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STATUS OF CHICKEN CAGED FARMING IN UGANDA

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LIST OF ACCRONYMS

DVOs	District Veterinary Officers
EU	European Union
FAO	Food Agriculture Organization
FGD	Focus Group Discussion
SVOs	Subcounty Veterinary Officers
UBOS	Uganda Bureau of Statistics

ACKNOWLEDGEMENT

It is a genuine pleasure to express a deep sense of gratitude to the Centre for Effective Altruism for their financial support in ensuring the successful execution of this study.

We appreciate Dr. Paul Ssuna for his immense contribution towards the development of this report.

Special thanks to the Project Research Team Josiah Ojwang, Dr Dennis Bahati, Sebastian Mwanza.

EXECUTIVE SUMMARY

Battery cage farming is one of the poultry production systems commonly used globally in confining birds for producing eggs on industrial scale. There is indeed a wider understanding and research on the status of battery cage poultry farming in a number of countries world-wide but not in the Ugandan. Thus, this study aimed at assessing the prevalence and status of poultry battery caging as a livestock management system in Uganda by reviewing the practice in 136 districts that constitute the Republic of Uganda. Personalized interviews (by phone call) guided by comprehensive questionnaires (n=120) were used in collecting primary data from district veterinary officers (DVOs) within the 136 districts in the country. The study also used focus group discussion (FGDs) method to collect primary data from the respondents. Results showed that most 85.8% (103/120) of the poultry farmers use free-range system, the highest poultry population at district level stands between 10,000 and 150,000 chickens, and the most commonly kept poultry breed is local breed. Results also showed that commercial poultry production was low in most of the Ugandan districts compared to local poultry production as noted by 27.5% (33/120) of the respondents. Results also showed that battery cage poultry management system was not common although it was largely mentioned that caged poultry farming was a good practice and that there are several target markets for poultry products mostly the urban population such as hotels. Results also showed that restricted movement of birds was the most prevalent welfare issue in battery cage system and most of the battery cage sellers and farmers are usually not aware about the animal welfare concerns. The study further revealed that most of the consumers of poultry products are not always concerned about the raising and management practices. Results also showed that the best awareness mechanism among farmers and general public on negatives impacts of battery caging system of poultry management was mass sensitization. The study concluded that much as there are few farmers in battery cage poultry farming at the district level, they produce and represent the largest number of poultry population, while there are many farmers using free-range system yet they represent the smallest number of poultry population.

Keywords: *Battery cage and poultry farming*

INTRODUCTION

In battery cage farming, chickens are usually kept in cages made of wires and are sized 15 inches tall and a few feet wide, which are generally barren, cramped and small, compromising both their psychological and physical well-being. On this note, chickens do not usually get the required space to exercise which often makes their bones get easily broken, grow brittle and their usual desires to nest, explore and scratch are denied.

The concerns of welfare arising from the system of battery cages have currently spurred numerous states and countries prompting the need to plan to ban or phase out these cages.

Global Perspective

The poultry sector largely contributes to the growth of the livestock industry, which contributes 33.3% of the protein consumed by people worldwide (Nabarro and Wannous, 2014; & Tabler, 2021). Globally, poultry farming has grown at over 5% every year since the 1960s with poultry greatly contributing to world meat production from 15% in 1960s to 30% in 2000s (Vaarst, Steenfeldt and Horsted, 2015).

In 2020, the total number of chickens increased to approximately 33 billion worldwide, from 14.3 billion in 2000 (Shahbandeh, 2021), of which over 71.6% is found in developing countries (Tabler et al., 2021). Chickens that are majorly farmed worldwide are of two types, including broiler chickens for meat and egg laying hens for egg production. Shahbandeh (2021) reported that China was the leading egg producer in 2020 at 596 billion eggs, followed by India at 114 billion eggs while the United States was the fourth although it was the most chicken meat producer worldwide at 20.5 million metric tons in 2020. China was the second meat producer at 15 million metric tons, followed by Brazil at 13.7 million metric tons (Shahbandeh, 2021).

