a preventive service as it provides a long term satisfaction than medical service, which only offers a satisfaction when the consumer is already sick. Lack of quality food or malnutrition in severe cases can lead to illness. It has been observed that poor health due to unsafe food consumption or malnutrition can be a major cause of high demand for medical service. Extreme cases of death risks associated with low quality food are rampant among households in an economy.

Food safety increases the economic value of agricultural products. Addition of value to food products in the marketing system increases the quality of the food, facilitating functions such as standardization, grading, sorting, food insurance policies, labeling and advertising provided during marketing process, provided a good assurance to consumers health improvement; hence, increases their satisfaction. The level of satisfaction provided by these quality services at a minimum cost increases marketing efficiency (Adekanye, 1988). Biotechnology has emerged as a technology offering promise of delivering food with a wide range of nutritional, economic and social benefit.

In recognition of the importance of food safety as an important factor for achieving high level of health for all Nigerians, the government of Nigeria launched the National Policy on Food Hygiene and Safety in 2000 as an integral part of the Nigerian National Health Policy. The overall goal of this policy is the attainment of high level of food

hygiene and safety practices which will promote health, control food borne diseases, minimize and finally eliminate the risk of diseases related to poor food hygiene and safety. The policy seeks to stimulate and promote legislations concerning food in areas of production, storage, handling, processing, preservation, trade, transportation and marketing. It also seeks to improve the quality to healthcare through ensuring that all food consumed in Nigeria, whether imported or exported are wholesome, nutritious free from contaminants and assessable to the consumers a reasonable prices. Implementation of the policy will also address the unsatisfactory level of food hygiene and safety practices which to a large extent is responsible for the prevalence of food borne diseases in Nigeria. The need to revise, update and harmonize existing legislations has become apparent, as some of them are outdated and do not accord with current trends and advances in food safety.

The Consumer and Street-Based Food Enterprises

The consumers perception of risk do not usually coincide with the actual hazards as seen from scientific point of view. Civil servants, students, artisans etc usually patronize the popular street based foods where harmful food handling practices are rampant. Majority of the people derive their daily food requirements from these sources without regards for the handling risks involved.

In most places in cities and rural areas, food restaurants are located close to refuse dumps, gutters etc. The foods are not protected from flies and dirts and appropriate handling techniques are not applied as a result of ignorance on the part of most of these vendors and also due to lack of appropriate food safety regulations in the country.

Community based food enterprises however possess great potential for employment and income generation. They grow rapidly because they are strongly oriented to the consumer and they supply inexpensive, tasty and required traditional place at convenient places and times. The relatively low level of education of the majority of people poses a barrier to effective integration of consumer interest in food control. Most of these low literacy consumers lack the basic knowledge and abilities to effectively communicate their problem to food control officials, understand the basic aspects of food safety and quality and gain empowerment to effect changes where necessary. The quality and safety of street foods is still an issue of major concern. This is due mainly to poor food preparation and handling practices. There has been several direct association between street vended foods and food-borne outbreaks and epidemics which have been scientifically established.

1.3 Objectives of the Study

The main objective of the study is to examine the impact of existing food safety policies on emerging agribusiness enterprises. Specifically, the study intends to:

Examine the level of food safety awareness among food business owners.

Estimate empirically the willingness of food business owners to pay for safety measures.

Literature Review

Food Safety Policy in Nigeria

The National Policy on Food Safety is intended to assign roles and responsibilities and provide official guidelines on the minimum food safety practices which must be adhered to and also assure consumers about the safety of food and food products meant for human consumption in Nigeria. It is an integral part of the Nigerian National Health Policy. The National Food Safety Policy provides for the establishment of a National Committee on Food Safety which shall draw its membership from the public and private sectors relevant to the production, storage, processing/preparation, distribution, transportation, and sale of food intended for consumption.

