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Research Article

The Effects of Yeast Culture Products on Fattening Performance, Rumen Papilla Morphology, Some Blood and Rumen Fluid Parameters in Saanen Male Kids [1]

Fatma KARAKAŞ OĞUZ [1] Kadir Emre BUĞDAYCI [1] Mustafa Numan OĞUZ [1]
Metin Koray ALBAY [2] Şima ŞAHİNDURAN [2] Jale ÖNER [3] Hıdır GÜMÜŞ [1]

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[1] Mehmet Akif Ersoy University, Veterinary Faculty, Department of Animal Nutrition and Nutritional Diseases, TR-15100 Burdur - TURKEY
[2] Mehmet Akif Ersoy University, Veterinary Faculty, Department of Internal Medicine, TR-15100 Burdur - TURKEY
[3] Mehmet Akif Ersoy University, Veterinary Faculty, Department of Histology and Embryology, TR-15100 Burdur - TURKEY

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Abstract

The aim of this study was to investigate the effects of live yeast culture and the live yeast culture enriched with vitamin-mineral supplementation as a feed additive on fattening performance, some blood and rumen fluid parameters in male kids. Totally 18 male Saanen goat kids (average 8 weeks old) were divided into one control and two treatment groups each containing 6 kids. Rations were prepared as isonitrojenic and isocaloric. Live yeast culture (LYC) and the yeast-vitamin-mineral complex (YVM) (RumiSacc® and Intetotal® respectively, Integro food Industry and Trade Co., Istanbul, Turkey, Live yeast cell 344 x 1010 cfu/g,) were incorporated into concentrates at the level of 0% (C), 1% (YC) and 1% (YVM) on as-fed basis. During the study concentrate feed and fresh water were given ad libitum and the ration did not contain any roughages. Dietary yeast culture at the level of 1% increased final live weight (4.7% regarding control group) as numerically but not significantly. The fattening performance, rumen fluid and blood parameters were not statistically affected from the dietary treatments throughout the study. While the dorsal papillae length was not changed, ventral papillae length was decreased in the treatment groups. The length of papillae in YVM groups were similar to that of control groups.

Keywords: *Blood parameters, Fattening performance, Kid, Live yeast culture, Rumen parameters*

Saanen Erkek Oğlaklarında Maya Kültürü Ürünlerinin Besi Performansı, Rumen Papilla Morfolojisi, Bazı Kan ve Rumen Parametleri Üzerine Etkileri

Özet

Bu çalışmanın amacı erkek oğlaklarda rasyona canlı maya kültürü ve vitamin-mineral ile zenginleştirilmiş canlı maya kültürü ilavesinin besi performansına, bazı kan ve rumen parametleri üzerine etkilerini araştırmaktır. Toplam 18 erkek Saanen oğlak, her biri 6 adet oğlaktan oluşan bir kontrol ve iki deneme grubuna ayrılmıştır. Rasyon izonitrojenik ve izokalorik olarak hazırlanmıştır. Deneme yemlerinde canlı maya kültürü (LYC) ve maya-vitamin-mineral kompleksi (YVM) (Sırasıyla RumiSacc® ve Intetotal®, İntegro Gıda Sanayi ve Ticaret, İstanbul, Türkiye; Canlı maya hücresi 344 x 1010 cfu/g) %0 (C), %1 (YC) ve %1 (YVM) düzeyinde kullanılmıştır. Hayvanlara yem ve su ad libitum olarak sunulmuş, rasyonda kaba yem kullanılmamıştır. Rasyona %1 oranında canlı maya kültürü ilavesi araştırma sonu canlı ağırlığı rakamsal olarak (kontrol grubuna kıyasla %4.7) arttırmıştır ancak bu fark önemli bulunmamıştır. Çalışma süresince deneme gruplarına ait besi performansı, rumen sıvısı ve kan parametreleri farklı maya kültürleri ilavesinden istatistiksel olarak etkilenmemiştir. Deneme gruplarında dorsal papilla uzunluğu değişmezken, ventral papilla uzunluğu düşmüştür. YVM grubunun papilla uzunlukları kontrol grubuyla benzerdir.

