CONTENT

Guest Editorial

INFPD ... a new era - N.A. Musharaf ................................................................. 2

Research Reports

Seroprevalence of Newcastle disease and infectious bursal disease in local chickens

Prevalence of parasitosis of the digestive tract of local chickens (Gallus gallus) in North-Guéra,

Summaries of Theses on Family Poultry

Rural poultry systems and the role rural women play in their management - S.N. Ngongi ........ 9
Improvement of local duck production systems in the Mekong Delta of Vietnam - B.X. Men ........ 9
Studies on village poultry production systems in the central highlands of Ethiopia - D. Tadelle ...... 10

Epidemiology of Newcastle disease in village chickens in Tanzania - M.G.S. Yongolo .......... 11
Molecular epidemiology of Salmonella enterica subsp. enterica serovar Gallinarum
biovar gallinarum infection in chickens in Tanzania - R.H. Mdegela .......................... 12

New Publications

Village chicken production systems in rural Africa: Household food security and gender
issues - A.J. Kitalyi ........................................................................................................ 14

Epidemiology, diagnosis and control of poultry parasites - A. Permin and J.W. Hansen ........... 14

The Southern African Chicken Book: How to start a small business keeping chickens - E. Wethli .... 15

News

Development Workers’ Tune Course in Denmark ............................................................. 16
Second M.Sc. Course 1999-2000 of the University of Tropical Agriculture Foundation .......... 16
Poultry Management Course in KwaZulu-Natal, South Africa ........................................ 17
International Conference at CCS Haryana Agricultural University, Hisar, India .................. 18
A Rural Poultry Development Project set up in Mali .......................................................... 18
Guest Editorial

INFPD ... a new era

N.A. Musharaf

Department of Poultry Science, Faculty of Animal Production, University of Khartoum, P.O. Box 32, Khartoum North, Sudan, Fax: (+249) 11 774 818/780 295, E-mail: nmusharaf@hotmail.com

[Prof. Nureldin A. Musharaf is Head of the Department of Poultry Science, University of Khartoum, Sudan. He is also president of WPSA-Sudan Branch and member of the following bodies: Executive Committee of INFPD, Editorial Board of Sudan Journal of Animal Production, Editorial Board of University of Khartoum Journal of Agricultural Sciences. He worked for many years in various fields of family poultry production systems, especially on poultry feeding and feedstuffs. He always actively participated in INFPD activities, and was one of the initiators of our network].

The XXI World’s Poultry Congress (WPC) of the ‘World’s Poultry Science Association’ (WPSA), scheduled to take place on 20-25 August 2000 in Montreal, Canada, will mark the beginning of a new era in the activities of the International Network for Family Poultry Development (INFPD). It will be the first international debut of the network in its new forum: dealing with different poultry species kept by families in rural and peri-urban areas of Africa, Asia, Latin America and the Pacific region. After including the First International Symposium on Rural Poultry Development Policy in the XIX WPC in Amsterdam, The Netherlands, and the Rural Poultry Development Symposium in the XX WPC in New Delhi, India, INFPD will mount another international symposium to be held as a satellite meeting of the XXI WPC.

This is a follow-up of the decision of the Executive Committee of WPSA in its meeting in Jerusalem, Israel in 1998 to recognize INFPD as a working group of WPSA. INFPD will undoubtedly benefit from this opportunity by bringing the issue of family poultry in the developing countries to the international audience. The important role of the different poultry species in the provision of food and alleviating hunger and malnutrition in third world countries has still not been recognized and long forgotten. Therefore, the selection of the Symposium theme for the Montreal meeting: ‘Family Poultry and Food Security’ could not have been timelier.

Another task awaiting INFPD is documentation. In all developing countries, there is a scarcity of data on rural and peri-urban family poultry that are available in easily accessible systems. This lack of accessibility will hinder all development plans. There is an urgent need to collect and classify the scattered information published in workshop and seminar proceedings or in expert consultation meetings.

In December 1998, INFPD succeeded in launching the First Electronic Conference on Family Poultry with technical and financial assistance from the Animal Production and Health Division of the FAO. The contributors to the Electronic Conference attested to the soundness of the idea. Nevertheless, the information amassed in the last two decades on diseases, feeding, breeding, socio-economic aspects, systems of production, etc. on the different species of poultry in various countries requires the immediate attention of INFPD. Moreover, INFPD may want to consider the possibility of promoting the Newsletter to become the ‘International Family Poultry Journal’. Since the specific problems facing family poultry in different regions may not appeal to the highly specialized, scholarly journals like ‘Poultry Science’ and ‘British Poultry Science’, articles dealing with these problems may not find its way for publication.
In the next millennium, INFPD has also to face the issue of collaborative research in the various fields of poultry science. Strategies must be set up for research and development at regional or continental levels that involve the collaboration and co-operation of national and international research institutes. Collaborative research plans can then be envisaged between the national or regional programmes and INFPD. Such an approach can bring scientists from all over the world to address effectively the constraints facing family poultry development. All these ambitious dreams need logistic support.

The establishment of permanent structures for INFPD, as suggested by Professor René D. S. Branckaert (Guest Editorial, INFPD Newsletter Vol. 8 No. 4, 1998), could represent the kick-off for these dreams to come true. We would like to take this opportunity to acknowledge the massive support from FAO to the network. The help rendered by CTA and IDRC during the initial foundation stage is deeply appreciated by all of us. Many individuals worked very hard to bring the network to success. The future progress and success of the Network will largely depend on the continued support from organizations involved in rural development and food security. Therefore, the search for sponsors should never stop!

