

Paul N. Mbugua

Curriculum Vitae

June 2013

Summary

Thirty years working experience in the agricultural field.

Career experience includes:

- Civil service administration - Government of Kenya
- University administration - Head Department of Animal production, University of Nairobi
- Teaching at university level.
- Research in various aspects of animal nutrition and production
- Outreach programs targeting smallholder dairy and poultry producers in Kenya
- Consultancy in various aspects of livestock production

AREAS OF EXPERTISE

a) Primary areas

Animal agriculture - animal nutrition and production

Education and training – university level

Livestock feeds – Standards, quality assurance and manufacturing technology

b) Secondary areas

Research - planning, implementation and evaluation

Training needs – assessment of community training needs

Technology transfer - agricultural technology transfer and adoption

1. Current Employment status

- a. Joined university of Nairobi as Lecturer in February 1984
- b. Have risen through the ranks to Associate Professor , the position I hold today

2. Personal information

Name Paul Njenga Mbugua
Date of birth 15th February 1948
Place of birth Limuru, Kenya
Marital status Married to Anne Waithera Njenga
Present position Associate Professor in animal production
University of Nairobi
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3. Education

1979-1983 Cornell university, USA (Ph.D. Animal Science)
1976-1978 University of Nairobi (M.Sc. Animal production)
1970-1973 University of Nairobi (B.Sc. Agriculture)
1968-1969 Thika high school ('A' level)
1964-1967 Kijabe high school ('O' level)

4. Professional experience

a. 1973- 1977: Research officer, Ministry of Agriculture, Kenya

b. 1979-82: Graduate student at Cornell University, USA

- Major Animal science
- **Minors** Animal physiology
International agriculture

c. 1983 – Feb 1984: Senior research officer

d. Feb. 1984 to date: Teaching, University of Nairobi

e. Administration and other responsibilities

1. Member, PREPARE PhD team under the STRAPA arrangement
2. **Chairman:** Department of Animal production (1992 - 1998).
3. **Coordinator:** The University of British Columbia -University of Nairobi linkage (1992-1998).
4. **Representative:** Faculty Postgraduate committee; Faculty senate representative; Technical committee of Kenya Bureau of Standards on animal feeds
5. **Member:** African network on small-holder rural poultry production
6. **Important** professional undertakings:
 - (i) 1985, FAO Expert consultation on animal feeds in developing countries
 - (ii) 1989, FAO: Expert consultation on waterfowl production in Africa
 - (iii) 1990, CTA consultation in drawing research priorities on rural poultry production in Africa
 - (iv) Editor, AKEFEMA News – a publication of the Kenyan feed manufacturers

5. Research areas over the years

Past

- (a) Study of intensive of beef production under intensively managed leys and stall feeding with maize silage
- (b) Dairy cattle production under extensive system of production
- (c) Evaluation of nutritive value of napier grass
- (d) Evaluation of alternative feed resources for use in poultry feeds

- (e) Vitamin and mineral nutrition: Assessment of requirement in poultry and dairy cattle
- (f) Evaluation of sunflower seed meal as feed for tilapia under aquaculture production system
- (g) Strategic supplementation of dairy cattle for improved productivity
- (h) Use of treated crop residues in dairy cattle feeding
- (i) Assessment of feed resource base in Nairobi and Nyandarua districts of Kenya
- (j) Assessment of chelated zinc and selenium on milk production in dairy cattle

On-going

- (k) Use of simulation models to assess smallholder dairy cattle productivity
- (l) Role of poultry in improving nutrition and income of rural households in Kenya
- (m) Evaluation of natural mineral sources for goats in arid and semi-arid lands (ASAL) of Kenya
- (n) Prepare PD: This is a project involved in improving PhD training
- (o) Evaluation of organic acids for improving gut health in chickens

6. Supervision of graduate student – Research projects

Programme	Student	Topic
<i>MSc</i>		
1	Kabuage	Effect of feeding diammonium citrate on body fat level and performance of chicken broilers
2	Maina	Effect of biotin supplementation on chicken broiler performance
3	Mwendia	Effect of β -carotene supplementation to grazing cattle on their reproductive performance
4	Kaheri	Evaluation of cotton seed cake as protein source in chicken broiler diets
5	Odweso	Grain sorghum as an energy source in chicken broiler diets
6	Njoroge	Water intoxication in calves
7	Ongare	Nitrogen metabolism in ostriches
8	Njue	Epidemiology of Ascites in broilers in Kenya
9	Karanja	Study of pathogenecity of E. coli in chicken broilers
10	Karanja	Mineral nutrition in dairy cattle in central Kenya
11	Okati	Effect of climate change on livelihoods in Kajiando
12	Barorot	Effect of poultry manure and mulberry leaves on silage quality
13	Katiku	Use of models to predict dairy cattle productivity
14	Wahome	Impact of smallholder poultry production on household income and nutrition
14	Moses Lengarite	Mineral nutrition in goats under extensive production system

