ADDIS ABABA UNIVERSITY

College of Natural and Computational Sciences

Department of Zoological Sciences

Dominance behavior, feeding items preference and activity patterns of chicken (*Gallus g. domesticus)* at ECG poultry farm and meat processing in Gelan town, Oromia special zone, Ethiopia.

Thesis submitted to the Department of Zoological Science in partial fulfillments for the requirements for the degree of Master of Science in Biology

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Approval Sheet

As a member the board of examiners of the thesis open defense examination, we have read and evaluated this thesis prepared by Worku Getachew entitled "Dominance behavior, feeding items preference and activity patterns of chicken (*Gallus g. domesticus)* at ECG poultry farm and meat processing in Gelan town, Oromia special zone, Ethiopia" we here by certify that the thesis accepted for fulfilling of the requirements for the award of degree of Msc in Biology.

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Abstract

The dominance interaction, food items preference and activity patterns of Chicken (Gallus g. domesticus) at ECG poultry farm and meat processing were studied in Gelan town Shaggar city, Oromia special zone of Ethiopia. Data were collected for three months, between December 2015 and June 2015 for a total of twenty four days using scan sampling method. A total of 660 scanning periods each with ten minutes duration were employed during the study. Two days each for dominance behavior, activity pattern and food items preference behavioral record in each maturity stages; juvenile, adults, decrepit and mixed was conducted. During dominance behavior study, the behavior of chickens such as playing, chasing, pecking and aggression was recorded. Food items preference of chickens based on their age categories was also examined. Data were analyzed by Excel Microsoft, SPSS software, frequency, chart and table. The average activity pattern behavior in different age classes of chickens had no stastically significant difference both in morning and afternoon time slots (p = 0.584) at 95% confidence level. The result showed that dominance behavior of chicken that was mostly expressed was playing (34%), followed by pecking (29%), aggression (22%) and chasing (16%). There was no significant difference between the sample means of four dominance behaviour (chasing, pecking, playing and aggression) of age classes (P= 0.522) at 95% confidence level. Feeding layer supper showed the highest proportion compared to other activities. Food preference of chickens was layer supper stuff food (64%) and followed by corn (20%). A layer supper food item was more preferred than others by adults and decrepit age group. There was a stastically significant difference of four food items preference in age classes of chickens (p =0.003) at 95% % confidence level

Key Words

Dominance, Activity patterns, Feeding, Aggression, Scanning, Pecking, Chasing, Grooming, alert, vocalization, copulation, resting, walking, drinking and playing.

CHAPTER ONE

1. Introduction

1.1. Background of the study

The domestic chicken (*G. g domesticus*) is a subspecies of the red jungle fowl (*Gallus gallus*), which is a wild variant of a chicken living in southeast Asia (Al-Nasser *et al.,* 2007). Domestication of chicken began long ago, as domestication of red jungle fowl was observed as early as 8000 years ago (West and Zhou, 1988). Although chickens have been domesticated for a long time, they are still similar to the red jungle fowl in many aspects such as basic needs and behaviors. There is also no evidence that the chicken's cognitive abilities should have been affected by domestication (Marino, 2017).

Chickens are omnivores and therefore have a wide diet, ranging from berries and seeds to insects and small vertebrates (Savory *et al. ,* 1978). Senses of chickens are characterized by a great eyesight and sense of touch, especially in the beak which is used for a variety of purposes. Uses of beak include picking up items, drinking, preening, as well as investigating and exploring the environment. The beak is also used during fights as a weapon (Gentle and Breward, 1986; Marino , 2017). Besides this, chickens also have other well-developed senses, such as those for taste and smell (Jones and Roper , 1997). Both the domesticated chicken and red jungle fowl form social groups, which usually consist of one dominant male and female as well as other individual of mixed rank and gender (Appleby *et al. ,* 2004). Within the group, the chickens communicate with each other in a variety of ways, such as through visual displays and sounds, where each type of sound has its own unique meaning (Joos and Collias, 1953 and Collias. , 1987). Even young individuals communicate using a variety of sounds as the chicks have been shown to give off alarm calls when predators are close. Additionally, chicken domestication started with red jungle fowl (Albino

and Tavernari , 2010) and is native to multiple regions in Southeast Asia (Hata *et al.* , 2021). These birds were first used as fighting animals or in rituals. Then, breeding the species began to be treated as an economic activity to generate profit from the production of meat and eggs (Nunez-leon *et al.,* 2019; Rubin *et al.,* 2010). During this period, animal welfare science's focus was to attend to animals' basic needs, such as biological function. However, over the years, scientific evidence has revealed animal suffering in the face of behavioral needs, so emotions and feelings began to be considered (Dawkuins, 1977 and 1978). Such factors demonstrate the science of animals, which means that animals have the ability to feel painful sensations and feelings (Abreu *et al.,* 2017). As a result, avoiding suffering and providing animal's preferences became essential in animal welfare (Dawkins, 1998). Dominance hierarchies play an important role in the social organization of animals living in groups (Rowell *et al.,* 1974).

Ethology can be used as a tool that can help us understand animal's health and their requirements (Wemelsfelder and Mullan , 2014). Behavior can be analyzed by the movements of a particular individual or group and is highly influenced by the environment in which this bird is conditioned (free, semi-confinement, or total confinement (Amaral *et al.,* 2016 and Costal *et al.,* 2012). Thus, this study was aimed at understanding dominance behavior, activity patterns and feeding behavior of domestic chicken in poultry farms.

1.2. Statement of the problem

In Ethiopia, commercial poultry production out of the 39 hatcheries, 50 % are not working presently, 40% perform below standards and only a few show good hatchability records. Because, farmers have issues of serious problems such as lack basic knowledge on good poultry keeping practices, lack of feedback response behaviors and scarcity of inputs needed. Additionally, in Ethiopia this titles is not yet researched very well on different aspects and it wanted to show in terms of our country context. Hence, dominance interaction, food items preference and activity patterns of chickens were performed to find solution for the problem.

1.3. Objectives

1.3.1. General Objective

The general objective of this study was to investigate the dominance behavior, feeding items preference and activity patterns of chicken (*Gallus gallus domesticus)* at ECG poultry farm and meat processing.

1.3.2. Specific Objectives

The specific objectives of this study were:

- ♣ To analyze the dominance behavior of chicken at ECG poultry farm and meat processing.
- ♣ To explore the feeding behavior of chicken at ECG poultry farm and meat processing.
- ♣ To identify activity patterns of chicken at ECG poultry farm and meat processing.

1.4. Research Questions

- ❖ Does chicken show dominance behavior?
- ❖ Does the diet of chicken vary depending on ages?
- ❖ Does activity pattern of chicken vary based on age and time of the day?

1.5. Significance of the study

The findings of this study are important to provide necessary information about dominance behavior, feeding items preference and activity patterns of chicken at ECG poultry farm and meat processing. In addition the findings of this study were help to better understand the ecology and behavior of chickens.

1.6. Limitation of the study

While doing this thesis, the researcher has faced various problems like:

- Unwillingness of wealthy/ businessman was high in the study site of the breeding chickens making it difficult to conduct the thesis research.
- During the three time slots, it's not easy to follow the study site of the breeding chickens.
- Shortage of financial resource.

