

Determination of Crude Nutrient Content of Natural Pastures of Sanliurfa Tek Tek Mountains, in Turkey

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Received Date: 03-June-2021

Accepted Date: 23-June-2021

Published Date: 30-June-2021

Abstract

In this study, the dry matter (DM), crude ash (CA), crude protein (CP), crude fat (CF), neutral detergent insoluble fiber (NDF) and acid detergent insoluble fiber (ADF) values were determined that the rangelands (Mera1, Mera2, Mera3, Mera4) in different regions of Sanliurfa region for March, April, May and June. DM, CA, CP, CF, NDF and ADF levels (%) for March, April, May and June were 26.6-42.8, 7.9-8.5, 17.4-8.2, 2.3-2.1; 36.3-62.1, 27.5-39.7; In the Mera2 region, respectively; 28.8-45.5, 8.4-9.1, 16.7-7.4, 2.0-2.7; 35.9-63.7, 30.7-40.1 in the pasture region respectively; 24.7-45.6, 6.9-10.7, 15.5-7.0, 2.6-2.1; 33.6-68.6; 31.5-44.7; In the pasture region respectively; 26.4-40.8, 8.4-9.5, 16.1-7.5, 2.5-2.7; 35.8-59.5, 29.6-39.8 were determined between the values. In all pasture regions, KM, NDF and ADF levels increased significantly ($P<0.01$), while CP levels decreased significantly ($P<0.01$). In March, April, May and June periods, the average of DM, CA, CP, CF, NDF and ADF levels of four different pasture regions were 26.6-43.5, 7.9-9.5, 16.4-7.5, 2.3-04.02; 35.4-43.3 and 29.8-41.3. Compared to the periods, mean DM, NDF and ADF levels increased while HP levels decreased.

Key Words: Crude nutrient content, Natural pastures, forage

INTRODUCTION

In animal husbandry, consantrate and forage feeds are produced and used in feeding animals. In order to meet the daily feed requirement of animals consantrate feeds are given to the forage group is required for the animal to be productive and healthy (Kılıç, 2003). Roughage; feeds of vegetable origin with high crude cellulose content, but low protein and energy levels, which is used as fresh, dried or silage animal feed; they constitute the main part of the ration of herbivorous animals structural, (Hanoğlu, 2014). Forage can be identified as materials having 14 % higher water rate and 16 % higher crude cellulose rate, and with low organic materials in terms of energy value and digestible organic substances (Kılıç, 2000).

In ruminant livestock feeding, 60-70 % of the production are fodder costs (Alçiçek, 2002). Due to the fact that fodder costs have a share of 70 % in total costs in livestock raising, the importance of good quality forage increases accordingly. Among good quality forage resources, it is worth mentioning rangelands and pastures, fodder plants and silage firstly (Şeker, 2006). This makes it clear how important is forage for an economical animal production is. In Turkey forage is mostly provided from pastures (Avcioğlu, 2000).

In order to sustain livestock raising, and obtain good quality and economic products, it is necessary to have a certain amount of forage in ruminant rations. Rangelands and pastures are important among forage production resources. In Turkey, livestock raising is conducted based on natural pastures. Raising livestock in closed places is expanding during the recent years.

The forage resources in Turkey are insufficient to meet the requirements of the animals. The rate of rangelands and pastures withing total lands is fine when compared to many countries, but they have low fertility due to ecological conditions and misuses. In order to avoid fodder shortcomings for animals, searches for alternative fodder plants have been initiated (Okuyucu and Okuyucu, 2006).

In Turkey, natural pastures where especially sheep are fed, host many different species of plants. Nutrient substance composition of plants types available in the pastures vary as per regions. In the GAP region, sheep and goat raising is a major activity. Around a quarter of the total sheep and goat population in Turkey is found in the Southeastern Anatolia Region. In Şanlıurfa region, sheep raising is seen from March-

April when pasture vegetation is available, to September when the vegetation is insufficient, in pasture conditions without giving additional fodder. In this study will provide information about nutrient substance compositions of the natural pastures according to regional basis.

