

# DFV DOXIVET 200 mg/ml

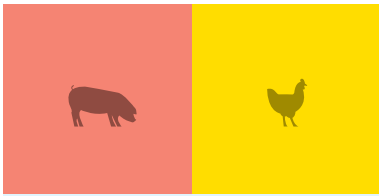
Solution for use in drinking water  
for pigs and chickens.



The  
reliable  
doxycycline



Animal health and welfare



## DFV DOXIVET 200 mg/ml

Solution for use in drinking water for pigs and chickens.

Doxycycline is a bacteriostatic antiinfective that belongs to the tetracycline group. Doxycycline binds to the 30S unit of the bacterial ribosomes inhibiting the synthesis of bacterial proteins.

### Compared to other tetracyclines, Doxycycline has:

1

Higher intestinal absorption, that ensures a more profitable use of the administered dose via water.

2

Lower tendency to form chelates that facilitate its use in all kind of waters.

3

Higher binding degree to plasma proteins that ensure a plasmatic half-life of 24 hours.

4

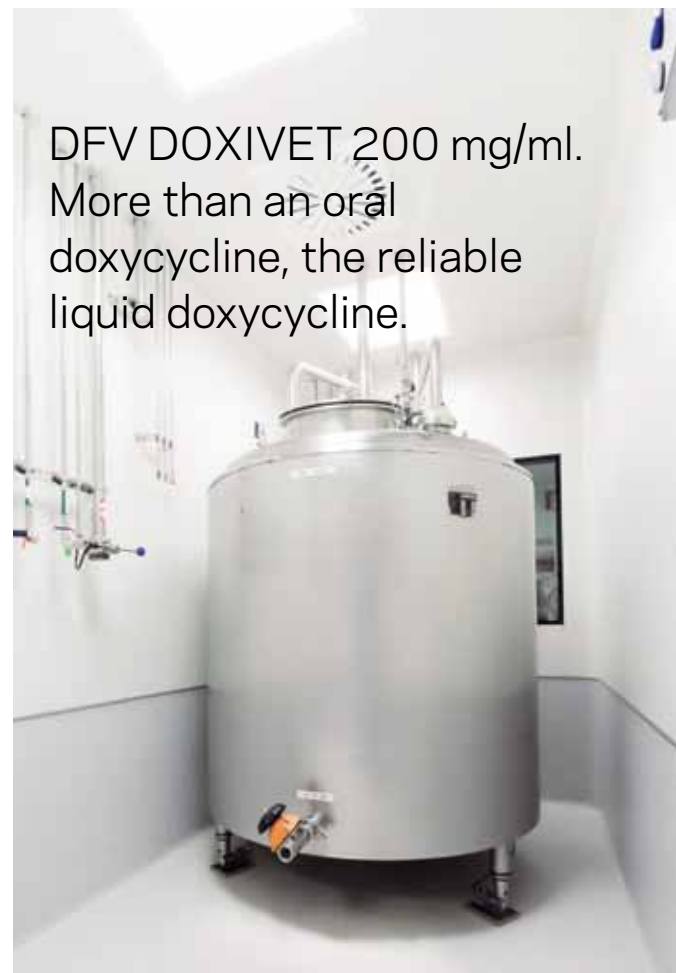
Higher liposolubility that facilitates the penetration in the affected tissues/cells.

**Doxycycline for use in drinking water is a convenient antiinfective to treat, mainly, respiratory infections in swine and chickens.**

**Nevertheless, it is not easy to develop and produce a good quality product, especially when considering an oral solution.**

### Oral solutions present interesting and practical benefits compared to soluble powders:

- Quick and easy dissolution.
- Better homogeneity.
- Better stability.
- Lack of precipitates:
  - Avoid the inactivation of the product.
  - Avoid the obstruction of tubes/nipples.
  - Reduce the risk of interactions with other products.



DFV DOXIVET 200 mg/ml.  
More than an oral doxycycline, the reliable liquid doxycycline.

# Innovative formulation

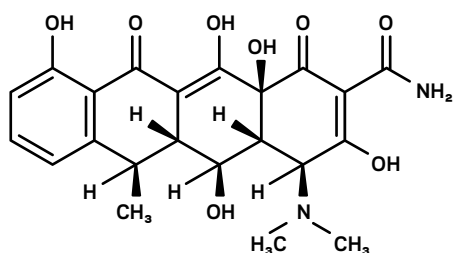
## Solvent system:

- Commercial doxycycline solutions use similar solvent systems.
- The solvent systems commonly used are unable to avoid doxycycline degradation.

