BE FRUITFUL AND MULTIPLY: THE BLESSING, THE LIVESTOCK AND THE QUALITY OF LIFE

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The Chairman and Vice-Chancellor, Professor Julius A. Okojie

The Deputy Vice-Chancellor

Other Principal Officers of the University

My Lords Spiritual and Temporal

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Members of the Fourth Estate of the Realm

Distinguished Guests

Highly esteemed Colleagues

Great Unaabites

Ladies and Gentlemen

This is the day that the Lord has made.
I will rejoice and be glad in it.

It is my pleasure and privilege to welcome you all to my inaugural lecture which is titled *Be fruitful and multiply: The blessing, the livestock and the quality of life.* For the past 27 years I have engaged in research and teaching, principally in the field of Reproductive Physiology, a specialised field within Animal Science.

Mr. Chairman, Sir, distinguished Ladies and Gentlemen, Great Unaabites: It is by the special grace of God that I stand before you today to share my experiences as a Reproductive Physiologist in an eventful academic career. If by the end of this lecture I would have shed a bit more light on public understanding of this (in the Nigerian context) obscure field of Animal Agriculture, if I would have somehow inspired a few more

students to venture into this very interesting field, and if I would have shown a little justification for the huge investments made on me by my family and country, then my task would have been accomplished.

THE BLESSING

And God blessed them, saying,

Be fruitful and multiply…..**(Genesis 1[22a], KJV)**

Mr. Vice-Chancellor Sir, in the biblical account of creation, God rested on the seventh day, having concluded the feats of wonder with the creation of Man. My question for you, Sir, is:

Why was God able to rest on the seventh day of creation?

The answer, Ladies and Gentlemen, is this:

God was able to rest on the seventh day because he granted all creatures the power to REPRODUCE. This was the first blessing.

Defining animal reproduction

Animal reproduction is the process through which offspring are produced by male and female parents. It normally involves heterosexual mating, conception, pregnancy, parturition and lactation. Conception occurs as a result of the fusion of the male and female gametes, namely spermatozoon and ovum respectively, in a process known as fertilisation. Before animals can reproduce, they must first attain puberty or reproductive age, from when they become capable of gamete production. Reproduction in animals involves close co-ordination or synchronisation of various physiological events and this is largely achieved through the actions of the reproductive hormones.

A proper understanding of animal reproduction would involve some knowledge of reproductive physiology, endocrinology, environmental physiology, cell biology, immunology, genetics, biochemistry, sociology, reproductive diseases, psychology, embryology, obstetrics and so on.

In agriculture, animal production revolves around reproduction. Livestock products such as eggs and milk are direct outputs from reproductive processes. Meat production depends primarily on production of offspring, which are subsequently grown out or fattened for slaughter. To a large extent, the efficiency of reproduction is the key determinant of profit margins.

Reproductive technologies

It is worth noting that some of the most spectacular technological advances in the latter half of the 20th century were in the area of human and animal reproduction. Throughout human existence, the ability to reproduce has had attached to it great sociological importance. There is often the desire to have a child of a specific sex. Also, the birth of twins is often accompanied either by much joy or much sorrow, depending on the beliefs of the community concerned.

The development of in vitro fertilisation techniques about two decades ago has widened opportunities for childless couples to have babies. The ability to preserve gametes and embryos in viable states for eternity has had a positive impact on the preservation and dissemination of animal genetic resources globally. It is now feasible to clone live or dead animals from preserved tissues.

In livestock production, the technique of multiple ovulation and embryo transfer has opened up possibilities for rapid genetic improvement. This is due to the opportunity it offers to apply high selection pressure on the female side, just as artificial insemination had made possible for the male side several decades ago.

An idea of some of the available technologies for manipulation of the reproductive process in mammals can be glimpsed in Chart I. It is possible these days for a man who died fifty years ago to still father a child, provided his semen was preserved. A couple could soon be able to have, if they so wish, a, designer baby of a particular sex, colour of eyes and IQ. A highly productive animal could be cloned to produce several more copies for a farmer.

Mr. Vice-Chancellor, Sir, distinguished Ladies and Gentlemen, I submit that the first blessing has succeeded so well with humans that the world today is overpopulated. Many are poor and hungry, especially here in Nigeria. I further submit that to alleviate poverty and feed the masses, the first blessing must now be efficiently put to work for food crops and livestock.

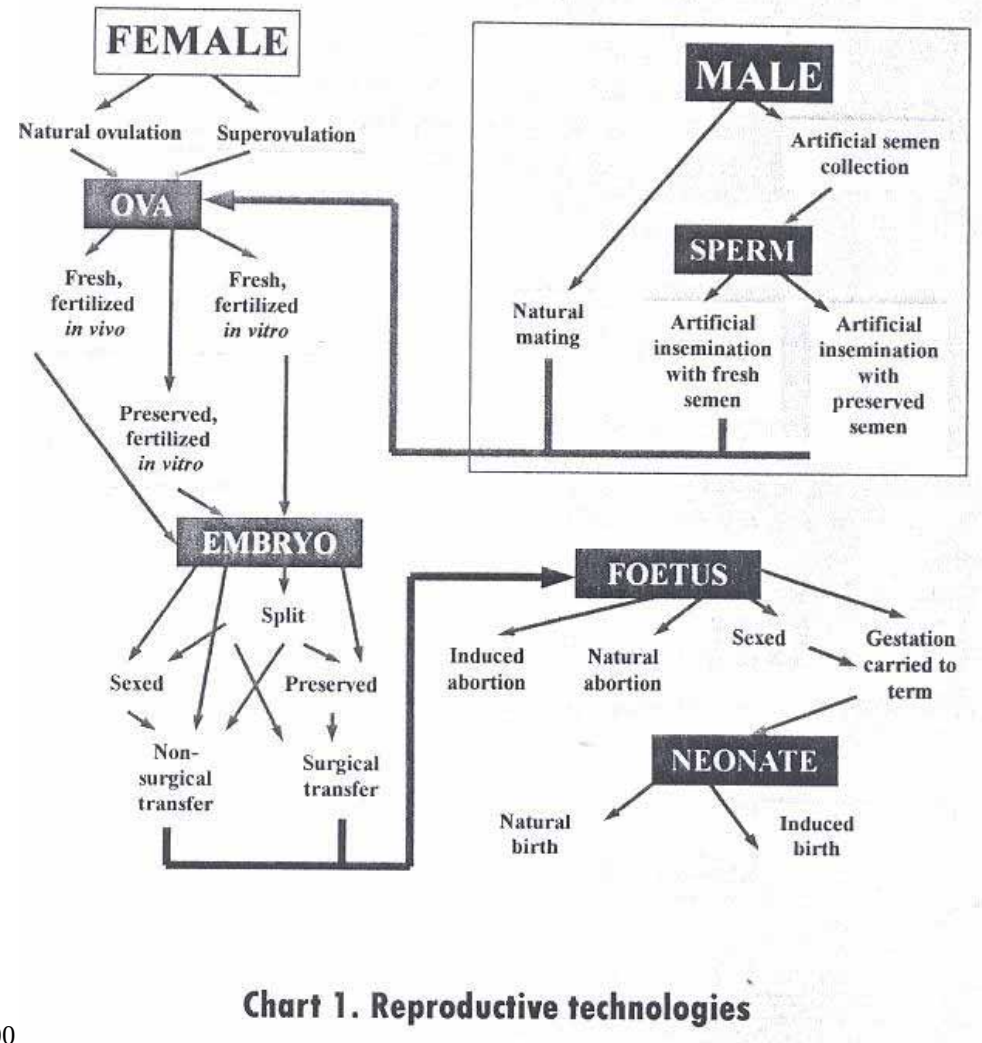


Chart 1. Reproductive technologies

Osinowo, 2000

THE LIVESTOCK

Do you know when mountain goats are born?

Have you watched wild deer give birth?

Do you know how long they carry their young?

Do you know when they crouch down

And bring their young to the world?

- (Job 39[1-9])

Sexual development in Yankasa rams

In sheep breeding programmes, the optimum rate of genetic improvement can be achieved through the application of high selection pressure and reduction of the generation interval. The former is enhanced by a high reproductive rate, achieved, for example through accelerated lambing schemes, while the latter can be achieved through the use of selected animals for breeding at an early age.

A study of the postnatal growth and development of the reproductive tract in Yankasa rams was carried by Osinowo *et al.* (1992). Highly significant correlation coefficients were preponderantly obtained between age, liveweight, gonadal and accessory sex organ development. Spermatogenesis had commenced in all rams by 14 weeks. Spermatozoa were present in the testes, epididymides, ductus deferens and ampullae of the rams at 39 weeks, by which age all penile adhesions had completely disappeared.

