

WE ARE WHAT WE EAT

INAUGURAL LECTURE SERIES 14

By

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This Lecture is dedicated to the
memory of my late mother
Madam Efunniwe Asande Farinu
who sacrificed so much
for me to be
educated

WE ARE WHAT WE EAT!

See what food can do.....

Like this, we all started.



When our people see tall, lanky, robust American lads (foot ballers and basketball players) or good looking individuals – the question usually asked is - “ What are you eating that is making you look so Nice”



On the other hand, the diminutive, stunted haggard looking, malnourished ones face the question – “Aren't you eating or have you been turned into a napkin?”



1.0 PREAMBLE:

WHY AN INAUGURAL LECTURE:

From Wikipedia (the free Encyclopedia)¹:- An inauguration is a formal ceremony to mark the beginning of a major public leader's term of office. The inaugural address is a speech given during this ceremony which informs the people of his/her intentions as a leader. Oliver ² stated thus – “The purpose of an inaugural lecture is to give the new appointed incumbent to a chair, an opportunity to state in public what he actually professes to know of his subject. Ayeni ³ quoted the Imperial College London that “An inaugural lecture is a lecture that is taken seriously in all universities. It is meant to show the basis for the promotion or appointment of an academic to a professorial position. The lecturer is expected to

present an overview of his/her research and update colleagues on the current and future plans and introduce the research to a wider audience.

Having missed the chance to be allowed to tell of what I profess at the time I attained the status of Professor, I would in addition to all the essence stated above rather like Swaminathan 4 attempt a sensitization of this audience on the relatively common (but least understood) issue of the relationship between what we eat and who we are.

Therefore, if one of the benefits of an inaugural lecture is to educate the audience, then I wish to present the following as guide to better health through nutrition.

To God be the Glory; Great things He hath done...

It is always said that "Some are born great; others have greatness bestowed on them. But for others, they have to struggle to attain greatness. The height attained by great men is not usually by sudden flights. If only one would stop to think, then he should always be grateful to God the Creator and those through whose channels he has received benefaction. I give all the honour and Glory to the Almighty who gave the Western Region of Nigeria the sage – Late Chief Obafemi Awolowo, as a political leader in the early days of the political life of the then emerging country – Nigeria. He saw education as a legacy that should be given to all children and he led the government then to start the Free Primary Education

Programme in January, 1955. Standing before you today is a humble product of the scheme. I strongly feel to pay this obeisance because many village boys of my age then might have been denied the golden access to the legacy that has produced many countless Nigerians like me contributing their little tokens to the development of different areas of life in Nigeria today. I made mention of that humble beginning, believing that we cannot build something on nothing. If I did not belong to the generation of the boys in the "Awolowo School" then, may be today I would remain a village farmer or would have ended up an "almajiri" under the Islamic itinerant teacher.

I once again give thanks to God and to this University for the opportunity to stand before this audience today to talk on a common day subject – "Eating to Live". By the Grace of God, I had good training as a teacher by attending the Wesley College, Ibadan and the Adeyemi College of Education, Ondo. It was out of choice to have an all-round professional training that I decided to pay the price of starting my University career from the scratch at the University of Ibadan, Ibadan. The price paid off because I was privileged to train under the scholarship/tutelage of the best nutritionists (Prof. V.A.O. Oyenuga, Prof. G.M. Babatunde and Prof. B.L.A Fetuga) all in the Department of Animal Science, University of Ibadan.

My university training was eventful and rewarding, being lucky to be counted among the University Scholars and capping the undergraduate years with the best grade attainable in any university degree examination (First Class Honours) in my final year .

I started my university working career in the Biochemistry Department, University of Ilorin, Ilorin as an Assistant Lecturer in August, 1978. During my thirteen years sojourn in Ilorin, I enjoyed the opportunity

of further training first at my base in the University of Ibadan to obtain a Master's degree in Agricultural Biochemistry and Nutrition. During the course of my Ph.D degree work in Ibadan, I was privileged to enjoy training in the Departments of Biochemistry, University of Pennsylvania, Philadelphia, United States of America, to learn the use of Radio-isotopic research techniques in Nutrition under the Post-graduate student Exchange Programme between the University of Ibadan and Pennsylvania University; Philadelphia, United States of America between April and October, 1982. In addition, I also had the opportunity under the Third World Academy of Sciences (TWAS) Post Doctoral Fellowship Award for Research and Training in Italian Laboratories at the National Institute of Nutrition, Rome, Italy from March 1989 to April, 1990. What has left a sad taste in one's mouth despite all the experiences gained from all these trainings is the non-availability of appropriate laboratory equipment and materials in our own laboratories. A painful and sad event was when I found out that the Scintillating Counter equipment in the Zoology laboratory, Faculty of Science, University of Ilorin was nonfunctional! This militated against any meaningful application at home.

Again, after all the training and exposure to the wider scientific world and the urge to settle down to create a niche for myself at the University of Ilorin, the monster of ethnic chauvinism reared its ugly head. Various unethical practices were introduced in the system such as promotion on basis of availability of vacancies and not on merit/productivity.

