

STATUS OF CHICKEN CAGED FARMING IN TANZANIA



Executive summary

Poultry productions have improved dramatically over the last decades. As a result, production capacity increased with the use of technologies aimed at genetic improvements, breeding, nutrition and developments in housing systems. High levels of mechanization are used in production systems including housing systems, egg collection, ventilation, feeding, lighting and waste handling. Egg producers have increased their net income by utilizing available housing facilities at maximum capacity. Formerly, commercial layer farms tend to overcrowd the hens by increasing the number of birds per cage and by increasing the density per bird. It has been shown that producers increase density knowing that there will be an increase in net income without taking into considerations potential negative outcomes on chickens due to overcrowding.

In Tanzania whereby the majority of the poultry farmers are attracted by the use of the poultry battery cages and think that the use of the cages is an improved means of raising chickens and even the low profile poultry farmers even wish to use the cages, But it's different in some of the European countries whereby animal rights activists have portrayed this means of chicken production practices in a negative manner, which has resulted in social and cultural pressures being placed on producers to change the housing practices. Especially, the public opinion has changed in the last years and animal welfare has become an important subject of recent studies such as the effects of increased stocking density on animal welfare. In the European Union countries, following regulations in 1998 and in 2002 predetermined that a layer cage should have 550 cm² cage area per hen, 10 cm feeder trough per hen, 2 nipple drinkers, floor slope less than 8 degrees, 40 cm height over 65% of cage area. This study was focused on the determination of the status of the poultry battery cage farming in Tanzania.

The study finds that the use of the battery cage system attracts majority of the poultry keepers, and they think it's an improved means of poultry production, also majority of the farmers are not even aware of the welfare issues concerning the chickens. Despite the fact that the use of poultry battery cages has been globally criticized for its violation of poultry welfare, whereby chickens are unable to express their natural behavior like nesting, perching, dust bathing, scratching, foraging, running, jumping, flying, stretching, wing-flapping, and even walking hence compromising their overall physical and psychological well-being.

Acknowledgement

We would like to take the chance to extend thanks to the Ministry of Livestock and fisheries development for their support in gaining access to the poultry farmers, District veterinary officers (DVO's), Tanzania Veterinary Association (TVA) and Livestock field officers (LFO's). We are also thankful to all key informants including poultry farmers and other resource persons for their valuable time and information to support this study. Finally, we 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. Thomas Kahema for his immense contribution towards the development of this report.

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

Table of Contents

CHAPTER ONE	4
INTRODUCTION	4
Background information	4
Global Perspective on poultry battery cages	6
Study Objectives	6
General objective.....	6
Specific objectives.....	7
METHODOLOGY	7
Study areas.....	7
Study Design and Approaches	8
Sampling procedure and sample size	8
Methods of data collection.....	8
Questionnaires	9
Administration of Questionnaires.....	9
Focus Group Discussion (FGD)	9
Data analysis.	9
Caged poultry farms Visiting.....	10
CHAPTER TWO	10
STUDY FINDINGS	10
Poultry management systems	10
Poultry population in the regions	11
FOCUS GROUP DISCUSSION HELD TOGETHER WITH BATTERY CAGE CHICKEN FARMERS & LIVESTOCK FIELD OFFICERS (LFO) IN DAR ES SALAAM, PWANI, MOROGORO, DODOMA AND MWANZA.....	16
Guidelines for discussion.....	16
Introduction	16
Advantages of rearing poultry by using battery cage	17
Disadvantages of rearing poultry by using battery cage/challenges	17
Benefits which acquired by the society by the use of battery cage.....	18
Summary of the Indicators and Factors responsible for poor welfare in Caged Birds.....	18
CONCLUSION	21
RECOMMENDATION	22
REFERENCES	23

CHAPTER ONE

INTRODUCTION

Background information

Poultry production is growing and has gained a huge market worldwide without any taboos. The system of poultry production followed to achieve this demand is intensive cage type. This system reduces the freedom of birds as their movement is restricted and welfare is compromised. There exist several problems because of cage system & few may be considered as indicators of wellbeing. The housing and other general management practices are matter of concern and determine the welfare of layers.

The potential of the poultry industry in Tanzania to reduce the meat production–consumption deficit, enhance food and nutritional security and contribute to household and national economic growth is enormous. A number of targeted interventions in the areas of animal health, genetics, marketing and processing and policies proposed as part of the Tanzania livestock master plan, if implemented, would increase the contribution of the national poultry sector to gross national product by 182% to nearly USD 324 million over the 2017–2022 period.

The proposed combined interventions of approximately USD 337 million—26% and 74% from the public and private sectors, respectively—for improved family and expanded commercial specialized poultry production systems would result in 666% tonne and 40% increase in chicken meat and egg production by 2022 to 465,600 tonnes and 4.2 billion eggs respectively. This would bring the production–consumption deficit for chicken meat from a surplus of 130,000 to 258,000 tonnes by 2022. The internal rate of return of the investment for improved traditional and improved tropical family chicken production is estimated at 75% and 58%, while for specialized broilers and layers the projected return would be 57% and 36%. Both returns on investment are well above the discount rate of 10%. Poultry sector investments would be designed to improve feeding, health, genetics, extension, policy and chicken product marketing and processing. The improvement of animal health services through the advancement and expansion of Newcastle disease, fowl pox and gumboro vaccine production centres, and enhancement of poultry industry biosafety programs. It is recommended that the remainder be

directed to policy development and the improvement of poultry product marketing and processing. Successful poultry interventions would enable Tanzania to meet the chicken meat and egg demand for its growing population and produce a very significant surplus for domestic industrial use or export.

