



# ANIMAL SCIENCE ASSOCIATION OF NIGERIA (ASAN-NIAS)

Proceedings of the

**20<sup>TH</sup>  
ANNUAL  
CONFERENCE**

**IBADAN 2015 JAM**  
**JOINT ANNUAL MEETING**

theme:

MEETING THE INCREASING DEMAND  
FOR ANIMAL PRODUCTS BY A HUNGRIER WORLD:

**THE CHALLENGE OF  
IMPROVED ANIMAL PRODUCTION**

**DATE:** SEPTEMBER 6 - 10, 2015

**VENUE:** INTERNATIONAL CONFERENCE CENTRE,  
UNIVERSITY OF IBADAN, IBADAN.

**Edited by:** O. A. ADEBIYI, O. A. OGUNWOLE, O. J. BABAYEMI and E. A. IYAYI

**ISSN: 9783477722**



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

**PROCEEDINGS OF THE 20<sup>TH</sup> ANNUAL CONFERENCE**

---

**Theme:**

**Meeting The Increasing Demand For  
ANIMAL PRODUCTS BY A HUNGRIER WORLD:  
THE CHALLENGE OF IMPROVED ANIMAL PRODUCTION**

---

**EDITED BY**

**O. A. ADEBIYI, O. A. OGUNWOLE, O. J. BABAYEMI and E. A. IYAYI**

**6<sup>TH</sup> - 10<sup>TH</sup> SEPTEMBER, 2015  
IBADAN**

Copy Right 2015: Animal Science Association of Nigeria

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

ISSN: 978 34777 22

Publication by  
The Animal Science Association of Nigeria (ASAN)

Printed by  
Aklad Publicity, Ibadan  
08023659093, 08106115818



## TABLE OF CONTENTS

CODE	TITLE OF PAPER	NAME OF AUTHOR(S)	ADDRESS	PAGE
	<b>ANIMAL BIOTECHNOLOGY</b>			1
AB: 01	The use of microsatellite to establish genetic similarities in some strains of Nigerian Guinea fowl	Umar, U. A., Kabir, M. Nwagu, B. I.	National Animal Production Research Institute, (NAPRI) Shika-Zaria, Nigeria	2
AB: 02	Polymorphism of <i>Tumour necrotic factor receptor super family 1 A</i> gene in Nigerian indigenous naked neck chickens	Adenaike, A. S. Ojerinde, T. E., Agbalaya, K. K. and C. O. N. Ikeobi	FUNAAB	6
AB: 03	Response of grower turkeys to different fibre sources supplemented with exogenous enzyme	Makinde, O. J., Inuwa, M., Babajide, S. E., Omotugba, S. K., Ibe, E. A., Ajibade, A. J., Mohammed, H. L., Bakare, K., Chukwudebe, E. P., Zaccheaus, O. S. and Awofolajin, A. O.	Federal College of Wildlife Management, (FCWM) New Bussa, Nigeria	10
AB: 04	Supplementation of Vitamin A and mycotoxin binder improved the growth performance of broilers fed contaminated yellow and white maize	Ademola, S. G., Shittu, M. D. and Akinwumi A. O.	LAUTECH	15
AB: 05	Effect of microbial phytase on growth and phosphorus utilization of broiler chicks	Daramola, O. T., Fasuyi, A. O. and Jimoh, O. A.	Federal Polytechnic, Ado Ekiti	20
AB: 06	Evaluation of Supplemental Crude Papain and Maxigrain Enzyme on Performance and Carcass yield of Broiler Chicken	Odunsi, A. A., Haruna, M. A. and Famakinwa, T. J	LAUTECH	24
AB: 07	Performance and cost benefits of broiler chickens fed diets containing graded levels of shea kernel cake meal with or without probiotic supplementation	Aguihe, P. C, Kehinde A. S, Ilaboya, I. I, Fatokun, B. O., Abdulmumini, S., Adelokun, K. M and Babatunde T. O.	FCWM	28
AB: 08	Effects of Egg Yolk Plasma from five different domesticated Nigerian avian species in chilled storage of rabbit semen	Popoola, M. A., Alemede, C. I, Aremu, A., Ola, S. I., Popoola, Y. R.	National Biotechnology Development Agency, Abuja, Nigeria NBDA	33
AB: 09	Effect of anti-nutritional factors on the nutritional potential of	K. O. Soetan and O. A. Abu	UI	39



	three varieties of Lablab bean ( <i>Lablab purpureus</i> ) in rats			
AB: 10	Genetic diversity of five populations of Nigerian local breeds of goat using Random Amplified Polymorphic DNA markers	Udeh, F. U., Ndofor-Foleng, H. M. and Onodugo, M. O.	UNN	44
AB: 11	Preliminary serum protein analysis of local and exotic chicken using SDS-polyacrylamide gel electrophoresis	Olaniyi, W. A., Bamidele, O., Ajao, B. H., Arowojolu, G. S. and O. G. Omitogun	AAUA	49
AB: 12	Effect of period of ensiling on the nutritional quality of sugarcane waste treated with poultry litter	Ashiru, R. M., Maigandi, S. A., Muhammad, I. R., Abdulhamid, S. U.	University of Science and Technology, Wudil, Nigeria	55
	<b>ANIMAL PHYSIOLOGY/ REPRODUCTION &amp; HEALTH I</b>			60
PH: 01	Changes in serum metabolites of rabbits of different age group transported by road	Anoh K. U. and Abdulahi I.	ABU	61
PH: 02	Blood profile of Nera black cockerels fed graded levels of Bioplex Zinc	*Adenekan, O. O., Adejumo, D. O., Ewuola, E. O. and Onyekwerek, T. O.	UI	66
PH: 03	Haematological indices of broiler chicken strains raised on different stocking densities	Olaniyi, T. A., Popoola, M. A., Olaniyi, O. A., Ijadunola, T. I. and Yahaya, M. O.	Federal College of Animal Health and Production Technology, (FCAHPT) Moor Plantation, Ibadan	70
PH: 04	Effects of rice milling waste-based diet on reproductive hormones, vital signs and serum enzymes in rabbits	Adeyina A.O., Akanbi A.S., Solihu A.O. and Oyebode, R. J.	University of Ilorin, Ilorin UIL	75
PH I: 05	Effect of dietary selenium on dexamethasone induced oxidative stress on broiler finishers	Amaefule, B. C., Uzochukwu, I. E., Udeh, F. U and Ezeokonkwo, M. C.	UNN	79
PH I: 06	Performance and haematological indices of cockerel chicks served aqueous extract of <i>telfairia occidentalis</i> (Hook. F)	Onyekwerek, T. O., Adejumo, D. O., Ewuola, E. O., Nworgu, F. C. and Adenekan, O. O.	UI	84
PH I: 07	Evaluation of hematological fluctuation in rabbit does during gestation in the dry season	Odi-Akpa, C. V., Bitto, I. I. and Addass, P. A.	University of Agriculture, Makurdi, Nigeria	88



PH I: 08	Physiological changes associated with a short-term isolation of West African Dwarf does from kids	Iyasere, O. S, James, I. J., Lawal, K. O., Williams, T. J. Oke, O. E and Iyasere, E.	FUNAAB	92
PH I: 09	Haematology Parameters of West African Dwarf Rams fed Velvet bean ( <i>Mucuna pruriens</i> ) ensiled with Whole Maize Stover	Alabi, B. O and Ososanya, T. O.	Osun State University, Ejigbo Campus	95
PH I: 10	Effects of Replacing Maize with Sugarcane Scraping Meal (SCSM) on the Haematological Parameters and Serum Biochemical Variables of Broiler Finisher Birds	S. E. Alu, M. M. Ari, N. N. Rimbut, Owuna, I. K. and A. A. Kigbu	Nasarawa State University	100
PH I: 11	Oxidative stress markers in four exotic breeds of rabbit bucks during peak Temperature Humidity Index of Ibadan	Jimoh, O. A. and Ewuola, E. O.	UI	105
PH I: 12	Effects of sodium bicarbonate on reduction of heat stress in broiler chickens fed high energy diet	Olayiwola, A. S., Sokunbi, O. A. and Adedeji, B. S.	UI	109
PH I: 13	Effect of two different types of physical exercise on the mean physiological parameters of Sudanese breed of horses in Ibadan	Oladipo T. A., Adekunle O. F., Akanbi, I. O., Odeyemi, T. A., Banjoko, O. J.	FCAHPT	113
PH I: 14	Haematological, biochemical and microbial status of broilers drinking grain steep water	I. O. Opowoye, J. O. Atteh, O. M. Kolawole and A.A. Annongu	University of Ilorin, Nigeria	118
	<b>ANIMAL PHYSIOLOGY/REPRODUCTION &amp; HEALTH II</b>			122
PH II: 01	Concentrations of cations and pH in different parts of epididymis of Red Sokoto goats fed <i>Moringa oleifera</i> supplemented diets	A.Y. Raji and I. S. R. Butswat	Bayero University, Kano,	123
PH II: 02	Effect of dietary selenium supplementation during different stages of gestation and lactation on reproductive performance of sows	Amaefule, B. C., Uzochukwu, I. E., Machebe, N. S., and Onuorah, S. I.	UNN	127
PH II: 03	Gross and histomorphometry of the testis and epididymis of Large White boars	S.G. Olukole., S.A. Famakinde., B.O. Okunsanya, B.O. Oke	UI	132