African Status

There are two major production systems in Africa, that is extensive (village) and intensive (commercial) poultry systems. Intensive poultry systems are used on large scale and specifically utilize exotic breeds, which are mostly raised in facilities that provide for the health, protection and feeding chickens with comparatively high returns while extensive poultry systems are on a small scale and specifically utilize indigenous breeds of chickens with lower productivity.

Both indirect and indirect impacts of climate change do threaten all poultry production systems in Africa (Bhadauria et al., 2014; Alemayehu & Woldeamlak, 2017). Among direct impacts, chickens can reduce their feed consumption in an environment that is usually hot and laying hens can reduce the size and number of eggs produced (Bhadauria et al., 2014). Indirect impacts include reduction of water in water bodies in Africa because evaporation is growing at a high rate (Alemayehu and Woldeamlak, 2017).

Over 5.7 million tons of chicken meat was produced in 2018 in Africa, which was an increase of 4.2% from 2017. The leading chicken meat producer was South Africa with over 1.8 million tons produced, Egypt was second at over 1.1 million tons, and the third was Morocco at 720,000 tons (Berkhout, 2020).

Sub-Saharan region

In Sub-Saharan countries especially Uganda, Kenya, Tanzania and Rwanda, the rapid growth of the poultry industry for the past 8 years has been driven by the growing need for animal protein, growth of the middle class, rapid urbanization and the increasing number of restaurants and hotels in urban areas (Tabler, 2021). The poultry sector of Kenya is the most developed, but the other Sub-Saharan economies are significantly expanding and growing their poultry sectors (Mathiu, Ndirangu and Mwangi, 2021). In Uganda, the Uganda Bureau of Statistics (UBOS) (2018) revealed that there are about 38.3 million chickens, of which 12.3% were exotic chickens and 87.7% were indigenous chickens. The country's poultry population grew by 9.6% while egg production predominantly grew by 9% between 2013 – 2017 (UBOS, 2018).

Both intensive and extensive poultry systems are used in Uganda, but the most recently adopted poultry production system is battery cage system because of its efficiency and effectiveness in egg production (Namugabi, 2019). However, it has some concerns of welfare such as feather pecking, paralysis in chickens that often prompts farmers to also maintain the deep litter system (Sherwin, Richards & Nicol, 2010).

Study Objective

The main objective of the study was to assess the prevalence and status of poultry battery caging as a livestock management system in Uganda by reviewing the practice in 136 districts that constitute the Republic of Uganda.

Sub-Objectives

The specific objectives of the study include the following:

i. To identify specific geographical zones that practice poultry battery caging within the 136 districts.
ii. To identify stakeholders' knowledge (including views and perspectives) on poultry battery caging and its associated animal welfare issues.
iii. To understand the varying drivers of battery caging among Ugandan poultry farmers.
iv. To establish a baseline for future assessment on the status of poultry management in the country.

METHODOLOGY

Study design and scope - Personalized interviews (by phone call) by use of comprehensive questionnaires targeting district veterinary officers (DVOs) within the 136 districts in the country. The study also used focus group discussion (FGDs) method to collect primary data from the respondents.

Sample size – 136 DVOs within the 136 districts in the country and 20 FGDs in four selected districts.

RESULTS

Out of 136 questionnaires administered to DVOs in 136 districts in Uganda, 120 (76.7%) questionnaires were successfully answered and received. Only 14 (23.3%) questionnaires were not returned.

Poultry Livestock Management System

About 85.8% (103/120) of the respondents revealed that the mostly used poultry livestock management system in Uganda is free-range system, 9.2% of them (11/120) revealed that it was semi-intensive, while the minority 5% (6/120) said that it is intensive (battery cage system) as shown in table 1.