Anahtar sözcükler: *Kan parametreleri, Besi performansı, Oğlak, Canlı maya kültürü, Rumen parametreleri*

İletişim (Correspondence)
+90 248 2132140
fkarakasoguz@mehmetakif.edu.tr

INTRODUCTION

Yeast and yeast products are often used in ruminant diets to manupulate rumen fermentation and improve animal performance. The benefits of live yeast culture are well understood. However, researches carried out on the effects of yeast products in small ruminants are limited. Studies on the effects of yeast cultures have reported variable results. These differences may depend on many factors such as diet composition, forage to concentrate ratio, type of forage feed, yeast dose, feeding strategy and stage of lactation [1]. *Saccharomyces cerevisiae* vary widely in efficiency, primarily because of differences in strain, the viability of yeast cells, and theirs dosage [2].

Studies reported that yeast supplementation increased growth, feed intake and nutrient utilization in Black Bengal kids [3], improved feed conversion ratio of Awassi lambs [4]. In contrast, yeast supplementation did not always improve the animal performance. One of the study on Awassi lambs and Shami goat kids reported that yeast supplementation had no effect on avarage daily gain and dry matter intake [5]. Another research conducted on Saanen dairy goats show that addition of live yeast into diet increased dry matter intake and milk yield in early lactation period [6].

Some of studies found that yeast culture supplementation did not affect some serological blood parameters in goats [7] and in dairy cows [1]. However, Galip [8] reported that dietary yeast culture altered serum total protein, urea, calcium concentrations, Ca/creatinine ratio and triglyceride concentrations in rams.

Addition of yeast culture to the ruminant diets has shown inconsistent effects on results of rumen volatile fatty acid (VFA) concentration. One of the reports on dairy cows with two different saccharomyces strains indicated that strain has an importance and that can modify ruminal ammonia, propionate and butyrate concentration. However, saccharomyces strains have no effect on productive performance [9]. Another study revealed that yeast culture addition to dairy cow diets had positive effects on ruminal VFA production [10]. Desnoyers et al.[11] reported that the positive effect of yeast supplementation on rumen pH was increased with the higher level of concentrate in the diet and the dry matter intake level. They also indicated that the positive effect of yeast supplementation on rumen was increased VFA concentration with higher dry matter and crude protein intake.Chaucheyras-Durand et al.[12] also mentioned that active dried yeasts in young ruminants has a stabilization function on rumen pH.

The goat population is about 5 million in Turkey and one of the prefered dairy goat species is Saanen. Male kids have less economic value for dairy farms in birth season when compared with females. Also there is growing concern about combination feed additives because of economic reasons. Combination of live yeast with vitamin-mineral is one of it. Effects of supplementing live yeast culture and the combination of live yeast culture with vitamin-mineral to the diets of fattening male Saanen kids have not been studied. Therefore, the objective of this study was to evaluate the effects of supplementation of these products to fattening diets of male Saanen kids on feed intake, growth performance, some blood parameters, papilla morphology and rumen organic acids.

MATERIAL and METHODS

The experiment was conducted in a commertial farm in Burdur, Turkey. Management protocols, animal care and protocols of the research were made in accordance with approved Local Ethical Committee on Animal Experiments of Mehmet Akif Ersoy University (01.04.2013- 93773921-30- verdict no: 29).

Animals, Housing, Feedstuffs, and Experimental Procedures

A total of 18 male, average 8 weeks old Saanen kids were used in the study. All animals were fed with milk replacer and concentrate (control group feed) before experiment. Rumisacc and Intetotal were not offered this period. All animals were treated for internal and external parasites using Ivomec (Novakim; active ingredient: 10 mg/ml Ivermectin; dose: 1 ml/50 kg live weight) 2 weeks before the experiment started. This study was conducted at the commercial feedlot for 11 weeks from May 2013 to July 2013. Kids were housed in individual cages (100x 150x120cm) under the shed with concrete floor with sawdust and dry manure bedding for the entire period of the experiment. Concentrates were prepared in a feedmill as a mash feed. The rations were formulated as isocaloric and isonitrogenous. The formulation and chemical composition of the concentrates are presented in *Table 1*.