PH II: 04	Factors affecting reproductive performance of Friesian x Bunaji dairy cows in Northern Guinea Savannah zone of Nigeria	Alphonsus C, Achi, N.P, Barje, P.P Yashim, S.M, Okafor, E.C and Ogundare, S. K	ABU	136
PH II: 05	Folliculogenesis and gonadal morphometry of late production layers fed varying levels of dietary salt	Aro, S.O., Adejumo, F.T. and Akintola, B. K.	FUTA	141
PH II: 06	Survey of plants of animal reproductive importance In Enugu State, Nigeria	Ogbuewu, I. P., Okechukwu, K. C., Etuk, I. F., Ezeokeke, C. T., Emenalom, O. O. and Okoli, I. C.	FUTO	145
PH II: 07	Haemocytological dynamics of giant African land snails ( <i>Archachatina marginata</i> ) under aestivation and arousal	Omoyakhi, J. M. and Okhale, O.	UNIBEN	150
PH II: 08	Survey of ecto-parasites affecting Equine species in Bauchi metropolis	Sa'idu, A. Sunusi, M. Garba, A. and Sani, I.	Abubakar Tafawa Balewa University, Bauchi, Bauchi State, Nigeria	154
PH II: 09	Reproductive performance of Red Sokoto Goats fed Baobab ( <i>Adansonia digitata L.</i> ) fruit meal based diet	Okunlola D.O , Olorunnisomo O.A, Amuda A.J , Agboola A.S and Ojoawo O.T	LAUTECH	159
PH II: 10	Effect of protein supplementation by dietary levels on physiological parameters of lactating West African dwarf goat	Omololu, B. A. and O. O. Adewumi	FUNAAB	163
PH II: 11	Semen characteristics of Yankasa rams fed ensiled mixture of cassava tops, maize stover and <i>Albizia saman</i> pods	Saliu, L. O., Ososanya, T. O. and O. J. Babayemi	UI	168
PH II: 12	Ultrastructural evaluation of spermatogonia types in the african sideneck turtle ( <i>pelusios castaneus</i> )	S. G. Olukole and B. O. Oke	UI	172
PH II: 13	Growth Performance and extra-gonadal sperm reserve of male rabbits fed dietary cerium oxide	Oyefeso, S.D., Akinmuyisitan I .W, Adu, O. A. and Adelowo, O. A.	FUTA	176
PH II: 14	The multi-functions of Vitamin E (A review)	Daudu, O. M., Balami, R. and Muhammad, M.	ABU	181



<b>ANIMAL PRODUCTS</b>				185
AP: 01	Influence of poultry manure on the growth and yeild of plumed cockscomb ( <i>Celosia argentea</i> ) seedling in a screen house in Kabba, Nigeria	Hinmikaiye, A.S, Babalola, T.S, Ogundare, S.K, Ayodele, F.G, and Atte, E.	Kabba College of Agriculture	186
AP: 02	Antioxidant effect of <i>Cymbopogon citratus</i> Stapf. extract on cooked chevon patties	Oyesanwen, A. T., Olusola, O. O. and Oshibanjo, D. O.	UI	190
AP: 03	Effect of age at slaughter on carcass yield, quality traits and sensory properties of different broiler strains raised in a derived savannah zone of Nigeria	Akinwumi, A.O., Odunsi, A.A., Ademola, S.G., Olawuyi, S.B and Akinlapa, T. P.	LAUTECH	194
AP: 04	Quality evaluation of meat floss from different muscles of a matured bull	Kassim, O. R. and A. B. Omojola	UI	199
AP : 05	Carcass yield and dressing percentage of feedlot Bunaji bulls fed varying levels of an agricultural industrial by-product based diet.	Wuanor, A. A., Ayoade, J. A. and Kuhe, S. R.	University of Agriculture, Makurdi	204
AP: 06	Carcass characteristics of indigenous cattle breeds in Nigeria	Madziga, I.I., Amodu, J.T., Lamidi, O.S., Goska, D.Y. and Barje, P.P	NAPRI	208
<b>ANIMAL BREEDING AND GENETICS</b>				213
BG: 01	Body weight and morphometric characteristics of farmed african cat fish ( <i>clariasgariepinus</i> ) in Okitipupa, Ondo state	Adeoye, A. A., Rotimi, E. A., Fasakin, V. D., Ogundipe, R. I. and Udoh, J. E.	Ondo State University Science and Technology Okitipupa	214
BG: 02	Genetic Variability among Cattle Breeds of Nigeria using Thyroid Hormone Responsive Spot 14 Alpha Gene (THRSP $\alpha$ ) through Polymerase Chain Reaction (PCR)	Ajayi, F. O., Agaviezor, B. O. and Nnah, E	UNIPORT	218
BG: 03	Relationship of Energy Balance with Milk Yield and Milk	Alphonsus, C., Akpa, G. N., Barje, P. P., Orunmuyi, M.,	ABU	223



	Composition Measures in Early Lactation	Nwagu, B. I., Yashim, S. M., Olaiya O, Opoola, E, Olayinka-Babawale O I, Hinmikaiye, A.S and <sup>2</sup> Achi NP		
BG: 04	Traits of Preference and Factor Influencing the Choice of traits by some Selected Mini livestock Farmers in Edo State	A.M. Orheruata and Aduba, P.	UNIBEN	228
BG: 05	Evaluation of litter traits of four breeds of rabbit in the humid tropics	Fadare, A. O. and Fatoba, T. J.	AAUA	233
BG: 06	Genetic parameter estimates for eight week body weight in a foundation stock of female line broiler chickens under selection	Adejoh-Ubani, E. O, Nwagu, B. I. Adeyinka, I. A.' Orunmuyi, M. Abeke, F. O, Sekoni, A. A, and Akinsola, O. M.	NAPRI	237
BG: 07	Interaction Effects of genetic and non-genetic factors on body weight development of Cane Rats ( <i>Thryonomys swinderianus</i> ) in a hot humid tropical environment	Jesuyon, O. M. A. and Bankole, T. O.	FUOYE	241
BG: 08	Genetic and phenotypic correlation estimates of litter and linear traits of rabbit kits at different ages	Olupitan, E. O. and Ajao, B. H.	FUTA	246
BG: 09	Haemoglobin variants among cattle populations in Borno State Nigeria	Raji, A. O., Mohammed, A. and Alade, N. K.,	UNIMAID	250
BG: 10	Qualitative traits characterization of native chickens in Benue state, Nigeria	E. A., Rotimi, Egahi, J. O. and Adeoye, A. A.	Federal University, Dutsinma. Katsina state.	255
BG: 11	Determination Of Conserved Regions Between A Portion Of The Growth Hormones Of The Helmeted Guinea Fowl ( <i>Numidia meleagris</i> ) And The Red Jungle Fowl ( <i>Gallus gallus</i> )	Adedibu I. I, Yahaya H. K., Bello O. A. and Kabir, M.	ABU	260
BG: 12	Linear body measurements of rabbit genotypes at various ages	Olupitan, E. O. and Chineke, C. A.	FUTA	263



