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Effect of Potatoes on the growth rate of Broilers

[*1]Ibrahimi Mumtaz, [2]Kamal Said Ismail, [3]Khosti Ajmal, [4]Khalid Aziz UR Rahman, [5]Hemat Zainullah & [6]Basharmal Khalid

[1, 2, 3 & 4]*Lecturer, Veterinary Science Faculty, Shaikh Zayed University, Khost city, Khost, Afghanistan*
[5 & 6]*Lecturer*

ABSTRACT

Broilers chickens forming is an important part of poultry, Because Broiler Chickens Meat is a good source of proteins, Minerals and Vitamins that have Special values. The object of this Study to find the effect of potato on the growth of broiler. This Study which is conducted in Nangarhar University Veterinary Faculty in research form, overall 48 broiler chickens which average weight is 42.5 grams and was randomly divided into four groups, every one groups had 12 chickens replaced in research form. first group the control group which is did not provide research Feed. and to the second group two percent potato powder with basic diet, to the third group and forth group three and four percent of potato powder with the basic diet. The Study indicate that in the first Week the three percentage group of potato powder were higher (p<0, 05) in the growth comparison to the control and other research groups, but this overview of the last two weeks later controls was not seen in all research groups(p>o, o5). In the third week, third group of potato powder and control group were significant changes (p< 0, 05) in growth compared to other research groups, but in the fourth week control and fourth group of potato powder were higher (p<0,05) in growth. Although there was not enough considerable viewpoint (p<0, 05) in research groups compare to the control group in Feed intake, only fourth group was closer (p<0.05) to the control group. But in food Conversion Ratio (F C R) Control and fourth groups were higher (p<0, 05) in first week, whereas in the second, third and fourth weeks was not seen Difference among control and research groups. Overall, this study show that the potato powder has considerable significant in growth but no there is significance in feed intake and food Conversion Ratio (F C R).

Keywords: *Effects, potatoes, Growth, Broilers*

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[*]Author's Correspondence

Ibrahimi Mumtaz

Lecturer, Veterinary Science Faculty, Shaikh Zayed University, Khost city, Khost, Afghanistan

✉ mumtaz.kunarai[at]gmail.com

1. Introduction

Afghanistan is an agricultural country with a large population engaged in agriculture and livestock, and as well as a large number of vegetables grown for daily life, one of which is the potato, which is used for human consumption, sometimes it is so severe that farmers suffer huge economic losses due to its deterioration. Potatoes are one of the most important food products in the world and many people around the world, especially in Asian countries, are engaged in potato in cultivation because they meet the nutritional needs of country. Plays a big role. At the same time, the yield of this crops on a certain land is much higher than that of other food corps because of the high dry weight of potato. Potato as an important food eliminate the problem of malnutrition and are considered a good source of nutrient, potatoes have been shown to be cold and dry by nature, so if applied to a burn, it will heal quickly and is also a remedy for eye pain. Another is that many families in Afghanistan live in poverty, suffering from a lack of work, and even some families who have lost their parent, siblings, and husbands in ware can afford to establish small and medium forms at home and feed them with potatoes, as they are available at ow cost in each season. Potatoes, which are a good source of carbohydrates, need to be added to the poultry diet for weight gain of broilers chickens, on the one hand, it will increase the production of broilers chickens in population areas and on the other hand, it will contribute to the strengthening of farmers, and the national economy as a whole. Researchers have found that potatoes are better than many vegetables because they can be used as a food with carbohydrates in their composition and as substitute for vegetables because they contain Vitamins B, A and C, as well as a number of minerals such as contains calcium, potassium, phosphorus, magnesium, sulphur, chlorine and iodine. Potato also relieve cough and phlegm, strengthen the eyes, relive joint pain and are a curative food for heart patients as they give strength to the body but eating potatoes is harmful for those who have gastrointestinal diseases and it's in addition, all parts of the potato skin contain a

substance called solanine, which is harmful to human and animal health. This substance is found in newly arrived potatoes or in potatoes that have been greened by the sun there are too many. Therefore, potatoes with a new blade should not be used if they contain too much solanine. Farmers can also use raw or cooked potatoes and dried potatoes for animal feed, especially for broilers chickens, as raw potatoes should be used better by ruminants. But before handling, potatoes should be clean first and mineral deficiencies should be taken into account when using potatoes. But to feed the birds, potatoes should be ground cooked after they are cooked, but not for other animals

2. Research area

The study was conducted at a research farm at Nangarhar University's Veterinary Faculty under the title The Effects of Potatoes on the Growth rate of broilers.