Live yeast culture and its vitamin-mineral combination product (RumiSacc® and Intetotal® respectively, Integro food Industry and Trade Co., Istanbul, Turkey) were both included in the concentrates at 1.0%. Copper is completely removed from YVM (Intetotal®) by producer. During the study concentrate feed and fresh water were given *ad libitum* and the ration did not contain any roughages. Refused feeds were collected once in a week and weighed to accuretly determine the feed intake.

Nutrient composition of concentrates were determined according to the AOAC [13], crude fiber was determined by the methods of Crampton and Maynard [14]. The metabolizable energy levels of concentrate feeds were determined by using the following formula of TSI [15].

ME (kcal/kg OM) = 3260 + (0.455xCP) – (4.037xCF) + (3.517xEE) where CP (crude protein), CF (crude fibre) and EE (ether extract) were expressed as g/kg OM (organic matter).

Table 1. *The formulation and chemical composition of concentrate feeds*
Tablo 1. *Konsantre yemin kimyasal kompozisyonu ve formülasyonu*

Diet Formulation	**C**	**YC**	**YVM**
Corn	35	35	35
Barley	21	21	21
Wheat Bran	11	11	11
Full fat soy	11	11	11
Sunflower meal, 36% Crude Protein	10	10	10
Soybean meal, 48% Crude protein	7	6	6
DCP	1.7	1.7	1.7
Canola oil	1	1	1
DL-methionine	0.1	0.1	0.1
L-lysin hidroclorid	0.1	0.1	0.1
Live yeast culture[1]	-	1	-
Live yeast - vitamin, mineral complex[2]	-	-	1
Lime stone	1.5	1.5	1.5
Salt	0.4	0.4	0.4
Vitamin mineral premix[3]	0.2	0.2	0.2
Chemical Composition			
Dry matter, %	88.38	88.40	88.09
Crude protein, %	16.34	16.68	16.38
Crude fiber, %	7.03	6.78	6.46
Ether extract, %	5.31	5.94	6.06
Ash, %	6.68	6.94	6.71
ME, kcal/kg ME	2640.72	2664.70	2677.20

C: *Control group;* ***YC:*** *Group fed with diet containing live yeast culture;* ***YVM:*** *group fed with died containing the combination of live yeast culture with vitamin and mineral,* ***1:*** *RumiSacc, Integro Food Industry and Trade Co., İstanbul, Turkey (Live yeast cell 344 x 10^{10} cfu/g, Dry matter: 91.50%, Crude protein: 44.31%),* ***2:*** *Intetotal, Integro Food Industry and Trade Co., İstanbul, Turkey (Live yeast cell 344 x 10^{10} cfu/g, Dry matter: 91.50%, Crude protein: 40.51%),* ***3:*** *Each kilogram of vitamin-mineral mix contains 12.000.000 IU A vit, 20.000 mg E vit, 50.000 mg Mn, 50.000 mg Fe, 50.000 mg Zn, 10.000 mg Cu, 800 mg I, 150 mg Co, 150 mg Se*

Animals were weighed individually at the beginning of the experiment and every two weeks. The average daily weight gain over the duration of experiment was determined individually. Daily feed intake of the kids were determined and feed conversion ratio was calculated as kg feed per kg live weight gain of kids individually.

Slaughter Procedures, Sampling and Ruminal Fluid Evaluation

Animals were slaughtered at 11th weeks of the trial (avaregely 19th weeks old aged). Kids were sacrificed in a commercial slaughter house. Ruminal fluid and rumen wall samples were collected.

