

OBAFEMI AWOLowo UNIVERSITY, ILE-IFE, NIGERIA.

Inaugural Lecture Series 209

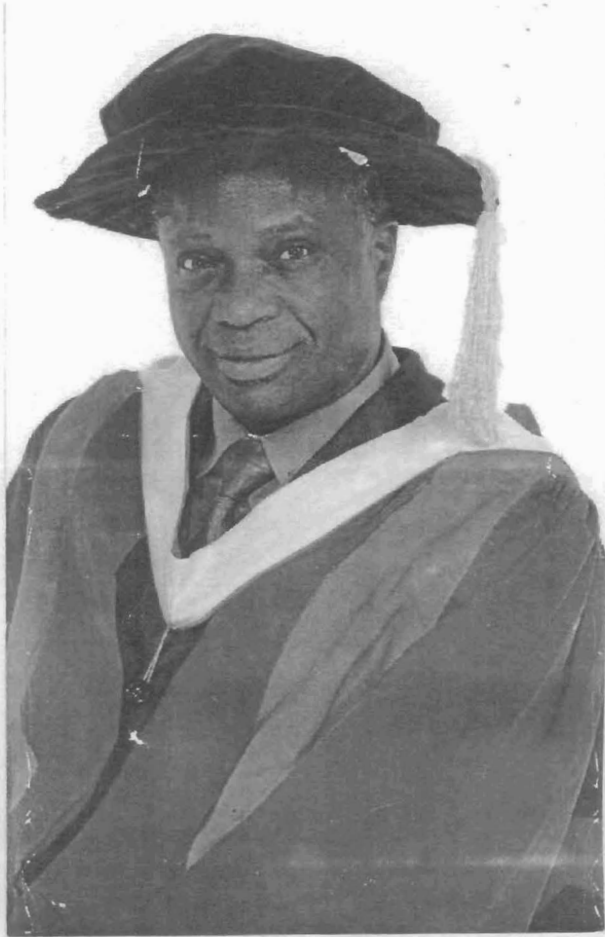
**A HEALTHY LONG LIFE: YOUR
BIRTHRIGHT**

BY

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Professor of Community Nutrition



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INTRODUCTION:

At the beginning when God created man, man was specifically instructed about all that he should eat to be healthy and live a quality long life. This, in **Genesis Chapter 1, Verse 29:**

“Behold I have given you every plant yielding seed which is upon the face of all the earth, and every tree with seed in its fruits; you shall have them for food”.

It is also written in the Quran, **Chapter 14, Verse 37 (Suratul Ibrahim Verse 37)**

“So fill some hearts among men with love towards them, and (O Allah) provide them with fruits so that they may give thanks”

The Omnipotent and Omniscient Creator knows that neither healthy life nor human capital development can be attained, sustained or promoted without adequate food that meets man’s biological systems. Buttressing this assertion, God promises in the Book of Isaiah **Chapter 65, Verse 20:**

“Never again will there be an infant there who lives only a few days, nor an old man who does not run his full course; for the youngest will die at a hundred”.

Therefore, biblically, every man is expected to live a healthy long life for 100 years. Even scientifically or physiologically, based on the numbers of cell division in each organ, man should be capable of living between 100 and 150 years. Hence, any life less than 100 years should be considered as premature death.

It is rather sad and pathetic to observe that in Nigeria today, many men and women are dying young, whereas, in the olden days, even in the midst of plethora of infectious diseases, any death at an age less than 70 years was considered sorrowful and premature. But, nowadays, nearly everyday young men and women are dying under 60 years of age. Nigerians are dying at an unripe age not because of infectious diseases but rather from

non-communicable chronic diseases (NCCDs) such as hypertension, stroke, adult diabetes mellitus (ADM), breast and prostate cancers. These (NCCDs) are preventable and manageable if only we can abide by sound advice and keep to diets prescribed by God

Of course, of all the essential needs of man, food stands out to be second to none. Food plays an important part not only in health and disease but also in our civilization. Abraham Lincoln, one of the greatest American Presidents once said,

“A hungry man knows no peace. He can sell his liberty for food. Our civilization is built on food, without food our civilization falls apart”.

Colton¹ (1832) also wrote, “There is this difference between two temporal blessings – health and money, money is the most envied, but the least enjoyed, health is the most enjoyed, but the least envied; and this superiority of the latter is still more obvious when we reflect that the poorest man would not part with health for money, but the richest would gladly part with all his money for health”.

Mr. Vice-Chancellor Sir, ladies and gentlemen, I have chosen the topic, “A Healthy long life: Your Birthright”, on the premise that quality food is the input of nutrition, and good health is the ultimate output that leads to high productivity and sustainable national development. The inference to be drawn from the above statement is that quality dietary intake in enough quantity is one of the indispensable requirements to restoring, sustaining and promoting healthy long life during the completion of the cycle of life.

HEALTH PROFILE OF NIGERIA

In Nigeria, there are two health profiles. On one hand, there are endemic diseases such as protein energy malnutrition (PEM)²⁻⁵ and tuberculosis among the poor. On the other hand, there are the diseases of the affluent or modern diseases which include obesity, hypertension, coronary heart disease, stroke, adult diabetes mellitus (ADM), appendicitis, diverticulosis, colorectal, prostate and breast cancers.

Exactly 44 years ago, on the invitation of the Federal Government of Nigeria, a Nationwide nutrition survey was carried out by the then School of Food Science and Applied Nutrition (now the Department of Human Nutrition), University of Ibadan, in collaboration with the United States Government. The survey revealed that the average energy and protein intake by an adult man were below the normal requirements. The survey also indicated that there was a prevalence of PEM amongst infants and toddlers.²

In fact, 60-80 percent of Nigerians have been conservatively estimated to be malnourished.⁵ It should be noted that these reports were at a time when the rate of inflation on food was less than 11%.^{3,6} Now that the rate of inflation is over 300%, the logical questions to pose to this audience are:

- What is the current nutritional status of our people, particularly, our children?
- What is the health status of our women of childbearing age, the reproducers, producers, home keepers, the best paediatricians and health givers?
- What are the current under five and maternal mortality rates?
- What are the causes of premature deaths?
- Has the quality of life improved since our independence 47 years ago?

Of all the parameters to measure health, infant mortality rate (IMR) is widely used to assess the health of any country. This IMR is defined as “the ratio of live born children who die within the first 365 days of life to the number of 1000 live births in a year”. The IMR reflects both health and socio-economic development of any nation. While IMR has been steadily declining in developed countries, the opposite is the case in developing countries, Nigeria inclusive.

The slow rate of decline in IMR in Nigeria and other developing countries is not unconnected with deaths from infectious diseases, malaria, poor

nutrition, micronutrient deficiencies, low standard of living, and environmental pollution.

If we accept that the social welfare, health status and the level of development of any country can be judged amongst other parameters by life expectancy at birth, infant, under 5 and maternal mortality rates, then our great country, Nigeria, the giant of Africa will be regarded as still poorly developed in spite of her endowment with abundant human and material resources. From Table 1, it is obvious that Nigeria has the highest figures of under 5, and maternal mortality rates and people who are not among the countries listed expected to survive to age of 40. She also has the lowest life expectancy at birth.

