**EVALUATION OF WATER INTAKE OF DIFFERENT CLASSES OF RABBITS**

**RESEARCH PROJECT**

**BY:**

**ABIA, VICTORIA SAMPSON**

**AK15/AGR/ANS/001**

**SUBMITTED TO:**

**DEPARTMENT OF ANIMAL SCIENCE**  
**AKWA IBOM STATE UNIVERSITY**

**JULY, 2022.**

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**IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF BACHELOR OF AGRICULTURE (B.AGRIC.) DEGREE IN ANIMAL SCIENCE**

**JULY, 2022.**

**DECLARATION**

This project is authentic and original work carried out by; **Abia, Victoria Sampson** with the Registration Number **AK15/AGR/ANS/001** in partial fulfillment of the requirements for the award of Bachelor of Agriculture (B. Agric.) degree in Animal Science.

Abia, Victoria Sampson …………….. …………..

***(Researcher)******Signature****.* ***Date***

**CERTIFICATION**

This is to certify that this research project title **EVALUATION OF WATER INTAKE ON DIFFERENT CLASSES OF RABBIT** was carried out by ABIA, VICTORIA SAMPSON with the Registration Number AK15/AGR/ANS/001 in the Department of Animal Science, Faculty of Agriculture, Akwa Ibom State University.

Dr. (Mrs.) Christopher, G. I …………………….. ………….

***(Project Supervisor) Signature Date***

Dr. (Mrs.) Comfort Essien …………………… ……………

***(Head of Department) Signature Date***

Prof. Edeheudim B. Etuk …………………….. ……………

***(External Supervisor) Signature Date***

**DEDICATION**

I dedicate this work to God Almighty, the maker of Heaven and Earth who saw me through my research period.

**ACKNOWLEDGEMENT**

I am grateful to God Almighty, whose help and grace made this research work a success. My most gratitude goes to my amiable supervisor, Dr. (Mrs) Grace I. Christopher for her motherly sacrifices, advices, encouragement which led to the success of this research work.

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My beloved brother and wife, Mr/Mrs Okon Sampson, my beloved husband, Mr. Nsidibe Anthony Okon, Mrs. Iniobong Daniel, I do appreciate your contributions throughout the course of my study. May God bless you all and reward you bountifully. I seize this medium to appreciate Mr. Akrasi Akrasi for the encouragement and financial support to achieve my goals. My spiritual parents, Mr/Mrs Idorenyin Paul Augustine, I appreciate your prayers and support. My cousin, Anietie Akpan Jacob, thank you is insufficient!

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**ABSTRACT**

*Water intake of the different classes of rabbits was investigated. The study area was in the hot humid tropics with a climate characterized by two seasons (rainy and dry season). Solar radiation ranges from 4.11-4.95mm. A completely Randomized Design was used for this experiment of five treatments and five replicates. Group I (T1) were adult male rabbits (buck) of about 8 months and above. Group II (T2) made up of young rabbits (weaner) of 6-8 weeks of age. Group III (T3) comprised of adult female rabbits (pregnant doe) about 8 months and above which were confirm to be pregnant. Group IV (T4) were adult female rabbits (dry does) from 8 months and above that were not pregnant nor lactating and Group V (T5) were of Adult female rabbits (lactating doe) that just kindled and breastfeeding which were above 8 months and above age. The daily water intake indicated that the lactating rabbit (T5) consumed significantly (P<0.05) higher volume of water when compared with other treatments. After the experiment, lactating rabbits had significantly higher body weight (P<0.05) than others, this value was followed by the pregnant animal and the least body weight was obtained from the weaner rabbits (T2). Pregnant doe (T3) had significantly (P<0.05) higher weight gain than other classes of rabbits, followed by the weaner rabbit. The lactating doe was found to have a negative value in weight gain indicating weight loss which may be attributed to the continuous suckling of the kittens. The higher weight gain for pregnant doe (T3) was associated with the developing fetus. Hence, it was concluded that Pregnant doe (T3) had higher body weight and Lactating does (T5) had higher water intake and an average water volume of 350g daily was recommended for both pregnant and lactating does.*

