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EFFECT OF DIETARY SUPPLIMENTATION WITH CHAMOMLE FLOWERS ON CARCASS CHARACTERISTICS AND HISTOLOGY OF SOME ORGANS IN RAHMANI SHEEP

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ABSTRACT

The main objectives of this work were to investigate the effects of using chamomile flowers (*Matricaria chamomile*) at different levels (0 – 1 and 2 g / head / day) on carcass characteristics and histology of digestive tract and kidneys.Twenty one growing male Rahmani lambs with an average age of 3-4 months and weighing on average 19.87 kg were used . The animals were divided randomly into 3 equal groups according to their life body weight. The experimental work lasted for 180 days. The nutrient requirements were determined every two weeks according to NRC (1985) recommendations. Three experimental rations (roughage/concentrate(R/C) ratio was40:60 in all treatments) were formulated from concentrate feed mixture(CFM), yellow corn(YC) and berseem hay (BH) and offered to the sheep in groups(G1,G2andG3)as follows,G1:CFM+YC+BH(control), G2:CFM+YC+BH+1g chamomile/head/day(treatment1),G3:CFM+YC+BH+2g chamomile/head/day(treatment 2). At the end of the growing trials, four representative lambs from each group were slaughtered to study the carcass characteristics and histology of the digestive system and kidneys. The results of the present study indicated that the differences among chamomile levels in fasting and carcass weights were statistically significant. Adding of chamomile to lambs rations had a positive effect on dressing percentage. The effect of treatments was positive (or significant) on shoulder , legs and flank as well as prime cuts (kg) . Whereas, carcass cuts as % from hot carcass weight differed slightly as a result to the presence of chamomile in growing lambs rations. Weight of 9-11 ribs cut was increased with increasing chamomile level in growing lambs rations. The animals fed on the control ration had the lowest value of eye muscle area, while the highest value was recorded with the ration containing the high level of chamomile and the differences were significant. Regarding the histological structure of liver, kidney, rumen and small intestine , the results indicated that the addition of chamomile to the growing lambs diet had beneficial effects on these organs , in particular on rumen and small intestine, without any harmful effects on liver and kidneys function.

keywords: chamomle flowers, carcass characteristics, histology, sheep.

INTRODUCTION

Using medicinal herbs as feed additives was the preventive solution to avoid the hazardous side effects of using synthetic chemicals. Row materials of these herbs and thier extracts and drugs proved to be safe always (Kholif, 2000; Berhane and Singh, 2002; Kraszewski et al., 2002; Ayyad 2003; El-Saadany et al., 2003 and Mohamed et al., 2003). Aromatic

plants are available in Egypt, since 37347 feddan are cultivated by aromatic plants produced 84795 tons/year (Wideneki et al., 1998). Using medicinal herbs such as chamomile in goat's diets had a positive effect on productive performance, feed conversion and economical efficiency as well (Zeid and Ahmed, 2004). This suggests that chamomile may have a role in improving immunity and performance of growing animals (as reported by Abdelhamid et al., 2002 and 2004 and Mohamed et al., 2003 with using some medicinal herbs in farm animals ' rations). However , chamomile has preserving power against fungal invasion and mycotoxin production even under moist condition of stored feeds (Abdelhamid et al., 1985). Herbs (including chamomile) are nowadays usually also used in horse feeding as feed additives (nutraceuticals) for improving horse digestion, temperament, muscles, and exercise recuperation therapy, respiratory therapy and as antimicrobial and immune stimulators (Abdelhamid, 2003). On growing Zaraibi kids, El-Hosseiny et al . (2000) found that the addition of chamomile to goats rations had noticeably increased fasting body weight, warm carcass weight, dressing percentage and eye muscle area. Therefore, the main objectives of the present study were to investigate the effect of using chamomile flowers at different levels(0 , 1 and 2g / head/ day) in a slaughter test and histological examination of Rahmani lambs.

MATERIALS AND METHODS

The main objectives of this work was to investigate the effects of using chamomile flowers (*Matricaria chamomile)* at different levels (0,1and 2g/h/day) on carcass characteristics and histological examination of the digestive system and kidneys. The lambs were fed for 30 days as a transitional period on the same experimental rations before the start of feeding trials on the growing lambs. At the end of the growing trials (180 days), four representative rams from each group were slaughtered to study the effect of each nutritional treatment on carcass characteristics and histology of the digestive system and kidneys. The animals were fasted for 16 hr and their fasted body weights were recorded before slaughter and the follwing weights were recorded. Different offals (heart, liver, kidneys, lungs and digestive tract) were weighed. Head and legs were weighed and carcass cuts or carcass components were estimated according to Abou Ammo (1992) and Ahmed (2003). Hot carcass of depended left side of the carcass was weighed. The 9-10-11th ribs cuts (eye muscle, *Longissimus dorsi*) were chilled, then separated to lean, bone and fat for studying the physical and chemical composition of eye muscle, weight and area as well as fat thickness were measured. Representative samples were takan from each eye muscle and the samples were oven dried at 60 °C for 24 hr, and finally ground then kept in plastic bags for chemical analysis (A.O.A.C, 1995). The weight of slaughter, hot carcass, four feet, head, digestive tract (full and empty), testes, heart , liver, kidneys , and internal fat (heart, kidneys and omentum fat) were recorded. The dressing percentage was calculated relative to hot slaughter weight or to hot carcass weight+ liver+ heart+ kidneys + testes.

