



Effect of Minosel Tablet on Blood Parameters of Goat Kids Raised under Poor Maintenance and Nutrition

Pinar Tanritanir¹, Gökhan Oto², Cennet Rağbetli³, Tuğba Bingöl⁴ and İbrahim Yörük⁵

¹Health Sciences School, Yüzüncü Yıl University, Van 65080, TURKEY.

²Department of Pharmacology, Medical Faculty, Yüzüncü Yıl University, Van, 65080 TURKEY.

³Department of Microbiology, Medical Faculty, Yüzüncü Yıl University, Van, 65080 TURKEY.

⁴Department of Animal Nutrition Faculty of Veterinary, Yüzüncü Yıl University, 65080 Van, TURKEY.

⁵Biochemistry, Science Faculty Yüzüncü Yıl University, Van 65080, TURKEY.

Corresponding author: P. Tanritanir, Email: pinartanritanir@hotmail.com

Received: 12 Oct., 2014;

Accepted: 20 Oct., 2014

ABSTRACT

As vitamins and minerals had significant effects on growth, reproduction, yield and the immune systems of animals, present study is conducted to research the impact of Minosel oral tablets, a combination of vitamins and minerals, on certain blood parameters of goat kids raised under poor nutrition and maintenance conditions. The experiment was conducted in 20 kids of both sexes of 3-10 days of age having 2-5 kg of body weight and they were raised under poor nutritional and management conditions in Van. After the systematic clinical examinations of ill grown animals, blood samples from each animal were collected before and after the administration of oral tablets for analysis of certain blood biochemical parameters viz. glucose, total protein, urea, ALP, ALT, AST, LDH, calcium, and vitamins A, D and E. Minosel oral tablets (Teknovet, Turkey) were orally administered to ill-grown animals. Vitamin D and vitamin E levels were found to be statistically significant ($P < 0.05$) while other blood parameters were statistically insignificant ($P > 0.05$). As a result, applying Minosel oral tablets prophylactically to newborn kids may cause some vitamin and mineral deficiencies; in order to repair the destruction of some tissues and organs, supplemental treatments may be needed in addition to these vitamins and minerals.

Keywords: kids, minosel, poor maintenance

Goat rearing as an important source of income for the people of Turkey has a wide range of characteristics unique to different breeders due to their socioeconomic and environmental conditions. Yields of reproduction, milk and meat per animal



are quite inadequate with the effect of genotype despite that it has an important place statistically (Aydin and Arık 1999).

The most critical point in animal breeding is the ability to produce a high yield. Mineral inadequacies, parasitic and infectious diseases hinder animal growth when they occur in the postnatal period; as a result, poor biological development can cause huge economic losses in our country. For this reason, detecting factors that hinder the normal growth of young animals such as lambs, goat kids, and calves is so necessary that measures should be taken in a timely manner (Çimtay 2001).

Malnutrition during the last stages of pregnancy weakens the kid and prevents the mother goat from being able to secrete enough milk during the lactation period (Aytuğ 1990). Studies on goat kids have shown that mortality rates increase after weaning; conversely, mortality rates decrease in kids sufficiently suckled the milk and living in the conditions with proper hygiene and maintenance (İmik *et al.*, 2000).

Van Der Westhusn (1974) stated that the period of 6 weeks after birth is a critical period for proper nutrition, as mortality rates increased with malnutrition in young goats. Shelton (1985) reported that yields improved when goat kids adapted to environmental conditions.

Çimtay (2001), one of the symptoms related to mineral deficiency is growth retardation and a decrease in live weight gain. Even in situations in which mineral levels are sufficient in the ratios, mineral absorption disorders may result from endoparasites.

Minerals in the organism participate in the structure of many tissues and serve as cofactors of various enzymes (Wastney *et al.*, 1983; Devlin, 1997; Kaneko *et al.*, 1997). Deficiencies in their ratios and/or in excess in the minerals of growth, reproduction, efficiency and the immune system may be negatively affected (Wastney *et al.*, 1983; McDowell, 1992).

Each of the vitamins and minerals such as vitamin E, zinc, selenium, sodium, copper, cobalt, and calcium, etc. is known to have an important effect in the organism (Wastney *et al.*, 1983; Altıntaş *et al.*, 1990). A biochemical profile (glucose, urea, total protein, Ca, AST, ALT, ALP, LDH) of the blood is required to monitor the animals' overall health status, disease diagnoses, prognoses, and responses to treatment.

