1. NAME OF THE VETERINARY MEDICINAL PRODUCT

Noroclav Injection for Cattle, Dogs and Cats

2. QUALITATIVE AND QUANTITATIVE COMPOSITION

Each ml contains:

Active substances:

Amoxycillin (as Amoxycillin trihydrate) 140 mg
Clavulanic acid (as Potassium clavulanate) 35 mg

Excipients:

Qualitative composition of excipients and other constituents
Butylated Hydroxyanisole
Butylated Hydroxytoluene
Propylene Glycol Dicaprylate/Dicaprate

An off-white suspension.

3. CLINICAL INFORMATION

3.1 Target species

Cattle, dogs and cats.

3.2 Indications for use for each target species

The veterinary medicinal product has a broad-spectrum of bactericidal activity against the bacteria commonly found in cattle, dogs and cats.

(a) *In vitro* the veterinary medicinal product is active against a wide range of clinically important bacteria including:

Gram-positive: Staphylococci (including beta-lactamase producing strains), Streptococci, Corynebacteria, Clostridia, *Bacillus anthracis*, *Actinomyces bovis*.

Gram-negative: *Escherichia coli* (including beta-lactamase producing strains), *Salmonella* spp. (including beta-lactamase producing strains), *Campylobacter* spp., *Klebsiella* spp., *Proteus* spp., *Pasteurellae* spp., *Fusobacterium necrophorum*, Bacteroides (including beta-lactamase producing strains), *Haemophilus* spp., *Moraxella* spp. and *Actinobacillus lignieresi*.

(b) The veterinary medicinal product is indicated for the treatment of diseases including:

Cattle:

Respiratory infections
Soft tissue infections (e.g. joint/navel ill, abscesses etc.)
Metritis
Mastitis

Dogs and cats:
Respiratory tract infections
Urinary tract infections
Skin and soft tissue infections (e.g. abscesses, pyoderma, anal sacculitis and gingivitis.)

3.3 Contraindications

Do not administer to rabbits, guinea pigs, hamsters or gerbils. Caution is advised in its use in other very small herbivores.

3.4 Special warnings

Cross-resistance has been shown between amoxicillin/clavulanic acid and other beta-lactam antibiotics. Use of the veterinary medicinal product should be carefully considered when susceptibility testing has shown resistance to beta-lactam antibiotics because its effectiveness may be reduced.

3.5 Special precautions for use

Special precautions for safe use in the target species:

Do not use in cases of hypersensitivity to penicillin or other substances of the beta-lactam group.

Use of the 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 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.

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

Penicillins and cephalosporins may cause hypersensitivity (allergy) following injection, inhalation, ingestion or skin contact. Hypersensitivity to penicillins may lead to cross-reactions to cephalosporins and vice versa. Allergic reactions to these substances may occasionally be serious.
Do not handle this veterinary medicinal product if you know you are sensitised, or if you have been advised not to work with such preparations.
Handle this veterinary medicinal product with great care to avoid exposure, taking all recommended precautions.
If you develop symptoms following exposure such as a skin rash, you should seek medical advice and show the package leaflet or the label to the physician. Swelling of the face, lips or eyes or difficulty with breathing are more serious symptoms and require urgent medical attention. Wash hands after use.

Special precautions for the protection of the environment:

Not applicable.

3.6 Adverse events

Cattle, dogs and cats:

Very rare (<1 animal / 10 000 animals treated, including isolated reports):	Immediate pain upon injection, injection site reaction. Allergic reaction[1] (e.g. allergic skin reaction, anaphylaxis)

[1] If allergic reactions occur, the product should be discontinued immediately. Appropriate symptomatic treatment should be initiated.

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 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:

Can be used during pregnancy, subject to observance of the withholding time for milk and the withdrawal time for meat intended for human consumption.

3.8 Interaction with other medicinal products and other forms of interaction

None known.

3.9 Administration routes and dosage

Intramuscular use: Cattle
Subcutaneous use: Dogs
Intramuscular use and subcutaneous use: Cats

The recommended dosage rate is 8.75 mg/kg bodyweight (1 ml per 20 kg bodyweight) daily for 3-5 days. Shake the vial well before use. After injection, massage the injection site. This veterinary medicinal product does not contain an antimicrobial preservative. Use a completely dry sterile needle and syringe. Swab the septum before removing each dose.

