1. NAME OF THE VETERINARY MEDICINAL PRODUCT

Valemas 50 mg/ml solution for injection for cattle, sheep, goats, pigs, dogs and cats.

2. QUALITATIVE AND QUANTITATIVE COMPOSITION

Each ml contains:

Actives substances:
Enrofloxacin 50 mg

Excipients:

Qualitative composition of excipients and other constituents	**Quantitative composition if that information is essential for proper administration of the veterinary medicinal product**
n-Butyl alcohol	30 mg
Potassium hydroxide (for pH adjustment)	
Hydrochloric acid, dilute (for pH adjustment)	
Water for injections	

Clear, pale yellow to yellow solution.

3. CLINICAL INFORMATION

3.1 Target species

Cattle (calves), sheep, goats, pigs, dogs and cats.

3.2 Indications for use for each target species

Calves
Treatment of infections of the respiratory tract caused by enrofloxacin susceptible strains of *Pasteurella multocida*, *Mannheimia haemolytica* and *Mycoplasma* spp.
Treatment of infections of the alimentary tract caused by enrofloxacin susceptible strains of *Escherichia coli*.
Treatment of septicaemia caused by enrofloxacin susceptible strains of *Escherichia coli*.
Treatment of acute mycoplasma-associated arthritis due to enrofloxacin susceptible strains of *Mycoplasma bovis*.

Sheep
Treatment of infections of the alimentary tract caused by enrofloxacin susceptible strains of *Escherichia coli*.
Treatment of septicaemia caused by enrofloxacin susceptible strains of *Escherichia coli*.
Treatment of mastitis caused by enrofloxacin susceptible strains of *Staphylococcus aureus* and *Escherichia coli*.

Goats
Treatment of infections of the respiratory tract caused by enrofloxacin susceptible strains of *Pasteurella multocida* and *Mannheimia haemolytica*.
Treatment of infections of the alimentary tract caused by enrofloxacin susceptible strains of *Escherichia coli.*
Treatment of septicaemia caused by enrofloxacin susceptible strains of *Escherichia coli*.
Treatment of mastitis caused by enrofloxacin susceptible strains of *Staphylococcus aureus* and *Escherichia coli.*

Pigs
Treatment of infections of the respiratory tract caused by enrofloxacin susceptible strains of *Pasteurella multocida*, *Mycoplasma* spp. and *Actinobacillus pleuropneumoniae.*
Treatment of infections of the alimentary tract caused by enrofloxacin susceptible strains of *Escherichia coli.*
Treatment of septicaemia caused by enrofloxacin susceptible strains of *Escherichia coli.*

Dogs
Treatment of infections of the alimentary, respiratory and urogenital tracts (including prostatitis, adjunctive antibiotic therapy for pyometra), skin and wound infections, otitis (externa/media) caused by enrofloxacin susceptible strains of *Staphylococcus* spp., *Escherichia coli*, *Pasteurella* spp., *Klebsiella s*pp., *Bordetella s*pp., *Pseudomonas* spp. and *Proteus* spp.

Cats
Treatment of infections of the alimentary, respiratory and urogenital tracts (as adjunctive antibiotic therapy for pyometra), skin and wound infections, caused by enrofloxacin susceptible strains of, e.g.: *Staphylococcus* spp., *Escherichia coli*, *Pasteurella* spp., *Klebsiella* spp., *Bordetella* spp., *Pseudomonas* spp. and *Proteus* spp.

3.3 Contraindications

Do not use in cases of hypersensitivity to the active substance, to other fluoroquinolones or to any of the excipients.
Do not use in animals that are epileptic or suffer from seizures since enrofloxacin may cause CNS stimulation.
Do not use in young dogs during their growth, i.e. in small breeds of dogs less than 8 months of age, in big breeds of dogs less than 12 months of age, in giant breeds of dogs less than 18 months of age.
Do not use in cats less than 8 weeks of age.
Do not use in growing horses because of possible deleterious damage on articular cartilage.

3.4 Special warnings

Cross-resistance has been shown between enrofloxacin and other fluoroquinolones in target pathogens, e.g. *Escherichia coli*. Use of the veterinary medicinal product should be carefully considered when susceptibility testing has shown resistance to fluoroquinolones because its effectiveness may be reduced.
A high resistance rate of *Pseudomonas* spp. to enrofloxacin (in some cases, higher than 90%) has been reported in dogs in Europe. Enrofloxacin should only be used for treatment of infections caused by this pathogen following susceptibility testing.

