

IMPROVEMENT OF HEALTH AND MANAGEMENT OF FAMILY POULTRY PRODUCTION IN ZIMBABWE

J. NQINDI

Central Veterinary Laboratory
Causeway, Harare, Zimbabwe

Abstract

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A field survey was carried out at Bora (ecological zone 1) and at Hwedza (ecological zone 2), these areas representing two different ecological zones in Zimbabwe on indigenous poultry production with the objective of establishing baseline data for use as guidelines in the improvement of production in this sector. Twelve rural female farmers were chosen from each zone on the basis of their willingness to participate in the survey. Preliminary results from the survey reveal significant differences between hatchability and chick survival in the wet and dry season in both zones.

1. INTRODUCTION

Chickens are the most widely distributed animal species of all livestock in Zimbabwe, since almost every household in the rural community keeps small flocks of indigenous chickens under a free-range system. The flock size in the sector ranges from 5 to 30 birds whose level of production is very low. It is estimated that there are approximately 20 million indigenous chickens in the country and these are raised on a free-range system in which they are left to scavenge during the day and housed at night. Poultry research has mostly benefited commercial producers who have the capacity to purchase better quality chicks, high quality feeds, vaccines and vitamin supplements. These large scale commercial producers produce millions of day-old chicks for the domestic and export markets. Therefore, it is necessary to investigate the possibility of improving poultry production in the rural sector through the identification and evaluation of constraints to production in order to formulate strategies for intervention. Among the constraints are high chick mortality, inadequate feeding, poor housing, parasite burden and other diseases.

2. MATERIALS AND METHODS

The survey was conducted in two ecological zones that are part of six geographical regions present in Zimbabwe:

Region 1 - high rainfall, main activity being forestry.

Regions 2a & 2b - moderate rainfall with intensive livestock and crop production.

Regions 3 and 4 - low rainfall with semi-intensive farming.

Region 5 - very low rainfall being prone to frequent droughts.

Twelve rural female farmers from Bora (zone 1) and twelve from Hwedza (zone 2) participated in a survey focusing on flock size and structure, production data on the basis of hen history, housing, feeding, animal health, flock ownership and management, extension services and marketing. Four farmers from each of three villages within each zone participated. The selection criteria were ownership of chickens, but not flock size and farmer willingness to participate. The study areas were designated as zones 1 and 2. Zone 1 is in region 2a with an altitude of 1580 m.a.s.l. and a rainfall of 975 mm per annum. Zone 2 is in region 2b with an altitude of 1384 m.a.s.l. and a rainfall of 795 mm per annum.

3. RESULTS

3.1. Ecological zone 1: Bora (Goromonzi district)

During the dry season survey only 8 households participated, while during the wet season 12 households participated. The production figures are shown in Tables I, II and III.

TABLE I. POULTRY PRODUCTION FIGURES IN TWELVE INDIVIDUAL HOMESTEADS DURING THE DRY AND WET SEASON

	Season	1*	2*	3*	4*	5*	6*	7*	8*	9*	10*	11*	12*
Cocks	Dry	1	1	1	1	2	1	1	2				
	Wet	1	0	1	0	3	1	1	2	2	6	6	4
Hens	Dry	4	3	7	3	4	5	5	6				
	Wet	6	5	6	10	3	4	3	6	3	17	9	19
Growers	Dry	9	12	8	4	5	9	7	10				
	Wet	3	0	4	0	4	0	0	0	2	0	1	1
Chicks	Dry	8	0	1	0	8	41	26	0				
	Wet	2	0	1	0	0	0	0	5	0	5	5	0

* individual homestead

TABLE II. AVERAGE VILLAGE POULTRY PRODUCTION FIGURES FOR THE DRY AND WET SEASON

	Dry season		Wet season	
	Mean	s.d.	Mean	s.d.
Cocks	1.250	0.463	2.250	2.094
Hens	4.625	1.408	7.583	5.368
Growers	8.000	2.619	1.250	1.603
Chicks	10.500	5.137	1.500	2.195

s.d. = standard deviation

TABLE III. PRODUCTION FIGURES PER CLUTCH OF EACH LAYING HEN IN THE DRY AND WET SEASON

Production parameter	Dry season (mean)	Wet season (mean)
Eggs/laying hen	13.22	10.54
Brooded eggs/laying hen	11.87	9.54
Hatchability/laying hen	9.13	4.54
Chick survival/laying hen	5.69	0.89

3.2. Ecological zone 2: Hwedza

During the dry and wet season 12 and 11 households participated in the survey, respectively. The results are shown in Tables IV, V and VI.

