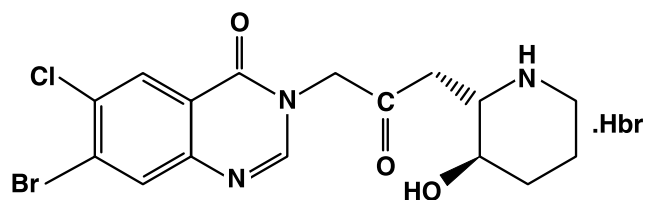


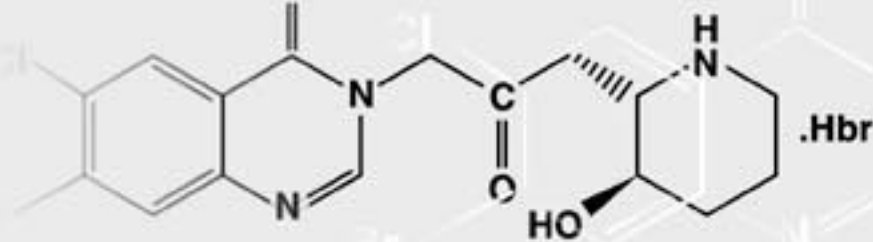
Effective against all major *Eimeria* species

Stenorol[®] 0.6% halofuginone

INTRODUCTION

Stenorol is a 0.6% premix, containing 6 g /kg of its active ingredient halofuginone with carrier substance corn cobs. It is a yellowish to brown homogenous mixture. Halofuginone is derived from febrifugine, one of the alkaloids contained in Dichroine, which is an extract of the plant *Dichroa febrifuga*. Dichroine has been used for centuries as a treatment for malaria and can be found in traditional Chinese pharmacopoeia. Thus, although manufactured by chemical synthesis, halofuginone is derived as a natural product, whose antiparasitic activity has been used successfully for hundreds of years.





UNIQUE ANTICOCIDIAL TRIPLE ACTION

MODE OF ACTION

Stenorol is a feed additive for the prophylactic control of the coccidial species *E. acervulina*, *E. maxima*, *E. tenella*, *E. necatrix*, *E. brunetti*, *E. praecox* and *E. Mitis* in chickens for fattening and chickens reared for laying as well as for *E. meleagrimitis*, *E. adenoides*, *E. gallopavonis*, *E. meleagridis* and *E. dispersa* in turkeys (graph 1).

