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Effect of Different Salt Sizes on Drinking Water of Broiler Chickens on Food Consumption and Body Weight Gain

Habibur Rahman Jawhari[1], Mohammad Ayoub Hanif[2] and Farahuddin Larghani[3]
[1]Faculty of Agriculture, Department of Animal Science, Faryab University, AFGHANISTAN.
[2]Faculty of Agriculture, Department of Animal Science, Faryab University, AFGHANISTAN.
[3]Faculty of Agriculture, Department of Animal Science, Faryab University, AFGHANISTAN.

[1]Corresponding Author: habibjawhari@gmail.com

ABSTRACT

Since the provision of clean and health water is one of the requirements of education and breeding of broiler chickens and the existence of salts and other sources of water resources, it can have an adverse effect on the production and breeding of poultry. On this issue, it is necessary to determine the effect of saline water on the fowl.

Knowing the effects of salt in drinking water of broiler chickens, considering that most water resources are salty to different degrees, paves the way for determining the permissible and tolerable limit for broiler chickens and will prevent its side effects caused by salt accumulation in chicken organs.

This study was conducted to determine the effect of different sizes of saltwater on food acquisition parameters and body weight gain of broiler chickens. This study was conducted in 5 treatments and each treatment with 12 repetitions for 29 days. first treatment had 0% salt and 2-5% salt and 0.5%, 1.5%, 1.5% and 2% salt content in their drinking water, respectively.

The information and data obtained from this study indicate the significant effects on different percentages of saline water on the studied indices. Because, second, third and fourth treatments expressed 18%, 28%-64% reduction in food acquisition and also 11%, 30%79% reduction in body weight gain compared to control group, respectively. These effects were extremely dangerous at 2% and caused the death of included chickens in this department.

Keywords- Water, Impact, Food, Broiler chicken, Salt, Body weight.

I. INTRODUCTION

Poultry breeding is necessary to provide animal protein. Because it is possible to produce meat and eggs in a limited environment using a surplus of foods unusable to humans in a short time. (Leeson, S; JD, Summers, 2004) There are now about 42 billion chicken pieces in the world. (Zia Z., 2012) Chicken plays an essential role in global trade due to the increasing demand for chicken meat consumption (Leeson, S. JD, Summers, 2004).

At the same time, it has imposed restrictions on poultry farming because in many regions of the world it is a source of water for saltwater poultry consumption, and poultry producers in these regions often complain, problems that may be associated with additional Na and Cl consumption.

Salt is considered as one of the most important and essential minerals of diet in the meat poultry breeding industry at the time of salt deficiency in the diet: weight loss, lethargy, napping, reduction and retardation of growth, reduction of food consumption and muscle weakness, and at the time of high consumption of salt in poultry drinking water or in the diet used: High thirst of birds and increased water consumption in flocks, wet beds, muscle tremors and seizures, kidney involvement and even gout, ascites and abdominal water supply can be seen (Hashemi, 2011).

As it is obvious, human society has faced an increase and a plurality of populations with each passing year, and this phenomenon is promoted mostly in most Developed Asian and African countries, which has caused numerous problems in providing adequate food and the needs of the human body. In order to prevent the problems caused by food shortages, education and early broiler breeding can be a suitable solution, which also requires research due to available water resources.

In this research paper, the effects of saline water with high salt water scale (environmental salt water) on feed acquisition and growth performance and body weight gain on broiler chickens using completely random system (CRD) in five treatments with 1 Two repetitions and percentages of salinity of the first 2nd to 5th treatments were 0.5 1, 1.5 and 2, respectively, for 29 days, and the results were considerable on the studied parameters were obtained due to the effects of salt questions on the drinking water of broiler chickens.

II. PRESENTING THE PROBLEM

Drinking water in some areas producing broiler chickens contains large quantities of Na and Cl, and producers in these areas often complain, problems that may be associated with excess intake of Na and Cl, including wet beds and leg disorders, poor weight and food conversion and falling.

Recent analysis of water resources for broiler chickens and objective observations has shown that the

water in these areas (different parts of Faryab province such as Naharin and Khwaja Splan villages in Qaisar district, Marshadi and Bayghazi villages in Almar district, Arab villages of Aqsai, Kariz and Mosquito Khan in Pashtunkot district and Dowlatabad district) was salty.