Research Reports

Seroprevalence of Newcastle disease and infectious bursal disease in local chickens commercialised in Niamey, Niger
A. Idi*, I. Maikano** and H. Adamou**
* INRAN/DRVZ, B.P. 429 Niamey, Niger, E-mail: inran@intnet.ne
** Direction des Laboratoires Vétérinaires, B.P. 485, Niamey, Niger, E-mail: camelin@intnet.ne
[Article edited and translated from the original French by E.F. Guèye]

INTRODUCTION

Village poultry represent almost the total national poultry flock in Niger and provide a significant part of poultry products that are consumed in the country. However, there are few research results published on the diseases affecting local poultry (Idi, 1994). Courtecuisse et al. (1990) carried out an investigation on the prevalence of Newcastle disease, infectious bursal disease, pasteurellosis and pullorosis in local chickens of the District of Tessaoua, Niger. Tager-kagan et al. (1992) investigated avian parasitism in the District of Niamey.

Newcastle disease (ND) or pseudo fowl pest is considered as the main plague of village poultry flocks in Africa (Anonymous, 1990). In Niger, ND outbreaks decimate every year a large number of local poultry (Idi, 1994). Infectious bursal disease (IBD) or Gumboro disease is commonly reported among the diseases affecting local poultry in Niger (Abdou, 1992). Its harmful role is also related to its immunodepressor effect that facilitates the introduction of other affections mortgaging the production.

This study aims at evaluating the prevalence of Newcastle disease and infectious bursal disease in village chickens, ten years after the work done by Courtecuisse et al. (1990).
MATERIALS AND METHODS

The ‘Communauté Urbaine de Niamey’ (CUN) is located in the western part of Niger and covers an area of 239 km². It is bordered on two sides by the District of Kollo. Administrative capital-city of the country, CUN counts approximately 700,000 inhabitants. It constitutes a large centre where white meat is not only consumed, but poultry products are also bought from all around the country, i.e. from villages surrounding the capital-city as well as from remote rural areas such as Birni Konni (420 km from CUN) (Idi, 1994).

The serums were collected from 16-17 month old chickens slaughtered in six points of sale located in the CUN. The serum collection was carried out during the period October-November 1996. Blood was collected in sterile tubes, which were then left at ambient temperature for 12 hours. Once the clot uncapped, the serums were centrifuged at 2000 revolutions a minute for 5 minutes and conserved.

The test used for antibodies against Newcastle disease and infectious bursal disease was ELISA (Enzyme-linked immunosorbent assay) was used (ELISA indirect, FlocCheck IDEXX, [IDEXX Laboratories, Inc. 1, IDEXX Drive, Westbrook, Maine 04092 USA]).

RESULTS AND DISCUSSION

Two hundred and twenty three serums (223) were tested for Newcastle disease and 119 for infectious bursal disease (Table 1).

Table 1: Prevalence of Newcastle disease and infectious bursal disease in local chickens.

<table>
<thead>
<tr>
<th></th>
<th>Newcastle disease</th>
<th>Infectious bursal disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of serums tested</td>
<td>223</td>
<td>119</td>
</tr>
<tr>
<td>Number of positive serums</td>
<td>63</td>
<td>88</td>
</tr>
<tr>
<td>Number of negative serums</td>
<td>160</td>
<td>31</td>
</tr>
<tr>
<td>Prevalence (%)</td>
<td>28.3</td>
<td>73.9</td>
</tr>
</tbody>
</table>

The average prevalence of Newcastle disease (ND) (28.3 percent) gave an indication of the fatal nature of the periodic ND outbreaks in Niger. Indeed, most of the affected birds died, and a small proportion of them showing antibody titres was found during samplings in a given population.

The high prevalence of infectious bursal disease (IBD) (73.9 percent) showed the endemic character of this disease and its low lethality. This might indicate a relative resistance of the local birds against the IBD virus (Courtecuisse et al., 1990). However, this disease does have negative incidence on production. Indeed, it affects the immune system, thus, facilitating the introduction of many other diseases and then mortgaging the productivity of the birds.

Courtecuisse et al. (1990) reported a prevalence of 47 percent for IBD and 14 percent for ND in unvaccinated chickens versus 63 percent for ND in vaccinated chickens. With the obtained prevalence of 28.3 percent for ND, it is likely that vaccinated and unvaccinated birds would have been sampled. This has not been investigated. Moreover, according to a survey carried out in 1998, ND occurs during the dry and cold season (November-February) and during the dry and warm season (March-June). Our study might have been conducted just after the ND outbreak. Birds
might have been in contact with the antigen during poultry regroupings in the rural and urban markets before their sale. In addition, it is not rare that poultry traders undergo heavy losses during this period. ND remains a major problem of the poultry sector in Niger. Regular vaccination campaigns of chickens are essential. IBD must also not be neglected because of its high prevalence and its immunodepressor effect under the very contaminated environment of poultry houses in Niger.

REFERENCES


Prevalence of parasitosis of the digestive tract of local chickens (*Gallus gallus*) in North-Guéra, Chad

A. Maho*, K. Youssouf**, L. Mbeurnodji**, M. Saboune* and L.Y. Mopate*

*Laboratoire de Recherches Vétérinaires et Zoot techniques de Farcha, B.P. 433, N’Djaména, Tchad,

E-mail: cnaruser@sdntcld.undp.org

**Ecole Nationale des Agents Technique de l’Elevage B.P. 750, N’Djaména, Tchad

[Article shortened, edited and translated from the original French by E.F. Guèye]

ABSTRACT

A parasitologic investigation was carried out on the faeces of 342 local chickens in the North-Guéra region, Chad, during the rainy season (July - August) 1998. Thirteen species of parasites were identified and the global prevalence of parasitosis was found to be 59 percent, out of which 27 percent for coccidiosis, 18 percent for cestodosis, 13 percent for nematodosis and 1 percent for trematodosis. It was observed that 8 percent of chickens were highly infested with parasites, and 75 percent of the 28 parasitic associations involved *Eimeria spp.* While the percentage of chickens showing normally coloured faeces was higher (40 percent) than those with abnormally coloured ones (20 percent), the percentage of chickens excreting normally consistent faeces was lower (25 percent) than those with abnormal ones (35 percent).

