1. NAME OF THE VETERINARY MEDICINAL PRODUCT

Pereprin 5 mg/ml pour-on solution for cattle, sheep and goats.

2. QUALITATIVE AND QUANTITATIVE COMPOSITION

Each ml contains:

Active substances:
Eprinomectin 5 mg

Excipients:

Qualitative composition of excipients and other constituents	**Quantitative composition if that information is essential for proper administration of the veterinary medicinal product**
Butylhydroxytoluene (E321)	0.1 mg
Propylene glycol dicaprylocaprate	
All-rac-alpha-tocopherol (E307)	

Colourless or light yellow oily-like liquid.

3. CLINICAL INFORMATION

3.1 Target species

Cattle (dairy cattle and cattle for meat production), sheep, goats.

3.2 Indications for use for each target species

For treatment of infestations with the following parasites:

Cattle:

PARASITE	**ADULT**	**L4**	**Inhibited L4**
Gastrointestinal Roundworms:			
Ostertagia spp.	◆	◆	
O. lyrata	◆		
O. ostertagi	◆	◆	◆
Cooperia spp.	◆	◆	◆
C. oncophora	◆	◆	
C. pectinata	◆	◆	
C. punctata	◆	◆	
C. surnabada	◆	◆	
Haemonchus placei	◆	◆	
Trichostrongylus spp.	◆	◆	
T. axei	◆	◆	
T. colubriformis	◆	◆	
Bunostomum phlebotomum	◆	◆	
Nematodirus helvetianus	◆	◆	
Oesophagostomum spp.	◆		
Oesophagostomum radiatum	◆	◆	

Trichuris spp.	◆	
Lungworm:		
Dictyocaulus viviparus	◆	◆

Warbles (parasitic stages):
Hypoderma bovis
Hypoderma lineatum

Mange Mites:
Chorioptes bovis
Sarcoptes scabiei var.*bovis*

Lice:
Damalinia bovis (biting lice)
Linognathus vituli (sucking lice)
Haematopinus eurysternus (sucking lice)
Solenopotes capillatus (sucking lice)

Flies:
Haematobia irritans

PROLONGED ACTIVITY
Applied as recommended, the veterinary medicinal product prevents reinfestations with:

Parasite	**Prolonged Activity**
Dictyocaulus viviparus	Up to 28 days
Ostertagia ostertagi	Up to 28 days
Oesophagostomum radiatum	Up to 28 days
Cooperia punctata	Up to 28 days
Cooperia surnabada	Up to 28 days
Cooperia oncophora	Up to 28 days
Nematodirus helvetianus	Up to 14 days
Trichostrongylus colubriformis	Up to 21 days
Trichostrongylus axei	Up to 21 days
Haemonchus placei	Up to 21 days

For the best results the veterinary medicinal product should be part of a programme to control both internal and external parasites of cattle based on the epidemiology of these parasites.

Sheep:

Gastrointestinal roundworms (adults):
Teladorsagia circumcincta (pinnata/trifurcata)
Haemonchus contortus
Trichostrongylus axei
Trichostrongylus colubriformis
Nematodirus battus
Cooperia curticei
Chabertia ovina
Oesophagostomum venulosum

Lungworm (adults):
Dictyocaulus filaria

Nasal Bots (L1, L2, L3):
Oestrus ovis

Goats:

Gastrointestinal roundworms (adults):
Teladorsagia circumcincta (pinnata/trifurcata)
Haemonchus contortus
Trichostrongylus axei
Trichostrongylus colubriformis
Nematodirus battus
Cooperia curticei
Oesophagotomum venulosum

Lungworm (adults):
Dictyocaulus filaria

Nasal Bots (L1, L2, L3):
Oestrus ovis

Warbles (L1, L2, L3):
Przhevalskiana silenus

For best results the veterinary medicinal product should be part of a programme to control both internal and external parasites of sheep and goats based on the epidemiology of these parasites.