15	Owengo	Evaluation of crop residues
16	Yohana	Use of feed enzymes in poultry feeds in Kenya

17	Justus Namasi	Assessment of adaptation to climate Vulnerability in ASAL
PhD		
1	Joyce Maina	Evaluation of oil seed cakes in diets of the tilapia fish
2	Josephine Nambi	Evaluation of dried poultry waste for use in broiler diets
3	Ben Kayngo	Evaluation of caged layer waste and crop residue as feed for ruminants
4	Raphael Wahome	Sow responses to varying levels of feeding during gestation and lactation
5	Jackline Jacob	Evaluation of sorghum and oil seed cakes for use in poultry diets
6	Lucy Kabuage	Evaluation of grain amaranth in broiler diets
7	Muia	Development of methods of predicting nutritive value of napier grass in dairy cattle

7. External Examining

Sokoine university of Agriculture - 1995 –1998

Botswana College of Agriculture - 1997-2001

Wageningen University, Holland – 2000 (one PhD student, Dr. Muia)

University of British Columbia, Canada – 2001(one PhD student, Dr. Maina)

8. Consultancies

- (a) Identification of policy entry points for climate change innovative strategies, AU/IBAR, November 2011
- (b) Capacity building for Kenyan Feed Manufacturers, Land O lakes January 2010
- (c) Development of certification courses for AKEFEMA. This is the umbrella body of the animal feed manufacturers in Kenya (**Winrock International**), 2009
- (d) Review of curriculum on Diploma in Animal Production (**Bukura College of Agriculture**), 2009
- (e) Development of Nation poultry policy for Kenya (**Ministry of Livestock Development**), 2008
- (f) Integrated value chain analysis for the Leather Sector in Kenya (**World Bank/MT/MSME Project**), 2008
- (g) Poultry feed situation in Kenya (**Ministry of Livestock development**), 2008

- (h) Development of National Feed Policy for Kenya (**Ministry of Livestock Development**), 2008
- (i) Consultancy on development of Action Plans on improvement and value addition in the agricultural sector covering: beef, dairy, hides/skins, fish/seafood, coffee, tea, horticulture and pyrethrum (**ASCU -Ministry of Agriculture, Kenya**), 2007
- (j) Environmental impact assessment of the proposed Tana Delta Integrated Sugar Project on livestock production in the delta (**HVA/Agriconsult**), 2007
- (k) Development of feed manufacturing manual (**Kenya Maize development program**), 2002
- (l) Agricultural technologies transfer and adoption in East and Central African region (**CIP/ASARECA/USAID**), 2000
- (m) Assessment of production and use of concentrates for dairy cattle in Kenya (**Small Dairy Development Project, ILRI**), 1998
- (n) Evaluation of poultry feed technologies in Kenya (**Abt associates, USA**) 1992
- (o) Evaluation of NORAD funded projects in Turkana, Kenya (Norconsult), 1987
- (p) Evaluation of cockerel exchange programme in Machakos District, Kenya (**National Poultry Development Programme, Ministry of Livestock, Kenya**), 1985

9. PUBLICATIONS

a) In refereed journals.

1. **Mbugua, P.N.**, D. Cunningham and R. E. Austic (**1983**): Effect of feed restriction on production performance of replacement pullets: *Poultry Science* **62**: 1169- 1176.
2. **Mbugua, P.N.**, R. E. Austic and D. Cunningham (**1985**): Effect of feed restriction on growth and metabolism of replacement pullets: *Poultry science* **69**: 1950-?
3. **Mbugua, P.N.** and J. Kiragu (**1989**): A case study of the importance of mineral supplementation in a dairy cattle herd: In Proceedings: 1st annual conference of faculty of veterinary medicine, University of Nairobi. *Bull. Anim. Hlth Pro. Afr. special issue pp 17-21*
4. Kabuage, L. W., **P. N. Mbugua** and B. N. Mitaru (**1991**): Effect of feeding diammonium citrate on body fat level and performance in broiler chickens: *Bull. Anim Hlth. Pro.Afr.* **39**: 405-409.
5. Muinga, R. W. and **P.N. Mbugua** (**1 991**): The feeding value of cocoyam (*Colocasia esculenta*) meal as a substitute for traditional energy source in broilers. *Bull. Anim. Hlth. Pro. Afr.* **39**: 355-360

