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Effect of using celery seed as a probiotic on the productive traits of kids local goats

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Abstract

The study was conducted in the animal field of the College of Agriculture and Marshes / University of Thi- Qar from 12/30/2021 to 3/15/2022 in order to find out the effect of giving celery base and probiotic to the kids of local goats and its reflection on the productive traits. This origin in the study gave 16 formulas weighing 14.5 kg, and performed randomly on a treatment with four replications for one treatment, T1 treatments: Treating the basic ration consisting of (59% barley, 37% bran, 1% urea, 2% salts, 1% vitamins) and without added, T2 (control treatment + addition of probiotic 2%), T3 (treatment of control + addition of celery seed 5%), T4 (treatment + addition of probiotic with celery). The results of the current study showed that the addition of celery seeds and the probiotic/head/day increased the rate of weight and weight gain. The results of the first week of the experiment showed that there was no significant difference in weight despite the presence of an arithmetic increase in favor of the probiotic and celery treatment, with an average of (15.89) kg compared to With the rest of the treatments, in the second week, the moral superiority was in favor of the two treatments (the probiotic + celery and celery) whose average was 16.37 and 16.54 kg, respectively, and through the results we find a significant superiority in the treatment (the probiotic + celery) for the fourth, sixth and eighth weeks And the tenth and twelfth of the experiment, and the averages recorded for their body weights were (17.300), 18.40, 19.30, 20.30, and 21.30 kg, respectively, compared to the rest of the experiment's treatments. As for the total weight gain, the moral superiority was in favor of the probiotic treatment, as it recorded an average of (7.15) kg compared to the rest of the treatments (the probiotic + celery, celery, and the control), where the average total weight increases were 5.41, 5.16, 4.19) kg, respectively. Significant superiority was noted in the daily weight gain rate in favor of the probiotic treatment, as it recorded an average daily weight gain of 85.11 (gm/day) compared to the rest of the experiment treatments (the probiotic + celery, celery, control) and the average daily weight gain values were (64.40, 61.42, 49.88)gm/boom, respectively. As for the efficiency of food conversion, it was a significant superiority in favor of the control treatment, as it recorded an average of (10.23) kg of feed / kg compared to the rest of the treatments (the probiotic + celery, celery, the probiotic) and their recorded averages were (8.65, 7.05) , 6.12) kg of feed / kg of weight gain, respectively.

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I. INTRODUCTION

Livestock in Iraq suffer from low livestock production and low numbers due to the lack of feed availability, low nutritional value, and low protein and energy content, which led researchers to use natural food additives, the most important of which is the use of biostimulants and medicinal plants. These additives are used to feed ruminants to improve the intake of ruminants Dry matter and increase the productivity of these animals, especially animals suffering from stress conditions, and the probiotic is a group of microorganisms that are widely distributed in nature (Jouany and Schingoethe et al., 2004 and 2007, Morgavi and Moallem et al., 2009). Either the use of many medicinal plants in animal diets as growth stimulants (Sarinivasan, 2005) or to improve growth and immune status (Durranim et al., 2007) and as an anti-fungal and anti-microbial (Tagoe et al., 2011). Plant materials are a relatively new class of food additives to feed, which have been successfully used to improve the performance and productivity of ruminants and use natural ingredients instead of chemical compounds (Cedillo, 2015). Because it contains many active substances, the most important of which are flavonoids, limonene, choline, and terpenes (Momin and Nair, 2001).

Aim of the study :

Studying the effect of adding celery and the probiotic to the concentrated diets used in feeding young goats on the economic characteristics such as body weight, weight gain, the amount of feed intake, and the efficiency and nutritional conversion of the kids of the studied treatments.

II. MATERIALS AND RESEARCH METHODS

This study was conducted in the animal field affiliated to the College of Agriculture and Marshlands / University of Dhi Qar for the period from 12/30/2121 to 3/15/2022. The study included (16) male calves of local goat cubs taken after weaning at the age of 3 months with an average weight of 14.5 (kg) purchased from the local market and examined by the veterinarian to ensure its safety and freedom from diseases. The individual weights were taken after the preliminary period of the experiment, by means of a digital scale, and then weighed every two weeks until the end of the experiment.