TABLE IV. POULTRY PRODUCTION FIGURES IN INDIVIDUAL HOMESTEADS DURING THE DRY AND WET SEASON

		1*	2*	3*	4*	5*	6*	7*	8*	9*	10*	11*	12*
Cocks	Dry	2	1	2	2	3	1	0	3	1	0	1	1
	Wet	2	2	0	2	1	1	0	2	-	1	2	2
Hens	Dry	4	2	5	7	5	6	1	13	2	9	5	7
	Wet	4	3	6	6	7	4	0	6	-	6	7	6
Growers	Dry	0	2	6	18	2	6	4	10	6	20	6	14
	Wet	0	5	0	10	0	0	2	1	-	9	10	1
Chicks	Dry	0	8	12	16	8	2	0	9	0	4	6	4
	Wet	2	7	0	3	0	5	0	4	-	0	5	0

* individual homestead

TABLE V. AVERAGE VILLAGE POULTRY PRODUCTION FIGURES FOR THE DRY AND WET SEASON

	Dry season		Wet season	
	Mean	s.d.	Mean	s.d.
Cocks	1.417	0.996	1.364	0.809
Hens	5.500	3.317	5.000	2.098
Growers	7.833	6.408	3.455	4.251
Chicks	5.750	5.083	2.364	2.580

s.d. = standard deviation

TABLE VI. PRODUCTION FIGURES PER CLUTCH OF EACH LAYING HEN IN THE DRY AND WET SEASON

Production parameter	Dry season (Mean)	Wet season (Mean)
Eggs/laying hen	15.18	11.00
Brooded eggs/laying hen	11.18	10.00
Hatchability/laying hen	8.46	5.60
Chick survival/laying hen	5.75	3.20

3.3. Additional results for both zones

TABLE VII. LOSSES

	Post hatching		Brooded, but not hatched	
	Dry season	Wet season	Dry season	Wet season
Zone 1	37.68 %	80.40 %	23.00 %	52.40 %
Zone 2	32.00 %	42.86 %	24.30 %	44.00 %

TABLE VIII. NUMBER OF HELMINTH EGGS PER GRAM OF FAECES

Ecological zone 1	Season	Post hatching					Brooded, but not hatched						
		1*	2*	3*	4*	5*	6*	7*	8*	9*	10*	11*	12*
Coccidial oocysts	Dry	0	0	0	0	0	0	0	0	0	0	0	0
	Wet	0	70	210	0	40	0	0	0	0	0	0	0
<i>Trichuris</i>	Dry	0	0	0	0	0	0	0	0	0	0	0	0
	Wet	0	0	20	0	0	0	0	0	0	0	0	0
<i>Ascaridia galli</i>	Dry	0	0	0	0	150	450	0	310	0	0	0	0
	Wet	0	0	70	60	0	0	0	50	0	0	0	0
Ecological Zone 2													
Coccidial oocysts	Wet	1000	0	128	0	0	720	0	15	0	0	0	0
				0					0				
<i>Ascaridia galli</i>	Wet	10	0	0	0	0	0	0	20	30	10	20	0
<i>Acuaria spiralis</i>	Wet	350	0	0	0	0	0	0	0	0	20	0	0
<i>Heterakis gallinarum</i>	Wet	0	0	0	0	0	0	0	0	0	390	330	0

* individual homestead

4. DISCUSSION

4.1. Poultry production

Production figures from previous studies are shown in Tables IX and X.

TABLE IX. DAY-OLD CHICK PRODUCTION FIGURES (IN MILLIONS) IN ZIMBABWE*

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Broilers	24.35	31.40	21.06	23.14	31.20	31.91	32.06	42.84	37.76
Pullets	2.13	2.91	1.75	2.75	2.51	2.63	2.57	2.95	2.90
Cockerels	1.93	2.51	1.73	1.98	2.05	1.72	1.24	1.14	0.72
Broiler breeds	0.64	0.66	0.11	0.89	0.79	1.03	0.90	1.60	1.12
Layer breeds	0.19	0.20	0.26	0.27	0.18	0.19	0.12	0.46	0.14
Total	29.24	37.68	24.91	29.03	36.73	37.48	36.89	48.99	42.64
Hatching egg set	38.55	53.65	33.24	39.00	54.30	53.79	55.18	65.50	60.23

* Poultry Advisory Services, Annual report 1999.

TABLE X. RESULTS FROM A STUDY ON POULTRY PRODUCTION IN ZIMBABWE IN 1996/7 [1]

District	Number of households	Cocks	s.d.	Hens	s.d.	Chicks	s.d.
Hwange	30	1.60	1.90	5.93	4.73	16.17	1.43
Lupane	30	1.90	1.45	6.13	4.26	8.83	7.18
Gokwe N	16	2.31	1.20	10.75	4.54	11.94	8.90
Mazowe	54	1.11	0.86	3.57	2.11	5.30	5.45
Goromonzi	71	4.44	13.61	5.69	4.96	13.18	32.12
Zvishavane	30	0.77	0.63	4.77	2.47	13.70	8.84
Gutu	28	1.39	1.29	4.46	2.22	9.29	7.63
Mutasa	57	1.12	1.43	3.11	1.73	10.98	8.22

s.d. = standard deviation

A group interview using questionnaires was conducted in eight districts of Zimbabwe (nine villages in each district) to investigate the role of women in indigenous poultry production [1]. Some unpublished results are shown in Table X. The major constraints cited in the report were the absence of technical support such as veterinary and extension services, very high mortality rates in chicks, lack of adequate knowledge of poultry production and a low egg production (having more hens did not necessarily result in more chicks).

