INFLUENCE OF THYME VULGARIS SUPPLEMENTATION ON BUFFALO CALVES DIGESTIBILITY, HAEMOBIOCHEMICAL PROFILE AND PRODUCTIVE PERFORMANCE

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SUMMARY

This work was fulfilled to assess the effect of supplementation diets with thyme plant in buffalo calves on growth performance criteria, digestibility coefficient and certain biochemical indices. A total number of 15 buffalo calves of (4-6) months of age and 121.44 kg average body weight were classified randomly into three equal groups (5 animals per each): Animals of T1 (control group) were fed on basal diet only and those of T2 and T3 (treated groups) were fed basal diet supplemented with 5 and 10 g of thyme plant per head daily, respectively. The experiment was expanded for 90 days. Blood plasma was obtained from all experimental animals in all groups at the finishing of study for detecting certain blood biochemical parameters. Results showed that treated groups were higher ($P \leq 0.05$) in blood plasma total protein, albumin and triglyceride, globulin ($P \geq 0.05$), while there were non-significant decreases in BUN (Blood urea nitrogen), AST, ALT and creatinine levels in treated groups with thyme (T2 and T3) in comparing with those in control one (T1). Groups supplemented by thyme plant (T2 and T3) recorded improvement ($P \leq 0.05$) in digestibility, growth performance and best feed conversion ratio compared with the control group (T1). The results collected from this study proposed that buffalo calves fed diets supplemented with thyme plant as a medicinal herb, showed significantly higher total weight gains, daily weight gains, and feed conversion rates.

Keywords*: *Buffalo calves, thyme, digestibility, biochemical profile and growth performance.

INTRODUCTION

Feed additives in ruminant nutrition play an essential role in enhancing nutrient utilization, promoting animal health, and improving overall performance. Benchaar *et al.* (2008) and Firkins *et al.* (2007) confirmed that feed additives have positive effects on rumen fermentation, reducing methane emissions, rumen stability, optimizing digestion and enhancing feed efficiency in cattle.

Moreove, Yang *et al.*, (2010) mentioned that essential oil (EO) that's come from plant extraction can be used effectively as a feed additive in ruminant nutrition. Also, essential oils are used as natural replacements of antibiotics, enhancing growth, feed efficiency and preventing future health damage to consumers, derived from residues of antibiotics (Ornaghi *et al.*, 2017). They display many antibacterial properties (Walsh *et al.*, 2003), primarily due to thymol and carvacrol, the essential components of thyme oil (Dauqan and Abdullah, 2017).

Thyme (*Thymus vulgaris L.*) is a perennial subshrub that belongs to the Lamiaceae family and can live for ten to fifteen years. Its propensity is both horizontal and upright, and during time, the stem becomes woody. According to Ozguven and Tansi, (1998), the plant is gynodioecious, meaning that populations comprise both hermaphrodite and female individuals. Thyme is a plant that grows all over the world and can be reproduced by seeds and vegetative parts such as root cuttings (Ozguven and Tansi, 1998).

Thyme is a lasting bush that has a place in the *Labiatae* family and is dispersed in Eurasia and the Mediterranean locale (Stahl-Biskup and Venskutonis, 2012). Thymus species are vital restorative plants. Numerous studies have already examined the antioxidant activity of thyme and its extracts (Dauqan and Abdullah, 2017; Al-asmari *et al.*, 2016).

Eat less containing refined thyme clears out repressed the lipid and shade oxidation of sheep meat (Nieto *et al.*, 2020), whereas eating less supplemented with 20 g/h/d of a thyme-celery blend expanded the serum

concentrations of glucose, thyroxine, and glutamate-pyruvate transaminase concentrations in Barki ewes (Khattab *et al.*, 2020). Supplementing with 15 g/h/d of thyme to the Barki sheep diets increases nutrient digestibility and the longissimus muscle region (Shaaban *et al.*, 2021).