(i) The Public Sector includes:

a. Federal Government Ministries
b. Federal Government Food Control Agencies
c. State Government Ministries of Health
d. State Government Ministries of Agriculture
e. Local Government Departments of Health
f. Local Government Departments of Agriculture

(ii) The Private Sector includes:

a. Industry
b. Non- Governmental Organizations (NGOs)
c. International Development Partners
d. Universities and Research Institutes
e. Professional Bodies/Associations
f. Consumer Associations.

Food, a basic necessity of life, derives its importance from the fact that it stimulates the appetite, and supplies a variety of ingredients that give energy (carbohydrates, fat, dietary fiber); replace worn out tissues, thus promoting growth (protein); and help in preventing and curing diseases (vitamins and minerals). The concept of healthy eating for healthy living and longevity is not new (Akobundu, 1999). A national survey by the National Bureau of Statistics on food expenditure by states and commodity types has shown that Nigerians spent double (¦ 110, 300,796) on food as against non-food items (¦ 59, 190,093) such as clothing, footwear, rent, fuel/light, household goods, health, transport, education, entertainment and drinks (NBS,2007). Protein foods were found to be the most expensive food commodities (¦ 24, 136,671), followed by cereals (¦ 23, 432,085), and processed food (¦ 15, 376,021).

Apart from serving a biological need, food has become an economic and political weapon . The Government of Nigeria launched the National Policy of Food Hygiene and Safety in 2000 as an integral part of the Nigerian National Health Policy. The overall goal of this policy is the attainment of high level of food hygiene and safety practices which will promote health, control food-borne diseases, minimize and finally eliminate the risk of diseases related to poor food hygiene and safety. The policy seeks to stimulate and promote legislations concerning food in areas of production, storage, handling, processing, preservation, trade, transportation and marketing. It also seeks to improve the quality of healthcare through ensuring that all food consumed in Nigeria, whether imported or exported are wholesome, nutritious, free from contaminants and accessible to the consumers at affordable price. Implementation of the policy is aimed at addressing the unsatisfactory level of food hygiene and safety practices which to a large extent is responsible for the prevalence of food-borne diseases in Nigeria (Omotayo, 2002). Issues of food security and poverty have been recognized as necessary conditions for the creation of a stable socio-political environment for sustainable economic development (Jibrin, 2004). It is, therefore, not surprising that eradication of extreme poverty and hunger is one of the eight millennium development goals set to be achieved by 2015.

Human nutrition basics require that food be consumed in an unbound, reduced and wholesome form so as to facilitate digestion, absorption and excretion. It also requires that food consumed to promote good health does not constitute any form of health hazard or such nutrition disorders as obesity, underweight, iron deficiency, dental caries and allergies. Others are attention deficit, hyperactivity, disorder autism, spectrum disorder, dietary fat and cardiovascular disease (Mahan, 2004). Dietary needs are dictated by physical, physiological, pathological and other conditions, including the condition of disease, convalescence, pregnancy and lactation. Others are infancy, allergy, hypersensitivity to food, underweight and the need to control sodium intake. In food processing, controllable factors that either positively or negatively influence the finished products are referred to as the quality control (Pearl, 1999).

Food safety is a serious issue globally, with legislative and administrative organs of government playing regulatory and surveillance roles. The United Nations (UN) specialized agency, the Food and Agriculture Organization (FAO) helps member countries to apply food standards in order to protect consumers. The Food and Drug Administration (FDA) and the United States Department of Agriculture (USDA) Food Safety Inspection Service (FSIS) also regulate food safety, while the Cooperative Extension Programme of the USDA, through the Expanded Food and Nutrition Education Programme (EFNEP) serves low income families to address such issues as child care, nutrition education, food preservation, food safety and budgeting (Mahan, 2004).

Food-borne diseases pose more risk than vector-borne diseases (malaria, yellow fever, plague etc); water contact diseases (Leptosipirosis, schistosomiasis); aerosolized or soil contact diseases (lassa fever); respiratory diseases (meningococcal meningitis); and animal contact diseases (rabies) (CIA, 2001).