Research design

This study conducted using the CRD Complete Randomized Design method using 48 chickens divided into four groups of 12 chickens in each group, with each group consisting of three sub-repetitive groups. However, each replicate has up to 4 chickens and is fed a routine and research diet for 28 days. At the end of the week, every checks are weighed a group of chickens and with the rest of the food, we added new food to the chickens and we took this record every day for 28 days.

3. Material and method

In this study, all 48 chickens were one day old and belonged to a Pakistani company that was bought from a market in Jalalabad. We provided bedding, light, ventilation, and heating for the chickens. Then we put a saw bore on the farm for four groups and put a newspaper on top of it, then the chicks were randomly weighed and divided into four equal groups. Each group consisted of three replicate, one was control group and remain three were research groups, each four groups had 12 chickens. The control group did not consider the research diet for comparison with the control group and 2% for the second group, 3% for the third group and 4% for the fourth group. Potato powder was considered with other common foods. When the chickens were brought to the farm, they were given glucose in water for the first three hours, followed by a small number of grains, which were given for two weeks. after two weeks the large size grain were fed. The amount of food given and leftover each day was weighed and the amount of food consumed was determined. The potatoes have get from the local market and was boiled in a container at a temperature of 50 degrees Celsius and then dried in the sun for three days to evaporate the water and then use a grinder machine to Flour and combine with other foods. For the dose we used a sensitive scale to weigh the feed, chickens, and the food leftovers. We added water to the chickens two or three times a day and we fed the chickens once a day in the afternoon. We would weigh the leftover feed each day and record it with ourselves and add the rest of the food to the chickens by the gram. The study also weighed a total of five time chickens during the study, which were recorded on average each time. Also in this scientific study we used some of the vaccines against viral viruses which include ND + IB vaccine in the form of eye drops on the sixth day in chickens with ND B1 strain and IB strain H-120. Was possessed. On the twelfth day, chickens were vaccinated with Gambor vaccine (IBD) in the form of eye drops. On the 18th day, he was also vaccinated against ND Lasota strain, which was also administered in the form of eye drops (Muhammad et al., 2012).

4. Data analysis

In this study, we used statistical analysis using the 16th version of SPSS 2015 software related to IBM SPSS Statistics Company and the results obtained were analysed by ANOVA LSD-Test. The overall confidence interval is 95% and significant changes ($P < 0.05$) are taken into account. The data I obtained was analysed using SPSS software for weight gain, meat conversion, and FCR.

5. Result

Table 1 shows the live weight of beef chickens on the first day. Statistical analysis shows that the live weight of chickens is between two percent of the potato powder group, three percent, four percent, and the control group ($p > 0.5$). No noticeable change is observed. Table 1 shows the effects of potato powder on the live weight of broiler chickens over a period of 1-7 days. According to the statistical analysis, the control and potato powder groups of 3% have noticeable variations ($p < 0.5$) with 2% and 4% groups. However, no significant ($p > 0.5$) variation was observed between the 2% group and the 4% group of potato powder. Table 1 shows

the live weight of broiler chickens over a period of 1–14 days. Statistical analysis shows that the control group with the 2%, 3%, and 4% of the potato powder in the control group is observable (p <0.5). Has variations. Also, 2% of the potato powder group and 3% of potatoes group had noticeable variations (p> 0.5) compared to 4% of the potato powder group but no noticeable (p> 0.5) changes between the 2% and 3% group. Is visible. Table 1 shows the live weight of broiler chickens over a period of 1-21 days. Statistically, the control group and 3% of the potato powder group were more suitable than the 2% of the potato powder group and 4% of the potato powder group. Has variability of observation (p <o.5). However, no significant (p> o.5) changes were observed between the first group and the third group of potato powders. Table 1 shows the live weight of beef chickens over a period of 1-28 days. Statistical analysis shows that the control group and the fourth group of potato powders are significantly higher than the 2% group and 3% group of potato powder. (p <o.5) has variations. However, no significant (p> o.5) changes were observed between the 2% group of potato powder and the 3% group (Table 1).

