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What holds us back: constraints among broiler producers in Ghana

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ABSTRACT

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In Africa, Chicken has become one of the most important meats in terms of consumption of which Ghana is no exception. In spite of the high demand for chicken in Ghana, its producers have been constrained by a number of factors. Formulating policies to address these constraints would be very difficult without knowing their order or rank and respective levels of severity from the perspective of the farmers. One hundred and twenty five broiler producers in the Greater Accra Region of Ghana were surveyed using the multistage sampling method. The various constraints were ranked with the use of their mean values from a Likert scale. Among the various constraints, competition from imported chicken was the number one while theft in production which was the least and was not seen as a constraint by the farmers. When broadly categorized, it was observed that the issue of marketing factors was the foremost constraint of the farmers followed by financial and production. The study therefore recommends government to reduce drastically the importation of chicken, create market for producers and subsidize poultry inputs in order to boost broiler production in Ghana.

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1. Introduction

Chicken has become one of the most famous meat consumed in the world (Watt Executive Guide, 2010). Africa is no exception in terms of where chicken consumption is gaining grounds (Shane, 2006; Killebrew and

Plotnick 2010), with countries like South Africa, Morocco, Egypt and Nigeria among the growing and large consumers (Food and Agricultural Organization Statistics (FAOSTAT), 2006).

In a country like Ghana, demand for chicken over the years has been tremendous and phenomenal (Ministry of Food and Agriculture (MoFA), 2010). Between 1997 and 2010, United States Department of Agriculture (USDA) (2011) noted that the per capita broiler meat consumed in Ghana increased from 1kg to 4kg, signifying about a 300% increase in chicken consumption per head. During that same period, domestic consumption of poultry shot up from 21,000 metric tonnes to 103,000 metric tonnes, representing an almost 400% increase in poultry meat consumed in terms of volume; the largest among all meat consumed in Ghana. In spite of the extra ordinary increase in the consumption of chicken in Ghana over the past decade, domestic output is not able to meet domestic demand. From year 2000 to 2010 for example, USDA (2011) noted the whiles the total amount of poultry meat consumed summed up to almost 728,000 metric tonnes, domestic production summed up to about 167,000 metric tonnes during that same period. This means domestic production fell short of domestic consumption on an average of about 51,000 metric tonnes annually.

More of the poultry farmers who hitherto were into the production of broilers have either shifted to the production of layers (eggs) or completely shut down due to the numerous challenges besetting the broiler sector. Among these challenges are high levels of importation of low priced chicken, high cost of production due to high cost of inputs especially in terms of feed, disease outbreaks, unavailability of credit facilities and market assessment problems (USDA, 2011). This has contributed to the inability of farmers to expand, meet the market demand and compete with imported chicken; in spite of the large potential market for local broiler producers.

Poultry production in Ghana at the commercial level though relatively young (Koney, 1993) has not had a smooth experience in terms of financial, production and marketing performance (Khor, 2006). Vibrant in the 1950s through to the 1980s where it reached its peak and started declining, each stage of performance of the poultry industry has had its own set of challenges or constraints. Though there have been common constraints over the years in the poultry industry, Khor (2006) noted that these challenges vary over the years in terms of its intensity.

In the 1980s when the sector became very vibrant, the leading constraints as Khor (2006) noted were access to credit to expand production and market and availability of feed ingredients for the poultry birds. In the early 1990s when the industry started declining on all fronts, the constraints in terms of its intensity changed. The leading constraint Aning (2006) and Khor (2006) noted was the high cost of production for farmers due to the requirement of the World Bank prescribed Structural Adjustment Programme (SAP) to withdraw government subsidies for poultry production. From the middle part of the 1990s to 2003, the leading constraint of the broiler industry was the massive importation of cheaper chicken from countries like the European Union (EU) and United States of America (USA) which had a competitive advantage over the locally produced chicken (Khor, 2006 and Issah, 2007). The bird flu pandemic which hammered the poultry sector in year 2006 and beyond became the leading constraint of the sector overshadowing its numerous constraints (Biol et al., 2010).

Some studies conducted in Ghana have identified some form of constraints with respect to poultry production in general. Nimoh et al. (2011) noted that access to credit was an important determinant of production performance because without credit, farmers will not be able to incorporate modern technologies and purchase feed; which was very vital in poultry production which Okantah et al. (2003) agrees. In addition, Okantah et al. (2003) noted constraints among poultry farmers in general in peri – urban centres in Ghana included inputs cost and availability and pests and diseases.