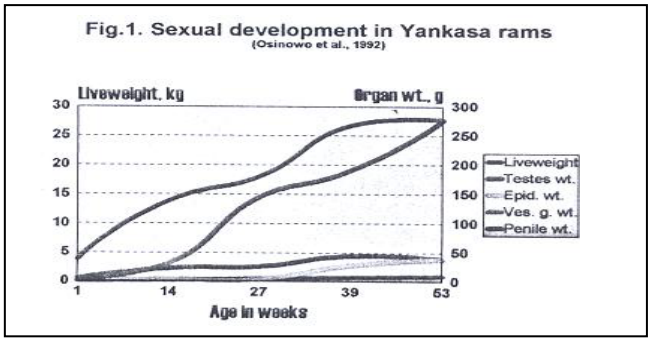


Fig. 1. Sexual development in Yankasa rams (Osinawo *et al.*, 1992)

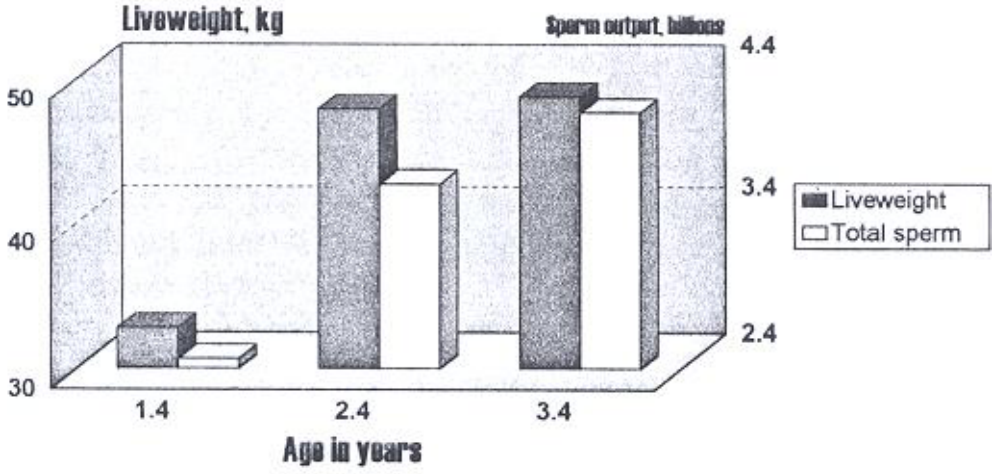
Gonadal sperm/spermatid count per ram averaged 13.9 x 10^9 cells, 17.6 x 10^9 cells and 21.4 x 10^9 cells at 27, 39 and 53 weeks respectively. Epididymal sperm reserves at the same ages were 1.3 x 10^9, 11.6 x 10^9 and 24.0 x 10^9 spermatozoa, respectively.

It is was concluded that Yankasa rams could be used for breeding from 39 weeks of age by which time all component parts of the reproductive tract were fully functional.

Semen quality and sperm output of Yankasa rams at different ages

Semen quality and sperm output of Yankasa rams at different ages were studied by Osinowo *et al.* (1988). Three groups of three rams aged 1.4, 2.4 and 3.4 years, weighing 32.8±0.8, 47.9±1.4 and 48.8±1.3 kg were ejaculated once per day for 14 days. Results showed that qualitatively, the ejaculates of rams aged 1.4 and 2.4 years were slightly better than those of rams aged 3.4 years. Quantitatively however, the latter were superior to the others (Fig. 2). Total sperm output per ejaculate (Y, x 10^9) was significantly correlated with scrotal circumference (X, cm) by the geometric regression equation $Y = 0.000128\ X^{3.03}$ ($r=0.71$; $P<0.05$).

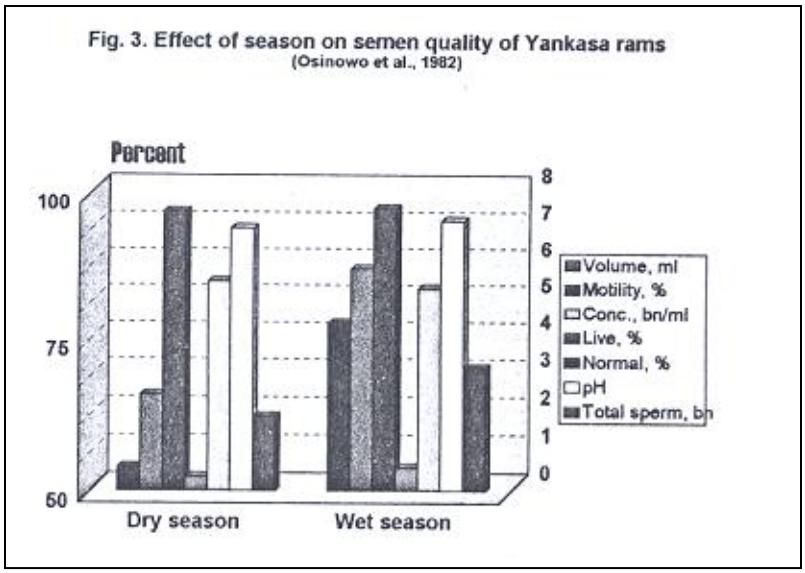
Fig.2. Effect of age on sperm output in Yankasa rams
(Osinowo et al., 1988)



Seasonal effects on semen quality of Yankasa rams

Some evidence for seasonal effect on ram semen quality was reported by Osinowo, *et al* (1982). Ejaculates collected during the wet season had higher volume, pH sperm motility and percentage of normal sperm than those collected during the dry season (Figure 3). However, the observed seasonal differences do not appear severe enough as to prevent all year round breeding.

Fig. 3. Effect of season on semen quality of Yankasa rams
(Osinowo *at al.*, 1982)

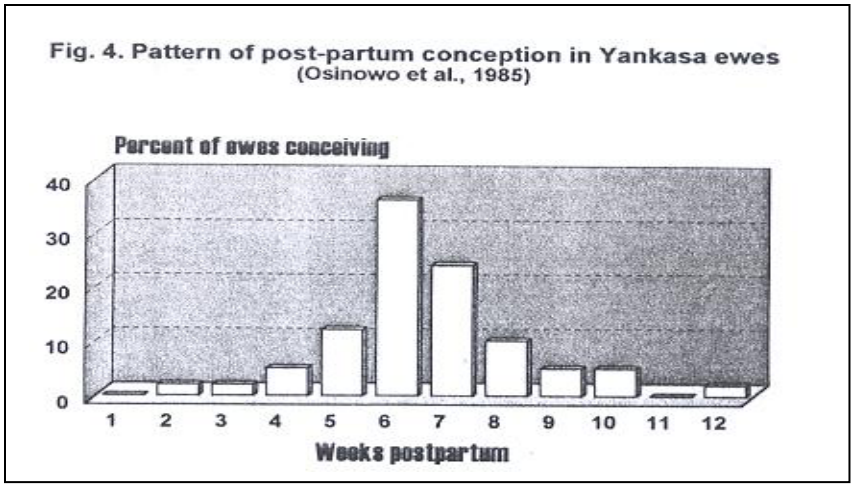


Postpartum oestrus and conception in Yankasa sheep

It is well known that tropical sheep breed throughout the year due to the absence of a non-breeding season, which obtains in temperate regions of the world. Concerning accelerated lambing in Yankasa ewes, studies were commenced in Zaria in 1979. It was clear right from the onset that an optimum of two lambings annually per ewe could be realised only if the re-breeding interval could be restricted to just 33 days, given a gestation period of 150 days.

A study of the pattern of postpartum oestrus and conception (Fig. 4) in Yankasa sheep (Osinowo and Ekpe, 1985) showed that re-breeding intervals averaging about 44 days could be realised under good management. For 61 ewes, the mean postpartum intervals to first oestrus and conception were 34.3$\pm$1.6 and 42.5$\pm$1.5 days respectively.

Fig.4. Pattern of post-partum conception in Yankasa ewes
(Osinowo *et al*., 1985)



Accelerated lambing of Yankasa ewes

The reproductive performance of Yankasa sheep under a twice-yearly lambing scheme was investigated by Osinowo et al. (1986). An average of 94 ewes were maintained and bred in the flock through four lambing periods in the 2-year study (Table 1). Mean lambing rate was 89.6% while litter size averaged 124. The number of lambs born per ewe bred at each lambing averaged 1.11. The weaning rate and weaning weight averaged 79.2% and 9.56 kg respectively. For the whole flock, the number of lambs born and weight of lambs weaned were 2.22 and 16.8 kg per ewe per year respectively.

Gestation length, litter size and litter birth weight in Yankasa sheep

Gestation length is the interval from fertile service to parturition and is principally determined by genetic factors. However, there is limited but definite variability in gestation length, which is accounted for by maternal, foetal and environmental factors. There appeared to be no report on gestation length as a trait of the foetus while no estimates of genetic correlations between gestation length, litter size and litter birth weight had been reported for any tropical African sheep breed, which led to a study by Osinowo, Abubakar and Trimnell (1993).

Table 1: Reproductive performance of Yankasa ewes under accelerated lambing

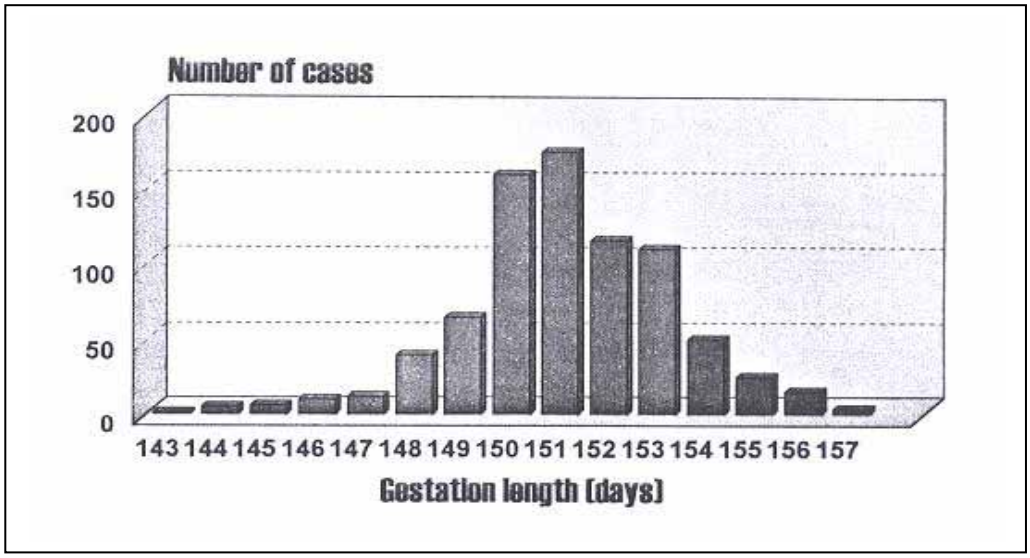
Item	1984 lambings		1985 lambings		Overall	Lambing details per 100 ewes/yr
	1st	2nd	1st	2nd		
Ewe bred	**98**	**77**	**97**	**104**	**376**	**100**
Ewes lambing	**93**	**76**	**87**	**81**	**337**	**-**
Lambing rate, %	**94.90**	**98.70**	**89.69**	**77.88**	**89.63**	**-**
Lambs born	**119**	**91**	**118**	**91**	**419**	**222.28**
Av. Litter size	**1.23**	**1.20**	**1.36**	**1.12**	**1.24**	**-**
Lambs/ewe bred	**1.21**	**1.18**	**1.22**	**0.88**	**1.11**	**-**
Lambs weaned	**79**	**81**	**98**	**74**	**332**	**158.48**
Weaning rate, %	**66.39**	**89.01**	**83.05**	**81.32**	**79.24**	**-**
Weaning weight*, kg	**7.06**	**12.82**	**8.65**	**9.88**	**9.56**	**1515.07**

Source: Osinowo *et al*. (1986)

The gestation length frequency distribution for Yankasas sheep, using records of 834 lambings collected over an 8-Year period, is as presented in Fig. 5. Gestation length averaged 151.4 $\pm$ 0.2 days. Litter size, year of birth and litter birth weight had significant influences on gestation length, while the effects of parity, season of birth and sex of lamb were not significant. Single lambs had a gestation length longer by 1 day than twin lambs (151.9 vs.150 days). The relationship between litter birth weight and gestation length was curvilinear with partial regression coefficients of 0.67 and -0.24 for the linear and quadratic components respectively.