This study was arranged to research the effects of Minosel on kids living in poor care and feeding conditions; Minosel has minerals and vitamins that are important micronutrients and antioxidants possibly having protective effects on the healthy development of kids.

MATERIALS AND METHODS

In this study, 20 kids in Karaagac village of Van Province were used as a subject. The kids ranged between 3-10 days, were male and female, weighed between 2 and 5 kg, and were raised in poor care and nutritional conditions. The kids were divided into working groups who were cachectic, anorexic, soil-eaters, iron-lickers, had difficulty sucking milk from their mothers, and could not stand on their feet because of health reasons. Minosel oral tablets were administered to the kids as single oral tablets.

Pre-treatment and post-treatment (after 10 days) methods for biochemical examinations of blood samples were extracted from each kid's vena jugularis and deposited in a gel tube. The blood serum was then transferred to 2 separate Eppendorf tubes after blood samples were centrifuged at 3000 rpm for 10 minutes. In serum samples in the first tube, ALT, ALP, AST, LDH, urea, glucose, total protein, and calcium levels were determined by auto analyzer (Modular PP, Roche-Hitachi/Japan) equipment. Vitamins A, D, and E in serum samples were kept at -20°C until the analyses were made. Analyses of A, D, and E vitamins in blood serum were made with HPLC (High-performance liquid Chromatography) (Kenneth *et al.*, 1985; Store *et al.*, 1994; Fechner *et al.*, 1998).

Statistical analysis of results obtained in this study were considered by using paired sample T-tests.

Table 1. Chemical composition of Minosel tablet (oral)

Alpha-tocopherol acetate (Vitamin E)	500 mcg
Zinc sulphate	10 mg
Sodium selenite	2.5 mg
Copper sulphate	10 mg
Cobalt sulphate	12.5 mg
Tri calcium phosphate	720 mg

RESULTS AND DISCUSSION

Blood samples were taken from sick who lived in poor conditions kids both before and after the administration of Minosel. The kids experienced some changes in blood parameters and statistical evaluations (Table 2). When pre- and post-Minosel groups were evaluated, glucose, vitamin D, and vitamin E levels were statistically significant ($P < 0.05$); however, other parameters (total protein, urea, ALP, ALT, AST, LDH, vitamin A, and calcium) were detected as statistically insignificant ($P > 0.05$).

**Table 2.** Some Blood Parameters Before and After Administering Minosel Oral Tablets

Parameter	Before application	After application	P
Glucose mg/dl	94.8889 ±3.529	81,0000 ±4.021	<0.05
Total protein g/dl	5.9889 ±0.099	6.0778 ±0.255	
Urea mg/dl	11.3222 ± 0.831	10.6667 ± 1.518	
ALP U/L	937.4444 ± 158,600	1103.22 ± 163.411	
ALT U/L	68.3333 ± 14,213	74.1111 ± 17.329	
AST U/L	207.6250 ± 38.685	105.1250 ± 16.629	
LDH U/L	693.1111 ± 111.874	515.8889 ±91.593	
Calcium mg/dl	8.21 ±0.83	9.1667 ± 0.572	
Vit A µg/ml	0.2211 ±0.019	0.2022 ±0.018	
Vit D µg/ml	0.0241 ± 0.001	0.0394 ± 0.005	<0.05
Vit E µg/ml	1.89 ±0.100	2.41 ±0.27	<0.05

Despite their low concentrations in an organism (0.55% of body weight), trace minerals are absolutely necessary substances for many important physiological functions: vitamin synthesis, hormone production, enzyme activity, cellular osmotic pressure regulation, collagen formation, tissue synthesis, oxygen transportation, energy production, growth, reproduction, and health (McDowell, 1992; Shelton, 1985; Arthur, 2000).

Avcı *et al.* (2000) reported that some biochemical parameters can be kept within physiological boundaries with the supplementation of vitamin A, vitamin E and selenium in the perinatal period of sheep, and that it would also be possible to protect both the mother and the fetus against deficiencies of these substances by administering these essential substances during pregnancy.