Hot carcasses were weighed, suspended through the achilles tendon, and then chilled at 4ºC for 24 h and weighted again. By this method hot and cold carcass yield were determined.

Rumen fluid samples were collected in two bottles from all kids in each group during the slaughtering process. Rumen fluid sample in one bottle was used for the measurement of pH, VFA and lactic acid. The pH was measured immediately by a pH meter (Hanna pH meter, model no: Hi917hN). Rumen fluid samples were filtered from cheese cloth before VFA analysis. After centrifugation (10.000 rpm, 10 min at +4ºC) concentrations of VFA in the supernatant were determined by HPLC system of Agillent 1260 series (Agillent Technologies, Waldronn, Germany) equipped with a Agilent-detector (1260 MVDVL) operated at 210 nm. Separation of acids was conducted using an organic acid analysis column (300 x 7.7 mm; Hi-plexH-organic acid column), with 0.005 M H_2SO_4 as eluent, at flow rate of 0.6 ml/min, and with the column temperature of 55°C. Rumen fluid samples were analysed in Integro lab. Concentrations of ammonia-N were determined by distillation (Gerhard, vapodest 2000) and titration, by using 5 ml of the rumen fluid which filtered by from cheese cloth [16].

Ruminal Wall Parameters

Samples were collected from the bottom of saccus ruminis dorsalis and ventralis for histological and morphometric examination after was slaughtered. The size of the samples was approximately 1x1x0.5 cm. The tissues were fixed for a period of 72 h after the collection in 10% formalin. Afterwards, the samples were processed using the common paraffin method, stained with haemotoxylin-eosin and evaluated by a light microscope. Ten papillae were measured in each section: the length of the papilla (from the base to the apex), the width of the epithelium (the distance between the external border of lamina propria mucosae and internal border of stratum corneum at the papillar base), the width of stratum corneum from the external end of stratum lucidum to the papillary surface and also keratinisation on the surface of the papillae [17].

Blood Analyses

At the first and last day of trial, blood samples were taken from jugular vein and collected in two tubes in the morning. In order to conduct hematological analysis the blood samples were transferred into tubes which contain EDTA and for biochemical analysis the blood samples were transferred into tubes which do not contain EDTA and centrifuged at 3.000 rpm at room temperature for 5 min and then serum was carefully harvested for determination of total cholesterol, triglyceride, glucose and blood urea nitrogen (BUN). Analysis was done with theVET TEST 8008 Autoanalyzer (IDEXX Laboratories, inc Westbrook ME 04092 USA). Other blood samples freshly used for hematological analyzes (WBC, RBC, HGB, HCT, MCV, MCH, MCHC, RDWc). Abacus Junior Vet Hematology Analyzer (Diatron MI PLC. Hungary) was used for hematological analysis.

Statistical Analyses

Statistical analysis was done by using computer programme. It is obtained that the means of data forming groups are normally distributed by using Shapiro-Wilk test One way ANOVA was performed to detect the differences between groups. The significance of mean differences between groups were tested by Duncan [18]. Values were given as mean ± standard error. Level of significance was taken as $P<0.05$.

RESULTS

Crude protein analysis of Rumisacc and Intetotal were found to be 44.31 and 40.51% respectively. Both of two dietary live yeast additives did not significantly affect final live weights of kids *(Table 2)*. Avarage body weight gain, feed intake, feed conversion ratio, hot and cold carcass yield *(Table 3)*, rumen pH, ammonia-N and VFA (total and individual) concentration *(Table 4)*, initial and final hematological and blood chemistry results *(Table 5* and *Table 6)* were not significantly affected (P>0.05) by treatments. Effects of dietary treatments on rumen papillae morphology has been showed in *Table 7*. While dorsal papillae lenghts did not change in all groups, ventral papilla lengths in YC group were shorter than the other groups (P<0.05). Thicknesses of epithelium were different among the groups (P<0.05).