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**CHAPTER ONE**

**INTRODUCTION**

* 1. **Background of the Study**

Water is a vital nutrient and has numerous crucial roles with respect to living things especially humans and animals (Jequier, 2010). Water is an essential nutrient to be considered when venturing into animal production. Water also serve as a key factor in the digestion and absorption of nutrient such as carbohydrate, protein and fat. The world protein needs have rapidly increased as the human population pressure increases (Gidenne, 2012). This has led to the need to search for alternative protein sources that are cheap, readily available and posing minimal competition to man (Akinmutimi, 2007). Rabbits *(Oryctolagus caniculus)* have therefore become a viable option, because of their proverbial prolificacy, early maturity, fast growth rate, high genetic selection potential, high feed conversion efficiency and economic utilization of space (Hassan *et al.,* 2012).

Best known for being prolific, rabbits are also herbivores which efficiently convert fodder to meat. The whole point of meat production is to convert plant proteins of little or no use to people as food into high value animal protein (FAO, 2018). In efficient production systems, rabbits can turn 20 percent of the proteins they eat into edible meat. Comparable figures for other species are 22 to 23 percent for broiler chickens, 16 to 18 percent for pigs and 8 to 12 percent for beef (FAO, 2018). Rabbit production is a veritable way of alleviating animal protein deficiency in Nigeria (Ajala and Balogun, 2004). Rabbit meat production is therefore an attractive proposition, especially when the aim is to produce quality animal protein (Pascal *et al.,* 2012). Rabbits can also easily convert the available proteins in cellulose-rich plants whereas it is not economical to feed these to chickens and turkeys the only animals with higher energy and protein efficiency. The rabbit also has immense potentials and good attributes which include high growth rate, high efficiency in converting forage to meat, short gestation period, and high prolificacy, relatively low cost of production, high nutritional quality of rabbit meat which includes low fat, sodium, and cholesterol levels (Biobaku and Oguntona, 2012).

**1.2 Statement of Problem**

Limitation of water intake reduces animal performance quicker and more dramatically than any other nutrients deficiency. Water constitutes approximately 60-70 percent of an animal life weight and consuming water is more important than consuming food (Faries *et al.,* 1997). Domesticated animals can live about sixty days without food but only seven days without water. Livestock an exact amount of water to carry out it metabolic functions and insufficiency in other animals suffer stress or dehydration, hence the need to ascertain the water intake and requirement of different classes of rabbits (Jequier, 2010)

**1.3 Justification of Study**

To satisfy the protein needs of the increasing human population, there is need to employ sustainable management practices for increased productivity. Rabbit production is a major source of income, means of employment and also provide protein for proper body building (Onebunne, 2013). Comparatively, unlike other animals such as; poultry, swines, and cattle, rabbit rarely indicate any symptoms of water stress and most small-scale livestock keepers assume rabbits do not require water. Water is one of the most essential compound for living things survival. Water is essential in the regulation of body temperature, aside from being the major constituent of the brain, it also absorb shock in the brain and also lubricate the respiratory system (Monclus *et al.,* 2006). Hence, the different classes of rabbit which comprise of the; buck (mature male rabbit), dry doe (female not pregnant), pregnant doe, lactating doe and weaners will require a certain amount of water. Hence, the need to evaluate the water intake for the different classes of rabbits.

**1.4 Objectives of the Study**

The main objective of the study is;

* To determine the water intake of the different classes of rabbits (buck, lactating doe, pregnant doe, dry doe and weaner).