III. IMPORTANCE OF RESEARCH

Since the increase of population requires the provision of food from economical and accessible resources and agricultural and livestock specialists are trying to sustain it. On this point, the breeding of broiler chickens, due to its rapid growth rate, can be of great importance for the supply of human foods. But the production and breeding of poultry is also faced with several challenges, including the provision of clean water and health for poultry in many parts of the world.

This research includes the general and lateral issues of the research objectives, so by implementing this research, its general and fundamental importance will be removed considering the following characteristics.

Broiler breeders will learn what the effects of salt water have on the amount of food taken by broiler chickens and the effects on body weight.

This study was conducted to provide answers to questions from broiler breeders about disorders in the legs, poor weight and food conversion, fesponse to the ground and wet bed, which may be caused by salty drinking water.

Nahata understands that the salinity of drinking water of broiler chickens causes insufficient water consumption and less food consumption and more salt intake, as well as explaining the effects of these questions on other economic indicators of poultry. This research creates mechanisms and solutions to prevent the impacts of questions related to research objectives and paves the way for further research on other indicators, which ultimately leads to the development of poultry breeding industry, in addition to other parts, in areas with saline water.

IV. GOAL

The effects of different amounts of drinking water salinity of broiler chickens on economic parameters and indicators such as:

1. Effects of salt at different amount in drinking water of broiler chickens on their food consumption.
2. Effects of different salt amount on drinking water of broiler chickens on growth performance and body weight gain.

Research Questions:

1. What are the effects of different sizes such as 0.5%, 1%, 1.5% and 2% salt in the drinking water of broiler chickens on their food intake and consumption?
2. What are the effects of different sizes such as 0.5 percent, 1 percent, 1.5 percent and 2 percent salt in the drinking water of broiler chickens on their growth and body weight?

V. BROWSE WORKS

Water is the most sensitive nutrient that we consciously provide to any animal. Water is the largest body component and accounts for about 70 percent of total body weight. 70% of this water is located inside the body's cells and 30% of it is in extracellular fluid and blood. Such a balance is very important because if the bird's body dehydration decreases, this sensitive ratio will change (Rashidi, 2017).

Water consumption increases with age, but decreases per unit of body weight. The tendency to drink water is closely related to food consumption. Therefore, any factor that affects food consumption will indirectly affect water consumption (Rashidi, 2017).

The amount of feed water is not normally considered to contain the water needed by the body. However, most foods contain about 10% free water. Another form of water, called bound water, is used during digestion and metabolism, thus providing 7-8% of the total body water requirement through feed (Rashidi, 2017).

The amount of water excreted through feces and urine varies according to changes in water consumption. Broiler waste contains 60-70% moisture content, while this amount is about 80% for laying hens (Rashidi, 2017).

Water quality is an issue that is considered nationally. High water quality is essential for successful poultry breeding systems. Salt is rarely the only mineral with a large concentration available in saltwater. Along with sodium and chlorine, calcium, magnesium and citrus bicarbonate, sulfate and nitrate are also commonly present. Each ingredient may exert its own toxic effects apart from the asthmatic effects associated with the entire dissolved solids.

It is well known that water consumption plays an important role in chicken resistance to high heat and maintaining electrolyte balance is very important for maintaining performance under temperature conditions. (Hashemi, 2011) and (Shahanaghi - Yeganeh, 2014) and on the other, water quality also varies in different regions depending on the depth of the source and composition of the soil (Hari, 2004) and at the same time, in many regions of the world, the water source for poultry consumption is salt water (Jahanpour, 2005) And the quality and quantity of salts in poultry nutrition plays an important role. The ratio of one athe to another is an important issue in nutrition (Medics, 2012). Meanwhile salt has been known for thousands of years that pets and wild animals need salt, just like humans (Maleki Mastouri - Yeganeh, 2014). Minerals are necessary for blood clotting, activating anzams, energy metabolism,