CHAPTER TWO

2. Literature review

2.1. General characteristics

Chicken domestication started with red jungle fowl (Albino and Tavernari, 2010). Thus, birds were first used as fighting animals or rituals. Later, people start keeping chickens primarily as a source of food (consuming both their meat and eggs) and as pets. Rooster or cock is a term for an adult male bird, and a younger male may be called a cockerel. A male that has been castrated is a capon. An adult female bird is called a hen and a sexually immature female is called a pullet.

2.2. Behavior of chickens

Behavior is an important subject in the management of commercial flocks. The behavior of chickens characterizes the species as much as does any anatomical attribute and is the means by which chickens cope with the environments in which they live. A chicken's flexibility in dealing with different situations is limited by its inherent behavioral characteristics. Commercial production systems must accommodate chicken behavior or fail to achieve performance objectives. In fact, production systems rely to a great extent on the behavior of chickens, e.g., feeding behavior, sexual behavior and egg laying behavior, etc. On the other hand, many of the problems that occur in intensive production systems arise from behavior which, unfortunately, is harmful to the flock or is inappropriate to performance objectives (McBride G.*et al.*, 1969).

2.2.1. Dominancy behavior

Chickens tend to be sociable animals that form groups or flocks. When space is available, birds often form subgroups, each with an established social order (Bhanja Sh. and Bhadauria P., 2018). Dominance is agonistic interaction between two individuals, in which one dominant individual subdues the other

individual (Chase and Seitz , 2011). Agonistic behavior in chickens includes fighting and pecking, as well as submissive responses such as avoiding contact (Iffland *et al.* 2021 and Teunissen *et al.*, 2018).

2.2.2. Feeding behavior

Feeding is one of the biggest moments of conflict and also the moment of trying dominance and establishing hierarchy. As a result, tolerance develops, and several birds may feed with only the posture of a threat being enough to maintain or strengthen social relationships (Grandin, 2019 and Gupta Shailesh *et al.*, 2015).

Jungle fowl and their domestic cousins are omnivores, consuming a variety of nuts, seeds, fruits, insects, crustaceans, molluscs, and small vertebrates (Arshad *et al.* , 2000)and chicks adjust their foraging behavior according to the most nutritionally appropriate food for their age (Murphy *et al.*,2014). Adult jungle fowl allocate a large proportion of their time to foraging activities; hens were observed ground pecking in 60% of minutes during the active part of the day, and ground scratching in 34% of minutes (Dawkins, 1989). These behaviors are also performed as part of the dust bathing behavior sequence (Kruijt 1964 and Collias , 1967), which hens perform for less than 30 min every other day, to maintain their plumage condition (Vestergaard, 1982). Chicks are also guided toward appropriate food by jungle fowl and domestic hens that use vocalizations and pecking movements directed toward food items to attract their chicks to food (Sherry, 1977 and Stokes , 1971). They modify their behavior/display, depending on the quality of the food and the behavior of the chicks (Moffatt and Hogan 1992, Nicol and Pope , 1996). In this way, chicks learn appropriate foraging behaviors, although this learning is modulated by the chicks' own experiences (Moffatt and Hogan 1992, Nicol 2004 & Hogan , 1973).

2.2.3. Nesting behavior

This behavior precedes ovipositor consists in the search of an adequate place to lay the egg (Stokes, 1971). Hens rapidly get in and out of the nest boxes, or build their nest on the litter. At the time of lay, the hen

enters the nest and remains there (Duncan, 1998).Nesting behavior is an example of natural behavior with a predominantly internal motivation, that is, it does not depend on the external environment. This behavior is expressed or attempted to be expressed 1h to 1h30 before lay. If the bird is not able to build the nest, this need is frustrated and the hen demonstrates its frustration sitting and not performing any activity (Duncan, 1998).

2.2.4. Aggressive behavior

In addition to expressing behaviors that may contribute to their welfare, that is, those promoting physical, psychological, and social benefits, chickens may also express negative behaviors, detrimental to their welfare, when frustrated or frightened. Freedom from fear and distress is one of the five animal freedoms established by the UK government in 1965, and later adopted by several international bodies as an animal welfare paradigm. According to Broom in 1991, fear is a preparation for danger or response to a detectable danger. It is associated with freezing behavior, tonic immobility, escape attempts, aggression, adrenal cortex activity, heart-rate elevation, and effects on meat quality. Fear reactions range from a mild state of alert to extreme panic, with behavior indicating suffering and welfare impairment(Duncan, 1998).

2.2.5. Communication behavior

Chicken communication consists of at least 30 distinct vocalizations, which some can be identified as alarm, warning, mating, fear, distress, food, contact, territorial, dust bathing, perching, battle cries, privacy, time calls, laying, nesting, mating, threat, submissive and dominance (Tefera, 2012).

2.2.6. Social behavior

Chickens tend to be sociable animals that form groups or flocks. When space is available, birds often form subgroups, each with an established social order (Bhanja Sh. and Bhadauria P. , 2018). Dominance is agonistic interaction between two individuals, in which one dominant individual subdues the other

individual (Chase and Seitz, 2011). Agonistic behavior in chickens includes fighting and pecking, as well as submissive responses such as avoiding contact (Iffland *et al.* 2021 and Teunissen *et al.,* 2018).

2.2.7. Drinking behavior

Water is fundamental in animal nutrition, and it also plays an essential role in the physiology and metabolism of birds, acting in thermal homeostasis, food digestion, and waste elimination (Khosravinia, 2015). The regulation of water intake in these animals counts on two voluntary mechanisms of action: cellular dehydration and the renin-angiotensin system, which act to stimulate thirst, and can be influenced by several extrinsic and intrinsic factors in birds (Vanderklis and Delange , 2013). Birds can have their water intake influenced by diet, in which diets rich in soluble fiber induce a daily water intake of 2.5 times higher (Nielson *et al.* , 2011). As well as the physical form of the diet, the pelleted and ground diets induce greater intake when compared to bran diets. Regarding temperature, increasing 1 ºC above the thermal comfort zone, we also improve the water consumption by up to 7% (Viola *et al.,* 2011).

CHAPTER THREE

3. Materials and methods

3.1. Description of the study area

ECG poultry farm and meat processing was land leased holding Gelan town administration issued for investment. It's established in 2007 and covers on 1400 m^2 of land coverage. The main target of this poultry farm was requesting egg and meat product to decrease inflation or to balance demand and supply in market in Ethiopia. The study was conducted in Gelan Sub-city located at 8° 45' 40"N to 8° 50' 30"N latitudes and 38° 42' 30"E to 38° 52' 100"E longitudes (Fig. 1). It is found 25km away from Addis Ababa. Gelan town has a moderate climate with an average annual temperature and of annual rain of 22^0 degrees 22^oc and 614mm, respectively. It is dry for 6 months with an average humidity of 64% and an UV- index of 5 (www.best time to visit.co.za). The town is well known in having various industries and the second city in Oromia region with more industries (www.best time to visit.co.za).

Figure 1. Location map of study area

3.2. Materials

The materials that were used during the study period were phone, stopwatch and data sheet, pencil

3.3.Methods

3.3.1. Preliminary survey

Ecological survey of chickens in and around Gelan town was carried out to gather relevant information. In this survey, an overall view of chickens specifically to chicken of the area was conducted. Information was collected from local people living around the study area and workers.

