

1. NAME OF THE VETERINARY MEDICINAL PRODUCT

Lyncoo 400 mg/g powder for use in drinking water for pigs and chickens

2. QUALITATIVE AND QUANTITATIVE COMPOSITION

Each g contains

Active substance:

Lincomycin 400 mg (equivalent to 453.6 mg of lincomycin hydrochloride)

Excipient:

Qualitative composition of excipients and other constituents
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Lactose monohydrate

Fine white powder.

3. CLINICAL INFORMATION

3.1 Target species

Pigs and chickens

3.2 Indications for use for each target species

Pigs

Treatment and metaphylaxis of enzootic pneumonia caused by *Mycoplasma hyopneumoniae*.

The presence of the disease in the group must be established before the veterinary medicinal product is used.

Chickens

Treatment and metaphylaxis of necrotic enteritis caused by *Clostridium perfringens*.

The presence of the disease in the flock must be established before the veterinary medicinal product is used.

3.3 Contraindications

Do not use in cases of hypersensitivity to the active substance or to any of the excipient.

Do not administer, and do not allow access to water containing lincomycin, to rabbits, hamsters, guinea pigs, chinchillas, horses or ruminants as this could result in severe gastro-intestinal disturbance.

Do not use in cases of known resistance to lincosamides.

Do not use in cases of hepatic dysfunction.

3.4 Special warnings

Medicated drinking water uptake can be affected by the severity of the disease. In case of insufficient uptake of water, pigs should be treated parenterally.

Cross-resistance has been shown between lincomycin and different antimicrobials including other lincosamides, macrolides and streptogramin B antibiotics. Use of the veterinary medicinal product

should be carefully considered when susceptibility testing has shown resistance to lincosamides, macrolides and streptogramin B because its effectiveness may be reduced.

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). The susceptibility of *Mycoplasma hyopneumoniae* to antimicrobial agents is difficult to test *in vitro* owing to technical constraints. In addition, there is a lack of clinical breakpoints for both *M. hyopneumoniae* and *C. perfringens*. Thus, 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. Repeated or prolonged use should be avoided by improving the farm management and hygiene practices. Antimicrobial medicinal products shall be used for metaphylaxis only when the risk of spread of an infection or of an infectious disease in the group of animals is high and where no other appropriate alternatives are available.

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

This veterinary medicinal product contains lincomycin and lactose monohydrate, either of which can cause allergic reactions in some people. People with known hypersensitivity to lincomycin or any other lincosamide, or to lactose monohydrate, should avoid contact with the veterinary medicinal product.

Care should be taken not to raise and inhale any dust.

Contact with skin and eyes should be avoided.

Personal protective equipment consisting of approved dust masks (either a disposable half mask respirator conforming to European Standard EN149 or a non-disposable respirator conforming to European Standard EN140 with a filter EN143), gloves and safety glasses should be worn when handling and mixing the veterinary medicinal product. If respiratory symptoms develop following exposure, seek medical advice and show this warning to the physician.

In case of accidental exposure to the skin, eyes or mucous membranes, wash the affected area thoroughly with plenty of water.

If symptoms such as skin rash or persistent eye irritation appear after exposure, seek medical advice immediately and show the package leaflet or label to the physician.

Wash hands and any exposed skin with soap and water immediately after use.

Do not eat, drink or smoke while handling the veterinary medicinal product. In case of accidental ingestion, seek medical advice immediately and show the package leaflet or the label to the physician.

Special precautions for the protection of the environment:

Not applicable.

3.6 Adverse events

Pigs:

Rare (1 to 10 animals / 10,000 animals treated):	Irritability ^{1, 2} Diarrhoea ³ Hypersensitivity reaction, Anal oedema (swelling) ^{3, 4} Reddening of the skin ¹
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¹ Usually self-correcting within 5-8 days without discontinuing the lincomycin treatment

² Mild, behavioural.

³ Within the first 2 days after onset the treatment.

⁴ Mild

Chickens:

None known.

