SUMMARY OF PRODUCT CHARACTERISTICS

1. NAME OF THE VETERINARY MEDICINAL PRODUCT

Norotril Max 100 mg/ml Solution for Injection for Cattle

2. QUALITATIVE AND QUANTITATIVE COMPOSITION

Each ml contains:

Active Substance

Enrofloxacin	100.0 mg

Excipients

Benzyl alcohol (E1519)	20.0 mg
Butyl alcohol	30.0 mg

For the 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

Indicated for the treatment of bovine respiratory disease associated with *Mannheimia haemolytica, Pasteurella multocida, Histophilus somni* and *Mycoplasma* spp. where clinical experience, supported where possible by sensitivity testing of the causal organism, indicates enrofloxacin as the drug of choice.

4.3 Contraindications

Do not use for prophylaxis

Do not use in case of disturbances in growth of cartilage and/or during injury of locomotory system particularly on functionally loaded joints or due to body weight loaded joints.

Do not use in cases of resistance against other fluoroquinolones, due to the potential for cross-resistance.
Do not use in cases of known hypersensitivity to the active substance or to any of the excipients.
Do not use in growing horses because of possible deleterious damage on articular cartilage.'

4.4 Special warnings for each target species

None known.

4.5 Special precautions for use

(i) Special precautions for use in animals

Normal sterile precautions should be taken.

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.

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

The product is an alkaline solution.
Avoid contact of the skin and eyes with the product. Wear glasses and gloves when handling the product.
In case of accidental spillage onto skin or eyes, rinse the affected area with large amounts of water. If irritation occurs, seek medical advice.
Take care to avoid accidental self injection: the product may cause local irritation and/or pain at the injection site. In case of accidental self-injection, seek medical advice immediately and show the package leaflet or label to the physician.
People with known hypersensitivity to the (fluoro)quinolones should avoid contact with the product.

Do not eat, drink or smoke when handling the product
Wash hands after use.

(iii) Other precautions

None.

4.6 Adverse reactions (frequency and seriousness)

Transient local reactions may occur at injection site.
Gastrointestinal disturbances may occasionally occur.

4.7 Use during pregnancy, lactation or lay

Laboratory studies have not produced any evidence of a teratogenic, foetotoxic or maternotoxic effects. The safety of enrofloxacin in pregnant and lactating animals has been shown in cattle. The product can be used during pregnancy and lactation.

4.8 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 phenols).

4.9 Amount(s) to be administered and administration route

Subcutaneous injection.
To ensure correct dosage, body weight should be determined as accurately as possible to avoid underdosing.
A single dose of 7.5 mg/kg bodyweight (7.5 ml per 100 kg bodyweight)
Not more than 15 ml should be administered at one subcutaneous injection site.

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

A dose of 25 mg/kg bodyweight administered for 15 consecutive days is tolerated without any clinical symptoms.

Clinical signs seen in significant overdosage include lethargy, lameness, ataxia, slight salivation and muscle tremors. In accidental overdose there is no antidote and treatment should be symptomatic.

4.11 Withdrawal period(s)

Meat and offal: 14 days

Milk: 84 hours

5. PHARMACOLOGICAL PROPERTIES

ATC Vet Code: QJ01MA90
Pharmacotherapeutic group: Anti-infectives for systemic use: fluoroquinolones

5.1 Pharmacodynamic Properties

Enrofloxacin is bactericidal in action with activity against many Gram positive and Gram negative bacteria and mycoplasmas. The mechanism of action of fluoroquinolones is that they act primarily to inhibit bacterial DNA gyrase, an enzyme responsible for controlling the supercoiling of bacterial DNA during replication. Resealing of the double stranded helix is inhibited resulting in irreversible degradation of the chromosomal DNA.
The fluoroquinolones also possess activity against bacteria in the stationary phase by an alteration of the permeability of the outer membrane phospholipid cell wall but are inactive against strict anaerobes.

Molecular resistance to fluoroquinolones has been observed to arise from two principal sources, (i) alteration to DNA gyrase or topoisomerase IV and (ii) alterations in drug permeability of the bacterial cell. Permeability changes occur either via decreased permeability of the hydrophilic pores or through alteration of the active transport (efflux) pump, thereby decreasing the intracellular content of fluoroquinolones. Both mechanisms lead to a reduced susceptibility of the bacteria to fluoroquinolones. Clinical resistance is dependent on several mutations accumulating in a step-wise manner.

5.2 Pharmacokinetic Particulars

The pharmacokinetics of enrofloxacin are such that oral and parenteral administration leads to similar serum levels. Enrofloxacin is lipid soluble and amphoteric and possesses a high distribution volume. Tissue levels 2-3 times higher than that found in the serum, have been demonstrated in laboratory animals and target species. Organs in which high levels can be expected are the lungs, liver, kidney, skin, bone and lymphatic system. Enrofloxacin also distributes into the cerebrospinal fluid, the aqueous humour and the foetus in pregnant animals.

After subcutaneous administration of 7.5 mg/kg enrofloxacin the mean peak plasma concentration is 0.8 µg/ml achieved within 6 hours. Enrofloxacin is partly metabolised in the liver. Approximately 45 per cent of the dose is excreted in the urine and 55 per cent in the faeces as active and metabolites.

5.3 Environmental Properties

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 product.

6. PHARMACEUTICAL PARTICULARS

6.1 List of excipients

Benzyl alcohol (E1519)
Arginine
Butyl alcohol
Water for injection

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: 2 years
Shelf-life after first opening the immediate packaging: 28 days

6.4 Special precautions for storage

Do not store above 25°C. Do not freeze.
Store in the original package in order to protect from light.

6.5 Nature and composition of immediate packaging

100, 250, 500 ml amber Type I glass vials with a grey bromobutyl rubber stopper and aluminium overseal.

100 ml vials sold in packs containing 1 x 100 ml, 4 x 100 ml and 12 x 100 ml
250 ml vials sold in packs containing1 x 250 ml, 4 x 250 ml and 12 x 250 ml
500 ml vials sold in packs containing1 x 500 ml, 4 x 500 ml and 12 x 500 ml

Not all 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

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

7. MARKETING AUTHORISATION HOLDER

Norbrook Laboratories Limited
Station Works
Camlough Road
Newry
Co. Down
BT35 6JP
Northern Ireland

8. MARKETING AUTHORISATION NUMBER

Vm 02000/4302

9. DATE OF FIRST AUTHORISATION

25 November 2010

10. DATE OF REVISION OF THE TEXT

October 2015

Approved: 27 October 2015