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Rural Poultry Populations and Strains in Two Agro-Ecological Zones of Nigeria

I.I. Dafwang[1], U. Musa[2], P.A. Abdu[3] and J.U. Umoh[3]
[1]National Agricultural Extension and Research Liaison Services, Ahmadu Bello University, Zaria, Nigeria
[2]National Veterinary Research Institute, Vom, Ahmadu Bello University, Zaria, Nigeria
[3]Faculty of Veterinary Medicine, Ahmadu Bello University, Zaria, Nigeria

Abstract: A study was conducted in Plateau State of Nigeria which has two distinct agro-ecological zones; a humid sub-temperate region in the North and a sub-humid hotter region that is part of the Northern Guinea Savanna ecological zone of Nigeria in the South. A sample of 1240 farmers from two Local Governments in each of the two ecological zones were surveyed to assess the poultry population and strains of birds as a prelude to the introduction of interventions for control of Newcastle Disease and other programs for improving rural poultry productivity. Results showed that the farmers owned an average of 20 chickens, 6 ducks, 0.3 turkeys, 1 pigeon and 1.2 guinea fowls per household. Each household reared two or more strains of chicken and most had different types of poultry in the same backyard. There were more Naked neck and long legged chickens in the hotter ecological zone but more Barred plumage strains in the cooler ecological zone.

Key words: Rural poultry, strains, agro-ecological zone

INTRODUCTION

The importance of rural or village chicken production in the life of rural communities in developing countries has been widely recognized (Spradbrow, 1990; Kitalyi, 1998 and Sonaiya, 2007). In Nigeria, virtually every household in rural and peri-urban communities keeps poultry for meat, supplementary income and for meeting a wide range of social obligations (Sonaiya and Olori, 1990; Dafwang, 1989 and Dafwang, 1990). Over the last two decades, there has been increasing interest by Governments at Federal and State levels in collaboration with international agencies to conduct studies on the current status of the poultry industry in order to facilitate the introduction of interventions for improving rural poultry productivity. This interest has been heightened by the recent outbreak of the Highly Pathogenic Avian Influenza (HPAI) in Nigeria in 2006 (Adene and Oguntade, 2006). The outbreak of this disease has also drawn greater attention to the widespread occurrence of Newcastle Disease which has been recognized as the major killer disease in rural poultry (Abdu *et al*., 2000). The purpose of this study was to update information on household rural poultry populations and the common strains available as a prelude to the development of strategies for the massive control of Newcastle disease and other programs for improvement of rural poultry productivity.

MATERIALS AND METHODS

Plateau State was chosen because it has the enviable position of having two agro-ecological zones: a cool humid sub-temperate climate in its northern region and a hotter sub-humid region in the South that is part of the Guinea Savanna Ecological Zone that spans across much of Central Nigeria, central West Africa and central Africa. The northern part of Plateau State has been classified as the Humid Jos Plateau Ecological zone (Ojanuga, 2006). It has an average annual rainfall of about 1400 mm and an average daily temperature of about 22°C in contrast to the Southern part which has a mean rainfall of about 1100 mm and average daily temperature of 30°C. The Ecological zonal classification is sub-humid Central Niger Benue trough. It was hypothesized that some strains may have adapted to either of the two contrasting ecological zones through natural selection and therefore would be more suitable for strain improvement programs.

Table 1: Number of livestock and poultry raised in the 32 villages of four Local Government Areas of Plateau State

Animal species	Mean per local Government area	Mean Per household
Chickens	1593.4 ± 728	20.3 ± 7.8
Ducks	1445 ± 231	6.0 ± 3.1
Turkey	61.8 ± 38.7	0.3 ± 0.0
Pigeon	208.5 ± 76.4	1.0 ± 0.2
G/Fowls	277 ± 14.2	1.2 ± 1.0

A multi stage sampling procedure was adopted to select two Local Government Areas (LGA) in each of the two zones and eight villages per LGA for the study. The LGAs were Jos South and Barkin Ladi in the North and Kanam and Shendam in the South. Random sampling

Corresponding Author: I.I. Dafwang, National Agricultural Extension and Research Liaison Services, Ahmadu Bello University, Zaria, Nigeria