regulating asthmatic pressure, acidic balance and body twins, and for proper functioning of muscles in the body. Mineral deficiency in the body causes bone diseases, slow growth and other diseases. Na and Cl are essential components of salt that a certain amount is needed for the specific activities of the bodies of living organisms and broiler chickens (Maleki Mastouri - Yeganeh, 2014). The benefits of salt for animals were recognized by the ancient Greeks. Initial discoveries have been recorded in Africa, Asia and North America. In the early 1800s salt values were shown for experimental animals. Many studies have been conducted since then. Many scientists have shown that the salt needs of animals vary. Some of the factors influencing salt needs are as follows: diet, sodium and chlorine levels with other minerals, production level, ambient heat, potashim concentration in the diet, genetic differences (Shahanaghi - Yeganeh, 2014) Salt is the main source of sodium and chlorine in the body (Ebrahimzadeh, 2011). High levels of Na and Cl in water are toxic to poultry. However, studies have shown that moderate levels of Na and Cl in drinking water are acceptable and may replace part of Na and Cl in broiler diets (Leeson & Summers, Broiler Breeder Chicken, 2004). The amount of soda and chlorine in drinking water is determined by the total amount of salt soluble in water and according to the NRC proposal less than 1000 ppm for chickens has no effect, 1000-2999 ppm the appropriate limit, 3000-000 4999 ppm is considered inferior, 5000-6999 ppm is not acceptable and can still survive up to 7000-10000 ppm under low tension conditions of chickens. The NRC's recommendations in 1984 changed to 0.15% profit in all cygnus rations, the need for chlorine for chickens changed from 0.12 to 0.15 fissures.

Viscosity researchers, with research on jowari, infant formula bran, after minced and post-meat powder, concluded that adding 0.5 percent of salt to the chicken salt needs would be provided. Mississippi researchers have shown that the sodium requirements of cage-grown chickens are nearly twice that of the chickens kept on Bicester (Mehroughi, 2013). Other findings based on reliable scientific books show that salt is often suggested in the amount of 0.25-0.50 percent of rations. In addition to this amount, it increases fecal moisture and becomes more (Sohrabi, 2018). And to meet the need for broiler chickens to have salt in the diet combination, 0.50% of the salt has been ordered (Pourzia - Sadeghi, 2012). Another study showed that the highest blood hematocrit was obtained at the level of 2.5% of salt in water intake and the lowest was at 0-1.5% levels. Also, the highest blood hemoglobin levels in the fourth and sixth weeks were at levels 2 and 2 and 2009, and the lowest was at levels of 0-1.5% (Venom, Broiler poultry breeding, 2009).

The results of another study suggest that chloride acidification of the diet and broilers may quickly be in metabolic status of acidosis. Metabolic acidosis is associated with pulmonary hypertension. Calcium carbonate diet with calcium chloride is used to increase the level of dietary chloride, the results have shown that high chloride causes pulmonary hypertension because chloride causes acidosis and vasodilation. 1396).

Another study on carcass composition traits shows that the highest thigh weight and breast muscle weight were consumed at the level of 1% water salt and the lowest amount was in the levels of 2.2% and 2.5% of salt, the highest abdominal fat weight at levels above 2% of the salt water consumed and the lowest in the level of 1% water salt consumed and the highest heart weight, liver. And gizzard at the level of 2.5% of water consumed and the lowest amount at the level of 1% salt of water consumed (Woolly - Moradi, 2010).

Another study was conducted to determine the effects of oral physical form and salt on yield, blood characteristics and carcass criteria of broiler chickens. The results showed that body weight gain and feed intake of broiler chickens containing diet were significantly higher than those fed in weeks 2-6. However, growth parameters such as body weight and weight gain have not been significantly affected due to sodium chloride supplements in water. The test was conducted at 1,500 ppm and 3,000 ppm of salt in drinking water with unsalted controls.

Also, this study indicates a direct relationship between the consumption of physical water of feed and the availness of salt in drinking water. Based on these results, it can be concluded that pellet and salt feed improves production performance up to 3000 ppm. But it has no interaction on the overall carcass traits of broiler chickens (Shakeri -Izadpanah, 2014).

The results of other researches show that the amount of salt in the diet of broiler chickens is 3.7 grams per kilogram (Iranians, 2012) but another source (Safamehr, 2015) suggests 0.15 percent salt in the diet combination. Finally, other researches (Zia, 2013) indicate 0.35% of salt in the diet composition.

VI. METHODS & MATERIALS

In this study, the effects of saline water with high salt water scale (environmental salt water) on indices such as: food acquisition, and body weight gain of broiler chickens from the beginning of the second week to the fifth weekend (from the age of seven days to thirty-five days) were investigated.