FEEDMILLING & INDUSTRY				267
FI: 01	Proximate composition and phytochemical screening of <i>Lagenaria breviflora</i> R. fruit	Adeyemi, M.A., Ekunseitan, D.A., Abiola, S.S., Dipeolu, M.A., Oluwatosin, O.O., Egbeyake L. T., Sogunle, O.M., Fabusoro, E., Takeet, M.I., Akerele, D., Adeleye, O.O. and Iyasere, O.S.	FUNAAB	268
FI: 02	Potentials of Baobab fruit ( <i>Adansonia digitata</i> L.) as a feed resource in ruminant nutrition	Okunlola D.O, Olorunnisomo O.A, Aderinola, O.A. Amuda A.J and Agboola A.S	LAUTECH	273
LIVESTOCK ECONOMICS & EXTENSION				277
LE: 01	Determinants of consumer expenditure on chicken in Ikorodu area of Lagos State, Nigeria	Ogunyemi, O. I. and Adejobi, M. A.	Lagos State Polytechnic, Ikorodu, Lagos, Nigeria	278
LE: 02	Assessment of local poultry chicken market structure in Saminaka town of Lere L.G.A., Kaduna State, Nigeria	Abdullahi, M. and Hassan, A. H.	ABU	282
LE: 03	Effect of training on Agricultural employees' job performance	Abiona, B.G. Fakoya, E.O, Fapojuwo, O.E, Ojekunle, I. and Ayansina, S.O.	FUNAAB	288
LE: 04	Analysis of Rural Women's Participation in Livestock Production in Ohaji/Egbema LGA, Imo State	Ekenta, C.M., Hinmikaiye, A. S., Olorunfemi, S.D. and Alphonsus, C.	ABU	293
LE: 05	Economics of scale of catfish farming in Ikorodu LGA, Lagos State, Nigeria	Mohammed, A. B, Hinmikaiye A. S, Oladeinde, K. B. and Ahmadu, R.	Kabba College of Agriculture	297
LE :06	Challenges of small-holder poultry farmers in Chikun Local Government Area of Kaduna State, Nigeria	Anosike, F. U. Naanpoes, C. D. Rekwot, G. Z. Sani, A. Owoshagba, O. B. and Madziga, I. I.	NAPRI	302
LE: 07	An Appraisal of the 2014 Growth Enhancement Support Scheme (GESS) Broiler and Pullet Value Chain in Ondo Central Senatorial District of Nigeria	Obademi, G. A., Ojo, R. F., Alajo, O. A., Adeogun, O. O. and Dada, O. O.	Department of Livestock Services, Ondo State Ministry of Agriculture, Akure, Ondo State, Nigeria	307
LE: 08	Survey on guinea fowl	Rafiu, T. A., Aiyedun, L. A.	LAUTECH	314



	( <i>Numidia meleagris</i> ) production and/or management in the derived savannah zone of Nigeria	and Adetunbi, S. I.		
LE: 09	Poverty profile of farming households in Jigawa State, Nigeria: implication for self sufficiency in animal protein consumption	Rekwot, G. Z., Ahmed, S. and Owoshagba, O. B.	NAPRI	320
LE: 10	Technical efficiency of poultry egg production in Kaduna State, Nigeria	Rekwot, G. Z., Ahmed, S. and Dawang, N. C.	NAPRI	324
LE: 11	Assessment of uptake of livestock innovations by small scale farmers through Kwara State Agricultural Development Project, Nigeria	I. F. Ayanda	Kwara State University	330
LE: 12	Consumer Behaviour of Domestic Rabbit Meat in Some Communities in Delta Central Senatorial District of Delta State Nigeria	G. U. Sorhue., M. A .Moemeka, F. A. Urhibo., Irikefe-Ekeke. E. P	Delta State College of Physical Education Mosogar, Sapele, Nigeria.	337
LE: 13	Socio economic impacts of nomadic farming in Ogo Oluwa Local Government Area of Oyo State, Nigeria	Okunlola, O. O.	Emmanuel Alayande College of Education, Oyo, Lanlate Campus, Lanlate, Nigeria	341
	<b>MICROLIVESTOCK AND AQUACULTURE</b>			346
ML: 01	Effect of zinc on haemolymph biochemical parameters and haemagglutination potential of giant African land snail ( <i>Archachatina marginata</i> )	Abiona, J. A., Olaoye, T. G., Abioja, M. O., Daramola, J. O., Ladokun, A. O., Oke, O. A., Osinowo, O. A., and Onagbesan, O. M.	FUNAAB	347
ML: 02	Growth and carcass characteristics of weaned rabbits fed diets containing graded levels of sun dried Sheanut ( <i>Vitellaria paradoxa</i> ) cake	Adetoro, B. O., Ayanlowo, F. A., Odetoogun, I. K., Olayinka, M. R., Odetola, O. M.	FCAHPT	351
ML: 03	Body and Performance Measurements of Grasscutters ( <i>Thryonomys swinderianus</i> ) in	Apata, E. S., Eniolorunda, O. O., Adebambo, O. B. and Okubanjo, A. O.	OOU	355



	Captivity fed diets of different Protein Sources			
ML: 04	Sorghum ( <i>Sorghum bicolor</i> , L) as substitute to dietary maize for Japanese Quails ( <i>Coturnix coturnix japonica</i> ): effect on laying performance and egg quality traits	Adeola, A. J., Makinde, O. J., Kehinde, A. S., Adeola, A. N., Babajide, S. E., Ajibade, A. J., Ibe, E. A., Zaccheaus, O. S.	FCWM	359
ML: 05	Sorghum ( <i>Sorghum bicolor</i> , L) as substitute to dietary maize for Japanese Quails ( <i>Coturnix coturnix japonica</i> ): effect on growth performance and carcass characteristics	Makinde, O. J., Adeola, A.J., Adeola, A.N., Bakare, K., Ajibade, A.J., Omole, E.B, Zaccheaus, O. S.	FCWM	363
ML: 06	Performance and Carcass Response of Japanese quails ( <i>Coturnix coturnix japonica</i> ) challenged with Newcastle Disease Virus	Omole, E. B., Kehinde, S. A., Makinde, O. J., Ntagbu, F. G., Mohammed, H. L., Amogbonjaye, M. O. and Zaccheaus, O. S	FCWM	368
ML: 07	Haematological Response of Japanese quails ( <i>Coturnix coturnix japonica</i> ) to Newcastle Disease Virus	Omole, E. B., Fayeye, T. R., Fatokun, B. O., Makinde, O. J., Ntagbu, F. G., Zaccheaus, O. S. Mohammed, H. L.	FCWM	372
ML: 08	Haematology and serum indices of weaner rabbits fed fermented pride of barbados seedmeal	Ogunbode, A. A., Adams, T.O., Adeniyi, O.A. Akinwumi, A.E and Saka, N.A	Oyo State College of Agriculture and Technology, Igboora	377
ML: 09	Egg production characteristics of Guinea fowl in the humid tropical environment	Odukwe, C. N., Ukachukwu, S. N. and Amaefule, K. U.	Michael Okpara University of Agriculture, Umudike	382
ML: 10	Growth Performance of Grower Rabbits fed diets containing Graded Levels of Cassava Leaf Meal	Finangwai, H. I., Magai, I. and Dafur, B. S.	Federal College of Education Pankshin	386
ML: 11	Haematological and serum biochemical profile of weaner rabbits fed ensiled water hyacinth based diets	Mako, A. A., Akinwande, V.O., Ettu, R. O., Awobajo, O. K., Abegunde, T. O., Abiola-Olagunju, O, Olumide, M. D. and Mosuro, A. O.	Tai Solarin University of Education, Ijagun, Ijebu-Ode. Ogun State, Nigeria.	390
ML: 12	Response of Japanese quail ( <i>Coturnixcoturnix japonica</i> ) chicks to dietary replacement of maize with honeybee slum gum waste meal	Ojebiyi O. O., Shittu M. D., Akinboboye R. O., Akinrinola C. T., Ayeye A. D. and Aboderin O. J.	LAUTECH	395
ML: 13	Performance and gut dimensions of weaner rabbits fed post-harvest maize crop	C.U. Idachaba, I. Abdullahi and D.A. Kurtong	ABU	401



	residue as dietary fibre source with supplemental fibrolytic enzymes			
ML: 14	Histopathological alterations in the liver and kidney of the sharptooth catfish ( <i>clariasgariiepinus</i> ) fed diets containing cooked <i>Jatropha curcas</i> seedmeal	Jimoh W. A., Shittu M. O., Oladele-Bukola, M.O., Adekunle O.F., Abdulsalami S.A., Okemakin F.Y. and Banjoko O.J.	FCAHPT	406
ML:15	Effect of age on the carcass, organ and palatability characteristics of quail and chicken meat	Fakolade P. O., Adedoyin A.A, and Ekeocha A. H.	College of Agriculture, Osun State University, Osogbo	411
ML: 16	Growth performance and nutrient digestibility of weaned rabbits fed cooked Cassava Peel Meal diets	O. Jiya, E. B. Santali, M. Manma, B. Mohammed and A. Mohammed	Niger Polytechnic Zungeru, Niger state, Nigeria	416
ML: 17	Performance and egg production of Japanese quails fed diets containing varying levels of sun-dried cassava peel meal fortified with palm oil	Ogbiko A., Ijiaya A. T., Abdulkadir, U., Alabi, O. J. and Yahaya, K. S.	Federal University of Technology, Minna, Niger State, Nigeria	420
ML: 18	Potentials of micro-livestock in sustainable improvement of protein supply to developing nations: A review	Muhammad, A. S., K. M. Bello, A. Garba and Adamu, N.	Abubakar Tafawa Balewa University	424
ML: 19	The feeding value of cassava peel meal for growing Japanese quails ( <i>Coturnix coturnix japonica</i> )	Edache, J. A., Yisa, A. G. and Okpala, E. J.	Federal College of Animal Health and Production Technology, Vom	428
	<b>MONOGASTRIC ANIMAL PRODUCTION I</b>			433
MP I: 01	Effect of <i>Allium cepa</i> and <i>allium sativum</i> on the performance and haematological indices of broiler starters	Onu, P. N., Uguru, J. O., Onuta, S. E., Obianwuna, U. E. and Aniebo, A. O.	Ebonyi State University, Abakaliki, Nigeria.	434