Omidbeygi *et al*., (2007) concluded that thyme supplementation may have potential effects on digestion and blood components via promoting the production of digestive enzymes and thyme contains compounds with antioxidant properties that could positively influence blood components. Using of thyme oils within the dietary admissions moved forward rumen maturation in goats (El-Essawy *et al.*, 2021), but not in dairy cows (Benchaar, 2021). Nevertheless, insufficient data were presented about the diet, metabolism, biochemical makeup, and growth characteristics of buffalo calves given thyme leaves and stem supplements.

MATERIALS AND METHODS

This study was conducted at the Experimental Research Station belongs to Faculty of Agriculture, Ain Shams University located in Shalakan village, Qalubia Governorate, Egypt. It was lasted for 90 days from 3 March 2023 to 1 June 2023.

The experimental animals and rations:

Fifteen buffalo male calves of about (4-6) months and 121.44 kg average body weight were distributed randomly into three experimental groups (T1, T2 and T3) of 5 animals in each group. Where, T1 is a control group fed on basal diet, T2 and T3 are the treated groups supplemented with 5 and 10 g/h/d ground thyme stems and leaves added to their basal diet respectively. Animals were fed according to NRC (2001). The composition of basal diet is presented in Table (1), while the composition of thyme vulgaris is shown in Table (2).

Table (1): Chemical composition of the experimental feed stuffs (% on DM basis).

Feed stuff	DM	OM	CF	CP	EE	NFE	Ash	AIA**
Berseem	16.79	91.35	29.03	19.50	3.67	39.15	8.66	4.49
Rice straw	91.21	81.98	45.18	3.91	1.89	31.00	18.01	14.01
CFM*	90.26	92.83	19.75	16.39	3.06	53.63	7.17	5.28

** CFM: Concentrate feed mixture, **AIA: Acid insoluble ash*

** The CFM composed of 38% ground maize, 15% soybean meal, 34% wheat bran, 5% rice bran, 3% molasses,1% mineral salts, 2% limestone powder,1% Sodium Bicarbonate and 1% sodium chloride.*

Table (2): Chemical composition of thyme vulgaris (% on DM basis).

Feedstuffs	DM	CP	EE	CF	Ash	NFE
Thyme V.	89.82	9.08	5.73	18.58	9.70	56.91

Analytical methods:

The samples of feedstuffs and feaces were analyzed to determine the chemical composition by using the A.O.A.C (1995) procedure to determine moisture, dry matter, organic matter, crude protein, crude fiber, ether extract and ash contents, while nitrogen free extract (NFE) content was calculated by difference.

Digestibility trials:

Digestibility trials were carried out for all experimental animals using a grab sample method according to (Schneider and Flatt, 1975), where acid insoluble ash (AIA) was applied to determine the nutrient's digestibility as a natural internal marker.

Blood plasma:

Blood samples were collected from the jugular vein from all calves at the end of the experiment. Blood samples were collected into clean dried tubes with EDTA. Samples were obtained by centrifuging at 4000

(rpm) for 15 minutes to determine the selected biochemical analysis. Blood plasma was analyzed for total protein (Armstrong and Carr, 1964), albumin (Doumas *et al.*, 1971), urea (March, 1965), creatinine (Husdan, 1968), GPT and GOT (Reitman and Frankel, 1957), cholesterol (Trinder, 1969) and triglyceride (Fassati, 1982): Globulin was calculated by difference.

Productive performance parameters:

Live body weights were individually recorded at two-week intervals. The average daily body weight gain was individually calculated. Daily feed intake was determined for each replicate treatment by the difference between the daily offered feed and the daily residual one. Feed conversion ratios were obtained by dividing the amount of feed consumption per calf by the corresponding weight gain in a certain stage (two weeks).

Statistical analysis:

The data obtained were statistically analyzed using (SAS) User's Guide (2001). Separation among means was detected by using Duncan multiple tests, (1955).