Table 1: Poultry Livestock Management System

Management System	Frequency (n=120)	Percentage (%)
Free Range	103	85.8
Semi-Intensive	11	9.2
Intensive (Battery caging)	6	5.0
Total	**120**	**100.0**

Current Poultry Population at District Level

About 7.5% of the respondents (9/120) revealed that the current poultry population at district level was less than 10,000 and between 311,000 and 450,000 chickens, 35.8% (43/120) said that it was between 10,000 and 150,000 chickens, 24.2% (29/120) said it was between 151,000 and 300,000 chickens, 5.8% (7/120) said it was between 451,000 and 600,000 chickens, 3.33% (4/120) said it was between 601,000 and 1,000,000 chickens, 6.7%(8/120) said it was more than 1,000,000 chicken, while 9.2% (11/120) were not sure as shown in table 2.

Table 2: Current Poultry Population at District Level

Current Poultry Population	Frequency (n=120)	Percentage (%)
Less than 10,000"	9	7.5
Between "10,000 - 150,000"	43	35.8
Between "151,000 - 300,000"	29	24.2
Between "311,000 - 450,000"	9	7.5

Between "451,000 - 600,000"	7	5.8
Between "601,000 - 1,000,000"	4	3.3
More than 1,000,000"	8	6.7
Not sure	11	9.2
Total	**120**	**100.0**

Commonly Kept Poultry Breed

Results show that 81.7% of the respondents (98/120) revealed that local breed is the most commonly kept poultry breed, followed by the local breed and broilers 5% (6/120), layers and broilers 3.3% (4/120), both exotic breed and layers 2.5 % (3/120), both broilers and kroilers 1.7% (2/120) and lastly white leg horn and broilers and kroilers 0.8% (1/120).

Table 3: Commonly Kept Poultry Breed

Poultry Breed	Frequency (n=120)	Percentage (%)
Local Breed	98	81.7
Layers & Broilers	4	3.3
Broilers	2	1.7
Broilers & Kroilers	1	0.8
Kroilers	2	1.7
Exotic breed	3	2.5
Local breed & Broilers	6	5.0
Layers	3	2.5
White Leg Horn	1	0.8
Total	**120**	**100.0**

Commercial poultry production in the districts

Over 72.5% of the respondents (87/120) revealed that commercial poultry production was low compared to local poultry production as noted by 27.5% (33/120) of the respondents.

Table 4: Commercial poultry production in the districts

Response	Frequency (n=120)	Percentage (%)
Yes	33	27.5
No	87	72.5
Total	**120**	**100.0**

Usage of Battery Cage poultry management system

Over 94.2% (113/120) of the respondents answered that battery cage poultry management system was not common while 5.8% (7/120) of them responded that it was common.

Table 5: Usage of Battery Cage poultry management system

Response	Frequency (n=120)	Percentage (%)
Yes	7	5.8

No	113	94.2
Total	**120**	**100.0**

Caged poultry farming a good practice

Over 85.5% of the respondents (103/120) declared that caged poultry farming is a good practice, 13.3% of them revealed that it is not good, while only 0.8% of them were not sure.

Table 6: Caged poultry farming a good practice

	Frequency (n=120)	Percentage (%)
Yes	103	85.8
No	16	13.3
Not Sure	1	0.8
Total	**120**	**100.0**

Target market for the poultry products

Both table 7 and figure 1 show that over 40.8% (49/120) of the respondents revealed that the biggest target market for poultry products is urban population such as hotels, 30.8% of the respondents (37/120) revealed that they target local population, 17.6% of them (21/120) target local and urban consumers, 5.8% of them (7/120) target urban population and export while only 5% of them (6/120) target exports.

Table 7: Target market for the poultry products

Consumer Category	Frequency (n=120)	Percentage (%)
Urban Population (e.g. Hotels, other businesses,	49	40.8
Local Population (e.g. Households	37	30.8
Export	6	5.0
Urban Population & Export	7	5.8
Local & Urban Consumers	21	17.6
Total	**120**	**100.0**