MP I: 02	Growth performance and carcass yield of Japanese quails fed graded levels of roasted Bambara nut ( <i>Voandzea subterranean</i> )	A. G. Yisa, A. Ezenwobi, J. A. Edache, O. D. Olaiya, and I. Y. Jabil	Federal College of Animal health and Production Technology, National Veterinary Research Institute, P M B, 01, Vom, Plateau State, Nigeria	439
MP I: 03	Nutrient digestibility and ileal digesta viscosity of broilers fed cassava peel and leaf meals based diets	V. A. Adepegba, Olaleru, I. F. and O. A. Abu	UI	444
MP I: 04	Proximate and phytochemical compositions of raw and water-soaked <i>Moringa oleifera</i> seeds	Akangbe, E. E., Adelani, S. A. and Abu, O. A.	UI	448
MP I: 05	Evaluation of <i>Morinda lucida</i> (Oruwo) Leaf Meal as Feed Additive on the Performance and Carcass Characteristics of Broiler Birds	Akingbade, A. O., Jinadu, K. B., Oluponna, J. A., Raji, M.A. and <sup>+</sup> Sorunke, A. O.	FCAHPT	452
MP I: 06	Haematology and biochemical response of cockerels fed graded levels of wild sunflower leaf	Amao E. A., Adeoti, T. M. and Olagun, Y.A.	The Oke – Ogun Polytechnic, Saki	457
MP I: 07	Comparative performance and haematological profile of cockerel chickens debeaked at varied length and at different ages	Bolarinwa, M. O. and Popoola, M. A.	FCAHPT	462
MP I: 08	Comparing the use of Fish Meal, Enzyme and Acetic Acid on growth of Broilers fed Maize-Soya Bean Diets	E. K. Ndelekwute, E. D. Assam, E. M. Assam, U. E. Udorok, S. U. Akpan, G. E. Bassey, and B. B. Utang	University of Uyo, Nigeria	467
MP I: 09	Performance characteristics of weaner rabbits ( <i>Oryctolagus cuniculus</i> ) fed honey comb pulp-based diets	Afolabi, K. D., Orimoloye, P. O., Akinsoyinu, A. O., Abu, O. A., Adeyosoye, O. I., Ndelekwute, E. K., and Ekanem, N. J	University of Uyo, Uyo, Nigeria	471
MP I: 10	Replacement value of feathermeal for fishmeal on the performance of starter Guinea cockerel	E. O. Ahaotu, A. U. Iheanacho, C. S. Durunna and C. M. Ayo Enwerem	Imo State Polytechnic Umuagwo, Nigeria	475
MP I: 11	Comparative evaluation of lard and palm oil as partial replacements for maize in the diets of finisher broiler chickens	I. A. Akpan, E. E. Nsa and C. O. Okereke	University of Calabar, Calabar	481



MP I: 12	Characterization of Eggs of some Avian Species in Northern Agricultural Zone of Nasarawa State in Nigeria	S. E. Alu, M. M. Ari, N. N. Rimbut. and I. K. Owuna.	Nasarawa State University, Keffi	484
MP I: 13	Effect of feeding garlic ( <i>Allium sativum</i> ) and copper on growth performance of Weaner Rabbits	Obamedo, T. N., Hassan, M. R. and Shehu, B. M.	ABU	489
MP I: 14	Efficacy of enzyme cocktails on <i>in vitro</i> digestibility of wheat offal	Jimoh, A. and Atteh, J. O.	Regulatory Affairs Department, Nigerian Institute of Animal Science, Abuja	493
MP I: 15	Early lay performance of two strains of layers raised on two housing types	Safiyu, k. K., Sogunle, O. M., olaniyi, O. A., Okusolubo, O. X., Odutayo, O.J. and Ogundele, M. A.	FUNAAB	500
	<b>MONOGASTRIC ANIMAL PRODUCTION II</b>			504
MP II: 01	Nutrient Utilization and Haematological Parameters of Broilers fed Honeybee Slumgum Waste meal (HSWM)	Bakare, A. M., Ojebiyi, O. O. and Aboderin, O. J.	LAUTECH	505
MP II: 02	Performance, haematology and serum biochemistry of broilers fed three types of commercial feed	Kareem, A. O., Rotimi, R. A. and Adeoye, A. A.	Ondo State University of Science and Technology, Okitipupa	511
MP II: 03	Effect of graded levels of toasted african yam bean seeds meal with enzyme supplementation on carcass characteristics of broiler chicks	Raji, M.O, Adeleye O.O and Ogunbode A.A	Oyo state College of Agriculture and Technology, Igboora	514
MP II: 04	Growth responses of weaner rabbits to dietary sorghum (sorghum bicolor) meal	Lere, H.I., Muhammad, A.S., Bello, K.M	Abubakar Tafawa Balewa University, Bauchi	517
MP II: 05	Body composition of grower rabbits ( <i>Oryctolagus cuniculus</i> ) fed cassava ( <i>Manihot esculenta</i> )-based diets	Nte, I. J., Oruwari, B.M., Amakiri, A. O., Sese, B. T. and Olefuroh-Okoleh, V. U.	Rivers State University of Science and Technology	520
MP II: 06	Effect of varying litter depths on growth performance and linear body measurements of locally adapted turkey poults	Odutayo, O.J., Sogunle, O.M., Akinosi, O.K., Safiyu, K.K. and Ekunseitan, D. A.	FUNAAB	525
MP II: 07	Effects of five different dietary vitamin mineral premixes on	Ogunwole, O. A., Ojelade, A. Y. P. and I. K. Aikore	UI	528



	chemical composition of eggs from layers reared on deep litter			
MP II: 08	Broiler chick response and Economic indices to low protein diets supplemented with synthetic amino acids	Ojediran, T. K., Obimakinde, B. S., Agbonmagbe, T. M., Amosu, D. M. and Emiola I. A.	LAUTECH	532
MP II: 09	Growth trajectory and egg production pattern of Japanese quails ( <i>Coturnixcoturnix japonica</i> ) reared in a typical tropical environment	Okorodudu, A., Oluwatosin, O.O., Fafiolu, A.O., Egbeyale, L.T.	FUNAAB	536
MP II: 10	Effect of feed forms of different particle sizes on nutrient digestibility of rabbit bucks	Olatubosun, O. O. and Sogunle, O. M.	FUNAAB	539
MP II: 11	Effects of citric and ascorbic acids on performance and immunity of broilers	Olupona, J. A. and Alonge, G. O.	FCAHPT	543
MP II: 12	Egg Quality Characteristics of Pullet Fed New Varieties of Maize in Battery Cage and Deep Litter Production Systems	Olupona, J.A. Okolie, C.G and Alonge, G.O	FCAHPT	547
MP II: 13	Effect of diet forms and frequency of feeding on the growth performance and physiological response of crossbred (land race x largewhite) growing pigs	O. O. Oyelowo, O.A. Adebisi, A.O.K. Adesehinwa and O.A. Adelowo	UI	551
MP II: 14	Performance of broiler finisher fed high, moderate and low energy diets during the wet season characterized by high temperature and humidity	Afolayan M., Dafwang I.I., Oimage J.J., Afolayan S.B. and Akintunde A.R	ABU	555
MP II: 15	Growth response and nutrient digestibilities of broiler chickens fed toasted African locust bean seed meal diets at starter phase	M. S. Tamburawa, S. O. Ogundipe, T.S.B. Tegbe and T.S. Olugbemi	Kano University of Science and Technology, Wudil	559
	<b>MONOGASTRIC ANIMAL PRODUCTION III</b>			563
MPIII: 01	Traditional methods of incubation and hatching of indigenous poultry eggs in Wamakko Local Government of Sokoto State	Ibrahim U. M, W. A. Hassan and Ahmed S.A.	NAPRI	564



