

FACTORS INFLUENCING THE HEMATOLOGICAL PROFILE IN DONKEYS

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REVIEW

Abstract

The breeding of donkeys shows an upward growth lately, both nationally and internationally, being demonstrated the advantages of maintaining this species for animal production such as that of milk and milk-based products. Thus, the study of the hematological profile is a crucial element in terms of in-depth knowledge of the species and the factors that can cause changes in them. Possible changes that can determine the different values in the blood and all at once influence the hematological profile of the species can be determined by factors such as nutrition, lactation, parturition, the health of the animal, reproduction and even the season. Therefore, knowledge of these changes that occur internally, can contribute to the improvement of optimal methods of feeding, maintenance and also once of conservation of the species, thus representing a lever in the development and technology of breeding alders.

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INTRODUCTION

The use of donkeys as traction and transport animals, began thousands of years ago, not being known the properties of the milk of this species (Zakari F. O., et al., 2016).

In the last few years, the use of donkey milk has shown an upward trend, so that, due to its hypoallergenic and nutritional properties, it is increasingly entering the diet of infants and people who are intolerant to the compounds present in milk (Zakari F. O., et al., 2016).

To determine the health of animals, different methods of finding it out were used (Yue Y., et al., 2022).

Studies conducted with the aim of determining the state of health of animals, have highlighted as the main methods of assessing the biochemical profile and hematological parameters are also used in the case of donkeys (Yue Y., et al., 2022).

Depending on the period of lactation, the state of health of animals may be different, so through these methods that monitor physiological parameters, a more extensive control over the health of animals is allowed (Mireșan V., et al., 2019).

Moreover, the hematological profile can be influenced by a multitude of factors, among which the best known are the season, the

lactation period, the fodder, the breeding, the methods of animal maintenance and last but not least their state of health, thus giving it a special importance in terms of nutrition programs of this species (Mireșan V., et al., 2019).

FACTORS OF INFLUENCE ON THE HEMATOLOGICAL PROFILE IN THE CASE OF DONKEYS

Blood, presents at the level of the body an important role in terms of maintaining physiological balance, also hematological indicators are extremely important in terms of animal health conditions (Anderson B. H., et al., 1999).

In order to have a better control over the health of the animals, it was resorted to performing hematological blood tests, in order to prevent and determine the possible diseases that outline the good growth of the donkeys (Brucka-Jastrzębska E., et al., 2007).

The first step in establishing certain conditions of both hematological and other nature is the examination of the hematological smear and the quantification of hematologic parameters (Wallach J., et al., 1996), so that knowledge of these values is important in terms of diagnosing various pathologies (Gerardo F. Q. R., et al., 2009; Smith B. I., and Risco C. A., 2005; Hoff B., and Duffield T., 2003; Dutta A., et al., 2001).

It was found from the studies carried out that the hematological profile showed changes under the influence of lactation (Mireșan V., et al., 2015, 2017), and the advanced lactation shows an influence on the level of hemoglobin in the blood (Feștilă I., 2012).

Thus, under the influence of the lactation period, the hematological parameters in the case of donkeys increase considerably, with the result that lactation is an important factor in terms of changes (Feștilă I., 2012, Coroian A., et al., 2011).

The sex of animals is also an extremely important factor in terms of hematological profile, so it is different from donkey to donkey, even if the conditions of maintenance and feeding are the same (Longodor A. L., et al., 2019).

Thus, in the case of donkeys, the values of hematological parameters such as RDW-CV and MPV are significantly higher compared to that of males of this species (Longodor A. L., et al., 2019).

In females, the MCH and CVM values are significantly higher compared to the values determined in the case of males (Horackova E., et al., 2017).

Also, the number of lactations can influence the level of certain parameters such as RBC, which apparently, is higher in the 2nd and 3rd lactation compared to the first lactation (Longodor A. L., et al., 2019).

In line with studies conducted by several authors, the results obtained for parameters such as NEU (%) and LYM (%), are strongly influenced by the number of lactation (Sedlinska M., et al., 2017; Coroian A., et al., 2013; Barker D. J. P., 1998).

The feeding and lactation internship are also extremely important factors in the case of the influences of certain hematological parameters in the blood (Iwona R., and Eugeniusz H., 2014).

Keeping animals on pasture and feeding them through pasture, shows a positive effect on hematological parameters and all the time on the welfare of animals beneficially influencing their productions (Scamell J. M., 2006).

Feeding animals of this species with concentrated feed, leads to the appearance of a larger volume of hematocrit and hemoglobin (Longodor A. L., et al., 2019).

The level of hemoglobin in the blood is strongly influenced by advanced lactation, also in the case of advanced gestation, decreases in hemoglobin have been observed and the level of

leukocytes shows variations in both physiological cases (Morris D. D., 2009).