DISCUSSION

Supplementation of YC increased final weight up to 1.44 kg numerically when compared to control group but this increase was not statistically significant. This situation may be attributed to low numbers of animals and individual

Table 2. *Effects of dietary treatments on body weight, kg, n=6*
Tablo 2. *Deneme rasyonlarının canlı ağırlığa etkisi, kg, n=6*

Days	C	YC	YVM	P
Initial (avarege of 8 weeks old) body weight, kg	16.45±0.82	16.80±0.35	16.82±1.22	0.939
Day 14 (10 weeks old)	19.39±0.86	20.03±0.45	19.29±1.26	0.808
Day 28 (12 weeks old)	22.16±1.21	22.12±0.35	22.41±1.49	0.866
Day 42 (14 weeks old)	24.20±1.44	25.57±0.54	24.44±1.43	0.683
Day 56 (16 weeks old)	27.67±1.64	29.02±0.47	27.43±1.48	0.654
Day 70 (18 weeks old)	30.15±1.71	31.68±0.52	29.91±1.70	0.629
Final day 77 (19 weeks old)	30.68±1.83	32.12±0.52	30.98±2.06	0.785

C: *Control group;* ***YC:*** *Group fed with diet containing live yeast culture;* ***YVM:*** *group fed with died containing the combination of live yeast culture with vitamin and mineral*

Table 3. *Effects of dietary treatments on performance and carcass parameters, n=6*
Tablo 3. *Deneme rasyonlarının performans ve karkas parametreleri üzerine etkisi, n=6*

Parameters	C	YC	YVM	P
Weight gain, g/d	175.67±16.59	187.59±12.66	181.30±22.65	0.881
Feed intake, g/d	952.06±50.57	1055.72±22.33	1013.05±68.96	0.325
Feed conversion ratio	5.53±0.27	5.78±0.48	5.79±0.53	0.889
Hot carcass weight, kg	14.30±0.83	14.70±0.28	13.80±1.00	0.706
Cold carcass weight, kg	13.86±0.81	14.33±0.29	13.48±0.96	0.717
Hot carcass yield, %	46.62±0.62	45.75±0.44	44.48±0.86	0.104
Cold carcass yield, %	45.21±0.77	44.61±0.50	43.46±0.75	0.236

C: *Control group;* ***YC:*** *Group fed with diet containing live yeast culture;* ***YVM:*** *group fed with died containing the combination of live yeast culture with vitamin and mineral*

Table 4. *Effects of dietary treatments on rumen organic acids (mg/l), pH and NH_3–N, n=6*
Tablo 4. *Deneme rasyonlarının rumen organic asit (mg/l), pH ve amonyak azotu üzerine etkisi, n=6*

Ruminal Fluid	C	YC	YVM	P
Lactic acid	185.50±84.08	89.00±53.69	162.66±76.47	0.720
Acetic acid	3146.00±320.38	2766.16±230.08	2719.00±340.23	0.558
Propiyonic acid	856.33±81.76	1055.50±112.13	893.33±146.41	0.456
Iso-butyric acid	159.50±60.59	91.00±18.45	37.33±13.36	0.101
n- butyric acid	795.50±104.61	748.83±86.76	899.00±132.50	0.621
pH	5.50±0.08	5.64±0.07	5.53±0.15	0.602
NH_3-N, mg/l	1079.33±190.90	991.00±53.31	992.00±50.10	0.101

C: *Control group;* ***YC:*** *Group fed with diet containing live yeast culture;* ***YVM:*** *group fed with died containing the combination of live yeast culture with vitamin and mineral*

Table 5. *Initial some blood parameters in kids, n=6*
Tablo 5. *Oğlaklarda deneme başı bazı kan parametreleri, n=6*

