



**ANIMAL SCIENCE ASSOCIATION OF NIGERIA  
(ASAN)**



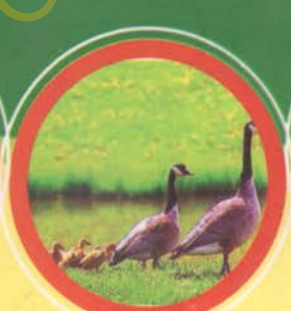
**PROCEEDINGS OF**

**14<sup>th</sup>**  
*Annual Conference*

**LAUTECH 2009**

**THEME:**

**GLOBAL ECONOMIC RECESSION  
and the CHALLENGES to LIVESTOCK  
PRODUCTION in NIGERIA**



**Date:** \_\_\_\_\_

**14th-17th September, 2009**

**Venue:** \_\_\_\_\_

**Ladoke Akintola University of Technology,  
Ogbomoso, Oyo State, Nigeria.**

**Edited by:**

Akinlade, J.A, Olayeni, T.B., Rafiu T.A., Akinwunmi, A.O.,  
Aderinola, O.A., Ojebiyi, O.O and Odunsi, A.A  
*Ladoke Akintola University of Technology, Ogbomoso, Oyo State, Nigeria.*

Copy Right 2009: Animal Science Association of Nigeria

ISSN = 978 34777 22

The Proceedings of the Annual conference of ASAN presents research or review articles relevant to animal production. Views expressed therein are not necessarily those of ASAN or the host institution.

All rights reserved. No part of this publication may be reproduced, stored in retrieval or transmitted in any form or by any means, electronic, electrostatic, magnetic tape, mechanical, photocopying, recording or otherwise, without prior permission in writing from the Animal Science Association of Nigeria (ASAN), or the Nigerian Institute of Animal Science (NIAS).

Re-typesetting by Rafiu T. A. & Akinwunmi, A. O. APH Dept, LAUTECH, Ogbomoso

Cover Design and Formatting by: Greenlight Computer Graphics, Ibadan.

Produced by the Department of Animal Production and Health, LAUTECH, Ogbomoso

*Published by:*  
The Animal Science Association of Nigeria (ASAN)

*Printed by Oluseyi Press Limited, Ibadan.*

UNIVERSITY OF IBADAN LIBRARY



**Trustees and National Executive Council of the  
Animal Science Association of Nigeria (ASAN)**

**Board of Trustees:**

1. Alhaji Azeez O. Bello
2. Professor G.M. Babatunde
3. Professor O.A. Osinowo
4. Professor I.I. Dafwang
5. Professor C.O. Ubosi (Late)

**National Executive Council**

1. Mrs. M.O. Omotoso - President
2. Prof. O.O. Alaku - 1<sup>st</sup> Vice President
3. Dr. Lawrence Asijie - 2<sup>nd</sup> Vice President
4. Dr. F.A.S. Dairo - General Secretary
5. Mr. T.O. Ososanya - Asst. Gen. Secretary
6. Mr. S.M. Yashim - Treasurer
7. Mr. A.R. Asafa - Financial Secretary
8. Mr. Felix Eneche - Publicity secretary
9. Prof. W.A. Hassan - Editor-In-Chief
10. Dr. G.S. Bawa - Dep. Editor-in-Chief
11. Dr. G.O. Oyediji - Ex-Officio
12. Mr. Funso Ogunsina - Ex-Officio
13. Prof. A.M. Bamgbose - Ex-Officio
14. Prof. I.D. Mohammad - Co-ord North-East
15. Dr. G.N. Akpa - Co-ord North-West
16. Alhaji I.F. Ayanda - Co-ord North-Central

**Local Organizing Committee and sub-committees**

- Prof. B.B. Adeleke (Vice-Chancellor) - Chief Host  
Prof. A.A. Odunsi - Chairman  
Dr. V.O. Asaolu - Secretary  
Dr. J.A. Akinlade - Treasurer

**Budget & Fund Raising Sub-Committee**

**Dr. I.A. Emiola - Chairman**

- Dr. O.O. Ojebiyi - Secretary  
Prof. G.M. Babatunde  
Prof. J.O. Akinokun  
Mr. Adewale  
Mr. Okunlola, D.  
Mr Ogunleye Olayiwola  
Ade Feeds, Ogbomoso  
Dr. J.O. Adewoye

**Opening Day/Registration Sub-Committee**

- Dr. O.S. Adedeji - Chairman  
Dr. I.O. Oladunjoye  
Mrs R.T. Binuomote - Secretary  
Mr Akanmu Ejikunle  
Ms Ogundipe, A

**Publicity/Exhibition Sub-Committee**

- Dr. T.A. Adedeji - Chairman  
Mr. A.O. Ige  
Dr. O.A. Aderinola  
Mr Gbadamosi M.A  
Dr Mrs Akinwande  
Dr. O.O. Ojebiyi

Dr. W.B. Akanbi

**Welfare and Protocols Sub-Committee**

- Dr. (Mrs.) Olaniyi C. O. - Chairperson  
Mr. Olayeni T. B. - Secretary  
Mrs. Olabanji, R.O  
Dr. (Mrs.) Badru, G.O  
Mrs G.F Folaranmi

**Conference Papers Presentation/Technical Sub-Committee**

- Dr. A. A. Akingbade - Chairman  
Mr. Amao O.A. - Secretary  
Dr. Ojedapo L.O  
Dr. A.O. Adewoye  
Prof. L.A. Sunmonu  
Dr. S.G. Ademola

**Agricultural Tours/Entertainment Sub-Committee**

- Dr. S.A. Ameen - Chairman  
Dr. S.G. Ademola  
Mr Ogunleye Olayiwola  
Dr. (Mrs.) G.O. Badru  
Dr. I. A. Oladosu

**Scientific/Programmes Sub-Committee**

- Dr. J.A. Akinlade - Chairman  
Mr. A.O. Akinwumi  
Mr. T.A. Rafiu  
Prof. J.G. Adewale  
Dr. O. Ajao  
Mr. T.O. Akande  
Dr. S.G. Ademola

**Security sub-committee**

- Mr A O Ige  
Mr Okunlola David  
Rep Man-o-War  
Rep-Road Safety club

Reviewers - All members of staff and cognate departments

## Donors/Sponsors

1. Oyo State Government
2. Osun State Government
3. Ladoke Akintola University of Technology Ogbomoso
4. Oyo State College of Agriculture Igbo-ora,
5. Nigerian Institute of Animal Science, Abuja
6. Prof D.O Adejumo (Chairman, Oyo SUBEB)
7. Obasanjo Farms Nigeria Limited
8. Chief Z.G Onigbinde, Best Food Farms Ogbomoso
9. Caps Feeds, Ibadan
10. Bio- Organics Nutrients Systems Ltd, Lagos
11. Bronco Farms, Ibadan
12. Animal Care Ltd, Ogere- Remo
13. Oluseyi Press, Ibadan
14. Pyramid ventures, Ikotun, Lagos
15. Hope Farms Ltd, Ibadan
16. Farm Support Services, Iyana-Church, Ibadan
17. Soptimal Ventures
18. Global Vet, Ibadan
19. Ayodara Ventures
20. Branch Manager, Skye bank Lautech Branch Ogbomoso
21. Prof J.O. Akinokun
22. Prof L.A Sunmonu, Lautech PDS Progr.
23. Manager, GTB Ogbomoso
24. Azeemoh Farms
25. Facco West African (Nig.) Limited



## TABLE OF CONTENTS

Cover page .....	.....
Copy Right statement .....	.....
Board of Trustees and NEC.....	.....
Members of the Local Organizing Committee.....	.....
Acknowledgement of Reviewers.....	.....
Acknowledgement of Sponsors/Donors.....	.....
Table of Content.....	.....
<b>Opening Address by the Chairman LOC.....</b>	<b>.....</b>
<b>Invited / Technical Papers.....</b>	<b>.....</b>
<b>Sessions 1-7 .....</b>	<b>.....</b>