RESULTS AND DISCUSSION

Based on our current research results, dry matter intake data showed overly increased but not significant ($P \geq 0.05$) dry matter intake when we supplemented the male buffalo calves' basal diet with thyme stems and leaves at 10 g/h/day (Table 3 and Fig. 1) compared with other experimented groups. However, adding thyme stems and leaves at 5 g/h/day (T2) showed lower ($P \geq 0.05$) dry matter intake values (within the period 0 to 60 days) than control group (T1), followed by a convergence until the end of the experiment (61 to 90 days).

In general, the results of using thyme showed an improvement in the dry matter consumed by ruminants, but it seems to be related to other factors. One of the most important factors was the concentration of use or the rate of addition of thyme. Such findings were mentioned by Khamisabadi *et al.* (2016) and (Wafa *et. al.*, 2022). Whereas, (Khamisabadi *et. al.*, 2016) concluded that thyme treatment increased ($P<0.05$) nutrient intake when reaching 3% of diet DM with fattening Sangabi lambs, and (Wafa *et. al.*, 2022) results indicated an increase in dry matter intake ($P<0.05$) when adding thyme (Thymus vulgaris) extract by 40 mg/kg BW to male Friesian calves during both the suckling interval (4–105 d) and post-weaning interval (106–150 d) compared with the control group.

Nutrients digestibility:

Based on current research results shown in Table (4) supplementing the male buffalo calves' basal diet with 10 gm/h/d (T3) thyme (stems and leaves) clearly showed significance ($P \leq 0.05$) increasing the digestibility coefficient of DM, OM, CP, EE, and NFE compared with the control group. However, T2 (5 gm/h/d) showed a significant increase in DM and EE digestibility compared with the control group.

Table (3): Effect of experimental treatments on dry matter intake (kg/h/d)

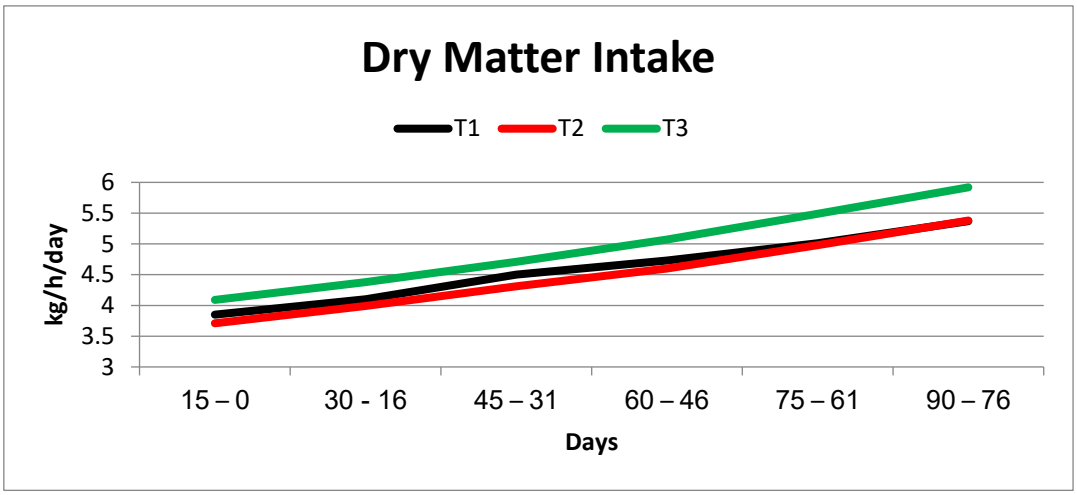
Item	**Treatments**		
days	**T1**	**T2**	**T3**
0 – 15	3.85± 0.41	3.71± 0.25	4.09± 0.38
16 - 30	4.10± 0.45	3.99± 0.25	4.38± 0.37
31 – 45	4.40± 0.49	4.31± 0.26	4.71± 0.40
46 – 60	4.73± 0.52	4.60± 0.27	5.07± 0.39
61 – 75	5.01± 0.54	4.98± 0.28	5.49± 0.40
76 – 90	5.37± 0.58	5.38± 0.29	5.92± 0.43
Average	4.57	4.49	4.94

T1 = Control Group, T2= 5 g Thyme per head/daily, and T3= 10 g Thyme per head/daily.