The number of Semple studied in the study was 60 broiler chickens. This semple was categorized and divided into five groups randomly and included 12 broiler chickens in each group, and one group as control and four other groups whose drinking water was compared with different percentages (second group 0.5 percent, third group 1 percent, fourth group 1.5 percent and group 5 2 percent) with control group.

Rations and foodstuffs, commercial rations with standard criteria for broiler chickens, were made

available to all groups alike, free and weighed day and night, and the rest of the food was deducted every day from the prepared food.

The organizations and ingredients used in this study included: 60 broiler chickens, balanced diets, treated drinking water, powdered salt, scales, drinkers, jorge seeds, cages, booklets, pens, kemereh and other necessary materials.

Initial data collection (raw) was performed for four weeks, two days in between and finally the data of each group were sorted in the same group, which, in total, five groups with relevant figures were obtained.

The initial data obtained from the completely randomized design scheme (CRD) were analyzed and statistically analyzed using computerized programs and ANOWA system to determine their statistical differences.

VII. FINDINGS OR OUTCOMES

1. The effect of different salt amount on food acquisition

The results of this study were obtained in relation to total and intermediate consumption of whole foods in four weeks for each repetition of the five orders.

The results in five treatments with each repetition in the first week were 247, 220, 177, 89 and 71 grams of food, respectively, and show the differences from this perspective. These differences are in the positive direction in the first treatment repetitions compared to other treatments, the second and third tartiments, each with drinking water of 0.5% and 1% salt, respectively, are followed by the first target. This shows that drinking water with different percentages of salt that existed in these two treatments, in the first week has had its effects, causing anorexia of chickens in these times..... On the other hand, by comparing the data of the first week and the second week between each other, the overall difference between the effects of drinking water and different salinities is revealed.

The data of the second week indicate that the overall change in the fifth group is more than any other group. The amount of food in the first group has also been in normal at the same time as the time and added to the age of the chickens has increased. In the second week, each unit of repetition of this trenment is 805 grams of food, which is a good sign to better understand the effects of different salt sizes on drinking water in the second to fifth groups.

According to the above, it can be seen that the first group still has the highest consumption in the third week of the first row. Chicks of this group have consumed 1091 grams of feed in this week, and by comparing the unit repetition of this group with each repeat unit of the second, third and fourth groups, we have seen an increase in feed intake of 129b, 174,500 and 250 percent in the first group compared to the mentioned groups, respectively. This feature, as well as the intermediate feed intake, is listed in chart (2).