This investigation showed that, in the North-Guéra region, there is a great spectrum of parasitism of the digestive tract of chickens as well as common parasitic associations. Thus, any effective antiparasitic treatment must take the spectrum of the parasitism as well as parasitic associations into account.

Key words: Chad, digestive tract, local chicken, parasitic association, parasitosis
INTRODUCTION

The North-Guéra area, situated in the central-east of the country, consists of three sub-prefectures (Mongo, Bitkine, Mangalmé. It is located at 550 km east of the capital-city N’Djama, Chad. Poultry production is very important in this region, which supplies the capital-city with chickens. Poultry keeping, which is practised traditionally, has to cope with many constraints, especially health-related ones (Maho et al., 1998; Mopate et al., 1998).

In order to contribute to the knowledge of avian diseases in the area and to undertake improvements in traditional poultry farming, a parasitologic investigation based on samplings and analyses of faeces was carried out.

MATERIALS AND METHODS

The survey was carried out on 19 villages in the area of North-Guéra, out of which nine were from the sub-prefecture of Mongo, six from that of Bitkine and four from that of Mangalmé. During the rainy season (July - August) 1998, faeces samplings were conducted on 342 local chickens, out of which 122 birds were from Mongo, 108 from Bitkine and 112 from Mangalmé. Birds were surveyed irrespective of sex and age. The faeces collection was performed in the morning when chickens left their housing or in the evening when they re-entered. The samples, collected in plastic bags, were placed into a refrigerator and conveyed to the laboratory for the coproscopic analysis.

Individual quantitative coproscopies were systematically carried out using a blade of Mac-Master. The flotation fluid used was an over-saturated sodium chloride (NaCl) solution. During macroscopic and microscopic observations, parasites and parasitic associations as well as the colour and the consistency of faeces were registered.

RESULTS AND DISCUSSION

Prevalence of parasitosis: Fifty-nine percent of chickens showed parasites in their faeces, and a total of 13 species of parasites were identified. They were especially coccidies (27 percent of the cases), cestodes (18 percent), nematodes (13 percent) and trematodes (1 percent). The dominant species of cestodes identified was Raillietina cesticellus, while the principal species of nematodes encountered was Ascaridia galli. The identification of various species of coccidies was not carried out (Table 1).

The existence of a broad spectrum of parasitism of the chicken digestive tract in the study area might be explained by the lack of vermifugation that characterizes traditional livestock farming in Africa.

Parasitic associations encountered: Twenty-eight cases of parasitic associations were observed, with Eimeria spp representing the species mostly associated (75 percent) with the others (Table 2). The importance of the coccidies in poultry farming is recognized by other authors (Gretillat, 1981; Alamargot et al., 1985; Ibrahim, 1996).
Table 1: Prevalence of identified parasites

<table>
<thead>
<tr>
<th>Identified species</th>
<th>Mongo</th>
<th>Bitkine</th>
<th>Mangalmé</th>
<th>Total</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amebaenia cuneata</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0.3</td>
</tr>
<tr>
<td>Ascaridia galli</td>
<td>8</td>
<td>4</td>
<td>9</td>
<td>21</td>
<td>6.1</td>
</tr>
<tr>
<td>Capillaria spp</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0.3</td>
</tr>
<tr>
<td>Eimeria spp</td>
<td>28</td>
<td>25</td>
<td>40</td>
<td>93</td>
<td>27.2</td>
</tr>
<tr>
<td>Cotugnia digonopora</td>
<td>8</td>
<td>3</td>
<td>5</td>
<td>16</td>
<td>4.7</td>
</tr>
<tr>
<td>Davainea proglottina</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>1.5</td>
</tr>
<tr>
<td>Gongylonoma spp</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0.3</td>
</tr>
<tr>
<td>Hetérakis spp</td>
<td>4</td>
<td>6</td>
<td>0</td>
<td>10</td>
<td>2.9</td>
</tr>
<tr>
<td>Hymenolepis carioca</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>9</td>
<td>2.6</td>
</tr>
<tr>
<td>Prosthogonimus ovatus</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>1.2</td>
</tr>
<tr>
<td>Raillietina cesticillus</td>
<td>10</td>
<td>11</td>
<td>8</td>
<td>29</td>
<td>8.5</td>
</tr>
<tr>
<td>Strongyloides spp</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>8</td>
<td>2.3</td>
</tr>
<tr>
<td>Subulura brumpti</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>0.9</td>
</tr>
<tr>
<td><strong>Total of parasites</strong></td>
<td>70</td>
<td>56</td>
<td>75</td>
<td>201</td>
<td>58.8</td>
</tr>
</tbody>
</table>

Table 2: Parasitic associations

<table>
<thead>
<tr>
<th>Types</th>
<th>Number of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eimeria spp./Ascaridia Galli</td>
<td>5</td>
</tr>
<tr>
<td>Eimeria spp./Hetérakis spp.</td>
<td>4</td>
</tr>
<tr>
<td>Eimeria spp./Raillietina cesticillus</td>
<td>3</td>
</tr>
<tr>
<td>Eimeria spp./Strongyloides spp.</td>
<td>2</td>
</tr>
<tr>
<td>Eimeria spp./Cotugnia digonopora ; Eimeria spp./Ascaridia galli/Strongyloides spp/subulura bumpti; Ascaridia galli/Raillietina cesticillus; Ascaridia galli/Hymenolepis carioca; Eimeria spp./Hymenolepis carioca; Eimeria spp./Ascaridia galli/Hymenolepis cesti- cillus; Eimeria spp./Ascaridia galli/Strongyloides spp/subulura bumpti; Ascaridia galli/Raillietina cesticillus; Ascaridia galli/Hymenolepis carioca; Ascaridia galli/Cotugnia digonopora ; Raillitina cesticillus/Davainea proglottina ; Strongyloides spp./Hetérakis spp. ; Strongyloides spp./Capillaria spp. ; Prothogonimus ovatus /Cotugnia digonopora</td>
<td>One case for each association</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>28</td>
</tr>
</tbody>
</table>

