

Chapter one

Introduction

Poultry industry is so important in the development of livestock market the great importance is the highly nutritional value of source of animal protein poultry industry has occupied a leading role amongst agricultural industries in many part of the world as it the major source of animal protein for human population (*Anonymous2002*).

poultry nutrition looking at all the difficulties confronting herds for this feed must contain all the necessary requirements to save bird life and continuing the economic products so nutrition is a key factors in the increase or decrease profits poultry projects representing about two-thirds of the cost.

In the Sudan problem facing of rising feed prices and expensive cost of feeds so feed sources and food additives alternative can help to reduce production costs and increase product quality. and falls under these unsaturated oils range sources as feed additives in poultry feed poultry feed such as soya, sunflower and peanuts.

Where results showed that peanuts contain high concentrations of antioxidants including(pcoumaric acid), which helps to reduce the risk of heart disease and related neurodegenerative atrophy .

The peanut plant is rich in vitamin e include percent GM almost 8 grams of this vitamin is an antioxidant, and is also rich in vitamin (b) vehicle, including folate, niacin, thiamine alraibovlavin vitamin (B6) and many minerals such as copper, iron, potassium, magnesium, zinc, selenium, Peanut receiving great importance to contain the fatty acids.

Objectives: The aim of this study was to examine the effect of adding peanut graduated levels on broiler diets and their effects on the overall performance in productivity which increase weight

Chapter two

Literature review

2:1 Poultry nutrition:

Poultry feeding costs constitute about 50-70% of the total cost of poultry production. Because of that the development of poultry industry depends upon the large extent on the availability of feedstuffs that are used or can be made suitable for use in poultry nutrition. Yellow maize and soybean meal are the two major ingredients used in poultry nutrition. The availability of these two feed ingredients in some areas like Sudan is very rare due to their high cost. This has made poultry nutritionists in Sudan to search and use feed ingredients produced locally at low cost. The groundnut or peanut *arachis hypogaea* is grown as an annual crop on about 19 million hectares in the warmer regions of the world principally for its edible oil and protein rich seeds borne in fruits pods which develop below the soil surface the dry pericarp of the mature fruit is known as the shell or husk historical trends Both the cultivated groundnut and the genus *A rachis* are exclusively south American the genus is thought to have originated in central brazil and the cultivated forms were probably domesticated northern Argentina and eastern Bolivia .

Few people believe that crop had reached other continents before the time of Columbus it was probably taken from brazil to Africa India and the far east by the Portuguese and from the west coast to the western pacific and to Indonesia and china by the Spaniards early in the sixteenth century groundnuts had probably girdled the globe well before the middle of that century The Groundnuts had probably girdled the globe well before the middle of that century.

2:2 Ground nut economic products and uses :

Groundnut crops are grown for their seeds the oil and meal dried from them and the residues about two-thirds of the world crop is crushed for oil which is used mainly for cooking it may also be used for margarines and vegetable ghee for shortening in pastries and bread in soaps pharmaceutical and cosmetic products lubricants and as fuel for diesel engines .

2:3 Ground nut seed farming system in developing countries:

In most developed countries groundnuts are rainfed and at least Partly mechanised row crop though supplementary irrigation is increasingly used in the USA it is recommended that groundnuts are not planted in the same field more than ones in three years in order to use fertiliser more efficiently to lessen losses from pests and diseases are more prevalent in groundnuts following cotton tobacco or soya beans than after grain crops such as sorghum maize or millets the grain crops also respond more profitably to fertilisers and the succeeding groundnuts can benefit from the fertiliser residues .

Sorghum (Feterita), groundnut cake, sesame cake and wheat bran are considered as the main source of energy and protein in poultry diets in Sudan. The relatively lower price has made sorghum (Feterita) preferable to other cereals as a source of energy for poultry diets in Sudan.

Some factors affect the chemical composition of sorghum, groundnut, sesame and wheat. Reasons for that variability in the chemical composition can be intrinsic (variety) and extrinsic factors (growing conditions, storage, growing season, geographical locations, etc.), both of which affect nutrient availability.

