SUMMARY OF PRODUCT CHARACTERISTICS

1. Name of the veterinary medicinal product

ZERMEX 1 mg/ml Oral Solution for Sheep
(UK: MOXIGRO 1 mg/ml Oral Solution for Sheep)

2. Qualitative and quantitative composition

Each ml contains

Active substance	
Moxidectin	1.00 mg
Excipients	
Benzyl Alcohol (E1519)	40.00 mg
Butylated Hydroxytoluene	2.50 mg
Disodium Edetate	0.27 mg

For a full list of excipients, see section 6.1

3. Pharmaceutical form

Oral solution
Pale yellow solution

4. Clinical particulars

4.1. Target species

Sheep

4.2. Indications for use, specifying the target species

Infections of sheep with parasites sensitive to moxidectin.

For the treatment and prevention of infections caused by:

- Adult and immature gastro-intestinal nematodes
.*Haemonchus contortus* (including inhibited larvae)
.*Ostertagia circumcincta* (including inhibited larvae)
.*Ostertagia trifurcata*
.*Trichostrongylus axei* (including inhibited larvae)
.*Trichostrongylus colubriformis*
.*Trichostrongylus vitrinus*
.*Nematodirus battus*
.*Nematodirus spathiger*
.*Nematodirus filicolis* (adults only)
.*Strongyloides papillosus* (larval stages only)
.*Cooperia curticei* (adults only)
.*Cooperia oncoaphora*
.*Oesophagostomum columbianum*

.*Oesophagostomum venulosym* (adults only)
.*Chabertia ovina*
.*Trichuris ovis* (adults only)
- Adult respiratory tract nematode
.*Dictyocaulus filaria*

The product has a persistent effect in preventing reinfection:
.for 5 weeks *by Ostertagia* circumcincta and *Haemonchus contortus*
.for 4 weeks *by Oesophagostomum columbianum*

Clinical trials, after experimental and natural infection, have shown that the product is effective against certain benzimidazole resistant strains of:
.*Haemonchus contortus*
.*Ostertagia circumcincta*
.*Trichostrongylus colubriformis*
.*Cooperia curticei*

4.3. Contraindications

None

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 body weight, misadministration of the product, or lack of calibration of the dosing device (if any).
  - 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 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.

- Resistance to macrocyclic lactones has been reported in *Teladorsagia* in sheep in a number of countries. In 2008, throughout Europe, moxidectin resistance is very rare; it has been reported in a single case involving a levamisole-, benzimidazole and ivermectin-resistant strain of *Teladorsagia circumcincta*. Therefore the use of this product should be based on local (regional, farm) epidemiological information about susceptibility of parasites, local history of treatments and recommendations on how to use the product under sustainable conditions to limit further selection for resistance to antiparasitic compounds. These precautions are especially important when moxidectin is being used to control resistant strains.

4.5. Special precautions for use

i) Special precautions for use in animals

None known.

ii) Special precautions to be taken by the person administering the medicinal products to animals

- Avoid direct contact with skin and eyes.
- Wash hands after use.
- Do not smoke or eat when using this product.
- Wear impermeable rubber gloves during use.

iii) Other precautions

4.6. Adverse reactions (frequency and seriousness)

None known.

4.7. Use during pregnancy, lactation or lay

Moxidectin has been shown to be safe for use in pregnant, lactating and breeding animals.

4.8. Interaction with other medicinal products and other forms of interaction

The effects of GABA agonists are increased by moxidectin

4.9. Amount(s) to be administered and administration route

Should be given as a single oral drench of 1 ml/5 kg live bodyweight, equivalent to 200 µg moxidectin/kg live bodyweight, using any standard drenching equipment.
To ensure administration of a correct dosage, body weight should be determined as accurately as possible; accuracy of the dosing should be checked. Do not mix with other products.

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

Symptoms generally do not occur at less than 5 times the recommended dose. They are manifested as transient salivation, depression, drowsiness and ataxia 8 to 12 hours post-treatment. Treatment is not generally necessary and recovery is generally complete within 24 to 48 hours. There is no specific antidote.

4.11. Withdrawal period(s)

Meat and offal: 14 days.

Milk: 5 days.

5. Pharmacological properties

Pharmacotherapeutic group: Endectocides (milbemycins)
ATC Vet code: QP54AB02

5.1. Pharmacodynamic properties

Moxidectin is a parasiticide active against a wide range of economically important internal and external parasites and is a second generation macrocyclic lactone of the milbemycin family. Its principal mode of action is interfering with neuromuscular transmission of the GABA (gamma amino butyric acid)-gated or glutamate-gated chloride channels.
Moxidectin stimulates the release of GABA and increases its binding to the postsynaptic receptors. The net effect is to open the chloride channels on the postsynaptic junction to allow the inflow of chloride ions and induce an irreversible resting state. This results in flaccid paralysis and eventual death of parasites exposed to the drug

5.2. Pharmacokinetic particulars

22% of an oral dose of moxidectin is absorbed with maximum blood concentrations being achieved 9 hours post treatment. The drug is distributed throughout the body tissues but due to its lipophilicity the target tissue is fat where concentrations are 10 to 20 times higher than those found in other tissues. The depletion half life in fat is 23-28 days.
Moxidectin undergoes limited biotransformation by hydroxylation. The only significant route of excretion is the faeces.

6. Pharmaceutical particulars

6.1. List of excipients

Benzyl Alcohol (E1519)
Butylated Hydroxytoluene
Disodium Edetate
Polysorbate 80
Propylene glycol
Dibasic sodium phosphate dodecahydrate
Monobasic sodium phosphate dihydrate
Purified water
Phosphoric acid (for pH adjustment)
Sodium hydroxide (for pH adjustment)

6.2. Incompatibilities

Not to be mixed with other Veterinary Medicinal Products before administration

6.3. Shelf-life

Shelf life of the veterinary medicinal product as packaged for sale: 2 years
Shelf life after the first opening of the immediate packaging: 6 months

6.4. Special precautions for storage

Protect from light.
Do not store above 25^0C.

6.5. Nature and composition of immediate packaging

1 litre HDPE jerrycan with white polypropylene cap (screw fit)
2.5 and 5.0 litre LDPE flexipacks with green polypropylene cap (screw fit)
Secondary pack: fibreboard carton containing 1 x 1 litre, 1 x 2.5 litre and 1 x 5 litre.
Not all pack sizes may be marketed.

6.6. Special precautions for the disposal of unused veterinary medicinal product or waste materials derived from the use of such products, if appropriate

DANGEROUS to fish and aquatic life.
Do not contaminate ponds, waterways or ditches with the product or used containers.
Any unused veterinary medicinal product or waste material derived from such veterinary medicinal product should be disposed of in accordance with local requirements.

7. Marketing authorisation holder

Zoetis UK Limited
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8. Marketing authorisation number

Vm 42058/4185

9. Date of first authorisation

04 November 2014

10. Date of revision of the text

November 2014

Approved: **04/11/2014**