6. Nambi, J., **P. N. Mbugua** and B. N. Mitaru (1991) Effect of heat processing on the chemical and bacteriological composition and gross protein value of poultry waste. *Discovery and Innovation* **3 (3)**: 91-96
7. Nambi, J., **P. N. Mbugua** and B. N. Mitaru (1992): The nutritive value of dried poultry excreta as a feed ingredient for broiler chickens. *Anim. Feed Sci. and Tech.* **37**:99-109
8. Mburu, J. N., J.M.Z. Kamau, M.S. Badamana and **P. N. Mbugua (1994)**. Use of serum vitamin B₁₂ in diagnosis of cobalt deficiency in small East African goats. *Bull. Anim. Hlth. Prod. Afri.* **42**: 141-146
9. Jacob, J. P., B. N. Mitaru, **P.N. Mbugua** and R. Blair. (1996): The effect of substituting Kenya Serena sorghum for maize in broiler starter diets with different dietary crude protein and methionine levels. *Anim. Feed Sci. and Tech* **61**: 27-39
10. Jacob, J. P., B. N. Mitaru, **P. N. Mbugua** and R. Blair (1996): The feeding value of Kenya sorghum, sunflower seed cake and sesame seed cake for broilers and layers. *Anim Feed Sci. and Tech.* **61**:41-56
11. Jacob, J. P., B. N. Mitaru, **P. N. Mbugua** and R. Blair (1997): The nutritive value of Kenyan sorghum for poultry. *Trop. Sci.* **37**: 43-48
12. Njoroge, E. M, J. M. Maribei and **P. N. Mbugua (1997)**: Pathological changes in calves that died from experimental water intoxication. *Onderstepoort J. Vet. Res.* **64**: 111-114
13. Maribei, J. M., E. M Njoroge and **P. N Mbugua (1998)**. Clinical Manifestation of experimental water intoxication in calves. *Indian J. Anim sci.* **68**:531-532
14. Njue, S. W. **P.N. Mbugua**, M.N. Kyule and J.M. Gathuma (1998). Risk factors associated with ascites in commercial broiler production in peri-urban areas of Nairobi. *The Kenya Veterinarian* **23**: 163-165
15. Njoroge, E. M., J.M. Maribei and P.N. Mbugua (1999). Water intoxication in cattle. *S. Afr. Vet Ass* **70**: 177-179
16. Muia, J. M. K., S. Tamminga, **P. N. Mbugua** and J. N. Kariuki (1999): Optimal stage of maturity for feeding napier grass (*Pennisetum purpureum*) to dairy cows in Kenya. *Tropical grasslands* **33**: 182-190
17. Muia, J.M. K, S. Tamminga. **P.N. Mbugua** and J.N. Kariuki (2000). Prediction of yield and digestibility on napier grass (*Pennisetum purpureum*) from maturity, leaf: stem ratio and laboratory analyses. *Tropical Science* **40**: 32-39
18. Muia, J.M. K., S. Tamminga and **P. N. Mbugua (2000)**. Effect of supplementing napier grass (*Pennisetum purpureum*) with sunflower meal or poultry litter- based concentrates on feed intake, live-weight changes and economics of milk production in Friesian cows. *Livestock production Sci.* **1**: 0-0 [confirm page numbers]