Heritability estimates by Paternal half-sib analyses, taking gestation as a trait of the foetus, were 0.20, 0.11 and 0.05 for gestation length, litter size and litter birth weight, respectively. Genetic and phenotypic correlations between gestation length and litter size, gestation length and litter birth weight, and litter size and litter birth weight were -0.29 and -0.15, 0.93 and -0.04, and 0.25 and 0.74 respectively. The negative genetic correlation between gestation length and litter size is an indication that selection for large litter size would be accompanied by a reduction in gestation length.

Fig.5. Frequency distribution of gestation length in Yankasa ewes
(Osinowo *et al*., 1993)



Dry season supplementary feeding in Yankasa sheep

The adoption of accelerated lambing scheme in the sub-humid and semiarid zones of Nigeria would result in one of the lambing seasons falling in the fodder-deficient dry Season. Poor nutrition of ewes during this season was recognised as being probably the most important single factor likely to depress biologic efficiency. The effect of dry season supplementary feeding on the reproductive performance of a twice-yearly lambing flock of Yankasa sheep was therefore studied by Osinowo, Doma, Pathiraja and Buvanendran (1987).

The results clearly showed the necessity for dry season supplementary feeding for optimum performance (Figs 6 - 7). Supplementation of ewes from late gestation resulted in higher lamb birth and weaning weights, lower ewe and lamb mortality up to weaning, and greater proportions of ewes bred within a short interval after lambing. Supplemented ewes also tended to have larger litter sizes than non-supplemented ones.

Fig 6. Effect of Dry Season Supplementary Feeding on Birth Weight, Weaning Weight, Weaning Rate and Ewe Mortality in Yankasa Ewes
(Osinowo *et al.*, 1987)

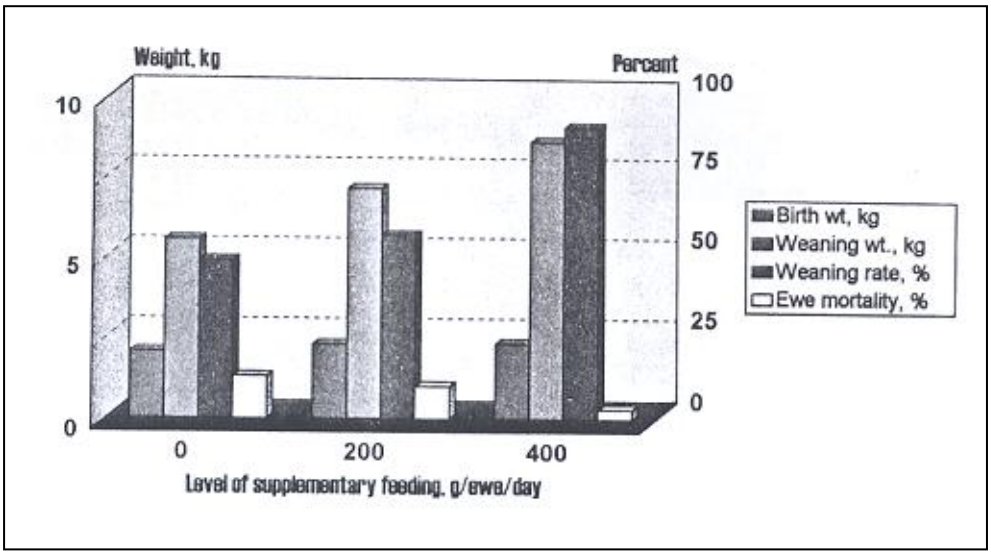


Fig. 7. Effect of Dry Season Supplementary Feeding on Litter Size, Lambing per Ewe in Flock and Postpartum Oestrus in Yankasa Ewes
(Osinowo *et al.*, 1987)

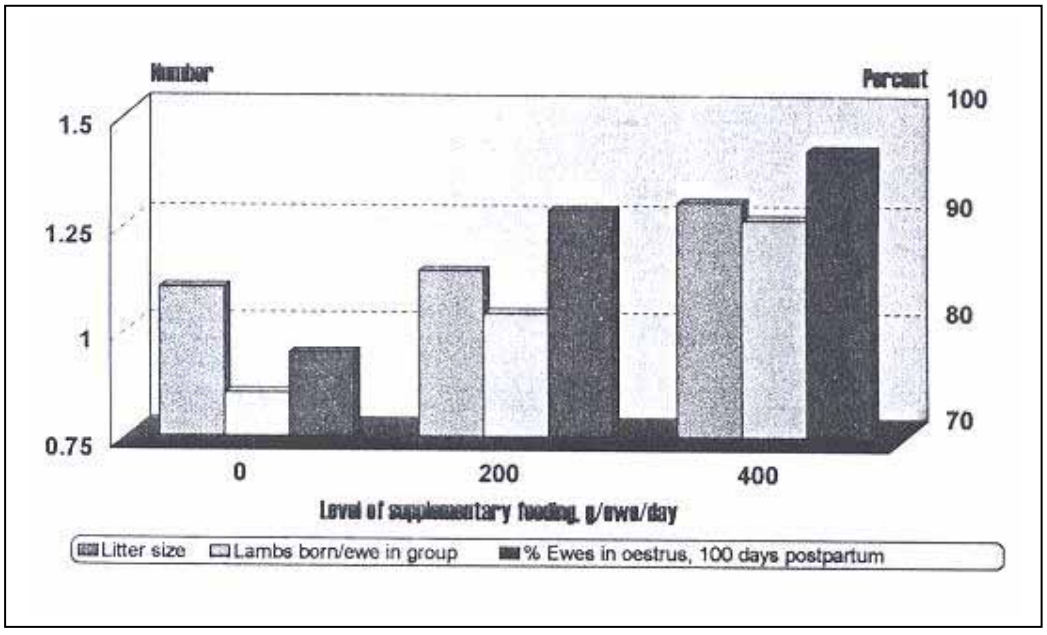


Chart II. Correlation Coefficients between climatic variables in the sub-humid zone of Nigeria

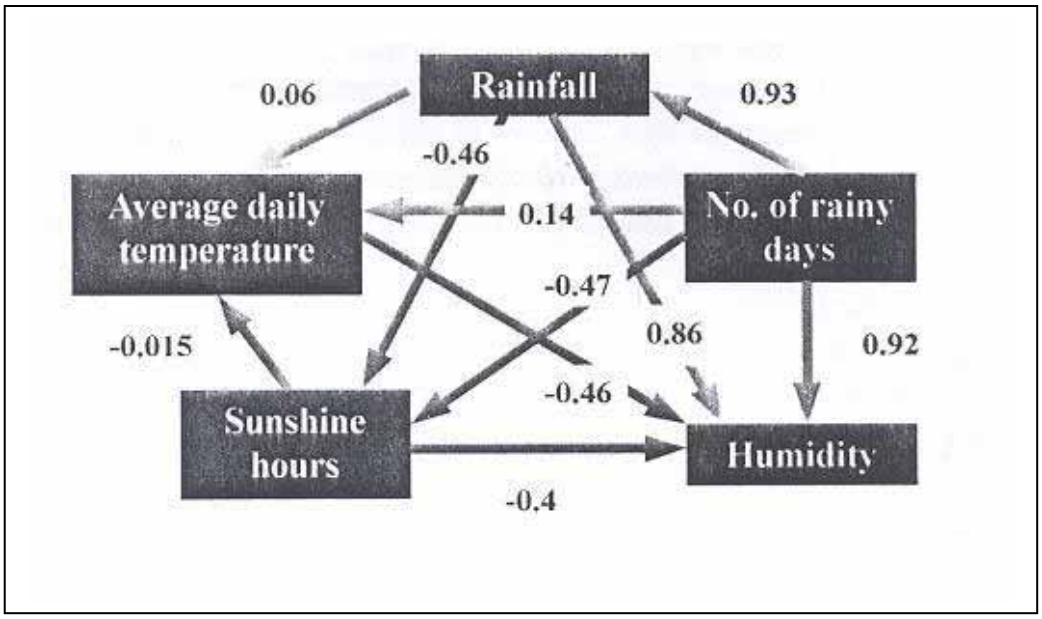
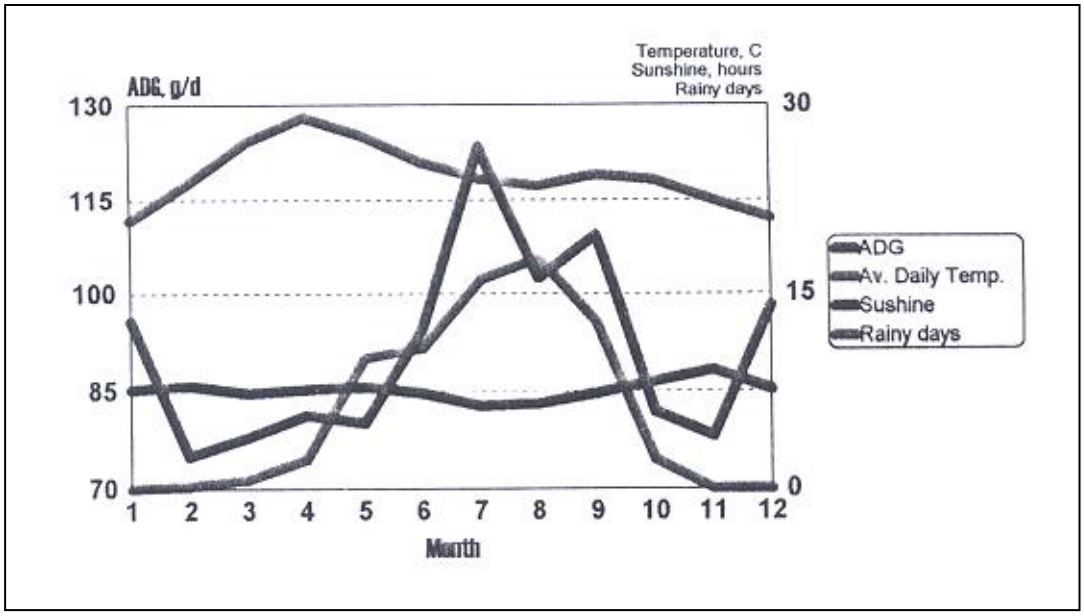