### Session One: Animal Breeding and Genetics (ABG)

TITLE	NAMES	UNIVERSITY	E-MAIL	Page
Egg Production Characteristics of Pure and Crossbred Local Chickens in a Humid Tropical Environment.	NWAOGWUGW, U.C, U.K. OKE and E.N. NWACHUKWU	UMUDIKE,	<a href="mailto:ugwublessed@yahoo.com">ugwublessed@yahoo.com</a>	27
Comparison of Internal and External Qualities of Eggs from Strains of Egg-type Chickens	SOGUNLE, O. M., EGBEYALE, L.T., ADENIRAN, K.A. and FANIMO, A.O.	UNAAB	<a href="mailto:jidesogunle@yahoo.com">jidesogunle@yahoo.com</a>	30
Evaluating the performance of exotic and local poultry strains in a tropical environment	ISAAC, L. J. and UMOH, D. U.	UNI UYO	<a href="mailto:isaac2005@yahoo.com">isaac2005@yahoo.com</a>	33
Effect of sex on carcass characteristics of the Fulani ecotype chicken (fec)	SOLA – OJO, F.E and AYORINDE, K.L.	UNI ILORIN.	<a href="mailto:mofesola1@yahoo.com">mofesola1@yahoo.com</a>	35
Factors influencing live weight of local chickens in Bauchi zone of Bauchi state Nigeria	I. TAHIR and M. ABDULLAHI	ABU	<a href="mailto:tahibatta@yahoo.com">tahibatta@yahoo.com</a>	38
Effect of strain and age on egg quality characteristics of two different strains of layer chicken kept in cages in derived savanna zone of Nigeria.	OJEDAPO, L.O., ADEDEJI, T.A., AMEEN, S.A., OLAYENI, T.B., AMAO, S.R., IGE, A.O., RAFIU, T.A., OJEDIRAN, T.K and AKINNIRAN, T.N.	LAUTECH	<a href="mailto:ojedapolam@yahoo.com">ojedapolam@yahoo.com</a>	41
Genetic parameter estimates for plasma alkaline phosphatase (pap) activity and egg productive traits in two strains of rhode island chickens.	ORUNMUYI, M., ONI, O.O., ADEYINKA, I.A. and ASIRIBO, O.E.	ABU.	<a href="mailto:modupeorunmuyi@yahoo.com">modupeorunmuyi@yahoo.com</a>	44
Variations in qualitative traits in the Nigerian local chicken	J. O. EGABI, N. I. DIM, O. M. MOMOH and D. S. GWAZA	UNAM	<a href="mailto:egahijoseph@yahoo.com">egahijoseph@yahoo.com</a>	48
Effect of wattle occurrence and some non-genetic factors on body sizes and physiological traits of West African dwarf goats under semi-intensive management	T.A. ADEDEJI, M.O. OZOJE., A.O. SANUSI, L.O. OJEDAPO., A.O. IGE., S.R. AMAO and R.O. ADEJUMO	LAUTECH	<a href="mailto:tosinadedeji2003@yahoo.com">tosinadedeji2003@yahoo.com</a>	50
Using principal axis factor scores in multiple linear regression model in predicting the carcass weight of broiler chickens	YAKUBU, A., K.O. IDAHOR <sup>1</sup> AND Y.I. AGADE	NSU LAFIA	<a href="mailto:abdulmojeedy@yahoo.com">abdulmojeedy@yahoo.com</a>	53
Effects of breeds on the growth performance of weaned pigs fed brewers dried grain diets.	EHEBHA, E.T.E, ISIDAHOME, C.E, OMOIKHOJE, S.O AND ARUNA, M.B	AAU EKPOMA		57
X-chromatin status of rabbits in selected farms in Portharcourt – Nigeria.	V.N. NYECHE; O.J. OWEN and L. NDOR,	RUST	<a href="mailto:congomfx@yahoo.com">congomfx@yahoo.com</a>	60
Egg quality traits of indigenous and	C.E. ISIDAHOMEN, B.M.	AAU		62



exotic chickens as influenced by specific genes	ILORI, M.O. OZOJE, S.O.OMOIKHOJE, M.A. ADELEKE and K. AKANO.	EKPOMA	<a href="mailto:ebicley2k@yahoo.com">ebicley2k@yahoo.com</a>	
The effect of genotype and season on linear body measurements of sheep	ADEWUMI, O.O. CHINEKE C.A, and ALOKAN, J.A.	UNAD	<a href="mailto:badewumi2003@yahoo.com">badewumi2003@yahoo.com</a>	66
Comparison and correlation of coat fibre characteristics with body dimension of the West African dwarf sheep	S.B. AKINYELE, A.E. SALAKO, K.D. AFOLABI and R. OLAJIDE	U.I.	<a href="mailto:akinleyebamide@yahoo.com">akinleyebamide@yahoo.com</a>	69
Correlation between milk yield and change in udder circumference before and after milking in West African dwarf goats	T.J. WILLIAMS, O.A. OSINOWO, S.A. ONADEKO, O.F. SMITH, I.J. JAMES, C.O.N. IKEOBI and O.M. ONAGBESAN	UNAAB	<a href="mailto:tolwilly@gmail.com">tolwilly@gmail.com</a>	72
Genetic effects on the comparative biochemical evaluation of semen mineral status of five chicken strains	C.E. ISIDAHOMEN, S.O. OMOIKHOJE, F. U. IGENE AND D. OSEMOTA	AAU EKPOMA,	<a href="mailto:ebicley2k@yahoo.com">ebicley2k@yahoo.com</a>	75
The use of polynomial equation in estimating body weight in Bunaji cows	M U TANKO, J O EGAHI and N I DIM	UNAM	<a href="mailto:egahijoseph@yahoo.com">egahijoseph@yahoo.com</a>	78
Colour variation of naked neck and frizzled feathered type of Nigeria indigenous chickens in the derived savannah	A.O. IGE., A.E. SALAKO., L.O OJEDAPO., T.A ADEDEJI., M.O. AKINYEMI A. YAKUBU and T.O ADEOTI	LAUTECH		80
Prediction of body weight from body linear measurement in pre-weaning castrates and non-castrates of savanna brown goats (kids)	TSADO, D.N, AREMU, A., J.O. ALABI and AKINLAWON, A.A	FUTMINNA	<a href="mailto:tsadonma@yahoo.com">tsadonma@yahoo.com</a>	83
Some biometric growth traits of purebred heavy ecotype of the Nigerian local chicken	OHEGENYI, I.J, NWOSU, C.C, NDOFOR, H	VOM PLATEAU STATE.		86
Heat tolerance traits among pure and crossbred turkeys in southwest Nigeria	B.M. ILORI, S.O. PETERS, D.D. ARULEBA, K. AKANO, M. WHETO, A.I. IYANDA, M.O. OZOJE and C.E. ISIDAHOMEN	UNAAB	<a href="mailto:lorealchosen@yahoo.co.uk">lorealchosen@yahoo.co.uk</a>	89
The effects of genotype, egg size and body weight of three strains of layer chickens on egg quality traits	S.U. NWANKWO and S.I. OMEJE	DELSU	<a href="mailto:smamaebele@yahoo.com">smamaebele@yahoo.com</a>	93
Path coefficient analysis of the relationship between somebody measurement and live weight in adult muscovy drakes	OGAH D. M., S. I. DAIKWO, M. O. MOMOH and N. I. DIM	COLA LAFIA	<a href="mailto:mosesdogah@yahoo.com">mosesdogah@yahoo.com</a>	96
Repeatability of egg number and egg weight in two strains of layer type chicken	<i>I. UDEH</i>	DELSU	<a href="mailto:drudeh2005@yahoo.com">drudeh2005@yahoo.com</a>	98
Evaluation of genetic variabilities of growth traits of two strains of broiler chickens kept in derived savanna environment of Nigeria.	AMAO, S.R., AKINOKUN, O., OJEDAPO, L.O., ADEDEJI, T.A., SODEINDE, F.G., OLAYENI, T. B., RAFIU, T. A., OKUNLOLA, D.O and OJEDIRAN, T.K	LAUTECH	<a href="mailto:amaosr@yahoo.com">amaosr@yahoo.com</a>	100

Estimate of genetic variabilities of growth traits of two strains of broiler chickens (starter phase) reared in derived savanna environment of Nigeria.	AMAO, S.R., AKINOKUN, O., OJEDAPO, L.O., ADEDEJI, T.A., SODEINDE, F.G., AMEEN, S.A., IGE, A.O., ALALADE, J.A and AKINWUMI, A.O	LAUTECH	<a href="mailto:amaosr@yahoo.com">amaosr@yahoo.com</a>	103
Performance of high and low body weight lines of divergently selected normal feather, naked neck and frizzle broiler chickens in a hot-humid environment.	E. N. NWACHUKWU, O. G. OKORO, S. N. IBE, A.H. AKINMUTIMI and G. S. OJEWOLA	UMUDIKE,	<a href="mailto:ennwachuk@yahoo.com">ennwachuk@yahoo.com</a>	106
Canonical discriminant analysis of performance traits in broiler strains	YAKUBU, A. AKINFEMI, H.K. ABIMIKU and D.I. HASSAN	NSU KEFFI	<a href="mailto:abdulmojeedy@yahoo.com">abdulmojeedy@yahoo.com</a>	109
The productivity of traditionally managed local chickens in Benue state of Nigeria	J.J. OKOH, A.I. ADEKA, O.M.MOMOH, M.I. AKU.	AOCA, YANDEV	<a href="mailto:okohjoe@yahoo.com">okohjoe@yahoo.com</a>	112

UNIVERSITY OF IBADAN LIBRARY



Session two: Animal Biotechnology and Products (ABP)

TITLE	NAMES	University	e-mail	Page
Chemical composition, in vitro digestibility and gas production characteristic of some cereal-by-products incubated with <i>panicum maximum</i>	OLUBUNMI O. FALOLA and O. J. BABAYEMI	U.I.	<a href="mailto:yenikeolubunmi@yahoo.com">yenikeolubunmi@yahoo.com</a> .	115
Effect of fermentation on some chemical constituents in sweet orange ( <i>Citrus sinensis</i> ) peel meal and nutrient digestibility in broiler chickens	O.I.A OLUREMI, G.J. WUANOR AND K.T. ORAYAGA	UNAM	<a href="mailto:biyioluremi@yahoo.com">biyioluremi@yahoo.com</a>	118
Influence of dietary cholesterol on consumption of chicken eggs in Zaria	IYIOLA-TUNJI, A.O., AKPA, G.N., NWAGU, B.I., ADEYINKA, I.A., UBANI, E.O. A. and IYIOLA-TUNJI, M.O.	ABU.	<a href="mailto:tunjiyiola@yahoo.com">tunjiyiola@yahoo.com</a>	121
Evaluation of rice offal as a substitute for maize in the enzyme-supplemented diets for finishing broiler chickens.	SALAMI, R.I., AKINDOYE, O. and ODUNSI, A.A.	Emmanuel Alayande College of Education		125
Microbial and sensory evaluation of suya-an intermediate moisture meat product in Ogun state.	APATA E. S.	OOU	<a href="mailto:ebunoluapata2008@yahoo.com">ebunoluapata2008@yahoo.com</a>	128
Response of broilers fed cassava grit, palm kernel cake and de-oiled cake with or without $\beta$ -mannanase	O. A. ABU, I. A. ANJUWON, V. A. ADETUNJI and O. O. TEWE	UI	<a href="mailto:oa.abu@mail.ui.edu.ng">oa.abu@mail.ui.edu.ng</a>	131
Comparison of traditional and mechanized abattoir management practices and production of blood meal locally at Lagos state abattoir complex, Oko-Oba. Agege, Lagos state, Nigeria	O.A. MAKINDE and O.A. AKISANYA	OAU	<a href="mailto:olukayodemakinde@gmail.com">olukayodemakinde@gmail.com</a>	134
Effect of dietary antibiotics, probiotics, organic acids and a herbal product on performance of broilers	K.O. ONASANYA, D.B. OKE, A.A. ADEKUNMISI, H.A. AWOJOBI and G.A. ADELEKE	OOU	<a href="mailto:delebolao@yahoo.com">delebolao@yahoo.com</a>	137
Growth performance, serum urea, serum enzymes and serum lipid profile of broiler chickens fed garlic, ginger and their mixtures.	ADEMOLA S.G., FARINU G.O. and BABATUNDE G.M.	LAUTECH		141
Response of laying hens fed garlic and ginger mixtures	ADEMOLA S.G., ADEJUMO I.O., OJEDIRAN T.K. and BAMIDELE O.	LAUTECH		144
Comparative study of carcass, organ and organoleptic properties of spent layers of different poultry types.	AKINWUMI A. O., ODUNSI, A. A., OMOJOLA, A. B., AKANDE, T. O., RAFIU, T. O., AMAO S.R and OJEDIRAN, T. K.	LAUTECH	<a href="mailto:yimika2akin@yahoo.com">yimika2akin@yahoo.com</a>	147
Consumer perception of meat - a case study of Lautech staff	AKINWUMI A.O., ODUNSI A.A.,	LAUTECH	<a href="mailto:yimika2akin@yahoo.com">yimika2akin@yahoo.com</a>	151