3.5 Special precautions for use

Special precautions for safe use in the target species:
Use of the veterinary medicinal product should be based on identification and susceptibility testing of the target pathogen(s). If this is not possible, therapy should be based on epidemiological information and knowledge of susceptibility of the target pathogens at farm level, or at local/regional level. Use of the veterinary medicinal product should be in accordance with official, national and regional antimicrobial policies.

An antibiotic with a lower risk of antimicrobial resistance selection (lower AMEG category) should be used for first line treatment where susceptibility testing suggests the likely efficacy of this approach. Narrow spectrum antibiotic therapy with a lower risk of antimicrobial resistance selection should be used for first line treatment where susceptibility testing suggests the likely efficacy of this approach

The veterinary medicinal product should only be used in individual animals.

Use of the veterinary medicinal product including use deviating from the instructions given in the SPC may increase the prevalence of bacteria resistant to enrofloxacin and may decrease the effectiveness of treatment with all fluoroquinolones due to the potential for cross-resistance.

Special caution should be taken when using enrofloxacin in animals with impaired renal function.
Special caution should be taken when using enrofloxacin in cats because higher doses than recommended can cause retinal damage and blindness (see section 3.10).
Degenerative changes of articular cartilage were observed in calves treated orally with 30 mg enrofloxacin/kg body weight during 14 days.
The use of enrofloxacin in growing lambs at the recommended dose for 15 days caused histological changes in the articular cartilage, not associated to clinical signs.

Not for use for prophylaxis.

Special precautions to be taken by the person administering the veterinary medicinal product to animals:
People with known hypersensitivity to fluoroquinolones, such as enrofloxacin, should avoid any contact with the veterinary medicinal product.
The veterinary medicinal product may cause skin and eye irritation. Avoid skin and eye contact. Wash any splashes from skin or eyes immediately with water.
Do not eat, drink or smoke whilst handling the veterinary medicinal product.
Care should be taken to avoid accidental self-injection. In case of accidental self-injection seek medical advice immediately and show the package leaflet or label to the physician.
Wash hands after use.

Special precautions for the protection of the environment:
Not applicable.

Other precautions:
In countries where feeding of fallen stock to scavenger bird populations is permitted as a conservation measure (see Commission Decision 2003/322/EC), the possible risk to hatching success should be considered before feeding carcasses of livestock recently treated with this veterinary medicinal product.

3.6 Adverse events

Cattle (calves), sheep, goats, pigs, dogs and cats:

Very rare (<1 animal / 10 000 animals treated, including isolated reports):	Injection site reaction[1] (e.g. oedema[2]) Digestive tract disorders (e.g. diarrhoea)[3]
Undetermined frequency (cannot be estimated from the available data)	Injection site inflammation[4]

[1] In calves, may be observed up to 14 days.
[2] In dogs, moderate and transient.
[3] Mild and transient.
[4] In pigs, after intramuscular administration may persist up to 28 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:
The safety of the veterinary medicinal product has not been established during pregnancy and lactation.
Use only according to the benefit-risk assessment by the responsible veterinarian.
Laboratory studies in rats and rabbits have not produced any evidence of teratogenic effects.
Laboratory studies in rats and rabbits have shown evidence of foetotoxic effects at maternotoxic doses.

3.8 Interaction with other medicinal products and other forms of interaction

Do not use enrofloxacin concomitantly with antimicrobial substances acting antagonistically to quinolones (e.g. macrolides, tetracyclines or phenicols).
Do not use concurrently with theophylline as the elimination of theophylline may be delayed.
Care should be taken during the concomitant use of flunixin and enrofloxacin in dogs to avoid adverse drug reactions. The decrease in drug clearances as a result of co-administration of flunixin and enrofloxacin indicates that these substances interact during the elimination phase. Thus, in dogs, the co-administration of enrofloxacin and flunixin increased the AUC and the elimination half-life of flunixin and increased the elimination half-life and reduced the C_{max} of enrofloxacin.

3.9 Administration routes and dosage

Intravenous (**i.v.**), subcutaneous (**s.c.**) or intramuscular (**i.m.**) use.
Repeated injections should be made at different injection sites.
To ensure a correct dosage, body weight (bw) should be determined as accurately as possible.

Calves:
5 mg of enrofloxacin/kg bw, corresponding to 1 ml/10 kg bw, once daily for 3-5 days.
Acute mycoplasma-associated arthritis due to enrofloxacin susceptible strains of *Mycoplasma bovis*: 5 mg of enrofloxacin/kg bw, corresponding to 1 ml/10 kg bw, once daily for 5 days.
The veterinary medicinal product can be administered by slow intravenous or subcutaneous administration.
Not more than 10 ml should be administered at one subcutaneous injection site.

