

Summary of Product Characteristics

1 NAME OF THE VETERINARY MEDICINAL PRODUCT

RESFLOR 300/16.5 mg/mL Solution for Injection for Cattle

2 QUALITATIVE AND QUANTITATIVE COMPOSITION

Each mL contains:

Active substance

Florfenicol	300.0 mg
Flunixin	16.5 mg

(as flunixin meglumine)

Excipients

Propylene glycol (Antimicrobial Preservative) 150.0 mg 150.0 mg

For a full list of excipients, see section 6.1

3 PHARMACEUTICAL FORM

Solution for injection.

Clear, light yellow to straw coloured liquid.

4 CLINICAL PARTICULARS

4.1 Target Species

Cattle.

4.2 Indications for use, specifying the target species

Treatment of respiratory infections caused by *Mannheimia haemolytica*, *Pasteurella multocida*, *Mycoplasma bovis* and *Histophilus somni* associated with pyrexia.

4.3 Contraindications

Do not use in adult bulls intended for breeding purposes.

Do not use in animals suffering from hepatic and renal diseases.

Do not use if there is a risk of gastrointestinal bleeding or in cases where there is evidence of altered hemostasis.

Do not use in animals suffering from cardiac diseases.

Do not use in the case of known hypersensitivity to active substances or to any of the excipients.

4.4 Special warnings for each target species

None.

4.5 Special precautions for use

Special precautions for use in animals

Use of the product should be based on susceptibility testing of the bacteria isolated from the animal. If this is not possible, therapy should be based on local (regional, farm level) epidemiological information about susceptibility of the target bacteria. Official and local antimicrobial policies should be taken into account when the product is used.

Use of the product deviating from the instructions given in the SPC may increase the prevalence of bacteria resistant to florfenicol.

Avoid use in dehydrated, hypovolaemic or hypotensive animals as there is a potential risk of increased renal toxicity.

Concurrent administration of potentially nephrotoxic drugs should be avoided.

Repeated daily dosing has been associated with abomasal erosions in the pre-ruminant calf. The product should be used with caution in this age group.

The safety of the product has not been tested in calves of 3 weeks of age or less.

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

Care should be taken to avoid accidental self-injection.

Wash hands after use.

Do not use the product in known cases of sensitivity to propylene glycol and polyethylene glycols.

4.6 Adverse reactions (frequency and seriousness)

Anaphylactic reactions were reported in very rare cases during post-marketing surveillance. Those reactions might be fatal.

Subcutaneous administration of the product may result in injection site swellings that become palpable 2-3 days after injection. The duration of the injection site swellings ranged from 15-36 days post-injection. Grossly, this is associated with minimal to mild irritation of the subcutis. Extension into the underlying muscle was noted in only a few instances. By 56 days post-dosing, no gross lesions were observed that would require any trim-out at slaughter.

The frequency of adverse reactions is defined using the following convention:

- very common (more than 1 in 10 animals treated displaying adverse reaction(s))
- common (more than 1 but less than 10 animals in 100 animals treated)
- uncommon (more than 1 but less than 10 animals in 1,000 animals treated)
- rare (more than 1 but less than 10 animals in 10,000 animals treated)
- very rare (less than 1 animal in 10,000 animals treated, including isolated reports).

4.7 Use during pregnancy, lactation or lay

The effect of florfenicol on bovine reproductive performance, pregnancy and lactation has not been assessed. Use only according to the benefit/risk assessment by the responsible veterinarian.

4.8 Interaction with other medicinal products and other forms of interactions

Concurrent use of other active substances that have a high degree of protein binding may compete with flunixin for binding and thus lead to toxic effects. Pre-treatment with other anti-inflammatory substances may result in additional or increased adverse effects and accordingly a treatment-free period with such drugs should be observed for at least 24 hours before the commencement of treatment. The treatment-free period, however, should take into account the pharmacokinetic properties of the products used previously.

The product must not be administered in conjunction with other NSAIDs or glucocorticosteroids. Gastrointestinal tract ulceration may be exacerbated by corticosteroids in animals given NSAIDs.

4.9 Amounts to be administered and administration route

40 mg/kg florfenicol and 22 mg/kg flunixin (2 ml/15 kg body weight) to be administered by a single subcutaneous injection. The dose volume given at any one injection should not exceed 10 ml.

It is recommended to treat animals in the early stages of the disease and to evaluate the response to treatment within the 48 hours after injection.

The anti-inflammatory component of Resflor, flunixin, may mask a poor bacteriological response to florfenicol in the first 24 hours after injection.

If clinical signs of respiratory disease persists or increases, or if relapse occurs, treatment should be changed, using another antibiotic, and continue until clinical signs have resolved.

The injection should only be given in the neck.

Swab septum before removing each dose. Use a dry sterile needle and syringe.

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

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

Overdose studies in the target species for 3 times the duration of treatment showed decreased food consumption in the groups given 3 and 5 times the recommended dose. Decreased body weights were observed in the 5 times overdose group (secondary to decreased food consumption). Decreased water consumption was observed in the 5 times overdose group. Tissue irritation increases with injection volume.

Treatment at 3 times the recommended treatment duration was associated with dose-related erosive and ulcerative abomasum lesions.

4.11 Withdrawal period(s)

Meat and offal: 46 days.

Milk: Not authorised for use in lactating animals producing milk for human consumption.

Do not use during lactation or drying off periods.

Do not use in pregnant animals which are intended to produce milk for human consumption within 2 months of expected parturition.