Fresh Blood Parameters	C	YC	YVM	P
WBC, 10 /L	11.82±1.14	12.54±1.85	12.10±1.17	0.937
RBC, 1012/L	17.31±0.39	17.60±0.42	17.85±0.49	0.697
HGB, g/dl	9.21±0.23	9.45±0.28	9.16±0.43	0.792
HCT, %	24.35±0.62	24.67±0.68	23.92±1.11	0.811
MCV, fl	14.00±0.44	14.00±0.44	13.40±0.50	0.607
MCH, Pg	5.31±0.13	5.36±0.14	5.14±0.20	0.487
MCHC, g/dl	37.86±0.70	38.21±0.34	38.32±0.50	0.829
RDWc, %	46.60±1.07	46.11±1.20	47.10±0.69	0.813
Blood Serum Parameters				
Total cholesterol, mmol/L	2.89±0.40	2.42±0.48	3.46±0.42	0.298
Glucose, mmol/L	5.77±0.24	5.73±0.52	6.53±0.50	0.395
BUN, mmol/L	3.28±0.38	5.90±0.98	4.48±1.23	0.143
Triglyceride, mmol/L	0.22±0.10	0.26±0.14	0.33±0.24	0.221

C: *Control group;* ***YC:*** *Group fed with diet containing live yeast culture;* ***YVM:*** *group fed with died containing the combination of live yeast culture with vitamin and mineral*

Table 6. *Final some blood parameters in kids, n=6*
Tablo 6. *Oğlaklarda deneme sonu bazı kan parametreleri, n=6*

Fresh Blood Parameters	C	YC	YVM	P
WBC, 10 /L	12.09±1.46	13.39±1.16	12.75±0.71	0.739
RBC, 1012/L	17.35±0.53	17.66±0.49	17.77±0.41	0.825
HGB, g/dl	9.21±0.25	9.66±0.22	9.54±0.63	0.685
HCT, %	23.21±0.55	24.11±0.76	22.95±1.41	0.655
MCV, fl	13.16±0.30	13.83±0.47	13.00± 0.70	0.474
MCH, Pg	5.31±0.60	5.46±0.13	5.36±0.27	0.797
MCHC, g/dl	39.71±0.43	40.11±0.43	41.44±0.76	0.107
RDWc, %	45.50±0.14	44.61±0.56	46.72±1.04	0.108
Blood Serum Parameters				
Total cholesterol, mmol/L	2.17±0.20	2.31±0.34	1.49±0.31	0.160
Glucose, mmol/L	3.64±0.14	3.67±0.10	3.65±0.14	0.989
BUN, mmol/L	7.38±0.53	7.43±0.66	7.54±0.56	0.983
Triglyceride, mmol/L	0.25±0.01	0.29±0.02	0.26±0.04	0.475

C: *Control group;* ***YC:*** *Group fed with diet containing live yeast culture;* ***YVM:*** *group fed with died containing the combination of live yeast culture with vitamin and mineral*

Table 7. *Effects of dietary treatments on rumen papillae length, rumen papillae epithelium and keratin thickness, µm*
Tablo 7. *Deneme rasyonlarının rumen papilla uzunluğuna, rumen epiteli ve keratin kalınlığı üzerine etkisi, µm*

Location	C	YC	YVM	P
Dorsal	3031.25±133.55 (n=60)	2773.40±168.56 (n = 20)	2912.78±77.86 (n=58)	0.522
Ventral	3365.00±160.98^{a} (n=50)	2053.96±97.74^{b} (n=50)	3075.00±157.72^{a} (n=40)	0.001
Epithelium	106.16±3.01^{a} (n=60)	97.21±2.79^{b} (n=50)	70.56±2.25^{c} (n=60)	0.001
Keratin	17.47±0.52 (n=60)	16.26±0.66 (n=50)	18.79±1.16 (n=60)	0.122