It was in trying to escape being caught in the web of the political lock jam of the Ilorin environment that I got my service transferred to the up and coming Ladoko Akintola University of Technology, Ogbomoso in November, 1991. The challenges of starting with the first set of students in the Faculty of Agricultural Sciences offered a unique experience of joining other staff in the department of Animal Production and Health in charting a course for the development of the academic programmes and putting the necessary infrastructures for teaching and research in place. The struggle for the building of the laboratory for the department as well as getting Farm structures suitable for training in the practical aspects of Animal Production and Health courses in the context of fulfilling the vision and mission of the department to fit into the national goal of training first degree holders in general agriculture, were among the challenges that characterized ones early years in LAUTECH. Apart from making my own contributions to the building of the Faculty that today admits one of the largest number of students in the University, I have served the University in other spheres like been the Director of Academic Planning Unit and Chairman of the Board of the LAUTECH College. I led the Academic staff Union of Universities as Chairman for four years. Also as paying part of my due in the area of Community service, I took time-out to go and do the pioneering assignment of building the Oyo State College of Agriculture, Igboora as the pioneer Provost from 2006 – 2011.

2.0 THE LECTURE

Abinitio - God created the World and all that inhabits it - Genesis 11 –

There were two forms of creatures -. Therefore when in Biology, we want to categorize God's creation – we talk of Living and Non-living things. The Living Forms were created as Plants and Animals. Both share similar characteristics of feeding, respiration, growth, movement (locomotion), excretion, irritability, reproduction and death. Therefore, the first fundamental information is the acceptance of the simple fact that all of us seated here are ANIMALS.

Secondly, it must be agreed that an animal basically is a product of its NATURE, NURTURE (and/ or) ENVIRONMENT.

Nature refers to all of the genes and hereditary factors that influence who we are – from our physical appearance to our personality characteristics.

Nurture, on the other hand, refers to all the environmental variables that impact who we are, including our early childhood experiences, how we were raised, our social relationship and our surrounding culture.

2.1 FOOD AND THE HISTORY OF NUTRITION:

Quote: To eat is a necessity but to eat intelligently is an art. In 400 BC, the Greek physician Hippocrates. The Father of Medicine said “Let thy food be thy medicine and thy medicine thy food”. This was because Hippocrates realized that food impacts a person's health, body and mind to help prevent illness as well as maintain wellness⁵.

In Greece during Hippocrate's time across pre-modern Europe and Asia since ancient times, foods were used to affect health. For instance, the juice of liver was squeezed on the eye to treat eye diseases connected to vitamin A deficiency. Also garlic was used to cure athlete's food and eating ginger was thought to stimulate the metabolism.

In 1770, Antoine Lavoisier, the Father of Nutrition and Chemistry, discovered the concept of metabolism, the transfer of food and oxygen into heat and water in the body creating energy, while the elements of carbon, nitrogen, hydrogen and oxygen which are the main components of food were isolated and connected to health in the early 1800s. Work in the area of the chemical nature of foods i.e. carbohydrates, fats and proteins was done by Justus Liebig of Germany and such work led to research in the area of vitamins in the early 20th Century. In 1912, a Polish Doctor Casimir Funk, coined the term – Vitamins as essential factors in the diet. The term vitamins - first called “vitamine” derives from “Vital” and “amine” because vitamins are required for life and they were compounds derived from ammonia

2.1.1 FOOD:

The most important function of food is that it replaces broken – down tissue. The tissue wastes of the preceding day are replenished by the food eaten; so the body remains about the same in weight, no matter how much exercise be taken or how much tissue is broken down. True food can therefore be described as one containing a number of elements (the counterpart of the elements destroyed) being necessary to offset the waste. These elements are protein, fat, carbohydrates and various salts. A food is nutritious and capable of sustaining life in proportion to its complexity – the best food being one that most nearly supplies the waste of the tissues. Proteins are used by the body to supply most of the muscle-forming elements and a part of the energy expended by the body. Fats and carbohydrates are supposed to be of use mainly to supply heat and energy to the system. The mineral salts that are contained in the foods do not fulfill any definite functions so far as is known but they are very essential never- the- less 6. If a diet lacks these salts totally, the body wastes away and dies of “saline starvation”. It will thus be apparent that foods very rapidly and very forcibly affect the state of the health and even the life of the individual. Food makes blood and the blood is absolutely dependent upon the food supply for its character and composition. The nature of the mind and its connection with the body is certainly dependent upon the body for its manifestation in this life and is coloured and influenced by the state of the body and by the condition of the blood.

The question of the food supply is the most important before the world today. This is because the first thought, the first instinct of any animal in life, is to search for and secure food; self preservation is the most powerful instinct in the world and the nutrition of the body occupies first place as one means of preserving life.

2.1.2 NUTRITION:

The science of nutrition developed in the twentieth century with the identification, isolation, elucidation of structure, synthesis and an understanding of the physiological functions of the primary essential macro and micronutrients. A short history of this vital science would not be out of place in a lecture of this type. The German chemist, Justus von Liebig, building on the work of Antoine Lavoisier, Francois Magendie, Jons Berzelius, Williams Prout, Gerrit Mulder and others, was a founder of biochemistry and was the Founder of Nutrition as a biochemical science. This great scientist and his followers first realized that physiological chemistry (The first name for nutrition) could be used to harness and master nature and to engineer the food systems of industrializing countries Von Liebig grasped the significance of protein as the chemical compound that accelerates the early growth of plants, animals and humans.