3.3.2. Data collection

The data was collected through direct observation and focus group discussion with selected facilitator and other key informants. Secondary data for this study was gathered from related published and unpublished materials, books, journals, manuals, and government publications which may found in the library, website and report from the poultry industry. Poultry farm was classified into four age groups consisting of juvenile (from 1-4 months), adults (5-9 months), decrepit (above 9 months) and all mixed (above 1 month). From each age group ten, nine, eight and six individual were sampled and followed for behavioral activities. Data was collected for a total of 24 days (4 age groups * 3 activities * 2 phase), two times for each observation of dominance behavior, activity patterns and food items preference behavior.

Plate 1 (Photography by Worku Getachew in 2015) Chicken of different age group.

A) juvenile B) Adult C) Decrepit and D) All mixed age group

3.3.2.1. Dominance behaviour

Data on dominance behavior of chickens was collected from four age groups namely; Juvenile (0-4 month), Adult (5-9 months), decrepit (>9 month) and all mixed (>1 month all involvement). Morphological differences and physical appearance were used to differentiate the adults from the juveniles and decrepit, because the adults are bigger, active, full of feathers and dominant over others. There was no male sex involvement in the poultry farm project of the stage selected for investigation, because of female chickens laying eggs by vitamins/ layer super food. Data behavior of chickens was collected by observing and recording individual chickens in the sample groups. During the observation period, a group or individual chickens were followed at a time of 5-10 minutes, depending on their presence. Five minute scan samples

were taken at interval of 5 minutes (Altman, 1974). The observations were made from early morning to late evening dividing the day into three time slots; morning 6:00–8:20am, mid-day 12:00am-14:00pm, and late afternoon from 16:00-18:20pm due to unable to gather data out of the day from business man fear of contamination of site of chicken breeding. In dominance interaction observation involving social behavior was priority consideration given for playing, chasing, pecking and aggression.

3.3.2.2. Feeding habits

Feeding behavior of chicken including food habits and food items preference of *Gallus g. domesticus* was collected using the same procedures for dominancy interaction data. Data was recorded two times per a day; because, feeding period of chickens occurred in two major categories namely; early morning from 6:00am–8:20am and late in the afternoon from 14:00pm-16:20pm and only four food items selected given to them for expecting of more products.

3.3.2.3. Activity pattern

Activity pattern of each four age groups was observed. Observations were made from early morning to late evening dividing the day into three time slots; morning 6:00–8:20 am., mid-day 12:00am-14:20 pm., and late afternoon from 16:00-18:20 pm. Activity pattern of chickens were recorded using scan sampling methods throughout the study period (Altima, 1974). During the observation period, a group or an individual chickens were followed at a time of five up to ten minute. Five minute scan samples were taken at an interval of five minute. For recording data, ten major activity patterns were performed on feeding, drinking, scanning, walking, grooming, resting, alerting, vocalization and copulating behavior of chickens were recorded.

3.4. Data analysis

Data were analyzed by Microsoft EXCEL, one way ANOVA and frequency, percentage, table, and chart were used to sum up dominance, activity patterns and food items preference behavior.

CHAPTER FOUR

4. Results

4.1. Dominance behavior in chickens

As tries to indicated in fig. 2 the highest from all dominance behavior of chicken's were playing (43%) and second in juvenile (37%). In case of all mixed age dominance behaviour of aggression in the first 41% and second (19%). Pecking of dominance behavior in decrepit chicken shows superior frequency observation (34%) and in juvenile (32%).

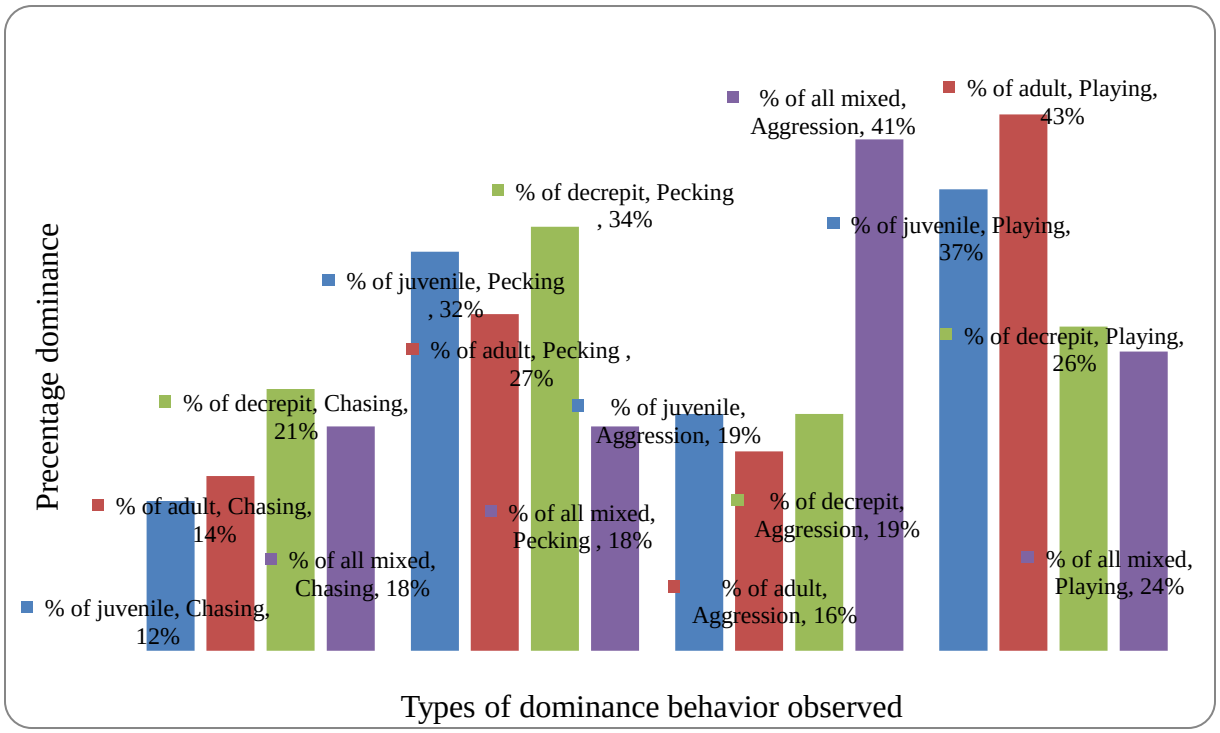

Figure 2: Dominance behavior of age classes of chickens

There was no significant difference between the sample means of four dominance behaviour (chasing, pecking, playing and aggression) of age classes (p= 0.522) at 95% confidence level. Therefore, calculated value of dominance behavior ($F_{3,12}$= 0.789) is less than the table value of ($F_{critical}$= 3.49) at 95% confidence level.

Hence, null hypothesis is accepted. This mean the analysis support the null hypothesis of statistically there is no significant difference between the sample means between the chasing, pecking and aggression varieties of behaviour of age classes).