Chicken production constitutes one of the major agricultural activities in Tanzania, with 94% of the total chicken population kept in villages and in peri-urban areas under the traditional free-range system, in most cases owned by women (MAFC, 2008). The traditional poultry system is the largest, supplying more than 90% of poultry meat and eggs consumed in rural areas, and 20% of the same consumed in urban areas. A decade ago, improvements in husbandry practices and adoption of a thermostable vaccine (strain I2) to control Newcastle disease, resulted into an increase in egg production from 790 million in 2002 to 1.8 billion in 2006 (MLD, 2008; Msami, 2008). Eventually, the per capita consumption of eggs rose from 23 eggs in 2002 to 50 eggs in 2008 per person per year. Despite an increase in supply of eggs the demand is still high, and the per capita consumption of eggs in Tanzania is quite low, compared with 106 eggs per person per year for Africa and 190 for high income countries (Gueye, 2004). The rising demand for eggs calls for more investments in the intensive layer chicken production and the poultry industry as a whole.

Layer chickens are among the most adaptable domesticated animals and more people are directly involved in layer chicken production throughout the world than in any other single agricultural enterprise (Bishop, 1995). Commercial poultry farming in Tanzania was introduced during the 1980s, and overtime visible growth in the production of layers has been observed to supplement egg supplies particularly in urban areas. The production of layer chickens is a better source of earning cash because it offers higher net returns (Paul et al., 1990); as compared to the production of local chickens which however predominate in the country. Small and medium enterprises have increased the numbers of layers from 27 million in 2001 to 38 million in 2008 while the commercial stock increased from 20 million to 25 million. On average, 5.5 million hatching eggs and one million-day old chicks are imported annually to produce a total of 25-million-day old chicks for commercial purposes (MLD, 2008). The production of layer chickens is gaining popularity in Tanzania with people engagements at different scales. The

small backyard production predominates, mostly engaging women either as a primary or secondary source of income at household level.

Global Perspective on poultry battery cages

It has been declared that Battery cage production systems prevents birds from expressing natural behaviors and exposes the chickens to high stress levels. Though there is trade-offs with caged production systems, the cages are a punishment for the birds and compromise the chickens' physical and physiological health. European Union and the United Kingdom have legally phased out battery cages, and Canada and New Zealand are currently phasing them out based on scientific reviews.

The battery cages system offers limited movement for the birds, preventing them from expressing normal behavior. The birds end up losing feathers as they rub themselves on the wires around the cages when they try to move around. This lack of movement contributes to weak bones, which can lead to cascading health and welfare issues.

Despite the welfare drawbacks, there are some advantages to battery cages. Farmers are able to achieve high egg yields with the system, and it is less labor intensive than other production models. It is also easier to maintain hygiene and biosecurity with caged systems. However, the battery cage system lacks physical and psychological space for the poultry; the poultry lack exercise resulting to higher incidences of metabolic disorders. The system lacks nesting opportunities resulting severe frustration for many birds each time an egg is laid.

Study Objectives

General objective

To assess the prevalence and status of poultry battery caging as a poultry management system in Tanzania.

Specific objectives

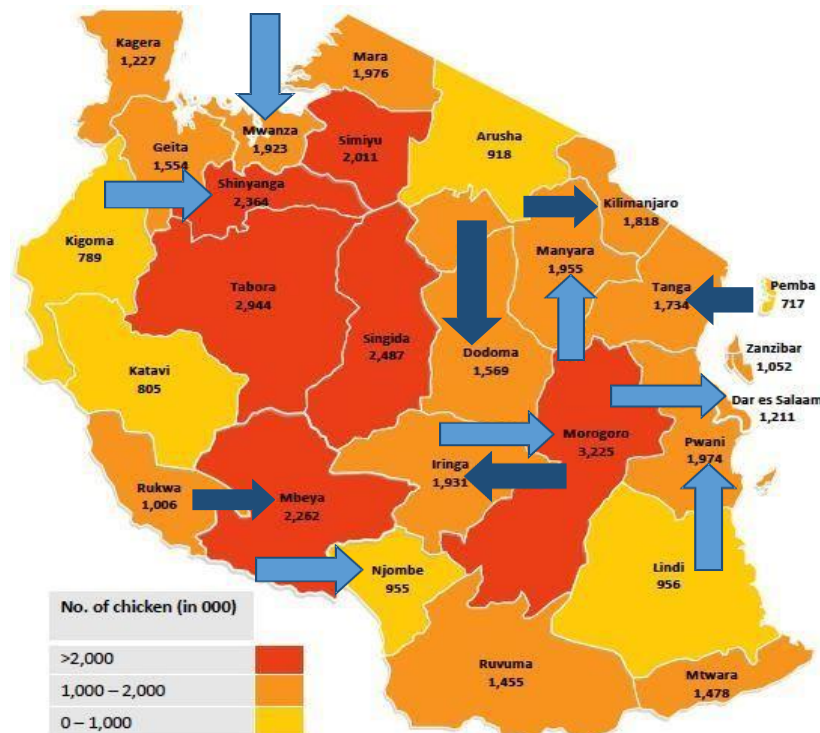
1. To identify specific areas that practice poultry battery caging in Tanzania.
2. To identify stakeholders' knowledge including opinions and perceptions on poultry battery caging and its associated animal welfare issues.

METHODOLOGY

Study areas

The study was conducted at United republic of Tanzania and In this field survey 12 regions were targeted as study areas namely Dare es Salaam, Pwani, Morogoro, Mbeya, Dodoma, Iringa, Njombe, Manyara, Kilimanjaro, Shinyanga, Tanga and Mwanza.

Map of the United republic of Tanzania showing number of poultry distribution in different regions of Tanzania including the study area regions.