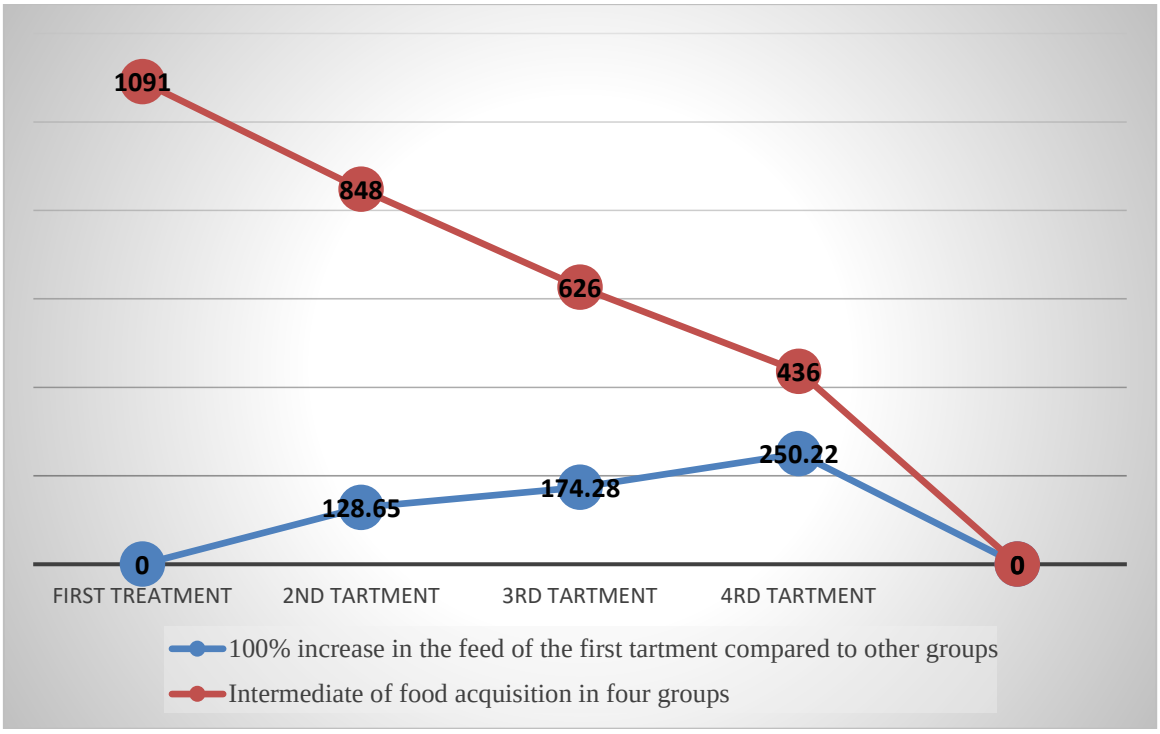
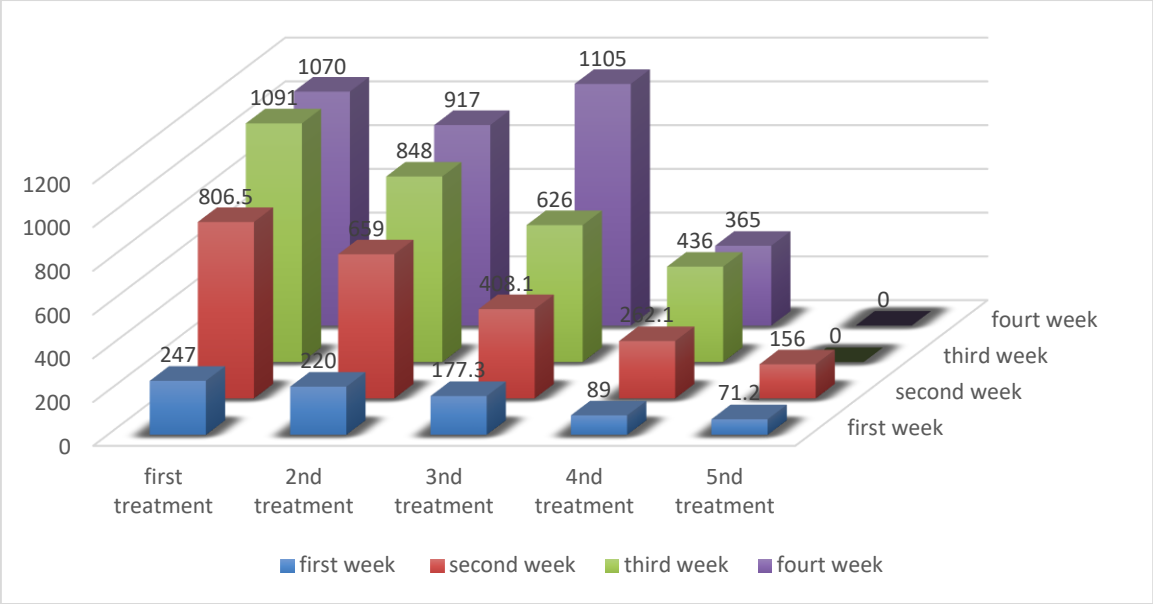


Diagram 1: Feed consumption per unit repetition of the first to fourth groups, as well as a percentage increase in feed per unit repeating the first group compared to the repetition of the second to fourth groups.



Graph 1: The amount of haftvar feed per repetition of the five orders within four weeks.

1.2. Weight Gain

The weight of getting and converting food into meat is one of the superior characteristics and special traits of broiler chickens that the mentioned trait factor (gin) has accumulated in broiler chickens due to the modification and continued generation. Therefore, this trait is one of the hereditary traits which is possible in normal conditions of environmental conditions and in the existence of balanced diet and health water by maintaining appropriate conditions.

The proportion of food conversion to meat normally is 2:1, the differences from this ratio are mostly related to various environmental factors (unclean water, insufficient food, poor accuracy, poor ventilation, coldness and warmth, etc.). Considering the above characteristics, in this study, final efforts have been made to control the effective reflectors on the studied parameter and the experienced chickens are in good environmental conditions.