Fig. 8. Effects of mean daily temperature, rainy days and sunshine hours on average daily gain in Yankasa ewes
(Osinowo *et al.*, 1987)



Climatic effects on pre-weaning growth in Yankasa sheep

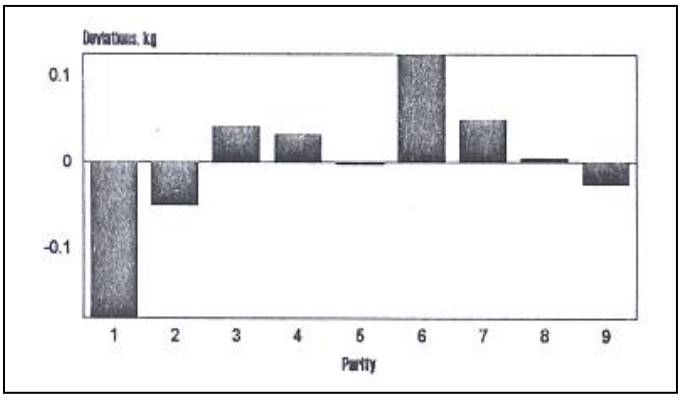
Climatic factors influence sheep productivity through their effects on forage and water availability, thermal stress, photoperiod and disease prevalence. These are usually reflected as seasonal trends in growth, reproduction and morbidity. These relationships were studied in Yankasa sheep within the sub-humid zone of Nigeria, using data on 1,180 lambs born between 1983 and 1991. The animals were semi-intensively managed.

The correlations between the amount of rainfall, number of rainy days, humidity, sunshine hours and mean daily temperature are presented in Chart II. All the fixed environmental factors examined (parity, litter size, sex, month and year of birth) had highly significant effects on birth weight, weaning weight and average daily gain. Weaning weight (WW) and average daily gain (ADG) were highly significantly influenced by average daily temperature and sunshine hours (Fig. 8).

WW and ADG were highest between July and September, which coincided with the period of moderate temperature, highest rainfall and lowest sunshine hours for the experimental location at Shika, Zaria. The lowest WW and ADG were obtained during the hottest months of the year from March to May, and also in February and November, which are the transition months from cold to hot and warm to cold weather respectively.

Environmental and Genetic factors Affecting Pre-weaning Growth in Yankasa Sheep

Fig. 9. Effect of parity on birth weight In Yankasa ewes (Osinowo e*t al*., 1992)



Data on birth weight (BW), 90-day weaning weight (WW) average daily gain to weaning (ADG) and weaning rate (WR) for 2,020, 1,203, 1,203 and 1,576 Yankasa lambs were analysed for effects of parity, litter size, sex, month and year of birth Osinowo *et al* (1992).

Fig.10. Effect of parity on weaning weight in Yankasa ewes (Osinowo *et al*., 1992)

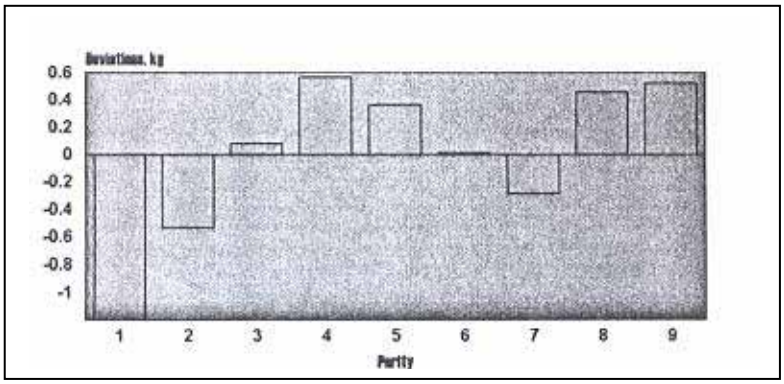


Fig.11. Effect of parity on weaning rate in Yankasa ewes (Osinowo e*t al*., 1992)

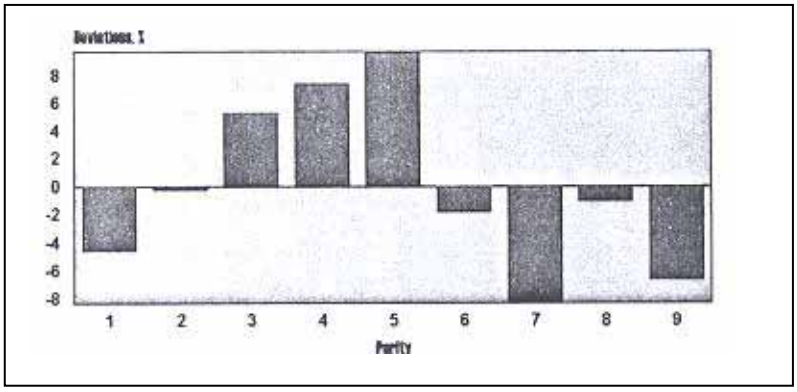


Fig.12. Effect of month on birth weight in Yankasa ewes (Osinowo e*t al*., 1992)

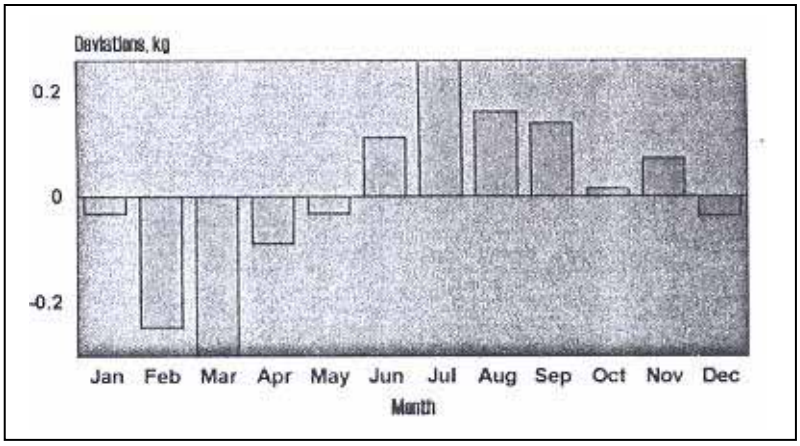


Fig.13. Effect of month on weaning weight in Yankasa ewes (Osinowo e*t al*., 1992)

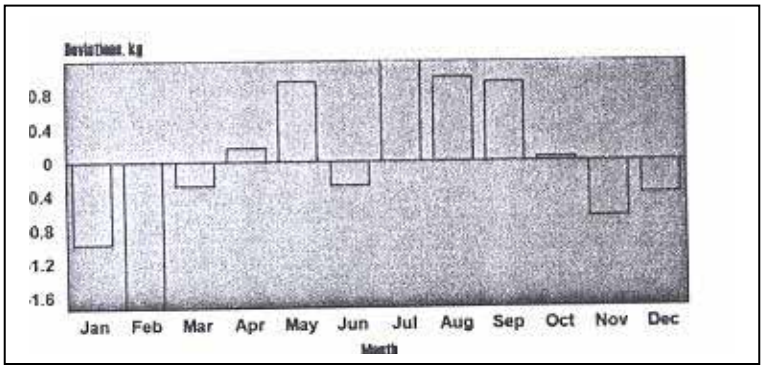
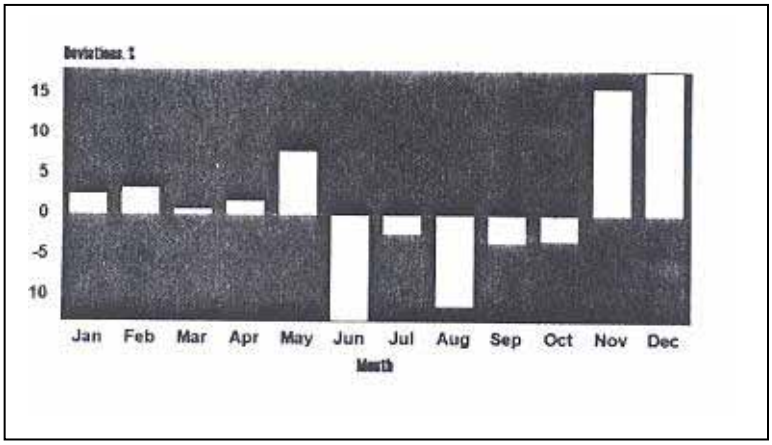


Fig. 14. Effect of month on weaning rate in Yankasa ewes (Osinowo e*t al*., 1992)



Least squares means (± SE) for BW, WW, ADG and WR were 2.51 $\pm$ 0.01 kg, 10.87 $\pm$ 0.08 kg, 91.86 $\pm$ 0.91 g/d and 0.78 $\pm$0.01 BW, WW and ADG were significantly affected by parity, litter size, sex, and month of birth. WR was significantly affected by parity, litter size, month and year of birth but not by sex of lamb.