3.3 Contraindications

Do not use in other animal species. Avermectins can cause fatalities in dogs, especially Collies, Old English Sheepdogs and related breeds and crosses, and also in turtles/tortoises.
Do not use in cases of hypersensitivity to the active substance or to any of the excipients.

3.4 Special warnings

For effective use, the veterinary medicinal product should not be applied to areas of the backline covered with mud or manure.

In cattle, rainfall before, during or after the application of the veterinary medicinal product, has been shown to have no impact on its efficacy. It also has been demonstrated that haircoat length has no impact on the veterinary medicinal product's efficacy. The effect of rainfall and haircoat length on efficacy has not been evaluated in sheep and goats.

In order to limit cross-transfer of eprinomectin, treated animals may be separated from untreated animals. Non-compliance with this recommendation may lead to residue violations in untreated animals and development of resistance to eprinomectin.

Unnecessary use of antiparasitics or use deviating from the instructions given in the SPC may increase the resistance selection pressure and lead to reduced efficacy. The decision to use the product should be based on confirmation of the parasitic species and burden, or of the risk of infestation based on its epidemiological features, for each herd.

Repeated use for an extended period, particularly when using the same class of substances, increases the risk of resistance development. Within a herd, maintenance of susceptible refugia is essential to reduce that risk. Systematically applied interval-based treatment and treatment of a whole herd should be avoided. Instead, if feasible, only selected individual animals or subgroups should be treated (targeted selective treatment). This should be combined with appropriate husbandry and pasture

management measures. Guidance for each specific herd should be sought from the responsible veterinarian.

It is recommended to further investigate cases of suspected resistance, using an appropriate diagnostic method (e.g. Faecal Egg Count Reduction Test). Where the results of the test(s) strongly suggest resistance to a particular anthelmintic, an anthelmintic belonging to another pharmacological class and having a different mode of action should be used.
Confirmed resistance should be reported to the marketing authorisation holder or to the competent authorities.
To date no resistance to eprinomectin (a macrocyclic lactone) has been reported in cattle while resistance to eprinomectin has been reported in goats and sheep within the EU. However, resistance to other macrocyclic lactones has been reported in nematode populations in cattle, sheep and goats within the EU, which may be associated with side-resistance to eprinomectin. The use of the veterinary medicinal product should take into account local information about susceptibility of the target parasites, where available.

While mite and louse numbers decline rapidly following treatment, due to the feeding habits of some mites, in some cases several weeks may be required for complete eradication.

3.5 Special precautions for use

Special precautions for safe use in the target species:
For external use only.
The veterinary medicinal product should be applied only on healthy skin.
To avoid secondary reactions due to the death of *Hypoderma* larvae in the oesophagus or in the spine, it is recommended to administer the veterinary medicinal product at the end of warble fly activity and before the larvae reach their resting sites.

Special precautions to be taken by the person administering the veterinary medicinal product to animals:
This veterinary medicinal product may be irritating to skin and eyes and may cause hypersensitivity reactions.
People with known hypersensitivity to eprinomectin, butylhydroxytoluene or propylene glycol dicaprylocaprate should avoid contact with the veterinary medicinal product.
Eprinomectin can be transferred to breast milk. Therefore, breast-feeding women should handle the veterinary medicinal product with great care.
Avoid contact with eyes and skin
Personal protective equipment consisting of rubber gloves, boots and waterproof coat should be worn when handling the veterinary medicinal product.
Should clothing become contaminated, remove as soon as possible and launder before re-use.
In case of accidental spillage on skin, wash the affected area immediately with soap and water.
In case of accidental eye contact, flush eyes immediately with plenty of clean water. Should irritation persist, seek medical advice and show the package leaflet or the label to the physician.
Do not ingest. In case of accidental ingestion, rinse out mouth thoroughly with water, seek medical advice immediately and show the package leaflet or label to the physician.
Do not smoke, eat or drink while handling the veterinary medicinal product.
Wash hands after use.