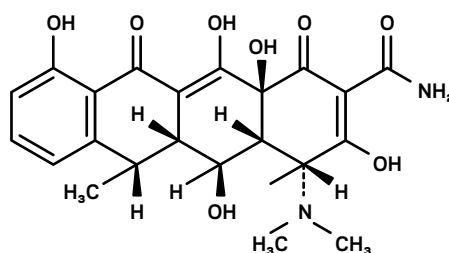
## In other commercial doxycycline solutions due to solvent system:

- The percentage of active doxycycline decreases over time.
- Degradation products, including epimers, increase. These are inactive.

## Active doxycycline molecule



## Inactive doxycycline epimer (4-epidoxycycline)



The use of some common solvent systems in the formulation decrease the effectiveness of doxycycline solutions over time.

## DFV DOXIVET 200 mg/ml: Auto-preservative effect.

- DFV Doxivet 200 mg/ml does not have added preservative agents.
- DFV Doxivet 200 mg/ml has an auto-preservative solvent system that avoids microorganism growth and oxidation. So, the integrity of the product is preserved without accelerating doxycycline degradation due to the specific solvent system used.

## DFV DOXIVET 200 mg/ml has an auto-preservative and innovative formulation that ensures the minimum presence of epimers and degradation products over time.

Commercial product: Clear yellow-brownish solution, Doxycycline darkens as it degrades. The darker the colour of the product is, the higher the degradation of the product is and the lower the percentage of the active doxycycline it contains.

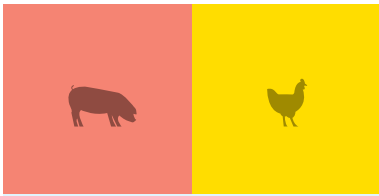


A-F: Other oral solution doxycycline 10%

G: DFV DOXIVET 200 mg/ml

DFV DOXIVET 200 mg/ml has the required active doxycycline during all shelf-life.

The difference between DFV DOXIVET 200 mg/ml and other doxycycline 10% oral solutions can clearly be seen in the aspect of the product 18 months after manufacturing date.

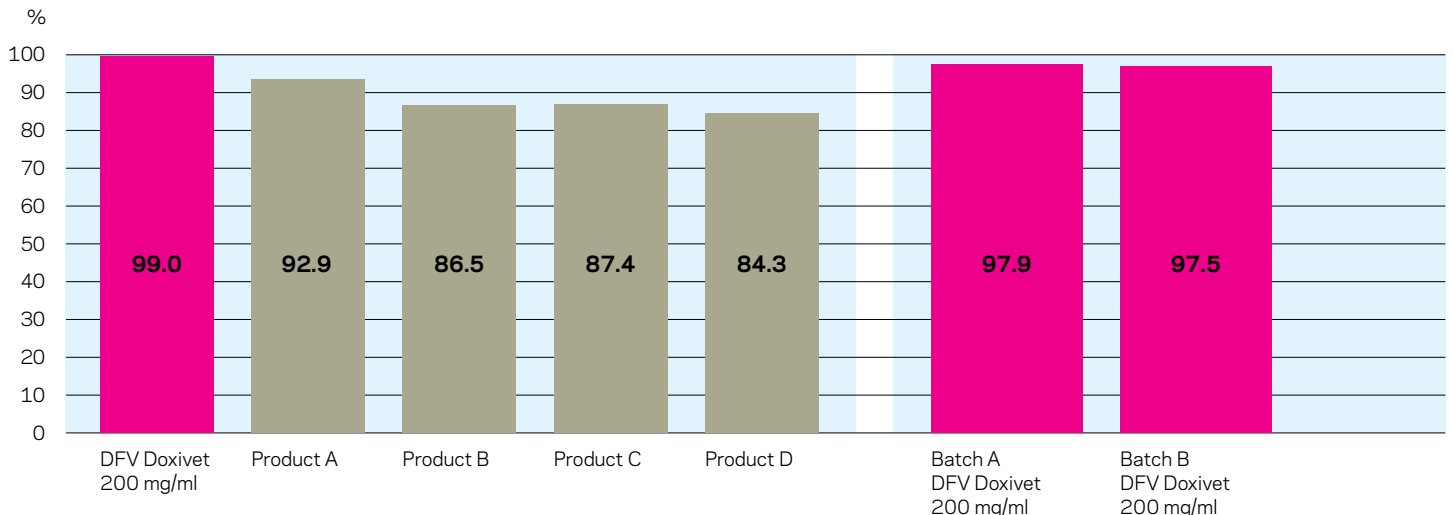


## DFV DOXIVET 200 mg/ml

Solution for use in drinking water for pigs and chickens.