The science of nutrition in its first period, that is between 1850 and 1950 was harnessed by governments of the great European powers and the United State of America to increase the yield of food from plants and animals and to build up their human resources when more and more factory workers and foot soldiers were needed to increase national advantage and to service industrialization

and imperialism. During this period, nutrition science was in the big time. Its teaching and practice were at first dominated by Britain and Germany and later by the United States of America and Britain. Half the economic growth in the United Kingdom and other Western European countries between 1790 and 1980 is attributed to improvements in population nutrition, together with other public health measures such as proper sanitation. Its impetus continued with early twentieth century experiments identifying a series of diseases whose usual fundamental cause is deprivation and destitution as vitamin deficiency diseases.

In Nigeria, Professor V. A. Oyenuga (late Emeritus Professor of Agricultural Biochemistry and Nutrition) of the Animal Science department, University of Ibadan, Ibadan brazed the trail in the areas of elucidating the chemical composition of Nigeria Feeds and Feeding stuffs. The results of these pioneering efforts are detailed in the publication.⁷

It was in the light of the adage that “like begets like” that those of us who were privileged to pass through the hands of the great Prof. VAO and later his protégé – Professor B.L.A Fetuga and cut our research teeth under their tutelages, have all along been trying to make our own modest contributions to the field of animal biochemistry and nutrition in our little corners of research. Under the duo of Professors Oyenuga and Fetuga, my first attempt of studying the chemical and nutritive value of the fluted pumpkin (*Telfairia occidentalis* Linn) turned out to be the first time anybody had attempted to look at a plant, commonly grown in the backyard of staff houses at the Abadina village of the University of Ibadan, Ibadan within the research environment. It was a fascinating experience. We were able to document that apart from the leaves of the plant serving as delicacy vegetable especially among the Igbo- Community, the seeds after proper cooking is also edible as snack. Animal feeding trials on the seeds led us to conclude that apart from cooking, removal of the oil from the seeds also enhanced the nutritive value in rats ⁸. Also during my training for the M.Sc and Ph.D degrees with Professor Fetuga, we did an elaborate study on rice-milling by-products with regard to the chemical composition, energy, amino acid composition and the nutritive value evaluation to poultry⁹. Another plant a 'weed' ¹⁰ caught my fancy during my short stay on the Farm Settlement, Ogbomoso in 1976 while participating in the Operation Feed the Nation Programme ¹¹ of the then Military Government and we later decided to see how “the weed” could be converted into “a feed”. Many studies ranging from the agronomic studies on the cultivation of the plant, the chemical and nutritive evaluation of the forage from the plant and the potential industrial and biomedical uses of the plant were conducted. The edible meal made from the forage was evaluated as feed stuff for varying species and classes of livestock especially poultry, pigs and rabbits. When fed to poultry; chicks, growers and layers were found to have performed well on diets that contained the wild sunflower as replacement for maize up to 30%. The egg yolk colour was also enhanced with the inclusion of the plant material in layer diets. When the forage meal of the plant was mixed with processed blood-meal, rabbits raised on the mixture showed growth and carcass characteristics similar to a maize based diet ¹¹⁻¹⁸.

The Nigeria Indigenous pig had existed for centuries with little or no information documented on the potentials of the pig breed as to growth, haematological, biochemical and physiological characteristics. We were able to identify that the small mature size of the animal may qualify it as a suitable model for protein-calorie malnutrition studies using the kidney, spleen, liver and pancreas as marker organs. Also

the changes in the composition of some muscles, as well as in the hematological and serum biochemical parameters of this pig breed compared to those of the Large - white XLand race cross bred pigs showed that our own local pig breed deserves attention from animal scientists instead of allowing it to go into extinction 19-22.

Rabbits have been described as offering alternatives to pig and poultry as sources of animal protein at the family level. To encourage rabbit production calls for the formulation of relatively cheap rabbit diets from feed resources that are not competed for by man and other monogastric animals. Thus we have tried different combinations of processed bovine-ruminal: blood meal, cassava peels, pigeon – pea grain meal and cooked mucuna beans in the feeding of rabbits. Key indicators of nutritive value of the mixtures such as growth rate and final body weight showed that rabbits would survive on the low-cost formulated feeds 23-33. Also other plant materials like ginger and garlic have been screened for their chemical constituents and as feed supplements in poultry feeding.

Ginger and garlic are common items used in human diets either as food additives or condiments. Their ability to reduce blood lipid in animals has been demonstrated in studies conducted on broiler chickens and the possible effects of these materials as having anti-microbial activities has been demonstrated by substituting them for regular antibiotics in poultry diets 34 – 37.

Garcinia cola has been studied to elucidate its potentials as a stimulant that can suppress “blood pressure” 38-40.