Table 1: In the table below, the effects of 2%, 3%, and 4% of potato powder on the live weight of broilers chickens over a period of 28 days are shown.

Groups	weight of the first day (Mean±SD)	1-7 days' weight per gram (Mean±SD)	days weight 1-14 per gram (Mean±SD)	days weight 1-21 per gram (Mean±SD)	days weight 1-28 per gram (Mean±SD)	p-value
Control group	42±0.66^{a}	166±0.72^{a}	496±5.43^{a}	728±33.09^{a}	1272±48.31^{a}	0.5
2% potatoes powder	42.41±1.25^{a}	152±7.62^{b}	390±20.5^{b}	691±14.37^{ab}	1149±62.03^{b}	0.3
3% potatoes powder	42.75±2.5^{a}	167±4.4^{a}	396±34.6^{b}	745±38.53^{a}	1172±95.29^{b}	0.3
4% potatoes powder	42.5±1.63^{a}	156±9.74^{b}	377±40.5^{b}	669±33.18^{b}	1237±14.38^{a}	0.5

The table above shows the average live weight, average, and standard deviation (mean ± SD) of each week of broiler chickens in English letters in the same column, a in the first step and b in the second step. Observations (p <0.5) have variables and numbers with the same English letters do not have observable (p> 0.5) variations between them.

Table 2 shows the daily feed intake of beef chickens over a period of 1–7 days, based on statistical analysis of the control group with 2%, 3%, and 4% of the potato powder group. (P<0.5) has variations. Also, 4% of potato powder groups have noticeable variations (p <0.5) compared to 3% and 2% of potato powder groups. However, no significant (p> 0.5) variation was observed between the 2% group and the 3% group of potato powder.Table 2 shows the daily feed intake of beef chickens over a period of 8–14 days, based on statistical analysis of the control group with 2%, 3%, and 4% of the potato powder group (p <0.5). Has variations. However, no significant (p> 0.5) variations were observed between the 2% group, 3% group, and 4% potato powder group.Table 2 also shows the daily intake of broilers chickens over a period of 15-21 days. Statistically, the control group consisted of two percent, three percent, and four percent of the potato powder group (p> 0.5). No significant changes (p> 0.5) were observed between the 2%, 3%, and 4% groups of potato powder.Also shown in this table is the daily feed intake of beef chickens over a period of 22-28 days.) Has variations. However, no significant (p> 0.5) changes were observed between the 2% group and the 3% group of potato powder, as well as between the control and 4% group of potato powder (Table 2).

Table 2: The effects of 2%, 3%, and 4% potatoes powder on the feed intake of broilers chickens over 28 days are shown in the table below.

Groups	1-7 feed intake/ gr (Mean±SD)	1-14 feed intake/ gr (Mean±SD)	1-21 feed intake/gr (Mean±SD	Totally feed intake (Mean±SD)	P- value
Control Group	186±16^{a}	641±15^{a}	1172±6^{b}	1964±39^{a}	0.4
2% potatoes powder	190±13^{a}	578±9^{ab}	1222±8^{a}	1965±33a	0.5
3% potatoes powder	170±15^{b}	543±15^{b}	1157±3^{ab}	1877±44ab	0.3
4% potatoes powder	175±6^{a}	598±6^{a}	1212±14^{ab}	1983±23a	0.7

The second table above shows the feed intake of broilers chickens, the weekly average and standard deviation (Mean ± SD) in English letters in the same column a in the first step and b in the second step from each other significant (p <0.5) differences and numbers with the same English letters do not have significant (p> 0.5) variations between them.