However these factors are not always considered when formulating the rations for poultry.(Nelson *et al.* 1975) reported a high variability in the metabolizable energy values of sorghum grains. The protein content in whole sorghum grain is in the range of 7-15% (FAO, 1995; Beta *et al.*, 1995). Wheat chemical and physical traits

may vary depend upon variety. For example wheat hardness (*Oury et al., 1998; Morris, 2002; Chantret et al., 2005*), activity of phytase (*Kim et al., 2003*), total non starch polysaccharides (*Carré et al., 2002*) have been shown to depend on wheat cultivar. The energy value is not constant and that may happens due to the conditions of harvesting (*Zijlstra et al., 1999*), post-harvest storage (*Kim et al., 2003*) or growing location (*George and McCracken, 2003*) that influence chemical composition *Int. J. Poult. Sci., 8 (4): 355-358, 2009* 356 within the same cultivar. Growing season has an effect analyzed were Methionine, Lysine, Asparagine, on specific weight, endosperm hardness, content of crude protein and starch and total non starch polysaccharides content of wheat (*Kim et al., 2003*).

Post-harvest storage and conditions change the chemical composition (*Kim et al., 2003*) and hence the nutritional value of wheat (*Choct and Hughes, 1997, 1999; McNab and Knox, 1999; Pirgozliev et al., 2006*).

Jacob et al. (1996) concluded that the same sunflower cake and sesame cake are high yielding protein source in layer diets. *Lee et al. (2005)* reported that sesame seed is composed of 45-50% lipid, 15-20% protein and 10-15% carbohydrate. *Mamputu and Buhr (1995)* revealed that sesame meal is considered as an important source of protein (47.1%). *Kaneko et al. (2002)* reported that sesame meal contained 52.9% crude protein. *Batal et al. (2005)* revealed that peanut nitrogencorrected metabolizable energy ranged from 2,273- 3,009 kcal/kg with a mean 2,664 kcal/kg whereas crude protein ranged from 40.1-50.90% with a mean of 45.6%.

They concluded that available peanut meal generally has lower crude protein and higher nitrogen-corrected metabolizable energy value than that reported by the NRC (1994). Most of Sudanese nutritionists formulate their poultry diets depend on local standard tables (Bulletin III) reported by (*Sulieman and Mabrouk, 1999*).

2:4 Nutritive value of grounds:

Groundnuts (*Arachis hypogaea*) or peanut is a legume which is widely grown as a food crop. It is an herbaceous plant of which there are different varieties such as Boro light, Boro Red, Mokwa, Campala, Guta and Ela (Anyasor, 2009). Peanut is an important source of edible oil for millions of people living in the tropics. In Nigeria, 1917 tons of peanuts are being produced annually (Ergul, 1988). Peanuts are among the oldest oil crops in Nigeria and are mostly consumed as Snack, after roasting (Bansal *et al.* 1993). Vegetable oil had made an important contribution to the diet in many countries, serving as a good source of protein, lipid and fatty acids for human nutrition including the repair of worn out tissue, new cells formation as well as a useful source of energy (Gaydou *et al.* 1983; Grosso and Guzman, 1995; Grosso *et al.* 1997,1999).

Groundnut provides an inexpensive source of high quality dietary protein and oil. The vast food preparations incorporating groundnut to improve the protein level has helped in no small way in reducing malnutrition in the developing Countries (Asibuo *et al* 2008).

Groundnut seed contains 44 to 56% oil and 22 to 30% protein on a dry seed basis and is a rich source of minerals (P, Ca, Mg and K) and Vitamins (E, K and B group) (savage and Keenan, 1994). Groundnut protein is increasingly becoming important as food and feed sources, especially in developing Countries where protein from animal sources are not within the means of the majority of the populace. The seed has several uses as whole seed or processed to make peanut butter, oil soups, stews and other products. The cake has several uses in feed and infant food formulations. Groundnut provides considerable amounts of mineral elements to supplement the dietary requirements of humans and farm animals. (Asibuo *et al* 2008). Groundnut seeds are reported to contain 9.5 to 19.0% total carbohydrates as both soluble and insoluble carbohydrate (Crocker and Barton,

1957;Rao *et al.*1965;Oke,1967;;Woodroof,1983).The chemical composition of groundnut seeds have been evaluated amin relation to protein level (Young and Hammons,1973).Good nutrition is a basic human right but in order to have a healthy population that can promote development, the relation between food, nutrition and health should be re-enforced. Knowledge of the nutrition value of local dishes, soup ingredients and local foodstuff is necessary in order to encourage the increase cultivation and consumption of this highly nutritive nut. The consumption will help to supplement the nutrients of stable carbohydrate foods of the poor who cannot afford enough protein foods of animal origin hence the objective of this study is to determine the food value of Arachi hypogeal seeds with respect to protein, fat, carbohydrate and other components. It is hoped that this would assist in its utilisation as a substitute for meat protein in our diet, to encourage the elderly ones in our midst to feed more on groundnut seeds and also as foodstuff for livestock that can in turn provide a reliable supply of protein to the people of Nigeria.