Miscellaneous efforts at elucidating the potentials of some other plant products as feed resources include the chemical analysis of *Luffa aegyptica*, *Butyrospermum paradoxom*, *Curcubita pepo*, *Phyllanthus pentadrous*, *Mangifera indica*, *Blighia sapida*, *Leucaena leucocephala*, *Artocarpus altilis* and the black-eye cowpea (*Vigna unguiculata*). These plant materials have been tested as feed resource materials for different species and classes of livestock 41 -51. We have also, with colleagues, done some work on the effects of manipulating the environmental conditions on the performance of some animal species 52-55.

Finally our current research efforts are directed at how we can use processing techniques to convert materials that otherwise would have constituted industrial wastes, such as the pulp from the processing of fruits like pine-apple, mango and cashew from the fruit canning factories, into feed stuffs that could replace energy source in the diets of farm livestock such as pigs and poultry.

3.0 MAN AND HIS FOOD

3.1 WHAT THEN SHOULD BE OUR DIET?

Having bored you so much with some scientific jargons that mean less to many of us here; let us turn to the social aspect of the discuss. I want to attempt to say a little about the relevance of the title of the lecture to our daily life. Permit me to borrow from Hereward Carrington 6 Nigeria' is passing through a great Financial crisis – because of badly adjusted financial conditions and as a result of greed – and we hear much talk of hard times and the lack of money where with to buy the necessities of life. Such hard times and such conditions could be largely averted if only the people were taught to live correctly: taught how to economize their food and how to take care of their bodies. There can be no doubt that much of the waste which occurs throughout the land is due to ignorance of the laws of life and health; and if people were only taught how to reduce their food – supply scientifically – and not to expend so much money on their bodies, and specially on their food there would be but a small amount of suffering compared with that which has existed up to now.”

Teach the public how to preserve the body in a state of health, upon a small amount of money and we shall have solved one of the greatest economic factors confronting us today. It is believed that this may be brought about in a large part at least by adopting the principles of nutrition: it is the desire to help humanity to secure better health – to teach them how to live cheaply and economically; above all, how to live so as to preserve the highest standard of health, strength and energy. We should thus have a cleaner, a hardier and a happier race of individuals; and I firmly believe that all true change – social, economic, religious – must come primarily through the body. This is saying that these reforms can only be effected by first of all reforming the body and its habits and when that has been rendered clean and pure, the coveted mental and moral reforms will be found to follow of themselves. External conditions and environment may count for much, but the internal factor counts for much more. The internal personality of the man is what we should aim to reach first of all; and this can be reached most easily and effectually by means of the body – for in that, he is most wrapped; with its feelings and emotions he is mostly connected. Reform the inner man and particularly his body, and trust to man to reform his environment. Make men and women what they ought to be and they will soon reform their external conditions.

Animals are classified into four great classes by scientists generally and anatomists in particular as – herbivorous, frugivorous, carnivorous and omnivorous. Man, along the ages, has been grouped among the OMNIVORES because of the contemporary nature (composition) of his diets. However, available facts from man's anatomy and physiology strongly suggest that he should be FRUGIVOROUS. The diet of any animal, in its natural state, is always found to agree both with its anatomical structure and with its several digestive processes and general bodily functions. The teeth, extremities, the alimentary canal, the liver, the placenta and the skeleton are anatomical structures which support the classification of man as FRUGIVOROUS while the physiological secretions of the digestive tract of man – the saliva, the gastric juice and excretions of man as well as such habits as time of sleep, mode of drinking water and possession of sweat glands, all put man in the class of frugivora.

We shall consider about two or more of these:

3.1.1 TEETH:

The animals that are frugivores have thirty-two teeth – sixteen in each jaw; four incisors or cutting teeth; two pointed teeth, known as cuspids; four small molars, known as bicuspid and six molars. The eye-teeth project somewhat beyond the others and fit into a blank space in the lower row, the other teeth articulating uniformly. In the anthropoids, the eye-tooth (canine) is comparatively so small when compared with those of carnivorous animals and are so similar in size and shape to the other types of teeth such that they cannot be easily picked out from the others. This is opposed to the situation in the pure carnivorous teeth as found in the tiger or the cat. Even in the omnivorous animal as represented by the hog the teeth are so much larger, as to be totally dis-similar to those of man.

The tooth of man corresponds in almost every particular, with the teeth of the gorilla and other frugivorous animals in number, arrangement, structure, nature and size. Man does not possess long canine tooth capable of catching and holding a captured prey; no tusks like the omnivorous animals, and in every other way bears no resemblance whatever to any other animal. Bearing all these facts in mind then, we surely can have no hesitation to classify man as a frugivorous animal- so far as his teeth are concerned.

Apart from the number and structure of the teeth, but also in the manner of masticating the food, in the movement of the teeth and jaws themselves, there is a distinct resemblance between man and animals in the frugivora, and a radical distinction between him and all other animals. The jaws of herbivorous animals have three distinct motions – a vertical or up-and-down motion; lateral or sidewise; and forward and backward. These movements are frequent and free, the result being that food eaten by these animals undergoes a thorough grinding process well suited to the nature of their food. In the carnivorous animals on the other hand, the movements of the jaws are in one direction only – they open and shut “like a pair of scissors”, and are well adapted for tearing and biting off food that is to be swallowed more or less en masse to be acted upon by the powerful gastric juice of the stomach. No such limited action is the case with man because his jaws move in three directions – as is the case of the herbivora. However, the extent of such motion is much more limited and man's diet necessitates grinding and on that account he may be grouped among the herbivora.