Generally, the pre-weaning growth traits were better in the wet seasons than in the dry seasons while the reverse was true for weaning rate (Figs 9-14). Heritability estimates by paternal half-sib analyses were 0.46 and 0.66 for BW and WW respectively, while genetic and phenotypic correlations between the two traits were 0.55 and 0.43.

The implications of the results of this study are that:

i. Breeding ewes should be culled after the fifth parity to reduce pre-weaning mortality.

ii. While lambs born in the wet season have better growth than those born in the dry season, the latter have a lower rate of pre-weaning mortality. Lambing in either season therefore involves a trade-off between the two traits.

Sperm physiology

Sperm physiology can be described as the study of the mechanics of sperm function and it provides a scientific basis for the understanding of sperm maturation, motility, transport, preservation and fertilising capacity. Experiments on sperm physiology involving the author have focussed mainly on sperm enzyme leakage as an indicator of cell damage during semen processing, and on the development of a new sperm preservation method based on formaldehyde treatment.

The leakage of enzymes from washed ram spermatozoa was studied by Osinowo (1981). Washing resulted in significant losses of lactic dehydrogenase (LDH) and glucose phosphate isomerase (GPI) from the cell suspensions. Pre-incubation of washed ram spermatozoa with 0.025% formaldehyde increased GPI levels but decreased LDH concentration in the extracellular fluid while hexokinase release was unaffected. Varying the incubation temperature between 20 and 37^{o}C affected extracellular LDH and GPI levels. It was suggested that enzyme release from spermatozoa may occur in the absence of any apparent cellular damage.

An investigation on the effects of formaldehyde treatment, incubation period and temperature on the reversible inhibition of motility in a phosphate-buffered saline (PBS) diluent and on eosin uptake by ram spermatozoa was reported by Osinowo, *et al*. (1982). A concentration of 0.005% formaldehyde in PBS achieved complete immobilization of ram spermatozoa while also yielding good recovery of sperm motility after removal by washing (Table 2).

Table 2 Effect of low levels of formaldehyde on sperm motility

Concentration of formaldehyde in PBS (%)	Sperm motility (%)	
	Before washing	After washing
0 (Control)	95.0 ± 0	78.3 ± 4.4
0.0025	58.3 ± 7.3	75.0 ± 5.0
0.005	0	66.7 ± 11.7
0.01	0	0

Source: Osinowo *et al.* (1982)

At a higher formaldehyde concentration (0.01%) recovery rate declined with increasing dilution rate. Incubation of spermatozoa in PBS containing 0.005% formaldehyde beyond 6 h at 5, 15 and 25^{o}C resulted in poor recovery rates. Of the incubation temperatures, eosin uptake was lowest at 25^{o}C. During 4 h post-wash incubation at 30^{o}C sperm motility was significantly affected by pre-wash formaldehyde concentration, which had no effect on the proportion of eosinophilic spermatozoa.

Given the critical nature of sperm washing to the experimental work on formaldehyde treatment of spermatozoa, a study was conducted to develop adequate control measures for washing-induced changes in rain spermatozoa (Osinowo *et al.*, 1988). A graded increase in ficoll washing fluid volume from 2 to 6 ml resulted only in a marginal, non-significant increase in sperm washing efficiency from 98.0 to 99.1% while causing significant deterioration in sperm motility, eosinophilia and agglutination. Sperm washing with 2 ml ficoll solution lowered soluble protein concentrations by 72.4% in sperm suspensions and 87.9% in the extracellular fluid.

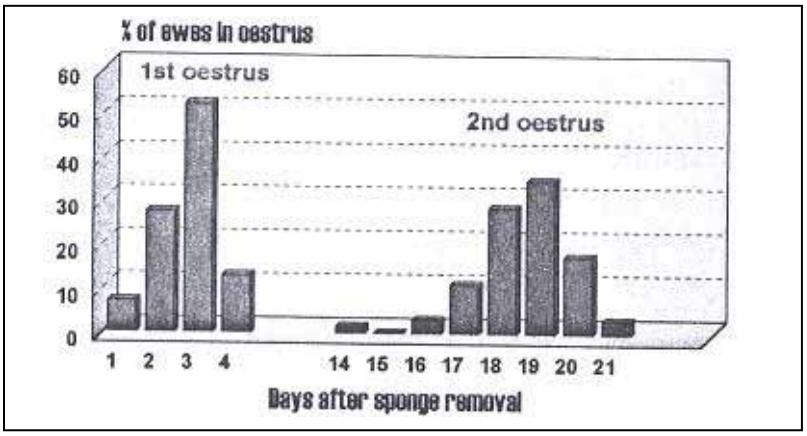
Motility of washed spermatozoa was significantly improved by the inclusion of 4 mg/ml of bovine serum albumin in the post-wash diluent. Sperm agglutination significantly declined with increasing citrate concentration in the post-wash diluent. Eosinophilia was also significantly reduced by re-suspending the washed spermatozoa in citrate diluent.

Oestrus synchronisation and artificial insemination in Yankasa sheep

Oestrus synchronisation of Yankasa ewes was tested by Osinowo (1982), using progestagen-impregnated vaginal sponges. Insertion of the sponges for 12 days followed by withdrawal resulted in good synchronisation of first and second post-treatment oestrus. Of 81 ewes treated,

about 80% exhibited oestrus I to 4 and 17 to 21 days after sponge withdrawal, for first and second oestrus respectively (Fig. 15). From this study, the oestrous cycle length in Yankasa sheep was determined to be 16.4 $\pm$ 0.1 days (n=61).

Fig. 15. Patterns of onset of oestrus in Yankasa ewes following progestagen treatment (Osinowo, 1982)



A study of the patterns of oestrus, conception and lambing in Yankasa ewes following progestagen treatment at different postpartum intervals was carried out by Osinowo *et al*. (1987). Results showed that ewes in which progestagen treatment was initiated 2 to 3 weeks postpartum had the shortest interval of 40.7 $\pm$ 2.5 days from lambing to conception (Table 3).

Table 3. Oestrus, conception and lambing patterns in control and progestagen-treated Yankasa ewes at different postpartum intervals

Parameter	Group					
	Control			Experimental		
	I	II	III	IV	V	VI
No. of ewes	11	11	17	19	14	20
Postpartum interval:						
To sponge insertion	-	-	-	10.7±0.4	18.6±0.5	26.0±0.6
To 1st oestrus	-	-	38.1±2.1	28.9±2.3	32.6±0.5	40.9±1.0
To conception	-	-	46.0±3.4	50.2+3.6	40.7±2.5	48.9±3.1
No. of oestrus periods per conception	1.09±0.09	1.0±0	1.29±0.14	1.95±0.12	1.50±0.14	1.45±0.17
% ewes lambing	81.8	100	82.4	94.7	85.7	90
Litter size	1.1±0.11	1.09±0.09	1.29±0.13	1.44±0.12	1.42±0.15	1.56±0.15

Source: Osinowo el al, (1982)

The first sheep artificial insemination trials in Nigeria were carried out by Osinowo (1982). Semen was collected by artificial vagina and extended in a Tris-glucose-yolk diluent at 30^{o}C. It was stored at room temperature (22-30^{o}C) and used within 8 hours of collection. The first trial involved 24 ewes while the second involved 39 ewes. All ewes were synchronized with progestagen-impregnated vaginal pessaries and inseminated at the second oestrus after synchronization. Lambing rates of ewes to artificial insemination or natural mating in Trial I were 50.0 and 91.7% respectively. Corresponding lambing rates in Trial II were 65.0 and 86.7%.

THE QUALITY OF LIFE

The supplies Solomon needed each day were
five thousand liters of fine flour
and ten thousand litres of meal;
ten stall-fed cattle
twenty pasture-fed cattle, and a hundred sheep,
besides deer, gazelles, roebucks, and poultry
- (1 Kings 4[22])

One piece of meat

The type of food we eat is as much a status symbol as a determinant of who we are. The undernourished child is stunted in growth, retarded in mental development and unable to attain his full intellectual potential. The hungry adult is lethargic, susceptible to diseases, irritable, incapable of optimal productivity and potentially a social misfit. Africa cannot realize its full potential economically, socially and politically unless its citizens are adequately fed. Hunger leads to socio-political instability, which in turn leads to more hunger. A Yoruba adage says, "*ibanuje mo niwon feni to ri gari wa mu*" (i.e. "*Sorrow is minimal for any person who find gari to drink*"). Filling the stomach may banish the worst manifestations of poverty, but enjoying the good life involves eating well.