Table 1: Dominance behavior of age classes of chickens

Dominance behavior	Age classes of chickens			
	Juvenile	Adult	Decrepit	All mixed
Chasing	12	13	17	11
Pecking	32	25	27	11
Aggression	19	15	15	25
Playing	37	39	21	15

	SUMMARY						
	Groups	*Count*	*Sum*	*Average*	*Variance*		
	Juvenile	4	100	25	132.6667		
	Adult	4	92	23	141.3333		
	Decrepit	4	80	20	28		
	All mixed	4	62	15.5	43.66667		
	ANOVA						
	Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
	Between Groups	204.75	3	68.25	0.789778	0.522551	3.490295
	Within Groups	1037	12	86.41667			
	Total	1241.75	15				

4.2. Food items preference of age groups chickens

The result from 660 observations of chickens showed preference of layer supper stuff food items (66% in juvenile, 64% in adult, 63% for each decrepit and all mixed age classes). A layer supper food item has taken high priority in four food items given to all four age classes of chickens. There was stastically significance difference of four food items preference in age classes of chickens ($p < 0.05$). (Fig. 2)

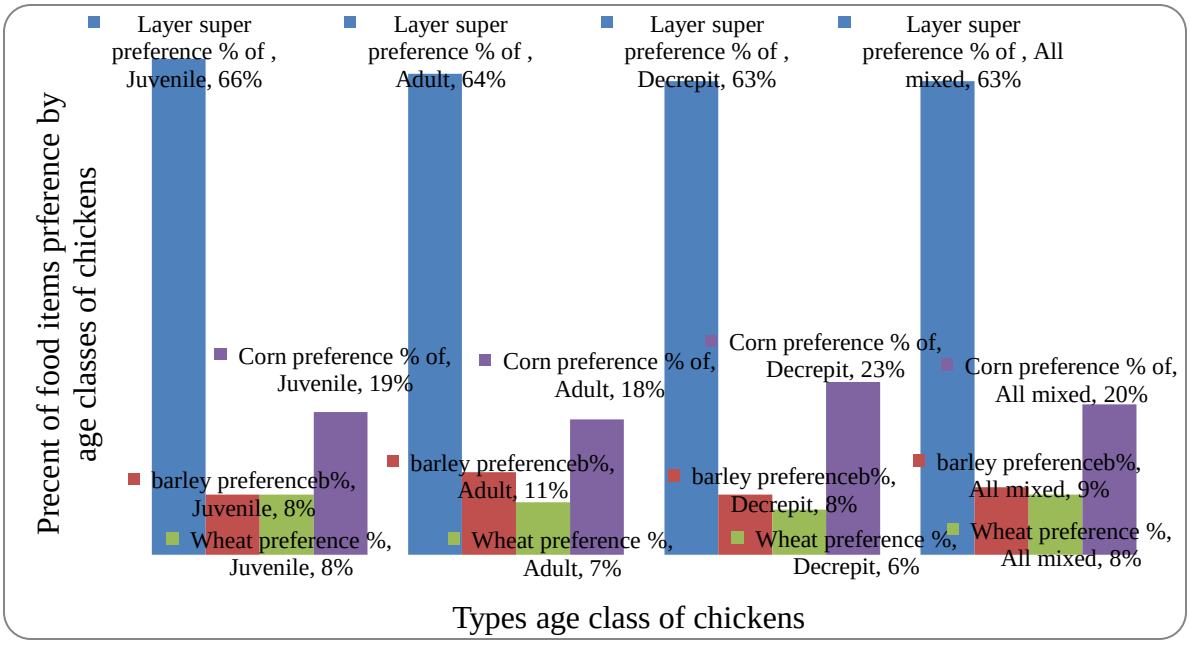

Figure 3: Food items preference by age classes of chickens

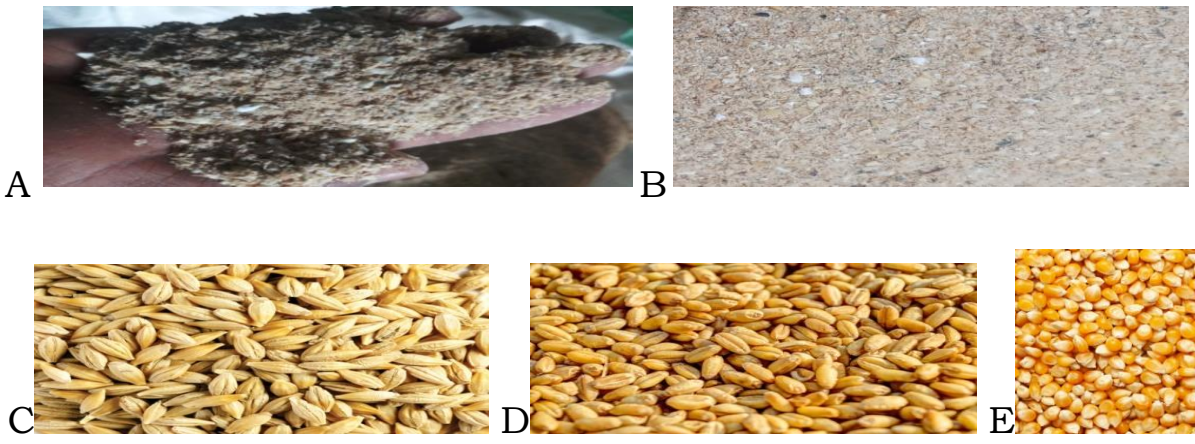

Plate 2. Photography captured by Worku G. in 2015) food items preferred by age group of chickens

Plate 2 implies that A (layer supper), B(pullet feed), C (barley), D(wheat) and E(corn) were indicates that preference of food items by different age classes of chickens

4.3. Activity patterns of chickens

The activities that shown in juvenile were mainly engaged and superior ranked 1 up to 3 were feeding (26%), scanning (19%), and resting (15%) (Fig.4). In others cases, juvenile age group of chickens also characterized by presence of aggression and grooming activities during three time slots.