**CHAPTER TWO**

**LITERATURE REVIEW**

**2.1. Rabbits and its classes**

Rabbits are best known for being prolific and also herbivores which efficiently convert fodder to food. The rabbit has immense potentials and good attributes which include; high growth rate, high efficiency in converting forage to meat, short gestation period, and high prolificacy, relatively low cost of production, high nutritional quality of rabbit meat which include low fat, sodium and cholesterol levels. It also has a high protein level of about 20.8% and its consumption is bereft of cultural and religious bias (Biobaku and Oguntona, 2012). According to Piuheiro *et al.,* (2012), the classes of rabbits is the status of a rabbit which might be denoted by the physiological condition or maturity stage of the rabbit and this include;

* Kitten – This is a young rabbit
* Buck – This is a mature male rabbit
* Doe – This a term used to describe a female rabbit that have given birth
* Weaners – This are rabbits that have been separated from the doe and this usually occur at 30-40 days of age.
* Dry Doe – This is a female rabbit that is not pregnant nor lactating.
* Lactating Doe – This is a female rabbit that is tending the kittens with milk
* Pregnant Doe – This is a female rabbit that is with the fetus awaiting parturition (kindling).

**2.2. Economic Importance of Rabbits**

According to FAO, 2018, Rabbit production is both beneficial to the keeper and the populace and this include;

* Major source of meat and protein globally
* Source of employment for it keepers
* Source of income from selling their products: the skin, the meat, the droppings for manure.
* Keeping rabbit is a stock of investment or wealth
* Rabbits serve the purpose of research constantly improve it utility and productivity

**2.3. Nutrients Requirement of Rabbits**

The term “*nutrient*” refers to chemical compound (natural or human-made), or a group of compounds of the same general chemical compositions, that help to support animal life (Piuheiro *et al.,* 2012). The basic nutrients required by animals and livestock includes; carbohydrate, protein, fats and oil, minerals, vitamins and water as a dietary essential (Brussaard *et al*., 2002). These nutrients are mostly derived from feed. In Addition, exception of water is also derived from a different source apart from feed alone.

**2.3.1 Carbohydrates**

Carbohydrates are the main sources of the energy and these includes; Starches and sugars (Brussaard *et al*., 2002). These are complex substances that contain only carbon, hydrogen, and oxygen. Carbohydrates are used to produce heat and energy which is required for growth and other metabolism (Brussaard *et al*., 2002). Good sources of carbohydrates are oats, barley, rice, wheat, corn, roughage, molasses and grasses.

**2.3.2. Protein**

Protein is composed of chains of amino acids. While rabbits do not require high amounts of it, protein is essential for growth, development, tissue repair and reproduction (Volatier *et al.,* 2000). Rabbit’s protein requirement can either be from plant or animal source. Plant sources mainly from; legumes; soybean, cowpea, calopogonium, mucuna, alfalfa, cowpea, etc. Thee animal source of protein is obtained from; fish meal, blood meal, etc. (Abu *et al*., 2008). Majorly, rabbit protein requirement is derived from concentrate feed and legumes.

**2.3.3. Fats and Oil**

Fat and oil are complex substances which also contain carbon, hydrogen, and oxygen. However, the proportions of carbon and hydrogen are much greater in fats than in carbohydrates. Any excess amount of fat is stored in the rabbit’s tissues (Brussaard *et al*., 2002). Fat is found in small quantities in common grains such as oats, barley, and wheat. Flax seed and soybean seed are high in fat while roughage has a very low-fat content. Fats and oils (liquid fats) are a concentrated source of energy. Fats in the diet are necessary for good health. They make certain vitamins available for use in the body, they cushion vital organs, they make up part of all body cells and they help to maintain body temperature (Brussaard *et al*., 2002). Fats also delay pangs of hunger because feed mixture containing fat remains longer in the stomach. Nutritionists distinguish between different types of dietary fats in food. Saturated fats are usually solid in form and are of animal origin (Volatier *et al.,* 2000). It is known that saturated fats can raise the level of cholesterol in the blood. Cholesterol is a natural waxy substance made by the body. It helps to form digestive juices and other functions. In animal nutrition, fat functions as an insulator and major source of energy.