Despite of a non-significant ($P \geq 0.05$), there is improvement in the digestibility coefficient of CF among treatments was detected. Adding thyme with 10 g/h/d significantly improved the digestibility of DM, OM, EE and NFE, and non-significant ($P \geq 0.05$) improved CP and CF compared with T2 (5 gm/h/d). Du, Xia, *et al.* (2023), concluded the same result of the increasing influences of supplementary thyme (*Thymus vulgaris L.*) on feed digestibility in sheep. Also, Kera, Feyissa, *et al.* (2022) found that introducing the

thyme (*Thymus Schimperi*) leaves and twigs in the feed improves the rumen degradability of the feeds in Sheep. Such improvements were attributed to an increase in rumen probiotics, rumen bacteria composition, and rumen enzyme concentrations which elevate protein synthesis and utilization in the rumen (Kera, Feyissa, *et al.*, 2022 and Du, Xia, *et al.*, 2023).

Fig (1): Effect of experimental treatments on dry matter intake (DMI).



T1 = Control Group, T2= 5 g Thyme per head/daily, and T3= 10 g Thyme per head/daily.

Table (4): Effect of experimental treatments on the nutrients digestibility coefficient of the Buffalo calves.

Item	T1	T2	T3
DM	62.36 ±0.67 ^{C}	65.29 ±0.21 ^{B}	70.45 ±0.65 ^{A}
OM	66.53 ±0.63 ^{BC}	69.23 ±0.37 ^{B}	76.47 ±1.57 ^{A}
CP	64.77 ±0.54 ^{B}	66.18 ±0.82 ^{AB}	71.40 ±0.50 ^{A}
CF	61.07 ±0.39	63.38 ±0.76	66.15 ±0.73
EE	77.02 ±1.49 ^{C}	80.58 ±0.47 ^{B}	84.41 ±0.86 ^{A}
NFE	71.87 ±0.25 ^{B}	74.11 ±0.86 ^{B}	78.28 ±0.85 ^{A}

A, B and C Means of treatments within the same row with different superscript letters are significantly different (P ≤ 0.05). T1 = Control Group, T2= 5 g Thyme per head/daily, and T3= 10 g Thyme per head/daily.

Blood plasma parameters:

Data from Table (5) showed a significant (P≤0.05) gradual increase of total protein, albumin and globulin (P≥0.05), while significant gradual decrease in cholesterol, AST, ALT and creatinine levels as the level of thyme decreased. Differences in thyme plasma urea were not significant. The values in all experimental groups were within normal physiological ranges (Kaneko *et al.*, 1997). The same results of total protein, albumin and globulin recorded by same results were recorded by El-Nagar *et al.* (2023) when they supplemented milk with thyme oil (2 ml), propolis (5 gm) and 5 gm propolis plus 2 ml thyme oil to newborn Friesian Calves. Also, Wafa *et. al.* (2022) and Wafa *et. al.* (2021) recorded the same results in newly born Friesian calves when they added thymus vulgaris extract (20 and 40 mg per kg BW) to calves' diet, Seifzadeh *et al.*, (2016) noticed that dietary thyme oil as a feed additive enhances blood total protein of Holstein's calves. Moreover, Froehlich, (2016) stated that supplemented diets with thyme oil increased serum protein parameters of dairy calves. Also, Belibasakis and Tsirgogianni (1996) Kumar and Dass

(2006); and Ebrahimi *et al.* (2018) reported the same results on albumin and globulin values when they feeding thyme oil supplementation in buffalo, dairy calves, and Brown Swiss calves, respectively.

The present results may be attributed that thyme vulgaris supplementation improves feed metabolism as a result to enhance apparent nutrients digestibility (table 4). In this connection, Kumar *et al.*, (1980) and Bush (1991) reported that serum total protein concentration reflects the nutritional grade of the animal and it has a great link with dietary protein level. Moreover, Khattab *et al.* (2011) noticed that the positive effects of treatment on total protein or their fractions may reflect the improving of protein anabolism by enhancing crude protein digestibility.