The results of the present study of family poultry production showed that the average number of eggs per hen during the wet season decreased by 20% and 28% compared with the dry season in ecological zones 1 and 2, respectively (Tables III and VI). Similarly, the number of eggs brooded but not hatched, increased significantly during the wet season indicating a major production constraint (Table VII). It is clear that many of these figures were influenced by infertility or embryonic death. The high prevalence of coccidia infections detected in family poultry production during the wet season (Table VIII) might have been a contributing factor.

4.2. Poultry health

The national disease outbreak figures shown in Table XI indicate that the largest production losses were due to Gumboro disease, coccidiosis and fowl pox. Additional production losses were due to infectious coryza, avian leukosis, fowl typhoid and Newcastle disease. However, the figures were collected predominantly from the commercial sector where infectious diseases spread rapidly due to the intensive production system resulting in high case fatality and mortality figures. Since birds in family poultry production units are not intensively farmed, the figures do not reflect the disease problems in such a system.

In the present study chicks from three homesteads in zone 1 were submitted for autopsy during the dry season. The birds were generally found to be malnourished. One bird from a homestead within the zone had brooder pneumonia. Autopsies were not done during the wet season. Post hatching and chick losses have been attributed to predation by birds of prey, dogs and mongooses, but could also have been due to other causes.

4.3. Rural poultry housing

The men construct chicken houses, which are mostly made of bricks, while a few are made of wire mesh. Roofing is either thatched or made of corrugated iron. The brick structures tended to be very small with a poor ventilation and no perches causing the birds to huddle together on the floor. Very few of the

homesteads had nesting boxes for the hens. In the majority of cases, the eggs were laid and brooded wherever the hens could find a suitable place. These were usually situated outside the housing structures and, therefore, exposed to adverse conditions and predators. Farmers indicated that during the rainy season, rain leakage into nesting sites was a major problem. Such deficiencies are directly under the farmer's control and could be easily rectified through improvements in housing, separation of the chicks from the mothers in "nurseries" and provision of additional feed for the chicks.

TABLE XI. DISEASE OUTBREAK FIGURES FOR THE YEAR 2000

Disease	Number of outbreaks	Number of cases	Number of deaths
Avian influenza	-	-	-
Newcastle disease	1	31	31
Infectious bronchitis	-	-	-
Avian tuberculosis	-	-	-
Fowl cholera	-	-	-
Fowl pox	70	923	161
Fowl typhoid	2	38	38
Gumboro	14	2320	2320
Marek's disease	-	-	-
Mycoplasmosis	-	-	-
Avian chlamydiosis	-	-	-
<i>Salmonella pullorum</i> disease	-	-	-
Coccidiosis	51	988	350
Infectious coryza	40	481	41
Avian leukosis	2	41	41
Runting stunting syndrome	-	-	-

4.4. Poultry nutrition

Chickens ranged freely during the day, were given clean water and were housed at night. During the rainy season and harvest time, there was plenty of food in the form of worms, insects and post harvest leftovers. Supplementary feeding was provided during the dry season in the form of kitchen leftovers and grain, if available. It was noted that farmers keeping commercial broilers were feeding them commercial feed, but were giving none to the indigenous birds.

4.5. Other issues

Farmers used chicken manure as fertiliser for gardens, but were reluctant to discuss the financial aspects. Eggs were consumed within the homestead.

The study revealed that farmers were not aware that veterinary personnel were available to provide assistance with poultry production problems. However, such ignorance was largely due to the fact that the veterinary assistants could be up to ± 10 km away from the homesteads and neither the farmers nor the veterinary assistants were motorised. Due to the inability to purchase veterinary drugs and little exposure to extension services, farmers tended to use traditional medicinal herbs, which were pounded and added to the drinking water. For the treatment of mites they applied shoe polish with astonishing good results.

Poultry was predominantly owned by women, but key decisions such as concerning disposal, were taken in consultation with the men. Chickens were kept as a source of food, for social functions and as a source of income. At present most of the farmers do not see family poultry production as a commercial enterprise. However, for those farmers who wish to develop their poultry production, availability of capital for inputs will prove to be a major drawback, as banks are not interested to lend money without collateral. Due to the small numbers of chickens being kept by individual farmers, marketing is presently not a problem, but needs to be addressed once village poultry production is increased.

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REFERENCES

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