Table 1: Some Selected Basic Health, and Socio-Economic Indicators of Selected African, Oil Producing and Industrialized Countries with Reference to Nigeria

No	Selected Indicators	COUNTRIES						
		Nigeria	Ghana	Kenya	Oman	Kuwait	Canada	USA
1.	Under 5-mortality rates (2003)	205	130	90	25	14	7	11
2.	Infant Mortality rate (2000)	114	79	62	28	17	6	9
3.	Life Expectancy at birth (2003)	43	56.6	53.6	70	75.2	79	76.2
4.	People not Expected to survive to age 40 (As % of Total Population, 1990)	33.8	24.9	22.3	8.8	3.8	3.1	4.0
5.	Population without Access to Health Services (1990-1995)	49	40	23	4	0	0	10
6.	Maternal Mortality Rate per 100,000 live births (2003)	948-1500	740	650	190	29	6	12
7.	% Underweight children under 5 (1990-1996)	36	27	23	12	6	0	0

Source: Human Development Report 1997; NDHS, 2003, FMOH, 2006

Of all the causative factors that precipitate high morbidity and mortality among the under 5 children in Nigeria, malnutrition and infection are in the fore front. In fact, 80% of under 5 deaths have been assisted by mild or moderate malnutrition (Table 2) while 52% of these deaths are associated with mild to severe malnutrition.⁷

Table 2: Percentage of Under-Five Deaths linked to Malnutrition in the Countries with 80% of the World Malnourished Children

Country	% of Malnutrition assisted deaths where Malnutrition was mild or moderate only	% of all Under-Five deaths associated with malnutrition (all degrees)
Nigeria	80	52
Pakistan	79	55
Indonesia	92	54
India	74	67
Philippines	93	46
Bangladesh	73	66
Vietnam	78	56
China	98	35

***Adapted from The Progress of Nations UNICEF, 1995.**

The inference to be drawn is that more of our under 5 children die from mild to moderate than from severe or overt malnutrition. This mild or moderate malnutrition is referred to as occult or covert malnutrition. It is rather sad to report that the number of under 5 children manifesting occult malnutrition continues to increase in Nigeria.

On critical analysis, Nigeria had 80% of Under Five deaths linked to malnutrition and has not made any significant impact on the reduction of deaths linked to the perennial health problem of malnutrition among the ten nations.⁸ (Table 3)

Table: 3: Rate of Progress in Reducing Child Deaths by the Ten Nations with 80% of the World Malnourished Children

Country	Under-Five Mortality Rate Average Annual Rate of Reduction					
	1980 Actual	1990 Actual	2000 Goal	1980-1990 Actual	1990-2000 Required	Difference between Actual and Required
Nigeria	196	191	70	0.2	10.1	-9.8
Ethiopia	260	216	70	1.9	11.2	-9.0
Pakistan	151	139	70	0.8	6.9	-6.0
Indonesia	128	111	70	1.4	4.6	-3.2
India	177	131	70	3.0	6.2	-3.2
Philippines	70	62	41	1.2	4.1	-2.9
Bangladesh	211	140	70	4.1	6.9	-2.8
Iran	126	67	45	6.3	4.1	On Target
Vietnam	105	55	37	6.5	4.1	On Target
China	65	43	29	4.1	4.1	On Target

*Adapted from: UNICEF; Child Malnutrition Progress toward the world summit for children goal, 1993. And the Progress of Nations UNICEF 1993.

Causes and Treatment of Childhood Malnutrition: Past and Present

Mr. Vice-Chancellor Sir, distinguished audience for the past thirty years, my colleagues and I at Obafemi Awolowo University and Obafemi Awolowo University Teaching Hospital Complex have been trying to tackle the perennial problem of childhood malnutrition in our community.

Up to the early 1980's poverty and ignorance have been frequently highlighted in the literature and in the National and International Conferences as the major factors precipitating childhood malnutrition among the under 5 children in Nigeria and other developing countries⁹⁻¹² But, very recent findings have substantiated that increased income did not necessarily reflect

remarkable changes in the nutritional status of growing infants in developing countries^{12,13} Even among the poverty stricken people in developing countries, there are legumes, and oil seeds that are readily available, cheap and of high quality protein and energy. Thus, it is apparent from Table 4 that legumes and oil seeds are high in energy and protein. Their amino acid profiles are comparable to that of animal protein except for the total sulphur amino acids¹⁴⁻¹⁶

Table 4: Energy and Protein Values of Some of the Local Traditional Foods in the Third World Countries*

Foodstuff	Values per 100g Protein		g
	Energy KJ	Kcal	
Cassava	466	111	0.7
Cocoyam	437	104	2.1
Yam	416	99	1.5
Fufu (Processed Cassava)	78	18	trace
Lafun (Cassava Flour)	1340	320	0.6
Gari (Cassava grits)	1150	274	0.8
GrainsMaize (Yellow Corn)	1550	370	9.6
Guinea Corn (Sorghum)	1460	348	13
Millet	1540	25	0.3
LegumesCowpea	1500	356	27
Groundnut	2420	575	26
Locust Bean	1800	430	35
Pigeon Bean	1410	336	22
Soybean	1770	422	41

*Adapted from Oke and Ojofeitimi, 1984

Infant feeding and cultural food practices are currently identified as the root of high infant morbidity and mortality in Nigeria.^{8,17-21} After all, there are numerous available nutritious foodstuffs, yet infants, preschool children, pregnant and lactating mothers are suffering in the midst of plenty. Infant feeding and cultural food practices should be recognized as serious causes of childhood and maternal morbidity and mortality in Nigeria.

In fact, our experiences in the past thirty years have ascertained that infant malnutrition starts from pregnancy. This assertion is made on the basis that most of the nourishing foodstuffs that would have restored and sustained healthy life are proscribed during pregnancy.²²⁻²⁶ This food proscription continues through lactation and infancy.²⁴⁻²⁷ As depicted in table 5, most of the nourishing foods were prohibited to infants and women and none to men.

It should be pointed out, however, that tubers and grains were rarely proscribed to infants, nursing and pregnant women.