Presence of pathogenic agents and aspects of the faeces: With regard to the colour of faeces, 70 (20 percent) of the birds showed abnormally coloured faeces (whitish, reddish, greenish, blackish, ashy) versus 137 (40 percent) having normally coloured faeces. The abnormal colours (reddish, greenish and blackish) were observed in certain birds parasitized by *Eimeria spp.*, *Raillietina cesticillus* and *Cotugnia digonopora*. For the consistency of faeces, 119 (35 percent) of the samples showed an abnormal consistency (liquid, too soft) versus 87 (25 percent) which were normal (firm). Although parasites are not the only agents responsible for modifications observed in the faeces, the contribution of their presence cannot be underestimated. The colour and consistency changes in faeces as well
as high levels of infestations were noticed in birds parasitized by *Eimeria* spp, *Raillietina cesticillus*, *Ascaridia galli*, *Cotugnia digonopora* and *Davainea proglottina*. The pathogenic capacity of most of these parasites was reported by Brugere and Silim (1992), Ibrahim (1996) and Maho et al. (1997).

Importance of the level and rate of infestation: Birds with low infestation (116) were more numerous than those highly (26) and moderately (6) infested. In the 26 highly infested birds, coccidies were found in 17 birds, *Raillietina spp.* in 4, *Ascaridia spp.* in 2, *Davainea spp.* in 1 and *Cotugnia spp.* in 2.

The highly infested chickens represented only 8 percent of the analyzed sample (Table 3). However, the low number of birds with high infestation level can increase in the event of prolonged stress (Maho, 1997).

<table>
<thead>
<tr>
<th>Rate</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absence EPG = 0</td>
<td>194</td>
<td>56.7</td>
</tr>
<tr>
<td>Low EPG &lt; 30 10³</td>
<td>116</td>
<td>33.9</td>
</tr>
<tr>
<td>Moderate 30.10³ &lt; EPG &lt; 45 10³</td>
<td>6</td>
<td>1.8</td>
</tr>
<tr>
<td>High EPG &gt; 45 10³</td>
<td>26</td>
<td>7.6</td>
</tr>
<tr>
<td>Total</td>
<td>342</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 3: Level and rate of infestation

EPG: Eggs Per Gram of faeces

CONCLUSION

The results of this investigation show the importance of parasitism of the chicken digestive tract in North-Guéra, Chad. To be effective, a bi-annual vermifugation must take the observed spectrum of parasites as well as parasitic associations into account. In addition, any improvement programme for the traditional poultry production system must pay attention to all health aspects, including the parasitism of the digestive tract.

REFERENCES


Maho, A., Mopate, L.Y., Kebkiba, B. et Boulbaye N. (1998): Enquêtes sérologiques sur quelques maladies...
avirars dans la région du Nord-Guéra (Tchad). *Rapport technique, Laboratoire de Recherches Vétérinaires et Zootéchniques (LRVZ) de Farcha, N’Djaména (Tchad).*


---

**Summaries of Theses on Family Poultry**

**Rural poultry systems and the role rural women play in their management**

Susan Namondo Ngongi

c/o via Fusignano 104, Vitinia, 00127 Rome, Italy, E-mail: susannongi@yahoo.com

*Master of Science Thesis, 1996, Veterinary Epidemiology & Economics Research Unit (VEERU), Department of Agriculture, The University of Reading, Reading, United Kingdom*

Rural poultry production has only just begun to receive attention from the scientific community. It is still the dominant form of poultry production that is practised in most developing countries. The importance of rural poultry, especially as a protein source for rural people and a potential income generating activity for women, has only recently begun to receive attention from policy makers, researchers and development workers.

This dissertation tries to broadly define and describe rural poultry production and the role women play in its management. Some of the constraints faced by rural poultry production, ways in which to overcome these constraints and some of the implications and assumptions that accompany such interventions are discussed.

---

**Improvement of local duck production systems in the Mekong Delta of Vietnam**

Bui Xuan Men

Faculty of Agriculture, Cantho University, Cantho, Vietnam, E-mail: bxmen@ctu.edu.vn

*Master of Science Thesis, 1996, Department of Animal Nutrition and Management, Swedish University of Agricultural Sciences, Uppsala, Sweden*

Two experiments were carried out to evaluate duckweed as a replacement for soya beans in the diets of growing ducks, and to study the effects of feed supplementation of scavenging ducks in Cantho province in the Mekong Delta.

The first experiment included two trials to evaluate the effects of feeding duckweed replacing soya beans in broken rice based diets fed to crossbred and local Muscovy ducks. In trial 1 on station, five treatments, with four replicates and ten ducks per replicate were included, consisting of supplements of 27 g/day soya beans (control D0) or 19, 15, 12 or 0 g/day soya bean meal with duckweed *ad-libitum* (D30, D45, D60 and D100, respectively). These diets were fed to crossbred ducks from 28 to 63 days of age, when two ducks per replicate were slaughtered for carcass evaluation. Daily food intakes were 95, 108, 105 and 107 g of dry matter (DM) and daily gains were 26.1, 29.1, 28.0, 27.1 and 27.6 g for D0 (control group), D30, D45, D60 and D100 groups, respectively (P<0.001). Corresponding DM feed conversion ratios (FCR) were 3.63, 3.71, 3.82, 3.89 and 3.88 (P<0.05).
In trial 2 on farm, six treatment groups consisting of four replicates with five ducks per replicate were given diets supplemented with 25 g/day of soya beans (control Df0) or 11 or 0 g/day soya beans with duckweed ad libitum (Df60, Df100) for the females and 29 g/day of soya beans (control Dm0) or 16 or 0 g/day of soya beans with duckweed ad libitum (Dm60, Dm100) for the males. These diets were offered to growing local Muscovy ducks from 28 to 70 days of age for the females and 84 days for the males. Daily intakes at 70 days of age were 88, 91, 90, 117, 116 and 116 g DM and daily gains 23.4, 22.5, 21.7, 36.1, 28.3 and 27.6 g for Df0, Df60, Df100, Dm0, Dm60 and Dm100, respectively (P<0.001). Corresponding FCRs were 3.8, 4.1, 4.2, 3.3, 4.1 and 4.2, respectively (P<0.001). There were no significant differences in carcass traits between treatments in both trials.