2:5 Proteins in Peanuts

It is common knowledge that all meat, chicken, turkey, fish and dairy foods are rich in proteins. Foods from animal sources provide all the protein needed by human body, which means they contain all the essential amino acids. Apart from meat, legumes such as beans, peas, and peanuts contain notable quantities of protein, more than any other nut. All amino acids must be present evenly in the body to supplement normal and active growth. Among the 20 amino acids 11 are non essential, and are continuously synthesized in the body through various reactions interlinking carbohydrate and lipid metabolism. The other 9 amino acids happen to be essential ones which, ironically, cannot be synthesized by the body by itself, and hence are needed to be supplied through diet. So far it is known that,

those proteins that contain all the essential amino acids in the required proportions are the complete proteins, such as casein (milk protein) .

In addition to milk and eggs another vital source of protein is peanuts. Peanuts contain all the essential amino acids necessary for normal body growth and metabolism (Hoffmann,etal 2004). For example, lack of tryptophan in the diet may lead to pellagra, which is a very severe skin disorder, sometimes fatal (Seal etal ,2007). Similarly, phenylalanine another essential amino acid is associated with formation of epinephrine and nor epinephrine, which are also called flight or fight hormones produced by the ad- renal medulla and the brain(Young,1996). Methionine is another essential amino acid for the synthesis of protein, and it acts as an initiating amino acid during translation of proteins. Tyrosine, another amino acid is associated with formation of melanin and thyroid hormones. All these amino acids are essential to prevent protein calorie mal- nutrition disorders such as Kwashiorkor (Shetty,2006) and Marasmus. Peanuts contain the above mentioned essential amino acids that are necessary for synthesis of proteins, and thus could be an indispensable component of human diet (*Conkerton,etal 1976*).

In many African countries often deaths are reported as due to malnutrition, and they could possibly be prevented by providing a protein rich diet (*Sanghvi,1997*). Peanut and peanut added foods could provide such a nutritious diet. The world health organization recommends an “average requirement” of 0.66 g of protein per kg of ideal body weight, and a “safe level” of 0.86 g/kg of body weight. According to a study peanuts contain more plant protein than any other legumes or nuts Peanut are some- times called a poor man’s protein as they are available at an affordable price.

2:6 Carbohydrates in Peanuts

Roasted peanuts contain 21.51 g of carbohydrates per 100 g. The major carbohydrate present in peanuts is starch, which is a homopolysaccharide made up of α -D glucose residues joined together by glycosidic bonds. When starch undergoes enzymatic degradation in the body by the action of amylase (present in human saliva), it is initially broken down to maltose and isomaltose]. These two disaccharides, when subjected to respective digestive enzymes, are converted to glucose and liberate energy. In countries such as India, the staple foods are mostly starch-containing foods such as rice and potatoes. Consuming large quantities of these foods could mitigate hunger but may not provide the vital nutrients required for proper sustenance. Addition of a small quantity of peanuts to the regular diet can enhance the nutrition value of a meal. The importance of the carbohydrate-amino acid interaction in the development of roasted peanut flavor and color is well documented. Carbohydrates are biomolecules, which are differentiated based on their properties as sugars and nonsugars, and the sugars are poly hydroxyl aldehyde/ketones, soluble in water, crystalline in appearance, and can be easily digested. The most abundant carbohydrate present in the human body is glucose. All the reactions associated with the metabolism of carbohydrates either begin with glucose or end up in glucose. Glucose in the form of glycogen is stored in the liver and muscle. In the muscle, carbohydrates are utilized for doing work and in the liver they are stored as glycogen and released as and when necessary, when the body demands additional glucose, to regulate vital metabolic processes. Peanuts have adequate amounts of carbohydrates amounting to 15% of the RDA value. Carbohydrates play a critical role in supplementing valuable nutrition to the human body.

