

SUMMARY OF PRODUCT CHARACTERISTICS

1. NAME OF THE VETERINARY MEDICINAL PRODUCT

Quiflor 20 mg/ml solution for injection for cattle, pigs and dogs [AT, BE, DK, DE, ES, GR, IT, NL, PT, UK]

Quiflox 20 mg/ml solution for injection for cattle, pigs and dogs [CZ, HU, LT, LV, SK]

2. QUALITATIVE AND QUANTITATIVE COMPOSITION

Each ml of solution for injection contains:

Active substance:

Marbofloxacin 20 mg

Excipients:

Metacresol 2 mg

Disodium edetate 0.10 mg

Monothioglycerol 0.50 mg

For the full list of excipients, see section 6.1.

3. PHARMACEUTICAL FORM

Solution for injection.

Clear, greenish yellow to brownish yellow solution.

4. CLINICAL PARTICULARS

4.1 Target species

Cattle (pre-ruminant calves up to 100 kg b.w).

Pigs.

Dogs.

4.2 Indications for use, specifying the target species

Cattle (pre-ruminant calves up to 100 kg b.w)

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

Fattening pigs

Treatment of respiratory infections caused by sensitive strains of *Actinobacillus pleuropneumoniae*, *Pasteurella multocida* and *Mycoplasma hyopneumoniae*.

Dogs

Treatment of infected wounds (including drained subcutaneous abscesses) due to *Escherichia coli*, *Pasteurella* sp. and *Pseudomonas* sp.

Treatment of lower or urinary tract infections due to *Escherichia coli* and *Proteus* sp.

The veterinary medicinal product should only be used based on susceptibility testing.

4.3 Contraindications

Do not administer in animals with known hypersensitivity to marbofloxacin or any other quinolone or to any of the excipients.

Marbofloxacin should not be used in dogs aged less than 12 months or less than 18 months for exceptionally large breeds of dogs, such as Great Danes or mastiffs with a longer growth period.

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

4.4 Special warnings for each target species

A low urinary pH could have an inhibitory effect on the activity of marbofloxacin.

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.

The fluoroquinolones have been shown to induce erosion of articular cartilage in juvenile dogs and care should be taken to dose accurately especially in young animals.

The fluoroquinolones are also known for their potential neurological side effects. Cautious use is recommended in dogs diagnosed as suffering from epilepsy.

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

People with known hypersensitivity to (fluoro)quinolones should avoid contact with the veterinary medicinal product.

Avoid contact of the skin and eyes with the product. In case of accidental spillage onto skin or eyes, rinse the affected area with large amounts of water.

Avoid accidental self-injection, since this can cause local irritation. In case of self-injection or ingestion, seek medical advice immediately and show the package leaflet or the label to the physician.

Wash hands after use.

4.6 Adverse reactions (frequency and seriousness)

In calves and pigs, administration by subcutaneous and intramuscular route may induce transitory oedema. Administration by the intramuscular route may cause pain reaction and inflammatory lesions at the site of injection. Inflammatory lesions persist 6 days in pigs and 12 days in calves.

4.7 Use during pregnancy, lactation or lay

Studies carried out with laboratory animals showed no embryotoxic, foetotoxic or teratogenic effects.

May be used in pregnant and lactating cows and sows.

No specific studies have been carried out on pregnant bitches. In pregnant and lactating bitches, use only according to the benefit/risk assessment by the responsible veterinarian.

4.8 Interaction with other medicinal products and other forms of interaction

Concomitant administration of theophylline requires careful monitoring as serum levels of theophylline may increase. Fluoroquinolones may reduce the metabolism and exacerbate the nephrotoxicity of cyclosporine.

Fluoroquinolones may be used concurrently with tolfemic acid. In the absence of studies with other non-steroidal anti-inflammatory drugs, interactions cannot be excluded.

4.9 Amounts to be administered and administration route

Cattle:

The recommended dosage is 2 mg/kg/day (1 ml/10 kg) in a single daily injection by intramuscular or subcutaneous route (the first injection may also be given by intravenous route), for 3 to 5 days.

Pigs:

The recommended dosage is 2 mg/kg/day (1 ml/10 kg) by a single daily intramuscular injection, for 3-5 days.

Dogs:

Treatment of infected wounds (including drained subcutaneous abscesses): 2 mg/kg (1 ml/10 kg) by a single subcutaneous or intravenous injection on the first day of treatment, followed the next day by oral administration of marbofloxacin tablets once daily at a dosage of 2 mg/kg for 6 days.

Treatment of infections of lower urinary tract: 2 mg/kg (1 ml/10 kg) by a single subcutaneous or intravenous injection on the first day of treatment, followed the next day by oral administration of marbofloxacin tablets once daily at a dosage of 2 mg/kg for at least 10 days and up to 28 days.

To ensure administration of a correct dose, body weight should be determined as accurately as possible, to avoid underdosing.