	OMOJOLA A.B., AWOREMI R, ADERINOLA, O.A., OKUNLOLA D.O., and ALALADE J.A.			
Response of growing turkeys to choline fortified sorghum based diets with/without xylanase enzyme supplementation.	A.M. BAMGBOSE and A.O. OSO	UNAAB	<a href="mailto:bamamu_2004@yahoo.com">bamamu_2004@yahoo.com</a>	156
Physical and sensory characteristics of fresh and dried meat of beef and camel meat.	FAKOLADE P.O. and OMOJOLA A. B.	UI	<a href="mailto:twinsfakolade@yahoo.com">twinsfakolade@yahoo.com</a>	158
Effect of cellulase/glucanase/xylanase enzyme combination on <i>amaranthus cruentus</i> fed as sole dietary protein source in rat assay	A.O. FASUYI	UNAD	<a href="mailto:dejifasuyi@yahoo.com">dejifasuyi@yahoo.com</a>	162
Extraction rates and some chemical compositions of <i>manihot esculenta</i> leaf protein concentrate obtained from top middle and bottom leaves using two different extraction methods.	C.B OLOMU AND S.O. NWOKORO	<i>Nifor, benin</i>	<a href="mailto:charlesolomu@yahoo.com">charlesolomu@yahoo.com</a>	167
Enhancement of feeding value of plantain peel through solid state fermentation by <i>aspergillus niger</i> for meat type chicken	T.E. LAWAL and I.A ALAGBE	<i>Department of animal science and fisheries management,</i>	<a href="mailto:zeklawal@yahoo.com">zeklawal@yahoo.com</a>	170
Proximate composition, energy content and mineral profile of <i>vernonia amygdalina</i> (bitter leaf) meal	O.J. OWEN, A.O. AMAKIRI, E.U. DAVID, V.N. NYECHE and L. NDOR	RUST	<a href="mailto:congomfx@yahoo.com">congomfx@yahoo.com</a>	173
Growth response and faecal evaluation of weanling pigs fed biotechnologically enhanced cassava tuber waste (ctw) diets.	ARO, S. O., ADEJUMO, D. O., ALETOR, V. A., ADEBOYE, A. A., ASHIMI, A. A. ODEJAYI, O. J. and ADESIDA, J. A.	FUTA.	<a href="mailto:sambolaro@yahoo.co.uk">sambolaro@yahoo.co.uk</a>	177
Characterization of cattle ownership and milk production in Zamfara grazing reserve, Nigeria	A. NASIRU, S. A. MAIGANDI, B. S. MALAMI and A. I. DANEJI	Bayero University, Kano, Nigeria		181
Evaluation of microbial qualities of skimmed milk (nono) in Nasarawa state, Nigeria.	E.A. OLATUNJI, I. AHMED and U. J. IJAH	UNIABUJA		184
Efficacy of lactic acid as a wash solution in reducing bacterial contamination in frozen chicken	SANWO, K. A., OKUSOLUBO, O. X. and ADEGBITE, J. A.	LAUTECH	<a href="mailto:bumogardens@yahoo.com">bumogardens@yahoo.com</a>	188
Species of animals used as bush meat in metropolitan kano	FATIMA BIBI- FAROUK and HINDATU S. DOMA	<i>bayero university</i>	<a href="mailto:fatima_ib@yahoo.co.uk">fatima_ib@yahoo.co.uk</a>	190
Physical and sensory characteristics of broiler birds fed previously on plethora and sub-optimal energy protein diets and later fed optimal diet.	AREMU A, T.Z. ADAMA, E.L SHIAWOYA and B.A. AYANWALE	FUTMINNA	<a href="mailto:aremuayo52@yahoo.com">aremuayo52@yahoo.com</a>	194



Cheese yield as determined by type and quantity of two indigenous milk coagulants	M. JIBIR and S. GARBA	UDU Sokoto	<a href="mailto:sanigarba2003@yahoo.com">sanigarba2003@yahoo.com</a>	197
Meat quality evaluation of yankasa rams fed graded levels of biscuit waste.	O.O. ENIOLORUNDA, E.S. APATA, K.A OJO, B.B BADEJO, A.O. OKUBANJO.	OOU	<a href="mailto:ebunoluapata2008@yahoo.com">ebunoluapata2008@yahoo.com</a>	199
Digestibility of nutrients by hybro broilers as affected by contents of anti-nutritional factors in wild cocoyam corm-based diets	OLAJIDE R; AKINSOYINU A. O.; AFOLABI K. D.; OWOSIBO A. O.; FAKOLADE P. O. and AKINLEYE S. B.	UI	<a href="mailto:Rotbos97@yahoo.com">Rotbos97@yahoo.com</a>	202
Physical and chemical components of two varieties of castor bean ( <i>ricinus communis l</i> ) seed in nigeria.	AKANDE T.O., ODUNSI A.A, OLANIYI C.O., OKUNLOLA D and BINUOMOTE	LAUTECH	<a href="mailto:yakande@yahoo.com">yakande@yahoo.com</a>	206
Performance of weaner – grower pigs fed graded levels of garlic ( <i>allium sativum</i> )	ORTSERGA, D.D.	Akperan orshi college of agriculture yandev	<a href="mailto:dortserga@yahoo.com">dortserga@yahoo.com</a>	210
Nutritive evaluation of ten day solid fermentation of corn cobs and straw with rumen liquor and urea	F. O. FAMILADE and O. J. BABAYEMI	UI		212
Swot analysis on the application of biotechnology in livestock improvement in Nigeria	O. A. ABU AND K. O. SOETAN	UI.	<a href="mailto:oa.abu@mail.ui.edu.ng">oa.abu@mail.ui.edu.ng</a> , <a href="mailto:ko.soetan@mail.ui.ng">ko.soetan@mail.ui.ng</a>	215
Antimicrobial activity of <i>ocimum gratissimum</i> extract on <i>suya</i> (an intermediate moisture meat) in Nigeria	OLUSOLA, O.O, OYADEYI, O.S and OMOJOLA, A.B	UI	<a href="mailto:olusolaolubunmi@yahoo.co.uk">olusolaolubunmi@yahoo.co.uk</a> , <a href="mailto:yasol@yahoo.com">yasol@yahoo.com</a>	218
Addition of coated or uncoated phytase improves performance, p digestibility and total ash content in broilers fed corn soybean meal-based diet	I. A. EMIOLA, A. A. ODUNSI, I. O. OLADUNJOYE, O. O. OJEBIYI and C. M. NYACHOTI	LAUTECH	<a href="mailto:walemiola@yahoo.com">walemiola@yahoo.com</a>	222
Influence of sex on carcass and organoleptic characteristics of meat from japanese quails	ODUNSI, A.A. and KEHINDE, M.O	LAUTECH	<a href="mailto:yodunsi@yahoo.com">yodunsi@yahoo.com</a>	226
Dairy products utilization pattern of agropastoralists in giwa local government area of kaduna state, Nigeria	AJALA, M.K.; VOH, J.P; GEFU, J.O. and ATALA, T.K.	NAPRI/ABU, ZARIA	<a href="mailto:kofoajala@yahoo.com">kofoajala@yahoo.com</a>	229
Proximate and mineral composition of castor seed ( <i>ricinus communis</i> ) cake as influenced by duration of fermentation	S.M. YASHIM, S.B. ABDU, C. ALPHONSUS and A. ADENIYI	ABU	<a href="mailto:yashimms@yahoo.com">yashimms@yahoo.com</a>	232