Samples of different pats of the digestive tract and kidneys were fixed, dehydrated, cleared, impregnated, embedded in paraffin, sectioned and stained for histological examination according to Bancroft and Stevens (1982). Data collected were statistically analyzed by one-way anlaysis of variance according to Snedecor and Cochran (1982). When F-test was positive, least significant differences were calculated (Duncan,1955) to differentiate the significance among means.

RESULTS AND DISCUSSION

1- Carcass characteristics :

1-1- Dressing percentage :

The data of hot carcass weight and dressing percentage of growing Rahmani lambs fed rations containing different levels of chamomile(0, 1and 2g / head / day)are presented in Table (1). The differences among the three experimental treatments(0 ,1 and 2 g chamomile/ head/day) in fasting and empty body weight as well as hot carcass weight were statistically significant. The higest values of fasting and empty body weight were recorded with G3 (54.88 and 48.4 kg, respectively), followed by G2 (53.13 and 47.70 kg, respectively), however the lowest values were detected with G1 (50.50 and 45.32 kg, respectively). Thus, using chamomile in growing Rahmani sheep , especially at the level of 2g/ head/ day (G3) led to greater improvement in dressing A% (47.80 vs. 45.70%), dressing B% (54.25vs. 50.95%), dressing C % (50.40 vs. 48.03 %) and dressing D% (57.15 vs. 53.50%) compared with the control ration (G1). A similar trend was reported by Salem and El-Mahdy (2001) with growing Ossimi lambs fed a ration containing some medicinal herbs. Moreover, Abou Ammou and El-Hosseiny (1999) observed that using herbs mixture as natural feed additives (such as Biotonic) had a possitive effect on fasting body weight (54.6 vs. 51.4 kg) and carcass weight (30.2 vs. 27.1 kg) as well as dressing percentage (relative to fasting weight , A)(52.7 vs. 50.2%) and dressing (relative to empty weight, B) (59.5 vs. 56.4) and the differences were significant in all parameters, except for dressing percentage (A). Regarding the effect of chamomile levels (0, 1 and 2 g/head /day) on kidneys and internal fat, the obtaind data in Table (1) indicated that kidneys and stomach fat as well as total internal fat were not significantly different by the experimental treatments in the three groups (G1, G2 and G). However, total internal fat % decreased in the animal groups received rations supplemented with the medicinal herbs and their values were 2.06, 1.79 and 1.75 %for G1, G2 and G3, respectively. Values of kidneys and internal fat in the present study were noticeably lower than those reported by Abou Ammou and El-Hosseiny (1999) in crossbred lambs (0.25 Finnish x 0.75 Rahmani), while it recorded approximately similar values with local sheep as reported by Gabr et al. (2003). They found that the values of kidneys fat ranged from 0.10 to 0.16 kg vs. 0.41 to 0.64 kg for internal fat .

Table (1):Carcass characteristics of slaughterd Rahmani lambs fed the experimental rations(means and standard errors).

Item	Treatments		
	G1	G2	G3
Fasting body weight, kg	50.5^{b}±0.87	53.13^{a}±0.43	54.88^{a} ±0.52
Empty body weight, kg	45.32^{b}±1.15	47.70^{ab}±0.55	48.4^{a} ±0.28
Hot carcass weight,kg*	23.08^{b}±0.37	25.13^{a}±0.31	26.24^{a} ±0.42
Hot carcass weight,kg **	24.24^{b}±0.40	26.48^{a}±0.26	27.66^{a} ±0.42
Dressing percentage % (A)	45.7^{b}±0.53	47.3^{a}±0.28	47.80^{a} ±0.46
Dressing percentage % (B)	50.95^{b}±0.54	52.7^{ab}±0.49	54.25^{a} ±0.81
Dressing percentage % (C)	48.03^{b}±0.64	49.8^{a}±0.20	50.40^{a} ±0.41
Dressing percentage % (D)	53.5^{b}±0.49	55.48^{a}±0.55	57.15^{a} ±0.83
Prime cuts, kg	15.94^{b}±0.46	17.52^{a}±0.21	18.53^{a} ±0.40
Prime cuts %	69.05±2.20	69.75±0.90	70.61±0.98
Kidney fat, Kg	0.16±0.02	0.17±0.01	0.18±0.03
Stomach fat, Kg	0.31±0.02	0.29±0.01	0.29±0.02
Total internal fat ,kg	0.47±0.02	0.45±0.01	0.46±0.04
Total internal fat, %	2.06±0.08	1.80±0.05	1.75±0.14

a-b: Means in the same row followed by different letters differ significantly at (P<0.05)