Table 5: Summary of Food Items Proscribed to Infants, Pregnant and Lactating Mothers*

Food Items	Reasons for proscription	Proscribed to
Milk and Bournvita	Makes baby too heavy	Pregnant Mother
Cowpea	Makes baby too heavy	Pregnant Mother
Guava	Causes nausea	Pregnant Mother
Mango	Produces worms	Pregnant Mother
Bitter leaf	Causes dizziness during Pregnancy	Pregnant Mother
Ebolo	Causes belching at delivery	Pregnant Mother
Bush meat	Causes animalistic behaviour in the new baby	Pregnant Mother
Pumpkin leaf	Causes slit on new borns head	Pregnant Mother
Mutton	Fat prevents normal delivery	Pregnant Mother

Vegetable oil	To prevent death of the child as result of slave curse	Lactating Mothers
Plantain	Delayed closure of anterior fontanelle	Lactating Mothers
Okro	Slippery, slimy stool	Lactating Mothers
Snail	Delayed Onset of Walking in infants	Lactating Mothers
Beans	Stomach ache in mother	Lactating Mothers
Cowpeas	Causes diarrhea, Indigestion and aggravates cough	Lactating Mothers
Groundnut	Causes pile and difficult to digest	Lactating Mothers
Melon Seed	Against family tradition	Lactating mothers
Egg	Development of expensive taste which may lead to stealing behaviour	Infants
Meat and Fish	Hard to digest, child becoming a thief	Infants
Meat	Produces worm and stealing behaviour	Infants
Cow milk	Causes black stool	Infants
Coconut	Causes pile	Lactating Mother
Food rich in fat	Causes colic and diarrhoea	Lactating Mother
Cocoyam	Causes hemorrhoids and infertility	Lactating Mothers
Banana	Causes dysentery	Lactating Mothers

***Sources: Ojofeitimi and Teniola, (1980); Ojofeitimi and Tanimowo, (1980); Ojofeitimi *et al.*, (1982); Masaiger, (1983); Byrne, (1962).**

It is obvious from Table 5, that most of the foodstuffs commonly proscribed to these vulnerable groups are not part of the traditional foods generally regarded as foods by the culture.^{24,28,29,33-35} The Yoruba tribe has a popular proverb that says: *“Iyan ni Onje Oka ni Ogun, airirara ni anje eko, ki enu ma dile ni anje guguru”*. Literarily translated: as ‘pounded yam is the real food, yam flour is only medicinal, in the absence of nothing one eats solidified pap, just to keep the mouth busy one chews popcorn’. It is apparent from this proverb that tubers and grains are the foodstuffs that are dictated by the culture. There is no reference to legumes, other oil seeds and fruits. The prohibition of legumes and other nutritious foodstuffs is thus, not due to poverty or ignorance, but to deep rooted cultural food practices that lean heavily towards mainly tubers and grains.

Our findings and those of other investigators have succinctly shown that pregnant women from lower socio-economic class provided more babies of low birth weights and that they also lose weight during pregnancy than their middle class counterparts. Some of the reasons adduced were cultural food practices, low energy intake, excessive energy output, higher parity, age and poor maternal nutrition^{22,23,30,31} But these investigators have inadvertently left out food taboos which are by far one of the greatest obstacles to full utilization of locally available, nutritious foodstuffs in Nigeria. Adequate nutrition during pregnancy is one of the best head-starts towards attaining healthy long life for both the mother and the foetus.³²

Child Feeding Practices

One of the major causes of childhood malnutrition in Nigeria is poor child feeding practices that include a break in the traditional breast-feeding, traditional method of preparing complementary feeds, monotonous feeding of traditional feeds without fortification or supplementation, forced feeding and inability of infants to suck enough breast milk.

Identification of Occult Malnutrition in Infants

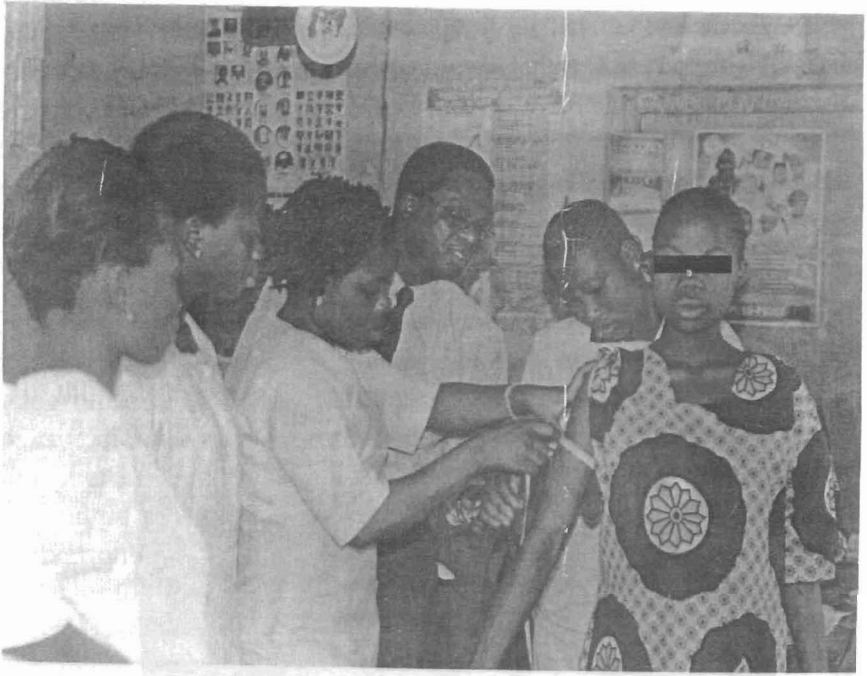
According to UNICEF⁸ 80% of under 5 deaths have been attributed to mild or moderate malnutrition than severe malnutrition.

In the past 30 years, my colleagues and I have vigorously applied simple and cheap technology that can be used by nursing mothers and community health workers to detect hidden malnutrition before it becomes overt. The tailors' measuring tape has been effectively used in our environment to measure mid .upper arm circumference (MUAC)

Fig. 1: Using MUAC to assess nutritional status of a child



Fig. 2 Using MUAC To Assess Nutritional Status Of A Pregnant Woman (Courtesy of OAU/Bill and Melinda Partnership Project)



Our investigations have also shown that Maximum Thigh Circumference (MTC) can be used as another independent single parameter to identify covert childhood malnutrition that contributes heavily to childhood deaths in Nigeria. It is sex and age independent and more importantly, it is a reliable indicator of hidden childhood malnutrition as early as seven months among the toddlers.³⁸ Stunting is one of the severe adverse effects of early poor feeding.

Prior to transfer of industrial advancement in technology, modernization and oil boom in Nigeria, breast-feeding was the main source of infant nutrition even up to three years of age. But about 47 years ago, infant formula began to compete with breast milk as an alternative to infants'

feed. From all the scientific data available in the literature, there is no substitute for human breast milk to promote healthy long life of infants. There is none and there shall never be an alternative to breast milk nutritionally, economically, and immunologically. The more scientists and health experts research into breast milk composition and breast feeding practices, the more new facts emerge buttressing its unparalleled superiority to cow's milk.^{24,32-37}

It is rewarding to report that our work in the areas of breast milk composition, knowledge and the art of breast-feeding practices have recorded the following significant findings:

Fig. 3: Nursing Mother with Breast Engorgement Being Assisted by a Consultant at NRC