Sheep and goats:
5 mg of enrofloxacin/kg bw, corresponding to 1 ml/10 kg bw, once daily by subcutaneous injection for 3 days.
Not more than 6 ml should be administered at one subcutaneous injection site.

Pigs:
2.5 mg enrofloxacin/ kg bw corresponding to 0.5 ml/10 kg bw once daily by intramuscular injection for 3 days.
Alimentary tract infection or septicaemia caused by *Escherichia coli*: 5 mg of enrofloxacin/kg bw, corresponding to 1 ml/10 kg bw, once daily by intramuscular injection for 3 days.
In pigs, the injection should be made in the neck at the ear base.
Not more than 3 ml should be administered at one intramuscular site.

Dogs and cats:
5 mg enrofloxacin/kg bw corresponding to 1 ml/10 kg bw once daily by subcutaneous injection for up to 5 days.

As the vials should not be broached more than 40 times the user should select the most appropriate vial size according to the target species to be treated.

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

In cases of accidental overdoses digestive tract disorders (e.g. vomiting, diarrhoea) and neurological disorders may occur.
In pigs, no adverse effects were reported after the administration of 5 times the recommended dose.
Cats have been shown to suffer ocular damage after receiving doses of more than 15 mg/kg once daily for 21 consecutive days. Doses of 30 mg/kg given once daily for 21 consecutive days have been shown to cause irreversible ocular damage. At 50 mg/kg given once daily for 21 consecutive days, blindness can occur.
In dogs, cattle, sheep and goats, overdose has not been documented.
In accidental overdose there is no antidote and treatment should be symptomatic.

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

Calves:
Meat and offal: **i.v**.: 5 days.
s.c.: 12 days.
Not authorised for use in cattle producing milk for human consumption.

Sheep:
Meat and offal: **s.c.**: 4 days.
Milk: **s.c.**: 72 hours.

Goats:
Meat and offal: **s.c.**: 6 days.
Milk: **s.c.**: 96 hours.

Pigs:
Meat and offal: **i.m.**: 13 days.

4. PHARMACOLOGICAL INFORMATION

4.1 ATCvet code: QJ01MA90

4.2 Pharmacodynamics

Enrofloxacin is a synthetic, broad spectrum antimicrobial substance, belonging to the fluoroquinolone group of antibiotics.

Mode of action
Two enzymes essential in DNA replication and transcription, DNA gyrase and topoisomerase IV, have been identified as the molecular targets of fluoroquinolones. Target inhibition is caused by non-covalent binding of fluoroquinolone molecules to these enzymes. Replication forks and translational complexes cannot proceed beyond such enzyme-DNA fluoroquinolone complexes, and inhibition of DNA and mRNA synthesis triggers events resulting in a rapid, drug concentration-dependent killing of pathogenic bacteria. The mode of action of enrofloxacin is bactericidal and bactericidal activity is concentration dependent.

Antibacterial spectrum
Enrofloxacin is active against many Gram-negative bacteria such as *Escherichia coli, Klebsiella* spp., *Actinobacillus pleuropneumoniae, Mannheimia haemolytica, Pasteurella* spp. (e.g. *Pasteurella multocida*), *Bordetella* spp., *Proteus* spp., *Pseudomonas* spp., against Gram-positive bacteria such as *Staphylococcus* spp. (e.g. *Staphylococcus aureus*) and against *Mycoplasma* spp. at the recommended therapeutic doses.

Types and mechanisms of resistance
Resistance to fluoroquinolones has been reported to arise from five sources, (i) point mutations in the genes encoding for DNA gyrase and/or topoisomerase IV leading to alterations of the respective enzyme, (ii) alterations of drug permeability in Gram-negative bacteria, (iii) efflux mechanisms, (iv) plasmid mediated resistance and (v) gyrase protecting proteins. All mechanisms lead to a reduced susceptibility of the bacteria to fluoroquinolones. Cross-resistance within the fluoroquinolone class of antimicrobials is common.