Graphic 1

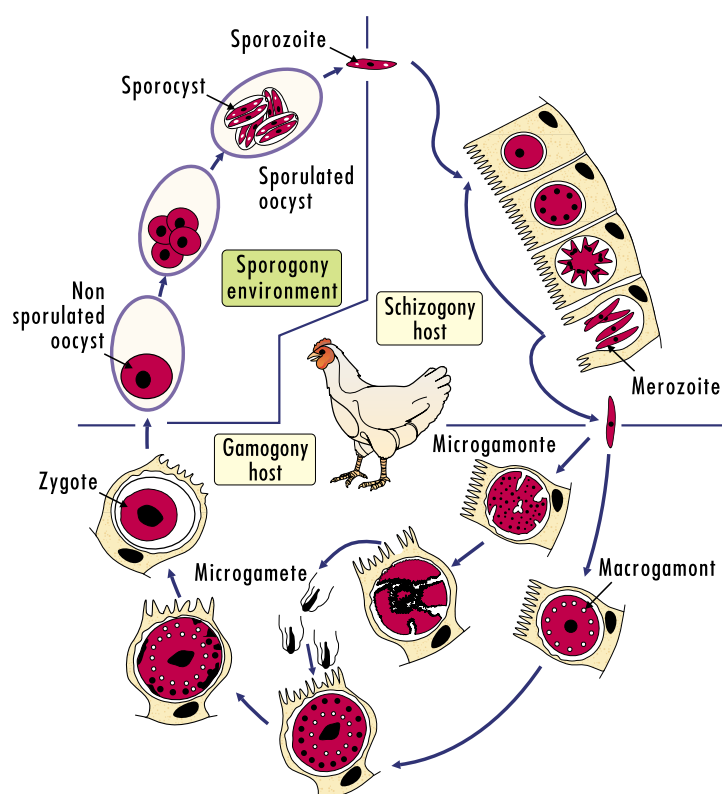
Stenorol® - broad spectrum efficacy

Chicken <i>Eimeria</i> spp.	Controlled by Stenorol
<i>E. acervulina</i>	Yes
<i>E. brunetti</i>	Yes
<i>E. maxima</i>	Yes
<i>E. mitis</i>	Yes
<i>E. necatrix</i>	Yes
<i>E. praecox</i>	Yes
<i>E. tenella</i>	Yes
Turkey <i>Eimeria</i> spp	
<i>E. adenoides</i>	Yes
<i>E. dispersa</i>	Yes
<i>E. gallopavonis</i>	Yes
<i>E. meleagridis</i>	Yes
<i>E. meleagrimitis</i>	Yes

Halofuginone, which is the active ingredient of Stenorol is a synthetic bromochlorinated derivative of the alkaloid febrifugine. It is a member of the unique chemical group, and is therefore chemically independent from all other anticoccidials. It acts at three stages in the coccidial life cycle: sporozoites, and later on the first generation of schizonts and second generation of schizonts. (diagram 1)

Diagram 1

THE CYCLE OF THE PARASITE



Sporogony: Stage when oocysts (free living forms in the environment) sporulate in order to become infective

Schizogony: Sporozite (infectious form) penetration in the host cells and series of asexual multiplications.

Gomogony: Sexual stage of the lifecycle leading to fertilization, zygote formation and oocyst output in the environment

WIDE MARGIN OF SAFETY: EFFECTIVE IN UNDERDOSAGE, SAFE IN OVERDOSAGE

Stenorol is a coccidiostat, which blocks protein synthesis in the parasite.

Stenorol works only against the parasite. It does not disturb the intestinal environment of the avian host or interfere with nutrient absorption and therefore does not induce side effects or require special feed reformulations to compensate for its effects.

Because of its activity at 3 stages in the parasitic life cycle Stenorol can safely replace any previous anticoccidial at any stage during the broiler rearing cycle (up to withdrawal). There are no known incompatibilities with any feed additives or therapeutics (in feed or water treatment).

RESISTANCE

Since the chemical structure of Stenorol is unlike other coccidiostats, there is no cross resistance between Stenorol and any other anticoccidial.

Alternating Stenorol with coccidiostats having different modes of actions- especially the ionophores, like i.e Sacox - helps to limit the coccidial resistance pressure. This strategic use of alternate coccidiostats maximises efficacy, avoids cross resistance and ultimately prolongs the effective lifetime of each drug.



Table 2

DOSAGE				
Target Species	Minimum and maximum content of halofuginone hydrobromide in complete feedingstuff (g/tonne)	Quality of Stenorol ® incorporated into the feedingstuff (g/tonne)	Maximum age weeks	Withdrawal period
Chickens for fattening	2-3	333-500	-	2 days
Chickens reared for laying	2-3	333-500	16	2 days
Turkeys	2-3	333-500	12	2 days



MODE OF ADMINISTRATION

Stenorol is a free-flowing premix of halofuginone hydrobromide with the following composition of 1000 grams:

Table 1

Active constituent-halofuginone	6 g
Other constituents: inert carrier-corn cobs	994 g
Total	1000 g

Stenorol should be mixed thoroughly into broiler feeds at level of 333g or 500g per tonne of finished food to provide a concentration of respectively 2 and 3 ppm.

To obtain a homogenous mix, it is recommended to incorporate Stenorol into a secondary premix prior to mixing into finishing feed.



