Summary of Product Characteristics

1 NAME OF THE VETERINARY MEDICINAL PRODUCT

Zearl 10 mg/ml Solution for Injection for Cattle and Sheep.

2 QUALITATIVE AND QUANTITATIVE COMPOSITION

Each ml contains:

Active substance:		
Doramectin		10.0 mg
Excipients:		
* Ethyl oleate		218.0 mg
* Sesame Oil	to	1.00 ml

* Contains 100 ppm Butylhdroxyanisole

3 PHARMACEUTICAL FORM

Solution for injection.
A clear, colourless to pale yellow solution.

4 CLINICAL PARTICULARS

4.1 Target Species

Cattle and sheep.

4.2 Indications for use, specifying the target species

Cattle:
For the treatment and control (therapy and prophylaxis) of gastrointestinal nematodes, lungworms, eyeworms, warbles, sucking lice, mange mites and ticks.

Gastrointestinal roundworms (adults and fourth stage larvae):

*Ostertagia ostertagi (*including inhibited larvae)
O. lyrata *
Haemonchus placei
Trichostrongylus axei
T. colubriformis
Cooperia oncophora
C. pectinata *
C. punctata
*C. surnabadaa (*syn. *mcmasteri*)
N. spathiger *
Bunostomum phlebotomum *
Strongyloides papillosus *
Oesophagostomum radiatum
Trichuris spp.*
* adults

Lungworms: (adults and fourth stage larvae)

Dictyocaulus viviparus

Eyeworms: (adults)

Thelazia spp.

Warbles: (parasitic stages)

Hypoderma bovis *H.lineatum*

Sucking lice:

Haematopinus eurystemus *Linognathus vituli*
Solenopotes capillatus

Mange mites:
Psoroptes bovis
Sarcoptes scabiei

Zearl may also be used as an aid in the control of *Nematodirus helvetianus*, biting lice (*Damalinia bovis*), the tick *Ixodes ricinus* and the mange mite *Chorioptes bovis.*

The pharmacokinetics of Zearl allow protection of cattle against infection or reinfection with the following parasites for the period indicated:

Species	Days
Bunostomum phlebotomum	22
Cooperia oncophora	21
Dictyocaulus viviparus	35
Haemonchus placei (adults only)	28
Linognathus vituli	28
Oesophagostomum radiatum	21
Ostertagia ostertagi	35
Psoroptes bovis	42
Trichostrongylus axei	28

To obtain optimal benefits from the action of Zearl, it is recommended that cattle which are set-stocked should be treated at turn-out and eight weeks later. Studies have demonstrated that, used in this way, Zearl will reduce the build-up of infective larvae on pasture and can protect animals from parasitic gastro-enteritis and parasitic bronchitis throughout the grazing season. To obtain these results, all animals must be included in the programme and untreated cattle must not be introduced onto the pasture. Treated cattle should always be monitored according to good husbandry practices. Treatment with Zearl at turn-out and eight weeks later of cattle set-stocked for the grazing season can protect against clinical disease caused by lungworm and may allow the development of naturally acquired immunity. However due to the unpredictable nature of lungworm epidemiology, clinical signs of lungworm disease may on occasion be seen, particularly towards the end of the grazing season, if the season is long. If this occurs, cattle should be further treated with an anthelmintic effective against lungworm.

Sheep:
For the treatment and control of gastrointestinal roundworms, mange mites and nasal bots.

Gastrointestinal roundworms (Adults and fourth stage larvae (L4), unless otherwise indicated)
Bunostomum trigonocephalum (Adults only)
Chabertia ovina
Cooperia curticei (L4 only)
C. oncophora
Gaigeria pachyscelis
Haemonchus contortus
Nematodirus battus (L4 only)
N. filicollis (Adults only)
N. spathiger
Ostertagia (*Teladorsagia*) *circumcinta**
Ostertagia (*Teladorsagia*) *trifurcata* (Adults only)
Oesophagostomum venulosum (Adults only)
O. columbianum
Strongyloides papillosus
Trichostrongylus axei
T. colubriformis
T. vitrinus
Trichuris spp. (Adults only)

* Inhibited larval stages (L4), including strains that are benzimidazole resistant, are also controlled.