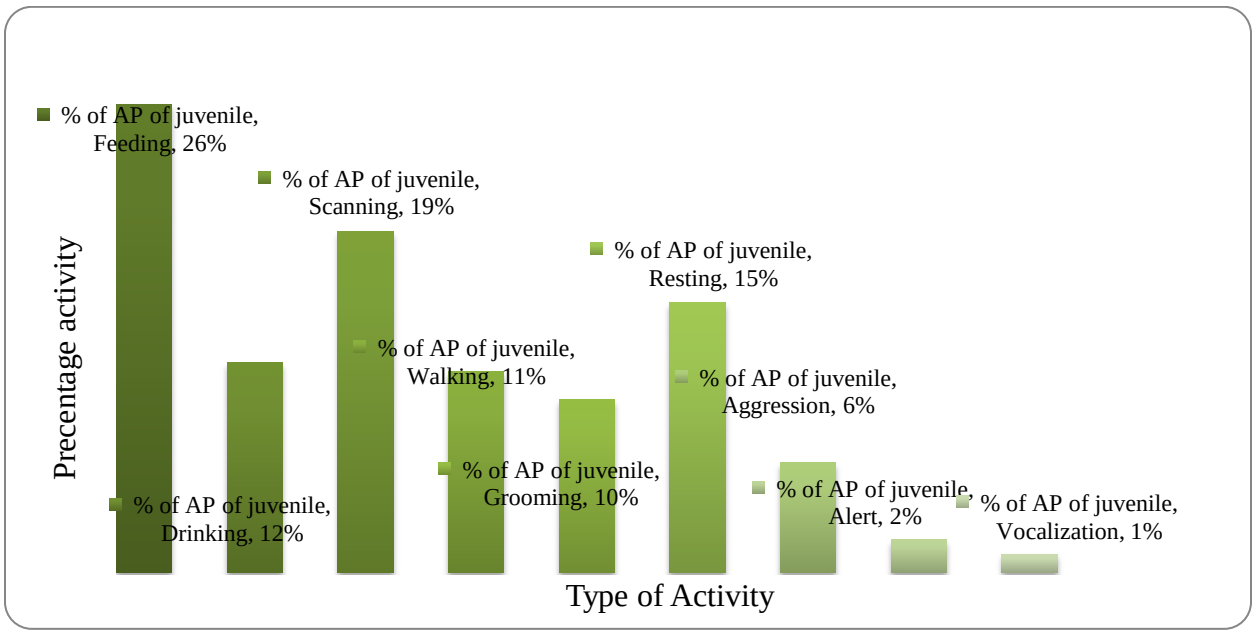

Figure 4: Percent of activity patterns of juvenile age class

Figure 5 indicates that during morning (6:00-7:35) time slot juvenile age classes shows high level observation of drinking behavior (54%) than others activities. In case of midday, an alert (67%) activity takes high superiority than other activities. Additionally, during afternoon time slots a chicken shows vocalization (67%) and walking behavior (52%). Then, all behavior activities have been observed by variable time sequence and behaviors. In all three time slots nothing copulation activities reflected.

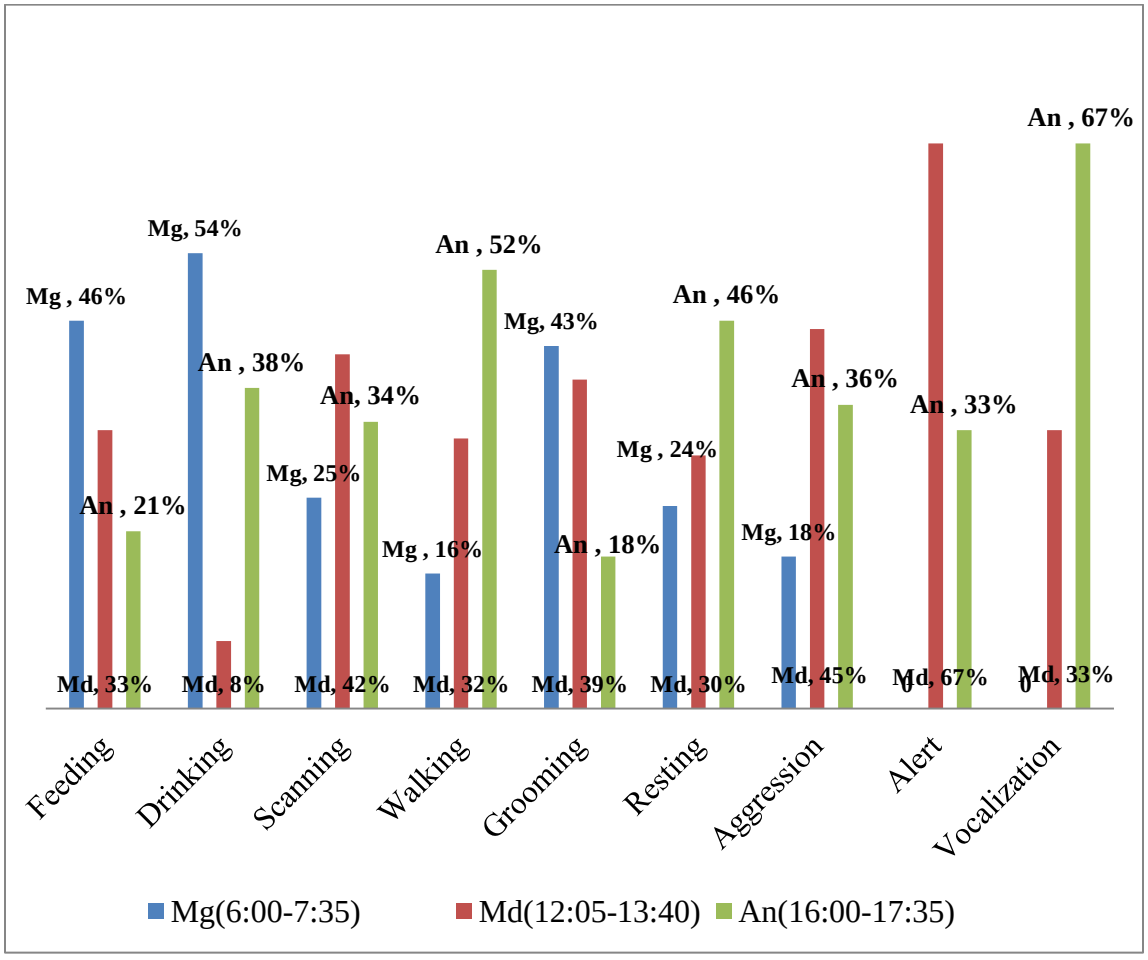

Figure 5: Percent AP of juvenile age group in three time slots (Mg: Morning; Md: Midday: An: Afternoon)

Adult age groups (Fig. 6) showed feeding behavior (24%), walking (20%), scanning, resting and drinking (12% for each). This reflects that out of ten behavior more proportion was spent for feeding, scanning and drinking behavior than others behaviors activity patterns.