MPIII: 02	Effects of graded levels of boiled sorrel seed ( <i>Hibiscus sabdariffa</i> ) meal on carcass characteristics of cockerels in a hot dry environment	Duwa, H., Saleh, B. and Girgiri, A. Y.	UNIMAID	568
MPIII: 03	Performance characteristics and cost implication of feeding local turkeys with different dietary levels of Palm Oil Sludge (POS)	Uzochukwu, I. E., Kur, T. R. and Ezekwe, A. G.	UNN	573
MP III: 04	Effect of probiotics ( <i>Lactobacillus acidophilus</i> ) on the growth performance and serum lipid profile of finisher broilers	Uzochukwu, I. E., Amaefule, B. C., Udeh, F. U., Dim, C. E., Tarinipre, G., and Ezekwe, A. G.	UNN	578
MPIII: 05	Carcass characteristics, proximate composition and residual retinol content of meat from broiler chickens fed $\beta$ -carotene cassava ( <i>Manihot esculenta crantz</i> ) grits based diets	Ogunwole, O. A., Lawal, H. O., Idowu, A. I., Oladimeji, S. O., Abayomi, F. D., Tewe, O. O and E. Ebenso	UI	583
MPIII: 06	The Growth, Economics and Sensory performance of rabbit fed dietary spices	Onunkwo, D.N and Ugwuene, M.C	Michael Okpara University of Agriculture, Umudike	588
MPIII: 07	Effect of replacement value of Brewer's Dried Grain with honey for maize on turkey poults performance	Ugwuene, M.C and Onunkwo, D.N	Michael Okpara University of Agriculture, Umudike	593
MPIII: 08	Effect of tocopherol or pyridoxine supplementation on growth performance and liver histology of broilers fed mouldy maize	Akande T.O., Okunola F.P., Taiwo O.M., Shittu A.E. and Adediji O.T.	OAU	598
MPIII: 09	Growth response of broiler chicks fed diets fortified with varying levels of tryptophan versus commercial diet under tropical environment	Opoola. E., Ogundipe. S. O., Onimisi. P.A. and Bawa, G.S.	ABU	603
MPIII: 10	Growth performance characteristics of broiler chickens fed graded levels of <i>Moringa oleifera</i> leaf meal	Ayo-Ajasa, O. Y., Omotayo, I. G., Abiona, J. A., Fafiolu, A. O., Egbeyale, L. T., Odeyemi, A. Y. and Abel, F. A. S.	FUNAAB	607
MPIII: 11	Performance and organ weight of broiler chickens fed graded levels of mixture of Ocimum	A. Y. P. Ojelade, A. W. Lamidi, J. I. Umoru and O.A. Ogunmiluyi	Federal College of Education (Technical) Akoka, Lagos,	611



	gratisimum and Vernonia amygdalina leaf meal-based diets			
MPIII: 12	Influence of starch type on digesta kinetics of broiler chicks	Adeleye, O.O., A. D. Ologhobo and B. T. Oje-Adetule	UI	616
MPIII: 13	Valuation of two types of synthetic Methionine supplement on the performance of starter broiler chicks	Makama R.S, Bawa G.S and Duru S.	ABU	620
MPIII: 14	Growth performance, carcass yield and nutrients digestibility of weaner rabbits fed wheat offal and rice bran based diets	Tamburawa, M.S., Rabi, M.M. Saulawa, L.A., Muhammad, A.S.	Kano University of Science and Technology, Wudil	627
MPIII: 15	Apparent ileal digestibility of crude protein and amino acids in wheat offal diets for broilers	Agboola, A.F., Omidiwura, B.R.O., Olayemi, U.O. and Iyayi, E.A.	UI	631
MPIII: 16	Haematological profile of broiler Chickens fed Baker's Yeast during the harmattan season in Northern Guinea Savannah	Buba, W, Olugbemi, T.S., Omage, J.J., Duru, S., Uchendu, C., Iyiola-Tunji, A.O., Opoola, E. and Akinsola, O.M	ABU	636
	<b>RUMINANT ANIMAL PRODUCTION I</b>			641
RP I: 01	Assessment of chemical composition and rumen degradation characteristics of some crop residues and agro-industrial by-products in the Semi-arid zone of Maiduguri	Ahmed, S, A. and Kibon, A.	UNIMAID	642
RP I: 02	Feeding of Kargo Foliage ( <i>Piliostigma reticulatum</i> ) to Small Ruminants in Jigawa State: A Preliminary Study	S. L. Abdurrahaman and A. Kibon	Federal University Dutse	647
RP I: 03	Nutritive value and acceptability of alkali treated <i>Pennisetum purpureum</i> hays by WAD goats	Abegunde, T. O., Lawan, A. O., Asebiode, T. J., Gbadamosi, A. A. and Adetona, E. A.	OAU	652
RP I: 04	Semen characteristics of pubertal Yankasa rams fed <i>Zingiber officinale</i> powder supplemented diet	Adeniji, S. A. and Ososanya, T. O.	UI	657



RP I: 05	Rumen microbial load and fermentation characteristics of West African Dwarf (WAD) rams fed feed containing varying levels of ammonium sulphate supplementation	Akinlade, A. T. and Ososanya, T. O.	UI	661
RP I: 06	Effect of ammonium sulphate supplementation on growth performance, nutrient digestibility and nitrogen balance of West African Dwarf rams	Ososanya, T. O. and Akinlade, A. T.	UI	666
RP I: 07	Influence of tethering in feeding system on haematological profile of West African Dwarf goats	Eniolorunda, O. O., Apata, E. S., Oyesiji, J. A, and Rabi, K. A.	Olabisi Onabanjo University	671
RP I: 08	Performance Evaluation of Semi-Intensively Managed Maradi goat placed on Palm Kernel Cake and Poultry Dropping Concentrates	Lamidi, A. A. and Okusor, J. A.	UNIPORT	674
RP I: 09	Observational study on the browsing habits of adult one humped camel ( <i>Camelus dromedarius</i> ) introduced in to a Sub-humid zone of Nigeria	Ibrahim, H., Mohammed, A. K., Tanko, R. J., Amodu, J. T., Ishiaku, Y. M., Ahmed, S. A., Ahmed, S., Onoru, I. A. and Abdullahi, M	NAPRI	678
RP I: 10	Evaluation of Urea treated Acha ( <i>Digiteria exilis</i> ) straw on Dry matter intake, growth and body measurement of growing Yankasa Rams	Finangwai. H. I. and Dafur, B. S.	Federal College of Education, Pankshin	683
RP I: 11	Quality and preference of <i>Gmelina arborea</i> leaves and cassava peel silage as off season feed for West African Dwarf goats	Ibhaze, G. A., Alade, C. T., Fajemisin, A. N., Olorunnisomo, O. A., Adewumi, M. K., Ekeocha, A. H., Tona, G. O.	FUTA	688
RP I: 12	Proximate composition and phytochemical screening of some selected herbs and spices	Faniyi, T. O., Adewumi, M. K. and A. A. Jack	UI	693
RP I: 13	Feed intake and nutrient digestibility by Uda rams fed graded levels of <i>Anogeissus leiocarpus</i> leaves	Y. Garba and N. S. Ado	Centre for Dryland Agriculture, Bayero University, Kano	697
RP I: 14	Influence of different animal manures on growth and yield of Columbus grass ( <i>Sorghum almum</i> )	S. S. Mohammed, Muhammad Baba	Addi Intergrated farm, Kumo Gombe state	702