- (i) That breastfeeding (BF) as a contraceptive method should not be advocated, unless the frequency of BF is going to be more than 8 times a day and the duration of BF would be at least 18 months. The higher the concentration of prolactin and oxytocin found in breast milk, the lesser the chance of getting pregnant since these two hormones are antagonists to progesterone, the hormone that promotes pregnancy³⁵
- (ii) There was a significant difference in the breast milk quality of well fed and undernourished nursing mother. Protein, lactose and triglyceride contents which are essential for optimum growth and child survival were lower among undernourished than well fed nursing mothers^{39,40}
- (iii) That undernourished nursing mothers had negligible amount of polygenic acids (linoleic, gadoleic and arachidonic). The values of polyenoic acids obtained from well fed nursing mothers were significantly higher than those from their undernourished counterparts. These long chain fatty acids play significant role in the biochemical development of the brain. They are found in the human central nervous system. Infants that are fully breast fed have been reported to have higher intelligent quotient and better speech development than those that depend on cow's milk. These important long chain fatty acids and taurine, an important protein can only be found in human breast milk^{40,45,46}
- (iv) That there was a significantly higher proliferation of bacteria counts in the stools of neonates who received glucose-D water than those who were given colostrum, the first milk that comes out after delivery^{26,42} and
- (v) Our recent findings have also shown that there has been a remarkable progress on the initiation of BF within the first twenty four hours of life unlike in previous studies that reported that the majority of nursing mothers did not initiate BF until the third day of life. But some nursing mothers are still giving glucose-D water to their neonates^{19,20,34,41,42}

It should be highlighted, Mr. Vice Chancellor and distinguished ladies and gentlemen that increased number of nursing mothers initiating BF within the 24 hours of life in our community is attributed to the intensive exclusive breast feeding campaign by the Baby Friendly Hospital Initiative in Nigeria. The Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC) Baby Friendly Hospital Initiative Steering Committee should be commended for her leadership role in executing effective programmes in her zone as well as in the whole Federation²⁰

Applied Nutrition Through Practical Demonstrations

One of the vital responsibilities of a Community Nutritionist is to ensure that direct application of nutrition research findings from the laboratories are made use of by the community in order to maintain and promote healthy life from the womb to geriatric population. This goal can only be attained through nutrition information dissemination and practical food demonstration in our community where malnutrition is still endemic. In pursuit of this goal my colleagues and I from the Department of Community Health and OAUTHC Comprehensive Health Centre Eleyele resuscitated Ilesha Multipurpose Nutrition Centre in 1977. This Centre was established by **Professor Morley** in the 1960s. A similar centre was created at Moore Health Centre in 1978 now Urban Comprehensive Health Centre Eleyele, Ile-Ife. These two Nutrition Rehabilitation Centres operate under OAUTHC. The Centres have been effectively utilized to improve the health status of malnourished children since their inceptions. These centres have also served as training centres for health personnel both from Nigeria and abroad.

FIG. 4A picture of Marasmic Kwashiokor Child at intake at NRC, OAUTHC, Eleyele, Ile-Ife.



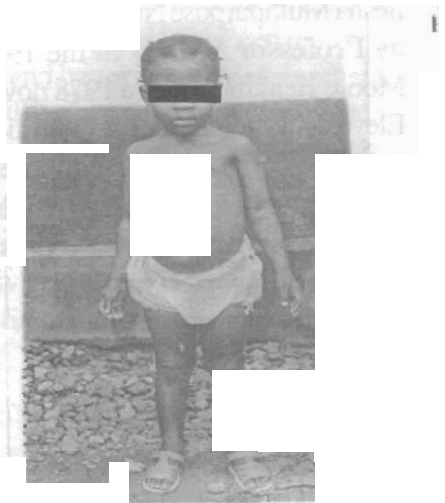
FIG. 4B picture of Marasmic Kwashiokor Child after two months at NRC, OAUTHC, Eleyele, Ile-Ife.



FIG. 5A picture of Marasmic Kwashiokor Child at intake at NRC, OAUTHC, Eleyele, Ile-Ife.



FIG. 5B picture of Marasmic Kwashiokor Child after two months at NRC, OAUTHC, Eleyele, Ile-Ife.



As previous scientists have shown that the most commonly consumed tubers such as yam and cassava are of poor nutritive qualities^{43,44} Soybean, cowpea and groundnut have been regularly introduced to infant feeding to improve the nutritive qualities of the grains and tubers. The utilization of these readily available nutritious legumes and oil seeds is based on energy and amino acid profiles. These two nutrients are indispensable nutrients to promote and maintain optimal growth patterns of infants.

At the two Nutrition Rehabilitation Centres (NRCs), we have modified the traditional method of preparing maize gruel, the most popular weaning food in Nigeria. The modification consisted of completely grinding the clean soaked maize combined with guinea corn to a fine paste without sieving. Sieving of maize gruel has been reported to lead to significant loss of essential nutrients such as protein and energy^{16,45} Interestingly, the chaff of maize gruel which contains all the essential nutrients is fed to the goats and birds while we consume non-nutrient starch. Thus, the goat's skin continues to shine, while that of the owner is scaly and dry.

We have also successfully introduced "Ewa-Ogi" pap (cowpea-corn mixture) in the treatment and prevention of Kwashiorkor. This simple and affordable home based nutritious complementary feed was widely acceptable by our nursing mothers. The combination of "Ewa-Ogi" pap showed that the protein content of sieved corn pap improved from 0.5% to 18%^{16,46}

At our NRCs we have assessed the unsieved cooked maize-guinea corn mixture samples biochemically, and organoleptically. Our analyses showed that both protein and energy losses were reduced by more than 60% and the nursing mothers favourably accepted the modified form⁴⁵

In our attempt to increase the geographical spread of the use of "Ewa-Ogi" pap by both mothers of well fed and malnourished children, we confirmed that some groups of women were of the belief that cowpea causes increased flatulence and would also aggravate diarrhoea in children and adults. These assertions have been linked with the low molecular weight oligosaccharides. These oligosaccharides contain two or more

monosaccharide linked to each other via glycoside bonds. Most of the oligosaccharides comprise of hexose sugars such as starchose, verbascose and raffinose. Previous studies have also confirmed the prohibition of cowpea to infants because of diarrhoea and flatulence^{47,48} One of the major reasons for flatulence and diarrhoea in some children and adults after consuming cowpeas is that the enzyme, galactosidase required to digest these oligosaccharides and subsequent fermentation of these hexose sugars in the large intestine is generally lacking in humans. Dehulling and cooking cowpeas in other forms have been reported to lessen these adverse effects by reducing the levels of oligosaccharides in cowpeas.⁵⁰⁻⁵²

Fig. 6: Food Demonstration of Groundnut Milk to Mothers at OAUTHC- Multi-purpose, Ilesa.