*Without edible organs ** with edible organs

(A)Hot carcass weight / Fasting body weight x 100

(B)Hot carcass weight / Empty body weight x100

(C)Hot carcass weight with edible organs / Fasting body weight x100

(D)Hot carcass weight /Empty body weight x100

1-2-Carcass cuts :

The data of carcass cuts (leg, loin ,neck, rack, brisket, flank and tail) are presented in Table (2). The effect of treatment was positive (or significa) on shoulder, legs and flank as well as prime cuts (kg). The differences in shoulder weight between G1 (3.92 kg) and G3 (4.72 kg) were significant , but G2 recorded medium value (4.42 kg). Moreover, both of legs and flank weights were significantly lower in the control group,G1 (5.96 and 1.17 kg, respectively) than with G2 (6.69 and 1.52 kg, respectively). However, there were no significant effect of feeding chamomile supplemented rations on loin, neck, rack, brisket and tail weights. Regarding caracass cuts as % from hot caracass weight, the obtained data showed that shoulder, legs, loin, neck, rack, brisket, flank, tail and prime cuts (%) were slightly different as a result of the presense of chamomile in growing lambs rations. However, the lowest values of shoulder, legs, flank, and prime cuts(%) were recorded in the control group, while the highest values were usually detected with the high level of chamomile (2g/head/day). A similar trend was observed by Abou Ammou and El-Hosseiny(1999) with lambs fed herbs mixture as a natural feed additive. In this respect, Salem and El-Mahdy (2001) reported that the prime cuts weight of lambs treated with *Nigella sativa* and *Carium carvi* had higher mean values than lambs without addition. The same trend was observed with total offals as % from fasting weight.

Table (2): Carcass cuts of slaughtered Rahmani lambs fed the experimental rations(means and standard errors).

Item	Treatments		
	G1	G2	G3
Carcass cuts weight, kg:			
Shoulder	b 3.92±0.23	ab 4.42±0.10	A 4.72±0.13
Legs	b 5.96±0.13	a 6.69±0.15	A 7.02±0.19
Loin	1.54±0.12	1.72±0.09	1.71±0.08
Neck	1.79±0.14	1.72±0.01	1.76±0.04
Rack	4.51±0.24	4.69±0.18	5.09±0.14
Brisket	0.76±0.07	0.82±0.06	0.88±0.09
Flank	b 1.17±0.04	a 1.52±0.11	A 1.57±0.12
Tail	3.39±0.60	3.49±0.19	3.45±0.20
Carcass cuts as % from hot carcass weight:			
Shoulder	17.05±1.15	17.63±0.60	17.98±0.47
Legs	25.85±0.61	26.08±0.69	26.75±0.49
Loin	6.67±0.48	6.85±0.42	6.51±0.30
Neck	7.76±0.51	6.86±0.10	6.72±0.22
Rack	19.55±0.99	18.63±0.64	19.38±0.36
Brisket	3.29±0.30	3.25±0.20	3.33±0.30
Flank	5.06±0.22	6.02±0.39	5.98±0.42
Tail	14.65±2.53	13.90±0.70	13.13±0.77
Prime cuts	69.05±2.20	69.75±0.90	70.61±0.98

a-b: Means in the same row followed by different letters differ significantly at (P<0.05)

1-3- Offals and organs :

The effect of chamomile levels (0, 1 and 2 g/head/day) on carcass offals and organs are presented in Table (3). The obtained results revealed that the average weight of most different offals (heart, kidneys, lungs and spleen) and organs (head, legs and pelt) were not significantly affected by chamomile levels (0, 1 and 2 g/ head/ day). The same effect was observed also with full and empty digestive tract. However, the highest values of full and empty digestive tract were recorded with G3 (10.60 and 4.12 kg respectively) followed by G2 (9.48 and 4.05 kg, respectively) and the lowest value was recorded with G1 (8.70 and 3.52 kg, respectively). Moreover, the weights of liver and testes were increased with increasing chamomile levels(0, 1 and 2 g/head/ day) and the differences were significant. But, liver as % from fasting weight was not significantly affected (1.19, 1.22 and 1.25 %) by the treatment of chamomile (0, 1 and 1 g/head/ day). In the same time , total offals were increased (1849, 2032 and 2129 g) with increasing chamomile levels (0, 1 and 2 g/head /day) but without significant differences.