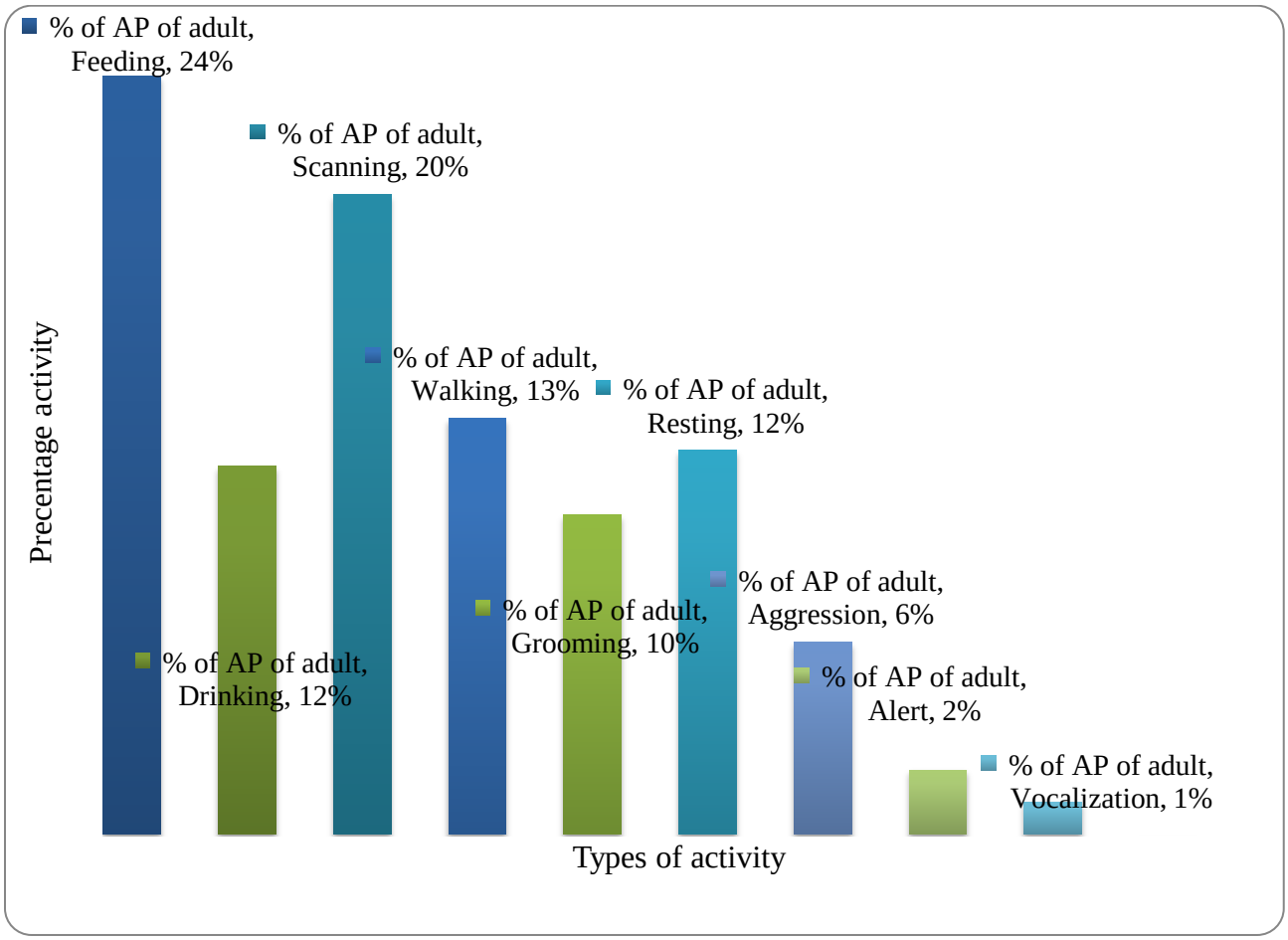

Figure 6: Percent of activity pattern observed by adult age class.

As shown in figure 7, activity patterns of behavior chickens in decrepit age groups percent observation of first and second phase ranked as feeding behavior (25%), scanning (20%) and walking (13%).

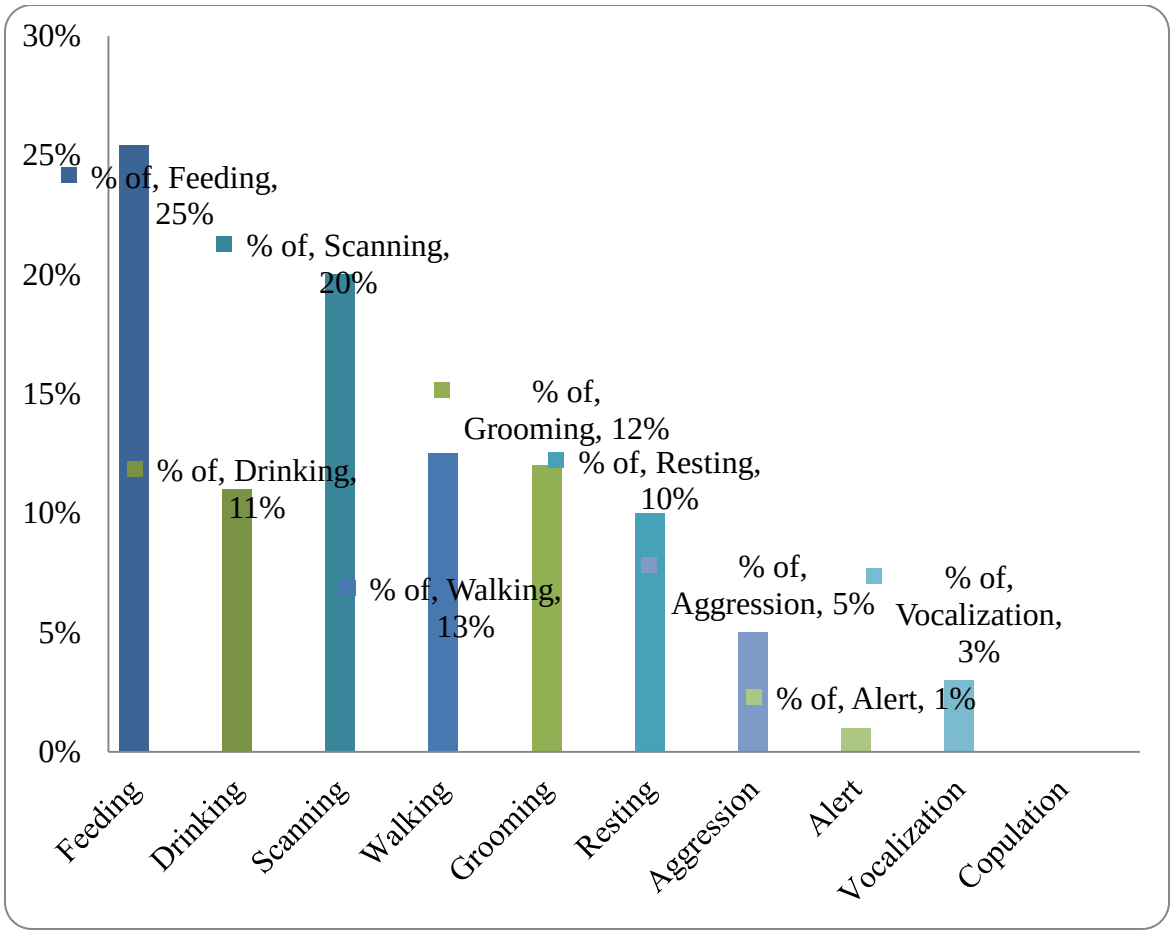

Figure 7: Percent of activity pattern behavior decrepit age class

As in figure 8, all mixed age group of chickens a variety of feeding and scanning activity pattern behaviors were reflected by percent as first and second rank (24% and 17%) respectively.