EFFICACY

Efficacy of Stenorol has been demonstrated in different challenge trials and under field conditions.

In a recent field trial performed in Belgium the efficacy of Stenorol was proven. In this trial, in which 128,000 commercial broilers were involved, 2 different groups were compared.

Treatment groups:

- Stenorol at a concentration of 2ppm from day 1 until day 30 of age.
- Control group receiving a shuttle programme with the combination product nicarbazin/narasin at a concentration of 50/50 ppm until 21 days followed by Sacox (salinomycin) at a concentration of 60ppm until 34 days.

Weight of the birds at different time points indicated that there was no difference in growth rate between the Stenorol group and the group receiving the shuttle program nicarbazin/narasin-salinomycin.

Examination of carcass weight and carcass composition after slaughtering showed no significant differences between the groups, except for the amount of waste which was significantly lower in the Stenorol group. (see table 3).



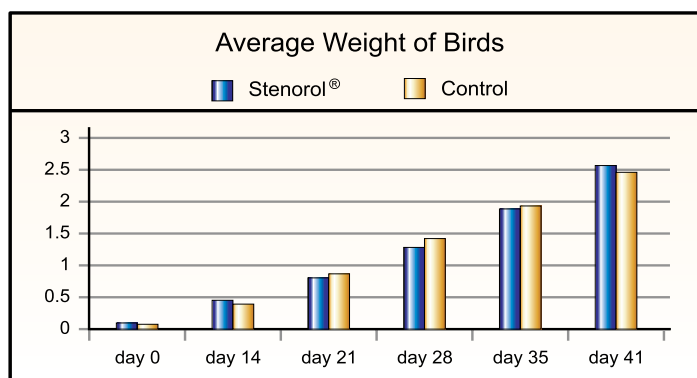
Graphic 2

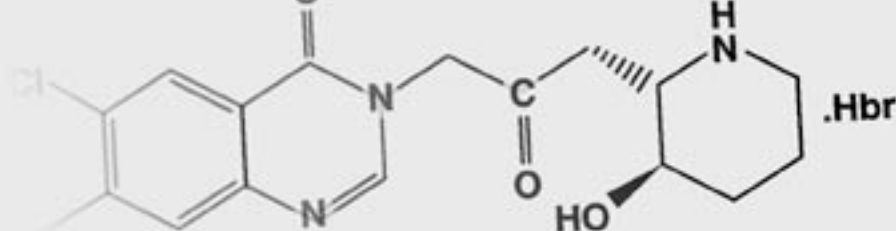
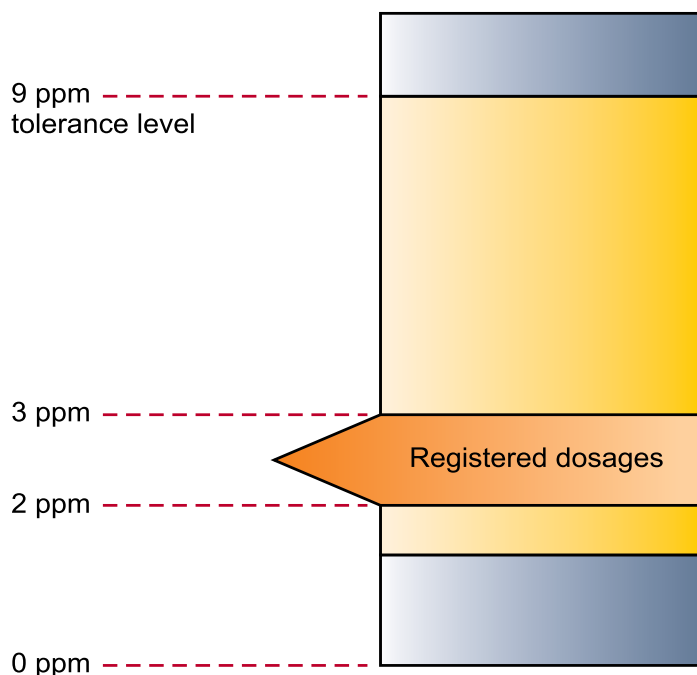
Table 3