Daily weight gain (g / day) = subsequent weight - previous weight / number of days

Total weight gain (kg) = final weight - starting weight

III. RESULTS AND DISCUSSION

1- live body weight:

Table (1) shows the weights of the results of the different experimental treatments when adding different levels of celery and the probiotic, and there were significant differences between the average weights during the study period of 12 weeks). Celery) an arithmetic increase with an average weight of (15.89) kg compared to the rest of the treatments (celery, the control and the probiotic), which averaged (15.61, 14.93, 13.80) kg. In the second week, the treatment (celery and the probiotic + celery), whose average weights were (16.54 and 16.37) kg, followed by

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treatments (control and probiotic) and the weight values were recorded for them (15.31, 14.71) kg, and in the fourth week, the treatment of (biotropic + celery) outperformed and its average weight was (17,300) kg compared to the rest of the treatments (celery, control and probiotic)), which recorded values of (17.100, 15.92, 15.80) kg. In the sixth week, the treatment (the probiotic + celery), whose average weight was (18.40) kg, was also superior to the treatments of celery and the probiotic, whose averages were (18.25, 17.10) kg, which was superior to the control treatment, whose average was (16.20) kg. The case of superiority was repeated in the tenth week in favor of the (biostimulant + celery) treatment, and its weight was (20.30) kg, followed by the treatments of (biostimulant, celery and the control) and their mean values were recorded (19.67, 19.62, 18.35) kg. The probiotic + celery, with an average weight of (21.30) kg compared to the rest of the experiment treatments (the probiotic, celery and the control), where the average weights were (20.95, 20.77, 19.12) kg .The increase in the average live weights of the broodstock of treated animals added to their diets of vital enhancers such as yeast and other enhancers is due to the improvement of rumen conditions and thus the increase in the number of microorganisms in it, especially total bacteria, especially cellulose-degrading bacteria, which led to an increase in the utilization of the food feed materials consumed and an increase in the amount of microbial protein reaching To the intestines, the probiotics are also rich in minerals, vitamins and important compounds that would increase the growth rates of the animal. This study agreed with Abu Salwa (2016, Ahmed et al. (2016), Al Ghalibi et al. (2017) and EIaref et al. 2020). And that celery seeds improved the microbial activity in the rumen and some gram-positive and gram-negative bacteria such as proteolytic bacteria, which led to the utilization of easily digestible nutrients, which led to the availability of the cows' needs for maintenance, growth, fattening and a decrease in the consumption of concentrated and rough feed (Khattap et al., 2020).

The reason for the weight gain of the treated animals fed celery seeds is due to the improvement of the rumen environment and the optimum utilization of the forage materials that are used to feed ruminants, in addition to the increase in the number of beneficial microorganisms because celery contains biologically active compounds such as thymol and caseinine. Stimulates an increase in feed consumption, thus improving growth and increasing daily and total weight. (Khattap et al., 2020). Studies have also shown that the use of natural nutritional supplements such as coriander oil and celery seeds increases microbial activity and the amount of feed and improves the digestion of nutrients, thus increasing the amount of microbial protein formed in addition to increasing the level of glucose and the amount of energy formed, and this collectively improves Weight and overweight (khattap, 2020; matloup, 2017).

Table (1) average body weight (kg) of the product in the studied treatments (mean ± standard deviation)

animal weights							Transactions
Week							
12	10	8	6	4	2	0	

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19.12 ± b 0.47	18.35 ± 0.41 b	17.02 ± c 0.42	16.20 ± c 0.41	15.92 ± b 0.53	15.31± ab 0.56	14.93 ± 1.83	the control
20.95 ± ab 0.52	19.67 ± 0.63 ab	18.07 ± b 0.42	17.10 ± b 0.41	15.80 ± b 0.32	14.71±0 b .34	13.80 ± 1.45	Probiotic
20.77 ± ab 1.36	19.62 ± 1.32 ab	18.42 ± ab 1.29	18.25 ± ab 1.42	17.100 ± 1.43 ab	16.54±1 a .25	15.61 ± 1.44	Celery
21.30 ± a 0.77	20.30 ± 0.72 a	19.30 ± a 0.77	18.40 ± a 0.73	17.300 a ± 0.78	16.37± a 0.75	15.89 ± 1.73	probiotic + celery
0.05	0.05	0.05	0.05	0.05	0.05	N.S	Morale

• The different letters vertically indicate the presence of significant differences between the mean of the transactions under the level of significance of 0.05

• N.S: There are no significant differences between the averages.

2- Weight increases:

Table (2) showed that there were significant differences in the total and daily weight gain by the kids of the different experimental treatments fed on different levels of celery and the prebiotic compared to the control treatment, as the highest averages were recorded in favor of the probiotic treatment, with an average weight of (7.15) kg. It was followed by treatments (the probiotic + celery, celery and control) and the average weight was (5.41, 5.16, 4.19) kg. As for the daily weight gain, it was noted that there was a significant superiority in the daily weight increases of the experimental treatment product in favor of the (biostimulant) treatment, with an average increase of (85.11) kg compared to the rest of the experiment's treatments (the probiotic + celery, celery and control), as the values of the weight increases were recorded. (64.40, 61.42, 49.88) kg, respectively.