The data showed that the body weight of the first to fourth groups increased from 201.4, 202, 209.5, and 188.3 grams to 411, 405, 385, and 270, respectively. But the fifth group has reduced the availity of 2% salt in their drinking water from 183 grams to 155 grams.

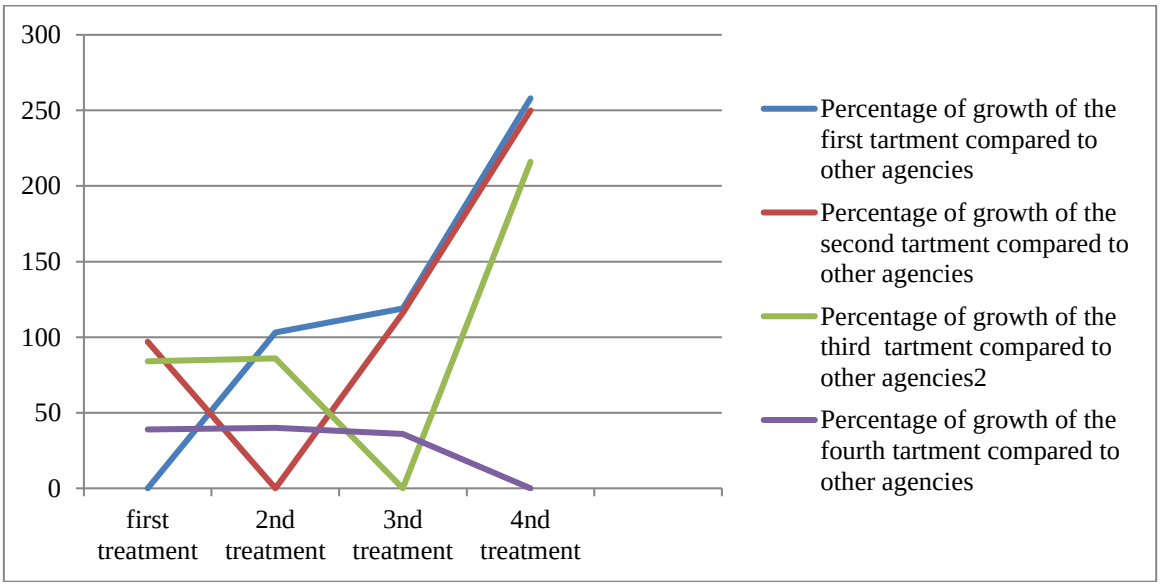
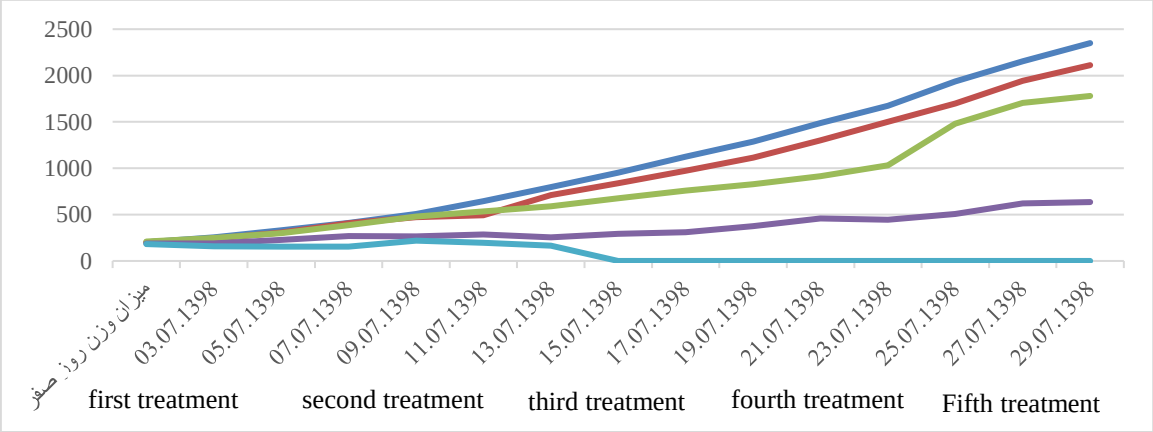


Chart 2: Percentage growth and weight gain in repetition of the first to fourth treatment units compared to the other during the first week.