When the body has adequate levels of insulin and glucose, it obtains its necessary energy from glucose (Wittwer *et al.*, 1993). However, malnutrition and stress reportedly co-occurred with hypoglycemia (Reynolds and Judd, 1984), and the low-energy balance and reproductive functions were adversely affected. (Jackson *et al.*, 1978; Bucholtz *et al.*, 1996) Blood glucose levels (hypoglycemia) decrease as a result of diseases and anorexia in neonatal animals (Umucahlar and Gülşen, 2005). Avcı *et al.* (2000) and Aksakal *et al.* (1996) have reported that the supplementation of vitamin E and selenium increases blood glucose. In the present study, blood glucose levels were increased after administering Minosel. These results were similar to previous results in existing literature (Aksakal *et al.*, 1996; Avcı *et al.*, 2000).

The most important symptoms of vitamin D deficiency are seen in the skeletal system. Defects like rickets, a calcium and potassium disorder, weaken, bend,

and cause bones to be brittle because of inadequate calcification (Turgut, 2000). In the present study, blood vitamin D levels were increased after administering Minosel. After administrating Minosel, blood levels of vitamin D and calcium increased in parallel with the improvement of clinical symptoms. Bioavailability of micronutrients that compose the ingredients of vitamin-mineral combination Minosel is high and may have important effects on the development and strengthening the skeletal system of kids exposed to poor care and feeding.

Studies show that vitamin E deficiencies lead to the decline in growth and changes in immune systems (İmik *et al.*, 2000). Vitamin E supplements in Turkey feed reduce mortality for those infected with *E.coli*. Vitamin E supplements for sheep infected with chlamydia improve their live weight gain (Murry *et al.*, 1993). Vitamin E also significantly increases in the plasma antibody levels of animals that have been experimentally infected (İmik *et al.*, 2000). In this study, vitamin E levels were increased after the Minosel therapy. Utilization of vitamin E may strengthen the defense mechanisms for kids exposed to poor care and feeding.

When some clinical findings (the difficulties at standing and sucking milk, immobility, anxiety, etc.) prior to applying Minosel were compared to the clinical findings (an increase in the milk-sucking reflex, mobility, vitality, etc.), vitamin-mineral supplements accelerated energy metabolism and improved the performance of vitality in kids exposed to poor care and feeding.

CONCLUSION

When pre- and post-Minosel results were compared, some vitamin and mineral deficiencies can be prophylactically hindered in kids: bone structures can be strengthened and live weight gain can be achieved as a result of accelerating newborn goat kids' metabolisms with Minosel oral tablets. Moreover, the absence of significant changes on blood enzymes can be considered as a proof of the drug's reliability. However, more extensive studies should be done about this subject, and this study is expected to provide an important basis for further studies.

REFERENCES

- Aksakal, M., Nazıroğlu, M. and Çay, M. 1996. Kuzularda Selenyum ve E Vitamininin Bazı Hematolojik ve Biyokimyasal Değerlere Etkisi. *Tr J Vet Hay Derg.*, **20**: 185-90.
- Altıntaş, A., Uysal, H., Yıldız, S. and Goncagül, T. 1990. Akkaraman Ve Melezlerinde Serum Ve Yapağı Örneklerinde Karşılaştırmalı Mineral Durumu. *Lalahan Hay. Araş. Enst. Derg.*, (1-4): 40 - 56.
- Arthur, A.J. 2000. Trace Minerals For Beef Cattle. Agriculture, Food and Rural Revitalization. Saskatchewan - Canada.
- Avcı, M., Karakılıç, Z. and Kanat, R. 2000. Vitamin A, E Ve Selenyumun Koyunlarda Döl Verimi Ve Bazı Biyokimyasal Parametre Düzeyleri İle Kuzularında Yaşama Gücü Ve Canlı Ağırlık Üzerine Etkisi. *Turk J. Vet. Anim. Sci.*, **24**: 45-50.
- Journal of Animal Research: v.4 n.2. Dec 2014