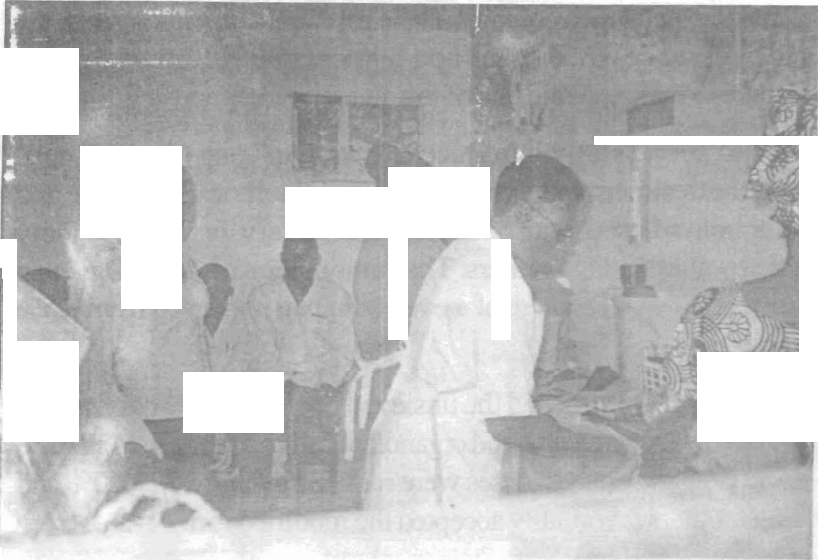


Fig. 7: Preparation of Groundnut Milk by Nursing Officers

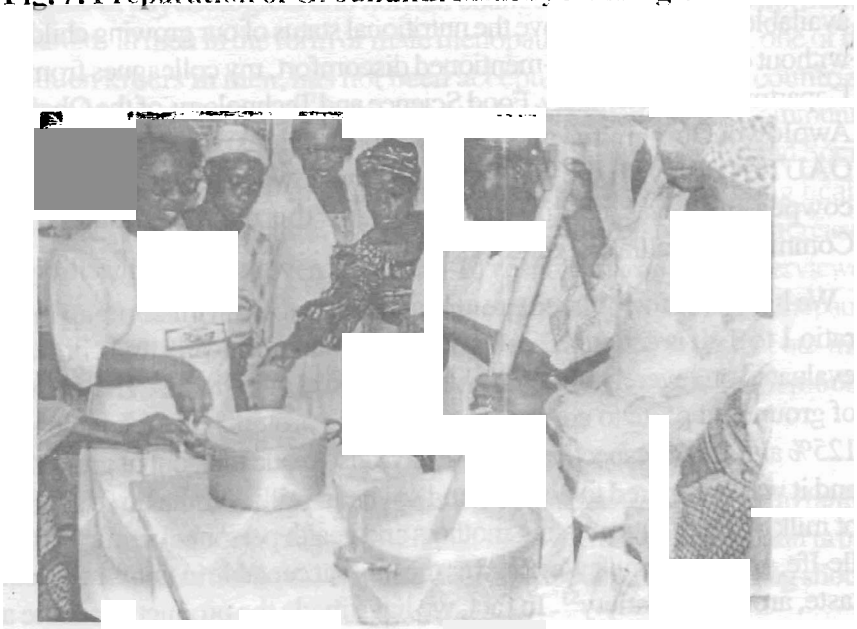


Fig. 8: Tasting the Ground Nut Milk with participants



In our continuous pursuit of full utilization of this nutritious and readily available cowpea to improve the nutritional status of our growing children, without causing the afore-mentioned discomfort, my colleagues from the Departments of Chemistry, Food Science and Technology, of the Obafemi Awolowo University, and Urban Comprehensive Health Centre, OAUTHC, Eleyele, Ile-Ife, have used the cowpea to make milk. The cowpea milk was readily acceptable by the nursing mothers and Community Health Workers.

We have also formulated groundnut paste mixed with cornpap in the ratio 1 to 3. It is called "Epa-Ogi" pap. It was chemically and clinically evaluated on severely malnourished children at our NRCs. The addition of groundnut paste to cornpap increased the protein and fat contents by 125% and 160% respectively.⁴⁷ We have also made milk out of groundnut and it was compared to cowpea and soybean milk. Of the three sources of milk offered to the nursing mothers and health personnel in our NRC at Ile-Ife, groundnut milk was rated as the most acceptable in terms of colour, taste, aroma and satiety⁵³ In fact, we have made the product available at an affordable price to nursing mothers and members of staff of OAUTHC, Eleyele, Ile-Ife. It is gratifying to note that as at 2007, over N236, 000 from groundnut milk had been consumed since the introduction of the product.

Our research endeavours have clearly shown that by utilizing the locally available foodstuffs in different forms, we could definitely overcome the frequently cited cultural food taboos as the bane of childhood malnutrition in Nigeria. More importantly, we can reduce our U5MR from 205 to 70 per 1000 live births in this millennium. Nigeria is still a long way from her expected rate of U5MR of 70 per 1000 live births by 2015.^{7,8,54 64-69} After all, most of our children are stunted because of lack of adequate and quality foodstuffs that would have promoted healthy life. More importantly, we have also shown that stunting was a risk factor for Vitamin A deficiency in preschool children in our community.⁵⁵

Reproductive Health Issues that need Urgent Attention:

It is very disheartening to note that Nigeria has a lot of widows than widowers. Some of the latent reasons are that men silently undergo

physical, psychological and normal changes in midlife. The hormonal changes in men in the form of male menopause or andropause, one of the hidden killers in men, has not been accepted in developing countries, Nigeria inclusive. Our research endeavors in the Department of Community Health in collaboration with the Department of Demography and Social Statistics have revealed that awareness on andropause among health workers was low and that prevalence of erectile dysfunction increased significantly with age even among 31–40 year old married men interviewed in our community^{56,57} Our results have actually shown that male menopause or andropause exists in our community. In an attempt to protect our men from assured health problem, we have advocated for Safe Fatherhood.

Our other research works have shown:

- (i) That contrary to generally held belief that men are opposed to family planning, our study showed that most men in both rural and urban communities believed that a decision about family planning should be made jointly by the spouses⁵⁹
- (ii) That negligible proportion of adolescents have knowledge of the contraceptive methods and that more than 60% of adolescents had their first sexual experience between ages 13 and 17 years⁶⁰
- (iii) That phase 3 delays occurred in our Teaching hospital mostly in patients requiring emergency caesarean sections due to theatre related issues⁶⁰

and

- (iv) That food demonstration and supplementation during pregnancy offered unique opportunities to reduce lowbirth weight babies, under nutrition and its related complications²⁴

Elusiveness of Healthy long life from 35 Years Upwards

While the battle against infectious diseases is being conquered by effective use of antibiotics, there are nutrition related non-communicable chronic diseases (NCCDs). These NCCDs predispose man to morbidity, unhealthy life, permanent disabilities and premature death. These NCCDs

include appendicitis, some forms of cancer, especially, breast and prostate cancers, adult diabetes mellitus (ADM), coronary heart diseases, (CHD), obesity, hypertension, stroke, dental caries, constipation and haemorrhoids
62-65