The age of donkeys can also be an important factor in the modification of certain parameters, such as neu, which is found in much higher values in old animals compared to young ones (Hoackova E., et al., 2017).

Thus, MCH, shows higher values in adult animals compared to young ones, and the parameter values are higher in the case of late lactations (Dezutto D., et al., 2018).

Table 1

Hematological parameters in donkeys in the first lactation after several authors

Parameter	n=10	Reference
WBC (G/l)	9,66±0,56	Longodor A. L., 2019
	9,5-22,1	Trimboli F., et al., 2020
	11,31	Sedlinska M., et al., 2017
Hb (g/l)	5,96±0,5	Longodor A. L., 2019
	124,81	Sedlinska M., et al., 2017
NEU (%)	29.4-69.3	Trimboli F., et al., 2020
	35,66	Sedlinska M., et al., 2017
	34,54±0,16	Longodor A. L., 2019
LYM (%)	38,72±0,69	Longodor A. L., 2019
	18,9-58,8	Trimboli F., et al., 2020
	56.43	Sedlinska M., et al., 2017
RBC (T/L)	5,69±0,5	Longodor A. L., 2019
	6,93	Sedlinska M., et al., 2017
	4,2-8,6	Trimboli F., et al., 2020

THE EFFECT OF INFLUENCE FACTORS ON THE HEMATOLOGICAL AND BIOCHEMICAL PROFILE OF DONKEYS

Lactation, age, sex, muscle mass, nutrition, physiological state as well as lactation significantly influence the hematological and biochemical profile of donkeys (Mori E. et al., 2003).

As for the biochemical parameters of blood they contribute to the health of animals by signaling possible diseases (Mori E. et al., 2003).

In the first lactation, the level of these biochemical compounds may be lower, compared to the other lactations, so both the levels of urea, creatinine, cholesterol and triglycerides are lower in this phase (Longodor A. L., et al., 2019).

The season, presents an important role in terms of blood glucose levels, so in the summer season, its level is much higher compared to the winter or rainy season (Longodor A. L., et al., 2019).

In lactations I, II and IV, the level of total calcium in the blood has the highest values, the lowest being reported in the case of lactation III, also magnesium gradually increases with the stages of lactation (Hagawane S. D., 2009).

Hematological and biochemical profile according to the day of calving

In the case of donkeys, calving and also once the production of colostrum shows significant changes in the case of the hematological and biochemical profile in the blood (Longodor A. L., et al., 2019).

Thus, after calving, the hematological parameters undergo significant changes, WBC, shows a high level on the first day after calving, then decreasing until day 30 (Longodor A. L., et al., 2019).

Significant changes also occur in the case of concentrations of haemoglobin, leukocytes and erythrocytes, all dependent on the age of the animals, forage and climatic and maintenance conditions (Ciaramella P., et al., 2005).

In advanced gestation, the level of leukocytes increases significantly in the case of dairy-producing animals (Fischbach F., 2009).

Also, hematocrit and other biochemical parameters may show changes in the case of donkeys subjected to agricultural work (Getachew M., et al., 2010).

Studies have determined that the concentration of hemoglobin during the breastfeeding period is altered showing values of about 9%, the milk being rich in nutrients

and immunoglobulins (Longodor A. L., et al 2019).

Biochemical parameters show lower values in the blood on the 30th day after calving (Longodor A. L., et al., 2019).

In the framework of some defense blood reactions or in the case of pathological alterations in the blood, changes in biochemical and hematological parameters occur, such as the increase in the level of leukocytes, especially in the case of infections, but also changes such as the season can cause increases in these parameters (Pysera B., and Opalka A., 2000).

During pregnancy, the level of cholesterol in the blood is significantly lower compared to the period of lactation, and the level of estrogen that plays an important role in the period of gestation, reduces the level of cholesterol in the blood (Longodor A. L., 2019).

According to Coroian A., et al., 2011, the colostral period shows important changes in blood both in donkeys and in females of other farm species.

Also, the level of triglycerides in the blood shows significant changes on the 5th day postpartum, decreasing trepatly until the 30th day, the same happens with calcium in the blood (Feștilă 2012).

CONCLUSIONS

The use of metabolic profile determination tests is extremely important both in determining and preventing certain problems and conditions that can affect especially the health of animals but also their milk production (Longodor A. L., et al., 2019).

Changes in hematological and biochemical parameters in the blood show variations that can be influenced both by external factors, such as season, forage, maintenance conditions, and by internal factors such as lactation, lactation, the period of colossing, the physiological state of the animals, sex and age.

The average values of the parameters show the lowest values in the case of the first two lactations (Longodor A. L., et al 2019).

Also, in the postpartum and breastfeeding period, the parameters show significant changes in the first 30 days compared to the rest of the lactation period.

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