RP I: 15	Nutrient Digestibility and Nitrogen Metabolism of West African dwarf Sheep fed diets containing <i>Garcinia kola</i> (Bitter kola) Seed Meal	Jinadu, K. B., Akingbade, A. O., Olona, J. F. and Oluponna, J. A.	FCAHPT	706
<b>RUMINANT ANIMAL PRODUCTION II</b>				711
RP II: 01	Effect of different levels of farm yard manure, N.P.K and Urea on the growth performance of <i>Brachiaria decumbens</i> grass	Nyako, H. D., Malgwi, I. H., Yahya, M. M., Aminu, I. M., Abdullahi, S., Tukur, I. I., Mohammed, I. D. and Mohammed, A.	Modibbo Adama University of Technology, Yola.	712
RP II: 02	Effect of hot water treatment duration on emergence of <i>Tephrosia bracteolata</i> (Guil. and Perr.) Seeds	Ishiaku, Y. M., Amodu, J. T., Tanko, R. J., Abubakar, S. A., Ahmed, S. A., Ibrahim, H. and Lasisi O. T.	NAPRI	717
RP II: 03	Effects of animal manure rates and irrigation frequencies on the mineral contents of selected herbaceous legumes	Ojo, V. O. A., Adeniran, M. M., Odunaye, B. T., Adetokunbo, G. A., Rafiu, M. A., Adeoye, S. A., Ogunsakin, A. O., Adelusi, O. O., Amodu, J. T. and Amole, T. A.	FUNAAB	722
RP II: 04	Organic acids and anti-nutrients of Guinea grass ( <i>Panicum maximum</i> ) ensiled with Brewers' spent grains	Ekanem, N. J., Ifut, O. J., Urang, S. H., Inyang, U. A. and Adedokun, O. O.	University of Uyo	726
RP II: 05	Herbage yield of switch grass ( <i>Panicum virgatum</i> ) as influenced by different sowing methods in Jega Semi-arid zone, Nigeria	Muftau, M. A., B. S, Malami., U. Y, Gwamba., M. I, Ribah and A. O, Suleiman	Kebbi State University of Science and Technology, Aliero, Kebbi State	731
RP II: 06	Effects of tillage practices and sowing methods on mineral composition of two Stylosanthes species sown in natural pasture	Muraina, T. O., Olanite, J. A., Ojo, V. O. A., Alalade, J. A., Adebisi, I. A., Mustapha, S. O and Adesetan, Y. T	Oyo State College of Agriculture and Technology, Igbo-Ora	735
RP II: 07	Evaluation of nutritive value of <i>Panicum maximum</i> in oversown natural pasture using <i>in vitro</i> technique	Muraina, T. O., Olanite, J. A., Dele, P. A., Okukenu, O. A., Sowande, O. A., Omisorè, K. O. and Emiola, C. B.	Oyo State College of Agriculture and Technology, Igbo-Ora,	740
RP II: 08	Nutritive evaluation of residues from cassava leaf protein extraction as feedstuff in ruminant production system	Obasa, O. A. and Fasae, O. A.	FUNAAB	745
RP II: 09	Performance Characteristics of	Adebisi, I. A., Ajibike, A. B.,	Oyo State College of	750



	West African Dwarf goats fed <i>Panicum maximum</i> supplemented with <i>Gmelina arborea</i> leaves mixture	Adams, T. O. and Amusa, H. O.	Agriculture & Technology, Igboora	
RP II: 10	Chemical evaluation of silage from rumen contents and some Multipurpose Tree Species	Chukwuemeka, M. U., Ashiru, R. M. and Maigandi, S. A.	Kano University of Science and Technology, Wudil	754
RP II: 11	Effect of replacing groundnut cake with <i>Daniellia oliveri</i> seed meal on haematological parameters of yankasa rams diet	Okunade, S. A., Olafadehan, O. A., Kehinde, A. S., Adeola, A. N., Ntagbu, F. G. and Makinde, O. J. and Awofolajin, A. O.	FCWM	759
RP II:12	Performance, Nutrient Digestibility and Nitrogen Retention in Weaner Rabbits fed diets Supplemented with <i>Leptadenia hastata</i> (Pers.) Forage	Hassan, M. R., Abdu, S. B., Amodu, J. T., Adewumi, O. M., Adamu, <sup>1</sup> H. Y., Musa, A., Kabir, M., Yashim, S. M., Braimah, Y., Tamburawa, M. S. and Abubakar, M.Y.	ABU	764
RP II: 13	Haematological and Serum Biochemical indices of West African Dwarf Goats Fed Diet Containing Varying Levels of Centro ( <i>Centrosema pubescens</i> ) Seed Meal.	Adedeji, O. Y., Saka, A. A., Falola, O. O., Olufayo, O. O., Adekanbi, A. O., Adetoro, B. O. and Adisa, A. F.	FCAHPT	770
RP II: 14	Intake and weight gain of West African Dwarf goats fed corncobs ensiled with cassava peel	Falola, O. O., Olufayo, O. O., Adisa, A. F., Adedeji, O. Y., and Saka, A. A	Federal College of Animal Health and Production Technology, I.A.R.&T Moor Plantation, Ibadan	775
RP II: 15	Evaluation of the haematological and biochemical profiles of yankasa rams fed fonio ( <i>Digitaria iburua stapf</i> ) straw based diets	Omiyale, C.A., Okonkwo, P.O., Usman, E., Adepoju, O.C., Adedayo, T and Echeonwu, S.T.	Federal College Of Veterinary and Medical Laboratory Technology, N V R I, Vom, Plateau State	778
RP II: 16	Nutrient digestibility and Nitrogen balance of bunaji bulls fed graded levels of rice offal	R.T. Sani, O.S. Lamidi, G.E Jokhtan, C.B.I Alawa, D.Y. Goska, M.Yusuf, I.I. Madziga, A.Sulieman and M.D. Salisu	NAPRI	782



## SUPPLEMENTARY PROCEEDINGS TABLE OF CONTENTS

CODE	TITTLE OF PAPER	NAMES OF AUTHORS	ADDRESS	PAGE
RP: 17	Haematology and serum chemistry of growth promoters (Tetracycline) inclusion in broiler starter diets	S.O Ereke, F.U. Samuel, J.O Jegede, A.U. Okorie, G.T.I. Erakpotobor, I. I. Madziga, I.U Gadzama, H.J Magaji, F.U Anosike, I.E Uzochukwu	National Animal Production Research Institute ABU Shika/Zaria	787
RP: 18	Genotypic Variation in Feed Utilization of Nigerian Local Chickens	Adeleke, M. A., Sanni, M. T., Ojoawo, H. T. A. and Adebambo, O. A.	Dept. of Animal Breeding and Genetics, Federal University of Agriculture Abeokuta, Nigeria	791
RP: 19	Response of starting chicks to oral administration of <i>Lagenaria breviflora</i> R. under two housing systems	Ekunseitan, D.A., Adeyemi, M.A., Abiola, S.S., Oluwatosin, O.O., Sogunle, O.M., Adeleye, O.O., Fabusoro, E., Egbeyale, L.T., Takeet, M.I., Akerele, D. and Iyasere, O.S.	College of Animal Science and Livestock Production,	795
RP: 20	Dry Matter, Protein and Fibre Digestibility by West African Dwarf Sheep Fed Varying Levels of <i>Vernonia amygdalina</i> Meal in Cassava Starch Residue – Based Diets	A.N. Fajemisin, O.B. Omotoso and G.A. Ibhaze	Department of Animal Production and Health, The Federal University of Technology, P.M.B. 704, Akure, Nigeria	799
RP: 21	Comparative evaluation of broilers raised on four different commercial feeds available in Anyigba Kogi State	Okpanachi, U., Oyewole, B.O., Shaahu, D.T. and R. O. Madaki	Department of Animal Production, Kogi State University, Anyigba, Nigeria.	803
RP: 22	Performance and serum biochemistry of broiler birds fed Egg Shell Meal (ESM) and Bone Meal (BM) inclusions	Okpanachi, U, Egbu, C. F., Ganiyu, O. Y. and F. E, Salifu	Department of Animal Production, Kogi State University, Anyigba, Nigeria.	807
RP: 23	Growth performance and body linear measurements of Nigerian indigenous male chicken genotypes at grower phase reared in the Northern Savannah of Nigeria	Olutunmogun, A. K., Orunmuyi, M., Kabir, M., <sup>†</sup> Musa, A. A. and Muhammad, H.	National Animal Production Research Institute (NAPRI), Shika, Zaria, Kaduna State, Nigeria.	811
RP: 24	Haematological variables of laying hens fed graded levels of dietary salt	S.O. Aro, B.K. Akintola and F. T. Adejumo	Department of Animal Production and Health, Federal University of Technology Akure (FUTA), Ondo State, Nigeria	816
RP: 25	Growth, carcass and organs characteristics of Red Sokoto bucks fed <i>Crotalaria retusa</i> (Rattle box)	M. Yusuf, S. M. Yashim, and L. R. Yakubu	National Animal Production Research Institute, Zaria	820