Source: Poultry Subsector in Tanzania: A Quick Scan

Study Design and Approaches

To achieve the objectives of the study, we adopted a descriptive survey design, for the aim of combination of both qualitative and quantitative data collection and analysis techniques. Quantitative data were derived from the questionnaires while qualitative data were generated from an interview schedule. The design was used to allow a surveyor to describe, explain and examine facts, trends and patterns that emerge from the study. Using descriptive survey design, large population was reached with only a portion of that population being used to provide the data. The design was appropriate to gather information on prevalence and status of poultry battery caging as a poultry production and or management system in Tanzania, and also to identify specific areas that practicing poultry battery caging in Tanzania, and finally to identify stakeholders' knowledge (including views and perceptions) on poultry battery caging and its associated animal welfare issues.

Targeted population

The survey targeted 145 poultry farmers in Tanzania particularly battery cage poultry users.

Sampling procedure and sample size

A sample size representative of the study population was selected using simple random sampling and purposive sampling. Representative sample, according to Gall et al (1996) gives results that can be generalized to the study population from which the sample will be selected. In this survey 12 regions were randomly selected during this survey which include Dare es Salaam, Pwani, Morogoro, Mbeya, Dodoma, Iringa, Njombe, Manyara, Kilimanjaro, Shinyanga, Tanga and Mwanza.

Methods of data collection

Methods of data collection comprised the tools or survey instruments used to acquire the required information for a study.

Questionnaires

Questionnaires were used to collect data from poultry farmers McMillan and Schumacher (2001) recommend a questionnaire if a researcher knows that the respondents will be in a position to answer the questionnaire. Open ended and Likert-scaled items were carefully used to generate information of influence. Largely, the scaled items obtain accurate assessment of opinions according to Macmillan and Schumacher (2001). Similarly, a questionnaire has the ability to solicit information from several respondents within a short time (Gupta, 2004).

Administration of Questionnaires

Face to face and phone interviews were carried out to the districts veterinary officers (DVOs) and Livestock field officers (LFOs). The interview schedule was designed in a way that more specific and truthful answers were obtained. These all were helpful in capturing information, not provided by the questionnaires. Kothari (2004) preferred this method because of its flexibility and ability to provide new ideas on the subject.

Focus Group Discussion (FGD)

The focus group discussion was used, whereby discussion meetings was conducted with a selected group of poultry farmers. This qualitative research method and data collection technique was designed to be used to gather appropriate information on which a selected group of people discusses in-depth animal welfare issues concerning poultry battery caging as a poultry production and or management system in Tanzania, and to identify stakeholders' knowledge (including views and perceptions) on poultry battery caging and its associated advantages and challenges. The discussions were guided and or facilitated by a professional, external moderator.

Data analysis.

The collected data was analyzed by using SPSS software (Statistical Package for the Social Sciences) commonly used in social sciences and health fields.

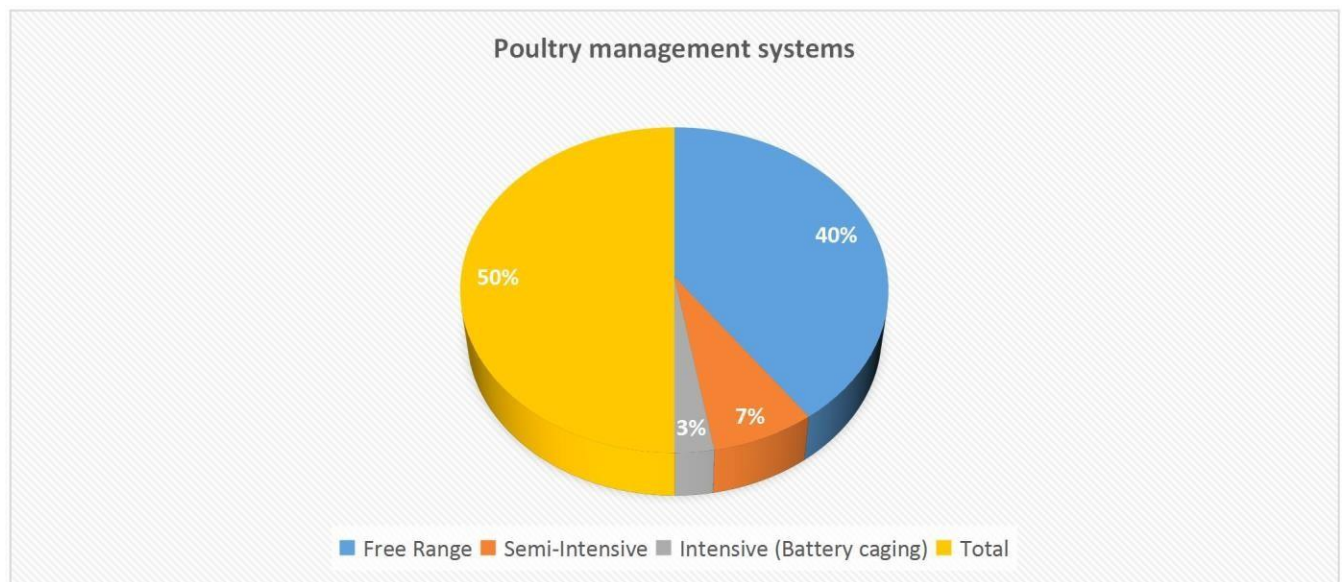
Caged poultry farms Visiting

Caged Chicken Farmers were visited and in 12 regions of Tanzania and their experiences and views on battery cage farming were obtained but also the team was making physical observation of the condition of chickens.

CHAPTER TWO

STUDY FINDINGS

This chapter extracts the findings from the interviews with District veterinary officers (DVO's), Livestock field officers (LFO's) and also from Focus Group Discussions (FGDs) with poultry farmers, the welfare assessment of poultry battery cages across the country and carrying out a desk examination on existing laws, policies and regulations governing the use and adoption of battery cages.