19. Muia, J. M. K., S Tamminga, **P.N. Mbugua** and J. N. Kariuki (2000). The nutritive value of napier grass (*Pennisetum purpureum*) and its potential for milk production with or without supplementation: a review. *Tropical Science* 40: 109-131
20. Muia, J.M. K., S. Tamminga and **P. N. Mbugua** (2001). Effect of moisture supply, maturity and supplementation with soyabean meal on digestibility of napier grass fed to sheep. *Trop Sci.* 41: 36-43
21. Muia, J.M. K., S. Tamminga and **P. N. Mbugua** (2001). Effect of supplementing napier grass (*Pennisetum purpureum*) with poultry litter and sunflower based concentrates on feed intake and rumen fermentation in Friesian steers. *Anim. Feed Sci. Techn.* 92: 113-126
22. Muia, J. M. K., S Tamminga, **P.N. Mbugua** and J. N. Kariuki (2001). Rumen degradation and estimation of microbial protein yield and intestinal digestion of napier grass (*Penisetum perpureum*). *Anim. Feed Sci. Techn.* 93: 177-192
23. Kabuage, L. W., **P. N. Mbugua**, B. N. Mitaru and T. A. Ngatia (2002). Effect of steam pelleting and inclusion of molasses in amaranth diets on broiler chicken performance, carcass composition and histopathology of some internal organs. *AGRIPA, FAO electronic publishing PP: 1-10*
24. *Kabuage, L. W., P. N. Mbugua, B. N. Mitaru, T. A. Ngatia and K. Schafer (2002). Effect of fortifying amaranth diets with amino acids, casein and ethylene diamine tetra acetate on broiler performance, amino acid availability and mineral utilization. S.Afr.J.Anim. Sci. 32: 144-153*
25. Maina.J.G. R.M. Beams, D. Higgs, **P.N. Mbugua**, G. Iwama and S. M. Kisia (2002). Digestibility and feeding value of some feed ingredients fed to tilapia *Oreochromis niloticus* (L.) *Aquaculture Research* 23: 853-862
26. Maribei, J.M., E.M. Njoroge and P.N. Mbugua (2002). Erythrocyte fragility of calves suffering from experimental water intoxication *Bull. Anim. Hlth. Prod. Afr.* 50: 202-204
27. Maina.J.G. R.M. Beams, D. Higgs,G. Iwama, **P.N. Mbugua** and S. M. Kisia (2003). Partial replacement of fishmeal with sunflower cake and corn oil in diets for tilapia (*Oreochromis niloticus* (Linn): Effect on whole body fatty acids. *Acquaculture Research* 34: 601-608
28. Maina.J.G. R.M. Beams, D. Higgs, **P.N. Mbugua**, G. Iwama and S. M. Kisia (2005). A comparison of the nutritional quality of Kenya omena fishmeal and LT Anchovy fishmeal fed to tilapia *Oreochromis niloticus* (Linn)*Veterinary Journal* 49: ??Check
29. Maina.j.G. R.M. Beams, D. Higgs, **P.N. Mbugua**, G. Iwama and S. M. Kisia (2007). *The feeding value and protein quality in high fibre and fibre reduced sunflower cakes and Kenya's "omena" fishmeal for tilapia(Oreochromis niloticus (Linn) Journal of Livestock Research for rural development* 19: (11) ?? Check
30. Maina.J.G. R.M. Beams, D. Higgs, **P.N. Mbugua**, G. Iwama and S. M. Kisia (2008). *Evaluation of limiting amino acids in tilapia diests based on sunflower cake. Bullketin of Animal Health and Production* 55 (3) ?? Check

31. J M K Muia, J N Kariuki, **P N Mbugua**, C K Gachui, L B Lukibisi, W O Ayako and W V Ngunjiri (2011). Smallholder dairy production in high altitude Nyandarua milk-shed in Kenya: Status, challenges and opportunities. *Livestock Research for Rural Development* **23** 2011
32. M.I. Lengarite, **P.N. Mbugua**, C.K. Gachui² and L.W. Kabuage (2011): Mineral Status of Sheep and Goats Grazing in the Arid Rangelands of Northern Kenya. *Pakistan Journal of Nutrition* 10 (x): xx-xx, 2011
33. Katiku P N, Gachui CK and **Mbugua P N** (2011): Characterization of dairy cattle farming in Mbeere District of Eastern Kenya. *Livestock Research for Rural Development* 23:
34. M.I. Lengarite, P.N. Mbugua, C.K. Gachui and L.W. Kabuage (2012): Mineral Status of Sheep and Goats Grazing in the Arid Rangelands of Northern Kenya. *Pakistan Journal of Nutrition* 11 (4): 383-390, 2012
35. M I Lengarite, **P N Mbugua**, C K Gachui and L W Kabuage (2012): Herders' knowledge on mineral nutrition and implication on sheep and goat productivity in Marsabit South District, Kenya. *Livestock Research for Rural Development* 24 (4) 2012
36. M I Lengarite, **P N Mbugua**, C K Gachui and L W Kabuage (2012): Mineral status of sheep and goats grazing in the arid rangelands of northern Kenya- *Pakistan Journal of nutrition* 11(4): 383-390, 2012
37. Wahome, R.G., P.N. Mbugua. L. Bebora, W. Kogi-Makau, P. Gathumbi and S. Shibauro (2012): The PhD training Supervision : Trainers' Manual. Art and Media House, Nairobi;
 - a. Chapter 2: Supervision competence and learning strategies
 - b. Chapter 3: Peer supervision, types and roles of supervisors and aligning supervision with research student's expectation.