Table 2: Strains of chicken reared by rural poultry farmers in plateau state

	Agro-Ecological zone					
	Humid Jos Plateau		Sub-Humid Central Niger Benue trough			
Strain	F	%	F	%	Total	%
Dwarf	83	8.3	65	5.0	148	6.4
Naked Neck	66	6.6	124	9.5	190	8.3
Frizzled	58	5.8	61	4.7	119	5.2
White	176	17.6	266	20.4	442	19.2
Black	196	19.6	280	21.5	476	20.7
Mottled	241	24.1	146	11.2	387	16.8
Barred	104	10.4	125	9.6	229	9.9
Long legged	51	5.1	224	17.2	275	11.9
Others	26	2.6	10	0.8	36	1.6
Total	1001	100.0	1301	100.0	2302	100.0

procedure was used to select the eight villages from each LGA. Thirty two villages with 1,240 households were selected and visited. A total of 1,240 structured questionnaires were administered to the rural poultry farmers. Based on the sample size per cluster, 1,240 farmers were randomly selected and given the questionnaires and where necessary interviewed. The flock structure was defined as chicks (0-10 weeks old), cockerels (11-20 weeks old), pullets (11-20 weeks old), adult cocks ($\geq$ 21 weeks old) and adult hens ($\geq$ 21 weeks old). Strains were identified by phenotypic features such as the most dominant plumage color and well known genes such as Naked neck, frizzled feathers, long leggedness and dwarfness which all have phenotypic expressions (Kitalyi, 1998). The frequencies for strains were compiled from only those farmers that responded to the question on strains.

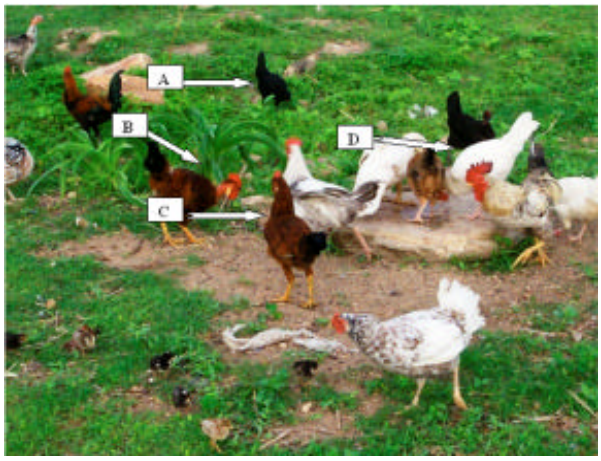

Plate 1: Some major strains of rural chickens in Kanam Local Government Area, A = Black, B = Naked neck, C = Barred, D = white

RESULTS AND DISCUSSION

The flock size of 20.3 chickens found in this study is similar with the findings of Dafwang (1989) who did a similar study in the Middle Belt Geo-political zone of Nigeria to which Plateau State belongs. The figure is however much lower than the figure of 10 chickens per household reported by the National Bureau for Statistics (NBS). It is possible that the NBS may have restricted its sampling to adult chickens only, because the average household flock size for most parts of Nigeria has been reported by agricultural professionals to be between 9-30 (Dafwang, 1990). This study shows that plans for massive vaccination in any given area of Plateau State and the Northern Guinea Savanna Agro Ecological zone of Nigeria in general can be based on an estimate of 20 chickens per household. This can be used in combination with the number of households/village listing estimates that have been listed by the Agricultural Development Programs which exist in all States of Nigeria to arrive at total poultry estimates.

Each household was found to be rearing two or more strains as shown in Plate 1. The distribution of chickens by strain is shown in Table 2. Chickens with white, black or mottled plumage colour constituted 57% of the total population. The long legged and the barred plumage colours constituted about 10% each while the naked neck, dwarf and frizzled feathered constituted 8.3, 6.4 and 5.2% respectively. Although there was a higher percentage of naked necks in the hotter ecological zone (9.5 versus 6.6%), their overall presence which constitutes only 8.3% of the total population indicates that they are not a dominant strain in any of the zones. Consequently, the speculation that the cool and hot climatic conditions may have resulted in the higher abundance of naked neck and white chickens in the hotter areas by natural selection was not confirmed in this study. The observation that there were much more mottled feathered strains in the cooler climate (24%) in contrast to only 11.2% in the hotter climate may have been because of a greater presence of commercial poultry in the Jos area. It is common knowledge that a lot farmers buy small numbers of commercial pullets and

layers which they mix with the rural poultry. The higher prepondence of long legged chickens in the hotter climate of 17.2% in contrast to only 5.1% in the cooler climate may be due to the higher presence of nomadic Fulani cattle rearers in the southern region of the State. The long legged chicken is a strain that has been found to be the most dominant amongst the cattle Fulani (Sonaiya and Olori, 1990). Further studies will need to be conducted to establish a stronger basis for the preferential adoption of Naked Neck chicken for improvement of poultry production in the hotter areas of Nigeria and the Mottled feathered chicken in the Plateau regions of Nigeria with a cooler climate. The adoption of the long legged chicken for rural poultry improvement may be recommended because of its higher average body weight.

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