Poultry management systems

Free-range poultry production was highlighted as the most common system adopted by most poultry farmers in the country at 40% followed by Semi-Intensive at 7%, Intensive/battery cages 3%. Most of the respondents mentioned that battery cages are very expensive on the market and that most farmers could not afford the battery cage price, even though most farmers are not

aware of the fact that they are a foreign system. Moreover, none of all the respondents mentioned that the farmers do not use battery cages because cages prevent chickens' welfare and freedom,

Poultry population in the regions

Table below indicates that most of the current poultry population at the regions whereby population in other regions ranges between 50,000 – 60,000 and the population in other regions ranges from 40,000- 50,000 chickens and some regions poultry population ranging from between 20,000-40,000. Nevertheless, other regions have poultry populations ranging from 15,000-20,000 chickens and others with chickens ranging 10,000-15,000 and other regions have population of chickens less than 10,000. The findings also indicate that most of the poultry farms are located in Dar es salaam, Mwanza, Coastal region, Morogoro and Dodoma respectively.

Table1: Poultry Population

Current Poultry Population	Frequency (n=145)	Percentage (%)
Less than 10000	95	65.5
Between 10000 – 15000	26	17.9
Between 15000 - 20000	11	7.6
Between 20000 - 40000	9	6.2
Between 40000 - 50000	1	0.69
Between 50000 - 60000	1	0.69
More than 60000	1	0.69
Not sure	1	0.69
Total	145	100.0

Figure 3 shows that the common poultry breeds local breeds which constitute 21% followed by layers and broilers which constitute 18%, broilers 3%, exotic breeds 2%. Local breed was identified as the most common chicken breed widespread in the country followed by layers and broilers and then the hybrids, these hybrids are preferred due to their resilience in their resistance to diseases.

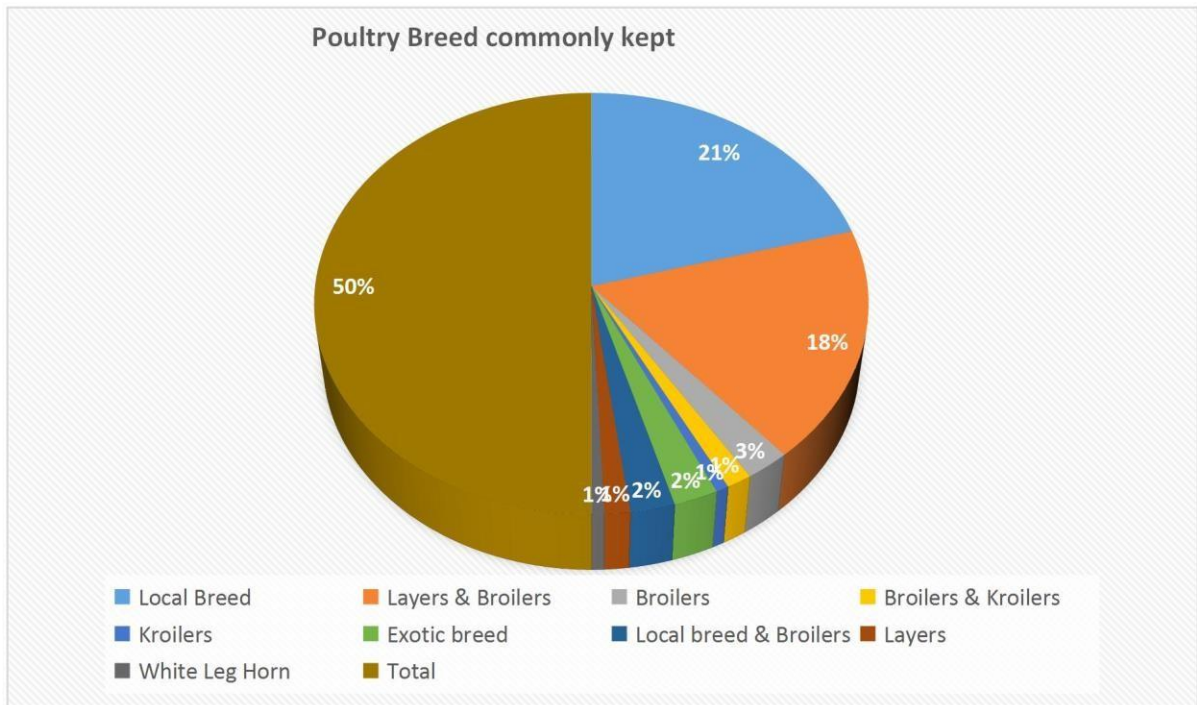


Figure 3: Common poultry breeds kept in Tanzania

Figure 4: Level of commercial poultry production in Tanzania

Figure 4 below indicates that most of the respondents 34% indicated that the level of commercial poultry production is low, while only 16% of the respondents indicated that the level of commercial poultry production is high.