Fig. 9 A

ADOLESCENTS WITH OBESITY



Fig. 9 B

ADULT OBESITY

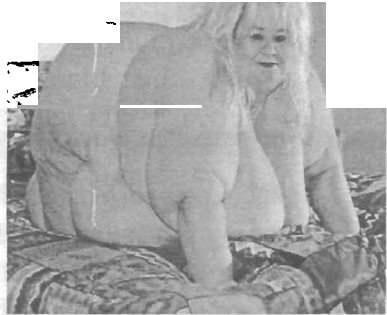


Fig. 10 A

BREAST CANCER

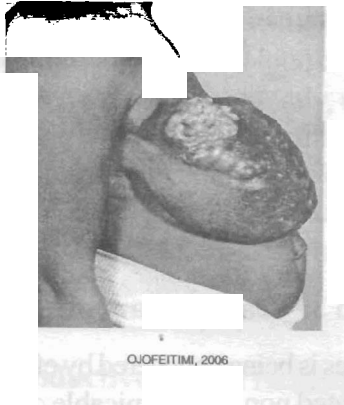
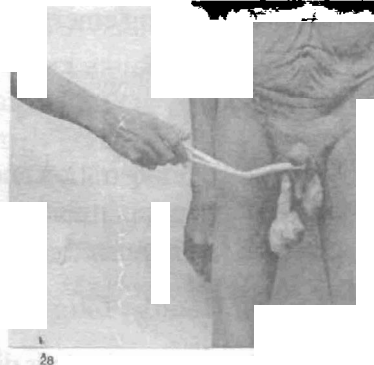


Fig. 10 B

PROSTATE CANCER



Contrary to earlier belief that Africans including Nigerians are protected from these NCCDs,, studies are now indicating that these NCCDs are steadily increasing ^{62,70-74} One of the main reasons adduced for the upsurge of these NCCDs is a deviation from traditional African diet to western diets. The emergence of NCCDs in Nigeria, especially, among wealthy Nigerians has been attributed to the adoption of western diets which are high in animal fats, refined carbohydrates, sweet drinks coupled with unhealthy lifestyles such as smoking and hypoactivity.

In fact, a diet that is low in dietary fiber but high in saturated fats and cholesterol (from animal protein) has been asserted to increase the risk of CHD, ADM, haemorrhoids, diverticulosis, appendicitis, colon, prostate and breast cancers. ^{62,69}

The questions at this point are “How do we control and prevent these NCCDs? How do we restore, maintain and promote healthy long life in this millennium through healthful eating habits among Nigerians regardless of income?

Prior to my suggesting nutritional interventions to ward off NCCDs, it is very pertinent that everybody present here this evening should attempt to answer the following questions after perusing Tables 7 and 8.

Table 7: Cholesterol in Commonly Consumed Products*

No.	Food Items	Cholesterol Content (mg/100mg)
1.	Cow's Brain	2360
2.	Egg Yolk	1600
3.	Cod Liver Oil	850
4.	Chicken Liver	746
5.	Cow's Kidney	410
6.	Cow's Lungs	350
7.	Cow's Liver	320
8.	Dried Salted Beef	110-330
9.	Butter	280

10.	Bacon	220
11.	Lobster	200
12.	Cow's Heart	150
13.	Cow's Tripe	150
14.	Cooked Crab Meat	150
15.	Shrimps	140
16.	Beef Tongue	140
17.	Beef	120
18.	Rabbit	120
19.	Cheddar Cheese	100
20.	Chicken (Fryer's Flesh and Skin)	90
21.	Mackerel Fish	80
22.	Lamb (Chop)	70
23.	Sardines Drained Solids	70
24.	Salmon	70
25.	Flounder Fish	70
26.	Eelfish	60
27.	Codfish	50
28.	Turkey	50
29.	Whole milk Pasteurized	10
30.	Egg White	0

***Source: Kowalski, 1987; Ojofeitimi and Fawole, 1988**

Table 8: Fiber content of Uncommonly Consumed Foodstuffs*

Foodstuffs	Fiber Content (g/100g)
Cassava young leaves	15.6
Pawpaw (unripe)	12.5
Pinto Bean	10.5
Talinum leaves	10.3
Kidney Bean	10.2
Okro, lady finger	9.8
Lima Bean	9.7

Sweet potato young leaves	9.0
Amaranthus	8.8
White Bean	8.7
Groundnut	8.3
Pawpaw (ripe)	6.0
Soya bean	5.8
Corn (Fresh on Cob)	5.6
Potato	5.3
Banana	3.2
Carrot	3.0
Guinea Corn	2.9
Orange	2.9
Egg Plant fresh	2.5
Mango (Ripe)	2.3
Pealed Water Yam	2.3
Cassava Grit (Gari)	2.3
Fresh Tomato	2.0
Peeled Cocoyam (Taro)	1.6
Peeled White Yam	1.4

Adapted from V.A. Oyenuga, Nigeria's Foods and Feeding Stuffs. Ibadan Univ. Press, R.C. Kowaslaki. The 8-Week cholesterol Cure Harps, Row Publisher New York, Cambridge, 1987.

What is your Body Mass Index (BMI)? Are you overweight or obese?

What is your favourite animal protein?

Is it high in Cholesterol!? Is it below 200mg/milliliter?

What is your cholesterol level?

Does your meal include rich sources of dietary fiber?

Assessing the commonly consumed foodstuffs in our environment, Table 8 shows that our popular foodstuffs from the tubers are low in dietary fiber when compared to the grains, legumes fruits and vegetables which are less often or sparingly consumed in our diets.^{22,23,65,72,73}

Mr. Vice-Chancellor Sir, distinguished ladies and gentlemen, it is with a strong conviction, that I declare that the surest way of avoiding NCCDS at any age is to increase intake of plant protein, fruits, legumes and leafy green vegetables combined with increase in physical exercise. The consumption of animal protein should be reduced. Having a little bit of everything at each meal qualifies one as having an adequate diet. After all, these were the foods appointed to man at the beginning of creation. Everybody in this hall this evening was born with a perfect body devoid of NCCDs. But because of our passion for sweet things and unhealthy lifestyle, majority of Nigerians barely live up to 70 years let alone 80, 90 or the Biblical 100 years.

The rate at which adults consume animal protein is alarming. Children who should have been the beneficiary of higher consumption of animal protein because they are still growing are deprived of it. Incidentally, most of our women in their quest to satisfy their men, prefer to give the lion share of animal protein to them instead of giving it to their children. Unknown to them is that they are inadvertently killing their men slowly because most of these men do not perform regular exercise. Some of the consequences of high consumption of animal protein and low intake of dietary fiber in the form of fruits, legumes and leafy green vegetables are constipation and adiposity. These chronic constipation and prolonged adiposity predispose humans to NCCDs that shorten healthy life.