Empirical Illustration of Food Vendors Willingness to Pay for Food Safety in Oyo State, Nigeria.

Methodology

The study was carried out in Oyo State. Oyo state is made up of 33 Local Government Areas. The state has Ibadan as its capital and covers an area of approximately 35, 745 square kilometers. It is bounded in the South by Ogun State, in the North by Kwara State, in the West by Republic of Benin and in the East by Ondo State. The vegetation of the state is mostly evergreen forest found in southern part of of the state. Oyo state falls within the rainfed upland rice production system.

The data used for this study was collected from two Local Government Areas within Ibadan township. These are

Akinyele and Ibadan North Local Government Areas. The data was collected from 50 randomly selected food vendors in Ojoo and Bodija areas of the city. The locations are close to the markets and motor parks in the areas. Twenty five respondents were selected from each of the LGAs.

A well structured questionnaire was used to elicit various information on vendors demographic features as well as the amount they were willing to spend to ensure food safety. Other relevant information elicited were their level of awareness about safety measures and the proportion of their income they will be willing to spend to make sure their consumers enjoy safe food. The vendors income level is also introduced into the data.

The relevant components of safety values added to food include:

Food inspection done by food task force agents from NAFDAC, labeling, improved preservation and storage, food insurance policies and implementation of other stringent outdoor safety measures on food vending to allow proper consumers protection on food consumed. While it is clear that most of these facilities were not properly installed in the areas presently, these components were introduced o the vendors interviewed to sensitize them and obtain the amount they can add o a unit measure of food if these physical and facilitative functions are made available in food marketing system.

Ordinary Least Square was employed to establish the BID for awareness or non awareness about food safety measures put in place by the Nigerian government. The data was analyzed using simple descriptive statistical tools of means and relative (percentage) frequency to identify the relevant socio-economic or demographic features of food vendors. Simple Regression Analysis was used in determining the relationship between the endogenous variable (willingness to pay for food safety) and exogenous variables (factors such as educational level, assets, years of experience etc). The adjusted R^2 was used to test the co- efficient of multiple determination, while the F-statistics was employed to test if he explanatory variables jointly accounted for the variation in willingness to pay for safer food consumed in the areas. The expression is given by:

AWTP = f (X_1 X_2 X_3 X_4 X_5) ..……(1)

Where AWTP =Amount they were willing to pay for safer food (Naira)

X_1 = Age of respondents (food vendors)

X_2 = Level of Education (years)

X_3 = Assets (Naira)

X_4 = Years of experience in business

X_5 = Dummy variable (Awareness or non- awareness about food safety regulations)

For X_2

Non-formal Education = 0 years

Completed Primary Education = 6 years

Completed Secondary Education = 11years

Completed Tertiary Education = 13 years

Completed University Education = 15 years

While the F- statistics was adopted for testing the goodness of fit of the model, the t- statistics was used to test for the significant explanatory which is the price for safer food consumed in the area.

Dichotomous analysis

The parameter estimates for consumers willingness to pay for flavor and tenderness in steaks as determined with an experimental auction was estimated using random effect (based on individual participation) ordered choice probit procedure for panel data in LIMPDEP (Dillon *et al.*, 2007). The model is specifie3d by:

BID = $X_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5 + B_6X_6 + B_7X_7 + B_8X_8 + B_9X_9 + \sum U$.....……..(2)

Where:

BIDij = the bid in $/k for jth steak sample X_1 and X_2 represents real continous variables which indicates marbel and tenderness levels of steak. X_3, X_4, X_5 and X_6 are dummy variables indicating Australian, Canadian dry age (1) and wet age steaks (0) respectively. X_7, X_8 and X_9 are the

Additional dummy variables that indicated time period. Ordinary least square is not efficient here due to panel nature of the data. A two step generalized least square (GLS) procedure was rather adopted (Greene, 2002).