RP: 26	Effect of synbiotic supplementation of high fibre diets on growth performance and intestinal microbial ecology of broiler chickens	Fatufe A. A., Igbeneghu O. A., Matanmi I.O. and Agboola N.B.	Department of Animal Sciences, Department of Pharmaceutics, Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria.	824
RP: 27	Aquaculture Insurance, a Requisite in Nigerias' Fish Production Quest: Nigeria Agricultural Insurance Corporation, Oyo State	Sule, S.O, Sotolu A.O. and Sanusi S.O.	Department of Fisheries, Federal University Gashua, Yobe State, Nigeria	830
RP: 28	Haematological Responses of Weaner Pigs Fed Raw Tiger nut (Cyperus esculentus) Based Diets.	Ukpabi,U.H., Saulawa, L.A., Mbachu,C.L. and Oguike B.C.	Department of Animal Science and Fisheries, Abia State University, Umuahia Campus. P.M.B. 7010, Umuahia	837
RP: 29	Comparative evaluation of Bambara nut waste and dry brewer's grain as dry season feed for West African Dwarf sheep	C. O. Osita and A. O. Ani	Department of Animal Science, Faculty of Agriculture, University of Nigeria, Nsukka, Enugu State, Nigeria.	842
RP: 30	Influence of varying levels of water supply and dietary protein on performance and carcass characteristics of broiler chickens	Jegede O.O., Adeyeye S. A. and J. O. Agbede.	Department of Animal Health and Production, College of Agriculture, Akure, Nigeria.	847
RP: 31	Growth Study and Yield Components of Congo Grass (Brachiaria ruziziensis) at Different Weeks Post-emergence	I. Sani, J. T. Amodu, M. R. Hassan, A. Garba and T. T. Akpensuen	Department of Animal Production, Faculty of Agriculture and Agricultural Technology, Abubakar Tafawa Balewa University, Bauchi, Bauchi State, Nigeria.	851
RP: 32	Effects of breed, sex and age on glutathione peroxidase and blood parameters of growing rabbits	U.A. Eshimutu M. Kabir and B.I. Nwagu	Genetics and Animal Breeding Unit, Department of Animal Science, Ahmadu Bello Zaria, Nigeria	857
RP: 33	Effect of breed and sex on haematological parameters of turkeys (Meleagris gallopavo)	Ibrahim, M.C., Kabir, M. and Orunmuyi. O.	Department of Animal Science, Faculty of Agriculture, Ahmadu Bello University, Zaria. Nigeria	861
RP: 34	Growth and egg characteristics of two strains of Japanese quails (Coturnix coturnix japonica) in Zaria, Nigeria	M. Kabir and M.M. Abubakar	Genetics and Animal Breeding Unit, Department of Animal Science, Ahmadu Bello University, Zaria, Nigeria	865



PH I: 09

**Haematology Parameters of West African Dwarf Rams fed Velvet bean (*Mucuna pruriens*) ensiled with Whole Maize Stover**

<sup>1</sup>Alabi, B. O and <sup>2</sup>Ososanya, T. O.

<sup>1</sup>Department of Animal Science, Osun State University, Ejigbo Campus, Osun State

<sup>2</sup>Department of animal Science, University Of Ibadan, Ibadan, Oyo State

**Abstract**

The haematological characteristics of West African Dwarf (WAD) Rams fed velvet bean (*Mucuna pruriens*) foliage ensiled with whole maize were determined. Twenty (20) growing rams aged 10-15 months with mean weight ranging between 11.75-12.00kg were randomly assigned to four dietary treatments comprising five animals per dietary treatment in a completely randomized design (CRD). Treatment 1 contained 100% ensiled whole maize, Treatment 2 contained 75% whole maize + 25% *Mucunapruriens*foliage silage, Treatment 3 contained 50% whole maize + 50% *Mucunapruriens*foliage silage, Treatment 4 contained 25% whole maize + 75% *Mucunapruriens*foliage silage respectively. Each animal receive each diet at 5% body weight for 105 days. Blood was collected through jugular vein and put into well labelled bottle containing anticoagulant ethylene diaminetetracetic acid (EDTA). The blood samples were analyzed for Red blood cell (RBC) count, Packed cell volume (PCV), haemoglobin (Hb), white blood cell (WBC) count, neutrophils, lymphocytes, eosinophils and monocytes. Significant differences ( $P < 0.05$ ) were obtained in haemoglobin and neutrophil which range from 6.11-9.87g/dl and 35.28 - 41.23% respectively while other parameters investigated showed no significant ( $P > 0.05$ ) differences. The nutritional health status of the rams can be enhanced when fed *Mucunapruriens*foliage and whole maize silage but best result could be obtained when fed silage containing 75% whole maize and 25% *Mucunapruriens*.

**Key words:** Whole maize, *Mucunapruriens*, silage, haematology.  
[banwoare45@gmail.com](mailto:banwoare45@gmail.com); (08032427544)

**Introduction**

Nutrition is one of the most important factors in Livestock production. So animals on good plane of nutrition regardless of breed and likely to dress out better [17]. However, the high cost of conventional feed ingredients which has resulted to high cost of animal production [15] limits profitable production. *Mucunapruriens* is a forage legume which its potential has not been fully harnessed by small ruminant farmers [5]. Maize is a cereal crop which its production is in abundant during rainy season, as large tonnes of maize are been thinned out as a post planting operation. Ruminants have potential to utilize whole maize plant but the whole maize plant dried up quickly after thinning. There is thus a need for preservation. Ensiling has been reported to effectively conserve forage and fodder crops [3]. Silage can be an economical source of nutrit for sheep and goat especially on large farms where feeding can be mechanized [14]. Blood examination is also a good way of assessing the health status of an animal as it plays a vital role in the physiological, nutritional and pathological status of an animal/organism [11]. This study was therefore designed to evaluate the effect of feeding whole maize stover with *Mucunapruriens*silages on haematological characteristics of West African dwarf rams.

**Material and Methods**

**Experimental animals and their management**

The experiment was carried out at the sheep and goat unit of the Teaching Research farms of the University of Ibadan, Ibadan. Twenty post weaned West African Dwarf rams with average initial weight of 12.00kg and 10-15months old were purchased from a nearby villages. The rams were later vaccinated against endo and ecto parasites. The animals were housed individually and were allocated to experimental diets in a completely randomized design.



### Silage Preparation

*Mucunapruriens* foliage was harvested manually at the onset of flowering while whole maize plant was harvested at milking stage of growth. The harvested fodder crops were chopped mechanically and wilted for 24 hours in order to reduce moisture content. The fodder crops were chopped into 2-3cm length for ease of compaction and consolidation for silage. Filling and compaction was done simultaneously to eliminate air. The silage was prepared in polythene bags in triplicates. The polythene bags were sealed and compressed with weight in small 4 litre mini silos for proximate analysis in the laboratory, while another set of silages were compressed with piles of heavy sand bags in 200litre containers for the feeding trials. Fermentation was done for 21 dya .Treatment 1 contained 100% ensiled whole maize, Treatment 2 contained 75% whole maize + 25% *Mucunapruriens* foliage silage, Treatment 3 contained 50% whole maize + 50% *Mucunapruriens* foliage silage, Treatment 4 contained 25% whole maize + 75% *Mucunapruriens* foliage silage respectively.

### Chemical analysis

From different points and depths of the silages, sub-samples were taken and mixed together for dry matter determination by oven drying at 65<sup>o</sup>C until a constant weight was achieved. The samples were later milled and stored in an air tight container until they were ready for chemical analysis. Crude protein, crude fibre, ether extract and ash content of the silages were carried out in each of the three replicates of each treatment as described by [1]. The fibre components was determined according to [16]. Haematological parameters including white blood cells (WBC), Red blood cells (RBC) count, haemoglobin (Hb) and parked cell volume were determined as described by [8].

### Collection of blood samples

Towards the end of the 105 days feeding trial, about 2mls of blood was collected from each of the animals by jugular vein puncture. The quantity was collected in ethylene diaminetetracetic acid (EDTA) bottles to prevent blood coagulation and taken to the laboratory for analysis.

### Statistical analysis

Data were analyzed by analysis of variance, ANOVA, using the procedure of SAS outlined by [12]. The significant means were then compared using Least Significant Difference (LSD) of the same package.

### Results

The proximate composition of the silages are shown in Table 1. Dry matter ranged from 21.57% in T<sub>4</sub> to 26.65% in T<sub>1</sub>. Crude protein increase with increased level of *Mucunapruriens* foliage in the silage with values ranged from 8.02% in T<sub>1</sub> to 13.01% in T<sub>4</sub>. While there were also significant differences (P<0.05) in crude fibre, Ether extract, Ash and nitrogen free extract (NFE) percentages across the treatments with valued ranged from 21.64 (T<sub>4</sub>) – 26.42 (T<sub>1</sub>), 2.35 (T<sub>1</sub>) – 6.60 (T<sub>4</sub>), 6.50 (T<sub>1</sub>) – 14.39 (T<sub>4</sub>) and 44.36 (T<sub>4</sub>) – 56.71 (T<sub>1</sub>) for CF, EE, ASH and NFE respectively.