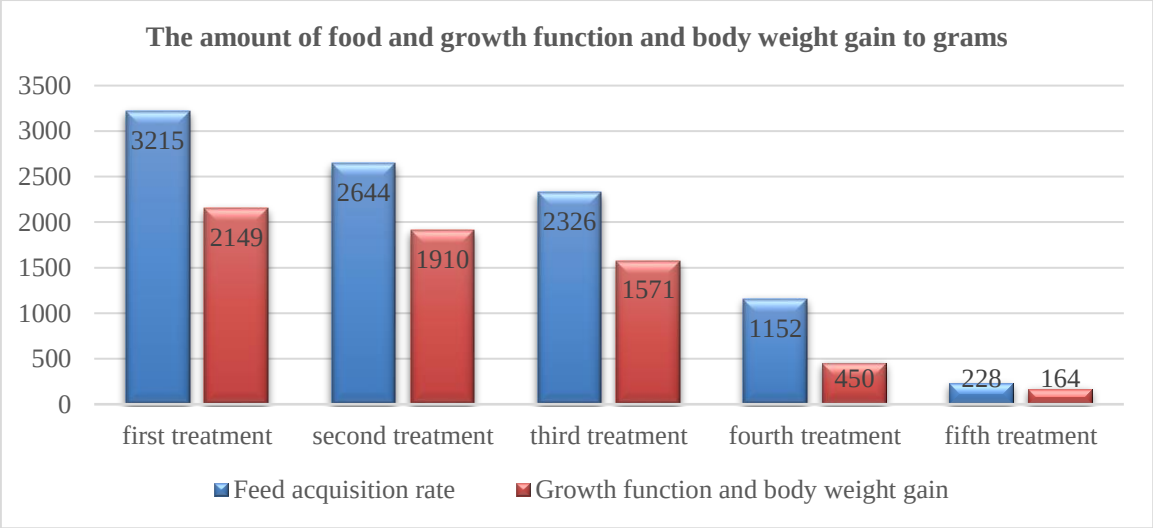
According to the above diagram, it can be seen that there has been a very high jump in the first, second and third treatments compared to the fourth treatment (the fifth sourging cultivars did not include the above diagram due to 100% death) and it is true that there is more salt in drinking water that causes weight loss in chickens.

According to the chart above, it can be seen that, on the second weekend, The Fifth Tartmet is zero. On this date, chickens including this trend have faced 100% losses, but the previous cultiron has also been descending compared to the first week. This shows that drinking water with 2% salt is extremely effective because it reduces appetite and weight gain. Body weight loss has appeared since the beginning of the week and reached its upper limit in the middle of the week, ultimately causing the chicken's death. However, individual resistance in the remaining chicks compared to other chicks included in the treatment was still active.

Also, if accurately observed in diagram 2-2, it is found that the weight gain speed in the first treatment (control) is normal and in a positive direction, but there are fluctuations in other departments. As a result, these details are mostly due to salt in the drinking water of the second to fifth treatments, the higher the amount of salt, the more negative returns we see, and in the fifth order from the beginning to the research, it is accompanied by weight loss until the remaining single chicken is also gotten to death.



Graph 3: Growth trend and getting weighted with the final weight per unit repeating the five groups within 29 days.



Graph 4: Intermediate feed intake and growth function and body weight gain in repeat units of the first to fiveters.

VIII. DISPUTE OR DISCUSSION

Zohari writes in 2009: Most birds should always have access to clean and proper water. Some breeders of mother flocks use water restrictions on laying hens, especially in hot climates, to prevent problems caused by wetting waste. However, before applying this method, other methods of prevention of the above problem should also be considered. But when chickens are deprived of water for 24 hours, production

may decrease by about 30 percent and take 30-25 days to return to normal production. Similar results have been reported for broiler chickens, so that reducing water consumption caused a sharp decrease in their weight gain. In the delirium study, the chickens had access to clean water for 24 hours, except for certain amounts of salt in certain cafeterias, and did not face any water restrictions and deprivations because there was no action to prevent the problems caused by wetting the waste, but it was seen that any factor that reduced water consumption (in the study of delirium) was found that increasing salt in drinking water caused less water consumption. It could have been drinking, it also reduced the food acquisition. According to the results of the research, the delirium is completely in accordance with the above-mentioned words.