**2.3.4. Minerals**

Minerals are inorganic elements required for functionality and development of cells and organs. Minerals are categorized into; essential and non-essential minerals. The essential minerals are those minerals that is essential for development of organs and it deficiency can upset critical issues in the animal and these includes; calcium, magnesium, phosphorus, nitrogen, sodium, chloride, potassium, iodine, iron, selenium, sulphur, etc. Non-essential minerals is usually synthesize by the body of the animal and these include; boron, bromine, silicon, etc. (Verger *et al.,* 2002). Minerals helps body processes function properly. They aid in digestion, muscle action, and manufacturing of blood and bone (Unwin and Moller, 2001). Minerals are stored in a rabbit’s skeleton and soft tissues. Most of the feed materials given to rabbits contribute to a varied intake of minerals. Most minerals are easy to obtain in quantities required by the body in form of supplements like; bone meal, limestone, salt, etc. (Verger *et al.,* 2002). Some minerals have their specific functions, for example; Iron helps to build red blood cells. It also helps the blood carry oxygen from the lungs to each body cell. Calcium and phosphorus is also essential in building skeletal structures; bones and teeth (Unwin and Moller, 2001).

**2.3.5. Vitamins**

Vitamins are organic molecule that is an essential micronutrient which an organism needs in small quantities for the proper functioning of its metabolism.

Vitamins are known as accessory food substances which is also required for rabbit proper growth and development. Vitamins regulate growth processes, assist in digestion, and help disease prevention. Vitamins are categorized into; fat-soluble and water-soluble vitamins. Fat-soluble vitamins include; vitamin A, D, E and K. They are digested and absorbed with the help of fats that are in the diet (Ireland and Moller, 2000). Vitamin A is needed for strong bones, good vision and healthy skin. It is found both in dark green and yellow fruits and vegetables. Vitamin D is essential for children because it helps calcium and phosphorus to form straight, strong bones and teeth. With direct sunlight on the skin, the body can manufacture its own vitamin D. Infants and young rabbits often need a vitamin D supplement because the lack of vitamin D can cause a disease known as rickets. Vitamin E helps to protect Vitamin A and red blood cells. It is found in a wide variety of foods, and it is easy to get enough. Vitamin K is one vitamin that is made within the body by bacteria that live in the intestinal tract. Small amounts are found as well in the green forages (Ireland and Moller, 2000). Fat-soluble vitamins can be stored in the body for long periods. They are stored in the fatty tissue and in the liver. Water-soluble vitaminsare thevitamin B complex and vitamin C (Ireland and Moller, 2000). Vitamin B complex are a group of several vitamins that helps to maintain healthy skin and a well-functioning nervous system. Vitamin B complex also help to convert carbohydrates into energy. Vitamin C, or ascorbic acid, is needed for building the connective tissue that holds body cells together. Vitamin C is essential for healthy teeth, gums and blood vessels (Ireland and Moller, 2000). It also helps the body to absorb iron. These water-soluble vitamins are not stored in the body for long. Good sources should be given to rabbits, although it is also obtained from green forages (Unwin and Moller, 2001).

**2.3.6. Water**

Water is a colourless, transparent, odourless liquid that forms the seas, lakes, rivers, and rain and is the basis of the fluids in living organisms. Water is a substance composed of the chemical elements hydrogen and oxygen and existing in gaseous, liquid, and solid states. It is one of the most plentiful and essential of compounds. Water is a polar liquid as it contains both negative and positive charges. A tasteless at room temperature, it has the important ability to dissolve many other substances, hence it is a universal solvent (Usoro, 2022). All vital processes in the body demand water. It is used in digestive processes and in the removal of wastes from the body. Fresh water is required by rabbits at all times. This is the cheapest and most essential feed required by all animals. In order to live, every cell in the body requires water for it effective functioning. Water takes an active part in many chemical reactions and is needed to carry other nutrients, to regulate body temperature, and to help eliminate wastes. Water makes up about 60 percent of the body weight.

**2.4. Sources of Water**

According to Usoro (2022) and Lukefahr (2007), Water for livestock production is derived from four major sources: Free drinking water, Water contained in feed, metabolic water produced by oxidation of organic nutrients and bound water.