Regarding kidney function results, thyme supplemented groups had numerically lower levels of creatinine and urea in blood plasma. Similar results were reported by Ebrahimi *et al.* (2018) in Friesian calves, Wafa *et al.* (2021); Wafa *et. al.* (2022) and El-Nagar *et al.* (2023) on newly born Friesian calves. These results might be attributed to efficient utilization of dietary proteins by the addition of the feed additive.

Table (5): Effect of experimental treatments on some blood plasma parameters.

Item	Treatments		
	T1	**T2**	**T3**
Total protein (g /dl)	6.18^{C}	6.55^{B}	6.74^{A}
Albumin (g /dl)	2.07^{C}	2.25^{B}	2.47^{A}
Globulin (g /dl)	4.11	4.30	4.27
Urea (mg /dl)	31.05	30.05	30.25
Creatinine (g /dl)	1.72^{A}	1.55^{B}	1.33^{C}
Triglyceride (mg/dl)	64.34^{B}	65.95^{B}	68.71^{A}
Cholesterol (mg/dl)	101.50^{A}	81.12^{B}	81.94^{B}
AST (unit /L)	58.43^{A}	50.87^{B}	38.97^{C}
ALT (unit /L)	41.74^{A}	35.23^{B}	34.47^{B}

A, B and C Means of treatments within the same row with different superscript letters are significantly different ($P \leq 0.05$). T1 = Control Group, T2= 5 g Thyme per head/daily, and T3= 10 g Thyme per head/daily.

Lower N wastage by great utilization of generated ammonia in the rumen was characterized in terms of lower blood urea nitrogen (BUN) levels in thyme supplemented group. So, supplementation had no opposing impacts on glomerular filtration, thus safe for renal functioning. Also, Petit and Flipo (1992); Davidson *et al.*, (2003) noticed that urea-N concentration in the blood is highly correlated with ruminal NH3-N concentration.

Activity of AST and ALT was significantly decreased ($P \leq 0.05$) in treated groups (T2 and T3) when compared with those in the control group (T1). However, the values in all the groups were within normal physiological ranges (Kaneko *et al.*, 1997).

The present values of AST and ALT activity indicate normal activity of the animal hepatic tissues, consequently, thymus vulgaris addition in the present study had no adverse effect on the liver activity. These results are in harmony with those obtained by Vakili *et al.* (2013); Biricik *et al.* (2016) in calves, Ebrahimi *et al.* (2018) in Friesian calves, when they fed diets supplemented by thyme oil. In addition, Wafa, *et. al.*,(2021); Wafa *et. al.* (2022) and El-Nagar *et al.* (2023) in newly born Friesian calves reported similar results.

Regarding to the levels of cholesterol and triglycerides in treated groups showed a significant decrease ($P \leq 0.05$) in cholesterol values, while the values of triglycerides were significantly increased ($P \leq 0.05$). The values in all experimental groups were within normal physiological ranges in buffalo calves (Kaneko *et al*., 1997) and of growing calves (Pysera and Opalka 2001 and Bozukluhan *et al.*, 2017). The same results were recorded by Wafa *et. al.* (2021) and Wafa *et. al.* (2022) on newly born Friesian calves.

Body weight and growth performance criteria:

When calculating the relative weight gain per initial weight ($\frac{Weight\ Gain}{Initial\ Weight} \times 100$), it was 47.131%, 54.595%, and 55.787% for T1, T2, and T3 respectively. Both T2 & T3 show closed values ($P \geq 0.05$) despite double treatment administrated which may be due

