

Effect of dietary inclusion of omega-3 in concentration of immunoglobulin in mares colostrum



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Introduction

Essential fatty acids comprise a class of molecules that cannot be synthesized by most mammals. In this group are linoleic and linolenic acid, also known as omega-6 and omega-3, respectively.

Maternal nutrition directly influences the quality of colostrum and milk available for foals (Martinez et al., 1983). Colostrum provides the offspring immunoglobulins (Ig) required for passive immunity, promoting resistance to infections and therefore survival (Khalaf et al., 1979).

The purpose of this study was to evaluate the effect of including dietary source rich in linolenic acid on the immunoglobulins concentration of colostrum mares.

Material and methods

- The experiment was conducted at the Equine Research Laboratory Feeding and Exercise Physiology (LabEqui) - Veterinary Medicine and Animal Science School São Paulo University.
- 18 mares were used with initial average weight of 521 ± 56 kg, the treatments were designated as C (without supplementation), OS (supplemental soybean oil) and OL (supplemented with linseed oil). The soybean oil or flaxseed oil provided in a proportion of 0.05% of body weight per day, during the last trimester of pregnancy for up to two months after delivery, added on the concentrate. The diet followed the recommendations of NRC (2007) for this category.
- Individual daily consumption of 2% body weight/dry matter, 50% concentrate and 50% forage - Tifton 85 hay and commercial concentrate.
- The colostrum samples were subjected to ELISA to determine the concentration of IgA, IgM, and IgG. We used a completely randomized design, three treatments and six replicates per treatment, with repeated measures.



Results and discussion

- The IgM and IgA levels range between 1.0 and 3.5 mg dL. It was observed that the isotope IgGb prevailing in the three groups of immunoglobulin have, followed by IgGa agreeing with result noted by Sheoran et al. (2000)
- The average concentration of IgGa in colostrum of mares supplemented with linseed oil was almost 4 times higher than that found on control group (50.4 mg/ml and 183.5 mg/ml) and almost 3 times higher than those supplemented with soybean oil (73.6 mg/ml and 183.5 mg/ml).
- The average concentration of IgGb in colostrum of mares supplemented with linseed oil was almost two times higher than that observed in the group supplemented with soybean oil (239.63 mg/ml and 155.3 mg/ml).

Table 1: Contraste Ortogonal das dietas comparando Imunoglobulinas no colostro

Item	Experimental Diet ¹				P value	
	C	SO	LO	EPM	C1	C2
IgGa	50.42	73.60	183.57	23.899	0,0872	0,0811
IgGb	130.38	155.3	239.63	19.379	0,0716	0,0968
IgA	6.17	5.87	10.08	1.103	0.4229	0.1836
IgM	0,01924	0,02690	0,03475	0,00040	0,1727	0,4910

¹Control (C); Soybean Oil (SO); Linseed Oil (LO). C1= Control X Oil (Soybean Oil, Linseed Oil); C2= Soybean Oil X Linseed Oil.

Conclusion

We can conclude that pregnancy mares supplemented with linseed oil had higher concentrations of IgG on colostrum and the supplementation with soybean and linseed oil had higher concentrations of immunoglobulin Ga and Gb on colostrum when compared to those without.

References

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