2:7 Lipids in Peanuts

Fatty acids that are present in peanuts belong to the category of lipids. In addition to carbohydrates, they also are considered as energy producing biomolecules act as Just like carbohydrates, proteins and amino acids, lipids must be supplemented in the diet for vital biological functions. Saturated fatty acid is necessary for storage of fat soluble vitamins like vitamin A When 1 g of palmitic acid undergoes complete degradation by beta oxidation pathway, it can produce 9 kilo calories of energy. Fatty acids are long chain or short chain organic acids with a terminal carboxylic acid group. Certain fatty acids like palmitic and oleic can be synthesized in the body, while fatty acids like the poly unsaturated fatty acids (PUFA) need to be given through the diet. The human body does not have any mechanism for synthesizing poly unsaturated fatty acids [19,20], the essential fatty acids that include, linoleic acid (18 Carbon atoms with 2 double bonds, $C_{17}H_{31}COOH$), and linolenic acid (18 Carbon atoms with 3 double bonds, $C_{17}H_{29}CO-OH$). These fatty acids must therefore have to be supplied from external sources through the diet. In terms of fatty acids present, edible part of roasted peanuts have 6.893 g saturated fatty acids, 24.64 g monounsaturated fatty acids (oleic acid) and 15.694 g polyunsaturated fatty acids. The presence of high mono and poly unsaturated fatty acids reduces the risk of coronary heart diseases. Hence peanuts and peanut oil can serve as a healthy source of nutrition .

2:8 vitamins in ground nut seeds:

Vitamins are a group of organic compounds that are not synthesized in the body, but have to be supplied to the body to maintain normal health and metabolism. They are classified as fat soluble and water soluble vitamins. Fat soluble vitamins are A, D, E, and K, and water soluble vitamins are B-Complex and vitamin C. Fat soluble vitamins play an important role in maintaining certain essential physiological functions. For example, vitamin A is associated with normal vision and epithelial functions, vitamin D is associated with calcium metabolism, and vitamin K for coagulation of blood. Water soluble vitamins are associated with certain biochemical reactions by forming coenzymes that assist the enzyme in converting a substrate into a product. For instance Riboflavin (vitamin B2) in the form of Flavin mono nucleotide (FMN) and Flavin adenine dinucleotide (FAD), participate in electron transfer and hydrogen transfer reactions in the human body. All anabolic (reactions involving synthesis of carbohydrates, lipids and proteins), and catabolic (reactions involving breakdown of carbohydrates, lipids and proteins) reactions in the human body require coenzyme derivatives of B complex vitamins which are water soluble. Peanuts are a vital source for introducing most of the water soluble vitamins into the human body along with vitamin E which is fat soluble.

An important fat soluble vitamin in peanuts is vitamin E mounting to about 6.93 mg Vitamin E is known as alphanatocopherol, and is an anti-oxidative vitamin [Lichtensteint,2001-2002]. It is associated with obstructing the formation of free consumed foods, respiratory membranes, and mitochondrial matrix in the human body. Vitamin E is associated with oxidative phosphorylation reactions in the mitochondria leading to formation of adenosine tri phosphate, known as ATP (energy currency of the cell associated with driving the metabolism of carbohydrates, proteins, and lipids). It also aids in preventing the oxidation of

hemoglobin and red blood corpuscles that help intracellular respiration and adequate exchange of gases. Peanuts, in general, and peanut oil in particular, are efficient sources for supplementing vitamin E to the body.

Peanuts are a good source of Thiamine (B1), a water soluble vitamin having thiamine pyrophosphate as the coenzyme, and playing a very important role in oxidative decarboxylation and cocarboxylation reactions associated with carbohydrate and amino acid metabolism. It is known that deficiency of thiamine leads to beriberi, a disease that can cause problems in the cardiovascular and central nervous system (CNS). Peanuts contain 0.438 mg of thiamine

Peanuts are also an efficient source of Vitamin B2. Sometimes referred to as Warburg's yellow enzyme, it has two derivatives namely FMN and FAD that act as coenzymes playing an important role in electron transfer reactions, and as carriers of electrons in the electron transport chain (chain of reactions converting oxygen to water through a series of electron transfer agents). They also act as coenzymes for enzymes called oxidases, and thus participate in carbohydrate, lipid and protein metabolism. It is now known that a deficiency of vitamin B2 leads to Cheliosis (fissures at angles of the mouth), angular stomatosis (throat infection) and mouth ulcers. These could be prevented by taking a diet rich in vitamin B2, and peanuts are a potential source of vitamin B2, containing 0.098 mg of riboflavin.