**Table 1: Proximate Composition of whole maize stover and *Macunapruriens* Silage**

Parameters	Treatment				SEM
	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	
Dry matter (%)	26.65 <sup>a</sup>	23.48 <sup>a</sup>	21.80 <sup>b</sup>	21.57 <sup>a</sup>	0.67
Crude protein (%)	8.02 <sup>c</sup>	8.98 <sup>c</sup>	11.74 <sup>b</sup>	13.01 <sup>a</sup>	0.54
Crude fibre (%)	26.42 <sup>a</sup>	26.20 <sup>a</sup>	24.02 <sup>b</sup>	21.64 <sup>ab</sup>	1.24
Ether extract (%)	2.35 <sup>c3</sup>	69 <sup>a</sup>	4.67 <sup>b</sup>	6.60 <sup>a</sup>	0.09
Ash (%)	6.50 <sup>c</sup>	8.36 <sup>b</sup>	10.39 <sup>b</sup>	14.39 <sup>a</sup>	0.12
Nitrogen Free Extract (%)	56.71 <sup>a</sup>	52.77 <sup>a</sup>	49.18 <sup>b</sup>	44.36 <sup>c</sup>	2.43

a,b,c: means within the same row with different superscripts are significantly different (P<0.05).

T<sub>1</sub> = 100% ensiled whole maize, T<sub>2</sub>= 75% whole maize + 25% *Mucunapruriens* foliage silage, T<sub>3</sub>= 50% whole maize + 50% *Mucunapruriens* foliage silage, T<sub>4</sub> = 25% whole maize + 75% *Mucunapruriens* foliage silage.



**Table 2: Haematological parameters of WAD rams fed Whole maize and *Mucuna pruriens* foliage silage**

Parameters	Dietary				SEM
	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	
PCV (%)	28.20	30.02	29.73	27.21	1.03
HB (g/dl)	9.00 <sup>a</sup>	9.87 <sup>a</sup>	9.56 <sup>a</sup>	6.11 <sup>b</sup>	0.34
RBC (x10 <sup>6</sup> µl/ml)	10.87	11.66	11.14	10.02	1.27
WBC (x10 <sup>3</sup> µl/ml)	7.48	8.85	8.08	7.43	0.77
NEUT (%)	41.01 <sup>a</sup>	41.23 <sup>a</sup>	40.05 <sup>a</sup>	35.38 <sup>b</sup>	3.24
LYMP (%)	56.28	57.03	56.62	56.02	3.46
MONO (%)	2.00	2.00	2.00	2.00	0.17
EOSI (%)	2.87	3.02	3.00	2.27	0.52

a.b.: means within the same row with different superscripts are significantly different (P<0.05).

T<sub>1</sub> = 100% ensiled whole maize, T<sub>2</sub> = 75% whole maize + 25% *Mucunapruriens* foliage silage, T<sub>3</sub> = 50% whole maize + 50% *Mucunapruriens* foliage silage, T<sub>4</sub> = 25% whole maize + 75% *Mucunapruriens* foliage silage.

Haematological response of WAD rams to different silages is shown in table 2. There were only significant differences (P<0.05) in haemoglobin concentration and Neutrophils across the dietary treatments while there were no significant differences (P>0.05) in the variations observed in all the other parameters investigated.

### Discussion

Crude protein and ether extract increased with increasing inclusion of *Mucunapruriens* foliage in the silage while the Dry matter decreased with increased level of *Mucunapruriens* in the silage. There were significant differences (P<0.05) in all the parameters across the treatment. The CP content in T<sub>1</sub> and T<sub>2</sub> were within the critical value of 7% recommended for small ruminants ([10] while T<sub>3</sub> is within the minimum protein requirement of 10-12% recommended value by [2] for ruminants while the CP content of T<sub>4</sub> was slightly above the recommended value by [2]. The CP contents of all the silages under investigation exceed the 8% that can provide the minimum ammonia level required for microbial activities [9]. Decrease in NFE percentage across the treatment is a good indication that whole maize stovers has high soluble carbohydrates needed to supply energy.

The PCV range of 27.21 – 30.02% obtained in this study were within the values (22.00-37.00%) reported by [13] for normal healthy sheep. These values were also close to 29.9 – 33.6% reported by [8] for Clinically healthy sheep. The Hb values obtained in this study is comparable to the normal values recorded for healthy sheep by [6], an indication that dietary treatments T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> respectively are capable of supporting high oxygen carrying capacity in the animals. Furthermore, the values of PCV and Hb of WAD rams fed whole maize Stover and *Mucuna pruriens* foliage silages is an indication that the animals were not anemic. For RBC, the range of value of 10.02-11.6% obtained in this study was above the range values of 2.40-4.20% reported by [13]. Also the values for White blood cells (WBC) and neutrophils (NEUT) were above the normal range reported for healthy sheep [8] while the values for lymphocytes, monocytes and eosinophils (EOSI) were within the normal range reported by the same authors for clinically healthy sheep. WBC in animal possesses phagocytes functions [4] differential WBC counts were used as an indicator of stress response and sensitive to immune function [5]. The higher WBC and differential counts reported in this study indicated that, the WAD rams seems to possess protective system, providing a rapid and potent defense against any infectious agent. This probably is the physiological basis for the adaptation of this species to this ecological zone characterized by high prevalence of disease.

### Conclusion

The results of this experiment revealed that the silages were not toxic to the animals and have no adverse effects on their health status. Although, most of the parameters investigated in this study were not significant statistically, animals fed silage containing 75% whole maize stover + 25% *Mucunapruriens* foliage performed better in most of the parameters measured.



## References

1. AOAC, (1995). The official methods of analysis. Association of official analytical chemist 16<sup>th</sup>Edn. Wshington.D.C.pp:69-88
2. ARC, (1984). The nutrient requirement of ruminant. Livestock supplement. No 1, Commonwealth Agriculture bureaux, Slough, UK.
3. Babayemi, O. J. (2009). Silage dry matter intake and digestibility by African dwarf sheep of Guinea grass (*Panicum maximum* cvNtchii) harvested at 4 and 12 week regrowths. *African Journal of Biotechnology*.
4. Campbell, T. N. and Cole, E. H. (1986). *Avia Clinical Pathology*. P. 279: in Cole, E.H (ed.) *Veterinary Clinical Pathology*. 4<sup>th</sup> edition W.B. saunder Co. Philadelphjia, Pennsylvania, USA. Pp. 178-207
5. Carsky, R. J, Tarawali. S. A., Becker. M., Chikoye. D., Tian, G. and Sangiga, N. (1998). Mucuna: Herbaceous cover legume with potential multiple use. Resource and Crop Management. Research Monograph. No. 25.International Institute of Tropical Agriculture, Ibadan. Nigeria.
6. Fajemisin,A.M.,Fadiyimu, A.A. and Mokan, J.A (2010). Performance and Nitrogen retention in west African Dwarf goats fed sundried. *Musa sapiertum* peel and *Gliricidia sepium*. *Journal of Applied Tropical Agriculture* 15 (Special issue): 88-91
7. Graczyk, S. Pliszczak-krol, A., kotonski, B., Wikzek, J. And Chmielak, Z. (2003).Examination of haematological metabolic changes mechanisms acute stress in turkey. *Electronic Journal Of Polish Agriculture Universities*. 6:1-10
8. Mitruka, B. M. and Rawnsley, H. M (1977). *Clinical Biochemical and Haematological reference values in normal experimental animals*. Masson Publishing, New York.
9. Norton, B.W (2010). The nutritive value of tree legumes. <http://www.fao.org/ag/AGP/doc/publication/Guttshell/X5556x0.html>
10. NRC, (1981). Nutrient requirment for goats.Angora diary and meat goat in temperate and tropical continent. National Academy of science.Press. Washington. D.C.
11. Onifade, A. A. and Tewe, O. O. (1993). Alternative tropical feed resources in rabbit diets, growth performance, diet digestibility and blood composition. *Wild Rabbit Science* (1):17-24
12. SAS, (2002). User guide on statistical analysis Institute Inocary
13. Sowande, O. S., Aina, A. B. J., Oguntona, E. B., Fanimu, A. O., Unaka, V. U., Hassan, T. A. and Oseni, M. O. (2008) performance, blood constituent and mineral balance of West African Dwarf Sheep fed preserved elephant grass, layers dropping and cassava peel diets during dry season. *Nig.J. of Animal Production*. 35:90-102
14. Susan, S. (2009). Coping with high feed costs.Western Maryland Research and Education Centre University of Maryland Extension. Small Ruminant Information Series
15. Taiwo, B. B. A., Ngere, I. A., and Adeleye, I. O. (2003). Body size and Carcass component Nigeria Dwarf sheep. *Journal of Animal Production Research*.3 (1): 89-101



16. Van Soest, P. J., Robertson, J. B. and Lewis, B. A. (1991). Methods of dietary fibre, neutral detergent fibre and non-starch polysaccharides in relation to animal nutrition. *J.Dairy science* 74:3583-3597
17. Warris, P. D. (200). Meat science. An introduction text.CAB publishers, *Brstol*.Pp10-37.

UNIVERSITY OF IBADAN LIBRARY