



RED BLOOD CELLS AND HOW DIETARY SUPPLEMENTS CAN MAXIMISE THEIR PRODUCTION.

Dr Finola McConaghy, BVSc, DipVetClinStud, PhD. Equine Veterinarian and Technical Manager at Nature Vet.

Red blood cells carry oxygen around the body via haemoglobin, a red-coloured pigment within the cells. The greater the number of red cells in the blood, the more oxygen can be carried to the muscles. The number of red cells within the body is measured when a blood count is performed.

Many athletic animals are slightly anaemic which means they have a low red blood cell count. Less red blood cells means less oxygen going to the muscles which means they cannot perform at their maximum level. This anaemia, often called 'sports anaemia', is due to a number of factors;

1. During strenuous exercise intermittent bleeding into the gut can occur, as can blood loss through the kidneys. The exact cause of this is unknown but may be due to blood flow changes during exercise. During intense exercise there is a reduction in blood flow to the kidneys and the gut in order to supply more blood to muscles.
2. 'Foot strike haemolysis' (haemolysis means loss of red cells) occurs during exercise, when the foot strikes the ground blood cells within the feet are compressed and thus damaged. Animals exercising daily, often at high speeds on hard ground, damage red cells as their feet strike the ground over and over again.
3. 'Compression haemolysis' is a similar cause of damage to blood cells which occurs within muscles contracting intensely. During maximal exercise red cells within the muscle may be compressed and thus damaged.
4. During exercise there is significant production of lactic acid, a by-product of energy production. Increased acid in the body is called acidosis and this acid may damage fragile blood cells.
5. Free radicals are produced in increased quantities during heavy exercise. Free radicals damage cell membranes, including red cell membranes.





To replace this constant drain on red cell numbers the body must increase red cell production. Iron is essential for making haemoglobin and iron supply may be low in animals due to losses of iron in damaged red cells, losses in sweat, and poor supply as iron in food-stuffs is poorly available. It is best to supplement with iron however iron alone does not increase red cell production and feeding too much iron is as bad as not enough. Side-effects of too much dietary iron are gut irritation and pain, and constipation. Iron must be fed with a number of other nutrients for optimal red cell production. These nutrients all work together, in synergy, to make red cells. Synergy occurs in many body systems and often feeding a single nutrient alone has very little effect, combined with its co-factors the same amount of that nutrient has a big effect. The nutrients involved in making red cells are; iron, folate, zinc, cyanocobalain (vit B12), pyridoxine and ascorbate (vit C). Folic Acid, Zinc, vitamin B12 are essential co-factors for making red cells. Pyroxidine is essential for the formation of haemoglobin and for the absorption of vitamin B12. Vitamin C is an anti-oxidant which protects folate from oxidation by free radicals and vitamin C increases iron absorption.

Supplying not just iron, but all the nutrients needed for red cell production will mean maximum red cell numbers and thus maximum oxygen to muscles and maximum performance.