TITLE	NAMES	UNIVERSITY	E-MAIL	Page
Reproductive performance of rabbit on fed dietary fumonisin	F. A. GBORE and O. S. OLORUNFEMI	AAU Akungba	dejiprecious@yahoo.com	234
Comparison of the chemical composition of hatchery waste of different strains of chicken	EGBEYALE, L.T., O.M. SOGUNLE, C.O. ONUEGBU, S.S. ABIOLA and O.O. ADELEYE	UNAAB	lawtoks23@yahoo.co.uk	237
Embryonic losses from slaughtering of pregnant ruminant animals at doma abattoir	IDAHOR K.O, OMEJE J.N. AND AKWE A.	NASARAWA STATE UNIVERSITY	omokingida@yahoo.com	240
Mortality in savanna brown does fed flamboyant tree seed meal as replacement for groundnut cake.	ALEMEDE, I.C., ADAMA, J.Y., OGUNBAJO, S and AHMED, Y	FUTMINNA	tee_baby2k6@yahoo.com	243
Physiological response of growing cockerels to dietary fossil shell flour	EWUOLA, E.O, SOKUNBI, O.A, ADEBIYI, A. O, LAWAL, T.O. and AKANGBE, O. O	UI	bisi_ewuola@yahoo.co.uk	246
The influence three different levels of dietary energy on parasitaemia and haematological values in west africa dwarf (wad) goats infected with <i>trypanosoma congolense</i>	AMEEN, S.A, JOSHUA, R.A, OKEWOLE, E.A' ADEDEJI O.S, OJEDAPO L.O. and AMAO.S.R.	LAUTECH.		250
Observations on the cases of dystocia in domestic ruminants in sokoto-nigeria.	ADEYEYE, A. A and OLAJIDE, F. A.	UDU Sokoto.	ayo4wale@yahoo.com	253
Intra-erythrocytic trace elements profile of emu <i>Dromaius novaehollandiae</i> (le souef 1907)	ADEWUMI, A. A., AYODELE, I. A., and ALABI, O. M.	UNIOSUN	abibay2001@yahoo.com	255
Assessment of the use of ethno-veterinary medicine in poultry health management in iwo local government of osun-state	F.A.ADEREMI, O.M.ALABI., A.O. OGUNTUNJI., T.E.LAWAL and O.O. OLALEYE	BOWEN	faaderemi@yahoo.co.uk	258
Market structure and demand for veterinary services by poultry farmers in oyo state	O.A. TOLAWO, F.O. IDUMAH, B.Y. OSHINUBI	FRIN	chrisabel_t@yahoo.com	261
Prevalence of sarcoptic mange in pigs in gboko area of benue state, nigeria.	OCHE, D.A., D.D. IOR, E.O. ODOH, M.I. AKU.	AOCA, YANDEV	eldaoche@yahoo.com	264
Studies on trypanosomiasis of pigs in gboko area of benue state, nigeria.	OCHE, D.A., D.D. IOR, E.O. ODOH, M.I. AKU.	AOCA, YANDEV	eldaoche@yahoo.com	267
Haematological and serum biochemical responses of growing rabbits fed diets containing processed mango ( <i>Mangifera indica</i> ) seed kernel meal	OLABANJI R.O.; OJEBIYI O.O.; TONA G.O. and OLAOGUNO	LAUTECH	olabanjiro@yahoo.com	270
The effects of different dietary fibre sources on the haematological parameters and serum biochemical	S.E. ALU, R.S. RUMA, A. A. U. UMBUGADU, M.M. ADUA and O. J.	NASARAWA STATE UNIVERSITY.	seafarms2000@yahoo.com	274



Effects of mating "clean" does to trypanosome-infected bucks on kindling parameters.	LEIGH, O. O; FATOKUN, B.O; AMEEN, S.A. and KEHINDE, A.S	FCWM, NEW BUSSA,	niyifatokundr@yah oo.com	277
Helminthic infections of grey-breasted guinea fowl ( <i>Numida meleagris galeata</i> ) reared intensively on deep litter in vom, Nigeria	EMENNA, P.E., IFENDE, V.I., AKAWU, B., PETER, J.G., ABATCHA, M.G., MUSA, U., DOGO, G.I and L.T.IKPA	NVRI VOM,	kankaraa@yahoo. com	280
Haematological parameters and reproductive tract morphometry of rabbits fed cassava leaf meal.	D.T. SHAAHU J.A. AYOADE, S.N. CAREW and M.E. ATE	UNAM	shaahut@yahoo.co m	283
Histopathology of the organs of broiler chickens exposed to Flame and fumes of kerosene burning	A.O. AMAKIRI, O.J. OWEN, and I.I. IBOH	RUST	aoa4u@yahoo.com	286
Effects Of Bovine Somatotropin On Changes In Udder Circumference After Cessation Of Milking In West African Dwarf Goats	I.J. JAMES, O.A. OSINOWO, O.F. SMITH, M.N. BEMJI, T.J. WILLIAMS and P.I. REKWOT	UNAAB	james_ikej@yaho o.com	291
Socio-economic implications of liver condemnation in Lagos state, Nigeria	A.A. IBIRONKE, C.M.E. MCCRINDLE, F.O. FASINA, M.O. ADEYEMI	UNIVERSITY OF PRETORIA, SOUTH AFRICA	ademolaibironke@y ahoo.com	294
Losses associated with mortality of cattle and camels during transportation to oko-oba abattoir, Lagos state, Nigeria	IBIRONKE, A. A., MCCRINDLE, C. M. E., ADEJUWON, T. A. and CADMUS, S. I. B	UNIVERSITY OF PRETORIA, SOUTH AFRICA	ademolaibironke@y ahoo.com	297
Sperm Production rate, Gonadal and Extragonadal Sperm reserves in the Red Sokoto (Maradi) buck in a Lowland Tropical Environment	I. I. BITTO and T. AGAM	UNAM	sibittos@yahoo.com	301

#### Session four: Livestock Economics & Extension (LEE)

TITLE	NAMES	UNIVERSITIES	E-MAIL	Page
Problems militating against commercial egg production in the southern guinea savannah of Nigeria	A. A. ADEYEMO and F. T. ADEYEMO	ARMTI, ILORIN.	akobimola@yaho o.com	304
Farmers' perception on the consumption of sabara ( <i>guiera senegalensis</i> ) by ruminant livestock in the Sudan zone of Nigeria	Y. GARBA and I.R MUHAMMAD	BAYERO UNIVERSITY, KANO.	yugarba@yahoo. com	306



Measuring technical efficiency of backyard family poultry production in Ogun State of Nigeria.	J.O.OLADEEBO	LAUTECH	oladeebo.jo@laut echnae-eedu.com	309
Economics of beef marketing in ilorin east local government area of Kwara State	OLADEJO, JOANA ADEFEMI	LAUTECH	joana.oladejo@y ahoo.com	313
Analysis of the role of women farmers in livestock production in kayoma local government area of Kwara state, Nigeria.	AYANWUYI E, KUPONIYI F.A AKINBOYE O.A and OYETORO J.O.	LAUTECH	ayanshola@yaho o.com	317
Analysis of loan repayment performance of livestock enterprises among loan beneficiaries of nigerian agricultural co-operative and rural development bank (nacrd)	SANUSI, W.A., OLADEJO, J.A and ADEBAYO, O.O	LAUTECH LEE	sannsiwa@yaho .com	322
Factors influencing adoption of local chicken improvement innovations: a case of chick's multiplication and production systems (cmps) in plateau state, Nigeria	S.A SANNI N.C. DAWANG, B. AHMED and I.I. DAFWANG	ABU LEE	loa collected	325
Allocative efficiency of fish farmers in Akufo farm settlement, Ibadan	USMAN J.M., AKOUN J. OJO M.O., OKEKE E.N. OSALUSI C.S OLATIGBE O.A and OKOZI M. N.	FEDERAL COLLEGE OF FORESTRY, IBADAN.	usmanj05@yaho o.com	329
Flock structure and management of local chickens in Dekina local government area of Kogi state, Nigeria	DAIKWO, I.S, OKPANACHI, U, OGAH, D.M and, OCHEJE, J.O	KOSU	daiikwo2@yaho. co.uk	332
Assessment of Farmers' use of Information Sources in Managing Poultry production Risks in Oyo Agricultural Zone, Oyo State, Nigeria.	OLANIYI, O. A, ADEBAYO O. O. and ADEWALE J. G.	LAUTECH	dayomuyiwa@ya hoo.com	334
Effect of bird flu outbreak on poultry products marketing in Kaduna state, Nigeria	E.I.IKANI and S. FAKAI	EXTENSION DIVISION, N V R I,VOM PLATEAU STATE	ikani50@yahoo.c om	338
Cost and returns analysis of small scale beef fattening enterprise in Bama local government area of Borno State	OMOLEHIN, R. A; AJALA, M. K; ABBA, S. S. U.	ABU		341
Assessment of Wholesale and Retail Marketing of farm raised <i>Clarias gariepinus</i> by Women in Southwest, Nigeria	A.O. AYANBOYE	OSCA Igbo-Ora	ayanoluyemi@ya hoo.com	345