Another important vitamin which is supplemented in the body by the intake of peanuts is vitamin B3 (known as Niacin or its corresponding amines, Niacinamide or Nicotinamide), to an extent of 13.525 mg. This vitamin plays an important role in the normal functioning of the respiratory chain and participates in hydrogen transfer, and electron transfer reactions through its coenzymes, Nicotinamide adenine dinucleotide (NAD) and Nicotinamide adenine dinucleotide phosphate (NADP). Deficiency of niacin leads to Pellagra, a disease characterized by

diarrhea, dementia and dermatitis Tryptophan is an essential amino acid associated with the formation of niacin and has to be supplied from dietary Vitamin B5, found in many food sources, needs a strong presence in human diet owing to its widespread applications in numerous biochemical reactions within the human body. B5 is found in good amounts in peanuts. Peanuts, mushrooms, soybeans, split peas, pecans, oat- meal, buckwheat, sunflower seeds, lentils, rye flour, cashews, and other whole grains and nuts are good sources of pantothenic acid. Chemically Vitamin B5 is a dipeptide consisting of pantoic acid and beta alanine, and as a whole known as pantothenic acid, which is an important constituent of peanuts, present to the extent of 1.395mg Pantothenic acid in humans is responsible for the formation of Coenzyme A, which is responsible for many vital reactions in the body such as the kreb's cycle, synthesis of and synthesis of heme. Another important water soluble vitamin, a notable constituent of Peanuts, is Vitamin B6, Pyridoxine. Vita- min B6 occurs in three naturally occurring forms namely pyridoxine, pyridoxamine, and pyridoxal. It has two coenzyme forms, pyridoxal phosphate and pyridoxal amine phosphate, and these two forms carry out many significant biochemical reactions in the body especially those associated with amino acid metabolism. It is highly essential to supplement this vitamin through the diet into the human body, and roasted peanuts will provide B6 to the human body to the extent of 0.256 mg.

Vitamin B9, more commonly known as folate or folic acid, is a water-soluble vitamin that is part of the B vita- min family. Folate occurs naturally in foods, while folic acid is the synthetic form of folate. Vitamin B9 is useful for human growth and helps the mechanism of normal nerve and brain functioning B9 is also credited with controlling blood-levels of the amino acid homocysteine, thus reducing the risk of heart disease and stroke. Folate present in peanuts to an extent of 145mg may also help protect against cancers of the lung, colon, and cervix.

2:9Minerals in Peanuts

Magnesium is an essential mineral for the human body for several useful functions. Magnesium is needed to maintain normal muscle and nerve functions and a healthy immune system. Magnesium promotes normal blood pressure, keeps bones strong, and helps to regulate blood sugar levels. People who consume peanuts have shown higher levels of magnesium. Peanuts are a good source of magnesium containing 176 mg

A mineral that is primarily associated with strengthening of bones, gums and teeth is calcium. Calcium plays an important role in the normal functioning of the visual cycle, and in the mechanism of blood coagulation. It is also associated with normal muscle physiology, helping in contraction and relaxation of muscles. Though, mainly present in milk, it is also present to a notable extent in peanuts containing 54 mg

A mineral that aids primarily in the formation of bones and teeth along with calcium is phosphorous. Phosphorous helps to synthesize protein for the growth, maintenance and repair of cells, and tissues. With 358 mg of phosphorous, peanuts are a good source of phosphorous providing about 50% of our daily needs.

One has to eat the right amount of foods that contain potassium to keep the blood levels in a healthy range. Maintaining fluid and electrolyte balance is a critical function in the human body and this function is taken care of by potassium. In association with sodium ions, potassium plays an important role in the brain and nerve functions, and for muscle development. Peanuts containing 658mg of potassium are a good source of this vital mineral

Zinc is a cofactor for most of the dehydrogenases that require the coenzymes NAD and NADP. This mineral also supports our immune systems, helps in wound healing, and is involved in building proteins. Zinc is an essential mineral for normal growth and development during pregnancy, childhood, and adolescence.