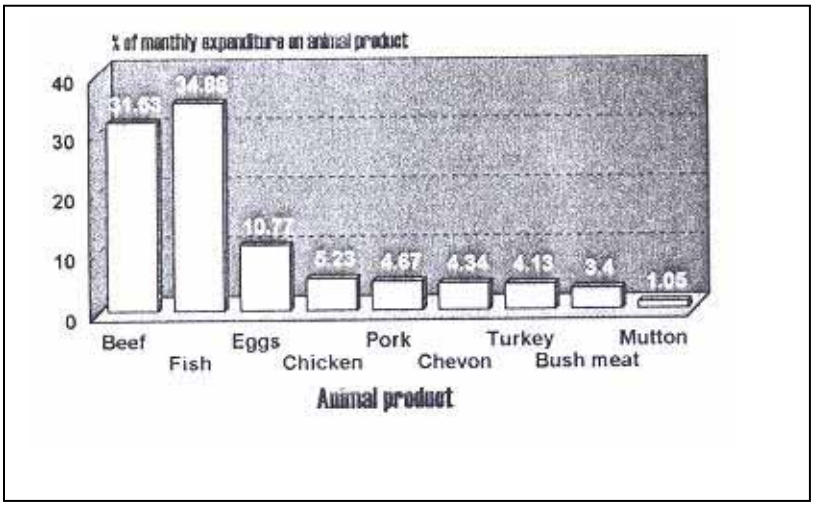
The quality of food is less a function of starchy foods which abound in Africa, but is rather a function of the animal protein content, which is in short supply. In 1992, the average Japanese consumed approximately, 4.5 times more fish, 12.6 times more eggs, 3 times more milk and 2.6 times more meat, than the average African (Osinowo, 1997). 1 make bold to state, "*Igbadun ni ka reran jeba*" (i.e. "*Enjoyment is being able to afford eating eba with meat*").

No matter the indices of socio-economic development used, regardless of any other achievement, in my opinion, the successful Nigerian leader is one who can ensure that every Nigerian citizen gets to consume at least one piece of meat, one egg and one glass of milk per day.

Livestock development in Ogun State

Livestock production in Ogun State revolves mainly around poultry, piggery and goat farming. The consumption pattern of animal products among households in Abeokuta as reported by Aromolaran and Igharo (1998) is presented in Fig. 16. Average monthly expenditure on animal products was 21 % of average monthly income of N3, 730.00 per household. From this data, it is clear that over 60% of the expenditure on animal products goes on species not produced in the State.

Fig. 16. Consumption pattern of animal products among households in Abeokuta
[Aromolaran and Igharo, 1998]



Conservatively, assuming 200 cows are slaughtered daily throughout Ogun State, each costing N25, 000.00, it follows that about N1.825 billion will be taken out of the State this year alone by the cattle dealers who scarcely re-invest in host communities. In the neighbouring State of Lagos, it has been estimated by Adubi and Aromolaran (1998) that a total of 202,087 cows would have been sold and slaughtered in 1998, amounting to a net outflow, according to my estimate, of N5.052 billion.

The need for a strategic re-think of livestock development policies in the entire Southwest region of Nigeria should by now be obvious, given the above scenario. It is safe to conclude from present trends that:

a) More and more resources will be devoted to beef purchases in Ogun State with increasing population growth and purchasing power.

b) The "increasing demand for beef will largely be met by supplies from the cattle Fulani who traditionally invest little in host communities.

c) Production and supply of beef will remain virtually outside the control of the State.

The strategic alternative is to develop the capacity for the substantial replacement of beef with other types of meat, which can be produced locally in abundance, with local producers re-investing their profits in the local economy. Ogun State should develop and promote poultry, pig and goat production for the following reasons:

i) These species of livestock constitute the bulk of holdings by indigenous producers.

ii) They are more amenable to intensive production systems suitable for the State, in view of the high population density and limited land.

iii) Production can be rapidly expanded to meet the animal protein needs of a growing population.

iv) With the faster rate of returns on investment, their production will be economically more beneficial to the State, especially as most of the profits will be re-invested locally.

v) Research has shown that relatively more poultry and pork products are consumed with increasing prosperity than beef, with the State standing to reap the benefits if well positioned to meet the need.

vi) Proximity of the State to other high population centres in Lagos, Edo and Oyo States can be capitalised upon to market the products outside the State.

vii) The proximity to major seaport, airport and international border can be capitalised upon to promote export trade in poultry and pork products.

Role of agricultural research in national development

Nigeria is largely an agrarian society with about 70% of its estimated population of 110.7 million people living in rural areas. The country's pentapodal economy rests on agriculture (including livestock, forestry and fisheries), petroleum, wholesale & retail trade, finance & insurance, and manufacturing, which in 1995 contributed 39.34, 12.44, 12.20, 9.19 and 6.88% respectively to the Gross Domestic Product (GDP), altogether accounting for 80.05% (CBN, 1995). Thus, contrary to popular belief, agriculture remains the cornerstone of the Nigerian economy, not petroleum.

Food is basic to human existence, as the source of nourishment for the body's growth and development and as a source of physical and mental energy for daily activities. A country's development will be stunted to the extent to which its citizens are malnourished. The cost of poor feeding to a nation also includes hidden costs due to increased morbidity and mortality rates, deterioration in security of life and property, and increased civil strife (“A hungry man is an angry man”).

Agricultural research encompasses all scientific investigations aimed at improving agricultural productivity, food security and the quality of life of farmers. It could be basic, strategic, applied, adaptive, disciplinary or multi-disciplinary. National development can be considered as all of a country's efforts directed towards the improvement of the standard of living of its people. It is multi-faceted and includes the development of a country's human resources, economy, industry, security, system of governance, sports, trade and commerce, transport, communications, arts and culture, infrastructure, agriculture, science and technology, educational system and so on. Such development could be progressive or retrogressive, indicating a rise or fall in living standards

respectively. To remain progressive, national development should be sustainable and with minimum damage to the environment.

Nigeria with its huge population which is growing at a rate of 2.83% per annum cannot afford to be complacent about its agriculture which is the main source of food supply, raw materials for industry and employment for 65% of its adult labour force. Given the finite land resource (between 910,332 and 941,850 km^2), high population growth and increasing degradation of the environment, the future food security of Nigeria lies in the pursuit of a rigorous agricultural research and development policy.

Improving the role of the university in the national agricultural research system (NARS)

Universities with Faculties of Agriculture form a distinct part of NARS, even though they are often overlooked as such. It is becoming increasingly clear that with their high concentration of scientists and research facilities, universities can contribute significantly to agricultural research and technology development. Two recent studies on ways of strengthening the roles of universities in the Nigerian NARS have come out with the following suggestions (ISNAR, 1995; Osinowo, 1999):

Mandate, objectives and policies

- In order to improve their role in NARS, the statutes of universities with agricultural faculties should be altered to include an explicit mandate for national agricultural research, in line with what obtains for the universities of agriculture.

- Increasing the lecturer to student ratio could help reduce the time allocation to teaching and increase research time allocation.

- Agricultural faculties in universities should be encouraged to develop an agricultural research strategy plan. This would enable the universities to have formal, spelt-out research priorities.

Organization, structure and linkages

- Universities should establish executive-type research directorates with more active involvement in research planning, coordination, monitoring, evaluation, linkages, research fund sourcing and allocation, and sponsorship to national and international conferences. This would produce better results than the present committee-type Board of Research operating at most of the universities. I

- A system of research planning that would embrace all on-going research within the agricultural faculty should be established. More stakeholders should be involved in the planning process, from within and outside the university.

- Masters and PhD research should be integrated into-on-going departmental research programmes for greater relevance to the national research objectives.

- The existing linkages of the universities with users and potential clients of research results should be strengthened. There is also the need to further strengthen the existing linkages between the universities and other NARS components.

Resources (human, financial, physical) and information

- More physical facilities for research need to be provided for to enhance their research performance.

- There is an overwhelming need to increase the level of research funding to universities, as this has been identified as the most important factor limiting research performance at present in Nigeria.

- Universities should increase their efforts in securing independent sourcing of funds for research from donors and through income-generating activities.

PROPOSAL ON
GRADUATE FARMER SCHEME FOR NIGERIA

Description

Agriculture is still one of the mainstay of the Nigerian economy, despite its steadily declining importance over the last two decades. The decline is due to many reasons, some of which are the predominance of peasant farmers with little land, low capital base, limited knowledge of scientific farming principles and conservative attitude to change and innovation. Meanwhile, farming has become highly competitive on the global scene and farmers in the more developed countries, operating at high technical efficiencies, are able to dump their processed agricultural products on the local market with its depressing effect on prices.

In tile late '50s in Southwestern Nigeria, the first farm settlements were established principally to provide employment avenue to Modem School leavers and to modernize the agricultural sector. This experiment proved largely successful for some time while appropriate policies were in place. The scheme however suffered neglect during the oil-boom years and is today only a shadow of itself. The Farm Settlement scheme nevertheless proved the efficacy of this approach.

Nigeria has about 28 Universities with faculties of agriculture and three Universities of Agriculture, producing nearly 5,000 agricultural graduates yearly. Most of these highly trained graduates are either engaged in teaching at Secondary schools or have moved on to other professions or are unemployed. This corps of graduate farmers represent a valuable human resource that can be assisted to help modernize Nigerian agriculture in the 21st century.

Together with Dr. A. 0. Adeola of the Department of Forestry and Wildlife Resources Management, UNAAB, a Graduate Farmer Scheme is being proposed for joint implementation by Federal, State and Local Governments in Nigeria. We believe its faithful implementation will make Nigeria the African food basket within the next decade.

Project Goals

- To assist agricultural graduates to become self-employed and practice their profession
- To strategically create a growing core of scientifically trained professional farmers capable of attaining high levels of technical efficiency in farming and able to compete effectively in the global market
- To establish modem farming estates with good infrastructure and grouping related farming enterprises to take advantage of economy of scale.
- To progressively replace the aging and depleting ranks of traditional farmers with trained farmers
- To provide an avenue for job creation to absorb some of the increasing numbers of unemployed youths.
- To increase food production, processing and export of processed agricultural commodities.

Expected Benefits

- Gainful employment for graduate farmers
- Increased food availability through higher productivity and better storage Lower prices for agricultural products arising from economy of scale
- Employment opportunities for jobless youths
- Increased value of agricultural products through processing
- Enhanced foreign exchange earnings through export of processed agricultural products
- Self-sufficiency in food production.