There are basic constraints which are predominant in the poultry sector in Africa in general irrespective of the country. Killebrew and Plotnick (2010) noted that in Africa, the poultry farmers are generally constrained by high costs of production, hygienic problems and inadequate knowhow in poultry production and marketing. Dupaigne et al. (2004) added that poultry farmers in Africa are constrained by access to inputs, high cost of veterinary services and disease outbreaks. Dupaigne et al. (2004) also cited marketing problems and cheap imported chicken as some constraint that inhibit the growth of the poultry sector in Africa. Ovwigho et al. (2009) also noted that factors like access to credit and theft of birds were also constraints among poultry producers in the Delta State in Nigeria. Mosinyi (1999) noted that lack of poultry equipment and high cost of input (mainly feed) served as constraints in the poultry industry in Botswana. Badubi et al. (2004) reported that poor prices offered for poultry products from farmers serves as a major constraint for broiler producers in Botswana. According to Moreki (2011) disease and pest with respect to poultry birds could explain why production was inhibited in Botswana.

The many factors which serve as constraints to the growth in the broiler production sector in Ghana as given by Koney (1993) and Khor (2006) could be broadly classified into marketing, financial and production. These factors

though not new to the poultry farmers are not really known in terms of their intensity. When the bird flu pandemic known as Highly Pathogenic Avian Influenza (HPAI) became an important issue in Ghana's poultry sector in year 2006, Birol et al. (2010) noted the constraint which became the most popular for policy makers was the poultry disease. Over the years vaccines which are capable of reducing widespread infections among birds have been introduced. Therefore the issue is, among the numerous constraints of broiler producers in the poultry sector, which are the leading ones? And with respect to the constraints, what is their intensity from the perspective of the farmers. The main aim of the study is to examine the intensity of the various constraints that affect the broiler production sector from the perspective of the farmers. The results obtained will not only give a better understanding of the constraints in the broiler sector but also ensure proper policy direction for the almost collapsing broiler sector as Khor (2006) asserted.

2. Materials and methods

2.1. Study area

The study was undertaken in the Greater Accra Region of Ghana, where the capital of the nation, Accra, is located. Smallest in terms of land size among the ten regions of Ghana though, it is very important in poultry production in Ghana (Aning, 2006). It used to be the leading producer of broilers in Ghana according to Aning (2006) but now ranks number four (4) according to MoFA (2010). It shares inland borders with other important poultry producing regions like the Central and Eastern Regions (Ministry of Local Government and Rural Development (MLGRD), 2006). The second largest in terms of regional population in Ghana and also constituting the region with the majority of middle class (Ghana Statistical Service, 2011), it has arguably the largest market for chicken in Ghana. Its religious distribution of 83% Christians, 10.2% Muslims and 6.8% belonging to other religions (MLGRD, 2006) also makes it easier and convenient for both chicken production and consumption as far as religious beliefs are concerned.

With a predominantly lowland and savannah grassland vegetation coupled with an annual temperature that ranges from 20°C to 30°C (MLGRD, 2006), it makes the region very suitable for broiler production. The Region has over five hundred (500) poultry farmers who are both involved in broiler production with the majority located in the peri urban centres like Dodowa, Ashiaman, Kpone, Ablekuma, Old Kasoa Barrier, Oyarifa, Michele Camp dominating though there are other equally important urban centres like Dansoman and Gbawe (Greater Accra Poultry Farmers Association (GAPFA), 2011).

2.2. Data collection procedure

Primary data was used for this study through the use of structured questionnaires. One hundred and twenty – five (125) farmers, representing about one third of the population of farmers in the region from more than sixty (60) suburbs were interviewed. The multistage sampling method was used in this study. The first stage was the cluster sampling method while the second stage was the purposive sampling and the third stage; simple random sampling. Five (5) clusters representing the Dodowa – Oyarifa, Ashiaman – Tema Camp, Achimota – Ofankor, Dansoman and Ablekuma all in the Greater Accra Region of Ghana, were created by the study and used after which only broiler farmers were purposively sampled. A relatively higher proportion of farmers were chosen from clusters with larger populations of broiler producers while smaller proportions were chosen from clusters with a relatively smaller population. Finally the simple random sampling method was used to select the broiler producers from each cluster to ensure a fair representation from the region.