Table 3 shows the effects of potato powder on beef chickens on FCR over 1–7 days compared to the control group and the 4% potato powder group compared to the 2% and 3% groups based on statistical analysis have significant ($p < 0.5$) variations. Also, 2% of the potato powder group has significant ($p < 0.5$) compared to 3% of the potato powder group. but between the control group and the 4% of the potato powder group, there are significant changes ($p < 0.5$) on FCR. Similarly, in Table 3 the effects of potato powder on broilers chickens on F.C.R were shown over a period of 8–14 days. According to the statistical analysis, 4% of the potato powder group and the control group have significant ($p < 0.5$) compared to the 2% of the potato powder group and 3% of the potatoes group. Also, two percent of the potato powder group has significant ($p < 0.5$) compared to the control group. However, there were no significant ($p > 0.5$) changes between the control and the 3% of potato powder groups. Similarly, in Table 3 the effects of potato powder on beef chickens on F.C.R were shown during 15-21 days. According to the statistical analysis, 4% of the potato powder group and 2% of the potato powder group have noticeable variations ($p < 0.5$) compared to the 3% group and control group. Also, 3% of the potato powder group has significant ($p < 0.5$) compared to the control group but no significant ($p > 0.5$) between the first group and 3rd group of potato powders. Table 3 also shows the effects of potato powder on broilers chicken F.C.R over 22-28 days. According to the statistical analysis, the control group did not have any significant ($p > 0.5$) changes compared to all the potato groups, nor did it show any noticeable ($p > 0.5$) changes between all the potato powder groups (III). Table).

Table 3: In the table below, the effects of control, 2%, 3%, 4% potato powder Groups on broilers chickens on F.C.R during 28 days are shown.

Groups	1-7 FCR/gr (Mean±SD)	1-14 FCR/gr (Mean±SD)	1-21 FCR/gr (Mean±SD)	1-28 FCR/gr (Mean±SD)	P- value
Control Groups	1.12 ± 2^{a}	1.3 ± 11^{b}	1.6 ± 22^{b}	1.5 ± 9^{a}	0.3
2% potatoes powder group	1.13 ± 4^{a}	1.5 ± 6^{a}	1.5 ± 11^{a}	1.7 ± 17^{b}	0.5
3% potatoes powder group	1.11 ± 6^{b}	1.3 ± 5^{b}	1.5 ± 16^{ab}	1.5 ± 4^{a}	0.4
4% potatoes powder group	1.12 ± 3^{a}	1.5 ± 3^{a}	1.8 ± 12^{a}	1.6 ± 12^{ab}	0.3

The table above shows the FCR of beef chickens and the mean and standard deviation of each week (Mean SD) in English letters in each column. In the same column a in the first step and b in the second step have noticeable variations ($p < 0.5$) and numbers with the same English letters have no significant between them ($p < 0.5$).

6. Discussion

In 2012, Muhammad and his colleagues showed in their research that potato powder was slightly less useful, and Unigwe and his colleagues also gave a small amount of potato powder to broiler chickens in 2014, but the results showed that Potato powder may not be effective in the starter phase of raising chickens, but it was effective in the finisher phase of research. However, in our study, we found that potato powder was initially more effective than the control group, except for the 3% group, which is why it is more effective than other research groups. The question is, what percentage is not effective? The answer lies in both Yakubu's research and our research, because Yakubu initially gave a small percentage of potatoes to research groups and gave impressive results. The scientists concluded that a small percentage of potatoes are very useful in the finisher phase of the Growth of broiler chickens. Our research is similar to the results of these scholars because in our study the potato powder in the fourth week is very close in weight with the control group. But in the third week, 3% of the potato group gained more weight than all the research groups and the control group. The question now is how much food did the 3% of the potato group eat? And if less food is replaced by more meat.The answer is shown in the third week of our study in the table of feed intake. The lowest intake group made up the same 3% group but this low intake diet turned out to be extremely meaty while the control group also gained good weight but why their intake is higher than all the other groups. In the fourth week, 3% of potato powder is added to the broilers chickens, so on the one hand feed costs will be reduced and on the other hand broilers chickens will gain better weight. The same result was obtained at the experimental centre of the Faculty of Agriculture at Carver University in the United States because the experimental centre gave 30 grams of potato powder per kilogram, which is 3 percent, therefore our research is similar to the above scholars and we have found a solution to the problem that we want to get more meat at a lower cost. Fortunately, we have succeeded to some extent in this and we have also found a way to assume that there is less potato Powders are a staple in the diet of broilers chickens.