Table (3): Average weight of different carcass offals and organs of Rahmani lambs fed the experimental rations(means and standard errors).

Item	Treatments		
	G1	G2	G3
Fasting body weight, kg	b 50.5±0.87	a 53.13±0.43	a 54.88±0.52
Hot carcass weight,kg	b 23.08±0.37	a 25.13±0.31	a 26.24±0.42
Head,kg	3.04±0.13	3.03±0.17	3.33±0.09
Pelt,kg	6.67±0.15	6.28±0.28	6.51±0.29
Legs, kg	1.10±0.05	1.15±0.10	1.19±0.07
Full digestive tract, kg	8.70. ±0.82	9.48±0.72	10.60±0.67
Empty digestive tract, kg	3.52±0.18	4.05±0.54	4.12±0.41
Heart, g	197±27	205±33	240±34
Liver,g	b 603±26	b 647±19	a 685±12
Kidneys,g	128±21	126±8.5	128±4.8
Lungs,g	590±44	648±56	633±25
Spleen,g	96±13	75±6.8	78±10.3
Testes,g	b 236±24	a 343±20	a 366±26
Total offals,g	1849±79	2032±75	2129±67
Total offals as % from fasting weight	3.67±0.17	3.85±0.17	3.88±0.11
Liver as % from fasting weight	1.19±0.04	1.22±0.04	1.25±0.02

a-b : Means in the same row followed by different letters differ significantly at (P<0.05).

The values of different offals and organs in the present study were nearly similar to the results obtained by Gabr et al (2003) with growing Rahmani lambs. The same study indecated that the values of total offals as % from fasting weight ranged from 3.73 to 4.04 %. In this respect, Abou Ammou and El-Hosseiny et al . (1999) found that the average weights of different offals (liver, kidneys, heart, lungs, spleen and testes) and organs (head, legs and pelt) were not significantly affected by using of Biotonic and Bosporo in sheep rations. They observed also that full gut and empty gut weights were increased (11.7 and 4.5 kg, respectively) with using herbs mixture (especially Bosporo) compared with the control (10.0 and 3.8, kg, respectively).

1 – 4 – Carcass quality and chemical analysis:

Data of carcass quality and chemical analysis of the *Longismus dorsi*(L.d.) are shone in Table(4). The control group had the lowest weight of the 9-11th ribs cut, while the highest was recorded in the group received 2g/head/day chamomile.The differences in weight of 9-11 ribs cut between either treatments G2 and G3 on one side and G1 on the other side were significant.

Table (4) Effect of the experimental treatment on carcass traits and chemical composition of *Longismus dorsi* muscle(means and standard errors).

Item	Treatment		
	G1	G2	G3
Weight of 9-11 ribs cut, g	B 497±8.4	a 541±12	a 562±7.8
Meat weight, g	B 258±10	ab 285±7.9	a 301±11
Meat weight % of ribs sample	51.8±1.2	52.5±1.0	53.5±1.2
Fat weight , g	B 118±3.0	ab 128±4.3	a 135±4.5
Fat weight % of ribs sample	23.5±0.65	23.8±1.1	24.0±1.1
Bone weight , g	103±35	114±65	115±3.6
Bone weight %of ribs sample	20.8±0.85	21.0±0.71	20.5±0.65
Meat :fat ratio of ribs	2.20±0.08	2.24±0.13	2.28±0.16
Meat :bone ratio of ribs	2.53±0.14	2.52±0.10	2.62±0.12
L. D.area , cm^2	B 23.1±0.97	a 27±1.08	a 28.8±0.85
Chemical composition of L.D.(%) :			
Moisture on DM basis	72.05±0.95	73.25±0.82	71.15±0.35
C .P. (DM basis)	72.05±1.75	74.13±2.0	73.86±1.35
E E (DM basis)	24.11±0.93	22.70±0.83	23.01±0.58
Ash (DM basis)	3.04±0.22	3.18±0.51	3.15±0.35

a-b = Means in the same row followed by different letters differ significantly at (P<0.05)

Also, there were significant differences in meat and fat weights (as well as there were increases in meat:fat and meat:bone ratios) and L.D. area which were increased by increasing chamomile levels. The same trend was observed by Abou Ammou and El-Hosseiny(1999). The highest and lowest percentages of CP and EE, respectively were in G2. The results of chemical composition agree with those reported by Abou Ammou and El-Hosseiny(1999).

2- Histological study:

In this study the histological structure of liver, kidneys, rumen and small intestine were performed to determine any histopathological effects or changes in their histogenesis in these organs as affected by feeding lambs on one (G2) or two grams (G3) of chamomile in their diets.