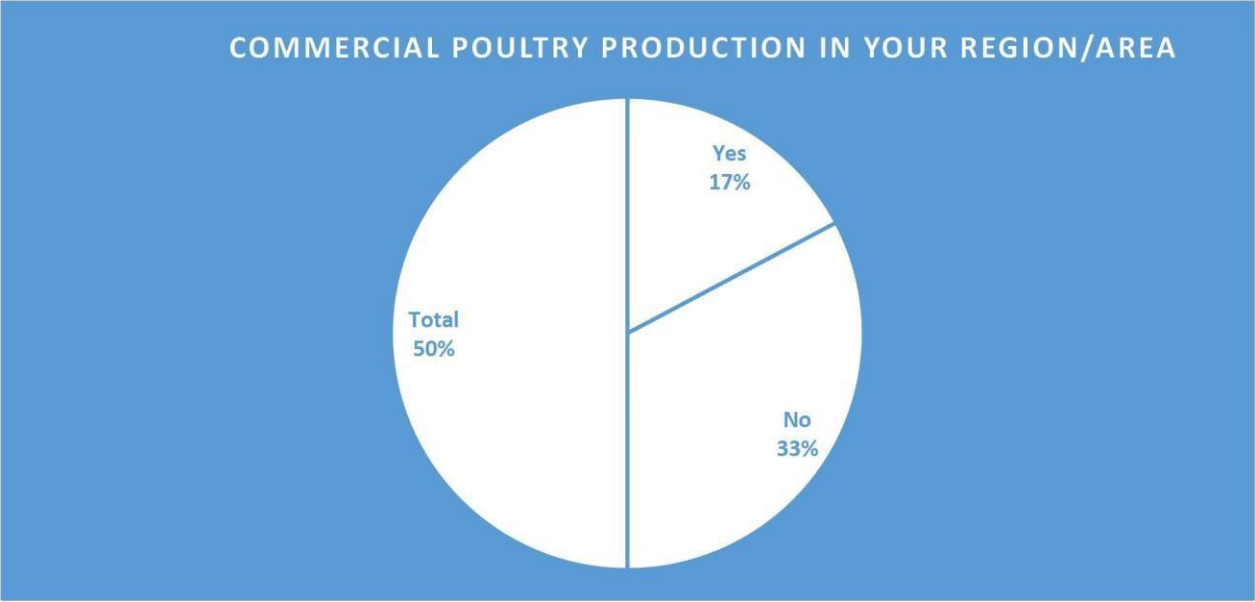


Figure 5: Battery cage as a common management practice in Tanzania

Figure 5 indicate that most respondents 34% disagreed that poultry battery cages are a common management practice in their areas/regions, while only 16% of the respondents agreed that poultry battery cages are a common management practice in their areas. When these poultry farmers asked why the battery cages are not common majority of them responded that poultry battery cages are not common in their localities due to their high cost, even though most of the farmers are not familiar about their usage, it also seems that majority of the poultry farmers are not aware of the welfare issues of concerns for the chickens raised from the use of poultry battery cages.

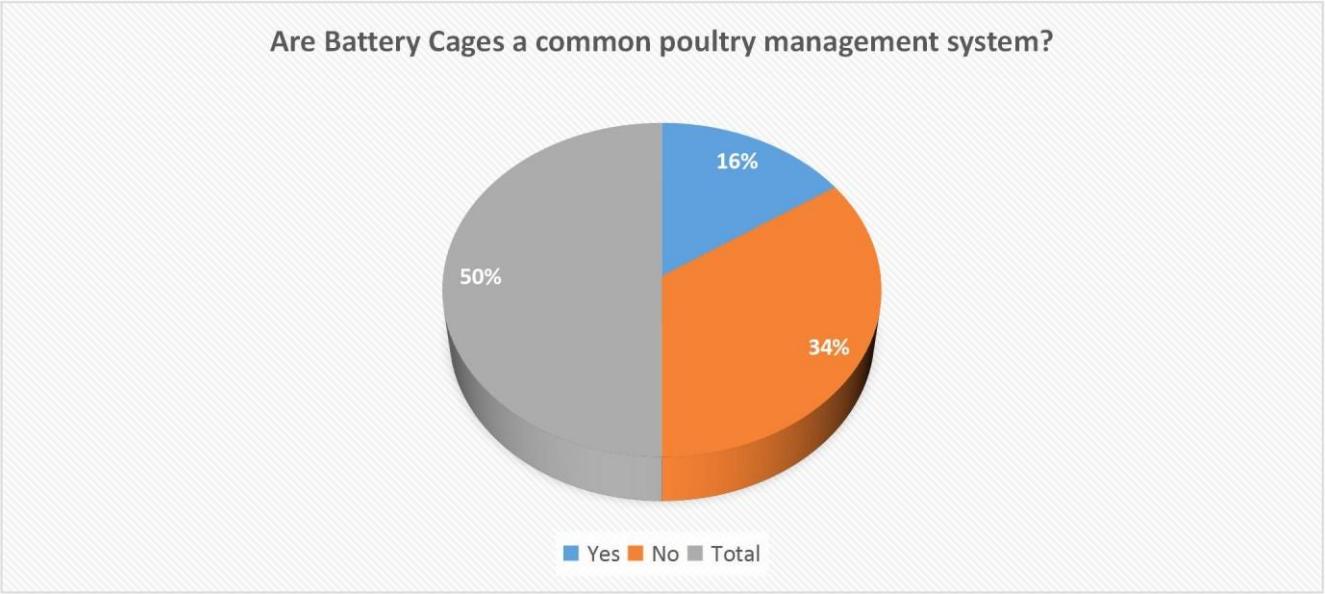


Figure 6: Respondents’ opinions on whether battery caged poultry farming is a good practice

33% the livestock field office, veterinary officers and farmers believe that poultry battery caged chicken farming is a good practice whereby 14% believe it is bad, and 3% are not sure whether bad or not a good practice.