In the second on farm trial, three supplements, consisting of 50 g/day of a broken rice and dried fish meal mixture (BFM), 50 g/day broken rice (BR), or 16 g/day dried fish meal (FM) were given to three flocks of scavenging crossbred ducks, and compared with a flock given no supplementary feed (control, S0). Liveweights at 70 days of age were 1855, 1749, 1659 and 1592 g and daily gains were 33.9, 30.1, 28.1 and 27.1 for BFM, BR, FM and S0, respectively (P<0.001).

Studies on village poultry production systems in the central highlands of Ethiopia

Tadelle Dessie

DZARC, P.O. Box 32, Debre Zeit, Ethiopia
(Present address: Philippstr. 13, Haus 9, 10115, Berlin, Germany), E-mail: dessie51@hotmail.com


This thesis focuses on village poultry production in the central highlands of Ethiopia, and consists of a survey, an investigation into the diets of scavenging hens and an on-farm feeding trial. The first paper describes a survey of village poultry production in three villages at three different altitudes, including high (Derek Wonz, 2,850 m asl), medium (Gende Gorba, 1,850 m asl) and low (Awash, 1,500 m asl) altitudes, and in three seasons, namely the dry (October to February), short rainy (March to May) and main rainy (June to September) seasons.

The approaches used included Participatory Rural Appraisal (PRA), checklists and year round case studies. The village poultry production systems, constraints and potentials are described. Village poultry have a unique position in the rural household economy, as suppliers of high quality protein to the family food system, in addition to their social and cultural roles in the daily life of the society. The birds are owned by individual households and maintained under scavenging systems with no or little additional inputs for feeding (small grain supplements), housing (only 11.5 percent of households have small night enclosures) and health care.

The objectives of keeping poultry were reported as being for sale (26.6 percent), sacrifice (healing ceremonies) (25.0 percent), reproduction (20.3 percent) and home consumption (19.5 percent) and for producing eggs, for hatching (51.8 percent), sale (22.6 percent) and home consumption (20.2 percent). Even though the hatchability of set eggs (80.9±11.1 percent) is reasonably good, chick mortality (61 percent) is very high. Disease is the major problem of village poultry production, and sometimes it eradicates whole flocks.

This trial was followed by the second study, the objective of which was to determine the dietary status of...
local scavenging hens. A total of 270 local hens, 90 from each of the three villages at different altitudes (high, medium and low) were purchased from the villagers and slaughtered in each of the three seasons (short rainy, rainy and dry) for physical and chemical analysis of the crop contents and carcass measurements. The physical analysis results revealed that the overall mean proportions of the materials present in the crop, as estimated by visual analysis, were: seeds 30.9 percent, plant material 23.3 percent, worms 6.7 percent, insects 11.1 percent and 23.9 percent unidentified materials. The overall mean liveweight and dressing percentage of the local birds were 1129.8±59.9 g and 65.6±1.5 percent, respectively.

There was a significant difference (P<0.05) between seasons and altitudes in liveweight and dressing percentage. There was a significant (P<0.05) difference in the chemical composition of the crop contents of birds slaughtered at different seasons and altitudes and the overall means were: dry matter (DM) 50.7±12.5 percent, crude protein (CP) 8.8±2.3 percent, crude fibres (CF) 10.2±1.6 percent, ash 7.8±2.7 percent, calcium (Ca) 0.9 ± 0.4 percent, phosphorus (P) 0.6±0.3 percent and metabolizable energy (ME) 11.9±0.9 KJ/g. The DM, CP, Ca and ME concentrations were below the recommended requirements for egg producing strains, and protein to energy and calcium to phosphorus ratios were too low. The mean CF of the crop contents was over 10 percent, which would have reduced the digestibility of the other components of the diet.

The third study was an on-farm trial that was conducted with 300 local laying hens over a six-month period in Angu village in the central highlands, to assess egg production performance of scavenging hens with and without supplementary feeding. The dietary treatments were supplements of maize only (MS), noug cake only (NCS), maize and noug cake (MNCS) and scavenging only (SO).

The percent hen-day egg production was 28 percent, 22 percent, 32 percent and 14 percent for the MS, NCS, MNCS and SO treatments, respectively (P<0.01), and there were also significant differences (P<0.05) in egg weight between treatments. Groups given the MNC, M and NC supplements were found to utilize the additional feed efficiently, requiring only 6.58, 5.19 and 7.33 kg feed/kg eggs respectively (assuming a mean egg weight of 40 g). The best economic performance was found for the MNCS treatment due to the combined effect of both energy and protein supplementation, followed by NCS and MS. However, the NCS treatment, followed by MNCS and MS, gave the lowest cost of feed / doz. eggs.