Participants in the Scheme

The GFS should be restricted to the following categories of persons:

- Graduates of Universities of Agriculture
- Graduates of Agriculture of other Universities
- Higher National Diploma graduates in Agriculture

Types of enterprises

Each participant would be required to choose an enterprise from the following list, depending on the comparative advantage and economic feasibility:

1. Mixed farming enterprises

A. Arable crops / Livestock

B. Arable crops / Short rotation tree crops

C. Tree crops / Livestock

D. Arable crops / Tree crops / Livestock

2. Sole farming enterprises

A. Poultry

B. Piggery

C. Arable crops

D. Tree crops

E. Livestock feeds

F. Honey production

G. Fish farming

3. Agro processing

A. Fruits

B. Spices

C. Meat and poultry products

D. Cassava

E. Grain mills (maize, rice, millet, sorghum)

Main Strategy: Establishment of Farming Estates

The main strategy for the GFS will be the establishment of modem Farming Estates, not unlike the approach to the establishment of Industrial Estates and Housing Estates by various Governments, State and Federal.

Each Farming Estate would cover an area of 500 hectares and would be provided with good access road and road network, electricity, telecommunications and water supply. A Farming Estate could accommodate between 50 and 500 farming enterprises.

In order to enhance the viability of the Farming Estate, four kinds of Estates would be established to take advantage of economy of scale, complementarity of enterprises (synergy) and to facilitate the formation of producers' cooperatives. The four kinds of Farming Estates are:

Type 1. Poultry / Piggery / Livestock feeds / Fish farming / Meat processing

Type 2. Arable crops / Grain milling / Cassava processing

Type 3. Arable crops / Fruit tree crops / Fruit processing

Type 4. Tree crops / Cattle / Sheep & Goats

For a start, there could be one Farming Estate per State.

Venture capital (Project financing)

Each participant will be given a low interest loan facility ranging between N500, 000 - N2, 000,000 per venture as working capital, depending on feasibility. This loan facility would be repayable in 10 to 15 years at a subsidized interest rate of 5% or less.

Land allocation

A land allocation of between 1 and 10 hectares could be made to each participant based on type of enterprise. Each Farming Estate would accommodate between 50 and 500 farmers.

Project Supervision

The Nigerian Agricultural Bank and other commercial banks under the credit guarantee scheme should supervise the GFS on behalf of the Federal Government. The GFS in each State should

have a Project Implementation Committee comprising of Federal and State Ministry of Agriculture officials, Credit Institution and representative of Participating Farmers.

ACKNOWLEDGEMENTS

The end of anything is better than its beginning
- Ecclesiastes 7[8]

Teachers

The knowledge that I have is from God. But it was imparted mostly by a long string of teachers from the primary to the tertiary levels of education. I am grateful to them all. Of all my primary school teachers at St. Paul's School, Odo Ona, lbadan, the one best remembered for her charm, intelligence and human touch is the one I can no longer trace: Mrs. C. Awosika. May God bless her wherever she is and bless her children.

Several teachers stand out clearly for their contributions to my secondary education at Mayflower School. They include:

Dr. Tai Solarin
Mrs. Sheila Solarin
Mr. Olatunde Balogun
Mr. A. Adedeji
Professor Awoderu

These and many more helped to shape my adolescent mind to be fiercely independent, self-assured and open minded. I was indeed highly privileged to have learnt from Tai Solarin the value of working with one's hands, to the bone, if necessary. Service to humanity: That was his Kingdom of God on earth.

The finishing touch to my academic training was at the University of lbadan, Sydney University, Ahmadu Bello University, and the Animal Research Station, Cambridge. For sheer inspiration and breathtaking knowledge, I owe the following lecturers and supervisors a lot:

Professor V. A. Oyenuga	Professor G. M. Babatunde
Professor D. H. Hill	Professor Steve Salamon
Professor Jorg Steincach	Professor S. M. Dennis
Professor Almut Dettmers	Dr. H. M. Dott

Colleagues and friends

The real family is the group of friends who surround us at every stage of life and with whom we share life's experience. Where shall we be without friends and colleagues? I am grateful to all my friends and colleagues who have had all kinds of subtle influences on my social and academic development. They are too numerous to mention but include the following:

* Gada youths, Moor Plantation, Ibadan, 1956 - 76	* Mr. Arthur Ricketts
* The class of 1956-61, St. Paul's School, Ibadan	* Dr. T. M. Phala
* The class of 1962-66, Mayflower School, Ikenne	* Professor S.T. Lagoke
* Graduating class of 1972, Animal Science, U.I.	* Professor Ayo Abatan
* Love Divine Bands, Zaria and Abeokuta	* Professor Akanji Nasiru
* Bible Study Groups, Zaria and Abeokuta	* Chief O.A. Shoboyede
* Nigerian Society for Animal Production	* Professor I. F. Adu
* National Animal Production Research Institute	* Mr. S. Adeleke
* International House, University of Sydney	*Professor M. A. Oladokun
* All COLANIM staff	* Dr. S. Adeola
* All PG School staff	* Dr. Heike Michelsen
* All Unaabites, staff and students	* Prof. Julius A. Okojie

Nigeria, Germany, Australia,s U.K. and ISNAR

My academic development was greatly facilitated by the following countries and International Service for National Agricultural Research (ISNAR), for which I am very grateful:

- **Nigeria** **Free primary education, tuition-free university education**
- **Germany** **German Academic Exchange Award, Undergraduate &**

Postgraduate

- **Australia** **Commonwealth Scholarship**
- **United Kingdom** **Commonwealth Fellowship**
- **1SNAR** **Consultancy**

Students

"We measure life by loss and not by gain.
Not by the wine drunk but by the wine poured forth". - Anon,

I have had the privilege of teaching many students in secondary school, teacher training college and university. I am grateful to them all for their friendship, respect and the pride they have made me feel through their later success in life.

Students have contributed immensely to my research activities through their undergraduate projects, masters and doctorate research.

Final Year Students' Projects supervised (B.Sc Agric./B.Agric.) 1983-2000:

1. Comparison of consumer acceptability of goat milk and cow milk as influenced by type of packaging. - ***Ogunmuyiwa, Kayode F. 2001.***
2. Effect of pasteurisation regime on microbial quality of goat milk - ***Akinosho, Tawakalitu M. 2001.***
3. Effects of breed and tether length on growth performance of sheep. ***Onikosi, A.G. 2001.***
4. Reproductive performance of the giant African land snails, *Archachatina marginata* and *Achatina achatina* at different body weights. - ***Adeleye, Rasheedat B. 2001.***
5. Effects of species and hatching weight on the growth rate of giant African land snail, *Archachatina marginata* and *Achatina achatina* under unrestricted feeding. - ***Adeleke, M.A. 2001.***
6. Reproductive performance of the giant African land snails, *Archachatina marginata* at different body weights - ***Adeniran, E.O. 1999 .***
7. Effect of type of feed on the growth rate of the giant African land snail,*Archachatina marginata* - ***Jabagun, Temilade 0. 1998***
8. Determination of heat stress index in three breeds of goats - ***Fasoro, Biola Funmilola, 1998***
9. Effects of type of feed on the reproductive performance of the giant African land snail, *Archachatina marginata* - ***O.D. Ogunlakin, 1998***

10. On-farm testing of UNAAB improved sheep and goat tethering system - ***C.C. Ogbonna, 1998***

11. Udder traits and milk offtake in West African Dwarf sheep - ***A. L. Ayinla, 1998***

12. On-farm performance of different strains of commercial pullets in Ogun State. - ***C. E. Akpiruo, 1997***

13. Development of small-scale heliculture - ***C.D. Jaiyeola, 1997***

14. Investigation on the reproductive system of the giant African land snail, *Archachafina marginata* - ***A.E. Mokogi, 1997***

15. Development of functional housing for goals in the humid tropics - ***A.B. Kako, 1996***

16. Investigations on udder conformation of West African Dwarf goats - ***R.O. Gbadamosi, 1996***

17. Development of improved goat tethering method in the humid zone of Nigeria - ***S.A. Eegunlusi, 1996***

18. Study of coat colour in West African Dwarf goats - ***A. B. Adelaja, 1996***

19. Body dimensions and live weight estimation in West African Dwarf goats - ***A. Arowolo, 1996***

21. A survey of local poultry in the Western Osun State - ***F. Ajayi, 1995***

23. A survey of local poultry in Eastern part of Osun State - ***O.L Adeosun, 1995***

24. Effects of dilution rate and number of inseminations per oestrus on the fertility of ram semen extended in milk-yolk diluent – ***E. Barwa, 1993***

25. The influence of climatic factors on rectal temperature pulse rate and respiratory rate in Yankasa sheep of different sexes and age-groups. - ***I. Hamisu, 1992***

26. Effect of dilution rate on the fertility of Yankasa ewes inseminated at different postpartum intervals - ***J.N. Ikyobo, 1991***

27. Effect of depth of cervical insemination on the lambing rate of Yankasa sheep - ***A.D. Deniran, 1990***

28. Growth and physical characteristics of the hair coat of Yankasa sheep - ***D.L Egbo, 1990***

29. Effects of diluent type and insemination with fresh semen on the lambing rate of Yankasa ewes - ***H.B. Odaibo, 1990.***

30. Semen quality of Red Sokoto bucks. - ***O.M. Kogo, 1999.***

31. Formaldehyde preservation of ram spermatozoa - ***A.Y. Onipe, 1989.***

32. The effects of insemination dose and time of insemination on the conception rate of Yankasa ewes

33. Progesterone profiles in Yankasa sheep - ***MX Olayemi, 1987.***

34. Reproductive performance of Yankasa sheep under twice-yearly lambing programme - ***H. Zaaban, 1985.***

35. Effects of age and ejaculation frequency on sperm output in Yankasa rams. - ***A. Abdullaki, 1984.***

36. Effect of plane of nutrition on postpartum interval to conception in Yankasa sheep. - ***KS. Doma, 1994.***

37. Ambient temperature storage of ram semen - ***P.B. Pano, 1983.***

38. Postpartum oestrus and conception in Yankasa sheep - ***KH. Maliki, M.***

39. Testicular development in Yankasa rams. - ***M.O. Longe, 1983.***

M.Sc. and Ph.D research projects supervised, 1985-2000:

1. Changes in the udder traits of West African Dwarf, Red Sokoto and Sahel goats during pregnancy and lactation and their effects on partial daily milk yield. - ***James, L J. 2000.*** M.Agric thesis, Dept. of Animal Production & Health, University of Agriculture, Abeokuta.