Karimi and colleagues conducted research in 2014 and Tamir and Tsega in 2010 to determine the effects of potato powder on the growth of beef chickens. He recommended 150-200 grams of potato powder per kilogram but did not notice any significant changes compared to the control group. Therefore, his research is different from ours and the rest of the world. Why the research of Karimi and his friends and the research of Tamir and Siga are different from ours and his world research? The answer is very clear in our research, Unigwi and Yakubu. A small percentage was given as a supplement, but in the research of Karim's, Tamir and Tsega study the percentage is much higher, so the recommendation for potato powder should be given to broilers chickens as a supplement. Another study was conducted in 2012 at Abu Bakar Tafwa University on the growth rate of broiler chickens. The results showed that in the starter phase, the chickens ate a lot of potato powder, but their weight gain was not significant. But in our study, the use of potato powder with commercial diets is similar to that of the scholar. This is because in the starter phase the research groups weighed less than the control group but the research groups differed very little from each other.

In Feed Intake, Mohammed and his colleagues in 2015, Yakubu in 2008 and Unigwi and his colleagues in 2014 concluded that initially more potatoes were consumed by research groups than by control groups. We found that in the first week and in the second week, the control group consumed more food than the other research groups. However, in the second stage, four per cent of the potato potatoes powder group had more feed intake than the two per cent group and three per cent groups, but in the third stage, the control group had the lowest intake of feed compared to other research groups. The percentage of groups that ate the least amount of food in the first week is again at the top of all groups this week, but there is not much difference in the diet between the groups of 3% and 4%. In the fourth week, the control group was at the top of the list in terms of feed intake, but overall, 2% of the group and 3% of the group ate less, and the control group and 4% of the group ate more.

In F C R (food conversion ratio) are not more beneficial to other research groups than to the control group in the first stage. We found that in the first week, the control group and the 4% group converted more feed to meat than the other two groups. However, the dose was significantly less consumed by the control group in the second week than in the 4% group, but 2% remained the same. This is the lowest level of feed consumption in the third week. The 2% and 4% groups have switched to more meat, but in the 4th week the control is more similar to meat with 4% and 2% to 3%. In a nutshell, Initially, the control group and 4% produced more meat, but in the average two weeks, it did not prove to be very useful, and in the last phase, research groups other than the control group produced more meat (Muhammad et al. 2015., Unigwi et al., 2014 and Tsega., et al., 2010)

7. Conclusion

As a result, the study showed that in the first week, control and three percent of the potato powder group has a significant in growth compared to other research groups. However, these growth-related observable changes were not observed in all research groups in the second week compared to the controls. In the third week, the third and control groups of potato powder has significant compared to other research groups, but then in the fourth week, there was significant in the growth of control and the fourth group of potato powder. In all of the research groups, the daily intake did not show significant changes compared to the controls, but only the fourth group had significant changes near the control group.

In the feed intake, the control group and the 4% potato powder group consumed more feed in the starter phase than 3% and 2% of the potato powder groups. But in the third week, this graph is much lower than in all other control groups. Also in the fourth week the intake of feed increased by the control group and in the fourth week the feed intake increased in the fourth and control groups. But there is not much difference between 2% and 3% of potatoes groups.

The control group and the fourth group of potato powder in the FCR (food conversion ratio) has significant in the first week. However, no significant were observed between the control group and all other research groups in the second, third, and fourth weeks. Overall, this study shows that potato powder has significant changes in the growth of broilers chickens, but not significant changes in daily feed intake and FCR.

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