The dose volume given at one injection site should not exceed 6 ml in calves and 3 ml in pigs.

In small dogs, a tuberculin or insulin syringe may be used to accurately dose the product.

In order to reduce the risk of particulate contamination of the product, it is recommended that a draw-off needle be used to reduce the number of times the septum is punctured.

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

In cattle and pigs, no sign of overdose has been observed after administration of 3 times the recommended dose.

Overdose may cause acute signs in the form of neurological disorders, hypersalivation or trembling which should be treated symptomatically.

In dogs, after subcutaneous administration, no undesirable effect is observed up to 2 times the maximum recommended dose. After intravenous administration of 4 mg/kg rare mild and transitory side effects like ptyalism (excess salivation), nervous disorders (vocalization, excitation) and trembling (myoclonia) have been reported in and dogs, which should be treated symptomatically.

4.11 Withdrawal period(s)

Cattle (Pre-ruminant calves up to 100 kg body weight):

Meat and offal: 6 days

Pigs:

Meat and offal: 4 days

5. PHARMACOLOGICAL PROPERTIES

Pharmacotherapeutic group: Antibacterials for systemic use, Fluoroquinolones, 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. Its bactericidal mode of action is predominantly concentration-dependent. It is effective against a wide range of Gram positive bacteria (in particular Staphylococci) and Gram negative bacteria (*Actinobacillus pleuropneumoniae*, *Bordetella bronchiseptica*, *Brucella canis*, *Campylobacter jejuni*, *Citrobacter*, *Enterobacter*, *Escherichia coli*, *Haemophilus* spp., *Histophilus* spp., *Klebsiella* spp., *Mannheimia haemolytica*, *Moraxella* spp., *Morganella morganii*, *Pasteurella multocida*, *Proteus* spp., *Pseudomonas aeruginosa*, *Salmonella typhimurium*, *Serratia marcescens*, *Shigella* spp.) as well as Mycoplasma (*Mycoplasma bovis*, *Mycoplasma dispar*, *Mycoplasma hyopneumoniae*). Marbofloxacin is inactive against anaerobic bacteria.

Susceptibility break points for aerobic pathogenic Gram positive and negative bacteria have been determined as ≤ 1 $\mu\text{g/ml}$ for sensitive, 2 $\mu\text{g/ml}$ for intermediate and ≥ 4 $\mu\text{g/ml}$ for resistant bacterial strains.

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. Cross-resistance of marbofloxacin with other (fluoro)quinolones can occur.

5.2 Pharmacokinetic particulars

After subcutaneous administration in cattle, pigs and dogs at the recommended dose of 2 mg/kg, marbofloxacin is readily absorbed and its bioavailability is close to 100%. In dogs, after subcutaneous administration of 2mg/kg, the maximum plasma concentration achieved is 1.0 $\mu\text{g/ml}$ and IV administration results in a similar pharmacokinetic profile for Area Under the Time Curve (AUC) and elimination ($T_{1/2}$) values. Marbofloxacin is weakly bound to plasma proteins (less than 10% in pigs and dogs, and 30% in cattle), extensively distributed and in most tissues (liver, kidney, skin, lung, bladder, uterus, digestive tract) it achieves higher concentrations than in plasma.

In cattle, marbofloxacin is eliminated slowly in pre-ruminating calves ($t_{1/2 \beta} = 5-9$ h) predominantly in the active form in urine (3/4) and faeces (1/4).

In pigs, marbofloxacin is eliminated slowly ($t_{1/2 \beta} = 8-10$ h) predominantly in the active form in urine (2/3) and faeces (1/3).

In dogs, marbofloxacin is slowly eliminated with an elimination half-life of approximately 11 hours, mainly in the active form in urine (2/3), and faeces (1/3).

6. PHARMACEUTICAL PARTICULARS

6.1 List of excipients

Metacresol
Disodium edetate
Monothioglycerol
Gluconolactone
Mannitol
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

Store in the original package in order to protect from light.
Do not freeze.

6.5 Nature and composition of immediate packaging

Bottle (amber glass type II), bromobutyl rubber stopper, aluminium closure: 20 ml solution for injection, in a box.

Bottle (amber glass type II), bromobutyl rubber stopper, aluminium closure: 50 ml solution for injection, in a box.

Bottle (amber glass type II), bromobutyl rubber stopper, aluminium closure: 100 ml solution for injection, in a box.

Bottle (amber glass. type II), bromobutyl rubber stopper, aluminium closure: 250 ml solution for injection, in a box.

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

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

7. MARKETING AUTHORISATION HOLDER

8. MARKETING AUTHORISATION NUMBER

9. DATE OF FIRST AUTHORISATION

10. DATE OF REVISION OF THE TEXT

June 2016

PROHIBITION OF SALE, SUPPLY AND/OR USE

Veterinary prescription.

Approved: 03 June 2016