5 PHARMACOLOGICAL or IMMUNOLOGICAL PROPERTIES

Pharmacotherapeutic Group: antibacterials for systemic use, amphenicols, combinations.

ATCvet Code: QJ01BA99

5.1 Pharmacodynamic properties

Florfenicol is a synthetic broad spectrum antibiotic effective against most Gram-positive and Gram-negative bacteria isolated from domestic animals. Florfenicol acts by inhibiting bacterial protein synthesis at the ribosomal level and is bacteriostatic. Laboratory tests have shown that florfenicol is active against the most commonly isolated bacterial pathogens involved in bovine respiratory disease which include *Mycoplasma bovis*, *Mannheimia haemolytica*, *Pasteurella multocida* and *Histophilus somni*.

Florfenicol is considered to be a bacteriostatic agent, but *in vitro* studies of florfenicol demonstrate bactericidal activity against *Mannheimia haemolytica*, *Pasteurella multocida* and *Histophilus somni*. Florfenicol bactericidal activity was characterised as essentially time dependant against the three target pathogens with the possible exception of *H. somni* where a concentration dependency was observed.

During the florfenicol susceptibility monitoring program (2000-2003) a total of 487 *M. haemolytica*, 522 *P. multocida* and 25 *H. somni* isolates were collected. MIC values ranged between < 0.12 and 2 microgram/ml for *M. haemolytica* (MIC₉₀ = 1 microgram/ml), between < 0.12 and 2 microgram/ml for *P. multocida* (MIC₉₀ = 0.50 microgram/ml) and between 0.12 and 0.5 microgram/ml for *H. somni*. Breakpoints have been established by the CLSI (Clinical and Laboratory Standard Institute) for bovine respiratory pathogens as follows:

Pathogen	Florfenicol Disk Concentration (microgram)	Diameter (mm)			MIC (microgram/ml)		
		S	I	R	S	I	R
<i>M. haemolytica</i> <i>P. multocida</i> <i>H. somni</i>	30	≥ 19	15-18	≤ 14	≤ 2	4	≥ 8

There are no established breakpoints for *Mycoplasma bovis* nor have culture techniques been standardized by CLSI. Despite a reduction in *Mycoplasma bovis* pathogen load, *Mycoplasma bovis* may not be fully eliminated from the lungs after treatment with the veterinary medicinal product.

The only mechanisms of chloramphenicol resistance that are known to have significant clinical relevance are CAT-mediated inactivation and efflux-pump resistance. Of these, only some of the efflux mediated resistance would also confer resistance to

florfenicol and thus have the potential to be affected by florfenicol use in animals. Resistance to florfenicol in the target pathogens has only been reported on rare occasions and was associated with efflux pump and the presence of the *floR* gene.

Flunixin meglumine is a non-steroidal anti-inflammatory drug with analgesic and antipyretic activity.

Flunixin meglumine acts as a reversible non-selective inhibitor of cyclo-oxygenase (both COX 1 and COX 2 forms), an important enzyme in the arachidonic acid cascade pathway which is responsible for converting arachidonic acid to cyclic endoperoxides. Consequently, synthesis of eicosanoids, important mediators of the inflammatory process involved in central pyresis, pain perception and tissue inflammation, is inhibited. Through its effects on the arachidonic acid cascade, flunixin also inhibits the production of thromboxane, a potent platelet pro-aggregator and vasoconstrictor which is released during blood clotting. Flunixin exerts its antipyretic effect by inhibiting prostaglandin E2 synthesis in the hypothalamus. Although flunixin has no direct effect on endotoxins after they have been produced, it reduces prostaglandin production and hence reduces the many effects of the prostaglandin cascade. Prostaglandins are part of the complex processes involved in the development of endotoxic shock.

5.2 Pharmacokinetic particulars

The administration of the product by the subcutaneous route at the recommended dosage of 40 mg/kg florfenicol maintained efficacious plasma levels in cattle above a MIC₉₀ of 1 microgram/mL for approximately 50 hours and above a MIC₉₀ of 2 microgram/mL for approximately 36 hours. Maximum plasma concentration (C_{max}) of approximately 9.9 microgram/mL occurred approximately 8 hours (T_{max}) after dosing.

After administration of the product by the subcutaneous route at the recommended dosage of 2.2 mg/kg flunixin, peak plasma concentrations of 2.8 microgram/mL were achieved after 1 hour.

The binding of florfenicol on proteins is approximately 20% and for flunixin > 99%. The degree of elimination of florfenicol residues in urine is approximately 68% and in faeces approximately 8%. The degree of elimination of flunixin residues in urine is approximately 34% and for faeces approximately 57%.

6 PHARMACEUTICAL PARTICULARS

6.1 List of excipients

Propylene glycol (E1520)
N-methyl-2-pyrrolidone
Anhydrous citric acid (Macrogol 300)

6.2 Major incompatibilities

Do not mix the product with other 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. Protect from frost.

6.5 Nature and composition of immediate packaging

100 ml and 250 ml
Glass vial Type I
Bromobutyl stopper
Aluminium cap.

Not all pack sizes may be marketed.

6.6 Special precautions for the disposal of unused veterinary medicinal products or waste materials derived from the use of such products

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

Intervet Ireland Limited
Magna Drive
Magna Business Park, Citywest Road
Dublin 24
Ireland

8 MARKETING AUTHORISATION NUMBER(S)

VPA10996/255/001

9 DATE OF FIRST AUTHORISATION/RENEWAL OF THE AUTHORISATION

Date of first authorisation: 14th September 2007

Date of last renewal: 13th May 2011

10 DATE OF REVISION OF THE TEXT

November 2020