2-1- Liver:

In the control lambs (G1), the liver was charactrized by intact hepatic lobular architecture with normal hepatocyte arrangement arround the hepatic central vein, and normal portal lobules. Also, pronounced blood sinusoides between the hepatocytes and normal central vein were observed within each lobule of the hepatic lobe.Moreover,intact hepatocytes in round shape containing central,circular and dark stained nuclei were found (Fig.1). The histological examination of the liver of lambs in G2 fed 1 g chamomile diet or

those fed 2 g chamomile diet (G3) showed normal histogenesis as found in the control lambs, without any pathological signs. Slight changes were observed in the liver of treated lambs in terms of widened blood sinusoides and presence of fat droplets within the hepatocytes (Figs 2 and 3). These changes in the liver of treated lambs (G2 and G3) were associated with increasing the hepato somatic index in these lambs (1.22 and 1.25, respectively) as compared to 1.19 in the control lambs. Generally, the detected finding in the liver of treated lambs showed normal liver function in these lambs as indicated from the insignificant differences in activity of AST and ALT in blood plasma of the treated lambs as compared to the control lambs (Abdelhamid *et al.*, 2004).

2-2- kidneys :

The histological examination of the kidneys of the control group showed normal architecture of the cortex and medulla. The renal cortex contained intact glomerulosa and Bowman's capsules. Also, normal proximal and distal renal tubules and blood and lymphatic vessels were observed within the renal cortex (Fig.4). The renal medulla showed regular renal tubules of Henel's lobes and collecting ducts, each was composed of single layer of squamous or flattened epithelial cells. Also, blood and lymphatic vessels were seen within the renal medulla (Fig.5). Nearly similar architecture was observed in the kidneys of lambs fed on the chamomile containing diets as found in the control group. The renal cortex in G2 (Fig. 6) and in G3 (Fig.7), and the renal medulla in G2 and G3 (Figs. 8 and 9, respectively) were intact and normal without any signs of pathological effects. These finding revealed normal kidneys function of lambs fed on the chamomile diets as indicated from the normal level of creatinine in blood plasma of treated lambs as in the control lambs. Also, the renal-somatic index was nearly similar in all gmoups, being 0.25 , 0.24 and 0.25 in G1, G2 and G3, respectively.

2-3-Rumen :

2-3-1-Ruminal tunica mucosa:

Ruminal mucosa of lambs in all groups was composed of lamina epithelialis mucosa and lamina propria. The histological examination revealed more developed mucosa in rumen of lambs fed chammomile as compared to the control lambs. The pronounced changes in histogenesis of the ruminal mucosa of treated lambs were found in lamina epithelialis mucosa in term of thicken stratum corneum in lambs of G2 and G3 than G1. Stratum basal, granulosum and spinosum were normal in all groups (Figs. 10 ,11 and 12, respectively). However, stratum corneum was more keratinized in lambs of G2 and G3 as compared to the control (Fig. 10 vs. Figs. 11 and 12). Also, in the control group, ballon like-cells were seen on the papillary surface (Fig .10) indicating slow development of lamina epithelialis as compared to those fed the chamomile diets in G2 and G3 (Figs. 11 and 12). Concerning lamina propria of the ruminal mucosa, it was more condensed containing more reticular fibers and blood vessels and less collagenous fibers in lambs of G2 and G3 (Figs 11 and 12, respectively) as compared to the control (Fig. 10).

2-3-2- Ruminal tunica musculosa:

Ruminal tunica musculosa in all groups was composed of inner circular and outer longitudinal muscle layer. The histological examination revealed that the longitudinal muscle layer was slightly thinner than the circular muscle layer in the control group (Fig.13). In lambs of G2 and G3, the tunica musculosa was charactrized by thinner longitudinal muscle layer than the circular muscle layer (Figs. 14 and 15, respectively). In general, the dietary factors were mainly affected the histological structure of the ruminal wall. The observed findings in the ruminal mucosa may be attributed to the chamomile addition. Most of changes in the ruminal mucosa were related to changes in rumen fermentation and in turn, level of VFA's production. In this study, there was insignificant differences in concentration of VFA's among all groups. So, the histological changes may be in relation to acetic : butyric: propionic ratio (Abdel- Khalek, 1986 and 2000).

2-4- Small intestine:

The histological examination showed that no pathological effects were found on villi and the intestinal crypts in all groups. However, pronounced effect of the chamomile addition was found on density in the intestinal crypts, being with lower density in the control lambs (Fig. 16) than those in G2 (Fig. 17) and G3 (Fig. 18). Also, goblet cells were numerous in the treated lambs(G2 and G3) as compared to the control (Figs. 17 and 18 vs. Fig. 16). These finding may indicate higher digestibility coefficients of the nutrients in the treated groups than in the control group as reported in the digestibility trials (Abdelhamid *et al.*, 2004) .