Care should be taken to avoid contaminating the remaining contents of a vial with water. Clavulanic acid is moisture sensitive. It is very important therefore, that a completely dry needle and syringe is used when extracting suspension for injection in order to avoid contaminating the remaining contents of the vial with drops of water. Contamination will result in obvious beads of dark, brown discolouration corresponding to the introduced water droplets. Material affected in this way should not be used as it may have significantly reduced potency.

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

Potentiated penicillin is of a low order of toxicity and is well tolerated by the parenteral route. Apart from occasional injection site reactions, which may occur at the recommended dose, no other adverse effects are to be expected from an accidental overdose.

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:

Meat and offal: 42 days
Milk: 80 hours

Animals must not be slaughtered for human consumption during treatment.
Milk for human consumption must not be taken during treatment.

4. PHARMACOLOGICAL INFORMATION

4.1 ATCvet code: QJ01CR02

4.2 Pharmacodynamics

Amoxicillin is a beta-lactam antibiotic and its structure contains the beta-lactam ring and thiazolidine ring common to all penicillins. Amoxicillin shows activity against susceptible Gram positive bacteria and Gram negative bacteria.
Beta-lactam antibiotics prevent the bacterial cell wall from forming by interfering with the final stage of peptidoglycan synthesis. They inhibit the activity of transpeptidase enzymes, which catalyse cross-linkage of the glycopeptide polymer units that form the cell wall. They exert a bactericidal action but cause lysis of growing cells only.
There are three major mechanisms of resistance available to bacteria: the production of ß-lactamase enzymes, impermeability of the cell wall by modification of the small pores and by modification of the amino acid sequences at the cytoplasmic membrane interface where the cell wall is constructed.
Acquired resistance may be due to chromosomal mutations or to horizontal gene transfer via resistant plasmids. Susceptibility and resistance patterns can vary with geographical area and bacterial strain, and may change over time.
Clavulanic acid is one of the naturally occurring metabolites of the streptomycete *Streptomyces clavuligerus*. It has structural similarity to the penicillin nucleus, including possession of a beta-lactam ring. Clavulanic acid is a beta-lactamase inhibitor acting initially competitively but ultimately irreversibly.
Clavulanic acid will penetrate the bacterial cell wall binding to both extracellular and intracellular beta-lactamases.
Amoxicillin is susceptible to breakdown by ß-lactamases produced by some bacterial species, and therefore combination with an effective ß-lactamase inhibitor (clavulanic acid) extends the range of bacteria against which it is active to include ß-lactamase producing species.

4.3 Pharmacokinetics

After parenteral administration of the maximum recommended dose to cattle, the following parameters were observed: C_{max} of 1.69 µg/ml, T_{max} of 2.67 hours, AUC of 30.59 µg/ml.h and t½ of 23.19 hours for amoxicillin and C_{max} of 0.94 µg/ml, T_{max} of 1.3 hours, AUC of 3.123 µg/ml.h and t½ of 1.71 hours for clavulanic acid.
After subcutaneous administration of the maximum recommended dose to dogs, the following parameters were observed: C_{max} of 8.66 µg/ml, Tmax of 1.78 hours and AUC of 50.98 µg/ml.h for amoxicillin.
Following either subcutaneous or intramuscular administration of the veterinary medicinal product to cats, both amoxicillin and clavulanic acid are well absorbed and well distributed in the tissues. The major route of elimination of amoxicillin and clavulanic acid is via the urine.

5. PHARMACEUTICAL PARTICULARS

5.1 Major incompatibilities

None known.

5.2 Shelf life

Shelf life of the veterinary medicinal product as packaged for sale: 1 year.

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

5.3 Special precautions for storage

Do not store above 25 ºC.

5.4 Nature and composition of immediate packaging

The veterinary medicinal product will be supplied in clear colourless type II glass vials of 50 ml and 100 ml, complete with nitryl bungs and aluminium caps.
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

Norbrook Laboratories (Ireland) Limited

7. MARKETING AUTHORISATION NUMBER(S)

VPA22664/058/001

8. DATE OF FIRST AUTHORISATION

27/09/2002

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

30/04/2026

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).