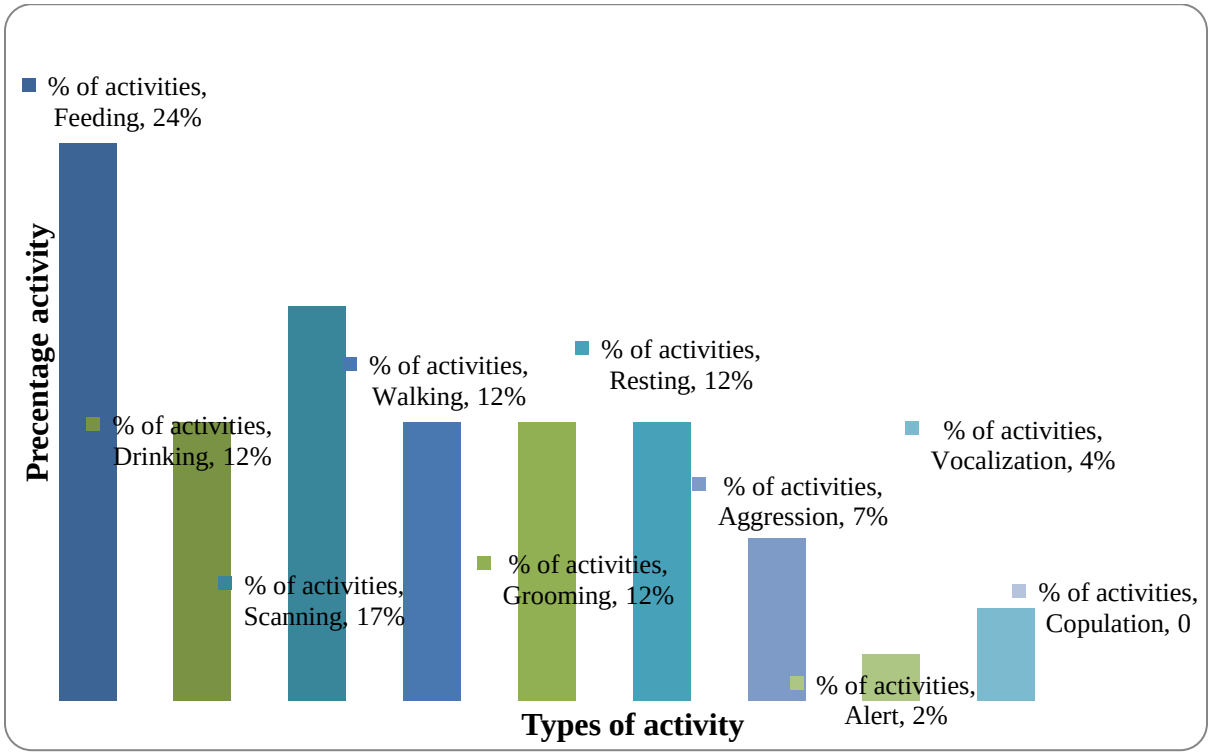

Figure 8: Percent of activity pattern behavior observed by all mixed age group

As tries to indicate in fig. 9 different age groups of chickens shows a varied mean average degree of activities based on their time slots and age classes. The highest proportion activities pattern behavior in all age class that ranked from 1 up to 3 were feeding (25%), scanning(19%) and walking(12%), respectively (Fig. 9).

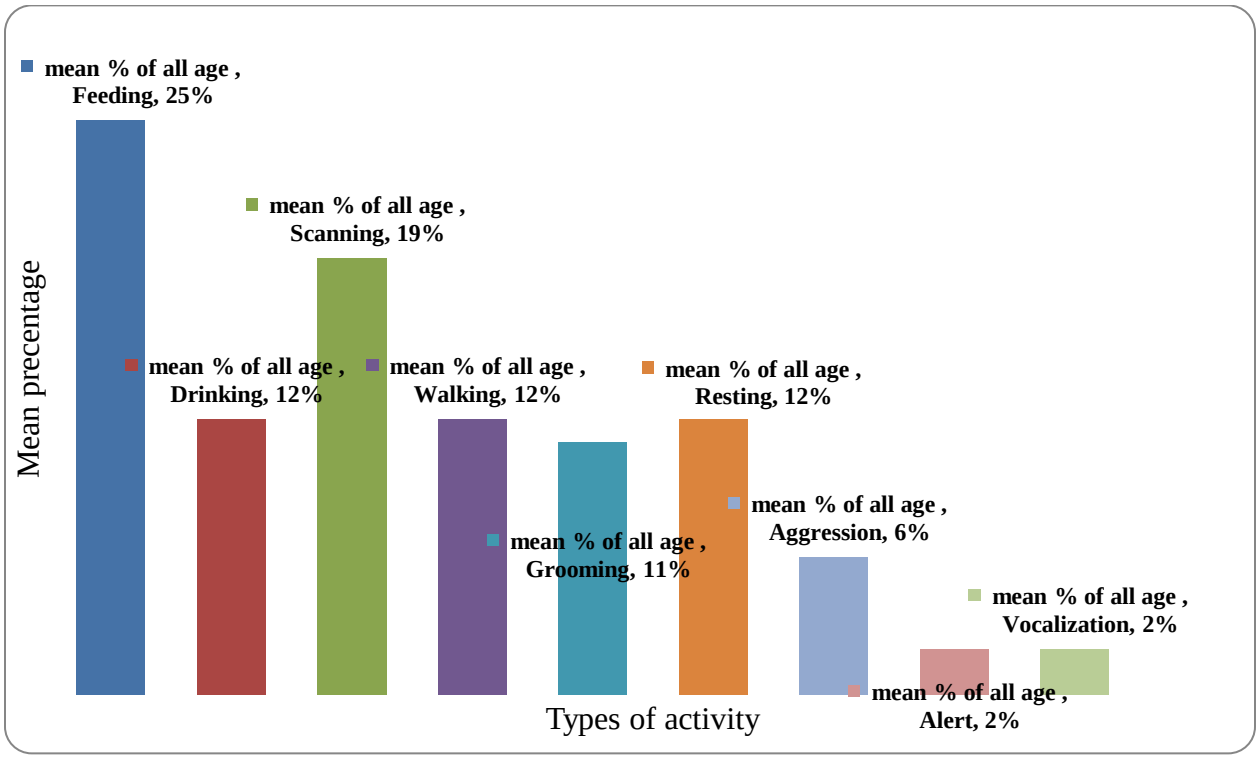

Figure 9: Mean percent activity pattern behavior of all age classes

Table 2 implies that the average activities behavior takes more superior to activities shown in juvenile, adult, decrepit and all mixed. Feeding (77,64,61,44), scanning(56,54,48,30) and resting (45,33,25,21) respectively.

Table 2. Average of activity pattern observation of age classes of chickens

Activity patterns	Average of observation of age classes of chickens			
	Juvenile	Adult	Decrepit	All mixed
Feeding	77	64	61	44
Drinking	35	33	27	21
Scanning	56	54	48	30
Walking	33	35	30	22
Grooming	29	28	29	22
Resting	45	33	25	21
Aggression	19	15	13	12
Alert	6	6	3	4
Vocalization	3	4	7	6
Copulation	0	0	0	0

According to result indicated by one way ANOVA and table 2 above , the average activity pattern behavior in different four age classes of chickens have no stastically significant difference both in morning and afternoon time slots (p =0.584) at 95% confidence level. Therefore, it is concluded that the difference in all age class of activity pattern behaviour $F_{3, 12}$= 0.789 is less than $F_{critical}$= 3.49 **(F_{calc}<$F_{critical}$)** output due to varieties is insignificant and is just a matter of chance in age class.