For the purpose of this study however, the equation can be rewritten as :

BIDij = $X_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 +$ …… (3)

Where BIDij = The bid for awareness (1) or non-awareness (0) about food safety regulations with

X_1, X_2, X_3 and X_4 representing age, educational level, assets and years of experience in business.

Ordinary least square estimates is efficient for adoption here since the data is not panel type.

The Model

In estimating willingness to pay for country of origin labeling, (Maria and Umberger, 2002) adopted a dichotomous choice, separate Logit models based on the following logistics probability functions:

$$Pi = f(WTP) = \frac{1}{1+e^{-WTP}} = {}^{1}/_{1+e^{-WTP}} \quad \ldots\ldots\ldots\ldots(4)$$

I = 1.....n

Where Pi is the probability that i^{th} consumer will make certain choice (answer = "yes"), given the observed socio demographic features, food safety attitudes and information contained in Xi and β is a comformable vector of parameters. If equation (4) represents the probability that the consumer will say yes, then 1-Pi is associated with the answer "NO" thus

$$P(1-Pi) = \frac{1}{1+e^{WTPi}} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(5)$$

To estimate the odds ratio in favour of "YES" or "NO" the ratio of both probabilities is shown by

$$\frac{Pi}{1-Pi} = \frac{1+e^{WTPi}}{1+e^{-WTPi}} = e^{WTPi} = e^{Xi\hat{a}} \ldots\ldots\ldots\ldots\ldots (6)$$

$$Log = WTP_i \left[\frac{Pi}{1-Pi}\right] = X_i b \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(7)$$

This model was based on latent and continuous, unobservable variables (WTPi) which according to Maria and Umberger represents consumers concerns about source verifications.

$$WTP_i = I_{(0,\infty)} (WTP_i^*)$$

Where $I_{(0,\infty)}$ is an indicator variable that restricts the observable WTP to the positive domain, and

$$WTP_i^* = X_i\beta + \quad \text{Therefore}$$

$$WTP_i = \begin{cases} 0 \\ 1 \end{cases} \text{ If } WTP_i^* = X_i\beta + \varepsilon_i \quad 0 \ldots\ldots\ldots\ldots\ldots\ldots(8)$$

The are i.i.d unobservable random variables, following a logistic distribution with mean zero and variance of . A "Yes" response is observed and only if the latent variable is greater than zero. Conversely, a "No" response is observed when the latent variable (consumers' concerns) is less than or equal to zero.

Results and Discussion

Socio- Economic Features of Food Vendors in Oyo State, Nigeria

Table 1:

Variable	Mid values	Frequency	Frequency (%)
AGE			
20 – 30	25	9	18
31 – 40	35.5	18	36
41 – 50	45.5	14	28
50 – 56	55	9	18
Total		50	100
Education			
Non - formal education		21	42
Primary Education		6	12
Secondary Education		11	22
Poly/College of Education		4	8
University		8	16
Total		50	100
Household			
1 to 4	2.5	24	48
5 to 8	6.5	14	28
9 to 12	10.5	6	12
Above 12	above	6	12
Total		50	100
SEX			
Male (M)		4	8
Female (F)		46	92
Total		50	100
Marital Status			
Single		10	20
Married		30	60
Divorced		6	12
Widowed		4	8
Total		50	100
Income (Per Month)			
Less than □ 10,000	5000	2	4
□ 11,000 - □ 20,000	15,000	8	16
□□1,000 - □ 30,000	25,000	18	36
□ 31,000 - □ 40,000	35,000	10	15
□ 41,000 - □ 50, 000	45,000	4	8
□ 51,000 and above	Above	8	6
Total		50	100

Table (1) shows the socio-economic demographic features of food vendors in Ibadan, Nigeria.

