Summary of Product Characteristics

1 NAME OF THE VETERINARY MEDICINAL PRODUCT

Virbacef 50 mg/ml Powder for Solution for Injection for cattle, pigs and horses

2 QUALITATIVE AND QUANTITATIVE COMPOSITION

Active substance:

Each vial contains 1 g or 4 g of ceftiofur as ceftiofur sodium.
Each ml of reconstituted solution contains 50 mg of ceftiofur as ceftiofur sodium.

For a full list of excipients, see section 6.1.

3 PHARMACEUTICAL FORM

Powder for solution for injection.

Cream to yellowish powder.

4 CLINICAL PARTICULARS

4.1 Target Species

Cattle, pigs and horses.

4.2 Indications for use, specifying the target species

Cattle
Treatment of cattle with acute bacterial respiratory disease in which *Mannheimia haemolytica, Pasteurella multocida*, *Histophilus somni* or other sensitive bacterial pathogens of the respiratory tract are involved.
Treatment of cattle with acute interdigital necrobacillosis (foul in the foot) in which *Fusobacterium necrophorum* and *Bacteroides melaninogenicus* are involved.

Pigs
Treatment of pigs with bacterial respiratory disease in which *Actinobacillus (Haemophilus) pleuropneumoniae*, *Pasteurella multocida* and/or *Streptococcus suis* are involved.

Horses
Treatment of horses with bacterial respiratory disease in which *Streptococcus equi ssp. zooepidemicus* are involved.

4.3 Contraindications

Do not use in animals previously found to be hypersensitive to ceftiofur.
Do not use in poultry (including eggs) due to risk of spread of antimicrobial resistance to humans.

4.4 Special warnings for each target species

Third generation cephalosporins such as ceftiofur should be reserved for the treatment of clinical conditions which have responded poorly, or are expected to respond poorly to more narrow spectrum antimicrobials.

4.5 Special precautions for use

Special precautions for use in animals

Virbacef selects for resistant strains such as bacteria carrying extended spectrum betalactamases (ESBL) and may constitute a risk to human health *if these strains disseminate to humans e.g. via food*. For this reason, Virbacef should be reserved for the treatment of clinical conditions which have responded poorly, or are expected to respond poorly (refers to very acute cases when treatment must be initiated without bacteriological diagnosis) to first line treatment. Official, national and regional antimicrobial policies should be taken into account when the product is used.
Increased use, including use of the product deviating from the instructions given in the SPC, may increase the prevalence of such resistance.
Whenever possible, Virbacef should only be used based on susceptibility testing.
If this is not possible, therapy should be based on the local (regional, farm level) epidemiological information about susceptibility of the target bacteria.
Virbacef is intended for treatment of individual animals. Do not use for disease prevention or as a part of heard health programmes. Treatment of groups of animals should be strictly restricted to ongoing disease outbreaks according to the approved conditions of use.

The administration of antimicrobials to horses under conditions of stress may be associated with acute diarrhoea, which could be fatal. If acute diarrhoea is observed, discontinue use of this antimicrobial and initiate appropriate therapy.

Special precautions to be taken by the person administering the veterinary medicinal product to animals
Wash hands after use.
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 product if you know you are sensitised or if you have been advised not to work with such preparations.
Handle this 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 doctor this warning. Swelling of the face, lips or eyes or difficulty with breathing are more-serious symptoms and require urgent medical attention.

4.6 Adverse reactions (frequency and seriousness)

The use of the product may cause occasional local discomfort upon injection but this is a transient effect.
In horses, mild muscular irritation may occur at the injection site. Lesions may evolve to muscular regeneration. Sometimes mild focus of necrosis may persist. Diarrhoea (dysenteric colitis) may occur in stressed horses (high physical activity).

In new born foals, with a weak muscular mass, local and transient inflammatory reactions (pain, swelling) may occur after intramuscular administration. Then, special cautions should be taken in case of repeated administrations. For instance, administration should be made alternatively on both sides of the neck.

4.7 Use during pregnancy, lactation or lay

Laboratory studies in rats have not produced any evidence of teratogenic, embryotoxic, or maternotoxic effects at therapeutic doses.
The safety of the product has not been assessed in pregnant and lactating cows, sows and mares. Use only according to the benefit/risk assessment by the responsible veterinarian.

4.8 Interaction with other medicinal products and other forms of interaction

None known.

4.9 Amounts to be administered and administration route

Reconstitution
1-g vial: reconstitute by adding 20 ml of water for injection.
4-g vial: reconstitute by adding 80 ml of water for injection.
For ease of reconstitution, use an 18-gauge needle. Rapid addition of diluent will give best results. The resulting solution contains 50 mg of ceftiofur per ml.
To ensure correct dosage body weight should be determined as accurately as possible to avoid underdosing.

Dosage in cattle
1 mg ceftiofur (as ceftiofur sodium)//kg of bodyweight. This is equivalent to 1 ml of the reconstituted solution per 50 kg of bodyweight.
For respiratory disease, the dose should be given once daily at 24-hour intervals for 3 to 5 days in total.
For foul in the foot, the dose should be given once daily at 24-hour intervals for 3 days in total.