Table 3: Statistical significance difference of activity pattern behavior

SUMMARY						
Groups	*Count*	*Sum*	*Average*	*Variance*		
Juvenile	10	303	30.3	607.7889		
Adult	10	272	27.2	453.0667		
Decrepit	10	243	24.3	382.4556		
All mixed	10	182	18.2	174.4		
ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	796.6	3	265.5333	0.656566	0.584129	2.866266
Within Groups	14559.4	36	404.4278			
Total	15356	39				

CHAPTER FIVE

5. Discussion

Pecking orders within each flock were determined from a combination of several methods. These consisted of dominant-subordinate relationships from direct flock observation and paired encounters between flock mates (Marks *et al.*, 1960). Both the domesticated chicken and red jungle fowl form social groups, which usually consist of one dominant male and female as well as other individual of mixed rank and gender (Appleby *et al.*, 2004). Within the group, the chickens communicate with each other in a variety of ways, such as through visual displays and sounds, where each type of sound has its own unique meaning (Joos & Collias, 1953 and Collias., 1987). As result obtained from studies, the calculated value of chasing ($F_{3,12}$= 0.789) is less than the table value of ($F_{critical}$= 3.49) at 5% confidence level. Hence, null hypothesis is accepted. Therefore, it is concluded that the difference in adult age class of chasing dominance behavior output due to varieties is insignificant and is just a matter of chance and the same decision procedure for aggression behaviour of adult age class. However, in case of pecking behaviour of calculated value of chasing ($F_{critical}$= 2.44) is greater than the table value of ($F_{1,2}$= 0.412) at 5% level of significance. Hence, hypothesis is rejected. This mean the analysis doesn't support the null hypothesis of statistically there insignificant difference between the sample means b/n the chasing, pecking and aggression varieties of behaviour of adult age classes). Therefore, it is concluded that the difference in adult age class of pecking dominance behavior output due to varieties is significant and is just a matter of chance and flow the same as rest one.

General type of resting behavior which (Scott, 1958), defined as a situation in which two or more individuals do the same thing with a mutual stimulation. This, however, would not necessarily be the sole reason for resting at very early ages. Other possible explanations that the thermo-regulatory mechanism in chickens is not fully developed at these ages (Lamoreux and Hutt, 1939) and that grouping during resting and sleeping was primarily for warmth. In result of studies different activities behaviors were based on different time slots such as morning, midday and afternoon in their daily life. However, all activities were not shown equal level in three time slots in all age group of chickens. Usually, resting /sleeping and drinking were primarily reflected after all activities, because of the would necessary to control thermo-regulatory system of chickens in poultry farm.

Chickens are omnivores and therefore have a wide diet, ranging from berries and seeds to insects and small vertebrates (Savory *et al.,* 1978). Senses of chickens are characterized by a great eyesight and sense of touch, especially in the beak which is used for a variety of purposes. Uses of the beak include picking up items, drinking, preening, as well as investigating and exploring the environment. The beak is also used during fights as a weapon (Gentle & Breward, 1986; Marino, 2017). As studies all types of food items was not make chickens profit and all age groups were not feed the same food items. Their food preference was based on their beak structure and age groups. Those juvenile age groups preferring of pullet layer food items for more rapidly development, increase body weight of pullet body ready for laying eggs and adult, decrepit and some all mixed age groups prefers layer supper food stuffs services as increase egg laying continuity and meeting processing. Pullet food items were almost similar to layer supper except some extent difference of constituent's and smaller particle crushed to make confortable for ingest by pullet chickens. Additionally, they can also feed raw seeds if given to them.

However, some members of juvenile age groups and others were difficult to pick up of raw seeds from land due to their beak truncated to minimize risk during attacking with in age group of chickens. The preference of food items different age group of chickens the quantity and types of food items preference varied from time to time based on their age. For instance, the juvenile stage feed low amount & preferring pullet feed than others food items. It doesn't mean of juvenile age group not foraging of layer supper & other food items; because of their except some extent difference ingredient, most contents were almost similar. The average percent of food items preference of layer supper types of food item was more preferred than others food items such as corn, wheat and barley by all age group of chickens. Because, layer supper food items was the continent of all those raw crops and necessary for egg lying stage of adult and decrepit chickens mostly used in the project of breeding chickens.

CHAPTER SIX

6. Conclusion and Recommendation

6.1. Conclusions

In Ethiopia studies on different aspects of the dominance behavior, feeding behavior and activity patterns of chicken were need emphasize and consideration for improving poultry farm. In the members of chickens within age groups the competition for survival fitness and continues their lifestyle dominancy behavior such as aggression, chasing, playing and pecking order were appreciated in study. Chickens were not feed all food items easily affordable in our environment. There was food items preference by stage of chickens that necessary for development, growth and egg lying. Layer supper food items preferred more than others by adults and decrepit age group of chickens that important for egg lying food stuffs. Likewise, pullet feed types of food stuffs were mostly selected by juvenile stage of chickens in order to growth faster and enough for poultry farm in short period of time. Additionally, different drugs given as addition to food items such as multivitamin that used for increasing appetite of chickens and drugs like *Aminotech* and *Garlimint* to increase immunity, antimicrobial and decrease the risks of respiratory infection diseases were necessary for well poultry farm product. Furthermore, chickens shows the a variety of activity pattern behaviors such as feeding, drinking, scanning, walking, grooming, resting, aggression, alert and vocalization were the behaviors reflecting by chickens in different stage within a variation of level in juvenile, adult, decrepit and all mix in first and second circle observation. Generally, Just by observing and interacting with them provides important empirical validation to our understanding of chicken behavior, anyone with an inquisitive mind and an interest in chickens can learn a great deal about them.

6.2. Recommendations

- Poultry farm and meat processing should be requires giving high priority consideration, good understood of all behavior stimuli observed and need to measure feedback response steps by steps according to activities behavior reflected from chickens within age groups.
- There was no significant difference between the sample means of four dominance behaviour (chasing, pecking, playing and aggression) of age classes (p= 0.522) at 95% confidence level.
- There was stastically significance difference of four food items preference in age classes of chickens (p=0.003) at 95 confidence level.
- The average activity pattern behavior in different four age classes of chickens have no stastically significant difference both in morning and afternoon time slots (p =0.584) at 95% confidence level.
- Poultry farms should be processing, directing and following with professional skilled man from training of servants up to treatments of chicken's health.
- Therefore, just by observing and interacting with them provides important empirical validation to our understanding of chicken behavior, anyone with an inquisitive mind and an interest in chickens can learn a great deal about them.

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8. Data sheet and appendix

Appendix 1: Activity patterns behavior of different age groups of chickens

Site/stage																					
Activity	Juvenile					Adult					Decrepit					All stage					
	Time				Average	Time				Average	Time				Average	Time				Average
Feeding																					
Drinking																					
Scanning																					
Walking																					
Resting																					
Aggression																					
Grooming																					
Alert																					
Vocalization																					
Copulation																					

Appendix 2:- Dominance behavior different age group of chickens

Dominance behavior of chickens	Age group of chickens in monthly during 6:20-8:20			
	1-4 month	5-9 month	>9 month	>1 month
Chasing				
Pecking order				
Aggression				
Playing				

Appendix 3. Feeding items preference by different stages of chicken

	Population size & food items preference of chickens																
	Layer supper				*Barley*				*Wheat*				*Corn*				
	Stage				*Stage*				*Stage*				*Stage*				
Time	*Juvenile*	*Adult*	*Decrepit*	*All mixed*	*Juvenile*	*Adult*	*Decrepit*	*All mixed*	*Juvenile*	*Adult*	*Decrepit*	*All mixed*	*Juvenile*	*Adult*	*Decrepit*	*All mixed*	*Sum*
6:00-6:05																	
14:00-14:05																	
6:15-6:20																	
14:15-14:20																	
6:30-6:35																	
14:30-14:35																	
6:45-6:50																	
14:45-14:50																	
7:00-7:05																	
15:00-15:05																	