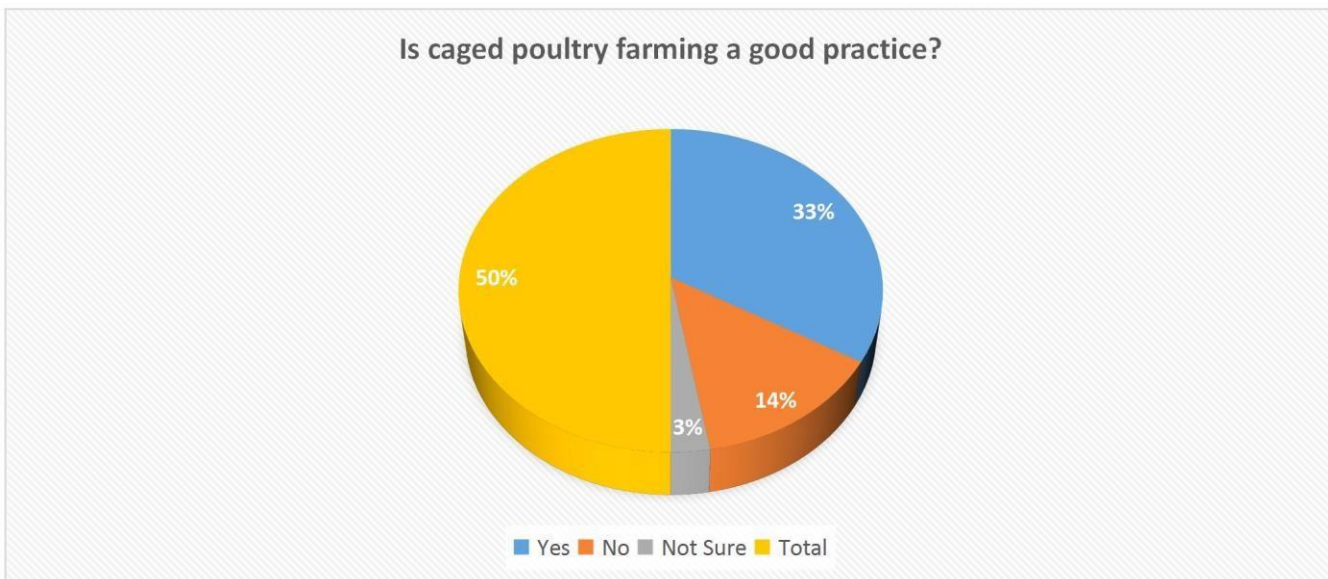


Table 2: Target market for the poultry products

Table below reveals that 61.4% of the urban population (e.g., hotels, supermarkets, and other businesses) is the most targeted market for poultry followed by 41% Local population. 15% of the respondents indicated that the market for their products is local and urban consumers.

Consumer Category	Frequency (n=145)	Percentage (%)
Urban Population (e.g. Hotels, other businesses,	89	61.4
Local Population (e.g. Households	41	28.3
Export	0	0
Urban Population & Export	0	0
Local & Urban Consumers	15	10.3
Total	145	100.0

Table 3: Animal welfare issues associated with Chicken battery Cage system

In table below 46.2% of respondents appreciate that battery cage restricts chickens' movements, 19.3% of respondent respond that the battery cages limit the chickens in exercising, 8.9% responded that the battery cages cause increased stress level and cannibalism, 0.69% were unsure if battery cage sellers were concerned about chicken welfare. People who stated that battery cage sellers are aware of these animal welfare concerns also stated that battery cage sellers are unable to discuss the welfare issues associated with battery cages with their clients because they are more concerned with making sales and profits than with animal welfare issues.

Issue	Frequency (n=145)	Percentage (%)
Stress & cannibalism	13	8.9
Restricted movement	67	46.2
Limited Exercise	28	19.3
Crowding/ Congestion	12	8.3
Easy spread of Diseases	0	0
Lack of Freedom	24	16.6
Not Sure	1	0.69
Total	145	100.0

Table 4: Best awareness mechanism among farmers and general public on negatives impacts of battery caging system of poultry management

Table 4 displays that 37.9% of respondent appreciate that Meetings & Extension workers is best awareness mechanism among farmers and general public on negatives impacts of battery caging system of poultry management, while 28.9% of the respondent agreed that newspapers, radio and television is the best awareness mechanism among farmers and general public on negatives impacts of battery caging system of poultry management.

	Frequency (n=145)	Percentage (%)
Media (e.g. Radio, Newspapers & TVs)	42	28.9
Meetings, & Extension workers	55	37.9
Sensitization & Focus group discussion	9	6.2
Community meetings	10	6.9
Mass sensitization	6	4.1
Use of extension workers	5	3.4
Legislation & Enforcement	3	2.1
Media & Community sensitization	6	4.1

18

Training of veterinary staff	1	0.7
Extension workers & sensitization	4	2.8
Not sure	4	2.8
Total	145	100.0

FOCUS GROUP DISCUSSION HELD TOGETHER WITH BATTERY CAGE CHICKEN FARMERS & LIVESTOCK FIELD OFFICERS (LFO) IN DAR ES SALAAM, PWANI, MOROGORO, DODOMA AND MWANZA.

Focus Group Discussion with Farmers, Animal Health Officers in Dar es Salaam

Guidelines for discussion.

1. Welcoming of the guests (farmers & animal health technician).
2. Introduction.
3. Merits of rearing poultry by using battery cage.
4. Demerits of rearing poultry by using battery cage/challenges.
5. Benefits which acquired by the society by the use of battery cage.

Introduction

What is a battery cage?

-A battery cage, is designed to house laying hens, meaning female chickens who produce eggs. Each cage usually contains between three to four birds, while designs may differ based on country or individual farm, generally battery cages are made of wire on all sides, including the bottom, so that waste falls through to collection troughs below. The floors of battery cages are sloped so that eggs roll down toward the troughs on one end of the cage, where the eggs are then collected for storage or to be taken to the market. A feeding trough is located at the front side of the cage, and food is generally always available to the birds what they do is to just push their heads and necks through the wire mesh so that to reach feeding trough and eat

Advantages of rearing poultry by using battery cage

- Increased hygiene resulting in a much lower incidence of diseases in which the infectious agent is spread through the droppings.
- It prevents cannibalism/vices but only when birds are not overcrowded per cage resulting in a low incidence of social friction.
- Ease of management/ easy way to monitor birds and making follow up.