Special precautions for the protection of the environment:
Eprinomectin is very toxic to dung fauna and aquatic organisms, is persistent in soils and may accumulate in sediments.
The risk to aquatic ecosystems and dung fauna can be reduced by avoiding repeated use of eprinomectin (and products of the same anthelmintic class).
In order to reduce the risk to aquatic ecosystems, treated animals should not have direct access to water bodies for two to five weeks after treatment.

3.6 Adverse events

Cattle (dairy cattle and cattle for meat production), sheep and goats:

Very rare (<1 animal / 10 000 animals treated, including isolated reports):	Alopecia Pruritus

Reporting adverse events is important. It allows continuous safety monitoring of a veterinary medicinal product. Reports should be sent, preferably via a veterinarian, to either the marketing authorisation holder or its local representative or the national competent authority via the national reporting system. See the package leaflet for respective contact details.

3.7 Use during pregnancy, lactation or lay

Pregnancy and lactation:
Laboratory studies in rats and rabbits have not produced any evidence of teratogenic or embryotoxic effects.

Cattle:
Laboratory studies in cattle have not produced any evidence of a teratogenic or foetotoxic effects at the recommended dose. The veterinary medicinal product can be used during pregnancy and lactation.

Sheep and goats:
The safety of the veterinary medicinal product has not been established during pregnancy in sheep and goats.
Use only according to the benefit-risk assessment of the responsible veterinarian.

3.8 Interaction with other medicinal products and other forms of interaction

No interactions with other medicines and no other forms of interactions are known. Since eprinomectin binds extensively to plasmatic proteins, this should be taken into account if it is used in association with other molecules having the same characteristics.

3.9 Administration routes and dosage

Pour-on use.
For single application only.

To ensure a correct dosage, bodyweight should be determined as accurately as possible. If animals are to be treated collectively, reasonably homogenous groups should be set up, and all animals of a group should be dosed at the rate corresponding to the heaviest one. Underdosing could result in ineffective use and may favour resistance development.

Accuracy of the dosing device should be checked.

The veterinary medicinal product should be applied topically by pouring along the backline in a narrow strip extending from the withers to the tailhead.

Cattle:
Administer by topical application at the dose rate of 0.5 mg eprinomectin per kg bodyweight, corresponding to the recommended dose rate of 1 ml per 10 kg bodyweight.

Sheep and goats:
Administer by topical application at the dose rate of 1.0 mg eprinomectin per kg bodyweight, corresponding to the recommended dose rate of 2 ml per 10 kg bodyweight.

When administering the veterinary medicinal product along the backline, part the fleece/coat and place the dosing gun nozzle or measuring pourer cap against the skin.

Method of administration:
For the 2.5 and 5 litre backpacks:
Connect the dosing gun and draw-off tubing to the backpack as follows:

- Attach the open end of the draw-off tubing to an appropriate dosing gun.
- Attach draw-off tubing to the spigot cap that is included in the pack.
- Replace shipping cap with the spigot cap having the draw-off tubing. Tighten the spigot cap.
- Gently prime the dosing gun, checking for leaks.
- Follow the dosing gun manufacturer's directions for adjusting the dose and proper use and maintenance of the dosing gun and draw-off tubing.

For the 250 millilitre and 1 litre bottles:
Both bottle types can be used with an appropriate dosing system such as a dosing gun and coupling spigot cap or a measuring pourer cap combined with a dip tube.

For use with a dosing gun: Unscrew the polypropylene cap. Remove the protective seal from the bottle. Screw a coupling spigot cap on the bottle and make sure it is tightened. Attach draw-off tubing to the spigot cap and connect the other end to a dosing gun. Follow the gun manufacturer's instructions for adjusting the dose and proper use and maintenance of the dosing gun and spigot cap. After use, coupling spigot caps should be removed and replaced by the polypropylene cap during storage.

