

BIORED

It has been scientifically proven that the recommended inclusion rates of Bioired can replace 50% of the vitamin A and E inclusion in the diets of ruminants and monogastric animals. This does not only lead to a significant cost saving but also has added advantages such as improved shelf life of meat, the inhibition of rancidity and decreased drip loss of meat

BIORED is the trade name for a natural plant extract anti-oxidant. It is made up of Monomeric Flavonoids and Polymeric Pro-anthocyanidins.

Properties:

- Soluble in water, partly in oils
- pH of 6.3 when dissolved in water at 0.5% m/v
- Stable against thermal and ultra violet degradation
- Antioxidant activity protects Vitamin E and A against depletion through anti-radical activity
- Benefits performance when 50% Vitamin A and E is replaced with BIORED in rations of ruminants and poultry at inclusion levels as indicated
- Improvement of meat shelf life and meat color
- Collagen stabilizing effect prevents tearing of gut during slaughter process decreasing contamination
- Improve water retention in poultry meat prior to freezing.

Bioired is a natural flavonoid and has the following general chemical structure:

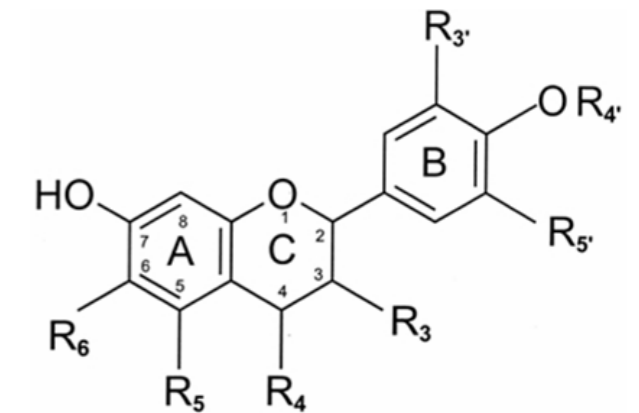


Figure 1. Chemical structure of a natural flavonoid.



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BIORED



The **Natural** Polyphonic Bioflavanoid

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PROPERTIES OF BIORED

Antioxidant:

- The polyphenol structure of the flavonoids with their bounded hydroxyl groups is responsible for the antioxidant effect.
- This is achieved by the flavonoid phenolic structure that scavenges free radicals (ORAC value avg. 700 000 $\mu\text{mole TE per 100 gram}$) and chelates heavy metals.
- Shelf life of meat is increased by limiting lipid oxidation.

Vitamin sparing effect:

- Vitamin C activity is intensified by the synergism between flavonoids and vitamin C.
- Biored has a vitamin sparing effect by protecting Alfa-tocopherol (Vit E) and Retinol (Vit A) against depletion through its antiradical action.

Anti-allergenic and anti-inflammatory effect:

- The free radical scavenging effect plays a role in preventing tissue damage due to the inflammatory reaction.

Digestion and metabolism:

- Biored is absorbed in the small intestine.
- Peak concentrations of Biored are found in connective tissues (cartilages, bone, blood vessels and skin) after 12 to 18 hours. Between 40 and 50% of peak concentrations are still found 108 hours after oral application
- Stimulates lactate users (*Megasphaera elsdenii*) reducing acidosis risk

INCLUSION RATES

Biored is usually included in the premix of rations. The following inclusion rates are recommended:

Tabel 1.

ANIMALS	INCLUSION
sMonogastric animals (poultry and pigs)	200g/ton feed
Ruminants (cattle, sheep and goats)	150g/ton feed
Equine (horses)	175g/ton feed

GENERAL CONCLUSIONS

Extensive trials with both monogastric and ruminant animals have shown that the use of Biored is a cost effective way to improve production, meat shelf life and general health. As vitamin A and E can be partially replaced it also has a positive impact the cost of vitamin supplementation.

Figure 2. The average daily gain of feedlot steers over a period of 115 days on 4 different diets.

The vitamin A and E levels in the plasma, liver and fat of these steers are reported in Table 1 and 2 below:

Table 1. The average vitamin A levels in the plasma, liver and fat of steers on 4 different inclusion levels namely 100% of the industry standard of vitamin A and E; 100% and 200g Biored per ton feed; 50% of the industry standard of vitamin A and E or 50% plus 200g Biored per ton feed.

Treatment	Plasma ($\mu\text{g/l}$)	Liver ($\mu\text{mol/g}$)	Fat ($\mu\text{mol/g}$)
100%	302.3a	28.9a	8.7a
100% + Biored	287.1a	41.1b	9.9b
50%	344.8a	24.6a	6.3c
50% + Biored	290.5a	30.0a	8.5a

*Column values without the same letter differ significantly ($P>0.01$).

In both the liver and fat stores, vitamin A levels were significantly higher on the 100% and Biored inclusion diet. This can perhaps be attributed to the vitamin sparing effect of Biored.

Table 2. The average vitamin E levels in the plasma, liver and fat of steers on 4 different inclusion levels:

Treatment	Plasma ($\mu\text{g/l}$)	Liver ($\mu\text{mol/g}$)	Fat ($\mu\text{mol/g}$)
100%	212.9	38.5a	14.3a
100% + Biored	181.8	52.2b	16.2b
50%	135.8	29.4a	10.9c
50% + Biored	182.5	37.6a	13.7a

*Column values without the same letter differ significantly ($P>0.01$)

Trail 2: Feedlot lambs. This trial was conducted with an inclusion level of 125 gram Biored per metric ton of feed.

Results:

- No negative effects on ADG, Feed conversion or ME content of feed when compared with synthetic anti-oxidants;
- Synthetic anti-oxidants when compared with BIORED, a natural anti-oxidant, significantly ($P>0.0672$) decreases the apparent digestibility of NDF (natural detergent fiber);
- A significantly slower decline in meat pH during the first 45 minutes. Decreasing protein denaturation responsible for pale color of meat and loss of water.
- A significantly ($P>0.0433$) lower pH measured 24 hours post slaughter. This is desirable as it reduces microbial activity leading to a longer shelf life and prevents the excessive darkening of the meat.

BROILERS

In terms of average daily gain there were no significant difference between the positive control group and the groups that received 50% of vitamin A and E and 150 or 200g per ton Biored. There were no significant difference in the carcass weight between the positive control group and the groups that received 50% of the supplementary vitamin A and E and 150 or 200g Biored per ton of feed

The lowest drip loss was found to be treatment 200g Biored/ 50% A and E". This is economically important as it is a major factor in carcass weight loss and it might also improve water retention prior to freezing

Treatment 150g/50% Vitamins had the highest shear force strength and differed significantly from the Control group. No significant differences in the lipid peroxidation of the chicken thigh meat was observed between the groups receiving 100% of vitamin A and E and the groups receiving 50% of the vitamin A and E and between 100 and 200g per ton Biored), using TBARS testing.

CONCLUSION

It has been scientifically proven that the recommended inclusion rates of Biored can replace 50% of the vitamin A and E inclusion in the diets of ruminants and monogastric animals. This does not only lead to a significant cost saving but also has added advantages such as improved shelf life of meat, the inhibition of rancidity and decreased drip loss of meat.