Disadvantages of rearing poultry by using battery cage/challenges

- Psychological problems; - Battery cages prevent chickens from engaging in most of their natural behaviors, including perching, roosting, and dustbathing/ Lack of dust bathing opportunities, and foraging.
- Physical trauma; - Battery cages cause a wide array of debilitating physical conditions for chickens. The wire mesh floors of battery cages can cause foot damage disorders, including toe pad hyperkeratosis, which develops due to pressure on certain areas of the feet. This condition can lead to painful open lesion on their feet, overgrown claws are also common, since chickens can ‘not engage in ground scratching behaviors that keep nails short naturally.
- Lack of nesting opportunities resulting in severe frustration for many birds each time an egg is laid/ it prevent the nesting behaviors of the chickens to be displayed; - Under normal circumstances, hens search out private places in order to construct nests before laying eggs. In battery cages, these desires are muted, manifesting instead as repetitive stress-induced behaviors (such as pecking at other chickens).
- Osteoporosis; - Osteoporosis can be caused by a lack of adequate movement and exercise, and it's a common condition among many species of captive animals. In caged hens, this degenerative disease is a widespread problem. The inability to walk more than a few paces, to run, or even to properly stretch their wings leads to bone fragility and fractures, especially during transport.

Benefits which acquired by the society by the use of battery cage

- Employment to other members of the society and battery cage sellers.
- Increased income per individual and household.
- Price of the eggs produced from the battery cage are affordable.
- Increased national income.

Summary of the Indicators and Factors responsible for poor welfare in Caged Birds

Bone Health: Commercial layers have very poor bone strength and are highly susceptible to osteoporosis. Such layers have the poorest musculoskeletal health and the highest number of fractures. As compared to the battery cages, layers have better bone strength in improved furnished cages. Whereas the birds under cage-free systems have the best musculoskeletal health.

Disease: Non-infectious diseases including disuse osteoporosis and fatty liver are largely attributed to the restriction of movement in battery cages. As a result of disuse osteoporosis there is higher chance of fracture in cage birds.

Movement: Birds in battery cages experience extreme restrictions. They cannot flap their wings, walk or run as in free range, and these birds do not completely adjust to this behavioral restriction. Certain furnished cages allow greater movement and expression of more normal behaviors, but behavior is still restricted. Though there are greater opportunities for movement in cage-free systems, this may also be compromised if stocking densities are too high.

Perching: Hens have a strong motivation to use perches, and most birds will perch at night if given the option. The provision of perches improves bone strength, reduces fearfulness and aggression, gives places for refuge, reduces injurious pecking, enhances the use of space and reduces stocking density on the floor. The inability to perch decreases musculoskeletal health. Rearing without early access to perches causes low muscle strength, a lack of motor skills, the inability to keep balance, and impaired cognitive spatial skills, which imposes effect on the welfare of birds. Hens exhibit signs of unrest when they are deprived of the opportunity to perch at night, and experience frustration and reduced welfare if perching is not possible.

The inclusion of perches in all housing systems has the potential to yield large improvements in welfare if placed and managed correctly.

Nesting: Nesting is one of the top priorities for hens. The need for hens to use a nest has been consistently demonstrated by motivation tests. An enclosed nest area may reduce cannibalism. If denied a nest, hens can become frustrated and retain their eggs beyond the expected time of lay.

Dust Bathing: Hens typically perform Dust Bathing every other day to clean their feathers. Hens have an instinctive motivation to dust bathe. Hens are unable to dust bathe in battery cages because of lack of substrate, and hence perform sham- Dust Bathing in contrast to the normal behavior. Sham- Dust Bathing does not satisfy birds, and also indicates a reduced state of welfare. When hens are unable to dust bathe, their plumage is in a poorer condition as it is dirtier and less insulative.

Foraging and Exploration: Foraging is a significant part of the normal behavior of hens. Studies have found that when litter is available, hens spend majority of their time pecking and scratching the ground. Hens exhibit this foraging behavior even when feed is freely available in feed troughs, indicating this is an instinctive behavioral motivation to forage for food. This normal behavior is restricted in the cages.

Severe Feather-Pecking and Cannibalism: Feather pecking is an injurious behavior where in the hens peck and pull out the feathers of other birds. It is a major issue of welfare concerned with commercial egg production. Severe feather pecking is considered multifactorial, affected by genetics, nutrition, and the environment. Birds in larger groups are found to exhibit this behavior than the birds of small group size.

Beak Trimming: Beak trimming is the commonly practiced method by the poultry managers to control the impact of severe feather pecking. Beak trimming can cause both acute and chronic pain and can even lead to problems during feeding. Though this procedure is relatively effective in controlling severe feather pecking, it affects the sensory capabilities and normal behavior of the birds. There is a need to focus on other enrichment programmes and good management strategies that can effectively reduce feather pecking in birds.

Foot Health: Foot pad dermatitis, the ulceration of the bottom of the foot, is largely attributable to contact with damp or wet litter. Bumble foot, abscesses on the foot and swelling, is affected by

moisture on perches or litter. Hyperkeratosis, the hypertrophy of the feet and toes, occurs most frequently in hens in battery cages. Battery cages can cause excessive claw length due to the lack of solid flooring and the inability for birds to scratch the ground. This can lead to trapping of the claw and damage to the foot.

Rearing During Early Life: The imprinting that takes place during initial days of life has a larger impact on hens during the laying period. Hence the environment under which the bird is reared during the initial days should match closely with its laying environment. This facilitates effective utilization of resources provided during the laying period and reduces the risk of severe feather pecking. The opportunity to explore and forage in early life can prevent the development of severe feather pecking in adulthood. Provision of exercise during rearing is linked with skeletal health later in life which is not provided when reared in cage system.