2.3. Method of data analysis

Various constraints with respect to broiler production were identified through literature after which they were broadly classified under production, financial and marketing. Pest and diseases, nature of production system, power failure, climatic conditions, theft, quality of labour and availability of equipment were classified as the production constraints. Cost of inputs, cost of maintenance and cost of credit were classified as financial constraints while factors such as unfavourable prices, low patronage of local broilers, competition from imported chicken and availability of market were listed as marketing constraints. In all fourteen (14) were identified with

production having seven (7), financial having three (3) and marketing having four (4). In ranking the various constraints, the Likert scale was used and the constraints were classified as: 1 as 'very severe', 2 as 'severe', 3 as 'not severe' and 4 as 'not a constraint'. The values on the scale given by all the farmers with respect the constraints were summed up and given averages; the constraint with the lowest value was considered as the first, while the constraint with the highest average was considered as the least. In interpreting the results of the severity of the constraint, averages obtained in decimals were approximated to whole numbers. This made it easier to specifically determine the various scales which were 1, 2, 3 and 4. In analyzing the constraint intensities, the individual constraints were separately analyzed from the broad constraints. With the first part of the analysis, the severities of the individual constraints were compared to ensure how intense each was irrespective of its category. Also, analysis was carried out on the individual constraints in order to ascertain how the proportion of farmers viewed the various levels of its severity. Also the various constraints were broadly categorized into three which determined their overall severity level. In conducting these analyses, the Statistical Package for Social Scientist (SPSS) was used.

3. Results and discussion

3.1. Socioeconomic characteristics of broiler producers

Table 1
Descriptive statistics of socioeconomic characteristics of farmers.

Age	20 – 29	30 – 39	40 – 49	50 – 59	60 – 69	70 – 79
Frequency	25	30	31	24	11	4
Percentage (%)	20	24	24.8	19.2	8.8	3.2
Gender	Male	Female				
Frequency	103	22				
Percentage	82.4	17.6				
Experience (in years)	1 – 5	6 – 10	11 – 15	16 – 20	21 – 25	26 – 30
Frequency	61	21	18	13	3	5
Percentage (%)	48.8	16.8	14.4	10.4	2.4	4
Experience (in years)	31 – 35	36 – 40				
Frequency	2	2				
Percentage (%)	1.6	1.6				
Level of Education	No Formal	Primary	JHS/Middle School	Voc./Tec./SHS	Tertiary	
Frequency	0	2	23	54	46	
Percentage (%)	0	1.6	18.4	43.2	36.8	
Extra Income (GHc)	0	1 – 5000	5001 – 10000	10001 – 15000	15001 – 20000	20001 – 25000
Frequency	18	38	19	10	9	10
Percentage (%)	14.4	30.4	15.2	8	7.2	8
Extra Income (GHc)	25001 – 30000	30001 – 35000	35001 – 40000	40001 – 45000	45001 – 50000	50000 –
Frequency	8	3	2	2	1	5
Percentage (%)	6.4	2.4	1.6	1.6	0.8	4
Farm Ownership	Only farmer	Nuclear Family	Extended Family	Partnership	Coop.	
Frequency	84	19	14	7	1	
Percentage (%)	67	15	11	6	1	

Source: Results obtained from field data (2011)

The socioeconomic characteristics of depicted by the study were age, gender, years of experience broiler production, level of education, extra income from broiler production and farm ownership; which have been represented in Table 1.

From Table 1, the mean age of the broiler producers in the region was 42.7 years and the standard deviation was 13.22. The lowest and highest ages of farmers respectively were 20 and 76 years respectively. Farmers whose ages were from 40 to 49 years made up 24.8% of the sample, representing the highest age group of farmers while 70 to 79 year old farmers were 3.2 % representing the lowest number in terms of age. Male producers constituted 82.4% while females constituted 17.6%; indicating broiler production is male dominated in the region.

Most of the farmers (48.8%) had spent up to 5 years in producing broilers with 16.8% of the farmers having between 6 to 10 years' experience in broiler production. Among the 125 farmers, those who had more than 30years of poultry farming experience were 3.2%. The other categories of years of experience are indicated in Table 1. Farmers with secondary, vocational or technical education were 43.2% which constituted the highest in the sample. All the farmers had at least primary education with 98.4% having at least Junior High School (JHS) education implying that almost all the farmers could read and write. Out of the 125 farmers, 85.6% earned income outside broiler production. The extra incomes earned were from the production of layers and cockerels, rearing of other animals, non – agricultural businesses and public sector employment as well. The remaining 14.4% solely earned income from broiler production. Majority of the farmers (67%) were sole owners of the poultry farms, followed by nuclear family ownership which was 15% with extended family ownership 11%. Partnership ownership and cooperative ownership were 1% each.