3.1.2 THE EXTREMITIES:

The animal kingdom has three great divisions as regards the extremities –

(i) Those which possess hoofs, (ii) those possessing claws and (iii) those possessing hands. The herbivore and omnivore belong to the first division; almost all animals possessing claws are carnivorous, while animals possessing hands are almost invariably frugivorous. There are very few exceptions to this rule. Since man certainly belongs to the class which possesses hands, he is certainly by nature frugivorous.

Nature has a reason for this adaptation in the different divisions - The herbivora have no need for hands; they have merely to walk about the grazing plains and partake of what nature has offered to them in abundance.

The carnivorous animal on the other hand, takes his food by violence – suddenly springing upon some defenseless and unresisting animal (prey) and tearing it to pieces with his sharp teeth and claws. Man's teeth and claws are entirely not suited for any such activity. Comparing the hands and extremities of man with those of other frugivorous animals, they bear close similarities between them. The reason for this is that man (according to Gen. 2:16) should go out into the open fields and forests and pick his food off the trees. In addition, incidentally all carnivores drink by lapping up the water or other liquid with their tongues; while man and all herbivores, drink by suction by drawing the water or fluid directly into their mouths.

3.1.3 THE ALIMENTARY CANAL:

The length of the alimentary canal is one of the most interesting comparisons made by comparative anatomists. On the two extremes are the very short, found in the carnivora and the very long in the herbivora. Compared to the length of the body in proportion, the alimentary canal of the carnivora is three times, while it is thirty times the length of the body in the herbivora (sheep). It is twelve times in the omnivora; and in man, as in the frugivora, twelve times. It can be seen from these anatomical comparisons that man strictly belongs to the frugivorous class. We should not be confused by the amusing blunder of some writers who make the proportionate length of the alimentary canal in man 1:6, instead of 1:12. This error is due to the fact that the body in man is doubled by measuring him while standing erect. This is evidently an error of measurement because it includes the length of the hind legs (extremities) which is omitted in other animals where the measurement is made from the tip of the nose to the end of the backbone.

In addition to the anatomical comparisons, let us consider some of the physiological arguments raised above. Among the secretions of the body relevant to the digestion of food are the saliva and gastric juice.

3.1.4 THE SALIVA:

The saliva in man, as well as its function is alkaline, though slightly so in a healthy man. But in the carnivore, the reaction of the saliva is acid, and because of this fact, the carnivore is able to dissolve the food (flesh) more or less whole and without the long process of mastication that is necessary for the herbivora or frugivora.

The saliva in the human being effects many chemical changes in the food – notable among these being the conversion of starch by the ptyalin in the saliva to glucose. Flesh (food for the carnivore) contains no starch!!

3.1.5 THE GASTRIC JUICE:

This is secreted in the stomach and one of its major elements is lactic acid which excites a slight fermentation of the chyme and thus exerts an influence upon the digestion of vegetable matter but not upon that of animal food (flesh). This is because the lactic acid is too weak to act upon the fibers of animal flesh. When flesh is consumed by man, it tends to undergo a process of decay in the stomach, causing a scrofulous poisoning of the blood. This unnatural action causes many complaints and disturbances of the system which include bad breath, heartburn, eruptions and vomiting. The gastric juice in the carnivora however, exerts a decomposing influence upon flesh and causes its assimilation and excretion. The comparatively weak nature of the gastric juice in man makes it of little value in preventing the putre-factive changes that occur when any piece of meat is exposed for some considerable period of time to an environment of heat and moisture. This is to show that the stomach

of man is not suited to the digestion of flesh and thus man can rather subsist on fruits and nuts as frugivorous animals do.

Another point that gives credence to the assertion on the nature of

man as being naturally suited to be frugivorous is the nature of his

alimentary tract. The character of the internal structure of the tract in

man as well as in the frugivora and herbivora is that the intestinal lining is corrugated or sacculated.

This feature being for the express purpose of retaining food

consumed as long as possible in the intestine, and until all possible

nutriments has been abstracted from it. This situation is admirably

suited to such foods as vegetables, fruits and nuts but unsuitable for

flesh food of all kinds which are enjoyed by carnivorous animals that

have short and smooth lined intestines which allow the flesh foods

to dissolve quickly and pass through the system as rapidly as possible .

3.1.6 THE LIVER AND BILE:

Thus if man eats too much of flesh-foods as has been pointed out, disastrous results often follow:

The carnivora possess proportionately larger liver than the other classes –herbivore and frugivora and thus the amount of bile secreted is far greater in the carnivora than in man. For example it has been found in experiments with dogs that the secretion of bile might increase by fifty percent or more when dogs are maintained on a purely meat diet. Thus it appears that the use of a meat diet will require a far

greater degree of activity on the part of the liver than any other diet. If man therefore decides to subsist on a meat diet, his liver will be called upon to do an extra amount of work and this may ultimately result in its premature breakdown. Another organ to worry about is the kidney.