**2.4.1 Free drinking water**

This water sources include water from; lakes, oceans, rivers, stream which is suitable and used by animal (Lukefahr, 2007).

**2.4.2** **Water contained in feed**

These include water contained in the feeding material of animals either concentrated feed or forages, it contains some moisture content which is water for animals. And it content is dependent on the feed and it composition. E.g., forages contain more moisture content than concentrates (Hassan, 2012).

**2.4.3 Metabolic water produced by oxidation of organic nutrients**

These is an amount of water released by the oxidation of any energy yielding nutrients through cellular respiration (Hassan, 2012).

**2.4.4 Bound water**

This water source is the constituent of the cells which is not affected by anything nor the environment

**2.5 FUNCTIONS OF WATER**

Water constitute approximately 60-70% of animal life weight and consuming water is more important than consuming food (Faries *et al.,* 1997)

Categorically the function of water can be divided into five basic functions:

* Digestion assistance
* Transportation vehicle
* Medium for chemical reactions
* Lubricant/shock absorber
* Temperature regulator.

In animals, it acts as both a solvent and a delivery mechanism, dissolving essential vitamins and nutrients from food and delivering them to cells. Body systems also use water to flush out toxins, regulate body temperature and aid our metabolism (Lukefahr, 2007).

**2.5.1 Water as a Digestion Assistance**

Water aid in the dissolution of feed particle, make feed particle absorbable and also assist during digestion. Aside, the digestive system is functional due to the action of water and water also functions in excretion (Mailafia *et al.,* 2010)

**2.5.2 Water as a Transportation Vehicle**

Water is called the “*universal solvent”* because more substances dissolve in it than any other fluid. The dissolved substances (solutes) include many materials including ions, sugars, amino acids, vitamins, and minerals. Molecules dissolve in water because of the hydrogen and oxygen molecules ability to loosely bond with other molecules (Mailafia *et al.,* 2010). Molecules of water (H2O) surround substances, suspending them in a sea of water molecules. The solvent action of water allows for substances to be more readily transported. Blood, the primary transport fluid in the body, is mostly made up of water. Dissolved substances in blood include proteins, lipoproteins, glucose, electrolytes, and metabolic waste products, such as carbon dioxide and urea, all of which are either dissolved in the watery surrounding of blood to be transported to cells to support basic functions or are removed from cells to prevent waste build-up and toxicity (Lukefahr, 2007).

**2.5.3 Water as a Medium for Chemical Reactions**

Water is required for even the most basic chemical reactions. Previously, you learned that enzymes are proteins that conduct specific chemical reactions. Enzymes conduct these reactions in a medium (environment); in the human body the medium is water bonds (Vignat *et al.,* 2002). Water is an ideal medium for chemical reactions as it can store a large amount of heat, is electrically neutral, and has a pH of 7.0, meaning it is not acidic or basic. Additionally, water is involved in many enzymatic reactions as an agent to break bonds or, by its removal from a molecule, to form bonds (Vignat *et al.,* 2002).

**2.5.4 Water as a Lubricant and Shock Absorber**

According to Lukefahr (2007), Water is the main component of the fluids that protect and lubricate tissues. For example:

* cerebrospinal fluid surrounding the brain and spinal cord protects these organs against sudden changes in the environment
* amniotic fluid provides a cushion of protection for a pregnant woman's developing baby
* pleural fluid lubricates the lungs to make breathing easier
* digestive secretions allow for easy passage of material through the gastrointestinal tract
* mucus lines the walls of the intestines which eases the movement of food along the gastrointestinal tract synovial fluid lubricates joints and eases the movement