3.2 Constraints of broiler producers

It was discovered that farmers on the average perceived competition from imported chicken as the number one constraint while theft was the least. The mean values of 1.6320 for competition from imported chicken and 3.8480 for theft indicate they are severe and not a constraint to the farmers respectively.

Table 2

Rank of specific constraints affecting broiler production.

Rank	Constraint	Mean	Std. deviation	Min	Max
1	Competition from imported Chicken	1.6320	1.04369	1.00	4.00
2	Cost of inputs	2.3120	1.04276	1.00	4.00
3	Low patronage of broilers	2.5520	1.16020	1.00	4.00
4	Availability of market	2.5600	1.02705	1.00	4.00
5	Unfavourable prices of broilers	2.7120	1.12031	1.00	4.00
6	Power failure in production	3.1040	1.12037	1.00	4.00
7	Pest and Disease	3.1440	1.04499	1.00	4.00
8	Cost of maintenance	3.1600	0.96219	1.00	4.00
9	Availability of equipment	3.4560	0.79822	1.00	4.00
10	Climatic conditions in production	3.4640	0.87569	1.00	4.00
11	Cost of credit	3.5680	0.91876	1.00	4.00
12	Nature of production system	3.6880	0.72308	1.00	4.00
13	Quality of labour in production	3.7680	0.52573	2.00	4.00
14	Theft in production	3.8480	0.49279	1.00	4.00

Source: Results obtained from field data (2011)

The results obtained for imported chicken is in line with the findings of Aning (2006) where it was admitted the prices of imported chicken were 30% to 40% lower than domestic prices. The result is also in line with meaning made by Killebrew and Plotnick (2010) where they emphasized the major problem facing the broiler sector in Ghana was competition from imported chicken. The results on the theft is similar to the findings of Ovwigho et al. (2009) where loss of birds due to theft and others was the lowest constraint in the intensive poultry system in Delta State, Nigeria and also similar to the findings Nmadu et al. (2012) where in poultry production in Niger State, Nigeria, it was next to the last constraint (other constraints combined) and only 32.2% of the farmers admitted to that. Nmadu et al. (2012) also asserted that the cost of feed was the second pressing constraint of which 56.2% of the farmers of their study agreed though their findings were different from this study with respect

to pest and disease. With respect to pest and disease, Nmadu et al (2012) found out it was the number one constraint among the farmers with a percentage of 61.2 admitting it.

Table 2 also indicates that aside from the two factors mentioned, the other constraints were perceived at various levels of severity. In order of rank, cost of inputs was perceived as second and was severe while low patronage of broilers, availability of market, unfavorable prices of broilers, power failure in production, pest and disease and cost of maintenance were considered as not severe though in the strictest sense factors like low patronage of broilers, availability of market and unfavorable prices of broilers between severe and not severe. Availability of equipment, climatic conditions in production, cost of credit, nature of production system, quality of labour in production, theft in production though ranked from 9 to 14 were all considered as not constraints to poultry farmers. The findings on cost of inputs is in agreement with Nimoh et al. (2011) where most of the poultry farmers in urban and peri – urban centres in Kumasi assessed credit basically for the purchase of production inputs.

Though market competition from imported chicken was the leading constraint, Table 3 indicates that 12% of the farmers admitted it was not a constraint to them while 67.2% and 14.4% indicated it was very severe and severe respectively. In order of rank, it can be observed from Table 3 that percentage of very severe for each constraint declines as the position reduces with the exception of rank 8 to 14 which explains differently. Though 7.2% believed cost of maintenance (which ranked as the number 8 constraint) is very severe, 8% believed cost of credit (which is the 11th ranked constraint) believed it was very severe. Also with respect to the subject of very severe, quality of labour (4.8%), nature of production system (4.0%), cost of credit (8%) and climatic conditions (8%) are more than availability of equipment (2.4%) though the latter in general is a higher constraint than the others mentioned. Under the subject of not severe, 40% admitted it was the cost of inputs and this was the highest. This was followed by identification of market (36%), low patronage of broilers (34.4%) with theft and nature of production having the least numbers of 3.2% each. 81.6% of the farmers admitted quality of labour was not severe, followed by 27.2% and 25.6% who also admitted same for cost of maintenance and pest and diseases respectively while 6.4% was the least number and admitted not severe for both theft and market competition from imported chicken. The highest number for not a constraint was theft (89.6%) followed by nature of the production system (80%) and cost of credit (78.4%) with 12% admitting that market competition from imported chicken was not a constraint while none (0%) admitted quality of labour was a constraint to them as shown in Table 3.