Constipation is a health problem that has not been given a serious consideration. While constipation is a symptom, it is the beginning of several chronic diseases. Evidence abounds in the literature that constipation has now been recognized as the underlying cause of some NCCDs such as haemorrhoids, appendicitis, diverticulosis, abdominal pain and hiatus hernia^{62,70,73}

Increased dietary fiber and decreased animal protein intakes are the surest ways of preventing constipation for healthy life. Our studies have shown that most men and women in our community regardless of age do not have daily bowel movement.⁷³⁻⁷⁴

Constipation is a serious problem that must be solved. Is there anyone in this hall who does not believe that constipation is a serious problem that needs urgent solution? Please listen to this anonymous writer:

***“WHEN THE LORD MADE MAN, ALL THE PARTS OF THE BODY ARGUED WHO WOULD BE BOSS THE BRAIN EXPLAINED THAT SINCE HE CONTROLLED ALL THE PARTS OF THE BODY, HE SHOULD BE BOSS THE LEGS ARGUED THAT SINCE THEY TOOK THE MAN WHEREVER HE WANTED TO GO, THEY SHOULD BE BOSS THE STOMACH COUNTERED WITH THE EXPLANATION THAT SINCE HE DIGEST ALL THE FOODS, HE SHOULD BE BOSS THE EYES SAID THAT WITHOUT THEM MAN WOULD BE HELPLESS, SO THEY SHOULD BE BOSS THEN THE ASS HOLE APPLIED FOR THE JOB THE OTHER PARTS OF THE BODY LAUGHED SO HARD THAT THE ASS HOLE BECAME MAD AND CLOSED UP AFTER A FEW DAYS THE BRAIN WENT FOGGY THE LEGS GOT WOBBLER, THE STOMACH GOT ILL, THE EYES GOT CROSSED AND UNABLE TO SEE THEY ALL CONCEDED AND MADE THE ASS HOLE BOSS.*”**

Preventing Premature Death In this Millennium

More than 2000 years ago, Cicero, one of the famous Roman writers wrote, “It is our duty to resist old age to compensate for its defects by a watchful care; to fight against it as we would fight against disease, and to adopt a regimen of health; to practice moderate exercise,”⁷⁷

Mr. Vice-Chancellor Sir and distinguished audience, in an attempt to put Cicero’s word into practice, my colleagues from different disciplines, private and non governmental agencies and I undertook an operational research on nutritional intervention among the elderly in some parts of Osun State.

Fig. 11: Demonstration of Stretching Exercise to the Elderly in one of the Churches in Osun State (Courtesy Obafemi Awolowo University Research Committee Grant (OAUURCG))



Fig. 12: Nutritional Health Education Discussion In one of the Mosques in Osun State, (Courtesy of OAUURCG)



Fig. 13: Health Assessment of the Elderly in one of the Mosques in Osun State Courtesy of OAUURCG)

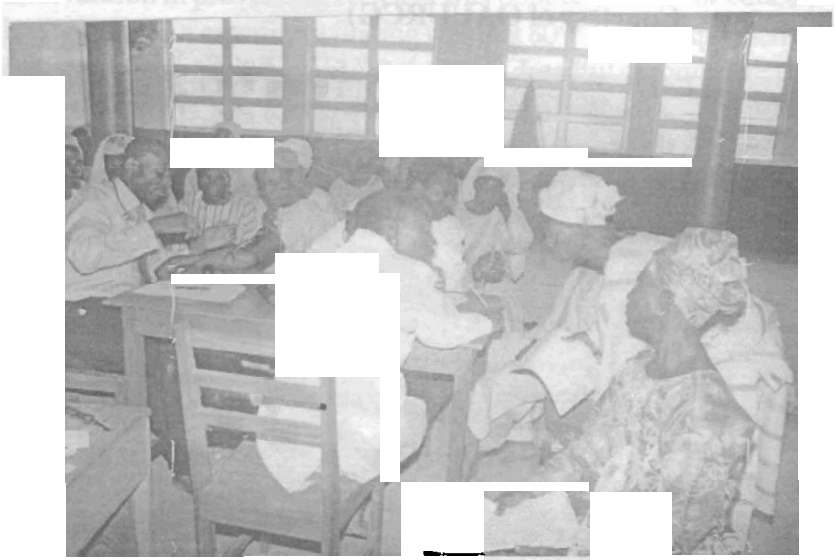


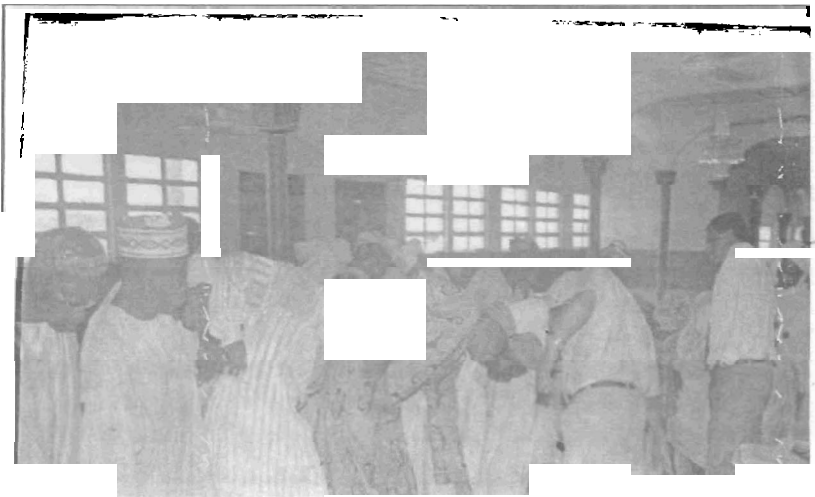
Fig. 14: Elderly Men and Women waiting for Nutritional, Dental and Ophthalmological Assessment In one of the Churches in Osun State (Courtesy of OAUURCG)



Fig. 15: Ophthalmological Examination of the Elderly Men and Women in one of the Mosques in Osun State (Courtesy of OAUURCG)



Fig. 16: Demonstration of Stretching Exercise to the Elderly Men in one of Mosques in Osun State (Courtesy of OAUURCG)



Our results showed that the community's awareness on nutritional intervention in preventing NCCDs was poor regardless of educational background. Of significant finding was that 80% of our respondents rated cancer of any part of the body as the most dreadful chronic disease. But less than 5% of our respondents had any idea about employing nutritional interventions to prevent cancer.^{65,73} We also observed that malnutrition in the forms of under nutrition, overweight and obesity is predominant among the elderly population in our environment^{78,79}.

Heckler, former United States of America's Secretary of Health once declared. "We now know that 80% of cancer causes are linked to lifestyle and environmental factors. And we know that most important causes are the ones we control or influence".

It is apparent from Table 9 that diet has significant role to play in the aetiology and prevention of cancer. Indeed, diet that are high in protein, total fat, saturated fats, and low dietary fibre have been implicated in the causation of not only colon, rectal, prostate and breast cancers, but also cardiovascular heart diseases, ADM and obesity.^{61,81-84}

Table 9: Causes of Cancer deaths in the United States of America*

Causes of Cancer (Or Contributing factor)	Percentage of cancer deaths Under age 65 years	
	Best Estimates	Range of Acceptable Estimates
Diet	35	10-70
Tobacco	30	25-40
Reproductive and Sexual Behaviour	7	1-13
Occupation	4	2-8
Alcohol	3	2-4
Geographical Factors	3	2-4
Pollution	2	1-2
Industrial By-Products	1	1-2
Medicines and Medical Procedures	1	0.5-3

*Adapted from USA National Cancer Control Programmes, 1984

Healthy life throughout man's life cycle is attainable by monitoring Waist Hip Ratio (WHR), waist increase and Body Mass index (BMI). Epidemiological studies have provided convincing evidence that measurement of abdominal fat (using WHR) and waist line are good indicators of rise of cardiovascular heart disease (CVD), ADM, obesity, stroke, breast and prostate cancers ^{69,82,85-87}