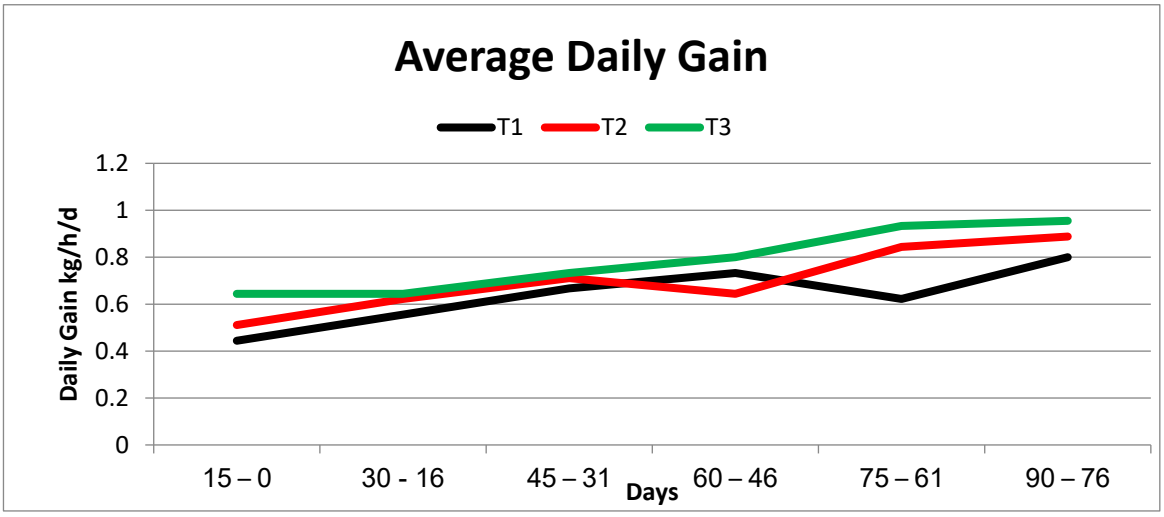
to treatment compatibility with a specific age and weight, however, both treatments T2 & T3 were higher significantly ($P \leq 0.05$) than the control group T1.

Table (6): Effect of experimental treatments on changes of body weights and daily gain (kg/h/d).

Item	Treatments		
	T1	**T2**	**T3**
	Animal weight		
Initial weight	121.66 ± 13.19	116.00 ± 8.02	126.66 ± 11.66
Final weight	179.00 ± 19.42	179.33 ± 9.93	197.32 ± 14.34
Total gain	57.34 ± 6.64	63.33 ± 2.40	70.66 ± 2.72
days		Average daily gain (kg/h/day)	
0 – 15	0.444 ±0.04	0.511±0.02	0.644±0.08
16 - 30	0.555 ±0.11	0.622±0.02	0.644±0.02
31 – 45	0.667±0.07	0.711±0.04	0.733±0.07
46 – 60	0.733 ±0.07	0.644±0.04	0.800±0.03
61 – 75	0.622 ±0.05	0.844±0.02	0.933 ±0.03
76 – 90	0.800 ±0.07	0.888±0.05	0.955±0.05
Average	0.637^{C}	0.703^{B}	0.785^{A}

A, B and C Means of treatments within the same row with different superscript letters are significantly different ($P \leq 0.05$). T1 = Control Group, T2= 5 g Thyme per head/daily, and T3= 10 g Thyme per head/daily.

Fig. (2): Effect of experimental treatments on average daily gain (ADG).



T1 = Control Group, T2= 5 g Thyme per head/daily, and T3= 10 g Thyme per head/daily.

As shown in Table (6) and Fig. (2), the average daily gain (kg/h./day) was significantly higher in T3 followed by T2 and T1, respectively. A case of data value inversion has been recorded between T1 and T2 within the days' range 46-60, followed by compensatory growth in T2 that could be due to health problems in some calves within the T2 group at this days' range. Many studies have tested the effect of thyme and its extracts on growth performance. (Wafa, *et al.*, 2021, Stefańska, *et al.*, 2021, Jahani-Azizabadi,*et al.*, 2021, Wafa, *et al.*, 2022, and El-Nagar, *et al.*, 2023) mentioned that adding thyme to male calves diets especially newborn (from suckling and weaning period) has a significant effect on growth performance via activating the immune system and increasing digestion rate. Same trend was concluded on small ruminants, where showed significant ($P<0.05$) improvements of adding thyme on the average daily gain (Andri, *et al.*, 2020, Shahravan, *et al.*, 2022, Khattab, *et al.*, 2022). On the other hand, there were no significant ($P>0.05$)

results for thymol administration on compensatory growth in severe feed-restricted of male Baluchi lambs (Ahmadibonakdar, *et al.*, 2024).