Table 3
Distribution of severity of constraints.

Rank	Constraint	Level	Frequency	Percentage
1	Market Competition by imported chicken	Very severe	84	67.2
		Severe	18	14.4
		Not severe	8	6.4
		Not a constraint	15	12.0
2	Cost of inputs	Very severe	30	24.0
		Severe	50	40.0
		Not severe	21	16.8
		Not a constraint	24	19.2
3	Low patronage of broilers	Very severe	27	21.6
		Severe	43	34.4
		Not severe	14	11.2
		Not a constraint	41	32.8
4	Identification of market	Very severe	20	16.0
		Severe	45	36.0
		Not severe	30	24
		Not a constraint	30	24
5	Unfavourable prices of broilers	Very severe	22	17.6
		Severe	35	28.0
		Not severe	25	20.0
		Not a constraint	43	34.4

6	Power failure in production	Very severe	19	15.2
		Severe	15	12.0
		Not severe	25	20.0
		Not a constraint	66	52.8
7	Pest and Disease	Very severe	15	12.0
		Severe	15	12.0
		Not severe	32	25.6
		Not a constraint	63	50.4
8	Cost of maintenance	Very severe	9	7.2
		Severe	22	17.6
		Not severe	34	27.2
		Not a constraint	60	48.0
9	Availability of equipment	Very severe	3	2.4
		Severe	15	12.0
		Not severe	29	23.2
		Not a constraint	78	62.4
10	Climatic conditions in production	Very severe	5	4.0
		Severe	17	13.6
		Not severe	18	14.4
		Not a constraint	85	68.0
11	Cost of credit	Very severe	10	8.0
		Severe	7	5.6
		Not severe	10	8.0
		Not a constraint	98	78.4
12	Nature of production system	Very severe	5	4.0
		Severe	4	3.2
		Not severe	16	12.8
		Not a constraint	100	80.0
13	Quality of labour in production	Very severe	6	4.8
		Severe	17	13.6
		Not severe	102	81.6
		Not a constraint	0	0.0
14	Theft in production	Very severe	1	0.8
		Severe	4	3.2
		Not severe	8	6.4
		Not a constraint	112	89.6

Source: Computed results obtained from field data (2011)

In ranking the constraints in broad terms, marketing was the first with a mean value of 2.248 which implies it was very severe on the average followed by financial with a mean value of 3.013 which averages as not severe. Production was the last with an average value of 3.496 which could be approximated as not a constraint as indicated in Table 4.

Table 4
Rank of broad constraints.

Constraint	Rank
Marketing	2.248
Financial	3.013
Production	3.496

Source: Computed results obtained from field data (2011)

4. Conclusion and Recommendations

Poultry producers in the Greater Accra Region of Ghana view competition from imported chicken as the number one constraint which holds the sector back in poultry production and its effect is severe. Though they are not solely the first four leading factors constraining poultry production, marketing factors in general lead as the first constraint in poultry production and are severe on the whole. On the whole, most broiler producers view financial factors as not severe and the production factors as not a constraint.

It is therefore recommended government reduces drastically the importation of imported chicken into Ghana through measures like tariffs and embargo on imported chicken, since chicken is on high demand in Ghana but local producers do not have a share. Though the patronage of local chicken is low amidst the high demand for broiler in general, government and non – governmental organisations should as much as possible create the market for the broiler producers through contract farming since the high cost of production makes local farmers sell their produce at high prices which is unable to compete with imported chicken. Also, government should as much as possible subsidize the inputs used in broiler production especially feed since it is their highest and number one variable cost.