In conclusion and based on the foregoing findings in liver, kidney, rumen and small intestine, it could be recommended that adding 2 g chamomile / animal / day in the growing lambs' diet had benificial effects on their organs, in particular on rumen and small intestine without any harmfull effects on liver and kidney function. It improves animal carcass quality may be for the positive effect of chamomile on the histological structure and functions of the gastrointestinal tract including the liver.

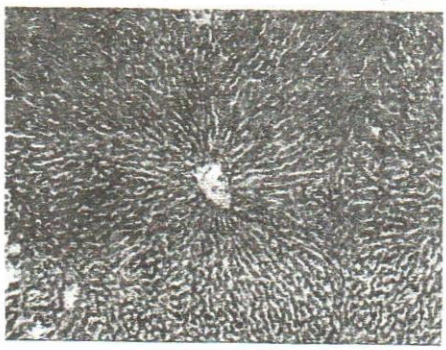

Fig.(1): Section in liver of the control lamb showing intact hepatic lobular architecture (x 40, H & E stain) .

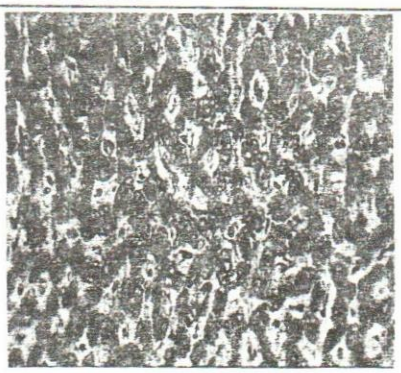

Fig.(2): Section in liver of lambs fed one gram chamomile diet(G2) showing normal hepatic central vein and widened blood sinusoids (x 100, H &E stain)

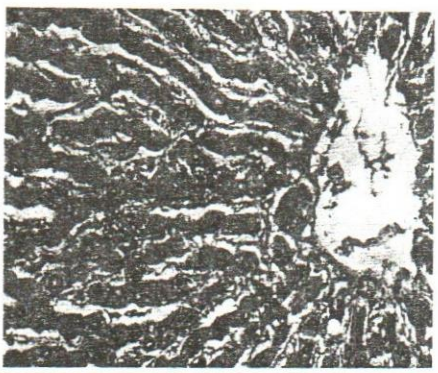

Fig. (3): Section in liver of lambs fed two grams chamomile diet (G3) showing widened blood sinusoides and fat droplets in hepatocytes (x100, H & E stain)

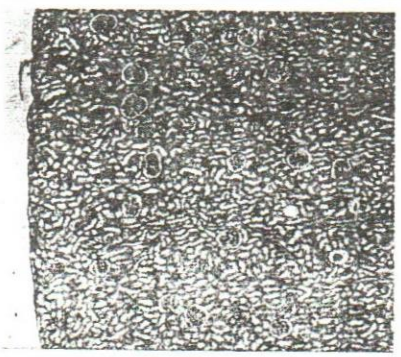

Fig.(4): Section in kidney of the control lamb showing intact renal cortex with normal glomerulosa and renal tubules (x 40, H & E stain)

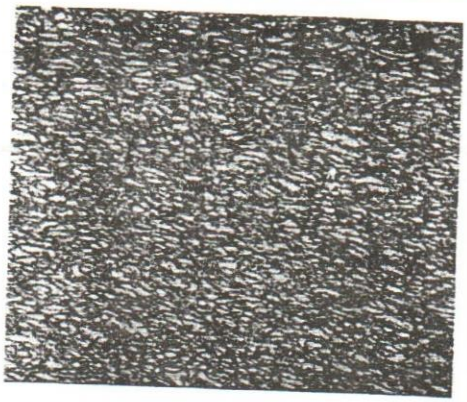

Fig. (5): Section in kidney of the control lamb showing intact renal medulla with regular renal tubules and collecting duct (x 40, H & E stain)

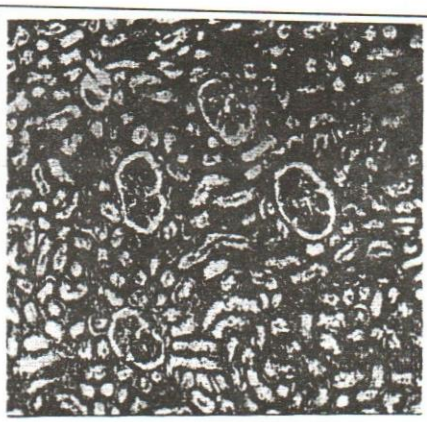

Fig. (6) : Section in kidney of lamb fed one gram chamomile diet showing intact renal cortex with normal glomerulosa and renal tubules (x 100, H & E stain)