Feed conversion (kg DM/ kg gain):

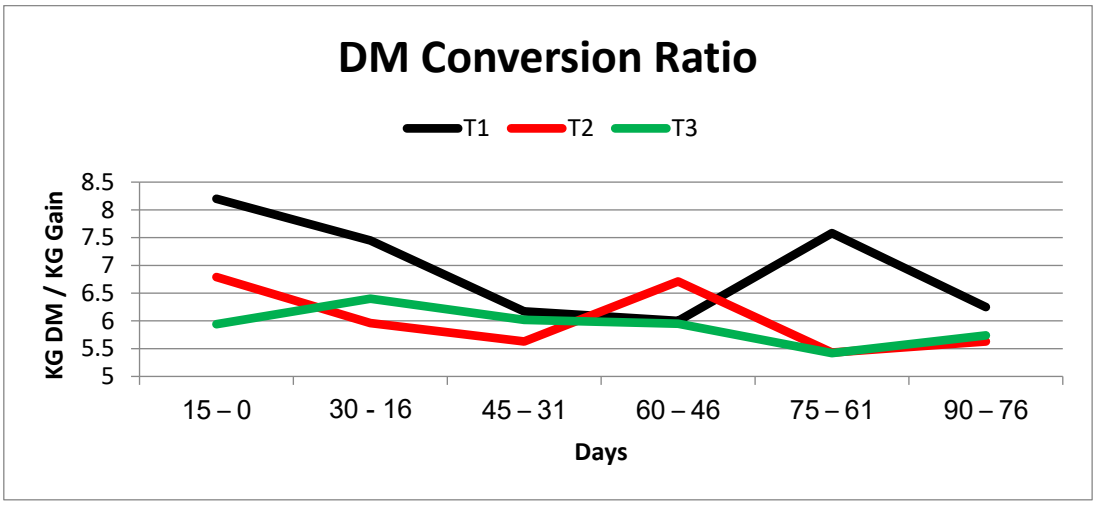
The current results of dry matter conversion ratio (kg DM/kg gain) output data (Table 7) demonstrated that supplemented buffalo male calves with 10g of ground thyme stems and leaves (T3) showed the most superiorly significant (P≤0.05) conversion efficiency (Table 7) compared with (T2) and (T1). Furthermore, supplementation with 5g of thyme (T2) showed a significant (P≤0.05) efficiency of dry matter conversion ratio compared with the control group (T1). Table (7) gives more detail. This finding follows the same path that's been obtained by Shahjalal *et al.* (2000) on goats. However, Du Xia *et al.* (2023) concluded that the improvement in feed conversion rate when supplemented Chinese Hu sheep feed with thyme was attributed to the effect on TP and ALB concentrations in serum, which are associated with protein synthesis. Adding to the increased effect of thyme supplementations on the relative abundances of the probiotics o_Lactobacillales, f_Lactobacillaceae and g_*Lactobacillus* and increasing the bacteria g_*Eubacterium_saphenum* and f_Oscillospiraceae g_*UCG-002 group* in the rumen liquor. Whatever, Rahmati Zaed *et al.* (2023) mentioned that adding a mixture of peppermint, thyme, and rosemary essential oils in a ratio of (3:1:2), respectively, to the fattening lamb's diet reduced both the total volatile fatty acids and acetate concentrations and hadn't a significant effect on the lamb's performance parameters or the immune system, which may be due to the effects of changing the chemical contents of these essential oils when they were mixed together.

Table (7): Effect of experimental treatments on dry matter conversion (kg DM/ kg gain).

