

ALL ABOUT CATOSAL.

The real way
to short
and long-term
success.



Catosal[®]
The power for success.

CATOSAL: THE PERFECT SYNERGISM OF ECOLOGY AND ECONOMY.

A familiar name for almost forty years. Used with confidence every day.

Catosal is an organic metabolic stimulant and tonic. First launched by



Bayer AG in 1958, it's now marketed and used in 70 countries worldwide. Decades of successful administration have consolidated Catosal's hands-on reputation. It's a tried-and-trusted favourite used day in, day out all over the world.

An ideal blend.

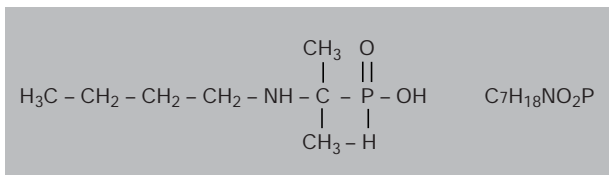
Catosal is made up of two active ingredients in an aqueous solution.

Catosal. 100 ml that spell success:

Butaphosphan	10.0 g
Cyanocobalamin (Vitamin B ₁₂)	0.005 g
Water for injection purposes	
Phosphorus content	17.3 mg/ml.

The main component is Butaphosphan: Its chemical name is: (1-butylamino-1-methyl) ethylphosphonic acid. Butaphosphan is an organic phosphoric acid compound that comes in the form of a white, crystalline, odourless substance.

The second major ingredient is Vitamin B₁₂ (cyanocobalamin): Vitamin B₁₂ is a dark red, crystalline, strongly hygroscopic (water-attractant) powder.



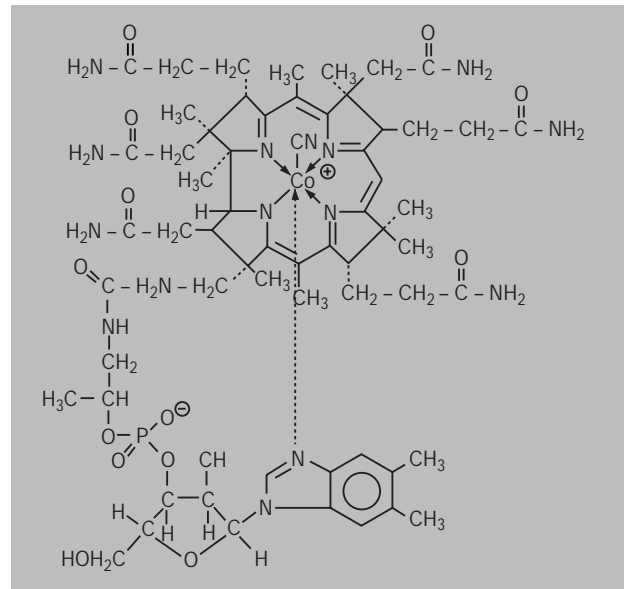
Close-up on perfect partners in action.

1. How Butaphosphan works:

Butaphosphan first made its mark at the turn of the century. Since then it's been used to benefit many species of animals.

Catosal - and Butaphosphan as its main ingredient - is active in stimulating metabolism and modulating the immune system.

In a 1971 study Sommer et al. showed a marked improvement in hepatic function and thus overall



metabolism by demonstrating a drop in previously elevated enzyme activity of AST (GOT) in bovine serum after Catosal treatment.

In an equine study Marbach (1978) also concluded that Catosal protected hepatic function and boosted energy metabolism, possibly by stimulating the ADP-ATP cycle.

According to the study by Bronsch (1968), Catosal's pharmacological efficacy can be attributed less to its capacity as phosphorus source and more to the inherent capacity of the intact, functioning Butaphosphan molecule to speed up the regeneration of depleted muscular systems.

Testing for metabolic reactions to stress in heifers, Hänsel et al. (1992) using propionate and butyrate as

principal agents, revealed that Catosal first induced a drop in hydrocortisone concentrations and second a rise in insulin concentrations. Investigations by Simon (1990) highlighted an attribute only touched on in previous studies - Butaphosphan's regulatory effect on the immune system. Findings revealed that antibody-dependent cytotoxicity normally activated by heat stress could be largely prevented. Tests with sheep produced especially significant results. Andersson et al. (1995) monitored the effect of Catosal on non-specific immunity in rabbits - and results here were also encouraging. Flow cytometry (the selected test route) revealed that Catosal does indeed improve the non-specific immune system and that these effects are dosage-related.

2. How Vitamin B₁₂ (cyanocobalamin) works:

Vitamin B₁₂, a source of cobalt, is produced exclusively by micro-organisms and is not present in green plants. Unlike its fat-soluble counterparts, this hydrosoluble vitamin can be stored only in minimal amounts and for short periods requiring continuous intake.

This is especially true for monogastric animals, e.g. horses, pigs, dogs and poultry and also for primuminant calves. Only ruminants are able to synthesise this vitamin in the rumen provided that they are appropriately fed. (Alsing, 1992).

Following ingestion via feed, vitamin B₁₂ ("intrinsic factor") binds with a substance (mucoprotein) formed in the gastric mucosa ("extrinsic factor"). The mucoprotein-cyanocobalamin complex is then stored in the organism.