Zinc also helps the cells in human body communicate by functioning as a neurotransmitter. Deficiency of zinc can lead to stunted growth, diarrhea, impotence, hair loss, eye and skin lesions, impaired appetite, and depressed immunity. Peanuts are a great source of zinc. One hundred grams of roasted peanuts will provide 3.31 mg of zinc

Peanuts contain 2.26 mg of iron Iron is an essential metal ion that acts as the chelating agent, and chelates with heme to form hemoglobin. It is an integral part of many enzymes that participate in biochemical reactions such as peroxidase, catalase and ferro chelatase. It is involved in oxygen transport and helps regulate cell growth and differentiation. It is known that the deficiency of iron leads to anemia which is prevalent in many parts of the world .

Copper plays a role in the production of key proteins in our body such as collagen and hemoglobin, which transport oxygen. A serving of one hundred grams of roasted peanuts provide 0.671 mg and thus peanuts are an excellent source of copper providing over 70% of our daily needs .

Selenium is an essential mineral but needed in small amounts for the human body. Selenium is naturally found in plants, seafood, meat and meat products. Selenium is a micronutrient and antioxidant, and a component of several essential enzymes. Selenium is believed to delay or prevent the onset of cancer and also has anti-aging effects Selenium is found in peanuts to the extent of 7.5 mg giving about 14% of our daily need

2:10 Ground nut seeds for feeding Animals:

Is a livestock feed, mostly used by cattle as protein supplements. It is one of the most important and valuable feed for all types of livestock's and one of the most active ingredient for poultry rations. Poor storage of the cake may sometimes results in its contamination by aflatoxin, a naturally occurring Mycotoxins that are

produced by *Aspergillus flavus* and *Aspergillus parasiticus* Groundnut cake is similar in function to Cottonseed cake, used as protein supplement for ruminants in monogastric rations. Groundnut cake is often preferred to the later due to its high gossypol contents.

Ground nut has been used as a protein supplement in broiler diets but its price has continued to increase in our markets. This has engineered the need for an alternative feed ingredient for groundnut cake as a protein supplement. Such an ingredient of choice in the diet of monogastrics must have the ability to supply required protein, amino acid profile, provides balanced energy: protein ratio and in addition possess .

Chapter three

Material and methods

3:1 The experimental site and duration:

Experimental work of the present study was carried out at Faculty of animal production science and technology, Sudan University of science and technology , during the period from January to December 2014 -2015 to study the effect feeding of ground nut beans on broiler performance.

3:2 Experimental birds and housing:

A total number of chicks is 120 of one day old. (Arber acer) were distributed randomly in to four groups of twelve equal replicates, each replicate containing 10 chicks .The experiment of house (4*4m) . Chicks were reared in cages in an open sided house, provided with feeders, drinkers, used as bedding materials.

3:3The experimental diets:

The experimental diets of four levels of ground nut beans (0% ,5% , 7% ,and 9%). The experiment diets were formulated was shown in table (2), the experimental diets were formulated to satisfy the brides total requirements according to NRC recommendation.

The pre starter diet given to chicks for 7day (adaptation period),followed by starter diets from 8 to 22and finisher the from 22 day to 42 day.

The ground nut beans(*arachis hypogaea*) was purchased from local market (Elshabi Omdurman) grinding and added to diets . the chemical composition of ground nuts shown in table (1) .

Table (1): Chemical Analysis of ground nut seeds.

sample	DM%	FAT%	CP%	ASH%	CF%
1	97.06	28.91	28.24	4.14	3.63
2	97.12	28.8	28.1	4.24	3.71

Table (2) : Ingredient and composition of Basel diets %. (Starter)

Ingredients(g/kg of diet)	0%	5%	7%	9%
Sorghum	64.34	59.24	58.24	56.24
G.N.C	26	26	25	25
Concentrate	5	5	5	5
DCP	.0072	.0072	.0072	.0072
Salt	.1	.1	.1	.1
Ground nuts seed	0	5	7	9
W B	4	4	4	4
Limestone	.013	.014	.014	.014
Premix	.2	.2	.2	.2
Mycotoxin	.2	.2	.2	.2
Lysin	.1	.1	.1	.1
Methonine	.04	.04	.04	.04
Total	100	100	100	100
Me	12.89	12.89	12.9	12.9
C p	22.56	23.26	23.9	23.6
Ca	1.1	1.1	1.1	1.1
P	.45	.45	.45	
C f	4.2	4	3.95	3
Lysine		1.2	1.2	1.2
Methonine	.45	.45	.45	.45

Table(3): Ingredients and composition of finisher diet %.