The kidneys are also greatly affected by the diet since it is now well known that uric acid is created in large amount by a flesh diet. It has been estimated that three to ten times as much as uric acid is secreted when flesh is eaten than when no meat is consumed. Uric acid has serious disastrous effects on the system and thus constitutes a powerful disease – producing agouti. This is also indicative of the fact that man cannot eat meat without running grave chances of diseasing and ruining his organism.

Instinctively, carnivorous animals would not eat their like (other flesh eaters). This has been frequently observed and may account for the fact that carnivores will always eat a horse or sheep if they have to make a choice. This scenario is painted of a shepherd on a horse tending his sheep. Their keen sense of smell detects that man is usually carnivorous in his habits and their instinct teaches them that the flesh of the pure herbivore is far superior to that of man. This is also the reason why a cat will kill a mouse and eat it, while a dog will kill a cat, but will not eat it. The reason is because the mouse is a vegetarian and the cat is a carnivore. Instinct teaches the cat that the tissues of the mouse's body are more or less pure and inoffensive while the dog, through instinct, believes the cat's body is impure and more or less poisonous because the flesh is tainted and full of poisons. The only reason is because of the diets of the animals. According to Professor Schickeysen – “the over loading of the blood with flesh foods, causes, in order to effect their decomposition an excessive consumption of oxygen and hence the difficulty of breathing and asthmatical affections' of many flesh eaters, and excessive excretion of- carbonic acid”⁶ .

Other reasons that may support the notion that man does not really belong to the class of flesh – eating animals include the following:-

-By nature, carnivorous animals sleep during the daytime and prowl about in search of their prey at night; this is not the case with man and other vegetarian animals.

-Another is the anatomical structure of the skin. All vegetarian animals perspire (to help in the elimination of 'poisons' such as uric acid) while in all the carnivora, the sweat glands under the skin are atrophied and inactive. Through evolution therefore, the herbivora must have preceded the carnivore in point of time- the carrion feeders being the connecting link between them. This may be taken to mean that at one time there were no carnivore on this globe; they merely developed through countless ages, as the result of deprivation and lack of their proper and natural diet.

These views above were canvassed by the school of thought based on detailed considerations of man's anatomy, physiology, chemistry and hygiene. However, this same school has this to say: "Man may eat a limited amount of meat and cereals without doing himself much harm; but he must always remember that they ought never to form his principal food. Also, I want us to look at the “The position of Mammals on the Food Spectrum”⁵⁷

TABLE 1:

THE POSITION OF MAMMALS ON THE FOOD SPECTRUM:

			Food Spectrum							
			Animal Origin				Vegetable Origin			
Where about of the foodstuff	Mammalian Order	Animal Types	Mammalian blood	Large Mammal	Other	Invertebrates	Fruit, Seeds, Flowers	Soft fibrous	Woody	
Airbone	Chiroptera	Many Microchiroptera				X				
Land-Arboreal	Chiroptera	Some Microchiroptera			X	X				
	Primates	Tarsiers			X	X				
	Marsupalia	Opposums								
	Primates	Lemurs; Lorises; Galagos; Gibbons								
	Carnivora	Most Procyonids; Many Veverids								
	Primates	New World monkeys; some Old World monkeys			X	X	X	x		
	Primates	Aye-Aye				X	X			
	Rodentia	Squirrels; Flying squirrels				X	X	x		
	Primates	Orang-Utan				X	X	X	x	
	Rodentia	Dormice			X	X	X	x		
Chiroptera	Fruit bats						x			
Dermoptera	Flying lemur				X	X				
Rodentia	Tree rats				X	X				
	Marsupalia	Thalangers; Tree kangaroos			X	X	X	X		
	Primates	Leaf-eating monkeys			X	X	X	X		
	Rodentia	Tree Porcupines				X	X	X		
	Carnivora	Giant panda				X	X	X		
	Proboscidea	Elephants				X	X	X		
	Artiodactyla	Cheetahs				X	X	x		
	Primates	Indris								
	Eidentata	Sloths								
	Hyraiodoea	Tree hyraxes								
	Perisodactyla	Tapirs; Most Rhinoceros								
	Artiodactyla	Many Deer; Giraffes; Okapi; Some Antelopes; Bison								
Land-surface	Chiroptera	Vampire s	x							
	Primates	Man	X	X	X	X	X	x		
	Carnivora	Wolves; Hyenas; Large cats		X	X					
	Marsupalia	Diaryues		X	X	X				
	Chiroptera	Some microchiroptera;		X	X					
	Carnivora	Aardwolf; small cats		X	x					
	Marsupalia	Bandcoots			X	X	x			

Man belongs to the Mammalian Order “Primates”; the Animal Type – “Man”; and on the food spectrum, he can feed on foods of both animal origin and vegetable origin. Man can feed on the blood of other mammals, the flesh of other mammals, birds, reptiles amphibians and fish, molluscs, insects and crustaceans (There is a culture which regularly ate earthworms and other annelids). Man eats honey, many fruits and nuts and he is able to extract the nutrients from lightly cellulosed plant materials by cooking, recourse only open to his species.