Item	**Treatments**		
Days	**T1**	**T2**	**T3**
0 – 15	8.20±0.09	6.79±0.18	5.94±0.26
16 - 30	7.45±1.37	5.96±0.37	6.40±0.84
31 – 45	6.17±0.29	5.63±0.35	6.02±0.36
46 – 60	6.00±0.24	6.71±0.41	5.95±0.79
61 – 75	7.58±0.16	5.43±0.19	5.42±0.24
76 – 90	6.25±0.22	5.63±0.43	5.74±0.13
Average	6.94^{A}	6.03^{B}	5.91^{C}

A, B and C Means of treatments within the same row with different superscript letters are significantly different (P ≤ 0.05). T1 = Control Group, T2= 5 g Thyme per head/daily, and T3= 10 g Thyme per head/daily.

Fig (3): Effect of experimental treatments on dry matter (DM) Conversion Ratio during the experimental period.



T1 = Control Group, T2= 5 g Thyme per head/daily, and T3= 10 g Thyme per head/daily.

As shown in Fig. (3), the DM conversion ratio (kg DM intake/kg gain) was efficiently higher ($P \leq 0.05$) in T3, followed by T2 and T1. A case of data value inversion between T1 and T2 within the days' range of 16–45 and 76–90, which was in favour of T2, did not show superiority for the lower treatment T2 due to the severe relapse of DM conversion efficiency even when compared with the control treatment T1.

CONCLUSION

The obtained results from this study suggested that supplementation of buffalo calves with thyme plant (stems and leaves) as a rate of 5 and 10 gm/h/d improved dry matter intake, nutrients digestibility, total weight gains, daily weight gains, feed conversion rates and haemobiochemical profile. The best results were recorded for 10 gm dose.

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تأثير إضافة الزعتر على المقدرة الهضمية وبعض القياسات الكيميائية الحيوية للدم والأداء الإنتاجي في العجول الجاموسي.

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تم إجراء هذا البحث على عدد 15 عجل جاموسي عند عمر 4-6 شهور ومتوسط وزن 121.44 كجم لتقييم تأثير اضافة علائق مكملة بنبات الزعتر علي معاييرأداء النمو ومعامل الهضم وبعض المؤشرات الكيميائية الحيوية قسمت بشكل عشوائي الي ثلاث مجموعات متساوية (5 لكل منها):

تم تغذية حيوانات المجموعة الضابطة (T1) على النظام الغذائي الأساسي فقط وتم تغذية حيوانات المجموعة الثانية(T2) والمجموعة الثالثة (T3) (المجموعات المعالجة) بالنظام الغذائي الأساسي المكمل ب 5 و 10 جم من نبات الزعتر لكل رأس يوميا ، على التوالي. استمرت التجربة لمدة 90 يوما.

تم الحصول على بلازما الدم من جميع حيوانات كل مجموعة (المجموعة الضابطة والمجموعات المعالجة) عند الانتهاء من الدراسة للكشف عن بعض المعلمات البيوكيميائية في الدم.

أظهرت النتائج أن المجموعات المعالجة كانت أعلى معنويا ($P\leq0.05$) في البروتين الكلي لبلازما الدم والألبومين والدهون الثلاثية والجلوبيولين ($P\geq0.05$) ، بينما كانت هناك انخفاضات معنوية في AST و ALT والكرياتينين في المجموعات المعالجة بالزعتر (T2 و T3) مقارنة بتلك الموجودة في المجموعة الضابطة (T1).

سجلت المجموعات المكملة بنبات الزعتر (T2 وT3) تحسنا معنويا ($P\leq0.05$) في المقدرة الهضمية ومعدلات النمو وكفاءة التحول الغذائية مقارنة بالمجموعة الضابطة (T1). أظهرت النتائج التي تم الحصول عليها من هذه الدراسة أن العجول الجاموسي التي تغذت على علائق مدعمة بنبات الزعتر كعشب طبي، زيادة في الوزن الكلي، وزيادة في معدل النمو اليومي ومعدلات تحويل الأعلاف.