(Leeson & Summers, Poultry Nutrition, 2013) writes: Water quality should be tested every 6 months. Alchemical materials are the main factors that affect water quality. Poultry typically adapt to the consumption of large amounts of some salts after a while, so only a relatively small number of salts in the water can severely affect herd production. In certain areas, the water is so salty that it greatly reduces the production and quality of the herd, in these cases it may be necessary to remove some of the salt in the diet, but this should be done carefully, because if the salt of the ration is too low, the production and quality of the herd will be greatly reduced. In the above text, one of the factors that affects the production of poultry is the presence of salts and salinity of drinking water. Therefore, the results of the research have been completely consistent with the above statements.

(Zuhri, Principles of Poultry Breeding, 2004) says: The quality and quantity of salts in poultry nutrition plays an important roll. The ratio of one athe to another is an important issue in nutrition that should be taken seriously. In the study, the solute ratios were not significant and only considering the salt size in drinking water, the results of this study were consistent with the above statements.

(Leeson & Summers, Poultry Nutrition, 2013) Says: Salt deficiency leads to reduced feed intake, weight loss, egg production and sometimes reduced egg size and slower growth in broiler chickens. Also, the deficiency of chloride soda can increase the susceptibility of birds to the disease by preventing immune system activity. Akhira Pymentel and Cook reported that Hobard broiler chickens fed rations containing less than 0.14% soda or 0.17% chlorine had a weaker iminin system due to a decrease in red blood cell transfusion compared to those fed with higher levels of chlorine. In the study of salt deficiency in food and its effects, it was not tangible, so the result of this study is in accordance with this phenomenon.

The findings of Dahl et al. in 1984 showed no clinical signs of poisoning due to the availity of 2,500 national grams of salt per kilogram of food. Recent findings also show that 2500 national grams in water probably does not cause toxic effects, but may increase egg shell defects (Mehroughi, 2013). Mississippi researchers believe that the amount of sodium requirements of cage-grown chickens is twice the requirement of chicks bred in salons, because of these statements, the above researchers may be due to the use of their peykhal chickens to compensate for the sodhim requirement in the chickens bred in the salon. The research, which was conducted under cage conditions, could possibly tolerate the presence of 0.5% salt in the diet. Another study showed that the highest blood hematocrit was obtained at the level of 2.5% of salt in water intake and the lowest was at 0-1.5% levels. Also, the highest blood hemoglobin levels in the fourth and sixth weeks were at levels 2 and 2 and 2009, and the lowest was at levels of 0-1.5% (Venom, Broiler poultry breeding, 2009).

(Berger, 2008), It was stated that most studies on nutrient requirements were carried out under conditions that minimized the stress caused by disease or environment. It is not surprising that the needs of sodium and chlorine increase in lower than optimal conditions. They stated that the reason for increasing the need for sodium and chlorine for fowl was controlled environmental conditions. And this also indicates the need for twice as many chickens raised in cages and compared to salons. In such cases, according to the research findings, bred fowl can tolerate up to 0.5% salt in drinking water under the above conditions. The NRC magazine in 1984 states: The existence of 4999-3000 national grams in the waters is satisfactory for domesticated live ends, although they may cause temporary diarrhea or may not be initially accepted by unaccuspied animals. These waters are inferior to poultry and often cause watery stools and higher salinity levels increase mortality and decrease growth, the above statements are completely consistent with the results of this study. (Yan & Park, 2005) it is said that drinking water containing 0.5% salt can be used in providing salt to lift food in foods that are not salt-free. (Yan & Park, 2005) also stated that moderate levels of salt can replace salt in foods. This indicates that park and yan mean less than 0.5% of the average salt level in chicken drinking water. As Yan & Park, 2005) states: Salt levels of 0, 0.025, 0.05, 0.075, 0.10, and 0.125 mg/L water are safe. The results of the research are also delirious. It is consistent with the NRC's statements and also with Park and Yan's statements.

IX. CONCLUSION OR RESULT

According to the studies and researches, the following results were obtained due to different salt availities in drinking water of broiler chickens.

1. The availity of 0.5% salt in drinking water showed 18% reduction in food intake and 47% increase in water consumption.

2. The availity of 1% salt in drinking water showed 28% reduction in food intake and 25% increase in water consumption.
3. 1.5% salt content in drinking water showed 64% reduction in food intake and 19% reduction in water consumption.
4. The availity of 2% salt showed a very severe decrease in food intake and water consumption. None of the experienced fowl could survive most of the two weeks.

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