I have to quickly beat myself back to the track before people start to question the relevance of Animal Production and my specialization Animal Nutrition and Biotechnology to the society such that my job and those of us in the field of Animal Science might not be put on the line. Mr. Vice – Chancellor, Sir, I hope you will not contemplate closing down of the Departments of Animal Production and Health as well as Animal Nutrition and Biotechnology. Rather we are requesting that you expedite action on the creation of a Faculty of Animal Sciences as stipulated by the “Charter of the Nigerian Institute of Animal Science”.

Animals generally provide man with the necessities of life – Food, shelter, clothing and also serve him in many other ways. Animals are used by man to provide Farm-power, to provide manure to replenish soil nutrients taken by plants; as source of medicine (e.g. insulin) to cure many ailments.

Table 2:

MAJOR ANIMAL BY-PRODUCTS AND THEIR UTILIZATION:

NO	By-Products	Processed Product	Industrial use	Remark
1	Blood	i. Blood meal ii. liquid blood	i. Animal feed and fertilizer ii. Source of serum for pharmaceuticals, albumin for glue, textile and dye industries	Proper treatment to avoid transmission of disease like anthrax
2	Bone	i. Bone meal ii. Fatslabs	i. Animal feed and fertilizer ii. Button, knife handle, dice, chessmen, combs, etae, gelatin	Needs proper processing
3	Hides and skin	Leather, hair	Footwear, gloves, belts, bags, upholstery textiles, drums, mats, musical strings, garment and brushes	Skin for food or industry in Nigeria
4	Horns and hooks	Horn and hoof meal	Fertilizer, gelatin and glue, combs, buttons, hairpins, decorations	
5	Gut contents, manure, solid waste	i. Feed ii. Methane	Animal feed, compost making, biogas as fuel for heating and lighting, stimulate microbial growth and plants, fish feeding in ponds.	
6	Meat fat/fallow	i. Tallow ii. Lard	Soap, and glycerin for lubricants, grease and waxes, industrial oil, fuel for heating and as energy source in animal feed.	
7	Feathers	Hydrolysed meal, feathers feather	Animal feed, decorations, upholstery, pillow, mattresses, fans, bats.	
8	Glands and organs	Pharmaceutical enzymes	Medicines: insulin, oestrogen, adrenalin	
9	Intestines	i. Surgical suture ii. pet food	Sheep intestine as catgut Sausage casing musical strings	For stitching
10	Lungs and liver	Heparin Cholesterol	Medicine.	Anticoagulant

Major Animal by-products and their utilization for food, meat, milk, eggs and various forms into which man can process them are available to man. The main essence of caution is that man has to limit how much of these animal products he consumes taking into account his age, state of health, occupation and well being. Our young people may still benefit from the array of animal foods because of the high densities of the nutrients in such foods. But as man advances in age, the luxury of the consumption of such delicacies and fashion foods that are prepared from animal products should be dispensed with.

Man derives many more benefits from animals than those already discussed. The horse, the elephant and others provide man means of enjoying his leisure. While the horse is used in sports like horse racing and polo, the elephant is used in circuses especially among people of the Eastern world. The dog provides man security in various forms. The cat keeps man company in the home while some people keep other species of animals, though they may be poisonous, such as snakes, scorpions and the like as pets.

Man will continue to need animals in so many ways, even in those researches and studies that contribute to human civilization. Remember space scientists, medical researchers and others who use various species of animals to serve as models in their studies!

4.0 THE SECRET OF LONG LIFE:

An Ancient sage said, “Man does not die: He kills himself 58. This is a truism for many people. It is also true that all must die sometime but many through their actions or inactions kill themselves before they reach their natural appointed time to die. Many young men and women enjoy good health and strong physique but when warned to desist from bad habits that injure health, they scoff and say “I am young and strong; doing this will not hurt me”. They however forget that what a man sows, that he will reap. Such bad habits as sexual excesses, the use of drugs, alcohol and tobacco are seeds of ill-health and they shorten life. All hope is not lost for those who have already passed their youthful period and may have been afflicted with diseases, they can still lengthen their years if they will at once leave off all those habits that injure the health and begin to practice those things that tend to prolong life.

To live long a Man must be temperate. Temperance is one of the essentials of long life. This requires that one must be free from excesses of all kinds – excessive eating and drinking; also is the need to control ones passions as well as to be able to control ones appetite. Avoidance of anger, envy, bitter feelings and having kind thoughts, contented mind which make one to act in harmony with the infinite one who rules the universe, are all pre-requisites to prolong one's life.

Daily exercise is essential in order to live long. This is because the body is likened to a machine and if an engine is not used, it soon gets rusty: and a rusty engine very easily breaks. Even old people should engage in daily exercise of walking in the fresh air of the environment such that they can continue to enjoy the use of their legs.

The mind should be exercised by reading and discussing important subjects. This and moderate physical exercise will keep the circulation active in the brain and will help to prevent the onset of mental retardation.