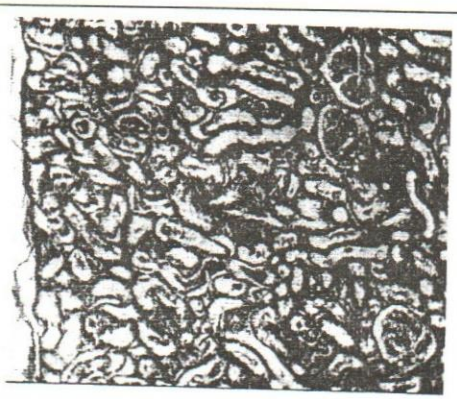

Fig. (7): Section in kidney of lambs fed two grams chammomile diet showing intact renal cortex (x 100 H & E stain)

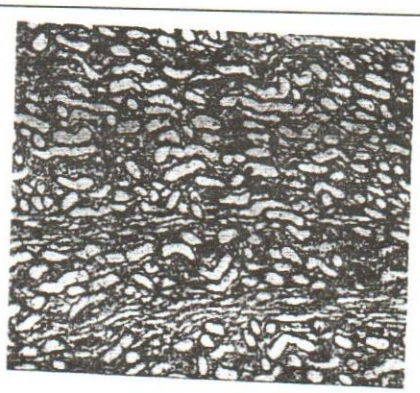

Fig (8): Section in kidney of lamb fed one gram chamomile diet showing intact renal medulla (x 100, H & E stain)

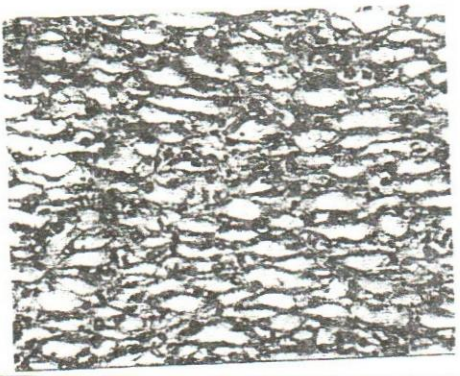

Fig. (9) : Section in kidney of lamb fed two grams chammomile diet showing intact renal medulla (x 100, H & E stain)

Fig .(10) : Section in the ruminal wall of a control lamb showing the ruminal mucosa with less developed lamina epithelialis mucosa (x 100, H & E stain) .

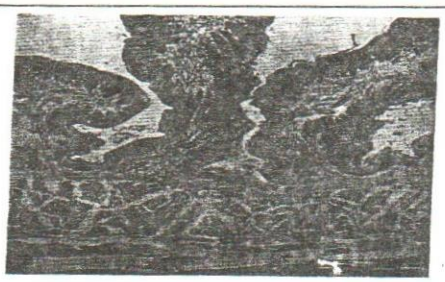

Fig. (11) : Section in the ruminal wall of a lamb fed one gram chamomile diet with more developed lamina epithelialis mucosa with more kiratinization of stratum corneum (x 100, H & E stain).

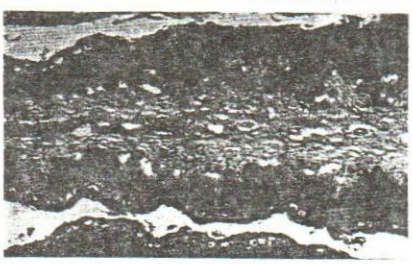

Fig (12): Section in the ruminal wall of a lamb fed two gnams chammomile diet with more dense lamina pro pria(x 100, H & E stain).

Fig. (13): Section in ruminal wall of a control lamb showing tunica musculosa with inner circular and outer longitudinal muscle layr (x 100, H & E stain).

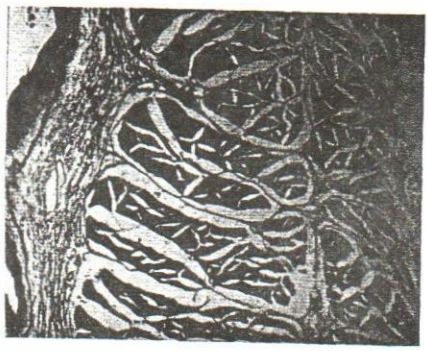

Fig. (14): Section in ruminal wall of a lamb fed one gram chammomile diet showing tunica musculosa with thicken circular muscle layer (x 100, H & E stain).

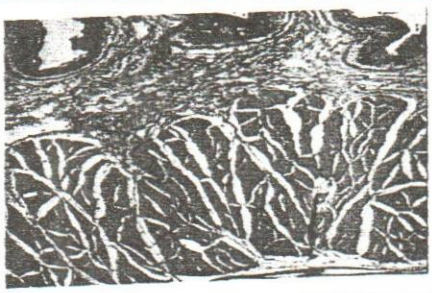

Fig. (15): Section in ruminal wall of a lamb fed two grams chammomile diet showing tunica musculosa with thicken circular muscle layer (x 100, H & E stain).