For use with a measuring pourer cap and dip tube: Follow the manufacturer's directions for adjusting the dose and proper use and maintenance of the measuring pourer cap and dip tube.
Unscrew the polypropylene cap. Remove the protective seal from the bottle. Insert the dip tube into the underside of the measuring pourer cap. Screw the measuring pourer cap on the top of the bottle. Squeeze the bottle gently to fill the measuring pourer cap to the required dose as to the manufacturer's instructions. Release your grip and any excess liquid will return to the bottle. Apply the full dose by tipping and pouring along the back line of the animal until the measuring pourer cap is empty. After use, measuring pourer cap and dip tube should be removed and replaced by the polypropylene cap during storage.

3.10 Symptoms of overdose (and where applicable, emergency procedures and antidotes)

No signs of toxicity appeared when 8-week old calves were treated at up to 5x the therapeutic dose (2.5 mg eprinomectin/kg bodyweight) 3 times at 7-day intervals.
One calf treated once at 10x the therapeutic dose (5 mg/kg bodyweight) in the tolerance study with an eprinomectin-containing veterinary medicinal product showed transient mydriasis. There were no other adverse reactions to treatment.

No clinical signs of toxicity were observed when 17-week old sheep were treated at doses up to 5 times the therapeutic dose (5 mg eprinomectin/kg bodyweight) 3 times at 14-day intervals.

No antidote has been identified.

3.11 Special restrictions for use and special conditions for use, including restrictions on the use of antimicrobial and antiparasitic veterinary medicinal products in order to limit the risk of development of resistance

Not applicable.

3.12 Withdrawal periods

Cattle:
Meat and offal: 15 days.

Milk: zero hours.

Sheep:
Meat and offal: 2 days.
Milk: zero hours.

Goats:
Meat and offal: 1 day.
Milk: zero hours.

4. PHARMACOLOGICAL INFORMATION

4.1 ATCvet code: QP54AA04

4.2 Pharmacodynamics

Eprinomectin is a member of the macrocyclic lactone class of endectocides. Compounds of the class bind selectively and with high affinity to glutamate-gated chloride (GluCl) ion channels which occur in invertebrate nerve or muscle cells. This leads to an increase in the permeability of the cell membrane to chloride ions with hyperpolarization of the nerve or muscle cell, resulting in paralysis and death of the parasite.
Compounds of this class may also interact with other ligand-gated chloride channels, such as those gated by the neurotransmitter gamma-aminobutyric acid (GABA).
The margin of safety for compounds of this class is attributable to the fact that mammals do not have glutamate-gated chloride channels; the macrocyclic lactones have a low affinity for other mammalian ligand-gated chloride channels, and they do not readily cross the blood-brain barrier.

Side resistance within the avermectin sub-family (eprinomectin, ivermectin, doramectin and abamectin) of the macrocyclic lactones is suspected.
Overexpression or polymorphisms in genes encoding P-glycoproteins – such as *pgp-1*, *pgp-2*, *pgp-9*, *pgp-11* - which belong to the ATP-binding cassette (ABC) transporter family, result in decreased intracellular accumulation of macrocyclic lactones and are associated with resistance. Mutations in glutamate-gated chloride channel (GluCl) genes—such as *glc-1*, *avr-14*, and *avr-15*—have been shown to reduce drug binding affinity. Resistance against eprinomectin and other macrocyclic lactones involves a complex interplay of multiple genes and regulatory pathways beyond those currently identified.

4.3 Pharmacokinetics

Eprinomectin is bound extensively to plasma proteins (99%).

Pharmacokinetic studies with an eprinomectin-containing veterinary medicinal product have been conducted in lactating and non-lactating animals, administered topically at a single dosage of 0.5 mg/kg body weight in cattle and at 1 mg/kg bodyweight in sheep and goats.