Ingredients(g/kg of diet)	0%	5%	7%	9%
Sorghum	76	72.6	70.9	69..1
G n c	16.9	15	14.8	14.7
Concentrate	5	5	5	5
D c p	.2	.7	.5	.5
Salt	.1	.1	.1	.1
Lime stone	1.2	.7	.9	.8
Premix	0	0	0	0
Mycotoxin	.2	.1	.2	
Lysine	.1	.3	.1	.2
Methonine	0	0	0	0
W b	.5	.5	.5	.5
Ground nut beans	0	5	7	9
Total	100	100	100	100
M e	13.17	13.26	13.29	13.32
Cp	20.83	19.69	19.73	2
Ca	1.03	.84	.87	.83
P	.46	.41	.40	.40
C f	3.28	3.3	3.29	3.30
Laysin	1.07	1.09	1.03	1.03
Meathone	.49	.49	.48	.48

Table (4):concentrate analysis.

Ingredient	ME	CP	Ca	p	CF	Methionine	Lysine
	8.8	36	7	4	5	4_5	11

3:4Vaccination program:

The birds were vaccinated against infectious bronchitis(IB) and new castle diseases(ND) in first week. at 14 days were vaccinated against Gambaro disease. The dosage then repeated at 21and 28 days of age for Newcastle disease and Gambaro respectively.

3:5Measurments :

Birds and feed were weighed daily to determine body weight and feed intake, and to calculate the feed conservation ratio (FCR) . On day 42 after 4 hours all birds were weighed and slaughtered. After slaughtered the carcass was weighed.

3:6Carcass preparation

At the end of sixth weeks the bird were fasted for 8hours then basis of average pen weight .After that eviscerated carcass weight were recorded and dressing percentage was determined internal organ (liver)and abdominal fats and gizzards were weighed and relative weight for liver and gizzard and abdominal fat s was calculated.

3:7 Mortality percentage

Dead birds were removed recorded and inspected for possible causes the total number of dead birds was used for calculating mortality percentage(0%).

3:8 Statistical analyses

Complete randomized design was used to analyzed the results obtained from this experiment and subjected to general linear model followed by lest significant difference test using the Spss program .

Chapter four

Result

Table(1): Effect of added ground nuts seed on weekly Feed intake (g/bird)of broiler chicks.

Weeks Experiment	Week 1	Week 2	Week 3	Week 4	Week 5
Control M±SD	338.50±2.60	644.20±27.45	701.40±50.40 ^b	1149.70±117.60	818.33±188.17 ^b
5% M±SD	327.00±21.15	656.20±14.95	617.00±65.04 ^b	1247.00±114.09	816.70±87.37 ^b
7% M±SD	350.17±4.48	684.50±10.83	824.70±61.12 ^a	1356.00±154.24	1160.00±96.44 ^a
9% M±SD	345.50±29.41	657.17±30.66	757.67±6.71 ^a	1268.70±50.83	1043.30±81.45 ^a
Sig	NS	NS	**	NS	*

NS: no significant

*:significant($p < 0.05$).

** :highly significant ($p \leq 0.05$)

Table(2): Effect of added ground nuts seed on weekly weight gain (g/bird) of broiler chicks.

Weeks Experimental	Week 1	Week 2	Week 3	Week 4	Week5
Control 0% M±SD	230.7±7.23 ^a	281.7±99.76	457.5±11.14	500.8±53.78	420±17.32
5% M±SD	194±16.93 ^b	355.8±11.09	449±36.83	502.5±84.65	425±10
7% M±SD	242±19.58 ^a	384.17±8.10	473±24.38	507.83±9.46	411.67±17.56
9% M±SD	207.17±21.17 ^{ab}	357.83±14.09	406.67±98.59	587.50±91.87	431.67±72.86
Sig	*	NS	NS	NS	NS

NS :NO significant

*:significant ($P \leq 0.05$)

a ,b, means the mean with different superscript in same column are significantly different at ($p \leq 0,05$)

Table(3): Effect of added ground nuts seed on weekly Feed conversion ratio.