**2.5.5 Water as a Temperature Regulator**

Water plays an important role in thermoregulation (temperature regulation). Human life is supported within a narrow range of temperature, with the temperature set point of the body being 98.6°F (37°C). Too low or too high of a temperature causes enzymes to stop functioning and metabolism is halted. At 82.4°F (28°C) muscle failure occurs and hypothermia sets in (Mailafia *et al.,* 2010). At the opposite extreme of 111.2°F (44°C) the central nervous system fails and death results (Mailafia *et al.,* 2010). Water is good at storing heat, an attribute referred to as heat capacity, and thus helps maintain the temperature set point of the body despite changes in the surrounding environment (Ajala and Balogun, 2004). There are several mechanisms in place that move body water from place to place as a method to distribute heat in the body and equalize body temperature. The hypothalamus in the brain is the thermoregulatory center. The hypothalamus contains special protein sensors that detect blood temperature. The skin also contains temperature sensors that respond quickly to changes in immediate surroundings (Biobaku and Oguntona, 2012).

**2.6 FACTOR AFFECTING WATER INTAKE OF ANIMALS**

According to Hassan, 2012, the water intake of animals is generally affected by a series of factors; management system, climatic factors and physiological status of the animal.

**2.6.1 Climatic factors**

Temperature and relative humidity determines the water intake of animals. In sunny days, animal tends to take more water than in cold days.

**2.6.2** **Physiological status of the animal**

The state of health of the animal determines water requirement. E.g., lactating cows tends to consumes more water than other class of animal because of its state of health.

**2.6.3 Management system**

These include: the type of feed given to the animal, the quality of the water offered and the delivery system of the water, these factors determine the water requirement of the animal (Hassan, 2012).

**2.6.4 Feed Quality, Type and Quantity**

Feed given, the type or the amount of which the feed is given to the animal is also a determining factor to it water intake. Animals given concentrate feed will require a different amount of water compared to those given forage (Hassan, 2012).

**2.7 Effect of feed on Water Intake of Animals**

Feed comprises of different feedstuffs and forms which provides varying nutrients to animals based on its composition (Abu *et al.,* 2008). Concentrates feed comprises of corn, soybean mean and other nutrients mixed in an amount that would meet up the nutritional requirements of animals (Abu *et al.,* 2008). Monogastrics fed concentrate fed requires about 200grams of water per 1kg of concentrate feed (Alfonso *et al.,* 2014), whereas ruminant has been reported to require more than 400g of water per 1kg of concentrate feed (Alfonso *et al.,* 2014). The intake of water by animals fed forages are based on seasons, either rainy or dry seasons. Forages in rainy season are always succulent and greenish and it contains 70-85% of water, hence animals fed this type of concentrate will require a little amount of water (Ajala and Balogun, 2004). At dry season, these forages moisture content reduces and it has been reported that it contains less than 35% of water. Animals fed with this type of forage or hay will require high amount of water to enhance it body metabolism and maintenance (Bartlett, 1996).

**2.8 Water Intake Requirements of Different Classes of Rabbits**

Regardless of the prolificacy and the production potentials of rabbits, it production for an increased supply to balance the increasing demand is relative faced with a major challenge of water starvation. This challenge is pose by the misconception of the superstition held by rabbit producers that rabbit do not require water as it does not show any symptoms of water starvation and this has led to unknown death, disease, low productivity and reproduction of rabbits over the years (Gidenne *et al.,* 2012). Although, the volume of water given to rabbit is affected by climate which is the loss of water due to evaporation and aside from evaporation loss of water, the animal still takes in a sustainable amount of water to meet it metabolism functions (ARBA, 2010). Additionally, the water intake of rabbit is also affected by it physiological state (i.e., the health status of the rabbit), the system of water delivery, type of feed given and the weather condition which is consist of element such as; temperature and relative humidity.

Although, there are limited reports on the water requirement or intake of rabbits. Notably, Adeyemo *et al.,* (2017) have reported that water requirement of some classes of rabbits was affected by variety of factors which have been stated earlier. He reported that, that buck rabbits at 2kg of feed requires 1.5kg of water daily, the lactating does at 3kg of feed requires more than 4kg of water daily and the pregnant does at 3kg of feed requires 3kg of water, hence h concluded that water requirements of rabbits were based on physiological status.