b) Papers in proceedings

1. Thomas, C. and **P. N. Mbugua (1981)**: Effect of supplements on the live weight gain of beef cattle given forage during the dry season. In proceedings: *International grasslands congress. Kentucky, USA*
2. Said, A.N. and **P. N. Mbugua (1985)**. Present situation of compounded feed industry in Kenya and perspectives for use of local feed resources. In proceedings: *FAO experts consultative meeting on animal feeds in the tropics, Bangkok, Thailand*
3. Mitaru, B. N., J. Nambi and **P. N. Mbugua (1988)**: Effect of heat processing methods on the nutritive value of layer waste for broiler chickens. In proceedings: *Vth World conference on animal production, Helsinki, Finland*
4. Kabuage, L. W., **P.N. Mbugua** and B. N. Mitaru (1988): Effect of diet on carcass fat in broiler chickens. In proceedings: *Animal production society of Kenya conference*

5. **Mbugua, P. N. (1989):** Progress made in identifying alternative ingredients for use in poultry feeds in Kenya. In proceedings: *DLG conference on poultry production in hot climates. Hameln, W. Germany*
6. **Mbugua, P.N.** Poultry production in Kenya **(1990):** In proceedings: *CTA International seminar on small- holder rural poultry production in Africa. Thessaloniki, Greece*
7. **Mbugua, P. N.** and L.W. Kabuage **(1998):** Sustainable use of grasslands, forests, grains and crop residues. In proceedings: *VIIIth World conference on animal production. Seoul, Korea*
8. **Mbugua, P.N. 2000.** Mineral *nutrition in dairy cattle under smallholder production system in Kenya.* Seminar given: Department of Animal Science, Wageningen University, Holland,
9. **Mbugua, P. N. 2001.** Vitamin B₁₂ status in dairy cattle in smallholder farms in Kenya. Seminar given: Department of Animal Science, University of British Columbia, Canada,
10. **Mbugua, P. N.** S.N. Muturi, L.N. Kimenyi and C. Gor (2001). Role of partnerships in agricultural technology transfer and adoption in eastern Africa. In proceedings 4th biennial Faculty of veterinary Medicine, university of Nairobi, conference
11. **Mbugua, P. N.** 2010: Impact of climate change on Animal Nutrition. In Proceedings Faculty of Veterinary Medicine, University of Nairobi Biennial Conference,
12. M.I. Lengarite, **P.N. Mbugua**, C.K. Gachui2 and L.W. Kabuage (2011): Mineral Status of Sheep and Goats Grazing in the Arid Rangelands of Northern Kenya: In Proceedings, KSAL Conference, KARI, 2011
13. **Paul N. Mbugua** (2011): Impact of climate change on animal production in Kenya: a review
In Proceedings, Agro2011, Faculty of Agriculture Conference, University of Nairobi 2011
14. Bio-economics of stall managed dairy cattle feeding regimes in mbeere district of Eastern Kenya. Katiku, P. N, Gachui, C. K. and **Mbugua, P. N.** KARI Biannual conference, Kenya, 2013
15. The potential quality, mode of feeding and constraints of feedstuffs in Mbeere District of Eastern Kenya. Katiku P N, Gachui C K, Mbugua P N, and Kimitei R K. KARI Biannual conference, Kenya, 2013
16. The potential use of *moringa oleifera* lam. As poultry feed supplement in Kenya. Gakuya D.W. S.G. Kiama, J.M. Mbaria, P.N. Mbugua , P.K. Gathumbi , M. Mathiu, Abuom, T. In proceedings: International Veterinary Scientific Conference and Exhibition 25th to 27th April 2012, Nairobi Kenya.
17. The effect of supplementation of *moringa oleifera* leaf meal in broiler chicken feed.

18. Gakuya, D.W, Mbugua, P.N., Kavoi, B. , Kiama, S.G.

In proceedings: Kenya Veterinary Association, April 2013 Mombasa Kenya.