Dosage in pigs
3 mg ceftiofur (as ceftiofur sodium)//kg of bodyweight. This is equivalent to 1 ml of the reconstituted solution per 16 kg of bodyweight. The dose should be given once daily at 24-hour intervals for 3 days in total. An appropriately-graduated syringe must be used to allow accurate administration of the required dose volume. This is particularly important when injecting piglets weighing less than 16 kg. Only the 20-ml vial should be used for treating small groups of piglets.

Dosage in horses
2 mg ceftiofur (as ceftiofur sodium)/kg of bodyweight. This is equivalent to 2 ml of the reconstituted solution per 50 kg of bodyweight. The dose should be given once daily at 24-hour intervals and continued for 48 hours after clinical signs have disappeared. The treatment duration should be limited to 10 days. A maximum of 10 ml of solution should be administered per injection site. For horses weighing more than 500 kg consideration should be given to use alternative treatments in order to limit the number of injections.

Administration
The intramuscular route only should be used in cattle, pigs and horses.. In the pig, particular care must be taken to avoid injection into fat tissue. Normal aseptic-injection techniques should be practiced.
If no response is seen within 4-5 days, the diagnosis should be redetermined.

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

In cattle, no general toxic signs were observed after parenteral administration of high doses.
In pigs, ceftiofur had a low toxicity after daily intramuscular administration up to eight times the recommended doses for 15 days.
In horses, in case of overdose, transient decrease of food consumption and mild to severe sub cutaneous oedema may be observed.

4.11 Withdrawal Period(s)

Cattle:
Meat and offal : 1 day
Milk : zero days
Pigs :
Meat and offal : 2 days

Horse:

Meat and offal :4 days
Milk: not to be used in mares producing milk for human consumption.

5 PHARMACOLOGICAL or IMMUNOLOGICAL PROPERTIES

Pharmacotherapeutic group: Antibacterials for systemic use, other beta-lactam antibacterials, third generation cephalosporins

ATCvet code: QJ01DD90.

5.1 Pharmacodynamic properties

The active ingredient, ceftiofur sodium, is a third-generation cephalosporin (beta-lactam antibiotic) which acts against both gram-positive and gram-negative bacteria, including betalactamases-producing bacteria.

Ceftiofur is a bactericidal antibiotic *in vitro* which acts by interfering with bacterial cell-wall synthesis.

In cattle, ceftiofur is active against the following microorganisms found in respiratory-tract infections: *Mannheimia haemolytica*, *Pasteurella multocida*, *Histophilus somni* as well as in the following bacteria responsible for acute interdigital necrobacillosis: *Fusobacterium necrophorum* and *Bacteroides melaninogenicus*.

In pigs, ceftiofur is active against the following microorganisms: *Actinobacillus (Haemophilus) pleuropneumoniae*, *Pasteurella multocida* and/or *Streptococcus suis.*

In horses, ceftiofur is active against the following microorganisms, found in respiratory-tract infections: *Streptococcus equi ssp. zooepidemicus*.

5.2 Pharmacokinetic properties

After intramuscular administration, ceftiofur is quickly metabolised to desfuroylceftiofur which reaches maximum plasma concentration within 1 hour. The plasma half-life for desfuroylceftiofur is on average over 9 hours in cattle and 13 hours in pigs. No accumulation has been shown after several administrations in cattle, pig and horses.

6 PHARMACEUTICAL PARTICULARS

6.1 List of excipients

Sodium hydroxide
Potassium dihydrogen phosphate.

6.2 Incompatibilities

None known.

6.3 Shelf-life

Shelf life of the veterinary medicinal product as packaged for sale: 3 years.
Shelf life after dilution or reconstitution according to directions:
- 7 days when stored between 2 °C – 8 °C.
- 12 hours when stored between 8 °C – 25 °C.

6.4 Special precautions for storage

Store in a refrigerator (2 °C - 8 °C). Protect from light.
Keep the container in the outer carton.

After reconstitution, the product may be stored at 2 °C – 8 °C for 7 days and 12 hours if stored above 8 °C and below 25 °C. Any reconstituted product remaining after the stated periods should be discarded.

6.5 Nature and composition of immediate packaging

20-ml type-1-glass vials closed by rubber injector stoppers and an aluminium flip-off seal containing 1 g of ceftiofur.

100-ml type-1-glass vials closed by rubber injector stoppers and an aluminium flip-off seal containing 4 g of ceftiofur.

Not all pack sizes may be marketed.

6.6 Special precautions for the disposal of unused veterinary medicinal products or waste materials

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

Virbac 1ère avenue
2065 m L.I.D.
06516 Carros Cedex
France

8 MARKETING AUTHORISATION NUMBER(S)

VPA 10988/084/001

9 DATE OF THE FIRST AUTHORISATION/RENEWAL OF THE AUTHORISATION

15th February 2013

10 DATE OF REVISION OF THE TEXT