# Product stability

**DFV DOXIVET 200 mg/ml: stability 18 months after manufacturing date (% respect the theoretic value).**



\* Products A, B, C and D correspond to other doxycycline 10% oral solutions.

\* Other doxycycline solutions only have 18 month's shelf-life and cannot be included in the graph.

DFV DOXIVET 200 mg/ml: stability after 18 months is  $\geq 99\%$  and higher than other commercial doxycycline 10%.

DFV DOXIVET 200 mg/ml: stability after 36 months is  $\geq 97.5\%$ .

### Product stability.

- 3 years after manufacturing date.
- 6 months after first opening.

### Storage conditions.

- Does not need special storage conditions:
  - Light does not affect the product.
  - No special storage temperature is required.
- No precipitation occurs at low temperatures (4 °C and -18 °C during 15 days).
- Product aspect does not change over time.

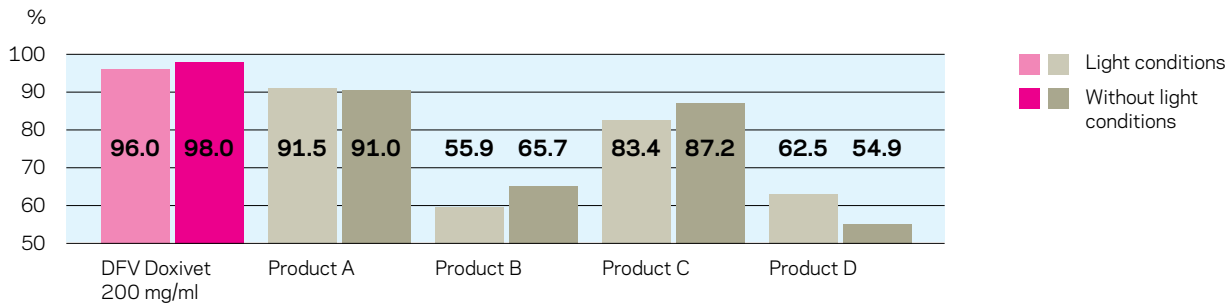


**DFV DOXIVET 200 mg/ml does not require any special storage conditions.**

# Stability after dilution in water

- Long shelf-life: 24 hours after dilution in any kind of drinking water.
- Suitable for both soft and hard water.
- Simplifies the use of the medication systems thanks to the long stability (24 hours).

## DFV DOXIVET 200 mg/ml: stability 24 hours after dilution in hard water (% respect the theoretic value).



Hard water: 200 ppm CaCO<sub>3</sub>.

\*Products A, B, C and D correspond to other doxycycline 10% oral solution.

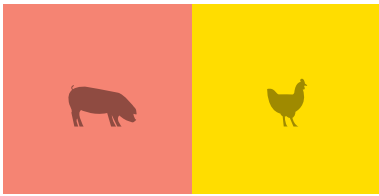
DFV DOXIVET 200 mg/ml: stability 24 hours after dilution in hard water is  $\geq 96\%$  under light exposure conditions and  $\geq 98\%$  under no light exposure conditions.

### Solubility

- Can be used up to 50 times the recommended dose with no solubility problems.
- No solubility problems at low temperatures:
  - 4 °C during 15 days.
  - 18 °C during 15 days.



DFV DOXIVET 200 mg/ml: Excellent solubility in water.



## DFV DOXIVET 200 mg/ml

Solution for use in drinking water for pigs and chickens.

# Indications, dose and withdrawal period



### Pigs:

#### Indications:

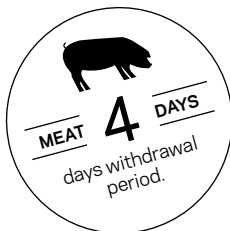
For the treatment of the clinical signs associated with porcine respiratory disease caused by *Actinobacillus pleuropneumoniae*, *Pasteurella multocida* and *Mycoplasma hyopneumoniae* susceptible to doxycycline.

#### Dose:

0.4 ml/litre (\*) of drinking water/day for 4 days = (12.5mg doxycycline hyclate/kg b.w. for 4 days).

#### Withdrawal period:

Meat and offal: 4 days.



### Chickens: (broiler, pullet, breeder)

#### Indications:

Where clinical disease is present in the flock, to reduce mortality, morbidity, and clinical signs and to reduce lesions due to Pasteurellosis caused by *Pasteurella multocida* or to reduce morbidity and lesions in respiratory infections caused by *Ornithobacterium rhinotracheale* (ORT).