Vitamin B₁₂ plays a beneficial role in many metabolic reactions. Sommer (1982) details these as follows:

- In conjunction with folic acid, vitamin B₁₂ promotes the metabolism of single-carbon compounds.
- Vitamin B₁₂ acts on fat and carbohydrate metabolism through the formation and transfer of weak methyl groups.
- Vitamin B₁₂ is important in the biosynthesis of methionine, a vital protein building-block and methyl group donor in choline biosynthesis, and the formation of creatine which promotes energy storage in muscle tissue.

- Vit B₁₂ also assists in the formation of red blood cells.
- Vitamin B₁₂ promotes general growth and makes for improved feed utilization, with an associated increase in body protein content.

Research has proven that Catosal is generally well tolerated.

Toxicological information:

Tests carried out on Butaphosphan for acute toxicity in mice and chicks, sub-chronic toxicity in rats, dogs and chicks, reproductive toxicity in cows show that even in high doses, Butaphosphan is very well tolerated (Hoffmann, 1971; Salem et al. 1983; Eiben and Schilde, 1987; Ruf and Rühl-Fehlert, 1992 and Andrews, 1994).

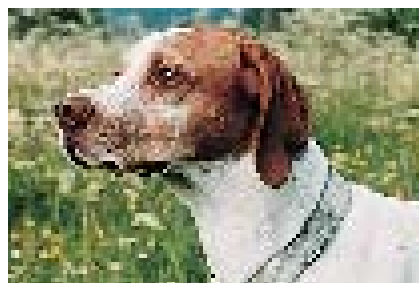
This outstanding safety record also applies to the metabolites butylamine, hypophosphoric acid and acetone (Sutton, 1962 and Oettel, 1974).

The overall tolerability of Catosal is further supported by a specifically targeted tolerance study carried out by Sagner (1966) and extensive field experience. As vitamin B₁₂ has a wide therapeutic margin, the question of toxicity does not arise.

Guide to using Catosal for different indications in practice.

Catosal has an established reputation as metabolic stimulant and tonic for use in a wide variety of species. The spectrum of indications is just as comprehensive. Depending on the indication, Catosal, whether used alone or in combination with specific therapy has a proven track record in:

- Metabolic disorders through malnutrition or faulty husbandry;
- Developmental and nutritional disorders in young animals, resulting from diseases during the growing period;
- Metaphylaxis of sterility and puerperal diseases and also as supportive sterility treatment;
- Tetany and pareses as adjunct to calcium and magnesium therapy;
- As effective tonic in cases of over-exertion and exhaustion.



REFERENCES

- ALSING, I. (1992):
Lexikon Landwirtschaft: Pflanzliche Erzeugung, tierische Erzeugung, Land-
technik, Betriebslehre, landwirtschaftliches Recht.
BLV Verlagsgesellschaft mbH, München
- ANDERSSON, R., MORCILLO, L. R. L., SOMMER, H. (1995):
Bericht über die Versuche zum Thema: In-vivo und in-vitro Untersuchun-
gen über den Einfluß des Präparates Catosal (Fa. Bayer; Wirkstoff
Butafosfan) auf die unspezifische Immunität von Kaninchen.
Bayer Report
- ANDREWS, P. (1994):
Bayer Report
- BRONSCH, K. (1968):
Bayer Report
- EIBEN, R.; SCHILDE, B. (1987):
Subchronic toxicological study in rats (Administration in drinking water
over three months).
Bayer Report
- HÄNSEL, A.; FUHRMANN, H.; SALLMANN, H.- P.; KLEE, W. (1992):
Intravenöse Infusion flüchtiger Fettsäuren als Stoffwechselbelastungstest
zur Überprüfung möglicher Butafosfanwirkungen auf den Energiestoff-
wechsel des Rindes.
Berl. Münch. Tierärztl. Wschr. 105, 11, 361-366
- HOFFMANN, K. (1971):
Catosal: Akute Toxizität an der Maus nach oraler und parenteraler Verab-
reichung.
Bayer Report
- MARBACH, W. (1978):
Hämatologische Parameter zur Kondition von Rennpferden und die Wir-
kung von Coforta/Catosal auf das erschöpfte Pferd.
Vet. Med. Nachr. 1, 82-92
- OETTEL, H. (1974):
Ullmanns Enzyklopädie der techn. Chemie.
4. Auflage, Band 7, 40, 387-388
- RUF, J. and RÜHL-FEHLERT, C. (1992):
Butaphosphan-Subchronische Toxizitätsstudie an Hunden.
Bayer Report
- SAGNER, R. (1966):
Zur Verträglichkeit von Catosal 20%ig mit Zusatz von Vitamin B 12.
Bayer Report
- SALEM, F. M. S; EL SHENNAU, M. M.; ALI, F. R. (1983):
Evaluation of "Butaphosphan" as food additive used in improvement of
poultry production. 1. Study of its toxic manifestations and effect on liver
and kidney.
Vet. Med. J. 31, 65-76
- SIMON, H. (1990):
Report über die Untersuchungen zu den stressabschirmenden Wirkungen
von Butafosfan beim Schaf.
Bayer Report
- SOMMER, H. (1982):
Catosal-Gutachten.
Bayer Report
- SOMMER, H.; MARX, D.; STARKER, G. (1971):
Versuche zur Reduzierung der Fruchtbarkeitsstörungen beim Rind durch
die Anwendung von Catosal in der Metaphylaxe.
Dtsch. Tierärztl. Wschr. 78, 22, 593-597
- SUTTON, W. L. (1962):
Chapter XLV: Aliphatic and alicyclic amines. in: Industr. Hygiene and Toxicology.
Publisher O.W. Fasset und D.D. Irish, N.Y., 2nd edition