The reason for the weight gain of the experimental treatment animals fed at different levels of the probiotic is attributed to the adaptation of the rumen environment to receive the new nutrients that are used to feed ruminants, and thus enabled the availability of the appropriate types of microorganisms to digest the nutrients entering the

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rumen, as it increased the kidney and cellulose-digesting bacteria and reduces the Lactate-producing bacteria, which achieves maximum benefit as a result of increasing the digestion of nutrients and increasing the amount of microbial protein formed, as well as increasing the level of glucose and the amount of energy formed, and thus this together improves the weight gain The reason for the weight gain of the treated animals fed celery seeds is attributed to the improvement of the rumen environment and the optimum use of the feed materials that are used to feed ruminants, in addition to the increase in the number of beneficial microorganisms because celery contains biologically active compounds such as thymol and caseinine. Stimulates an increase in feed consumption, thus improving growth and increasing daily and total weight. (khattap et al., 2020). These results are in agreement with both al-Ghalibia (2010)), Khattap (2020), and Nassar (2017).

Table (2) Total weight gain (kg) and daily (g/day) of the product in the studied treatments (mean ± standard deviation)

daily weight gain (g/day)	Total weight gain (kg)	Traetment
49.88 ± 7.45 b	**4.19 ± 1.07 b**	the control
85.11 ± 12.62a	**7.15 ±1.43 a**	Probiotic
61.42 ± 9.36 b	**5.16± 2.15 ab**	Celery
64.40 ± 10.17 ab	**5.41 ± 1.13 ab**	probiotic + celery
0.05	**0.05**	Morale

The different letters vertically indicate the presence of significant differences between the mean of the transactions under the level of significance of 0.05

N.S: There are no significant differences between the averages

1- Amount of feed consumed and feed conversion efficiency

Table (3) showed that there were no significant differences in the amount of forage consumed by the kids of the different experimental treatments, which were fed at different levels of celery and the probiotic, despite the presence of a clear arithmetic increase for the efficacy of the treatments added to their diets celery seeds and the probiotic compared to the control treatment, and the highest averages were Recorded in favor of the (biotropic +

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celery) treatment, with an average arithmetic increase of (46.85) kg, followed by the treatments (biotropic, control, and celery), where the averages were recorded (43.78, 42.90, 36.38) kg, respectively.

Celery seeds improved microbial activity in the rumen and some gram-positive and gram-negative bacteria such as proteolytic bacteria, and this leads to the utilization of easily digestible nutrients (Khattap et al., 2020). How many studies have shown that the use of natural nutritional supplements such as coriander oil and celery seeds works to increase the microbial activity formed in addition to increasing the level of glucose and the amount of energy formed, and celery is characterized by a strong flavor and aroma and makes it appetizing and thus stimulates the animal to consume more feed and improve the efficiency of food conversion and increase Weight. The results of this study were in agreement with Al-Ghaliby (2010), (Khattap, 2020 and Matloup, 2017) and Al Nassar (2017).

As for the efficiency of food conversion, it was noticed that there were clear significant differences ($p \leq 0.05$) for the results of the different experimental treatments that were fed at different levels of celery and the probiotic (Table 3). The significant increase was clear in favor of the results of the treatment (control), whose average was (10.23) kg of feed / kg Weight gain compared to the rest of the treatments (probiotic + celery, celery and probiotic), the averages of which were recorded (8.65, 7.05, 6.12) kg of feed / kg.

The reason for the improvement in the efficiency of feed conversion is due to the addition of the probiotic, which in turn is effective in increasing the rates of improving the weight gain (Jang et al., 2009). In addition, the probiotic increases the production of microbial protein in the rumen and amino acids prepared for the ruminant animal and also increases the amount of feed intake. And improve the digestibility of nutrients (Antunovic et al., 2006) and the reason could also be due to the addition of the probiotic works to provide a suitable environment for the growth of beneficial microorganisms, thus increasing the numbers of protozoa that degrade cellulose, and thus maintaining the pH, which led to an increase in the utilization of starchy compounds High nutritional value, easy to digest, and this led to providing the goats' needs for maintenance, growth and fattening, so their consumption of rough and concentrated feed was reduced (EI-Shaer, 2003).

Table (3) Amount of feed intake (kg) and feed conversion efficiency (kg feed intake/kg weight gain) for the cows in the studied treatments (mean ± standard deviation)

feed conversion efficiency (weight gain / kg feed intake)	Amount of feed (intake (kg	Treatment
10.23 ± 1.03 a	42.90	the control
6.12 ± 1.17 b	43.78	Probiotic

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7.05 ± 1.32 ab	**36.38**	Celery
8.65 ± 0.87 a	**46.85**	probiotic + celery
0.05	**N.S**	Morale

3- The different letters vertically indicate the presence of significant differences between the mean of the transactions under the level of significance of 0.05

4- N.S: There are no significant differences between the averages.

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