**CHAPTER THREE**

**MATERIALS AND METHODS**

**3.1 Experimental Site**

The study was carried out in the Rabbitry unit of the Department of Animal Science of Akwa Ibom State Univeristy, Obio Akpa, Oruk Anam, Akwa Ibom State. The area lies between latitude 4030’N and 50 00’N and longitudes 700 30’E and 800 00’E of the Greenwich meridian. The area is in the hot humid tropics with a climate characterized by two seasons (rainy and dry season). The rainy season spans between April and October, while the dry season spans between November and March. Temperature are uniformly high throughout the year ranging between 26oC and 28oC. Solar radiation ranges from 4.11-4.95mm, partly because of the values of insulation and temperature (SLUS-AK, 1989).

**3.2 Experimental Animal and management**

A total of 25 rabbits were used in this experiment. The animal was grouped into five groups each group comprising of 5 rabbits (i.e., five treatments and five replicates).

Group I (T1) were adult male rabbits (buck) of about 8 months and above.

Group II (T2) made up of young rabbits (weaner) of 6-8 weeks of age.

Group III (T3) comprised of adult female rabbits (pregnant doe) about 8 months and above which were confirm to be pregnant.

Group IV (T4) were adult female rabbits (dry does) from 8 months and above that were not pregnant nor lactating

Group V (T5) were of Adult female rabbits (lactating doe) that just kindled and breastfeeding which were above 8 months and above age.

The rabbits were managed under the intensive system of management in individual hutches and fed with both concentrate and forages (grasses and legumes). Routines management practices in terms of sanitation and medication were strictly adhered to.

**3.3 Data Collection**

The volume of water given to each class of the rabbit was using it water trough measured using the measuring cylinder and the leftover also measured daily to determine the amount taken in by the animal. Since, water is also lost through evaporation, a control water measurement was placed side by side to note the amount of water loss due to evaporation.

The water loss due to evaporation was known by subtracting the initial from the final volume of water and this was used to account for the actual water intake by each class of animal.

**3.4 Data Analysis**

The data obtained was subjected to analysis of variance (ANOVA) in completely randomized design (Steel and Torrie, 1980) and the significant means was separated by applying Duncan multiple range test as outlined by (Duncan, 1955).

**CHAPTER FOUR**

**RESULTS AND DISCUSSION**

**4.1 Water Intake**

The results for the water consumption of the different classes of rabbits (bucks, weaner, pregnant does, dry does and lactating doe are presented on Table 4.1 below;

**Table 4.1: Water intake of different classes of rabbit (ml)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Weeks** | **T1**  **(Bucks)** | **T2**  **(Weaners)** | **T3**  **(Preg Does)** | **T4**  **(Dry Does)** | **T5**  **(Lac. Does)** | **SEM** |
| **1** | 271.18b | 175.67 c | 293.25 b | 271.10 b | 342.80 a | 46.86 |
| **2** | 252.63 b | 133.35 c | 295.11 a | 212.72 b | 341.81 a | 47.00 |
| **3** | 239.88 c | 132.53 d | 290.08 b | 224.51 c | 376.29 a | 48.78 |
| **4** | 228.75 | 168.53 d | 295.96 b | 257.07 c | 352.06 | 46.80 |
| **5** | 264.38 b | 161.84 c | 298.62 b | 288.44 b | 358.57 a | 46.91 |
| **6** | 224.86 b | 154.53 c | - | 270.85 b | 334.29 a | 46.55 |

\*SEM – Standard Error of Mean \*a, b, c means in a row with different superscript are significant different (P<0.005)

**Discussion**

The daily water intake as shown on the Table 4.1 for the respective weeks (1-6) indicated that the lactating rabbit (T5) consumed significantly (P<0.05) higher volume of water when compared with other treatments. Additionally, the pregnant doe consumed significantly (P<0.005) higher volume of water when compared with dry doe, while the buck consumed significantly (P<0.05) higher volume of water than the weaner rabbit during the experimental period. Probably, the lactating rabbit consumed more water than other classes to meet up the demand for the production of milk and this result is similar to the reports of Owoideh *et al.,* 2017.