Epidemiology of Newcastle disease in village chickens in Tanzania

Mmeta Graceford Simon Yongolo

Department of Veterinary Microbiology and Parasitology, Faculty of Veterinary Medicine, Sokoine University of Agriculture, P.O. Box 3019, Chuo Kikuu, Morogoro, Tanzania, E-mail: MY@kvl.dk or Yongolo_mmeta@hotmail.com

[Master of Veterinary Medicine Dissertation, 1996, Sokoine University of Agriculture, Morogoro, Tanzania]

The epidemiology of Newcastle disease (ND) in village chickens was studied in Morogoro and Tabora regions. The prevalence of ND was determined by analysis of data from cross-sectional study through serological survey and virus isolation, informal and formal data, and retrospective data.

Out of the 1566 sampled chickens, 582 were seropositive giving an overall seroprevalence of 37.2 percent. A higher seroprevalence rate was found in Morogoro (46.8 percent) than in Tabora (30.7 percent). The difference between the two regions was statistically significant (P<0.001). The highest seroprevalence was
found in September-October (63.5 percent), followed by March (50.6 percent), July (25.5 percent), December-January (19.1 percent), with the lowest seroprevalence rates in June (18.1 percent). The mean haemagglutination inhibition test titres were highest in September-October (Log₂ 4.4) and lowest in June (Log₂ 1.21). Severe ND outbreaks were reported and confirmed in June, July to October. The difference in seroprevalence rates in different months was statistically significant (P<0.001).

Studies on region, age, sex, presence of other domestic birds, proximity of households and season showed that the difference in seroprevalence in the factor exposed and non-exposed chickens was statistically significant (P<0.05). Epidemiological association was shown by odd ratios ranging from 0.68 to 1.99 and population attributable factors ranging from 0.11 to 0.23.

A total of 27 Paramyxovirus 1 (PMV 1) field isolates were isolated in embryonated chicken eggs from 1566 apparently healthy chickens. Of these, 14 were velogenic, 7 were mesogenic and 6 were lentogenic. Two isolates were from ducks.

The role of concurrent diseases was not established in this study. However, seasonal occurrence of ND in Tanzania was established. In this study, the presence of field lentogenic strains which could be used as vaccines, and the role of village chicken and duck populations in sustaining an endemic situation of ND was revealed and is reported for the first time in Tanzania.

Strategic control of ND in village chickens is recommended.

Molecular epidemiology of *Salmonella enterica* subsp. *enterica* serovar Gallinarum biovar gallinarum infection in chickens in Tanzania
Robinson Hammerthon Mdegela

*Department of Veterinary Medicine and Public Health, Sokoine University of Agriculture, P.O. Box 3021, Morogoro, Tanzania, E-mail: vmph@suanet.ac.tz*

[Master of Science Thesis, 1998, Department of Veterinary Microbiology, The Royal Veterinary and Agricultural University, Copenhagen, Denmark]

Sero and cultural prevalence studies of *S. gallinarum* infection in scavenging local chickens and commercial layers are described in the first trial. A total of 672 scavenging local chickens was randomly selected from Morogoro, Iringa, Mbeya, Tabora and Mwanza regions for this study. Blood samples were collected from all selected scavenging local chickens whereas cloacal swabs were collected from 586 of the total 672 chickens. On the other hand, a total of 480 commercial layers was randomly selected from Dar es Salaam and Morogoro regions.

Blood samples were collected from all selected commercial chickens while cloacal swabs were collected from 326 of the total sampled commercial chickens. Among the scavenging local chickens, the sero and cultural prevalences were 6.3 percent and 0.0 percent respectively whereas in commercial layers the sero and cultural prevalences were 26.9 percent and 11.3 percent respectively. Sero and cultural prevalences were found to be significantly higher (P<0.001) in commercial layers than in scavenging local chickens.

Also, the risk of infection in scavenging local chickens kept in-contact with commercial chickens was found to be five times higher than the risk of infection.
in scavenging local chickens with no contact with commercial chickens (RR=5). The difference in infection rates between the scavenging local chickens and commercial layers was attributed to extensive and intensive types of management respectively, or due to resistance mechanisms among local chickens to fowl typhoid.

The genetic diversity of 63 S. gallinarum isolates from chickens in Tanzania was determined using plasmid profiling and ribotyping (second trial). Plasmid profiling demonstrated two plasmids of different molecular weights (85kb and 2.5kb). Basing on plasmid carriage, three different plasmid profiles were observed. Fifty-one isolates carried both 85kb and 2.5kb plasmids, five isolates carried only 85kb plasmid and seven isolates had no plasmids. Seven different ribotypes designated Ha through Hg were demonstrated indicating the chromosomal differences that exist in Tanzanian S. gallinarum isolates. Of the seven ribotypes, ribotype Ha was the commonest.

Both typing methods, plasmid profiling and ribotyping were capable in tracing back the source of infection and in identifying one strain which had persisted for many years. However, ribotyping using HindIII restriction enzyme, was more discriminatory than plasmid profiling. Forty-seven of the total isolates typed had similar results on plasmid profiling and ribotyping indicating that probably they belong to one clone.

The experimental study on the pathogenicity of S. gallinarum infection in local and commercial broiler chickens is described in the third trial. This experiment was conducted for a period of 14 days on 19 local and 19 broiler chickens. Basing on clinical signs, mortalities, pathological features, serological response and antibody titres, both groups of chickens were found to be susceptible to S. gallinarum infection. However, basing on severity of the disease and mortalities, local chickens were found to be more susceptible than commercial broilers.