MIC clinical breakpoints

Cattle:
Clinical breakpoints established by CLSI[1] in 2024 for enrofloxacin in cattle for bovine respiratory disease are as follows:

Organism	Minimum inhibitory concentration breakpoints of enrofloxacin (µg/ml)		
	susceptible	intermediate	resistant
Mannheimia haemolytica	≤0.25	0.5-1	≥2
Pasteurella multocida	≤0.25	0.5-1	≥2

[1] CLSI. Performance standards for antimicrobial disk and dilution susceptibility tests for bacteria isolated from animals: 7th ed. CLSI supplement Vet01S Clinical and Laboratory Standards Institute

Pig:
Clinical breakpoints established by CLSI[1] in 2024 for enrofloxacin in pigs for porcine respiratory disease are as follows:

Organism	Minimum inhibitory concentration breakpoints of enrofloxacin (µg/ml)		
	susceptible	intermediate	resistant
Actinobacillus pleuropneumoniae	≤0.25	0.5	≥1
Pasteurella multocida	≤0.25	0.5	≥1

[1] CLSI. Performance standards for antimicrobial disk and dilution susceptibility tests for bacteria isolated from animals: 7th ed. CLSI supplement Vet01S Clinical and Laboratory Standards Institute

Dog:
Clinical breakpoints established by CLSI[1] in 2024 for enrofloxacin in dogs for canine respiratory disease, urinary tract, skin and soft tissue infection are as follows:

Organism	Minimum inhibitory concentration breakpoints of enrofloxacin (µg/ml)		
	susceptible	intermediate	resistant
Staphylococcus spp.	≤0.06	-	≥0.5
Pseudomonas aeruginosa	≤0.06	-	≥0.5
Escherichia coli	≤0.06	-	≥0.5
Proteus mirabilis (urinary tract, skin and soft tissue infection)	≤0.06	-	≥0.5
Klebsiella pneumoniae (urinary tract infection)	≤0.06	-	≥0.5

[1] CLSI. Performance standards for antimicrobial disk and dilution susceptibility tests for bacteria isolated from animals: 7th ed. CLSI supplement Vet01S Clinical and Laboratory Standards Institute.

Cat:
Clinical breakpoints established by CLSI[1] in 2024 for enrofloxacin in cats for feline skin and soft tissue infection are as follows:

Organism	Minimum inhibitory concentration breakpoints of enrofloxacin (µg/ml)		
	susceptible	intermediate	resistant
Staphylococcus spp.	≤0.5	1-2	≥4
Escherichia coli	≤0.5	1-2	≥4

[1] CLSI. Performance standards for antimicrobial disk and dilution susceptibility tests for bacteria isolated from animals: 7th ed. CLSI supplement Vet01S Clinical and Laboratory Standards Institute

4.3 Pharmacokinetics

Enrofloxacin is rapidly absorbed after parenteral injection. Bioavailability is high (approximately 100% in pig and cattle) with a low to moderate plasma protein binding (approximately 20 to 50%). Enrofloxacin is metabolized to the active substance ciprofloxacin at approximately 40 % in dogs and ruminants, less than 10 % in pigs and cats.
Enrofloxacin and ciprofloxacin distribute well into all target tissues, e.g. lung, kidney, skin, and liver, reaching 2- to 3-fold higher concentrations than in plasma. Parent substance and active metabolite are cleared from the body via urine and faeces.
Accumulation in plasma does not occur following a treatment interval of 24 h.
In milk, most of drug activity consists on ciprofloxacin. Overall drug concentrations peak at 2 hours after treatment showing an approximately 3-fold higher total exposure over the 24 hours dosing interval compared to plasma.

	Dogs	Cats	Pigs	Pigs	Cattle	Calves
Dose rate (mg/kg bw)	5	5	2.5	5.0	5.0	5.0
Route of administration	**s.c.**	**s.c.**	**i.m.**	**i.m.**	**i.v.**	**s.c.**
T_{max} (h)	0.5	2	2	2	/	1.2
C_{max} (µg/ml)	1.8	1.3	0.7	1.6	/	0.73
AUC (µg·h/ml)	/	/	6.6	15.9	7.11	3.09
Terminal half-life (h)	/	/	13.12	8.10	/	2.34
Elimination half-life (h)	4.4	6.7	7.73	7.73	2.2	/
F (%)	/	/	95.6	/	/	/

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: 4 years.
Shelf life after first opening the immediate packaging: 28 days.

5.3 Special precautions for storage

This veterinary medicinal product does not require any special storage conditions.

5.4 Nature and composition of immediate packaging

The product is presented in amber Type II glass bottles of 50 ml, 100 ml and 250 ml with chlorobutyl rubber stoppers sealed with a flip-off aluminium cap with a tamper-evident polypropylene seal, in a cardboard box.

Package sizes:

Cardboard box with 1 bottle of 50 ml
Cardboard box with 1 bottle of 100 ml
Cardboard box with 1 bottle 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

FATRO S.p.A.

7. MARKETING AUTHORISATION NUMBER

VPA10836/005/001

8. DATE OF FIRST AUTHORISATION

07/06/2019

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

03/11/2026

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).