C: *Control group;* ***YC:*** *Group fed with diet containing live yeast culture;* ***YVM:*** *group fed with died containing the combination of live yeast culture with vitamin and mineral;* ^{a,b} *Means in a row with different superscripts are significantly different (P<0.01)*

differences in body weight of the animals in the groups. Interestingly, avarage daily weight gain was approximately two times higher in YVM group than in other treatment groups at the final week of the experiment. Related with the average body weight gain results of this study is similar with Titi et al.[5]. The investigators reported that yeast culture supplementation did not affect live weight, live weight gain and dry matter intake in Ivesi lambs and Shami goat kids. On the other hand significant increases in live weight gain associated with yeast supplementation have been reported in goats [7,19] and lambs [4]. In the present study kids fed diets containing either two yeast culture product consumed 10.89 and 6.41% more feed respectively than control group. Beside this result, Kamal et al.[19] reported that live yeast supplementation significantly improved dry matter intake (DMI) per kg liveweight gain. Investigators were also mentioned that the more DMI and relatively more avarage daily gain in live yeast fed groups subsequently lead to improvement in the feed conversion ratio at the same study. There are several studies which have mentioned improvement in feed conversion ratio due to yeast feeding in lambs [4] and in goats [20]. However Titi et al.[5] reported that yeast culture supplementation incresed digestibility with no effect on growth, feed intake or feed conversion ratio of fattening Awassi lambs and Shami kids.

Addition of YC and YVM did not alter hot or cold carcass weight. Very little published literature is available concerning effects of yeast culture supplemetation on carcass, especially with small ruminants. Titi et al.[5] reported that yeast culture supplementation significantly decreased cold dressing proportion and hot carcass weight of Awassi lambs however did not affect on Shami goat kids as our results.

Our ruminal pH results are similar with a series of study which have shown that ruminal pH was not affected by the supplementation of *Saccharomyces cerevisiae* [8,19,21]. However significant increases in ruminal pH associated with yeast supplementation, have been reported in goats [7,22]. In the present study kids were adapted to concentrate in early age, this situation may have influence this stability of ruminal pH. Also there are investigations which have similar result [23,24] are available related with *Saccharomyces cerevisiae* and ruminal fluid of ammonia-N concentration with our results. However Özsoy et al.[7] reported that dietary inclusion of 3.0 and 4.5% live yeast culture significantly increased ammonia-N concentration on goats. Similarly Galip [25] indicated that ruminal ammonia-N concentrations were significantly increased by dietary yeast culture supplementation whatever the ratio forage/concentrate of the diet. Related with VFA concentrations of ruminal fluid there is a series of study [7,21,23,26] which have similar results with ours. However Kamal et al.[19] indicated that total volatile fatty acid concentration was significantly higher in live yeast culture fed kids at 2 and 4 months.

Blood chemistry results and some hematological parameter results of present study had parallel with the of results Özsoy et al.[7] that plasma cholesterol and triglyceride concentrations were not altered by yeast culture supplementation on goats and Yalçın et al.[1] on dairy cows. On the other hand, dietary yeast supplementation decreased serum triglyceride level in rams [8].

Various studies were available recording to the effect of nutrition on rumen papillae size. The papillae size is directly related to food intake, digesta weight in rumen, rate of fermentation, and weigh of rumen. The diet influences rumen papillae surface area and eventually the rumen efficiency and animal health [27]. Butyrate has been shown to have potent effects on papillae size [27,28]. The results presented in this paper showed that ventral papillae lengths of YC groups shorter than the other groups. In YC group, in spite of the fact that papilla length was not different from the other groups, ventral papillae were shorter than the other groups. The cause of this depression of ventral papilla length may be rumen fluid accumulate in this area.

Addition of live yeast culture and its vitamin mineral combination to male kids fed with concentrate (without forage) did not affect fattening performance, some blood and rumen fluid parameters, but ventral papillae lengths of YC groups shorter than the other groups. Dietary yeast culture at the level of 1% increased 4.7% final live weight when compeared with control group as numerically. Differences in results from some literatures depend on animal traits (animal strain, animal sex, animal's race, health status), yeast traits (vaiability, amount of yeast) ration traits (rate of forage/concentrate, forage ang grain types). More reasearches with different doses and more replicates are required to be conducted to determine the affects of live yeast culture products.

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