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

The safety of the veterinary medicinal product has not been established during pregnancy, lactation or lay.

Pregnancy and lactation:

Laboratory studies in rats have not produced any evidence of teratogenic effect, although foetotoxicity has been reported.

Use only according to the benefit-risk assessment by the responsible veterinarian.

3.8 Interaction with other medicinal products and other forms of interaction

Antagonism may exist between lincomycin and macrolides such as erythromycin and other bactericidal antibiotics; concurrent use is therefore not recommended due to competitive binding at the 50S ribosomal subunit of the bacterial cell.

The bioavailability of lincomycin may decrease in the presence of gastric antacids or activated charcoal, pectin or kaolin.

Lincomycin can potentiate neuromuscular effects of anaesthetics and muscle relaxants.

3.9 Administration routes and dosage

In drinking water use.

The recommended dosage rates are:

Pigs:

Enzootic pneumonia: 10 mg lincomycin per kg of body weight (corresponding to 25 mg veterinary medicinal product per kg bodyweight) for 21 consecutive days.

Chickens:

Necrotic enteritis: 5 mg lincomycin per kg of body weight (corresponding to 12.5 mg veterinary medicinal product per kg bodyweight) for 7 consecutive days.

To ensure a correct dosage, body weights should be determined as accurately as possible.

The intake of medicated water depends on the clinical condition of the animals. In order to obtain the correct dosage, the concentration of lincomycin may need to be adjusted accordingly.

The use of suitably calibrated weighing equipment is recommended. The uptake of water should be monitored frequently.

Based on the recommended dose and the number and weight of animals to be treated, the exact daily concentration of the veterinary medicinal product should be calculated according to the following formula:

$$\frac{\text{mg veterinary medicinal product / kg body weight per day} \times \text{average body weight (kg) of animals to be treated}}{\text{average daily water intake (L/animal)}} = \text{mg of veterinary medicinal product per litre of drinking water}$$

Complete dissolution of the veterinary medicinal product should be ensured.

The maximum solubility of the veterinary medicinal product in soft/hard water is 50 g/L at 20°C and 15 g/L at 5°C.

For stock solutions and when using a proportioner, take care not to exceed the maximum solubility which can be achieved under the given conditions. Adjust the flow rate setting of the dosing pump according to concentration of the stock solution and water intake of the animals to be treated.

The medicated water should be the only source of drinking water for the animals for the entire duration of the treatment period.

The daily amount is to be added to the drinking water in such a way that all medication will be consumed within 24 hours. Medicated drinking water should be freshly prepared every 24 hours. No other source of drinking water should be available.

After the end of the medication period, the water supply system should be cleaned appropriately to avoid intake of sub-therapeutic amounts of the active substance.

In regards to biocide compatibility, please see section 5.1.

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

A dosage greater than 10 mg lincomycin per kg of body weight may cause diarrhoea and loose stools in pigs. In case of accidental overdose, the treatment must be stopped and restarted at the recommended dose level. There is no specific antidote, treatment is 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

Pigs:

Meat and offal: 1 day.

Chickens:

Meat and offal: 5 days.

Not for use in birds producing or intended to produce eggs for human consumption.

4. PHARMACOLOGICAL INFORMATION

4.1 ATCvet code

QJ01FF02

4.2 Pharmacodynamics

Lincomycin is a lincosamide antibiotic derived from *Streptomyces lincolnensis* which inhibits protein synthesis. Lincomycin binds to the 50S sub-unit of the bacterial ribosome close to the peptidyl transfer

centre and interferes with the peptide chain elongation process by causing premature peptidyl-tRNA dissociation from the ribosome.

Lincomycin is active against some gram-negative bacteria (*Clostridium perfringens*) and mycoplasmas (*Mycoplasma hyopneumoniae*).

While the lincosamides are generally considered to be bacteriostatic agents, the activity depends on the sensitivity of the organism and concentration of the antibiotic. Lincomycin may be either bactericidal or bacteriostatic.