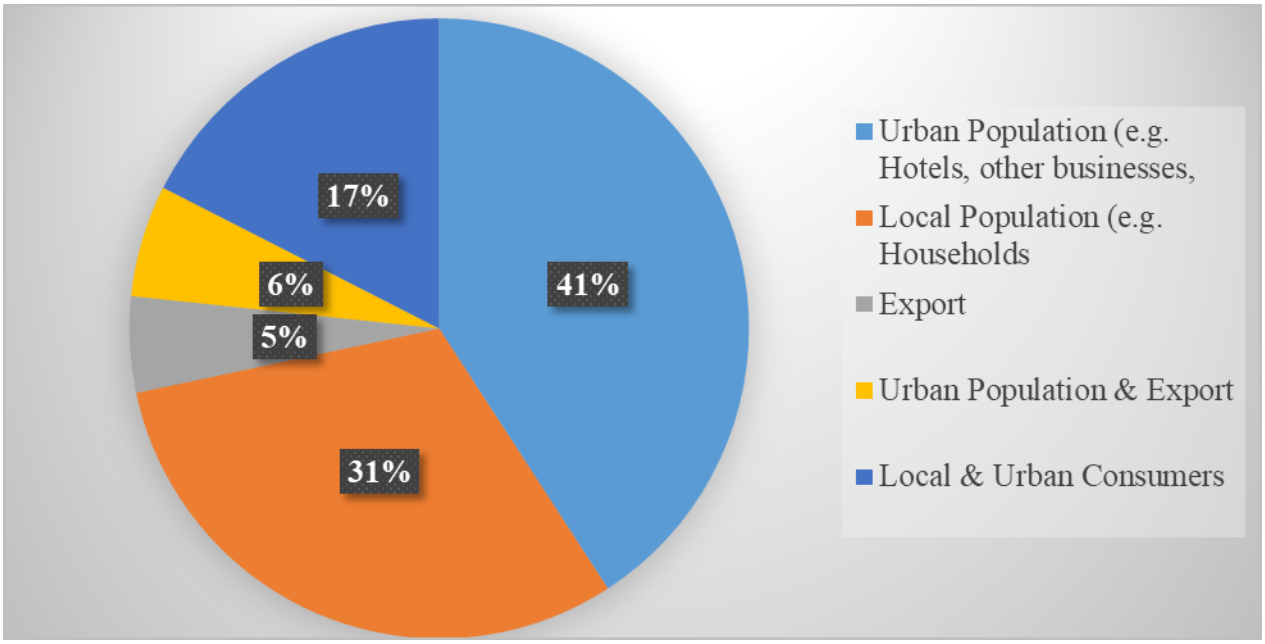

Figure 1: Target market for the poultry products

Animal welfare issues associated with Chicken battery Cage system

Table 8 shows that 10.8% (13/120) of the respondents pointed out that the animal welfare issues associated with chicken battery cage system is stress and poultry vices, 28.3% (34/120) assured that it is restricted movement, 20% (24/120) limited exercise, 15.9% (19/120) crowding / congestion, while 12.5% (15/120) were not sure.

Table 8: Animal welfare issues associated with Chicken battery Cage system

Issue	Frequency (n=120)	Percentage (%)
Stress & Poultry vices	13	10.8
Restricted movement	34	28.3
Limited Exercise	24	20.0
Crowding/ Congestion	19	15.9
Easy spread of Diseases	10	8.3
Lack of Freedom	5	4.2
Not Sure	15	12.5
Total	**120**	**100.0**

Battery Cage sellers and Farmers' awareness of Animal welfare concerns

Over 67.5% (81/120) of the respondents revealed that battery cage sellers and farmers are not aware about the animal welfare concerns, 29.2 of them (35/120) revealed that they are always aware, while only 3.3% of them (4/120) were not sure.

Table 9: Battery Cage sellers and Farmers' awareness of Animal welfare concerns

Response	Frequency (n=120)	Percentage (%)
Yes	35	29.2
No	81	67.5
Not Sure	4	3.3
Total	**120**	**100.0**

Consumers' concern about the raising and management practices

Table 10 shows that 84.2% (101/120) of the respondents revealed that consumers of poultry products are not concerned about the raising and management practices, while 15.8% (19/120) of them agreed that they do.