The risk of dying at an unripe age and living unhealthful life can be avoided if WHR, waist lines and BMI are regularly checked at least four times yearly during medical and physical examination. The lowest risk of dying from any of the above chronic diseases is when the BMI is not greater than 25 and not less than 19 in both sexes. WHR is more sensitive than BMI as a predictor of CVD, ADM, back and knee pains, prostate and breast cancers. The lowest risk is when the WHR is less than 0.95 for men and 0.80 for women. The sensitivity of WHR is based on the fact that WHR measures central or abdominal obesity while BMI assesses generalized obesity ^{60,69,85}

Distinguished ladies and gentlemen, central or abdominal obesity is a major impediment to healthy long life^{67,69} Extra padding around the middle puts a person at risk for all the NCCDs especially, CVD, ADM, obesity, and prostate cancers, for the following reasons:

(i)As a source of fuel, fat in the abdominal area is rapidly used and replaced much more frequently than fat stored any where else in the body,

and

(ii)During stress, catecholamine (epinephrine and norepinephrine) cause increased lipolytic activity with depressed lipoprotein lipase, especially, in abdominal adipocytes).

This central abdominal obesity has recently been linked with low back and knee pain.⁸³

Our experiences on the assessment of abdominal fat using WHR among older persons in our community have confirmed that our clients, presenting

with ADM, stroke, hypertension, congestive heart failure, musculoskeletal pain, breast and prostate cancers had high WHR above the normal range of 0.80 to 0.95^{76,82,85} Indeed, central obesity is a major risk factor against healthy long life.

Mr. Vice-Chancellor Sir, distinguished ladies and gentlemen, while we can not change our genes, we definitely can change our lifestyles. Consequently, the following nutritional and fitness strategies to achieving healthy long life are suggested:

- (i) Avoid obesity by taking foods that are low in fat and also limit the intake of animal protein.
- (ii) Limit your sweet and alcoholic drinks, refined carbohydrates (biscuits, meat pies, bread etc.).
- (iii) Increase your dietary fiber intake by consuming more fruits, leafy green vegetables and legumes at each meal. Consumption of these food items will definitely lead to regular daily bowel movement.
- (iv) Be physically active. Benefits from physical activities include improve lipoprotein profile and carbohydrate metabolism, lower blood pressure and weight reduction.
- (v) At least perform 30 minutes of physical exercise everyday regardless of your tight schedule and space (walking, dancing, swimming, footballing, bicycling, jogging, aerobic exercise); and
- (vi) Be less anxious and create time to relax, meditate and have a positive mind.

CONCLUSION:

From the foregoing it is apparent that without quality food in enough quantity, promoting healthy long life from neonate to old age is impossible. The pertinent questions we should take home this evening are: Why is it that the majority of our children are still suffering from malnutrition despite all the health experts, scientific knowledge and abundance of natural and human resources?

What has gone wrong?

Why are active and productive adults dying young?

Is it that government, health providers, policy makers or mass media experts have not understood that reducing infant and adult malnutrition is an investment that should lead to healthy long life, high productivity and quality human development?

Is there any specific health and social programmes designed for older population that will ensure successful ageing in this country?

The answers to the above questions may be found in piece meal reports in various government documents, research centers, and higher institution in Nigeria. There has never been a comprehensive or collated studies addressing the nutritional disorders and their relationship with NCCDs that are on the increase in Nigeria.

RECOMMENDATIONS:

What is needed to promote healthy long life from pregnancy to old age is political will and commitment from the local to Federal levels of government to ensure endorsement of Preventive Programme. Preventive rather than curative medicine has been endorsed as the most effective strategy to reduce morbidity, mortality, physical disabilities, and to reduce health costs. Such a Preventive Programme should include:

- (i) Improvement of nutritional status of the community through nutrition education such that the results of nutrition researches are not only disseminated to the public, but are also applied in practical terms
- (ii) Intensive nutrition Intervention programmes for the under two children. This intervention should include adequate maternal nutrition during pregnancy and promotion of Exclusive Breast Feeding for the first six months of life. There must be provision of complementary feeding for infants from 7 months upwards and compulsory growth monitoring and promotion at the community level. All Comprehensive Health Centres should be provided with a functioning NRC.

- (iii) There is an urgent need to strengthen the Nutrition Component of Primary Health Care to apply the multi sectoral strategies in solving the perennial health problems of PEM and nutrition related chronic diseases in Nigeria. The Nutrition Unit should seek the support and services of Information, Communication, Education, Economics, Medical Team, Agriculture Food Technology, Medical sociology and Anthropology. This multi sectoral approach should be conscientiously sought by the three tiers of government.
- (iv) There are piecemeal research data on prevalence of childhood malnutrition from different parts of the country, but there is no national figure on prevalence of childhood obesity, and obesity in all those aged 20-64. There is a dire need to have a national survey on the impact of obesity on health and productivity.
- (v) There is need for Specific Preventive Programme for Non-communicable Chronic Diseases and Governments should endeavour to have dietary goals for the prevention of Non-communicable Chronic Diseases (NCCDs). Such dietary goals should include the need to reduce average blood cholesterol level; avoidance of excess weight gain and obesity in the community. Total fat intake, especially saturated fatty acids usually derived from animal protein; sugar and salt intake should be minimized. Consumption of dietary fiber in forms of fruits, vegetables, cowpea, and other oil seeds should be encouraged. The alternative ways of reducing obesity such as increased physical activity and reduction of foods that are high in energy density such as butter, fried meat and plantain should be disseminated to the public.
- (vi) There is a dire need to formulate health policy measures for maintenance of an optimum health care and social services for the elderly in Nigeria.

Ensuring easy access to health care services and creating the enabling environment for physical fitness recreation, and opportunity for the elderly so that they can be useful to the young population.

Finally, Mr. Vice-Chancellor Sir, distinguished ladies and gentlemen, I have for almost three decades tried to solve the riddle of Protein Energy Malnutrition (PEM) especially, in Nigeria. I have during this period enjoyed the unflinching support of the authorities, my colleagues from Obafemi Awolowo University and Obafemi Awolowo University Teaching Hospital Complex to whom I am very grateful. I am also taking this opportunity to acknowledge the financial support for some of our research efforts from University Research Committee, West African Health Organisation, Bill and Melinda Gates Foundations, Nigerian Prevention of Maternal Mortality and the United States Agency for International Development (USAID). To my families and friends, I say thanks for your unparalleled encouragement and support.

We have in the process made some contributions nationally and internationally. However, our findings have pointed to other areas for further research as to the use of unconventional protein sources in the prevention of PEM and NCCDs and the use of anthropometric indices in identifying at-risk individuals for NCCDs which militate against healthy long life among active, young and productive adults in Nigeria.

While we will continue to do our best, I challenge other researchers (especially the younger ones) to build on the solid foundation that we have laid. I am positive they will find these areas of scientific endeavours not only captivating but highly rewarding.

Thank you all for your attention and may the Almighty God bless you abundantly in the new year.

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