

عنوان مقاله:

Antioxidant effect of different vitamins on methemoglobin production: An in vitro study

محل انتشار:

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خلاصه مقاله:

Nitrite intoxication occurs frequently in ruminants and equines. The most common treatment of this disorder is administration of 1% methylene blue, although the use of some antioxidant agents e.g. vitamins and complementary treatment may also be useful. The aim of this study was to evaluate the in vitro antioxidative effects of some vitamins on methemoglobinemia induced by sodium nitrite. For this purpose the blood sample of a healthy dairy cattle was pre-incubated with three different concentrations (5, 10, 20 mmol L⁻¹) of each vitamin (E, C, B₁, A and a combination of vitamin E and vitamin C) as antioxidant agent at 4 °C for 24 hours. A control group with normal saline instead of vitamin was applied. Then, all samples were treated with sodium nitrite (10 mmol L⁻¹) as an oxidant agent for 10 minutes and the level of methemoglobin formation was measured spectrophotometrically. The results revealed that the level of methemoglobin decreased significantly ($P < 0.05$), when vitamin E (10 and 20 mmol L⁻¹) and vitamin C (5 mmol L⁻¹) was applied to the tests, separately. Vitamin C at the concentration of 20 mmol L⁻¹, was not effective, but it even increased methemoglobin formation significantly. Combination of vitamin E and C was significantly effective at concentration 5 mmol L⁻¹, but not at concentration 10 and 20 mmol L⁻¹. Vitamin A and vitamin B₁ were not effective in any concentration. It was concluded that vitamins especially vitamin C and E can reduce oxidative effects which induced methemoglobin formation in vitro and could be used as an alternative medication.

کلمات کلیدی:

Vitamin, Methemoglobin, Antioxidant, Nitrite, In vitro

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