The analysis shows that the respondents have a mean age of 41 years with the majority falling between 31 years and 50 years of age (about 64 percent). This implies that they are mostly in their middle ages and must have had many years of experience in food business. The result also shows that the majority (92 percent) of the respondents are females. This is an indication that women are the ones mostly involved with fast food selling in local canteens and restaurants.

This is in conformity with the fact that traditionally, food preparation is predominantly women's affair in the study area. Again, 42 percent of the respondents have no formal education while 58 percent have either finished primary, secondary, tertiary or university education. This implies that they have acquired some level of education.

The distribution of the respondents according to household number shows that there is an average of 6 persons per household and with relatively low income levels to sustain livelihood. Most of the food vendors are not highly educated as the areas are dominated by traders and very few educated elites who are aware of safety and its relevance in food. Majority (42 percent) of the food vendors earn less than ¦ 50,000.00 (about US $312) per month which could also be a reason why it may not be easy for them to purchase food safety materials.

Awareness About Food Safety Regulations In Oyo State, Nigeria

From the analysis of the level of respondents awareness about food safety regulations, the result (Table 4.2) indicates that educational level and amount of assets owned by respondents have direct relationships with their awareness about the need for food safety regulations. The more the number of years spent in school, the easier it becomes to generate income from the business and adopt technological innovations associated with food safety regulations.

The negative signs of X_1 and X_4 (age and years of experience) means due to lack of education of most of the respondents, even as they continue growing older and stay longer in business they may not see the need to spend additional money on safety measures as it does not have much meaning to them.

Willingness to Pay for Food Safety in Oyo State, Nigeria

Table.2 shows results of OLS Regression analysis. The results indicate that simple regression analysis has a coefficient of multiple determination of 0.50. This means that 50% of the variations in the dependent variable were explained by the variations in the explanatory variables. The F- ratio shows that the F calculated is greater than the F tabulated, hence, there is a significant relationship between the dependent variable (amount paid for food safety and the independent variable ie. Age , education, years of experience and assets.

It was observed that the signs of the explanatory variables with the exception of educational level and years of experience show positive relationships with the dependent variable. This means, with increase in age, (though not significantly), respondents are willing to pay for food safety measures. Also, the more the assets acquired by the respondents, the easier it becomes to increase the

Table 2: Regression Results

Variable	Coefficient	Std.Error	b/St.Er	PÀZÀ>z	Mean
Constant	-992.868173	3154.3532	-0.315	0.7544	
X1	1.440454648	67.336903	0.021	0.983	41.08
X2	-35.69507998	110.34821	-0.356	0.7238	6.58
X3	0.33138246	5.24E-02	6.328	0	11980
X4	-23.94188969	48.575726	-0.493	0.6245	16.76
X5	214.8477765	1076.7292	0.2	0.8424	0.84

R2 = .504584
R2 adjusted = .44829
F Statistics = 8.96
Auto correl:
Durbin Watson
Statistics = 2.32803
Rho = -0.16402

proportion of income to be spent on food safety. This is as implied by X_3 which has a positive relationship with dependent variable at 1percent. Education and years of experience having negative relationships could mean that even with more education and years of experience, the respondents may not be able to set aside enough funds for ensuring food safety. This could be as a result of other factors such as number of dependent relatives. With more mouths to feed it becomes increasingly difficult to acquire food safety materials. Level of awareness about food safety measures (X_5) also shows positive relationship with the dependent variable indicating that as people become aware that there need for safety precautions, the willingness to acquire those materials that will ensure selling healthy, non contaminated food to consumers increase. Those materials that the respondents need to acquire to ensure safety include electric fly catcher, wetting of structures, fly-proof materials for food storage, fans, refuse bins etc.

Although the respondents claimed to have access to Local government Food safety

Officials, who brief them on food safety rules, the state of the centres show that the people still need to be sensitized on food safety rules through grassroots food safety programmes that will enhance the quality of food consumed in the area. Government supervisory role is yet to reach majority of the local food vendors as most of them claim to be visited by only local government officials. A few of them have been visited by NAFDAC food safety officials before and these are bigger modern restaurants.