Table 10: Consumers' concern about the raising and management practices

Response	Frequency (n=120)	Percentage (%)
Yes	19	15.8
No	101	84.2
Total	**120**	**100.0**

Awareness mechanism among farmers and general public

Results in table 11 show that 30.8% (37/120) of the respondents revealed that awareness is done via media, such as radios, newspapers and TVs, 1.7% of the (2/120) noted that it is Meetings/ Sensitization with farmers and use of Extension workers, 4.2% (5/120) noted sensitization and meetings, 5% (6/120) chose community meetings, 32.5% (39/120) chose mass sensitization, 10% (12/120) said it is use of extension workers, 2.5% (3/120) said it is legislation and enforcement, 9.1% (11/120) said it is media & community sensitization, 1.7% (2/120) said that it is training of veterinary staff, 0.8% (1/120) said that it was extension workers & sensitization, while only 1.7% (2/120) were not sure.

Table 11: Awareness mechanism among farmers and general public

	Frequency (n=120)	Percentage (%)
Media (e.g. Radio, Newspapers & TVs)	37	30.8
Meetings/ Sensitization with farmers and use of Extension workers	2	1.7
Sensitization & Meetings	5	4.2
Community meetings	6	5.0
Mass sensitization	39	32.5
Use of extension workers	12	10.0
Legislation & Enforcement	3	2.5
Media & Community sensitization	11	9.1
Training of veterinary staff	2	1.7
Extension workers & sensitization	1	0.8
Not sure	2	1.7
Total	**120**	**100.0**

FOCUS GROUP DISCUSSIONS

Four districts were selected out of the 135 districts in Uganda, using MS Excel's random selection function, for FGDs. The selected districts involved include Wakiso, Mityana, Masaka and Kampala, and the participants included individual farmers, farmers in groups/associations and sometimes, subcounty Veterinary officers. The study considered 20 FGDs, each involving at least 10 farmers with at least 5 FGDs in each of the districts. After the FGDs, the team visited 2 - 3 battery cage famers from that FGD.

Within a short timeframe, FGDs offered the researchers the opportunity to seek different opinions from various people. All shared opinions were corroborated by all group members in order to draw objective conclusions especially about the status of battery cage farming in Uganda.

All the planned 4 district-based Focus Group discussions (FGDs) were successfully prepared. Using the beneficiaries' phone numbers, subcounty Veterinary officers (SVOs), individual farmers and farmers in groups/associations assisted in organizing FGDs. In all districts, both farmers of deep litter and battery cages expressed the challenges they normally face.

The issue of most concern was about space available for chickens. The deep litter farmers revealed that chickens needed more space compared to battery cage- where so many chickens can be raised in a small space. Most participants also revealed that the stocking density was very high among chickens kept in battery cages (usually not below 9 chickens per cage) hence leaving very little space which they exemplified to be as small as the size of a sheet of paper per chicken/bird. On the same note, farmers expressed concern that the middlemen and some markets (especially affluent customers) are now more interested in working with farmers on battery cage with large supplying capacity.

The issue of concern during the FGDs was about the poor hygiene and higher incidence of diseases in deep litter compared to battery cage system. A number of participants revealed that the cases of disease and its progression was high in deep litter systems compared to battery cage, which has prompted several farmers to adopt the cages. This is attributed to the ease of cleaning in battery cage and also because chickens have less contact with fecal matter. However, battery cage farmers disclosed that they usually face a challenge of poor hygiene because it always requires them to regularly clean the poultry dung from the floor. There were concerns about management of the dung from battery cages, mainly because this waste accumulates in a short period of time and farmers have not established a definite solution towards it management.

Participants also raised issues about the source, quality and reliability of feed for chickens. They emphasised the challenge of increasing cost and scarcity of feeds, specifically feed and additives and the production losess arising from poor quality of these feeds.

Participants also revealed that chickens in cages usually get paralyzed, sometimes peck each other's feathers and get stressed, which leads to reduced laying percentage and laying duration. This was attributed to the small space accorded to individual chickens, inability to rest while in

the cages and the poor quality of the feeds on the market. Some participants (largely battery cage farmers) indicated that they have established 'sick bays' where the paralyzed chickens are kept for some times and later reintroduced into the general flock.