References

- Aning, K., 2006. The structure and importance of the Commercial and village based poultry in Ghana, Fin. Rev. Rep., Rome. FAO of UNO.
- Badubi, S.S., Ravindran, V., Reid, J., 2004. A Survey of small-scale broiler production system in Botswana. *Trop. Anim. Health Product.*, 36 (8), 823-834.
- Biról, E., Asare-Marfo, D., Ayele, G., Mensa - Bonsu, A., Ndirangu, I., Okpukpara, B., Roy, D., Yakhshilikov, Y., 2010. Investigating the Role of Poultry in Livelihoods and the Impact of Avian Flu on Livelihoods Outcomes in Africa: Experience from Ethiopia, Ghana, Kenya and Nigeria. IFPRI Discussion Paper 01011. Int. Food Pol. Res. Inst.
- Dupaigre, B., Baris, P., Liagre, L., 2004. Étude sur la compétitivité des filières agricoles dans l'espace. In Elaboration d'un argumentaire de choix de filières. Ouagadougou: West African Economic and Monetary Union (UEMOA).
- Food and Agricultural Organization (FAO)., 2010. *FAO Statistical Yearbook* (2010 ed.). Rome: FAO.
- Food and Agricultural Organization(FAO)., 2010. *Global Poultry Trends*. Rome: FAO.
- Food and Agriculture Organization(FAO)., 2006. *FAO Statistical Year Book* (2006 ed.). Rome: FAO.
- Ghana Statistical Service., 2011. *Population and Housing Census*. Accra: Gover. Ghana.
- Govern. Ghana(Ministry of Local Government and Rural Development (MLGRD))., 2006. Retrieved., March 2012, from www.ghanadistricts.com: www.ghanadistricts.com/home
- Greater Accra Poultry Farmers Association., 2011. *Record Book*. Accra: Greater Accra Poultry Farmers Association.
- Issah, M., 2007. Right to food of tomato and poultry farmers: Report of an investigative mission to Ghana. Corpwatch. Heidelberg: Fian Int.
- Khor, M., 2006. The Impact of Globalisation and Liberalisation on Agriculture and Small Farmers in Developing Countries:The Experience of Ghana. *Impact of Globalisation and Trade Liberalisation on Poor Rural Producers – Evidence from the Field and Recommendations for Action*. Accra: Third World Network.
- Khor, M., 2006. The Impact of Globalisation and Liberalisation on Agriculture and Small Farmers in Developing Countries:The Experience of Ghana. *Impact of Globalisation and Trade Liberalisation on Poor Rural Producers – Evidence from the Field and Recommendations for Action*. Third World Network.
- Killebrew, K., Plotnick, R., 2010. *Poultry Market in West Africa:Ghana*. University of Washington, Evans School Policy Analysis and Research (EPAR). Seatle: Evans School Publ. Affairs.
- Koney, E., 1993. *Poultry Health and Production*. Accra: Koney.
- Ministry of Food and Agriculture (MoFA)., 2010. *Agriculture in Ghana: Facts and Figures 2009*. Accra: Govern. Ghana.
- Ministry of Local Government and Rural Development (MLGRD)., 2006. *About Ghana:Greater Accra Region*. Accra: Government of Ghana. Retrieved., March 2012, from www.ghanadistricts.com: www.ghanadistricts.com/home
- Moreki, J., 2011. Poultry meat production in Botswana. *Livest. Res. Rur., Livest. Res. Rur. Dev.*, 23(163), Retrieved July 8, 2013, from <http://www.lrrd.org/lrrd23/7/more23163.htm>.
- Mosinyi, I., 1999. Factors affecting the development of poultry and poultry products in Botswana. National Workshop on Food Industry in Botswana, (pp. 28-31). Gaborone., Sun Hotel.18th to 19th August, 1998.

- Nimoh, F.A.K., Addo, K., Tham-Agyekum, E.K., 2011. Effect of formal credit on the performance of the poultry industry: The case of urban and peri-urban Kumasi in the Ashanti Region. *J. Dev. Agr. Econ.*, 3(6), 236-240.
- Nmadu, J.N., Iwuajoku, R.C., Jiya, E.Z., 2012. Commercialisation Level of Poultry Production in Minna Metropolis, Niger State, Nigeria. *Asian J. Agr. Extens. Econ. Sociol.*, 1(1), 1-15.
- Okantah, S.A., Aboe, P.A.T., Boa-Amponsem, K., Dorward, P.T., Bryant, M.J., 2003. Smallscale chicken keeping in peri-urban Accra and Kumasi.. Final Technical Report of DFID-funded Project.pp74. Dep. Int. Dev., (DFID), Accra.
- Ovwohio, B.O., Mmereole, F.U.C., Udeh, I., Akporhwarho, P.O., 2009. Comparison of Constraints to Poultry Producers in Delta State Nigeria. *Int. J. Poul. Sci.*, 8 (5), 480 - 484.
- Shane, S., 2006. The future of the world's broiler industry. *Zootechnica Int.*, 12-19.
- United States Department of Agriculture (USDA)., 2011. GAIN Report: Poultry and Products Brief Annual. USDA. Foreign Agr. Serv.
- Watt ., 2010. Watt Executive Guide to world poultry trend : Statistical reference for poultry executives (2010 ed.). (P. Best, Ed.) Rockford: Watt .