Lungworms (Adults and fourth stage larvae (L4)
Cystocaulus ocreatus (Adults only)
Dictyocaulus filaria
*Muellerius capillaris (*Adults only)
*Neostrongylus linearis (*Adults only)
*Protostrongylus rufescens (*Adults only)

Nasal bots (1st 2nd and 3rd instar larvae)
Oestrus ovis

Mange mites
Psoroptes ovis

4.3 Contraindications

Not permitted for use in lactating animals producing milk for human consumption.

Extra-label use in dogs should be avoided, as severe adverse reactions may occur.
In common with other avermectins, certain breeds of dog, such as collies, are especially sensitive to doramectin and particular care should be taken to avoid accidental consumption of the product.

4.4 Special warnings for each target species

Care should be taken to avoid the following practices because they increase the risk of development of resistance and could ultimately result in ineffective therapy:

- Too frequent and repeated use of anthelmintics from the same class, over an extended period of time.
- Underdosing which may be due to underestimation of bodyweight, misadministration of the product, or lack of calibration of the dosing device.

Suspected clinical cases of resistance to anthelmintics should be further investigated using appropriate tests (e.g. Faecal Egg Count Reduction Test). Where the results of the tests strongly suggest resistance to a particular anthelmintic, an anthelmintic belonging to another pharmacological class and having a different mode of action should be used. Resistance to avermectins has been reported in certain nematodes in sheep within the EU. Therefore, the use of this product should be based on local (regional, farm) epidemiological information about susceptibility of nematodes and recommendations on how to limit further selection for resistance to anthelmintics.

4.5 Special precautions for use

Special precautions for use in animals

Use sterile equipment and follow aseptic procedures.

Special precautions to be taken by the person administering the veterinary medicinal product to animals

Do not smoke or eat while handling the product.
Wash hands after use.

Other precautions

Doramectin is very toxic to dung fauna and aquatic organisms and may accumulate in sediments.
The risk to aquatic ecosystems and dung fauna can be reduced by avoiding too frequent and repeated use of doramectin (and products of the same anthelmintic class) in cattle and sheep.
The risk to aquatic ecosystems will be reduced by keeping treated cattle away from water bodies for two to five weeks after treatment.

4.6 Adverse reactions (frequency and seriousness)

None known.

4.7 Use during pregnancy, lactation or lay

May be used in pregnant cows and ewes.
Not permitted for use in lactating animals producing milk for human consumption.
Do not use in pregnant cows or heifers, which are intended to produce milk for human consumption, within 2 months of expected parturition.
Do not use in pregnant ewes, which are intended to produce milk for human consumption, within 70 days of expected parturition.

4.8 Interaction with other medicinal products and other forms of interaction

None known.

4.9 Amounts to be administered and administration route

To ensure administration of a correct dose, bodyweight should be determined as accurately as possible. If animals are to be treated collectively rather than individually, they should be grouped according to their bodyweight and dosed accordingly, in order to avoid under- or overdosing.

Use properly calibrated dosing equipment.

The veterinary surgeon should give advice regarding appropriate dosing programmes and stock management to achieve adequate parasite control.

For the treatment and control of gastrointestinal roundworms, lungworms, eyeworms, warbles, lice and mange mites in cattle, and gastrointestinal roundworms and nasal bots in sheep, a single treatment of 1 ml (10 mg doramectin) per 50 kg bodyweight, equivalent to 200 mcg/kg bodyweight, administered in the region of the neck by subcutaneous injection in cattle and by intramuscular injection in sheep.

For the treatment of clinical signs of *Psoroptes ovis* (sheep scab) and elimination of living mites on sheep a single treatment of 1 ml per 33 kg bodyweight, equivalent to 300mcg/kg bodyweight, administered in the neck by intramuscular injection. In addition, adequate bio-security measures should be implemented to prevent reinfestation. It is important to ensure that all sheep which have been in contact with infested sheep are treated.