#### Dose:

- **Pasteurellosis:** 0.2 ml/litre (\*) of drinking water/day for 3-4 days. (10 mg doxycycline hyclate/kg b.w. for 3-4 days).
- **ORT:** 0.4 ml/litre (\*) of drinking water/day for 3-4 days. (20 mg doxycycline hyclate/kg b.w. for 3-4 days).

#### Withdrawal period:

- Meat and offal: 3 days (in case of 10 mg/kg b.w.).
- Meat and offal: 12 days (in case of 20 mg/kg b.w.).



(\*) Indicative dose depending on daily water consumption.

Only 3 days treatment can be sufficient  
Flexibility in the dose (10–20 mg/kg) for chickens.

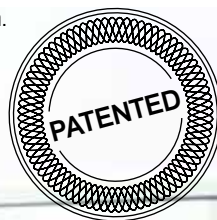
# Research and development

## **Divasa-Farmavic Group: Expertise in doxycycline R+D.**

- More than 15 years' experience in doxycycline R+D.
- R+D experience in soluble powders, injectable solutions and oral solutions.
- DFV DOXIVET 200 mg/ml is the result of several years of the highest and widest grade of R+D with doxycycline.

## **Patented formulation:**

- Only patented oral solution doxycycline.
- Patent based on a unique and innovative formulation.



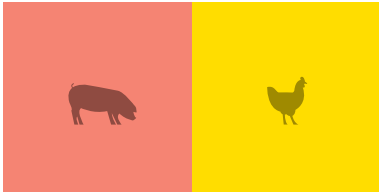
## **The only doxycycline solution registered in 20 EU countries.**

- Experimental studies validated and accepted by 20 European authorities.

DFV DOXIVET 200 mg/ml:  
The doxycycline with the  
highest and widest grade of  
Research and Development.







## DFV DOXIVET 200 mg/ml

Solution for use in drinking water for pigs and chickens.

- Totally new, innovative and patented formulation.
- Auto-preservative effect that prevents doxycycline degradation and ensures the minimum presence of epimers and degradation products.
- Required active doxycycline during all shelf-life.
- High stability.
- Excellent solubility.
- Favourable storage conditions.
- Short treatment: 3 days can be sufficient (chickens).

# The reliable doxycycline



DFV DOXIVET 200 mg/ml, solution for use in drinking water for pigs and chickens. COMPOSITION: Doxycycline hyclate 230 mg/ml, equivalent to 200 mg doxycycline base/ml. Excipients q.s. TARGET SPECIES: Pigs and chickens (broiler, pullet, breeder). INDICATIONS: Pigs: For the treatment of the clinical signs associated with porcine respiratory disease caused by *Actinobacillus pleuropneumoniae*, *Pasteurella multocida*, and *Mycoplasma hyopneumoniae* susceptible to doxycycline. Chickens: Where clinical disease is present in the flock, to reduce mortality, morbidity, and clinical signs and to reduce lesions due to Pasteurellosis caused by *Pasteurella multocida* or to reduce morbidity and lesions in respiratory infections caused by *Ornithobacterium rhinotracheale* (ORT). DOSAGE: Administration orally with the drinking water. The recommended dose in pigs is: 12.5 mg doxycycline hyclate (0.054 ml product) per kg body weight per day for 4 consecutive days. If no improvement in clinical signs is seen within this time, the diagnosis should be reviewed and treatment changed. In case of severe infections the medication period may be prolonged for a maximum of 8 consecutive days as determined by the attending veterinary surgeon. The recommended dose in chickens is: 10 mg doxycycline hyclate (0.043 ml product) per kg body weight per day for 3-4 consecutive days in case of infections caused by *P. multocida* and 20 mg doxycycline hyclate (0.087 ml product) per kg body weight per day for 3-4 consecutive days in case of infections caused by *O. rhinotracheale*. WITHDRAWAL PERIOD: Pigs: Meat and offal: 4 days. Chickens: Meat and offal: 3 days, following a dose rate of 10 mg/kg body weight for 4 days. Meat and offal: 12 days, following a dose rate of 20 mg/kg body weight for 4 days. Eggs: Not authorised for use in laying birds producing eggs for human consumption. Do not use within 4 weeks of onset of the laying period. SHELF LIFE: Shelf-life of the veterinary medicinal product as packaged for sale: 3 years. Shelf-life after first opening the immediate packaging: 6 months. Shelf-life after dilution or reconstitution according to directions: 24 hours after dilution in drinking water. PRESENTATION: 1 litre and 5 litres. Marketing authorization holder: DIVASA-FARMAVIC, S.A. Ctra. Sant Hipòlit, km 71 08503, Gurb-Vic, Barcelona (Spain).

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