Summary of Product Characteristics

1 NAME OF THE VETERINARY MEDICINAL PRODUCT

Marbokem 100 mg/ml solution for injection.

2 QUALITATIVE AND QUANTITATIVE COMPOSITION

Each ml contains:

Active substance:
Marbofloxacin ..... 100.0 mg

For a full list of excipients, see section 6.1.

3 PHARMACEUTICAL FORM

Solution for injection.
Clear yellow solution.

4 CLINICAL PARTICULARS

4.1 Target Species

Cattle.

4.2 Indications for use, specifying the target species

Treatment of respiratory infections caused by sensitive strains of *Pasteurella multocida*, *Mannheimia haemolytica* and *Histophilus somni*.

4.3 Contraindications

Do not use in animals with known hypersensitivity to fluoroquinolones.
Do not use in cases where the pathogen involved is resistant to other fluoroquinolones (cross resistance).

4.4 Special warnings for each target species

None.

4.5 Special precautions for use

Special precautions for use in animals
Official and local antimicrobial policies should be taken into account when the product is used. Fluoroquinolones should be reserved for the treatment of clinical conditions which have responded poorly, or are expected to respond poorly, to other classes of antimicrobials.
Whenever possible, fluoroquinolones should only be used based on susceptibility testing.
Use of the product deviating from the instructions given in the SPC may increase the prevalence of bacteria resistant to the fluoroquinolones and may decrease the effectiveness of treatment with other quinolones due to the potential for cross resistance.

Special precautions to be taken by the person administering the veterinary medicinal product to animals
People with known hypersensitivity to quinolones should avoid any contact with the product.
If the product comes into contact with the skin or eyes, rinse with copious amounts of water.
Accidental self-injection can induce a slight irritation.

4.6 Adverse reactions (frequency and seriousness)

Fluoroquinolones are known to induce arthropathies. Nevertheless, this effect has never been observed with marbofloxacin in cattle.
Administration by the intramuscular route may cause transient local reactions such as pain at the injection site and slight muscular inflammatory lesions (resulting in fibrosis). The process of cicatrisation starts rapidly (varying from fibrosis to synthesis of extracellular matrix and collagen) and may persist for at least 15 days after injection.
No other adverse injection site effects have been observed in cattle.

4.7 Use during pregnancy, lactation or lay

Studies in laboratory animals (rats, rabbits) did not show any evidence of a teratogenic, embryotoxic or maternotoxic effect associated with the use of marbofloxacin. Safety of the product at 8 mg/kg has not been determined in pregnant cows or in suckling calves when used in cows. Use therefore according to the benefit/risk assessment carried out by the responsible veterinarian.

4.8 Interaction with other medicinal products and other forms of interaction

None known.

4.9 Amounts to be administered and administration route

Intramuscular use.
The recommended dosage is 8 mg/kg bodyweight i.e. 2 ml/25 kg bodyweight in a single intramuscular injection.
If the volume to be injected is more than 20 ml, it should be divided between two or more injection sites.

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

No sign of overdosage has been observed after administration of 3 times the recommended dose. Overdosage may cause signs such as acute neurological disorders which should be treated symptomatically.

4.11 Withdrawal Period(s)

Meat and offal: 3 days
Milk : 72 hours

5 PHARMACOLOGICAL or IMMUNOLOGICAL PROPERTIES

Pharmacotherapeutic group: Anti-infectives for systemic use
ATCvet code: QJ01MA93

5.1 Pharmacodynamic properties

Marbofloxacin is a synthetic, bactericidal antimicrobial, belonging to the fluoroquinolone group, which acts by inhibition of DNA gyrase. It has a broad-spectrum activity *in vitro* against mycoplasma, Gram-positive and Gram-negative bacteria.
The marbofloxacin *in vitro* activity against pathogens isolated between 2004 and 2007 from bovine respiratory diseases in Europe (France, Germany, Italy, UK, Czech Republic, Ireland and Belgium) is good: MIC values are between 0.004 and 1 µg/ml for *Pasteurella multocida* (MIC_{90}= 0.06 µg/ml; MIC_{50}= 0.01 µg/ml), between 0.015 and 0.5 µg/ml for *Mannheimia haemolytica* (MIC_{90}= 0.10 µg/ml; MIC_{50}= 0.03 µg/ml), and between 0.008 and 0.06 µg/ml for *Histophilus* somni (MIC_{90}= 0.05 µg/ml; MIC_{50}= 0.03 µg/ml).
Strains with MIC $\leq$ 1 µg/ml are sensitive to marbofloxacin whereas strains with MIC $\geq$ 4 µg/ml are resistant to marbofloxacin.
Resistance to fluoroquinolones occurs by chromosomal mutation with three mechanisms: decrease of the bacterial wall permeability, expression of efflux pump or mutation of enzymes responsible for molecule binding.

5.2 Pharmacokinetic properties

After a single intramuscular administration in cattle at the recommended dose of 8 mg/kg, the maximum plasma concentration of marbofloxacin (Cmax) is 8 µg/ml reached in approximately 1 hour (Tmax). Binding to plasma proteins is about 30%. Marbofloxacin is eliminated slowly
(terminal T1/2 = 9.5 h), predominantly in the active form in urine and faeces.

6 PHARMACEUTICAL PARTICULARS

6.1 List of excipients

Glucono-delta-lactone.
Water for injections.

6.2 Incompatibilities

In the absence of compatibility 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 packaging: 28 days.

6.4 Special precautions for storage

Keep the container in the outer carton in order to protect from light.

6.5 Nature and composition of immediate packaging

Primary packaging:
Amber PP/Ethylene vinyl alcohol/PP multi-layer plastic vials.
Type II chlorobutyl rubber stopper

Pack size
Cardboard box containing one 50 ml vial
Cardboard box containing one 100 ml vial
Cardboard box containing one 250 ml vial
Cardboard box containing one 500 ml vial

Not all pack sizes may be marketed.

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

Any unused product or waste materials should be disposed of in accordance with national requirements.

7 MARKETING AUTHORISATION HOLDER

Ceva Sante Animale,
10 avenue de la Ballastiere
33500 Libourne,
France

8 MARKETING AUTHORISATION NUMBER(S)

VPA 10815/011/001

9 DATE OF THE FIRST AUTHORISATION/RENEWAL OF THE AUTHORISATION

19th February 2010

10 DATE OF REVISION OF THE TEXT