MATERIAL andMETHOD

In this research, samples have been gathered from natural pastures of *Karahisar* (pasture1), *Boncuk* (pasture2), *Parmakkapı* (pasture3) and *Altıntepe* (pasture4) villages (Figure 1), where pasture based sheep raising is seen, during different periods (1 March 2015, 1 April 2015, 1 May 2015, 1 June 2015) For sampling, quadrants having dimension of 50x50 cm (0,25 m²) were placed in 4 places at each location, and the grass remaining inside them was mowed from earth level. The dried samples were conducted as; dry matter (DM), crude ash (CA), crude protein (CP), crude fat (CF) analysis made according to AOAC 2000, and for identification of crude cellulose (CC), ADF, NDF substances, made via anaylze methods set by Van Soest (1991) by using ANKOM analysis devices. The data obtained from the study were analyzed according to one way variance analysis method, and in comparison of intergroups differences, Duncan multi comparison test has been used.



Figure 1. Study zone

Results and Conclusion

DM, CA, CP, CF, NDF and ADF values of pastures in different areas of Şanlıurfa region for March, April, May and June periods are given in Tables 4.1, 4.2, 4.3. and 4.4.

As Table 1 is studied, it is seen that in Pasture 1 region, DM, NDF and ADF levels increase significantly ($P < 0.01$) in March, April, May and June, while CP level decreases ($P < 0.01$). On the other hand, statistical differences have not been found between CA and CF levels between different periods. In a study conducted by Erkovan et al. (2009) it is identified that in grazing and preserved pastures, CP levels (%17.7-11.8 and %17.9 -12.1) decrease as vegetation matures, while ADF (%19.2-28.7 and %20.7-29.7) and NDF (%41.0-55.2 and %49.7-58.4) levels increase. Our study is in conformity with these notices.

Table 1. Pasture1 nutrient substance contents in different periods (%)

Period	DM	CA	CP	CF	NDF	ADF
March	26.6±0.8 ^a	7.9±0.4	17.4±0.9 ^d	2.3±0.1	36.3±1.4 ^a	27.5±0.9 ^a
April	31.1±0.9 ^b	8.6±0.5	14.6±0.6 ^c	2.0±0.2	43.5±1.9 ^b	32.4±1.2 ^b
May	35.2±1.2 ^c	8.3±0.7	11.3±0.7 ^b	1.9±0.2	55.8±2.1 ^c	36.5±1.1 ^c

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June	42.8±1.4 ^d	8.5±0.7	8.2±0.8 ^a	2.1±0.1	62.1±2.7 ^d	39.7±1.3 ^d
P	**	ns	**	ns	**	**

^{abc}: Difference between groups in the same column is statistically significant. **P<0.01 ns:önemsiz

As Table 2 is reviewed, it is observed that in Pasture 2 zone, DM, NDF and ADF levels increase significantly (P<0.01) in March, April, May and June, while CP level decreases (P<0.01). On the other hand, difference in CA level is important (P<0.05) while significant differences have not been found in CF levels.

Table 2. Pasture2 nutrient substance contents in different periods(%)

Period	DM	CA	CP	CF	NDF	ADF
March	28.8±1.1 ^a	8.4±0.3 ^a	16.7±0.6 ^d	2.0±0.1 ^a	35.9±1.1 ^a	30.7±1.3 ^a
April	34.6±1.4 ^b	8.0±0.4 ^a	15.1±0.6 ^c	2.5±0.1 ^b	45.0±1.6 ^b	33.2±1.1 ^b
May	36.9±1.3 ^c	9.3±0.5 ^b	10.6±0.5 ^b	2.2±0.2 ^{ab}	57.3±2.4 ^c	35.8±1.9 ^c
June	45.5±1.6 ^d	9.1±0.5 ^b	7.4±0.4 ^a	2.7±0.2 ^b	63.7±3.1 ^d	41.0±1.6 ^d
P	**	*	**	ns	**	**

^{abc}: Difference between groups in the same column is statistically significant. *P<0.05 **P<0.01 ns:önemsiz

As Table 3. is reviewed, it is observed that in Pasture 3 zone, DM, NDF and ADF levels increase significantly (P<0.01) in March, April, May and June, while CP level decreases (P<0.01). Koç et al. (2003) have reported that the CP level of the grass samples taken from the grazelands in Palandöken region during grazing period vary between 12-16 %, and that CP level decreases as grazing season proceeds. The results obtained is similar to other studies. On the other hand, difference between CF levels as per periods (P<0.05) is found significant.