2. Evaluation of udder traits in West African Dwarf and Red Sokoto goats - ***Amao, O.A. 1999***. M.Agric thesis, Dept. of Animal Production & Health, University of Agriculture, Abeokuta.

3. Effects of feeding *Ficus thonningii* leaves on growth and reproduction in Yankasa ewes - ***F. Bibi-Farouk, 1995***. MSc thesis, Dept. of Animal Science, Ahmadu Bello University, Zaria, Nigeria. - ***P.J. Damang, 1988.***

4. Estimates of genetic and phenotypic parameters for reproductive traits in Yankasa sheep – ***M.V. Bemji, 1995***. MSc thesis, Dept. of Animal Science, Ahmadu Bello University, Zaria, Nigeria.

5. Effects of season on reproductive performance of sheep and goats in Bauchi. - ***LS. Butswat, 1994.*** PhD thesis, Animal Production Programme, Abubakar Tafawa Balewa University, Bauchi, Nigeria.

6. Study of factors affecting the physiological responses of Yankasa sheep to heat stress. - ***B.S. Oladimeji, 1994***. MSc thesis, Dept. of Animal Science, Ahmadu Bello University, Zaria, Nigeria.

7. Effects of plane of nutrition and rearing method on reproductive development of Yankasa sheep - ***G.N. Akpa, 1991.*** M.Sc thesis, Dept. of Animal Science, Ahmadu Bello University, Zaria, Nigeria.

8. Study of factors affecting survival and fertility of chilled ram spermatozoa. - ***P.N. Pano, 1991.*** M.Sc thesis, Dept. of Animal Science, Ahmadu Bello University, Zaria, Nigeria.

9. Ram semen preservation at ambient temperatures by flow-dialysis techniques. - ***LS. Butswat, 1989.*** M.Sc thesis, Dept, of Animal Science, Ahmadu Bello University, Zaria, Nigeria,

10. Comparative evaluation of cryoprotectants for deep freezing ram spermatozoa in Tris diluent. - ***M.S. Ahmed, 1989***. Ph.D thesis, Dept. of Vet. Surgery & Medicine, Ahmadu Bello University, Zaria, Nigeria.

11. Postnatal development of the reproductive tract of Red Sokoto bucks. - ***B.N. Marire, 1986.*** M.Sc thesis, Dept. of Veterinary Surgery, and Medicine, Ahmadu Bello University, Zaria, Nigeria.

Family Relationships

"Give me life with its struggles and victories,
With its successes and failures,
With its deep moral meaning and unknown goal."

-Anon.

I could not have been born into a nicer family. My parents are such wonderful people. They were well educated and they made sure all their children had even better education. My childhood was so beautiful and it gave me positive view of life. At every turn, they were always there for me. This year, my father, Adetola, and my sweet mother, Sophie, celebrated their 90th and 80th birthdays respectively. May goodness and mercy follow them all the days of their lives, Amen.

The extended Osinowo family is a closely knit one. It has always represented a safety net in social terms. I am grateful to every one of my uncles, aunties, cousins, nephews and nieces for their collective love. My in-laws, the Ogunbanke-Idowu dynasty, headed now by Olori Yetunde Gbadebo, have been a pillar of support which I herewith gratefully acknowledge.

From childhood, I have always looked up to my eldest brother, Olugbenro, a Professor of cardiovascular surgery. His brilliance and intellectual disposition gave me a role model from early in life. My eldest sister, Oluremi, did all she could to support my education. My junior brothers and sisters, Taiwo, Kehinde, Idowu and Tunde have always been a source of joy to me for their love, affection and respect. I am grateful to them all.

No matter how bright the sun, some dark cloud always remains. I remember today, my departed elder cousins, Dr. Tai Adebanjo, who would have been the first Professor in our family, and Mr. Soji Osilowo (alias No Molest), one of the finest gentlemen who ever lived. They both died in different motor accidents in their prime. While they lived, they gave their best. May their souls rest in perfect peace.

My children, Tolu, Tola and Femi have been such wonderful children. They have been a source of pride and joy to me with their different, yet multi-talented natures. I thank them for their love

and respect. May they and others like them be granted the grace of God to ensure a better future for our country, Nigeria.

I found my love in a taxi one unheralded morning in 1974, at the University of lbadan, and since Morohuntodun entered my life, it has been music all the way. Our chance meeting was God's doing, and it was marvelous in our sight. After 22 years of marriage, through the ups and downs of life, I love her more today than in that first taxi ride. Today, from the bottom of my heart, I say **"thank you for everything"**.

CONCLUSION

A real soldier does his boasting after a battle, not before it.
– 1 Kings 20[11]

Mr. Vice-Chancellor, Sir, Principal Officers of the University, Deans, Directors, Colleagues, Friends, Family members, Gentlemen of the Press, Distinguished Ladies and Gentlemen, Great Unaabites, I would like to end this lecture with a prayer:

May our sons in their youth
Be like plants that grow up strong.
May our daughters be like stately pillars
which adorn the corners of a palace.

May our barns be filled
with crops of every kind.
May the sheep in our fields
bear young by the tens of thousands.
May our cattle reproduce plentifully
without miscarriage or loss.

May there be no cries of distress in our streets.

Happy is the nation of whom this is true;
Happy are the people whose God is the Lord!

-Psalm 144[12-15] [GNB]

To God be the glory.

Thank you and God bless.

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Resume

Professor Olusegun Ayodeji **Osinowo** was born at Moor Plantation, Ibadan, in 1950 to an agriculturist father and business-minded mother. He attended Mayflower School, Ikenne for his secondary education. This was under the great educationist, Tai Solarin. He attended the University of lbadan where he obtained the Bachelor of Science degree in Agriculture, in 1972, finishing in Second Class Upper Division and specializing in Animal Science. His most notable lecturers were Professors VA. Oyenuga, J. Steinbach, E.A. Olaloku and Almut Dettmers. He was the recipient of the prestigious German Scholarship at undergraduate and postgraduate levels while at UI.

Between 1974 and 1975, Osinowo studied for his Master of Science degree in Reproductive Physiology at the University of Sydney, Australia, under the Commonwealth Scholarship Programme. His outstanding lecturers then were Professors T.J. Robinson and S. Salamon, world-renowned Reproductive Physiologists. He later obtained his Doctor of Philosophy degree in Reproductive Physiology at Ahmadu Bello University, Zaria. His Major Supervisors were Professor S.M. Dennis of Kansas State University and the late Professor D.I.K. Osori, a one-time Deputy Vice-Chancellor at Usmanu Danfodiyo University, Sokoto.

Postdoctoral research followed in 1978 and 1979 at the Animal Research Station, Institute of Animal Physiology, Cambridge, under Drs. H.M. Dott and Charles Polge, the originator of deep frozen storage of semen, which is the basis for worldwide practice and trade in Artificial Insemination. This was courtesy of a Commonwealth Fellowship.

For 18 years, he worked as a Research Scientist at the National Animal Production Research Institute (NAPRI), Ahmadu Bello University, Zaria, rising to become Professor of Reproductive Physiology in 1989. While there, he served for 14 years as Editor-in-Chief of the international Journal of Animal Production Research. He left NAPRI in 1994 as an Assistant Director (Extension and Linkages), for this great University, UNAAB.

Since transferring to UNAAB, he has served the University in various capacities, including the following: [I] Deputy Dean, COLANIM, [II] Dean, Postgraduate School, [III] Chairman, MANCOT, [IV] Chairman, Task Force II on Movement to the Permanent Site, [V] Ag. Director of Academic Planning, [VI] Member of the Harmonisation Committee of the Universities of Agriculture, [VII] Chairman, Small Ruminant Technical Committee, and [VIII] Member, Committee on Excess Workload.

Professor Osinowo was the arrowhead of the University's preparations for the last Accreditation exercise and is currently a member of the Strategic Planning Committee. He has supervised 37 undergraduate student projects and eleven Masters and PhD students at ABU, UNAAB and ATBU. He has taught courses from 200 - 700 levels at UNAAB. He is currently Editor-in-Chief of the new UNAAB Journal, ASSET. He has numerous publications and consultancy reports to his credit. He is currently engaged in research on goat milk production and the development of small-scale snail production systems.

At the national and international levels, Professor Osinowo was President, Nigerian Society for Animal Production from 1990 to 1994 and is currently a Trustee of the Animal Science Association of Nigeria. He was Consultant Breeder to the National Livestock Development Project, Federal Ministry of Agriculture from 1990 -1992, the World Bank Supervision Mission to NARP in 1998, Council Member of the World Association for Animal Production from 1990-1994, and National Consultant, ISNAR Project on Role of Universities in National Agricultural Research Systems in Sub-Saharan Africa.

Professor Osinowo rose to the pinnacle of his professional career in March 2000 when be was elected a Fellow of the Nigerian Society for Animal Production (FNSAP). He is currently a member of the Governing Council, University of Agriculture, Abeokuta.

His hobbies are Bible Study, Chess and Farming. He is a member of the Cherubim and Seraphim Church where he is currently a Senior Apostle. He is staff adviser to five Student Associations at UNAAB.

He is married to former Miss Morohuntodun Idowu, an alumnus of the Obafemi Awolowo University, Ile-Ife. They are blessed with 3 children, one of whom, Tolulope, is a Unaabite.