- Aydın, U. and Arık, İ.Z. 1999. Entansif Besiye Alınan Ve Köy Koşullarında Yetiştirilen Kıl Keçisi Oğlaklarının Kesim ve Karkas Özelliklerinin Karşılaştırılması. *Akdeniz Üni. Ziraat Fak. Derg.*, **12**: 75-86.
- Aytuğ, C.N. 1990. Metabolizma ve Noksanlık Hastalıkları. Koyun ve Keçi Hastalıkları ve Yetiştiriciliği Kitabı, Tüm Vet Hayvancılık Hizmetleri Yayını, No: **2**, *Teknolojik Matbaası, İstanbul*, 277-306.
- Bucholtz, D.C., Vidwans, N.M., Herbosa, C.G., Schillo, K.K. and Foster, D.L. 1996. Metabolic interfaces Between Growth And Reproduction. V. Pulsatile Luteinizing Hormone Sécrétion İs Dépendent On Glucose Availability. *Endocrinology* **137**: 601-607.
- Çımtay, İ. 2001. Kuzularda Süt Emme Dönemindeki Gelişme Geriliğinin Etyolojisi Üzerine Araştırmalar. Yüzüncü Yıl Üniversitesi, *Sağlık Bilimleri Dergisi*. **7**(1-2): 98-102.
- Devlin, T.M. 1997. Textbook of Biochemistry with Clinical Correlations. Wiles-Liss, Inc., USA.
- Fechner, H., Schlamet, M., Guthmann, F., Paul, A., Stevens, A. and Rüstow, B. 1998. a- and 8- Tocopherol Induce Expression of Hepatic a-Tocopherol Transfer- Protein mRNA. *Biochem. J.*, **331**: 577-581.
- İmik, H., Aytaç, M., Coşkun, B. and Fidancı, H. 2000. Strese Maruz Bırakılan Ankara Keçisi Oğlaklarında E ve C Vitaminlerinin Büyüme Ve İmmünite Üzerine Etkileri. *Türk J. Vet Anim Sci.*, **24**: 51-58.
- Jackson, D.W., Law, G.R. and Nockels, C.F. 1978. Maternal Vitamin E Alters Passively Acquired Immunity of Chicks. *Poult. Sci.*, **57**(1): 70-73
- Kaneko J.J., Harvey J.W., Bruss M.L. 1997. Clinical Biochemistry of Domestic Animals, 5th Ed. *Academic Pres*, London.
- Kenneth, W., Miller, K.W. and Chung, S.Y. 1985. An Isocratic High-Performance Liquid Chromatography Method for the Simultaneous Analysis of Plasma Retinol, a-tocopherol and Various Carotenoids. *Analytical Biochemistry*, **145**: 21-26.
- McDowell, L.R. 1992. Minerals İn Animals And Human Nutrition. Academic Pres, New York.
- Murry, K.R., Granner, K.D., Mayes, A.P. and Rodwell, W.V. 1993. Harper's Biochem. Twenty - third Ed. App. Lan. 25-75.
- Reynolds, S.L. and Judd, H.J. 1984. Rapid Procedure for the Determination of Vitamins A and D in Fortified Skimmed Milk Powder Using High- Performance Liquid Chromatography. *Analyt.*, **109**: 489-492.
- Shelton, M. 1985. Breeding and Improvement of Angora Goats. *Angora Goat Mohair J.*, **27**(1): 9-13.
- Şahin, T. 1999. Endoparazitli Koyunlarda Bazı İz Element ve Biyokimyasal Parametrelerin Seviyeleri Üzerine Araştırmalar. Yüzüncü Yıl Üniversitesi. Sağlık Bilimleri Enstitüsü. Doktora Tezi. Van.
- Turgut, K. 2000. Pankreas Hastalıkları ve Testleri, Veteriner Klinik Laboratuar Teşhis Kitabı, Bahçivanlar Basım Sanayi A.Ş., ISBN 975-94595-1-5; 266-269.

- Umucahlar, H.D. and Gülşen, N. 2005. Ruminantlarda Beslemeye Bağlı Bozukluklar. Çiftlik Hayvanlarında Beslenme Hastalıkları Kitabı. Selçuk Ü. Veteriner Fak. Hayvan Besleme ve Beslenme Hastalıkları Anabilim Dalı, S.Ü. Basımevi, S. 141-142.
- Van Der Westhuysen, J.M. 1974. Factors Influencing the Breeding Potential of Angora Goats. *Angora Goat Mohair J*, **16(2)**: 25-32.
- Wastney, M.E., Wolf, J.E. and Bickerstaffe, R. 1983. Glucose Turnover And Hepatocyte Glucose Production Starved and Toxaemic Pregnant Sheep. *Aust. J Biol Sci.*, **36(3)**: 271-28.
- Wittwer, G., Hever, G., Contreras, P.A. and Bohmwald, H. 1993. Clinical Blood Chemistry Values of Downer Cows From The South of Chile. *Arch. Med. Vet.*, **25**: 83-88.