**Session five: Monogastric Animal Production (MAP)**

TITLES	NAMES	UNIVERSITY	e-mail	Page
Effect Of Cooked-Sun-Dried Blood Meal on Economic Parameters of Starter Broiler Chicks Fed Diets without Synthetic Lysine	NDELEKWUTE, E.K., NYANG, U. O., UZEGBU, H.O., IGWE, I.R., OGBE, S. E. and AGBARA, D.O.	UNI UYO	nekresearch@yahoo.com, ask4nekel@yahoo.com	348
Replacement of Fish Meal with Whole and Shellless Hatchery By-Product Meal on Performance and Carcass Characteristics of Broilers	S. S. ABIOLA, A. A. ADELAJA, A. M. AKANMU, O. M. SOGUNLE and L.T. EGBEYALE	UNAAB	abiolass@yahoo.com	351
Performance Characteristics and Gut Morphology of Broiler Chickens with Oral Supplementation with Telfaria Occidentalis Leaf Extract at Finisher Phase	O.M ALABI, F.A. ADEREMI, M.O.AYOOLA., T.E. LAWAL., A.A. ADEWUMI., A.O. OGUNTUNJI and O.B. ALABI	BOWEN	femiatom@yahoo.com	354
Effect of Feeding Three Types of Forages on The Performance of Weaner Rabbits	N.E. UKPE, I.E UKPE and S.U ILO	ERS, UMUAHIA, ABIA STATE	idloveukpe@yahoo.co.uk	357
Performance and Nutrient Utilization of Weaner Rabbit Fed Breadfruit ( <i>Artocarpus altilis</i> ) Meal	OLADUNJOYE I. O., OJEBIYI O. O., AMAO O A., RAFIU, T. A. and OLANIYI C. O	LAUTECH	iooladunjoye@yahoo.com	359
The Effect of Urea and Corn Cob Ash Treated Cocoa Pod Husk on Some Linear Body Parameters of Growing Pigs.	A.A. AYUK, B.I. OKON, B. OKON, E.I. UMOH, G.S.I. WOGAR, and M.I. ANYA	UNICAL	yinsaj@yahoo.com	362
Influence of Ziziphus ( <i>Ziziphus mauritiana</i> ) Leaf Meal Inclusion on Nutrient Digestibility and Nitrogen Balance in Rabbits	ABDU, S.B., YASHIM, S.M., HASSAN, M.R. ADAMU, H.Y. and JUDE, U.E.	ABU	abduab@gmail.com	366
A Review of the Role Of Vitamins in Ameliorating the Adverse Effects of Hot Weather in Poultry Production.	O.M. DAUDU, S.O. OGUNDIPE and M. ORUNMUYI.	ABU	remidaudu@yahoo.com	369
Utilization of Supplemental Tridax Procumbens Meal in Cassava Based Diets by Growing Rabbits.	S. A. IKURIOR, A.T. IGBA, and D.T. SHAAHU	UNAM.	shaahut@yahoo.com	372
Growth Response and Carcass Characteristics of Broiler Finisher Chickens Fed Varying Dietary Levels of Sun-Dried Animal Plasma	G. A. NKWOCHA, K.U. ANUKAM and V. I. NKWOCHA	IMO STATE POLY, UMUAGWO,	geffmacnkwo@yahoo.com	375
Performance of Broiler Starter Birds Fed Varying Dietary Levels of Neem ( <i>Azadirachta indica</i> ) Leaf Meal.	OLABODE ADEYEMI and A.E. ONYIMONYI	FEDCOL OF AGRIC, ISHIAGU.	adeoladavid2005@yahoo.com	379
Effect of Dietary Inclusion of	OKEREKE, C.O., OTI, E.,	NRCRI	ogbokereke2009	382



Orange-Fleshed Sweet Potato Meal on Egg Quality of Laying Hens	and NWAUZOR, E.C.	UMUDIKE,	@yahoo.com	
Poultry Industry and Alternative Feed-Staffs – A Mini Review	O.O. EGBEWANDE	IBB UNIVERSITY, LAPAI.	oofegbewande@yahoo.com	385
The Replacement Value of Pigeon Pea ( <i>Cajanus cajan</i> ) For Maize in Growing Rabbit Diets	M.I. IORGYER, S.N. CAREW and J.A. AYOADE	AOCA, YANDEV, BENUE STATE	davidiorgyer@yahoo.com	388
The Effects of Different Dietary Fibre Sources on The Growth Performance and Carcass Characteristics of Growing Rabbits.	S.E. ALU, R.S. RUMA and A. A. U. UMBUGADU AND O. J. MAKINDE	NASARAWA STATE UNIVERSITY, KEFFI,	seafarms2000@yahoo.com	390
Performance and Carcass Characteristics of Weaner Pigs Fed Wildsunflower-Blood Meal Mixture Diets	T.B. OLAYENI, G.O. FARINU and OJEDIRAN T.K.	LAUTECH	olayenitb@yahoo.co.uk	393
Growth Performance of Cockerel Chicks Fed Graded Levels of Boiled Pigeon Pea	A. G. YISA, O. D. OLAIYA, K. N. AKANNI, A. AKINYEMI and J. A. EDACHE,	NVRI, VOM,		397
Performance Characteristics and Haematological Profiles of Adult Rabbits Fed Moringa ( <i>Moringa oleifera</i> ) Leaf Meal Supplements	E.N. OKEKE, J.M. USMAN, OSALUSI C.S., AKINOLA, O.O, ABIOLA, J.K. and A.C.NWACHI	FED COL FORESTRY IBADAN.	usmanj05@yahoo.com	400
The effect of Allzyme SSF supplementation on rice mill by-product based diet on performance and carcass characteristics of finishing pigs	ADESEHINWA, A.O.K., B. OMOJOLA, O.O. OBI, M.A. ADESINA and O. OLUWOLE	MOOR PLANTATION	aokadesehinwa@yahoo.com	404
Evaluation of <i>Moringa oleifera</i> Leaf Meal Inclusion in Cassava Chip Based Diets on Egg Quality of Laying Birds	T.S. OLUGBEMI, S.K. MUTAYOBA and F.P. LEKULE	ABU	tsolugbemi@abu.edu.ng	407
Effect of Duration of Cooking of <i>Lablab purpureus</i> Beans on Haematological Parameters of Broilers Finishers and Pullet Chicks.	ABEKE, F.O., OGUNDIPE, S.O., SEKONI, A.A., DAFWANG I.I. and ADEYINKA, I.A.	ABU	francisabeke@yahoo.com	411
Effect of Feed Manipulation on The Growth and Development of Male Line Broiler Parent Stock Reared Under Tropical Open Sided House	F.O. ABEKE, A.A. SEKONI, A.I. ADEYINKA C.A. IGBOZURIKE, E.O. UBANI and M. OTU.	NAPRI, ZARIA	francisabeke@yahoo.com	413
Effect of Graded Levels of <i>Lablab purpureus</i> Beans on the Haematological Parameters of Growing Pullets and Broiler Finishers.	ABEKE, F.O., OGUNDIPE, S.O., SEKONI, A.A., DAFWANG I.I. and ADEYINKA, I.A.	NAPRI, ZARIA	francisabeke@yahoo.com	416
Growth Performance and Economy of Maize Offal as a	NSA, E. E., OKON, B., AKPAN, I. A., ANYA, M.	UNICAL		418



Replacement for Maize in Broiler Finisher Diet	I., WOGAR, G.S.I., EDET, G. D., OKEREKE, C. O. and JUOBI, V. I.			
Growth Performance, Blood Characteristics and Cholesterol Status of Growing Pullet Fed Copper Salts	JEGEDE, A. V., FAFIOLU, A. O., OSO, A. O and SOBAYO, R. A	UNAAB	vinbjegade@yaho o.com	422
Nutritional Evaluation of Toasted <i>Mucuna sloanei</i> Meal in the Diet of Grower Pigs	A.H. AKINMUTIMI and E. K. OGU	UMUDIKE		425
Comparative performance of four different strains of broiler chicken in Nigeria	A.A. ADEKUNMISI, H.A. AWOJOBI and A.A. TAIWO	OOU	hezeking@gmail. com	429
The Impact of Commercial Feeds on Broiler Performance – an Assessment of The Situation in Ogun State, Nigeria	OLARINMOYE, A.O., TAYO, G.O., CHIOMA, G.O., ESURUOSO, G.O., OTELAJA, O.M.	BABCOCK	aolarinmoye@gm ail.com	433
Poultry Waste Management Practices and Nitrogen Composition of Faecal Waste in Selected Farms in Remo Zone of Ogun State	G.O. TAYO, O. KILANKO and O. OLARINMOYE	BABCOCK	toyin_tayo@yaho o.co.uk	436
Deep Stacking Poultry Litter as Feed Ingredient in Livestock Production	O.J. OWEN, J.P.ALAWA, S.N. WEKHE, AMAKIRI, A.O E.M. NGODIGHA	RUST	congomfx@yahoo .com	439
Performance and Egg Quality Characteristics of Growing Pullets Fed Differently Processed Mango Seed Kernel Meal Based Diet.	RAFIU, T. A., DABATUNDE, G. M., ODUNSI, A. A., ADERINOLA A. O., OLANIYI C. O., AKINWUMI, A. O., FAKOREDE, M. T., AKANBI M. J. and OYALADE A.	LAUTECH	rafiuta@yahoo.co m	442
Performance of Grower Rabbits Fed Diets Containing Graded Levels of Mango ( <i>Mangifera indica</i> ) Seed Kernel Meal.	A. M. YUSUF, M. H. GARBA, O. A. OLAFADEHAN, M. INUWA, U. O. IROKANUIO, A. J. MEDUNA and T. R. ADEKOJO	FED COL, NEW BUSSA,	aliyuefuturi@yah oo.com	446
Replacement Value of Neem Seed Kernel Meal for Soyabean Meal in Broiler Chicks Diet	ADAMU, S. B., A. O., RAJI, G. MUHAMMAD and S. A. OMOLARA	UNIMAID	essbeepot@yahoo .com.	449
Variation of Energy and Protein Content on The Performance and Carcass Values of Broiler Chickens	F.A.S DAIRO, T.A. OLUWASOLA, A.O.K. ADESEHINWA, J.A. OLUYEMI	UNAD	fasdairo@yahoo.c om	452
Evaluation of Carcass Characteristics and Organ Proportions of Local Turkeys Fed Varying Levels of Rice Milling Waste as Substitute For Dietary Maize	G.N. NWOICHE, G.S. OJEWOLA and A.H. AKINMUTIMI	UMUDIKE	gnnenwoche@yah oo.com	455
Performance Indices of Starting Broilers Fed Dietary Levels of Roasted Fluted Pumpkin Pod Husk Waste Meal	S.O. OMOIKHOJE, E.T.E. EHEBHA , A.M. BAMGBOSE and B.A. OSIFO	AAU Ekpoma	soomoikhojeaau @yahoo.com	459