Many more people are becoming affected by nutrition-related diseases, such as cardiovascular disease or obesity to mention a few. In like manner, concerns about the rising cost of health care are being voiced nationwide. All these are related to unhealthy life-styles. One way of minimizing the effect of this phenomenon is adopting healthier lifestyles which include healthy eating. The practice of healthy eating, which may become a sine qua non for those in the latter years of life or are already feeling the pangs of the so-called diseases of old age, may best be achieved with a plant-based diet. A plant-based diet may be defined as a regimen that encourages whole, plant based foods and discourages meats, dairy products, and eggs as well as refined and processed foods. The advantages of such a diet include their cost effectiveness and the tendency to lower the body mass index, blood pressure, HbA10 and cholesterol levels. Such a diet regime may also reduce the number of medications needed to treat chronic diseases and lower ischemic heart disease mortality rates.

A healthy, plant-based diet aims to maximize consumption of nutrient-dense plant foods while minimizing processed foods, oils and animal foods (including dairy products and eggs). Such diet encourages consumption of lots of vegetables (cooked or raw), fruits, beans, peas, soybeans, seed and small amounts of nuts and should generally be low in fat. When the diet is to be used for reversal of a disease condition, it may include small amounts of animal products such as egg white and skim milk. The general term used for such diets is vegetarian or vegan. It should be noted that such diets that are adopted for ethical or religious purposes may not be healthy. A plant-based diet, despite its numerous benefits, is not an all-or-nothing programme. It is however, a way of life that is tailored to each individual's needs. It may especially be beneficial to those suffering from obesity, Type 2 diabetes, high blood pressure, lipid disorders or cardiovascular disease.

The benefits that could be realized will be relative to the level of adherence and the amount of animal products consumed. Though the diet type may not cure chronic diseases, but it may help prevent and control them by changing how we eat.

4.1 RULES FOR LONGEVITY:

1. Be sure to have the rooms you occupy well ventilated.
2. Seek out door occupations and recreation
3. Sleep out doors if you can
4. Breathe deeply
5. Avoid overeating
6. Eat sparingly of meats and highly spiced foods
7. Eat slowly and chew thoroughly
8. The bowels should be evacuated daily
9. Stand, sit and walk erect
10. Keep the teeth, gums and tongue clean by brushing the teeth daily
11. Follow principles of sanitation to prevent disease producing organisms from entering the body
12. Do not overwork. Rest when you are fatigued. Sleep from seven to nine hours daily, according to your needs.
13. Avoid anger and worry-keep serene

Source: Selmon, A.C. (Revised by Nelson P.S. (1969)

- The New Health and Longevity P.92

5.0 CONCLUSION

It has been shown by the arguments canvassed in this presentation that man, is by constitution and by construction, naturally endowed with the ability to subsist on Foods of plant origin – fruits and nuts particularly. But that the body of man can live upon other foods and maintain a certain degree of health. Man has by adaptation (evolution) occasioned by modernization through the development of crop and animal agriculture modified his diets to include products from these other sources. The important fact that the consequences that man suffers from such dietary patterns are grievous because most of the diseases associated with advances in age are nutrition related. We have been cautioned to abstain from excessive consumption of foods derived from animal products.

There are so many more ways man can derive benefits from livestock that would rather enhance his healthy living than injure his organism. Some Fruits and nuts that we may have around include apples, bananas, pears, grapes, pineapples, oranges and lemons, melons and tomatoes. Various types of nuts and legumes are known to be great source of proteins and may serve as the sole element of the meal or when mixed with fruits.

6.0 RECOMMENDATIONS

Mr. Vice Chancellor, Sir, it is gratifying to note that after about twenty-five years when a fifty (50) – student capacity laboratory was built for the Department of Animal Production and Health, the University is now, under the financial support of the Tertiary Education Trust Fund, providing a laboratory building complex for the Faculty of Agricultural Sciences. While the capacities of the laboratory spaces under construction may not be enough for the number of students intended to use them, the development is progressive.

It is strongly recommended that the University should provide the right types of equipment and materials that would make these laboratories functional. This will encourage researchers to diversify into areas more related to human nutrition for healthier, hardier and happier human population. This is because there are many local fruits and nuts that may be nutritious but are yet to be fully exploited or even not yet known with regard to their chemical composition and nutritional value. Some of these include the African mango” (oro)”, 'Osan agbalumo'; Walnut (awusa), 'agbayun' etc.

Also Mr. Vice-Chancellor Sir, the University has a gold-mine that has remained not utilized since. This is the Adegolu – 7,500 – layer Poultry – house with all the cages and ancillary facilities.

Be it remembered that during the 1994 crisis that commemorated the 1993 – annulment of the Late MKO Abiola's June 12 Presidential election, this University subsisted on the proceeds from the sale of eggs from a 2,500 layer poultry outfit. I am recommending that you reactivate the use of the Adegolu Poultry house and such other non-functional facilities such that the “Enterpreneural Studies Programmes “ could take advantage of these livestock resources and complement the internally – generated revenue base of the University.

Finally, I wish to recommend that no matter the age, sex, and state of health or status of all of us here today, we should all pay better attention to what we eat and not be contributors to the untimely deaths of our human bodies.

Thank you for listening!

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Mr. Vice – Chancellor, esteemed invited guests, ladies and gentlemen of the Press (especially Mr. Ninyo Adediji), I thank you for your patience. God bless you.