It was concluded that, under experimental conditions, local chickens are more susceptible to fowl typhoid than commercial chickens. This suggests that the low infection rate observed in scavenging local chickens in the field studies (first trial) was likely due to the extensive type of management and not to resistance mechanisms to fowl typhoid. Nonetheless, within local chickens, some were found to be less susceptible to S. gallinarum infection as they did not die up to the end of the experiment.
New Publications

Village chicken production systems in rural Africa: Household food security and gender issues
Aichi J. Kitalyi
Animal Husbandry Advisor – RELMA, P.O. Box 63403, Nairobi, Kenya, E-mail: a.kitalyi@cgiar.org
[FAO Animal Production and Health Paper 142, 1998, Rome, Italy]

This publication represents the results of a field study on village chicken production and health and an analysis of their importance in household and national economies. The research was carried out under an FAO André Mayer Research Fellowship (1994-1995), granted to scientists whose research inputs may contribute to FAO’s global work towards improved food security. Poultry is viewed within FAO’s Special Programme for Food Security (SPFS) as a crucial element in the struggle for sustained food production and poverty alleviation.

In rural Africa, the poultry production systems are mainly based on scavenging indigenous chickens, which are found in virtually all villages and households. Over 70 percent of the poultry products and 20 percent of the animal protein intake in most African countries come from this sector. The author, with over 20 years experience in agricultural research and development in rural farming systems of Africa, promotes a holistic multidisciplinary approach to rural poultry production, embracing institutional and organizational capacity building. Gender issues are strongly emphasized.

A model for village chicken production systems is presented, and the text is supported by a comprehensive review of the global literature on the subject. Recommendations on the most cost-effective targets for FAO’s Technical Assistance that should be focused on poverty alleviation among rural women, were also made. The study confirms that enhanced village chicken production forms the basis for transforming the rural poultry sector from subsistence to a more economically productive base. The material is particularly pertinent to countries participating in the SPFS, where village chicken production will have a special impact in increasing household food security and gender equity.

Epidemiology, diagnosis and control of poultry parasites
Anders Permin* and Jørgen W. Hansen**
* Section for Parasitology, Institute of Veterinary Microbiology, The Royal Veterinary and Agricultural University, Copenhagen, Denmark, E-mail: Anders.Permin@vetmi.kvl.dk
** FAO Animal Production and Health Division, Rome, Italy, E-mail: Jorgen.Hansen@fao.org

Poultry products are among the most important protein sources for humans throughout the world, and the poultry industry has experienced continuing growth during the past 20 to 30 years. The extensive traditional rural scavenging systems have not, however, seen the same growth as commercial production systems and are faced with serious management, nutritional and disease constraints. These include a number of parasites that are widely distributed in developing countries and contribute significantly to the low pro-
ductivity of backyard flocks.

This manual provides an overview of the parasites of major pathogenic and economic importance and presents procedures and techniques for their diagnosis, epidemiological study, survey and control. The book is designed for routine use in all types of animal health institutions where diagnostic parasitology is performed, including universities, research institutes and field laboratories. It is hoped that the distribution of the handbook will facilitate the standardization and improvement of diagnostic capabilities as well as stimulate the collection and use of epidemiological data, the foundation for effective disease control programmes.

The Southern African Chicken Book: How to start a small business keeping chickens

Ed Wethli
KwaZulu-Natal Poultry Institute Management Training Centre, P.O. Box 101188, Scottsville, 3209, South Africa, E-mail: kznpi@pmb.lia.net
[Juta Publishers, 1999, Kenwyn, South Africa]

Keeping chickens is one of the most popular business options for both rural and urban areas. The Southern African Chicken Book shows how to start a small poultry business, and how to make a success of it.

This easy to read and well illustrated manual has all the business ideas and technical information on chickens that are needed. It covers how to keep records, how to prevent diseases, what to feed chickens, how to house them, and where to get advice. The book shows how a poultry business can be started with as little as R 1000 weekday (US$ 1= about 6 Rands).

This book (ISBN 0 7021 4709 5; Price: R 35 plus postage costs) is now available and can be ordered from your local bookseller or from the KwaZulu-Natal Poultry Institute Management Training Centre.

For additional information please contact: Marike Roth (mroth@juta.co.za) or Josie Egan (jegan@juta.co.za), Tel: (021) 797-5101 / Fax: (021) 762-7424
Juta Publishers (e-mail: books@juta.co.za ; website:http://www.juta.co.za), P.O. Box 14373, Kenwyn 7790, South Africa
News

Development Workers’ Tune Course in Denmark

The workshop took place at the Tune Landboskole, about 30 km from Copenhagen, Denmark, from 22 to 26 March 1999. The workshop, with the theme “Poultry as a Tool in Poverty Eradication and Promotion of Gender Equality”, was attended by sixty participants from nineteen countries (six Asian-Pacific, six African, five European, one North American and one South American). They were representing universities, research institutes, governments, NGOs, international agencies and donors. The overall objective was to bring together up-to-date information on rural poultry that will promote gender equality and assist in eradication of poverty. The immediate objectives were: to receive and discuss reports from countries; to identify experience that can be replicated in other countries and projects; to identify training and research needs; and to promote the development of policies and action plans.

More than 30 papers and reports were presented and discussed. Topics dealt with the situation in ongoing projects and the possibilities of scaling up, networking and replication; interactions between poultry breeds and their production environments (socio-economic and cultural aspects, diseases, feeding/nutrition, etc.); links between involved persons, institutions and technologies. Working group sessions and reporting completed the Course. Outcome and recommendations of this workshop are available on the Internet:

http://www.husdyr.kvl.dk/htm/php/tune-conclus.htm

Workshop organizer and contact person:
Dr Frands Dolberg, Institute of Political Science, University of Aarhus, 8000 Aarhus C, Denmark,
E-mail: frands@mail1.stofanet.dk

Second M.Sc. Course 1999-2000 of the University of Tropical Agriculture Foundation

The University of Tropical Agriculture (UTA), P.O. Box 2423, Phnom Penh 3, Cambodia, will start the Second M.Sc. Course 1999-2000 on the 25th of November 1999. Requirements are:

- BSc degree in natural or social sciences;
- Ability to communicate, read and write in English;
- Participants working already in NGOs and State Agencies involved in Rural Development will have priority. Priority is also given to students from tropical developing countries in any part of the world. Participants from other countries will be accepted if places are available.