Average carcass weight

Average	Control	Stenorol ®	P-Value
Feet	83	82	0.67
Breast	399	380	0.43
Leg	346	327	0.17
Drumstick	194	187	0.39
Wings	154	145	0.14
Waste	280	258	0.03

Average birds weight in kg



**Graphic 3****SAFETY**

Commercially, Stenorol has a wide margin of safety in both under- and overdosage, which can be summarised as follows for broilers:

Table 4

0-1.5 ppm	No anticoccidial effect
1.5-2 ppm	Acceptable anticoccidial effect
2-6 ppm	Safe dosage with registered dosage of 2-3 ppm
6-9 ppm	No serious consequences to the animal
Over 9 ppm	Depression of feed intake and growth rate progressively worse with increasing dosage

Halofuginone is an extremely effective anticoccidial when used in broilers, pullets and turkeys. Weight gain and feed conversion are unaffected until more than twice the recommended dose.

No problems of compatibility or combined toxicity have been observed when used in conjunction with other feed additives. Since the chemical structure of Stenorol is unlike any other coccidiostat, there is no cross resistance between Stenorol and any other anticoccidial product.

ADDITIONAL INFORMATION**ELIMINATION**

Stenorol is rapidly eliminated in the faeces. Litter in the poultry houses in which Stenorol is administered, can be utilised without danger; this has been carefully checked by a study involving several different types of crops. Please refer to the registered label for manure use rates on pasture.

WITHDRAWAL PERIOD: 2 days

Treated chickens must not be slaughtered for use in food for at least 2 days after the latest supplementation.

SIDE EFFECTS

Laboratory tests have shown that Stenorol in the recommended dosage range of 2-3ppm does not impair growth performance, feed conversion, feathering, subcutaneous fat and taste of meat. There is no correlation between heat stress and the use of Stenorol. There is no impact on water consumption.

CONTRAINDICATIONS:

Do not feed to layers or breeder birds in production, young Guinea fowls, ducks and water fowls. The use of Stenorol is also not recommended in young quails, pigeons and red-legged partridges because of feed refusal and weight gain reduction.

WARNING

Use only as directed. Do not use feed containing Stenorol for the treatment of outbreaks of coccidiosis. As with all feed additives, caution should be exercised when handling Stenorol. Direct contact with skin and eyes should be avoided by wearing protective gloves, clothing and dust masks. Dust must not be inhaled. Keep out of the reach of children.

SHELF LIFE

Stenorol is stable for 6 months when included in premixtures and 3 months in finished feeds. Stenorol is stable under all conditions of modern poultry feed production (pelleting, extruding, expanding).



STENOROL BENEFITS

- Proven broad spectrum efficacy
- 3- stage anticoccidial effect
- Effective development of immunity
- Control of coccidiosis during periods of immune suppression
- Unique chemistry limits possibility of cross resistance to other coccidials
- Compatible with all feed additives and therapeutics
- No feed reformulation requirements
- No adverse effects on water consumption or litter quality
- No negative side effects (i.e. heat stress, feathering, pigmentation)
- Low lesion scores and low oocyst output

STORAGE

Store below 25°C in a dry well ventilated place, that is protected from direct sunlight



PACKAGING

20kg polyethylene lined multi-wall paper bags.

Stenorol is a New Zealand registered veterinary medicine ACVM number A011396

For use in broiler chickens.

Indication: As an aid in the prevention of *coccidiosis* caused by *Eimeria acervulina*, *E. maxima*, *E. necatrix*, and *E. tenella* in broiler chickens.

Add 0.5kg of Stenorol to each tonne of chicken feed. This produces a halofuginone hydrobromide content of 3g/tonne in finished feed.

Withholding period: 2 days