Table 3. Pasture3 nutrient substance contents in different periods (%)

Period	DM	CA	CP	CF	NDF	ADF
March	24.7±0.8 ^a	6.9±0.2 ^a	15.5±0.8 ^d	2.6±0.1 ^b	33.6±1.4 ^a	31.5±0.7 ^a
April	30.4±0.9 ^b	7.7±0.3 ^b	12.3±0.7 ^c	2.0±0.2 ^a	41.1±1.9 ^b	36.2±1.3 ^b
May	38.5±1.2 ^c	10.1±0.6 ^c	9.1±0.7 ^b	2.5±0.2 ^b	59.3±2.1 ^c	41.3±1.5 ^c
June	45.6±1.4 ^d	10.7±0.6 ^c	7.0±0.6 ^a	2.1±0.1 ^a	68.6±2.7 ^d	44.7±1.6 ^d
P	**	**	**	*	**	**

^{abc}: Difference between groups in the same column is statistically significant. **P<0.01

As Table 4 is reviewed, it is observed that in Pasture 4 zone, DM, CA, NDF and ADF levels increase significantly (P<0.01) in March, April, May and June, while CP level decreases (P<0.01). On the other hand, significant differences have not been found in CF levels.

Table 4. Pasture 4 nutrient substance contents in different periods (%)

Period	DM	CA	CP	CF	NDF	ADF
March	26.4±0.8 ^a	8.4±0.6 ^a	16.1±0.9 ^d	2.6±0.1 ^d	35.8±1.4 ^a	29.6±1.1 ^a
April	30.1±0.9 ^b	8.6±0.5 ^a	12.4±0.8 ^c	2.5±0.1 ^c	43.4±1.9 ^b	33.9±1.6 ^b
May	32.2±1.2 ^c	9.3±0.5 ^b	9.3±0.8 ^b	2.6±0.1 ^b	52.3±2.1 ^c	37.3±1.9 ^c
June	40.2±1.4 ^d	9.5±0.6 ^b	7.5±0.6 ^a	2.7±0.2 ^a	59.5±2.7 ^d	39.8±2.3 ^c
P	**	**	**	ns	**	**

^{abc}: Difference between groups in the same column is statistically significant. **P<0.01

In the study conducted, general average level of crude nutrient substance contents in March, April, May and June have been calculated and given in Table 4.5. Average DM, NDF and ADF levels have increased while CP level has decreased.

Avcı et al. (2006), in a study conducted to identify the pasture of Ceylanpınar Agricultural Enterprise in different vegetation periods (April-June), have reported that DM, NDF and ADF levels increase in pasture grass as vegetation proceeds, while CP and CF levels, and OMS and energy levels decrease. In a study conducted by Arslan and Tufan (2011) in Kars region, it is reported that as the grass mowing period proceeds, OM, CA, and EE contents of the grass do not change significantly, but CP levels decrease, and

that NDF (48.23, 51.40, 52.96 and 53.77 %) and ADF (% 33.70, 35.22, 37.85 and 39.77%) levels increase significantly.

The results we have obtained are in conformity with the results of other studies in terms of changes according to vegetation periods.

In this study, DM, CA, CP, CF, NDF and ADF values were determined from pastures (Pasture1, Pasture2, Pasture3, Pasture4) in different regions of Şanlıurfa region for March, April, May and June. In all pasture regions, in March, April, May and June periods, the average of DM, CA, CP, CF, NDF and ADF levels of four different pasture regions were 26.6.-43.5, 7.9-9.5, 16.4-7.5, 2.3- 04.02; 35.4-433 and 29.8-41.3. Compared to the periods, mean DM, NDF and ADF levels increased ($P<0.01$) while CP levels decreased ($P<0.01$).

In Sanliurfa region, sheep raising is seen from March-April when pasture vegetation is available, to September when the vegetation is insufficient, in pasture conditions without giving additional fodder. This study is expected to provide a scientific contribution to identification of nutrient substance contents of the regional based natural pastures.

In feeding of the ruminants, conformity to feeding physiology and an economical feeding is possible through good quality forage. There are major differences between distribution of grazeland and pastures, and grass fertility amounts as per regions. Quality of the pasture grass depend on their growth conditions, vegetation period, botanic composition, climatic factors, irrigation and fertilization. Thus, reseraches on nutrient substance contents of the pastures in Sanliurfa region where sheep are raise, are limited. Therefore it is necessary to increase the number of scientific studies to identify nutrient substance contents of the pastures in the region.

Acknowledgement

This study is one of the first studies on this subject in the region and was derived from a master's thesis. This study has been financed by Harran University Scientific Research Projects Committee (Project No: 14183).

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