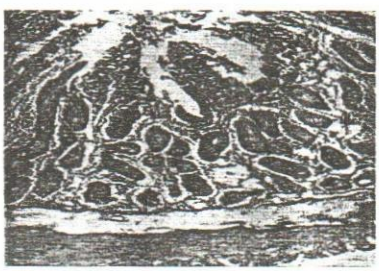

Fig. (16): Section in small intestine of a control lamb showing lower density of the intestinal crypts in duodenum (x 100, H & E stain).

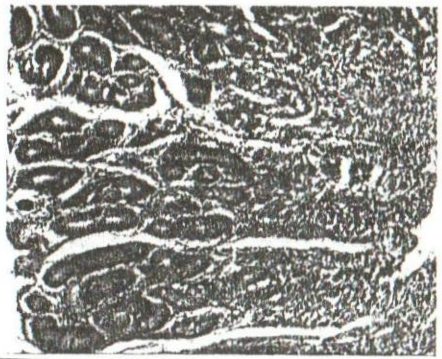

Fig. (17): Section in small intestine of a lamb fed one gram chamomile diet showing more density of the intestinal crypts and numerous Goblet cells duodenum(x 100, H & E stain).

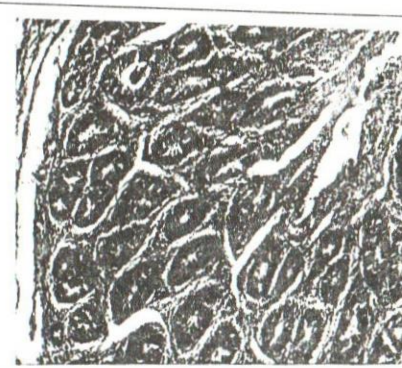

Fig.(18): Section in small intestine of a lamb fed two grams chamomile diet showing more density of the intestinal crypts and numerous Goblet cells duodenum (x 100, H & E stain) .

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تأثير الإضافة الغذائية بزهور البابونج (الكاموميل) على خصائص الذبيحة والتركيب النسيجى فى الأغنام الرحمانى

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تم استخدام ٢١ حولي رحماني ، متوسط عمرها ما بين ٣-٤ شهور، ومتوسط الوزن ١٩,٨٧ كجم، قسمت لثلاث مجموعات متساوية تبعاً لوزن الجسم، والتغذية داخل العلائق التجريبية فى المجموعات الثلاثة كانت عبارة عن العلف المصنع والأذرة الصفراء والدريس مع إضافة الكاموميل كالتالى: المجموعة الأولى: علف مصنع+ أذرة صفراء + دريس البرسيم(مجموعة المقارنة، مج١) ، المجموعة الثانية: علف مصنع+ أذرة صفراء ودريس البرسيم+ ١جم كاموميل/ رأس يوميا(مج٢) ، المجموعة الثالثة: علف مصنع+ أذرة صفراء +دريس البرسيم+ ٢جم كاموميل/راس يوميا(مج٣) . نسبة المادة الخشنة إلى المركزة فى كل المجموعات(٤٠ :٦٠) . ويمكن تلخيص أهم النتائج المتحصل عليها كما يلى: لوحظ وجود اختلافات معنوية بين المجموعات الثلاثة في وزن الذبيحة والتصافي، وكان للمعاملة بالكاموميل(مج٢، مج٣) تأثير إيجابي على وزن الذبيحة وكذلك نسبة التصافي. كان هناك تغير فى دهن الأحشاء الداخلية الكلية (حينما كان منسوباً لوزن الذبيحة) حيث سجل ٢,٠٦ ، ١,٧٥،١,٨٠ % للمجموعات مج١، مج٢، مج٣ على التوالي. لوحظ وجود تأثير إيجابي للمعاملة على معظم قطعيان الذبيحة . حدثت زيادة في وزن العضلة العينية مع زيادة مستوى الكاموميل. الأغنام المغذاة على عليقة المقارنة(مج١) أعطت أقل قيمة فى مقياس مساحة العضلة العينية. فيما يتعلق بالتركيب الهستولوجى للكبد ، والكلى، والكرش، والأمعاء الدقيقة فقد لوحظ أن إضافة الكاموميل له تأثير إيجابي ومفيد على هذه الأعضاء خاصة الكرش والأمعاء الدقيقة وبدون أي تأثير عكس على وظائف الكبد والكلى. والخلاصة أنه يوصى بإضافة ٢ جم بابونج (كاموميل) لـلعليقة / حولي / يوم وذلك للتأثير الموجب للبابونج على التركيب النسيجي ووظيفة الجهاز الهضمي بما يشمله من الكبد وانعكاس ذلك ايجابيا على خواص جودة الذبيحة.