For cattle, results from two representative studies with an eprinomectin-containing veterinary medicinal product found mean peak plasma concentrations of 9.7 and 43.8 ng/ml that were observed at 4.8 and 2.0 days post dose. The corresponding elimination half-lives in plasma were 5.2 and 2.0 days, and mean area-under-the-curve values of 124 and 241 ng*day/ml.

Eprinomectin is not extensively metabolized in cattle following topical administration.
Faeces was the major route of elimination of the drug in beef cattle and dairy cows.

For sheep, a mean peak plasma concentration (C_{max}) of 6.20 ng/ml was observed following a topical dose of 1mg/kg. The half-life in plasma was 6.4 days with mean area under the curve (AUC_{last}) value of 48.8 ng*day/ml.

For goats, peak mean plasma concentrations ranging from 3 to 13.1 ng/ml were observed on average from 17 hours to 2 days post dose. The mean half-life in plasma ranged from one day to up to 5 days with area under the curve mean values ranging from 15.7 to 39.1 ng*day/ml.

An *in vitro* microsomal metabolism study was conducted using liver microsomes isolated from cattle, sheep and goats. It showed that the differences in pharmacokinetics observed between cattle, sheep and goats do not result from differences in the rate or extent of metabolism but suggests more complete absorption of eprinomectin by cattle.

Environmental properties
Extremely dangerous to fish and aquatic life (see also section 5.5).

Like other macrocyclic lactones, eprinomectin has the potential to adversely affect non-target organisms. Following treatment, excretion of potentially toxic levels of eprinomectin may take place over a period of several weeks. Faeces containing eprinomectin excreted onto pasture by treated animals may reduce the abundance of dung feeding organisms which may impact on the dung degradation. Eprinomectin is very toxic to aquatic organisms, is persistent in soils and may accumulate in sediments.

5. PHARMACEUTICAL PARTICULARS

5.1 Major incompatibilities

In the absence of compatibility studies, this veterinary medicinal product must not be mixed with other veterinary medicinal products.

5.2 Shelf life

Shelf life of the veterinary medicinal product as packaged for sale: 2 years.
Shelf life after first opening the immediate packaging: 1 year.

5.3 Special precautions for storage

Store in the original container in order to protect from light.
This veterinary medicinal product does not require any special temperature storage conditions.

5.4 Nature and composition of immediate packaging

White, high-density polyethylene 250 ml bottle and white high-density polyethylene backpack bottles of 1 l, 2.5 l or 5 l, closed with black screw closure made of polypropylene with a polyethylene-lined sealing disk (wadding) for induction sealing inside. Separate polypropylene spigot cap.

Pack sizes:
Box containing 250 ml bottle with a spigot cap.
Box containing 1 l bottle with a spigot cap and backpack strap.
Box containing 2.5 l bottle with a spigot cap and backpack strap.
Box containing 5 l bottle with a spigot cap and backpack strap.

Not all pack sizes may be marketed.

5.5 Special precautions for the disposal of unused veterinary medicinal products or waste materials derived from the use of such products

Medicines should not be disposed of via wastewater or household waste.

Use take-back schemes for the disposal of any unused veterinary medicinal product or waste materials derived thereof in accordance with local requirements and with any national collection systems applicable to the veterinary medicinal product concerned.

The veterinary medicinal product should not enter water courses as eprinomectin may be dangerous for fish and other aquatic organisms. Do not contaminate lakes or waterways with the product or used containers.

6. NAME OF THE MARKETING AUTHORISATION HOLDER

Huvepharma NV

7. MARKETING AUTHORISATION NUMBER(S)

VPA10782/049/001

8. DATE OF FIRST AUTHORISATION

9. DATE OF THE LAST REVISION OF THE SUMMARY OF THE PRODUCT CHARACTERISTICS

10. CLASSIFICATION OF VETERINARY MEDICINAL PRODUCTS

Veterinary medicinal product subject to prescription.

Detailed information on this veterinary medicinal product is available in the Union Product Database (https://medicines.health.europa.eu/veterinary).