The fees for the total course are US$10,000 (US$5,000/year). These figures do not include travel between UTA and the participant’s institution.

Rural family poultry production is among the selected areas of study, and the title of the qualification is: “Master of Science in Integrated Farming Systems for Sustainable Use of Renewable Natural Resources”

This degree will be conferred jointly by the University of Tropical Agriculture and the Royal University of Agriculture (Cambodia). Detailed information is available on the Internet:

www.hcm.fpt.vn/inet/~utaf/MSC99/msc99.htm;
www.hcm.fpt.vn/inet/~utaf/utaProspectus.htm

Enquiries can also be sent by e-mail to the UTA Foundation at the following persons:
Applicants are encouraged to complete and send the application form before **30 September 1999**. The application form can be down-loaded from the site (www.hcm.fpt.vn/inet/~utaf/MSC99/utaapplic.htm) or as a Word document (www.hcm.fpt.vn/inet/~utaf/MSC99/utaapplic.doc). It can be filled in on a computer and then sent by e-mail to utaaplic@email.com, and a printed version must be sent by airmail to UTA (see postal address above).

**Poultry Management Course in KwaZulu-Natal, South Africa**

The Poultry Management Training Centre (PMTC) of the KwaZulu-Natal Poultry Institute (KZNPI) was initiated to fill the gap which exists between short courses and University degrees for people with minimal entry qualifications (around Std 8 plus English literacy and numeracy).

The PMTC offers a four to five month course in all aspects of poultry production. Twelve-week courses, specialising in broiler and layer production under rural conditions, will be run for extension officers in the Department of Agriculture. If space in the programme is available, the PMTC can be contracted to run courses, workshops or seminars according to the client’s requirements.

In addition to the above, shorter courses (one to five days) will be offered in specialised topics (e.g. cleaning and disinfection of poultry houses, brooding of chicks, high temperature management) for poultry farm workers.

The courses are taught by highly qualified and experienced poultry specialists. The programme of courses for 1999 includes all aspects of poultry husbandry, support courses, practical work and visits to all the different facets involved in the poultry sector.

Students are trained for a wide range of possible future employment including farming on their own, working for a company allied to the poultry industry, or becoming extension workers or trainers. Courses are open to women and men of all ages and races. The language of instruction is English and/or Zulu depending on the particular group of students, and the Certificate is issued jointly through the University of Natal and the KZNPI.

The fees per student are:

- **Tuition**: approx. R100 (excl. VAT) per weekday (US$1= about 6 Rands);
- **Accommodation & board**: approx. R60 (excl. VAT) per day.

*Fees are subject to adjustment according to the type of course*

At present a bursary fund is available to help those South African students unable to obtain sponsorship, but in all cases a deposit of at least R1000 is payable before the start of the course.

Dr Ed Wethli, The Principal, KwaZulu-Natal Poultry Institute Management Training Centre, P.O. Box 101188, Scottsville, 3209, South Africa, Tel: 0331-460049 / Fax: 0331-63600, E-mail: kznpi@pmb.lia.net
International Conference at CCS Haryana Agricultural University, Hisar, India

An ‘International Conference on Sustainable Animal Production, Health and Environment: Future Challenges’ will take place at CCS Haryana Agricultural University, Hisar, India, from 24 to 27 November 1999.

The objectives of the Conference are:

- to know the future challenges for sustainable livestock production systems;
- to assess the scope of conventional and biotechnological strategies for production of diagnostics and vaccines;
- to assess the status of animal wealth for value added products and future perspectives;
- to generate awareness about socio-economic and environmental issues related to animal husbandry;
- to promote research and development linkages among public-private-NGO sectors.

The Conference, which has English as working language, will be structured upon four symposia: S1. Animal Production and Management; S2. Animal Health; S3. Animal Products Technologies and Marketing; and S4. Resource Management and Social Dimensions of Livestock Sector.

Abstract and paper submission: Abstracts up to 250 words (two copies) by 30-09-1999; Invited papers (15-20 typed pages) by 24-10-1999; Contributory/Poster papers (6-8 typed pages) by 24-10-1999. Registration fee is Rs. 1,500 (up to 30-10-1999) and Rs. 2000 (after 30-10-1999) for Indian participants; and US$ 200 (up to 30-10-1999) and US$ 250 (after 30-10-1999) for participants from abroad.

Information related to the technical programme, panel discussion, poster presentation, accommodation and transportation, banking facilities, etc. can be obtained from the Conference Co-ordinator:

Prof. R. A. Singh, Conference Co-ordinator, College of Animal Sciences, CCS Haryana Agricultural University, Hisar-125 004 (Haryana), India, Tel. (+91) 1662-34015 (R), 26171 (R), 37721 Ext. 4491, 4396 (O) / Fax: (+91) 1662-34952, 33511, 33257, E-mail: hau@hau.hry.nic.in

A Rural Poultry Development Project set up in Mali

The ‘Projet de Développement de l’Aviculture au Mali’ (PDAM) (or Rural Poultry Development Project in Mali) was set up in 1998. It is financed jointly by the Arab Bank for Economic Development in Africa (BADEA) and the Government of Mali, and has as objectives:

- to develop poultry production in Mali in order to contribute to white meat self-sufficiency;
- to satisfy the increasing demand in poultry products;
- to increase the productivity of the poultry business through appropriate poultry feeding techniques and genetic improvement, the control of poultry diseases, the organization of marketing channels, the organization and the training of professionals involved in the poultry sector.

For further information please contact:

Dr Ibrahim Yacouba Maiga, Directeur, Projet de Développement de l’Aviculture au Mali (PDAM), B.P. E 1529, Bamako, Mali, Tel/Fax: (+223) 240960

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~