Conclusion

The willin9gness to pay for food safety by food vendors is a study that estimated the willingness to pay for safety package imbedded in food enterprises in Oyo state, Nigeria. The study reveals that some vendors are actually willing to pay for food safety, but most of them are ignorant about safety as consciousness about quality food is yet to be established.

A case study of food vending in Oyo state revealed that though awareness on food safety has not been given publicity as such, sellers are willing to increase their payment for safer food provided it will fetch them more income. Packages such as standardization of food products, labeling, producers' identification, NAFDAC assurance and high level hygiene are still lacking for street vended food. The major factors that can increase marginal willingness to pay for food safety are increased income level and more sensitization on food safety measures. NAFDAC's activities should therefore include organizing awareness-creation workshops on principles of food safety for farmers, homemakers and operators of commercial food facilities (food vendors, hoteliers and canteen operators).

References

Adekanye, M.T 1988 : Readings in Agricultural Marketing. *Longmans Nigeria Limited* Department of Agricultural Economics, University of Ibadan 215Pp.

Akobundu ENT 1999 Healthy food in human nutrition *Journal of Sustainable Agriculture and the Environment* **1**(1):

Assuring Food Quality and Safety: Back to the Basics – Quality Control throughout the Food Chain. 1999.The Role of Governments. Food and Agricultural Organization (FAO). ALICOM 99/10.

Carnevale. C.W. 2001. Regulating Food Safety. Working Paper for the Strategic Planning Meeting on Food Safety. WHO. Geneva. February.

CIA 2011. World Factbook. Major Infectious diseases .http//www .indexmundi.com /Nigeria/ major_infectious-diseses.html.

Dillion, M.F. Wendy J.U. and Chris R.C. 2007. The Potential for Canadian Branded Beef Steaks in the U.S Market: Results from an Experimental Auction . CAFRI: Current Agriculture, Food and Resource Issues 01/2007.

Greene, W.H. 2002. Econometric Analysis, 3rd Ed. Saddle River, N.J Prentice Hall 1997- LIMDEP version 8.0 Economic Modelling Guide, Vol. 1 Planner, N.Y. Econometric Software wix. 2002.

Jane Omijokun 2013. PDF. Regulation and Enforcement of Legislation on Food Safety in Nigeria. *National Agency For Food And Drug Administration and Control (NAFDAC), Nigeria*

Jibrin A 2004. Global food security. Excerpt of Obasanjo's speech. In Obasanjo and the New Face of Nigeria's Foreign Policy. M.O.D. Press and Publishers, Kaduna.

Mahan LK, Escott-Stump S 2004. Krause's Food, nutrition and diet therapy, 11th Edition Elsevier, USA.

Maria, L.L and Umberger W.J 2002: Estimating Consumers willingness to pay for country of origin labeling. *Journal of Agricultural and Resource Economics* **28** (2) 287-301.

NBS (National Bureau of Statistics) 2007 Consumption Pattern in Nigeria. Lagos

CIA 2011. World Factbook. Major Infectiou diseases .http//www .indexmundi.com /Nigeria/ major_infectious-diseses.html.

Omotayo RK, Denloye S 2002. The Nigerian experience on food Safety regulations. Conference Room Document proposed by Nigeria. FAO/WHO Global Forum of Food Safety Regulators, Marrakesh Morocco, 28-30 January 2002.http://www.fao.org/ DOCREP/Meeting /004/AB538E.HTM. (Accessed 9/28/2011

Pearl, A., 1999. Quality and process control in the food industry. The Ghana engineer. Reprinted online withGhIE permission by the African Technology Forum.

http://home.att.net/~africantech/GhIE/ QPCFood.htm.

10-Point Regional Strategy for Food Safety in the South-East Asia Region. 1998. World Health Organization Regional Office for South – East Asia.