Group Size and Space Allowance: Group size and social preferences small, there is very limited opportunity for subordinate hens to escape from aggressive hens. This can lead to chronic fear, injuries, and sometimes death due to cannibalism. Hens in larger groups have a greater ability to escape aggressive birds and seek refuge as they are in more complex environment. Birds should be housed in complex environment and in optimum sized group. Such that it will help them to have better social preferences and will even adequately express normal behaviors.

Husbandry and Handling: Good animal husbandry and management are crucial to animal welfare in any type of system. Those responsible for hen welfare should be appropriately trained to handle birds gently to minimize distress, be able to identify sick or injured animals and administer appropriate treatment, and proactively monitor hens for health and behavior. Husbandry is particularly important in cage-free systems, where there is a heightened need to monitor for severe feather pecking and infectious diseases.

Air Quality: The ammonia concentration is high in indoor rearing of birds which has adverse effect on the health and as well as on the production. It can result in damage to the respiratory system and also may cause a higher risk of infectious disease.

Light: Birds if reared in dim light can have impaired vision. Birds show less preening and foraging behaviours under low lighting. Low light intensities can be inadequate for workers to effectively inspect birds.

Access to Feed and Water: The major factors affecting the adequate access to feed and water are stocking densities, positioning of the feeders and drinkers, and the positioning of other objects within the housing environment.

CONCLUSION

Even though in Tanzania, the government has put in place measures aimed at enhancing and protecting the domestic poultry industry by imposing an import ban on poultry and poultry products from countries whose sectors are heavily subsidized and thus, have lower production costs. Despite having policies and strategies that support the poultry sector, implementation and enforcement is still not good. For example, there is no policy in place for regulating the poultry battery cages and their uses in our country therefore some of the chicken's battery cages lack standards whereby some of them are not well galvanized or not galvanized at all to prevent them from getting rust, this is of disadvantages to poultry farmers. Also, the battery cages have some of the welfare issues of concerns whereby this system of keeping chickens reduces the freedom of birds as their movement is restricted and so the chicken's welfare is compromised. The lack of free space appears to constrain activities that chickens would otherwise choose, restriction of movement in cages can have tangible consequences on the physical integrity of birds too. While the welfare of chickens in floor systems is not without concern, the advantages of a cage-free system for chicken's production are more total space, greater opportunity for exercise and improved bone health compared to cage production. Birds kept in litter-based systems are able to express more of their natural behavior, including ground scratching and dust bathing.

RECOMMENDATION

The poultry farmers and the poultry stakeholders generally must be aware that moving from a floor system to a cage system does not improve the overall welfare of birds raised, and this important consideration should be carefully weighed in future decisions regarding expansion of cage systems for chickens' production so that birds will have more space for expressing their behaviors as birds raised in deep liter/ or floor system. Also, bird's welfare is not attained solely by following non-cage or free ranging system, the nutrition, environment, and health domains are also important and contribute effectively towards the chicken's welfare. Rearing in non-cage systems allow poultry to express a wider behavioral range like foraging, scratching, dust bathing, wing flapping, perching, and nesting behavior. The Animal Welfare Act of 2008 binds everything on the five freedoms of animals and obviously the battery cage poultry framing is a problem and a source of animal welfare concern to be dealt with as it is expanding quickly in the country.

REFERENCES

1. Abeyesinghe SM, McLeman MA, Owen RC, McMahon CE, Wathes CM. Investigating social discrimination of group members by laying hens. *Behavioural processes*. 2009; 81(1):1-13.
2. Bradshaw RH. Discrimination of Group Members by Laying Hens *Gallus-Domesticus*. *Behavioural processes*. 1991; 24(2):143-151.
3. Collias NE, Collias EC. A Field Study of Red Jungle Fowl in North- Central India. *Condor*. 1967; 69(4):360.
4. Cooper JJ, Appleby MC. The value of environmental resources to domestic hens: A comparison of the work-rate for food and for nests as a function of time. *Animal Welfare*. 2003; 12(1):39-52.
5. Dawkins R. The ontogeny of a pecking preference in domestic chicks *Z. Tierpsychol*. 1968; 25:170.
6. Fraser D. Assessing animal welfare at the farm and group level: the interplay of science and values. *Animal Welfare*. 2003; 12:433-443.
7. Green TC, Mellor DJ. Extending ideas about animal welfare assessment *New Zealand Veterinary Journal*, 2011; 59(6):263-271.
8. Hemsworth PH, Mellor DJ, Cronin GM, Tilbrook AJ. Scientific assessment of animal welfare. *New Zealand Veterinary Journal*, 2015; EFSA. 2005. The welfare aspects of various systems of keeping laying hens. *EFSA Journal*, 197: 1–23.
9. Fleming, R.H., McCormack, H.A., McTeir, L. & Whitehead, C.C. 2006 Relationships between genetic, environmental and nutritional factors influencing osteoporosis in laying hens. *British Poultry Science*, 47:742–755.
10. LayWel. 2006. Welfare implications of changes in production systems for laying hens. www.laywel.eu/web/pdf/deliverable%2071%20welfare%20assessment.pdf.
11. Newberry, R.C. 2004. Cannibalism. In G.C. Perry, ed. *Welfare of the laying hen*, pp. 239–258. Wallingford, UK, CABI Publishing.
12. Perry, G.C. 2004. *Welfare of the Laying Hen* Wallingford, UK, CABI Publishing
13. Rodenburg, T.B., and Koene, 2004. Feather pecking and feather loss. In G.C. Perry, ed. *Welfare of the Laying Hen*, Wallingford, UK, CABI Publishing

15. Rodenburg, T.B., Komen, H., Ellen, E.D., Uitdehaag, K.A. & van Arendonk, J.A.M. 2008. Selection method and early-life history affect behavioural development, feather pecking and cannibalism in laying hens: A review. *Applied Animal Behaviour Science*, 110: 217–228. 63:24-30.