All the farmers recommended that poultry drug distribution and dispensation should be greatly regulated, subsidies on the factors of production should be given to framers and that their suppliers should ensure good quality chickens/birds and poultry inputs. They further stated that farmers should be given cheap bank loans and importation of feeds should be regulated to minimize on counterfeits that are sold expensively to farmers. It was recommended that the price of poultry products especially eggs at the farm should be raised and that the cages should be produced locally because they are currently being imported and are expensive.

DISCUSSION

In this study, majority 85.8% (103/120) of the respondents revealed that free range is the most used poultry production system in Uganda. The majority 35.8% (43/120) of the respondents stated that the highest current poultry population at district level stands between 10,000 and 150,000 chickens, largely produced for domestic purposes under free-range. This would possibly imply that the welfare of chickens raised under this system may be better, especially in having enough space and range access to express their natural behaviors. However, Campbell, Bari & Rault (2020) argued that range access can be connected to various health risks such as heat stress, parasites, disease (such as spotty liver disease) and predation in comparison to caged housing systems. Furthermore, Sánchez-Casanova et al. (2020) reported that chickens may not necessarily experience better welfare in free-range systems because they are never provided with an environment that is a preferred habitat.

The majority, 81.7% (98/120) of the respondents revealed that the most commonly kept poultry breed is the local breed, which survives better in the free-range production system. This is similar to reports by Asumang et al. (2019), Gilbert (2015), Macharia (2018) and Manyelo et al. (2020) who asserted that domestic chicken are the most commonly kept poultry among free range systems.

The majority, 94.2% (113/120) of the respondents revealed that battery cage poultry management system was a good practice although it was not common among farmers. This study argues that it is expensive for Ugandan farmers to invest in battery cage poultry system. This implies that farmers mostly prefer management systems that are cheap, especially deep litter and free-range systems. This is similar to report by Mutura et al. (2020), showing that the key limiting factor that prevents farmers from adopting battery cage farming system in Kenya was high cost of investment. In addition, this study argues that battery cage management system requires skilled farmers to invest in it. Thus, it is necessary to train farmers on how to use it. This is supported by Ovwigho, Bratte & Isikwenu (2009) who asserted that farmers need to be educated about battery cage poultry system, especially how to rear hens for egg production.

The majority, 40.8% (49/120) of the respondents revealed that the biggest target market for poultry products is urban population such as hotels. This implies that commercial exotic breeds have more market demand compared to local breeds because they take a short period to mature. This is similar to what Ovwigho, Bratte & Isikwenu (2009) declared that commercial battery cage eggs production is usually carried out by few farmers on a large scale.

Majority 28.3% (34/120) of the respondents noted that restricted movement of birds was the most welfare concern in battery cage system. This was supported by Meseret (2016) that some of the behavioral restrictions that are very inherent to the systems and hens are usually prevented from freely expressing their highly motivated and natural behaviors for their laying lifespan.

Majority 67.5% (81/120) of the respondents revealed that battery cage sellers and farmers are not aware about the animal welfare concerns. Hence, farmers need to be educated about animal welfare concerns in order to improve welfare practice amidst the growing market demand worldwide. However, some countries, especially in European Union have banned the battery cage system (Doyon, 2016).

Majority 84.2% (101/120) of the respondents revealed that most of the consumers of poultry products are not always concerned about the raising and management practices. Results also showed that the best awareness mechanism among farmers and general public on negative impacts of battery caging system of poultry management was mass sensitization. This is similar to what Cornish, Raubenheimer & McGreevy (2016) asserted that mass sensitization is usually the best mechanism of making farmers aware about the negative impacts of battery cage management system.

CONCLUSIONS

The study concluded that there are few farmers in battery cage poultry farming at the district level in Uganda who produce the largest number of poultry population. However, there are many farmers who use free-range system but they produce the smallest number of poultry population. In addition, the welfare of battery cage poultry farming has the potential to continue improving in Uganda, but it is necessary to develop more regulations, policies and standards that ensure proper functioning and chicken welfare.

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