Performance of Cockerel Starters Fed Copra Meal Based Diets.	EHEBHA, E.T.E; OMOIKHOJE, S.O and BAMGBOSE, A.M	AMBROSE ALLI UNIVERSITY,		462
Growth and Haematological Status of Starter Broiler Chicks Fed Diets Containing Afzelia Africana Seed Meals.	OBUN, C.O.; AYANWALE, B.A. YAHAYA.M.S.; ALLISON, D.S. and OLAFADEHAN,O.A.	FED COL., NEW BUSSA,	obunotu@yahoo.com	465
Haematological Studies and Serum Biochemistry of Rabbits Fed Raw Kapok ( <i>Ceiba pentandra</i> ) Seed Meal.	OCHEFU, J.; BITTO, I. I. and CAREW, S. N.	UNAM.	jochefu@gmail.com	468
Effect of Late Feed Restriction on Performance And Economic of Production in Broilers Chickens	IBITOYE, E.B., OLOREDE, B.R., JIMOH, A.A., SULEIMAN, N., GWIMI, B.P. and UKO, O.J.	UDUSOK	emmavet2001@yahoo.com	471
Haematological Indices and Carcass Characteristics of Broiler Chickens Fed Graded Levels For Yam Peel Meal As Partial Replacement of Maize	MOHAMMED, G., IGWEBUIKE, J. U, ADAMU S. B., DIBAL., E and AYEWE, F	UNIMAID		475
The Comparative Effects of Replacing Maize with Full Fat Rubber Seed (Cooked) and Palm Kernel Cake on the Performance of Broiler Chicks	B.C.LALABE, S.F. YUSTUS, S. O. ARIBIDO and OKPANACHI, U. :	RRIN. BENIN CITY.	lalabecham2020@yahoo.com	478
Unmilled Rice Offal as A Replacement for Maize in the Enzyme Supplemented Diets of Broiler Starters: Effects on Live Performance Traits.	R. I. SALAMI	EACOED, OYO,	risalami@yahoo.com	481
Influence of Housing Systems on the Performance and Reproductive Characteristics of Weaner Rabbits Reared in Port Harcourt, Rivers State	L. NDOR, O.J. OWEN AND V.N. NYECHIE	RUST	congomfx@yahoo.com	484
The Feed Value of Fossil Shell Flour for Grower Rabbits	J.A. AYOADE, D.T. SHAAHU, and S.N. CAREW	UNAM.	sncarew2001@yahoo.com	487
Some Muscle Growth in Broiler Chickens Fed Sorghum Dust in Place of Maize Based Diets	K. AJAJA	COL OF EDU., IKERE- EKITI	kolawoleajaja@yahoo.com	490
Growth Response and Nutrient Digestibility of Weaner Rabbits Fed Maccaroni Waste	A.O. OSO, A.O. FAFIOLU, P. A. DELE, V.O.A. OJO, K.A, YUSUF, T.A. AMOLE, O.O. ONI and O.B. ODUNFA	UNAAB	drosoann@gmail.com	493
Performance of crossbred rabbits fed varying Levels of Dry or Wet Season <i>Panicum maximum</i>	ADERINOLA, O.A., RAFIU, T.A., AKINLADE., J.A., AKINGBADE, A.A., ALALADE J.A., OJEDIRAN T.K., BINUOMOTE, R.T and ALABI O. L	LAUTECH	ade4aderinola@yahoo.com	496
Effect of Dietary L-carnitine Supplementation of Diets Containing Cashew Nut Reject Meal by Broiler Chickens	FAFIOLU, A. O., A. V. JEGEDE, A. O. OSO, O.M.O. IDOWU and R.A. SOBAYO	UNAAB	fafiolu2000@yahoo.com	499



The Effect of Methionine Supplementation on the Growth Performance and Haematological Responses of Growing Rabbits Fed Diets Containing Cassava Peel/Leaf Meal.	OJEBIYI O.O., ESO R.I., OLABANJI R.O., FARINU G.O., BABATUNDE G.M.	LAUTECH	segunojebiyi@yahoo.com	502
Performance and Carcass Evaluation of Broiler Chickens Fed Bread Waste Based Diets	A.O. OWOSIBO, O.O. ADEJINMI, S.O. ODUKOYA, B.J. FAPOHUNDA and A.M. RAJI	MOOR PLANTATION	owosibo@yahoo.com	505
Effects of Partial Replacement of Maize With Yam Peel Meal on The Growth and Economic Performance of Broiler Chickens	IGWEBUIKE, J. U., MOHAMMED, G., ASHEIKH, L. G., UBOSI, C. O. and MOHAMMED, B.	UNIMAID		508
Performance of Weaner Pigs Fed Different Levels of Faba Bean ( <i>Vicia faba</i> l.) Meal as Replacement for Full FAT Soybean Meal.	EMIOLA I. A, OLAYENI T.B., AKANDE T. O, OLANIYI C. O. and GOUS R.M	LAUTECH		511
Growth Performance of Finisher Broilers Fed Fish Meal Replaced with Wing Reproductive Termite ( <i>Macrotermes nigeriensis</i> ) Meal.	A.T. IJAIYA, E.Z. JIYA, J.O. ALABI, J. MUSA, M. YUNUSA and O. JIYA	FUTMINNA	alabioj@yahoo.com	515
Comparative Study on the Effect of Sole Forage and Mixed Concentrate-Forage Feeding Regimes on the Performances of Weaner Rabbits	EKEREUKE E O., EFFIONG H.E. and ESSIEN V.	AISKAS, Ikono	ekereuke@yahoo.com	518
Growth Performance and Economy of Production of Cockerel Chicks Fed Cassava Leaf Based Diets.	KEHINDE A.S, BOBADOYE, A.O. and BABATUNDE T.O	FRIN	osuba01@yahoo.com	521
Brooding performance of indigenous domestic fowls at Takalmawa and Nasarawa villages of Sokoto state, Nigeria	RAJI, A. AND W.A. HASSAN	U.D.U. SOKOTO		524
Growth Performance and Economy of Production of Cockerel Chicks Fed Cassava Leaf Based Diets	KEHINDE A.S, BOBADOYE, A.O. and BABATUNDE T.O	FRIN	osuba01@yahoo.com	

#### Session six: Micro-livestock and Fisheries Production (MFP)

TITLE	NAMES	UNIVERSITY	E-MAIL	Page
Climate Change Versus Wildlife: Causes, Consequences, and Cure	OLOWOHUNWA I.J, FALEYIMU, O.I, AKINYEMI, O and ADEJOBA, O.R	FED. COL. FORESTRY MECH., AFAKA, KADUNA	orimoloyespecial@yahoo.com	529
Resource Productivity and Efficiency Among Urban Fish Farmers in Abuja Metropolis	BALOGUN, O.S, AGBOMAKHA F. I and AKINYEMI, M	FED. COL. FORESTRY MECH., AFAKA, KADUNA	baaseg2006@yahoo.com	532



Problems and Prospects of Fish Farming in Port Harcourt City Local Government Area	M.O. IRONKWE AND I. ETELA	UNIPOINT	monicaironkwe @ yahoo.com	537
Guinea Pig ( <i>Cavia porcellus</i> ) as an Untapped Protein Source for Man: the Potentialities, Opportunities and Challenges	A.H. DIKKO, S.S.A. EGENA, A.A. MALIK and H. IBRAHIM	FUTMINNA	dikkoaliyu@ymail.com	540
Study of Carcass Characteristics and Meat Attributes of African Giant Rat ( <i>Cricetomys gambianus</i> ) in a Semi-Arid Zone of Nigeria.	B.F. MUHAMMAD AND S.L. IBRAHIM	BAYERO UNIVERSITY,	bmfagge2000@yahoo.com	543
Influence of Weaning Age on Post-Weaning Performance of Grass Cutter Pups	HENRY, A. J.	UNICAL	affys.henry@yahoo.com	547
Growth performance of African Catfish Fed Locust Bean Meal ( <i>Parkia implobosa</i> )	OLANIYI, C.O., ADERINOLA, O.A., RAFIU, T.A., AKANDE, T.O and OKUNLOLA, D.O	LAUTECH	dayomuyiwa@yahoo.com	550
Growth Performance of Growing Japanese Quail ( <i>Coturnix coturnix japonica</i> ) Fed Diets Containing Different Crude Protein Levels.	AKPAN, I. A. and NSA, E. E.	UNICAL		553
Hatching Success and Embryonic Mortality in Japanese Quail ( <i>Coturnix coturnix japonica</i> ) Farm in North Central Nigeria	ABATCHA, M.G., EMENNAA, P.E., MUSA, U., AHMED, M.S., NJAM, L.R., KARSIN, P.D., JAMILU, H., and H.O. AJIBOLA	NVRI, VOM.,	mustygoni@yahoo.com	556
Use of Morphological and Haematological Indices of African Mudfish ( <i>Clarias gariepinus</i> ) to Assess Doma Dam Water Quality	S.A. OKUNSEBOR AND K.O. IDAHOR	NASU, KEFFI.		559
The Effect of Domestication on Proximate Composition, Mineral Content and Cholesterol Level of Grass Cutter's Meat ( <i>Thryonomys swinderianus</i> ).	ONYEANUSI, A.E., BOBADOYE, A.O., AKINYEMI, I.G. and BOBADOYE, B.O.	FRIN	bobadoyed@yahoo.com	562
Donkey Breeds and Management in Semi-Arid Areas of North-East Nigeria	M.R. HASSAN, S. B. ABDU, S. M. YASHIM, M. ABDULRASHID and H. Y. ADAMU	ABU	mohammedrabiu92@gmail.com	564
Effects of Replacing Soya and Fish-Meals with Mulberry and Siam-Weed Leaves in the Supplementary Diet of <i>Archachatina marginata</i> swaison (African giant snail)	IMRAN, G.T.; OKUNADE, S.A. and C.F.A. ADEBAGBO	FRIN	murainagbola@yahoo.com	567



Session seven: Ruminant Pasture Production (RPP)