Weeks	Week 1	Week 2	Week 3	Week 4	Week 5
Experimental					
Control M±SD	1.47±.05 ^c	1.58±.07 ^c	1.54±.15	2.30±.30	1.94±.39 ^b
5% M±SD	1.69±.06 ^{ab}	1.83±.06 ^a	1.40±.10	2.63±.42	2.03±.06 ^b
7% M±SD	1.45±.13 ^c	1.77±.03 ^{ab}	1.76±.19	2.63±.25	2.81±.18 ^a
9% M±SD	1.66±.03 ^{ab}	1.83±.12 ^a	1.97±.55	2.20±.26	2.48±.56 ^{ab}
Sig	*	*	NS	NS	*

NS : No significant

*: significant ($p \leq 0,05$)

Table(4): effect of added ground nuts seed on Edible offal's weight(g)

Experiment	Control 0%	5%	7%	9%	Sig
Liver	34±.002	40±.008	37±.002	36±.004.	NS
Gizzard	28±.004	32±.004	28±.004	34±.002	NS
Fat	26±.002	21±.004	22±.004	21±.005	NS

NS : No significant

Table(5):Effect of added ground nuts seed on overall performance results of 6 weeks broiler birds.

Treatment	0%	5%	7%	9%	Sig
Parameters					
Experiment period	35	35	35	35	-
Number of birds	30	30	30	30	-
Initial body weight/g bird	164.3±4.75	165±4.36	161.33±9.80	170.83±1.04	NS
Feed in take g/bird/day	3652.00±382.19 ^b	3660.8±238.04 ^b	4375.3±252.45 ^a	4072.3±168.66 ^a	*
Weight gain g/bird	1890.70±158.76	1926.30±115.35	2018.70±25.91	1990.80±37.83	NS
FCR g feed/g gain	1.93±.23	1.90±.02	2.17±.15	2.05±.12	NS
Final body weight g/bird	2181.7±54.85	2091.2±119.37	2180±17.32	2161.7±37.53	NS
Carcass Weight/kg	1.48±110	1.55±87.37	1.45±70.24	1.43±90.19	NS
Mortality %	0.00	.33±.58	0.00	0.00	NS
Cost of Kg	17.5	17.75	18	18.25	-

NS: No significant different.

*:significant($p \leq 0.05$).

Chapter five

Discussion

The results obtained from the present study was shown that there was no significant differences among different groups in both feed consumption rate and feed conversion ratio and mortality.

The study showed that there is no significant differences in feed intake (table1), among groups feed ground nuts seed with different levels of 5%, 7%, 9%, compared with the control except in third and five week there is significant different between treatment may be lower temperature in the third and five week.

In case of weight gain (table2).The study revealed that there is no significant different in all weeks except in the first week between all treatment and that may be to the lower temperature in the first week

Also the present study showed that there is significant different between treatments except in the third and fourth week there is no significant different between treatment in feed conversion ratio(table3).

This study in case of offal's (table4). Showed that there is no significant different between all treatment.

The average weight gain, final weight, feed conversion ratio , carcass weight and mortality of chicks fed the control, 5%, 7% and 9% ground nut diets for 6 weeks (table5). Showed that there is no significant different ($p \leq 0.05$) in all this parameters between all treatment in six weeks except in feed intake there significant different this result is agreement with(*Nelson et al. (1975)* who reported that there is some factors affect the chemical composition of sorghum, groundnut , sesame and wheat. Reasons for that variability in the chemical

composition can be intrinsic (variety) and extrinsic factors (growing conditions, storage, growing season, geographical locations, etc.), both of which affect nutrient availability. However these factors are not always considered when formulating the rations for poultry.

This study recorded that there is no significant differences in mortality between all transactions i.e. There is no mortality during the experiment to any bird that shows the health benefits of ground nuts seed inside installing Bush benefits as stated and this may be due to the effective impact of beans on many pathogenic bacteria.

Chapter six

Conclusion and recommendations

6:1 Conclusion:

The experiment concluded that the uses of CGS has significant influence of broiler performance with best carcass weight value when added 5% CGS than other experimental groups.

6:2 Recommendation:

- You can rely on groundnuts in reducing mortality as the study concluded that adding peanut graduated levels (5%, 7%, 9%) led to a significant improvement in the quality and softness of the meat on the other hand also observed through experience low mortality .
- This confirms that you can use peanut beans as feed nutrition and gives better results than others, can be used to up to 5% of these results we recommend that you repeat the experiment to more research studies in this area.

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