4.10 Overdose (symptoms, emergency procedures, antidotes), if necessary

In cattle and sheep overdoses up to 25 and 10 times the maximum label recommended dose, respectively, resulted in no adverse clinical signs.

4.11 Withdrawal Period(s)

Cattle:

Meat and offal: 70 days
Not permitted for use in lactating animals producing milk for human consumption.
Do not use in pregnant cows or heifers, which are intended to produce milk for human consumption, within 2 months of expected parturition.

Sheep:

Meat and offal: 70 days
Not permitted for use in lactating animals producing milk for human consumption.
Do not use in pregnant cows or heifers, which are intended to produce milk for human consumption, within 2 months of expected parturition.

5 PHARMACOLOGICAL or IMMUNOLOGICAL PROPERTIES

Pharmacotherapeutic group: Anthelmintics, doramectin.
ATC vet code: QP52AA03

5.1 Pharmacodynamic properties

Doramectin is a new fermentation-derived antiparasitic agent which belongs to the avermectin class, and is closely related structurally to ivermectin. Both compounds share a wide spectrum of antiparasitic activity and produce a similar paralysis in nematodes and parasitic arthropods. Whilst it is not possible to assign a single mode of action to the avermectins, it is likely that the entire series share a common mechanism. In parasitic organisms the effect is mediated through a specific avermectin binding site. The physiological response to avermectin binding is an increase in membrane permeability to chloride ions. In invertebrate nervous tissue an influx of chloride ions into the excitatory motor neurone in nematodes or muscle cell of arthropods results in hyperpolarisation and the elimination of signal transmission with resulting paralysis. Doramectin is exceptionally well-tolerated in mammals, where receptor/channel complexes are localised in the CNS. Poor penetration of large molecular weight compounds, such as avermectins, through the blood-brain barrier suggests that high systemic concentrations would be required before neurological function is affected.

5.2 Pharmacokinetic properties

Maximum plasma concentration of doramectin occurs in cattle 3 days after subcutaneous administration of Zearl. In sheep the maximum plasma concentration of doramectin occurs 2 days after subcutaneous or intramuscular administration of Zearl. An elimination half-life of around 6 days for cattle, following subcutaneous administration, and 4.5 days for sheep, following either subcutaneous or intramuscular administration, results in sustained doramectin concentrations which protect cattle and sheep from parasitic infection and reinfection for extended periods following treatment.

5.3 Environmental properties

Like other macrocyclic lactones, doramectin has the potential to adversely affect non-target organisms. Following treatment, excretion of potentially toxic levels of doramectin may take place over a period of several weeks. Faeces containing doramectin excreted onto pasture by treated animals may reduce the abundance of dung feeding organisms which may impact on the dung degradation.

Doramectin is very toxic to aquatic organisms and may accumulate in sediments.

6 PHARMACEUTICAL PARTICULARS

6.1 List of excipients

*Ethyl Oleate
*Sesame oil

* contain Butylahydroxyanisole

6.2 Incompatibilities

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

6.3 Shelf-life

Shelf life of the veterinary medicinal product as packaged for sale :3 years
Shelf life after first opening the immediate container : 3 months

6.4 Special precautions for storage

Do not store above 30^0C.
Do not refrigerate or freeze.
Protect from direct sunlight.

6.5 Nature and composition of immediate packaging

Zearl is supplied in 50 ml, 250 ml and 500 ml amber multi-dose Type II or Type III amber glass vials with chlorobutyl rubber stoppers.

Not all pack sizes may be marketed.

6.6 Special precautions for the disposal of unused veterinary medicinal products or waste materials

Extremely dangerous to fish and aquatic life. Zearl should not enter water courses.

Any unused veterinary medicinal product or waste materials derived from the use of such product should be disposed of in accordance with local requirements.

7 MARKETING AUTHORISATION HOLDER

Elanco Animal Health
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Priestly Road
Basingstoke, Hampshire
RG24 9NL
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8 MARKETING AUTHORISATION NUMBER(S)

VPA: 10047/027/001

9 DATE OF THE FIRST AUTHORISATION/RENEWAL OF THE AUTHORISATION

18th October 2009

10 DATE OF REVISION OF THE TEXT

March 2014