Mechanisms of resistance to lincomycin include efflux of the antibiotic and drug inactivation, and the most widespread mechanism which is target-site modification by methylation or mutation that prevents the binding of the antimicrobial to its ribosomal target. The rRNA methylases are encoded by different erythromycin-resistant methylase (erm) genes that can be horizontally transferred. This mechanism of target site modification can confer cross-resistance to macrolides, other lincosamides, and streptogramins B (i.e., MLSB phenotype). Furthermore, resistance genes can be located on plasmids or transposons, such as the vga genes and the cfr gene (conferring cross-resistance between pleuromutilins, oxazolidinones, phenicols, streptogramin A, and lincosamides). This type of resistance is transferable between bacteria and bacterial species. The mechanism of antimicrobial resistance varies among bacterial species.

4.3 Pharmacokinetics

In pigs, lincomycin is rapidly absorbed following oral administration. A single oral administration of lincomycin hydrochloride, at dose levels of approximately 22, 55 and 100 mg/kg body weight in pigs, resulted in dose related lincomycin serum levels, detected for 24-36 hours after administration. Peak serum levels were observed at 4 hours after dosing. Similar results were observed following single oral doses of 4.4 and 11.0 mg/kg body weight in pigs. Levels were detectable for 12 to 16 hours, with peak concentrations occurring at 4 hours. A single oral dose of 10 mg/kg body weight was administered to pigs to determine the bioavailability. The oral absorption of lincomycin was found to be $53\% \pm 19\%$.

Repeated dosing of pigs with daily oral doses of 22 mg lincomycin/kg body weight for 3 days indicated no accumulation of lincomycin in the species, with no detectable serum levels of antibiotic after 24 hours post administration.

Crossing the intestinal barrier, lincomycin is widely distributed to all tissues, especially the lungs and joint cavities; the volume of distribution is about 1 litre. The elimination half-life of lincomycin is greater than 3 hours. Approximately 50% of lincomycin is metabolised in the liver. Lincomycin undergoes enterohepatic circulation. Lincomycin is eliminated unchanged or in the form of various metabolites in bile and urine. High concentrations of the active form are observed in the intestine. Chickens were administered lincomycin hydrochloride in the drinking water at a level of approximately 34 mg/litre (5.1-6.6 mg/kg body weight) for seven days. Metabolites comprised more than 75% of total residues in the liver. Unmetabolised lincomycin declined at a slightly faster half-life ($t_{1/2} = 5.8$ hours) than total residue. Lincomycin and one unknown metabolite comprised >50% of the muscle residue at zero hours. The excreta contained mostly unmetabolised lincomycin (60-85%) during treatment.

Environmental properties

Lincomycin is known to be toxic to terrestrial plants, cyanobacteria and groundwater bacteria.

5. PHARMACEUTICAL PARTICULARS

5.1 Major incompatibilities

Do not mix with any other veterinary medicinal product.

This veterinary medicinal product may be administered using drinking water containing hydrogen peroxide at a maximum concentration of 35 ppm, but must not be administered using drinking water containing chlorine as the lincomycin degrades very rapidly in the presence of chlorine.

5.2 Shelf life

Shelf life of the veterinary medicinal product as packaged for sale: 2 years.

Shelf life after first opening the immediate packaging:

150 g sachet: 7 days.

1 kg bag and 5 kg bags: 21 days

Shelf life after dissolution in drinking water according to directions: 24 hours

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

3-layer foil 150 g heat-sealed sachet made of low-density polyethylene/aluminium/polyester

4-layer foil 1 kg heat-sealed bag made of low-density polyethylene/polyamide/aluminium/polyester

3-layer foil 5 kg heat-sealed bag made of low-density polyethylene/aluminium/polyamide

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.

The veterinary medicinal product should not enter water courses as lincomycin may be dangerous for aquatic organisms.

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

ENDECTOVET EOOD

7. MARKETING AUTHORISATION NUMBER(S)

VPA25365/001/001

8. DATE OF FIRST AUTHORISATION

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

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) (<https://medicines.health.europa.eu/veterinary>).