TITLE	NAMES	UNIVERSITY	E-MAIL	Page
Sulphur utilization by two breeds of goats	YUSUF, A.O. and BAWALA, T.O.	UNAAB	zee_mine@yahoo.com	569
Intake and digestibility of red sokoto goats fed varying proportions of andropogon gayanus and pterocarpus erinaceus forage	O. A. OLAFADEHAN, O. O. OLAFADEHAN, C. O. OBUN, A. M. YUSUF, A. A. ADENIJI, O. O. OLAYINKA and B. ABDULLAHI	UNIABUJA	oaolafadehan@yahoo.com	572
Traditional sheep and goat rearing and taboos in south-western nigeria	AINA, A. B. J., SOWANDE, O. S., FASAE, A. O., OLOKO, O.O. and ODERINDE, O. O.	UNAAB	ainabj@yahoo.com	575
Effect of grass monocultures on earthworm density, ecological categories and biomass in grassland ecosystem	M.R. HASSAN, A. ELGERSMA, R. G. M DE GOEDE, I.R MUHAMMAD, G.E JOKTHAN, G.N AKPA and S. B. ABDU	ABU	mohammedra biu92@gmail.com	578
Assessment of Panicum maximum (jacq), gliricidia sepium (jacq) and gmelina arborea (roxb)-based diets as all year round feed for west african dwarf goat	A.A.LAMIDI, A.B.J AINA, S.O SOWANDE, A.O JOLAOSHO.	UNAAB	adr.lamidi@yahoo.com	582
Stock management factors of small ruminant productivity in abeokuta north local government area of ogun state	S. O. IPOSU & M. K. OYEDEJI	UNAAB	iposuepe@gmail.com, iposuso@unaab.edu.ng	585
The effect of replacing cassava peel meal with discarded tiger nut (cyperus esculentus) meal on performance of lactating red sokoto goats	OCHEPO, G. O, AYOADE, J. A and IBEAWUCHI, J. A	UMUDIKE		588
Sustainable strategies for small ruminant production in rivers state	I. ETELA AND M.O. IRONKWE	UNIPORT	ibetela@yahoo.com	592
The role of condensed tannins from whole cassava plant on faecal parasitic egg-counts in west african dwarf goats	O. E. FASINA, OGUNTADE, S. B. and ADEBANJO, A. B.	OOU	emmybummy@yahoo.com	597
Influence of source of organic manure on proximate composition of sorghum alnum silage	M. BABA AND S. M. ABUBAKAR	BUK	babamuhammad01@yahoo.com	600
Browse plants of egbado north rangeland: distribution and chemical composition.	TAIWO, B.B.A., ADEKUNMISI, A.A. and ADEYEMI, A.A.	OOU	tunstai@yahoo.com	606
Dry matter and crude protein degradation of some tropical browse leaves by west african dwarf goats	ISAH, O. A., ODEKUNLE, O.,	UNAAB	bukkyisah@yahoo.com	603
Effect of intercropping Panicum maximum var. Ntchisi and lablab purpureus on the growth, herbage yield and nutritive qualities of panicum maximum var. Ntchisi at different harvesting times.	OJO, V. O. A., P. A. DELE, T. A. AMOLE, S. A. ADEOYE, U. Y. ANELE, J. A. OLANITE and O. A. HASSAN	UNAAB	ojovoa@gmail.com	609
In vitro gas production and dry matter degradability of ensiled guinea grass (panicum maximum) harvested at 1	F. O. FAMILADE and O. J. BABAYEMI	UI		613



and 3 months regrowths				
Effect of dry season supplementation of palm kernel cake (pkc) on the performance of n'dama and bunaji calves	OKUNLOLA D.O, ADEWUMI M.K, BUSARI A.A, AKINWUMI A.O, and OJEDIRAN T.K	LAUTECH		616
Effect of dietary monensin inclusion on selected hematological parameters in west african dwarf goats.	ADERINBOYE, R. Y., ONWUKA, C. F. I., AINA, A. B. J. and ODUGUWA, O. O.	UNAAB	aderinbry@ya hoo.com	619
Performance of west african dwarf (wad) sheep fed leucaena – based multinutrient blocks	AYE P.A.	UNAD	ayepius2008 @yahoo.com	622
Incidence of foreign materials in the rumen of slaughtered ruminant animals	AINA, A. B. J., IPOSU, S. O., SOWANDE, O. S. and JINADU, G. D	UNAAB	ainabj@yaho o.com	626
The effect of replacing cassava peel meal with discarded tiger nut ( <i>Cyperus esculentus</i> ) meal on performance of lactating red sokoto goats	OCHEPO, G. O, AYOADE, J. A and IBEAWUCHI, J. A	UMUDIKE	ochochegodw in@yahoo.co m	
Nutritional assessment of the milk of indigenous cow traditionally managed by fulani herdsmen	OGUNDUN, N.J, AKINLADE, J.A., MEDUNA, A.J. ODEJIDE, O.J. and UMUNNA, M.O	FCWM. NEW BUSSA,	folagboyeogu ndun@yahoo. com	629
Effect of three species of stylosanthes on the performance of west african dwarf sheep	OGUNBODE S.M. and AKINLADE J.A.	FOUNTAIN UNIVERSIT Y,		632
Preliminary study on the nutritive potential of some under-utilized tropical plants' seeds of ondo state as indicated by chemical characterization.	A.N. FAJEMISIN, A.A. FADIYIMU, J.A. ALOKAN and A.O. BOBADOYE	FUTA	debofajemisin @yahoo.co.uk	636
Feeding values of panicum maximum cultivar t58 (cvt58) fed to west african dwarf goat	Y.B. OSINUBI, A.E. ONYEANUSI and O.O. TOLAWO	FRIN	realjoke2001 @yahoo.com	639
Effect of cutting regimes on fodder yield of <i>moringa oleifera</i> in the rainforest zone of Nigeria	A. A. FADIYIMU, J. A. ALOKAN, R. D. ALADESANWA, A. N. FAJEMISIN	FUTA	yemifadiyimu @yahoo.com	642
Preliminary evaluation of <i>flemingia macrophylla</i> (willd) merr. Foliage for use in ruminant nutrition.	ASAOLU, V. O., ODEYINKA S. M., SODEINDE, F. G., ODEDIRE, J. O., BABAYEMI, O. J., AKINLADE, J. A., BINUOMOTE, R.T., AMAO, S.R and OYESOLA, T. O.	LAUTECH	voasaolu@ya hoo.com	646
Chemical composition and <i>in sacco</i> degradability of four varieties of cassava leaves grown in south-western nigeria	A.O. ONI, O.M. ARIGBEDE, O.O. ONI, K.O. YUSUF AND C.F.I. ONWUKA	UNAAB	profoni2003 @yahoo.com	649



Effect of roughage to concentrate ratio on goat milk composition and milk secretion rate	F.T. SOLOLA, O.A. OSINOWO and O.M. ONAGBESAN	LAUTECH	ositemi@yahoo.com	652
Challenges facing ruminant livestock production in nigeria – a review	ADEDEJI, O.S., OBUDU, C.E OLAYENI T.B., AMEEN S.A., AYANDIRAN, T.A. and AMAO, S.R	LAUTECH	drsegun.adedeji@yahoo.com, amaosr@yahoo.com	655
Influence of legumes intercropping on stover yield fed to west african dwarf sheep.	ALALADE, J.A., AKINLADE, J.A., AKINGBADE, A.A., AKANBI, W.A., SODEINDE, F.G., ADERINOLA, O.A., AMAO, S.R., AKINWUMI, A.O and OKUNLOLA, D.O	LAUTECH	alaladeja@yahoo.com	657
Utilization of selected five browse plants by pregnant west african dwarf goats	OGUNBOSOYE D.O and BABAYEMI O.JI	MOOR PLANTATION	Bosoyeme@yahoo.com	660
Characterization of cattle ownership and milk production in zamfara grazing reserve, nigeria	A. NASIRU, S. A. MAIGANDI, B. S. MALAMI and A. I. DANEJI	BUK		663
Herbage yield and quality responses of plant components of jack bean ( <i>canavalia ensiformis</i> ) to planting density	BINUOMOTE, R. T., AKINOLA, J. O., AKINLADE, J. A., BABAYEMI, O. J	LAUTECH	temitopeyan@yahoo.com	666
Towards revitalization of the Nigerian small ruminant livestock sub-sector – a review	ADEDEJI, O.S., OBUDU, C.E., OLAYENI T.B. AMEEN S.A., AMAO, S.R AND AYANDIRAN, T.A.	LAUTECH		669
Organic Livestock Production: A New Challenge To Livestock Farmers, Scientists And Researchers In Nigeria	OLABIYI T.I, HARRIS P.J.C and ODUNSI A. A.	LAUTECH	t.olabiyi@yahoo.co.uk	679





## Swot Analysis on the Application of Biotechnology in Livestock Improvement in Nigeria

O. A. Abu<sup>1\*</sup> and K. O. Soetan<sup>2</sup>

<sup>1</sup>Department of Animal Science, Feed Biotechnology Unit, University of Ibadan, Ibadan, Nigeria. E-mail: oa.abu@mail.ui.edu.ng

<sup>2</sup>Department of Veterinary Physiology, Biochemistry and Pharmacology, University of Ibadan, Nigeria. E-mail: ko.soetan@mail.ui.ng

### Abstract

The application of modern biotechnology to livestock improvement programme in Nigeria is still at its infancy compared with crop agriculture. Application of biotechnology in animal agriculture holds promise in Nigeria in terms of improved quantity and quality of livestock and livestock products. The establishment of a national policy on biotechnology by the national government is an incentive to the promotion of agricultural biotechnology. However, the level of funding is low in spite of the availability of skilled albeit few researchers. Funds from local and international donors should however be judiciously utilized since mismanagement of funds is one of the major treats to successful application of animal biotechnology in Nigeria. There is also the need to re-design animal science curriculum at the undergraduate and postgraduate levels to include the teaching of biotechnology to improve capacity building. The existing national policy on biotechnology should be geared towards the safe application of biotechnology, poverty alleviation and conservation of biodiversity, and these should be captured in well articulated strategic plans.