**4.2 Body Weight**

The result of the weekly body weight of the experimental animal are presented in Table 4.2 below;

**Table 4. 2: Body Weight of different classes of rabbit (g)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Weeks** | **T1**  **(Bucks)** | **T2**  **(Weaners)** | **T3**  **(Preg Does)** | **T4**  **(Dry Does)** | **T5**  **(Lac. Does)** |
| **1** | 2115b | 715.00 e | 2014.60 c | 2000.60 d | 2904.00 a |
| **2** | 2205 c | 818.00 e | 2658.00 b | 2051.00 d | 2896.00 a |
| **3** | 2211 c | 966.00 e | 2696.00 b | 2144.00 d | 2849.00 a |
| **4** | 2219 c | 1388.00 e | 2878.00 a | 2127.00 d | 2820.00 b |
| **5** | 2228 b | 1434.00d | 2937.00 a | 2215.00 c | 2211.00 c |
| **6** | 2229 a | 1503.01 d | - | 2214.00 b | 2196.00 b |

\*SEM – Standard Error of Mean \*a, b, c means in a row with different superscript are significant different (P<0.005)

**Discussion**

After the experiment, it was observed that the lactating rabbits had significantly higher body weight (P<0.05) than others, this value was followed by the pregnant animal and the least body weight was obtained from the weaner class of rabbits. The higher the body weight of lactating doe could be as a results of the pregnancy lactating hormone (progesterol, prolactin, oxytocin and relaxin). This results were similar to that of Mailafia *et al.,* (2010).

**4.3 Weight Gain**

The result of the weight gain is presented on Table 4.3 below;

**Table 3: Water Intake and Weight Gain of different classes of rabbit**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Parameters** | **T1**  **(Bucks)** | **T2**  **(Weaners)** | **T3**  **(Preg Does)** | **T4**  **(Dry Does)** | **T5**  **(Lac. Does)** | **SEM** |
| **Total water Intake (ml)** | 1036.8 c | 6484.8 e | 10673.04 b | 10311.0 | 14740.74 a | 48.78 |
| **Av. Daily water Intake (ml)** | 246.9 c | 154.40 e | 254.20 b | 245.50 d | 350.97 a | 1.15 |
| **Initial Body Weight(g)** | 2115b | 715.00 e | 1814.60 d | 2000 c | 2904.00 a | 9.76 |
| **Final Body weight (g)** | 2229b | 1503.00 e | 2937.00 a | 2219.00 c | 2196.00 d | 9.22 |
| **Weight Gain(g)** | 114 c | 788.00b | 1122.4 a | 218.40 d | -708.00 e | 9.49 |

\*SEM – Standard Error of Mean \*a, b, c means in a row with different superscript are significant different (P<0.005)

**Discussion**

After the experiment, it was observed that the pregnant doe (T3) had significantly (P<0.05) higher weight gain than other classes of rabbits, followed by the weaner rabbit. The lactating doe was found to have a negative value in weight gain indicating weight loss which may be attributed to the continuous suckling of the kittens. The higher weight gain for pregnant doe (T3) is associated with the developing fetus. The increase in the weaner rabbits can be attributed to the growth hormones (thyroxine). This experimental results is similar to the report of Owoideh *et al.,* 2017.

**CHAPTER FIVE**

**CONCLUSION AND RECOMMENDATION**

**5.1 Conclusion**

Animals of different class required a sustainable among of water attributed to it physiological state and Rabbits inclusive. From the research, it could be concluded that the lactating does (T5) required high volume of water with an average of 350.97g volume of water daily and the pregnant does (T3) had the highest final body weight of 2937g compared to other treatments.

**5.2 Recommendation**

From the research, it could be recommended that lactating and pregnant rabbits should be given an average of 350g volume of water daily for sustainability, reproduction and productivity.

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