1. NAME OF THE VETERINARY MEDICINAL PRODUCT

Marbosyva 100 mg/ml solution for injection for cattle and pigs

2. QUALITATIVE AND QUANTITATIVE COMPOSITION

Each ml contains:

Active substance:

Marbofloxacin ..... 100 mg

Excipients:

Qualitative composition of excipients and other constituents	**Quantitative composition if that information is essential for proper administration of the veterinary medicinal product**
Metacresol	2 mg
Monothioglycerol	1 mg
Disodium edetate	0.1 mg
Gluconolactone	
Water for injections	

Clear, yellowish solution

3. CLINICAL INFORMATION

3.1 Target species

Cattle and pigs (sows).

3.2 Indications for use for each target species

In cattle:

- Treatment of respiratory infections caused by marbofloxacin-susceptible strains of *Histophilus somni*, *Mannheimia haemolytica*, *Pasteurella multocida* and *Mycoplasma bovis*.

- Treatment of acute forms of mastitis induced by marbofloxacin-*susceptible Escherichia coli* strains, during lactation.

In pigs (sows):

- Treatment of Postpartum Dysgalactiae Syndrome, PDS (Metritis Mastitis Agalactia Syndrome) caused by marbofloxacin-susceptible bacterial strains.

3.3 Contraindications

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

Do not use in cases of hypersensitivity to the active substance, to any other quinolone or to any of the excipients.

3.4 Special warnings

None.

3.5 Special precautions for use

Special precautions for safe use in the target species:

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 efficacy data showed that the product has insufficient efficacy for the treatment of acute forms of mastitis induced by gram-positive bacteria.

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.

Care should be taken to avoid accidental self-injection, it can induce a slight irritation.

In case of accidental self-injection, seek medical advice immediately and show the package leaflet or the label to the physician.

In case of contact with skin or eyes, rinse with plenty of water.

Wash hands after use.

Special precautions for the protection of the environment:

Not applicable.

3.6 Adverse events

Cattle and pigs:

Very rare (<1 animal / 10,000 animals treated, including isolated reports):	Injection site lesion[1,2] Injection site reactions (such as pain and swelling)[2]

[1] Inflammatory lesions following subcutaneous administration.
[2] Following intramuscular administration, may persist for at least 12 days after injection..

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, foetotoxic or maternotoxic effects.

Safety of the veterinary medicinal product at 2 mg marbofloxacin/kg body weight has been established in pregnant cows and in sucking calves and piglets when used in cows and sows.

Can be used during pregnancy and lactation

Safety of the veterinary medicinal product at 8 mg marbofloxacin/kg body weight has not been established in pregnant cows or in sucking calves when used in cows. Therefore, this dose regimen should be used only according to the benefit/risk assessment by the responsible veterinarian.

3.8 Interaction with other medicinal products and other forms of interaction

None known.

3.9 Administration routes and dosage

Cattle:

In cattle, the subcutaneous route was shown to be better tolerated locally than the intramuscular route. Therefore, the subcutaneous route is recommended in heavy cattle.

Respiratory infections:

The recommended dosage is 8 mg marbofloxacin/kg body weight (2 ml veterinary medicinal product/25 kg body weight) in a single injection by the intramuscular route. If the volume to be injected is more than 20 ml, it should be divided between two or more injection sites.

In cases of respiratory infections caused by *Mycoplasma bovis*, the recommended dose is 2 mg marbofloxacin/kg body weight (1 ml veterinary medicinal product/50 kg body weight), in a single daily injection for 3 to 5 consecutive days, by the intramuscular or subcutaneous route. The first injection may be given by the intravenous route.

Acute mastitis:

The recommended dosage is 2 mg marbofloxacin/kg body weight (1 ml veterinary medicinal product/50 kg body weight) in a single daily injection, by the subcutaneous or intramuscular route, for 3 consecutive days. The first injection may be given by the intravenous route.

Pigs (sows):

The recommended dosage is 2 mg marbofloxacin/kg bodyweight (1 ml veterinary medicinal product/50 kg body weight) in a single daily injection by the intramuscular route, for 3 consecutive days.

In cattle and pigs, the preferred injection site is the neck area.

To ensure a correct dosage bodyweight should be determined as accurately as possible to avoid underdosing.

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.

As the vial cannot be broached more than 50 times, the user should choose the most appropriate vial size according to the target species to treat.

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

No sign of overdosage has been observed with the product after administration of 3 times the recommended dose.

Signs such as neurological disorders may occur when the dose is exceeded. Do not exceed the recommended dose. These signs would have to be treated symptomatically.

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:

Indication	**Respiratory**		**Mastitis**
Dosage	2 mg/kg for 3 to 5 days (IV/IM/SC)	8 mg/kg on a single occasion (IM)	2mg/kg for 3 days (IV/IM/SC)
Meat and offal	6 days	3 days	6 days
Milk	36 hours	72 hours	36 hours

Pigs:
Meat and offal: 4 days

4. PHARMACOLOGICAL INFORMATION

4.1 ATCvet code: QJ01MA93.

4.2 Pharmacodynamics

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 Gram-positive bacteria (in particular *Staphylococcus*), against Gram-negative bacteria (*E. coli*, *Histophilus somni*, *Mannheimia haemolytica* and *Pasteurella multocida*) and against *Mycoplasma* (*Mycoplasma bovis*). Resistance to *Streptococcus* may occur.

Strains with MIC $\leq$ 1 µg/ml are susceptible 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.

4.3 Pharmacokinetics

After subcutaneous or intramuscular administration in cattle and intramuscular administration in pigs at the recommended dose of 2 mg/kg bodyweight, marbofloxacin is readily absorbed and reaches maximal plasma concentrations of 1.5 µg/ml within less than 1 hour. Its bioavailability is close to 100%.

It is weakly bound to plasma proteins (less than 10% in pigs, and 30% in cattle), extensively distributed and in most tissues (liver, kidney, skin, lung, bladder, uterus, digestive tract) it achieves a higher concentration than in plasma.

In cattle, marbofloxacin is eliminated slowly in pre-ruminating calves ($t_{½}\beta$ = 5-9 h) but faster in ruminant cattle ($t_{½}\beta$ = 4-7 h) predominantly in the active form in urine (3/4 in pre-ruminating calves, ½ in ruminants) and faeces (1/4 in pre-ruminating calves, ½ in ruminants).

After a single intramuscular administration in cattle at the recommended dose of 8 mg/kg body weight, the maximum plasma concentration of marbofloxacin (C_{max}) is 7.3 µg/ml reached in 0.78 hours (t_{max}). Marbofloxacin is eliminated slowly ($t_{1/2}$ terminal = 15.60 hours).

In pigs, marbofloxacin is eliminated slowly ($t_{½}\beta$ = 8-10 h) predominantly in the active form in urine (2/3) and faeces (1/3).

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: 28 days.

5.3 Special precautions for storage

Do not freeze.

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

5.4 Nature and composition of immediate packaging

Cardboard box containing one Type II amber glass vial of 50 ml, 100 ml or 250 ml, with a Type I bromobutyl rubber stopper and an aluminium cap.

Pack sizes:

Cardboard box containing 1 vial of 50 ml.

Cardboard box containing 1 vial of 100 ml.

Cardboard box containing 1 vial of 250 ml.

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.

6. NAME OF THE MARKETING AUTHORISATION HOLDER

Laboratorios SYVA, S.A.

7. MARKETING AUTHORISATION NUMBER(S)

VPA10495/003/001

8. DATE OF FIRST AUTHORISATION

24/10/2012

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

22/02/2024

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).