### Introduction

The human population projection for sub-Saharan Africa is put at about one billion by the year 2020 (Winrock, 1992). Nigeria presently with a population of over 140 million is expected to contribute a significant percentage of the expected population growth. This means more pressure on governments on how to feed the expected huge population. The present rate of growth in the agricultural sector is considered too slow to match the expected population growth. The application of biotechnology to agriculture in Nigeria is not new as traditionally biotechnology has been applied to food preparation and preservation in African societies long before now. However with respect to animal production little is done in this respect though animal improvement is largely restricted to crossing of seemingly "best parents". Tewe and Abdullah, 2005 reported that biotechnology application in poultry and feed mill operations in Nigeria should focus on the development of quality chicken, improved feed ingredients, diseases detection, prevention and control, heat stress management and waste management. A study by Ajani *et al.* (2009) conducted in the Southeastern Nigeria revealed that some of the institutions have been involved in biotechnology research for the past two decades but significantly in the areas of bio-processing (58.8%) and cell and tissue culture (33.2%). The results may not be too different from other ecological zones of the country. There are several techniques used in biotechnology. The use of biotechniques in livestock production is progressing fast and includes molecular biological techniques for genome diagnosis and genetic engineering (Peters, 1992; Rege, 1996) and anti-nutritional factors in feeds (Soetan and Abatan, 2008). Africa holds a great percentage of livestock in the world but low productivity of the animals continues to be a source of concern. A careful and selective application of some of these modern biotechnology techniques will no doubt enhance animal production in Nigeria (Abu, 2007; Alabi *et al.*, 2007). The Nigerian government has been reported to openly support

modern agricultural biotechnology (Rothschild, 2005). In this article the SWOT analysis and way forward for biotechnology application in Nigeria are highlighted.

### Challenges of biotechnology in animal production in Nigeria

Nigeria is still grappling with morphological and genetic characterization of the indigenous livestock population. Studies have been conducted in the development of anticolon antibodies and vaccines. Analysis of genomes of livestock is still rudimentary. Gene separation and gene mapping of our genetic resources and reproductive performance by conventional quantitative genetic procedures are opportunities for advancement. The development of the Shika Brown chicken is a major step towards the development of the locally produced strain of laying chicken. Bioinformatics is almost none existence and if at all practiced it is at the very rudimentary level. Conventional cross breeding is slow and measurement of genetic distance and progress is also slow. Unlike cloning and other advanced technologies it is possible to make very rapid genetic gains via these molecular techniques (Carnwath, 1992). The strengths, weakness, opportunities and threats to animal biotechnology in Nigeria are explained in Table 1. The institution and enforcement of patent and copyright laws will guarantee innovativeness and hence ensures that the holders have exclusive rights to use the invention for commercial purpose. Patent also encourages innovativeness. However, the level of patent and copyright in animal biotechnology in Nigeria is low. Meyn (1992) opined that in livestock breeding the possibilities to secure special rights are; animal breeder rights, utility patterns and process patterns. However in Nigeria Irefin *et al.* (2005) reported that only 4.0% of scientists studied possessed intellectual property rights and received royalties regularly, while the majority did not patent their research results because of the lack of interest (45.4%), ignorance (32.0%) and the rigours of the procedure (32.3%). The level of biotechnology research



publications in Nigerian Journal of Animal Science is low compared with other areas of research such as animal production, nutrition, conventional breeding and genetics. (Unpublished data).

### Conclusion and Recommendations

A successful implementation of biotechnology in Nigeria will require a Biosafety policy so that biotechnology is focused on feeding the population in a safe and sustainable manner. Biotechnology is expensive and the huge cost of training can be reduced by designating centres of excellence, reducing duplications and cost. Foreign donors should assist in developing specific areas that are of immense and direct benefits to our development. Regular and constant supply of electricity is important. Running biotechnology facilities on a 24-hr electricity supply from generating sets is

polluting, uneconomical and therefore unsustainable. Genuine efforts should be made to supply sufficient sustainable electricity from the national grid. The Nigerian Institute of Animal Science with the National Universities Commission (NUC) should re-design the curriculum of the animal science courses to include animal biotechnology. Institutions involved in animal biotechnology should focus on research that has commercial value. The ethics and regulation of law concerning introduction of animal biotechnology should also be controlled and pursued with relevant government bodies. For small scale of livestock farmers to benefit therefore such biotechnological interventions should be tailored to meet the needs of the farmers. The intervention must be affordable and flexible to fit into local animal production systems.

**Table 1.** SWOT Analysis of Animal Biotechnology in Nigeria

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>i. Availability of diverse intact crop and animal genetic resources?</li> <li>ii. High human and livestock population to absorb biotechnology products?</li> <li>iii. Availability of trainable staff?</li> <li>iv. Availability of infrastructure and market for service (s) or products?</li> <li>v. Working relationship established with foreign and national institutions and agencies?</li> <li>vi. Vibrant, effective and efficient information media?</li> <li>vii. Press freedom</li> <li>viii. Favourable disposition of National government to biotechnology in Nigerian agriculture</li> <li>ix. Absence of pressure group to introduction of biotechnology products</li> </ul>	<ul style="list-style-type: none"> <li>i. Poor implementation of national biotechnology policy</li> <li>ii. Low level of awareness of biotechnology in the public domain?</li> <li>iii. A deteriorating competitive position with other African countries?</li> <li>iv. Obsolete facilities and curricula in institutes and universities?</li> <li>v. Non-availability of highly qualified and competent staff in certain areas e.g. bioinformatics?</li> <li>vi. Poor track record in implementing strategy?</li> <li>vii. Lack of funds to finance needed changes in strategy?</li> <li>viii. Inadequate working capital base and wasteful expenditure?</li> <li>ix. Absence of a comprehensive computerized database on biotechnology research</li> <li>x. Biotechnology research skewed to crops than animal production.</li> </ul>
Opportunities	Threats
<ul style="list-style-type: none"> <li>i. High capability for trainable personnel</li> <li>ii. Accessibility of biotech products to end users</li> <li>iii. Opportunities in large genuine partnerships and linkage with industry and international organizations</li> <li>iv. Opportunities to go into commercial ventures due to its unique and potentials</li> <li>v. Opportunities for assistance with national and international donor agencies</li> <li>vi. Patents and rights of biotechnological inventions</li> </ul>	<ul style="list-style-type: none"> <li>i. Poor funding?</li> <li>ii. Inconsistency in government policy?</li> <li>iii. Poor implementation strategy of education policy?</li> <li>iv. Decline in funding of tertiary institution?</li> <li>v. Loss of the few skilled staff due to other countries.</li> <li>vi. Political instability</li> <li>vii. Deplorable state of infrastructural facilities and equipment in research institutes and universities.</li> <li>viii. Mismanagement of funds</li> <li>ix. Loss of biodiversity</li> </ul>



inable  
nt and  
igerian  
versity  
um of  
animal  
t has  
laws  
should  
nment  
enefit  
ild be  
ention  
nimal

References

O. A. (2007). Application of biotechnology in Animal Sciences. . A paper delivered at a workshop organized by Nigerian Institute of Science Laboratory Technology, Federal Ministry of Science and Technology, Samonda, Ibadan, 22- 26 October 2007.

S. B., A. A. Babatunde and K.C. Egemba (2007). Agricultural biotechnology in developing countries: Status in Nigeria. *Res. Jour. of Applied Sciences*: 2 (10): 1019-1024.

E. N, M. C. Madukwe, A. E. Agwu and E. A. Onwubuya (2009). Assessment of technology generating institutions in biotechnology innovation system of South-Eastern Nigeria. *African Journal of Biotechnology* Vol. 8 (10): 2258-2264

Smith, J. W. (1992). Gene technology as a useful tool in developing countries in: Potentials and limitations of biotechnology in livestock production in developing countries. Proceedings of a Symposium held at the Institut für Tierzucht und Tierverhalten (FAL), Mariensee, Germany, May 1992 in cooperation with the Council for Tropical and Subtropical Agricultural Research (ATSAF) edited by H. Niemann, H. Franzen and D. Smidt. Pp 154-161

I. A., Ilori, M. O. and Solomon, B. O. (2005). Agricultural biotechnology R and D and Innovations in Nigeria. *International Journal of Agricultural resources, Governance and Ecology*. Vol. 4 (1): 64-80

K. J. (1992). Do we need biotechnology in livestock production in developing countries in: Potentials and limitations of biotechnology in livestock production in developing countries. Proceedings of a Symposium held at the Institut für Tierzucht und Tierverhalten (FAL), Mariensee, Germany, May 1992 in cooperation with the Council for Tropical and Subtropical Agricultural Research (ATSAF) edited by H. Niemann, H. Franzen and D. Smidt. Pp 162-175.

Rege, J. E. O. (1996). Biotechnology options for improving livestock production in developing countries, with special reference to Sub-Saharan Africa. In: Lebbie S.H.B. and Kagwini E. 1996. *Small Ruminant Research and Development in Africa*. Proc. Of the Third Biennial Conf. of the African Small Ruminant Research Network, UICC, Kampala, Uganda, 5-9 Dec, 1994. ILRI, Nairobi, Kenya 322pp. <http://www.fao.org/wairdocs/ilri/x5373b/x5473b05.htm>.

Rothschild, J. (2005). Nigeria biotechnology agricultural biotechnology report 2005. Global Agriculture Information Network, USDA report No. N15014, Template version 2.09.

Soetan, K. O. and Abatan, M. O. (2008): Biotechnology a key tool to breakthrough in medical and veterinary research- A Review. *Biotechnology and Molecular Biology Review* Vol. 3(4),pp. 088-094. <http://www.academicjournals.org/BMBR>.

Tewe, O. O. and Abdullah, A. (2005). Biotechnological options for livestock Research, International Livestock Research Institute. A Monograph edited by C. B. Sonaiya..

Winrock. (1992). Assessment of Animal Agriculture in sub-Saharan Africa. Winrock International, Morrilton, Arkansas, USA. 125 pp.

UNIVERSITY OF IBADAN