SUMMARY OF PRODUCT CHARACTERISTICS

1) NAME OF THE VETERINARY MEDICINAL PRODUCT

Vitamin K_1 Laboratoire TVM, Solution for injection for dogs, 10 mg/ml (for UK, IT, D, AT, NL)
Vitamina K_1 Laboratoire TVM, Solution for injection for dogs, 10 mg/ml (for ES)
Vitamine K_1 injectable TVM, Solution for injection for dogs, 10 mg/ml (for FR)

2) QUALITATIVE AND QUANTITATIVE COMPOSITION:

1ml contains:
Active substance:
Phytomenadione ..... 10,0 mg

For full list of excipients, see section 6.1.

3) PHARMACEUTICAL FORM

Solution for injection
Yellow, clear to slightly opalescent liquid.

4) CLINICAL PARTICULARS:

4.1 - Target species

Dogs

4.2 - Indications for use, specifying the target species

In dogs:
Emergency treatment of anticoagulant rodenticide poisoning, before starting oral treatment.

4.3 - Contraindications

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

4.4 - Special warnings for each target species

As the anticoagulant effects of rodenticides are known to be long lasting it is recommended to start vitamin K_1 supplementation with an oral formulation within 12 hours of the last injection for a duration of 3 weeks, and to evaluate the coagulation status (via one stage prothrombin times) 48 hours after the last administration. In the case of persistence of the anticoagulant in the body, the duration of treatment can be extended as long as the anticoagulant persists, to avoid relapse (the coagulation status has to be evaluated 48 hours after each attempt of treatment cessation).

4.5 - Special precautions for use

i.Special precautions for use in animals

The product should be administered only by veterinarian.
Administer by slow intravenous injection.
The formation of prothrombin may be inadequate when dealing with patients with severe liver dysfunction. Therefore requires a careful monitoring of coagulation parameters after administration of vitamin K_1.

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

People with known hypersensitivity to phytomenadione should avoid contact with the veterinary medicinal product.
Avoid contact with eye. In the event of accidental contact with eye, rinse immediately and thoroughly with tap water, then seek a doctor and show the label to the physician.
In case of accidental self-injection, seek medical advice immediately and show the package leaflet or the label to the physician.

iii. Other precautions

None.

4.6 - Adverse reactions (frequency and seriousness)

Some cases of hypersensitivity reactions (anaphylactic-type reactions) have been described.

4.7 - Use during pregnancy, lactation or lay

The safety of the veterinary medicinal product has not been established in bitch during pregnancy and lactation.
Studies conducted in laboratory animals have shown no teratogenic or fœtotoxic effects. Vitamin K_1 crosses the placental barrier.
Use only accordingly to the benefit/risk assessment by the responsible veterinarian.

4.8 - Interaction with other medicinal products and other forms of interaction

Salicylates (NSAID) and cephalosporins presenting the N-methyl-thiotetrazole moiety may reduce the effect of vitamin K_1, by inhibition of the vitamin K_1 recycling.

4.9 - Amounts to be administered and administration route

Slow intravenous injection of 5 mg vitamin K_1 per kg bodyweight (equivalent to 0.5 ml of the product per kg bodyweight) prior to commencing oral therapy (see section 4.4).
Treatment by injection should be repeated once 12-18 hours later if oral treatment is not immediately possible.

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

Vomiting has been observed in the dog after the 1st and the 2nd injections, administered 12 hours apart at 3 times the recommended dose (15 mg of vitamin K_1 per kg of body weight per injection).
Repeating dosing (10 days) at 7 times the recommended dose of a degraded solution (degradation of lecithin into lysolecithin is observed with time during the storage of the product) caused intravascular haemolysis, involving marked anaemia and vomiting.

4.11 - Withdrawal period

Not applicable.

5) PHARMACOLOGICAL PROPERTIES:

ATC Vet code: QB02BA01
Pharmacotherapeutic classification: antihemorrhagic

5.1 - Pharmacodynamic properties

Vitamin K_1 is a cofactor necessary for the synthesis of K-dependent coagulation factors (factors II, VII, IX and X). During this synthesis, vitamin K_1 is converted into vitamin K_1

hydroquinone (active form of vitamin K_1) and then into vitamin K_1 epoxide. It is then recycled back into vitamin K_1. Antivitamin K rodenticides inhibit the recycling of vitamin K_1 epoxide, causing a risk of uncontrolled bleeding through the absence of functional factors II, VII, IX and X synthesis. The supply of vitamin K_1 must be sufficiently large to activate hydrogenase enzyme that converts it to its active (hydroquinone) form.

5.2 - Pharmacokinetics particulars

After intravenous administration at 5 mg/kg in the dog, the following pharmacokinetic parameters were obtained:
C_{max} = 85.2 µg/ml, AUC = 4246 µg.min./ml, $T_{1/2}$ = 179.5 min., Cl = 1.15 ml/min., a bioavailability of 100 % and a distribution volume estimated at 4×10^{-4} ml.
One hour after intravenous administration, vitamin K_1 is detected in the liver (90% unchanged) before being distributed throughout the body.
Some of the vitamin K_1 is eliminated with the bile in the intestinal tract after metabolism in the liver, and some is eliminated in urine (in the form of glucuronoconjugated metabolites).

6) PHARMACEUTICAL PARTICULARS

6.1 - List of excipients

Glycocholic acid
Lecithin (soya bean)
Sodium hydroxide
Hydrochloric acid
Water for injections

6.2 - Incompatibilities

In the absence of compatibility studies, this veterinary medicinal product must not be mixed with other veterinary medicinal products.

6.3 - Shelf-life

Shelf-life of the veterinary medicinal product as packaged for sales: 3 years.
Use immediately after opening.

6.4 - Special precautions for storage

Protect from light.
Store below 25°C.
Any solution remaining in the ampoule following withdrawal of the required dose should be discarded.

6.5 - Nature and composition of immediate packaging

5ml amber clear glass ampoules, type I.

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

Any unused veterinary medicinal product or waste materials derived from such veterinary medicinal product should be disposed of in accordance with local requirements.

7) MARKETING AUTHORISATION HOLDER

Laboratoire TVM
57 rue des Bardines
63370 LEMPDES
France

8) MARKETING AUTHORISATION NUMBER

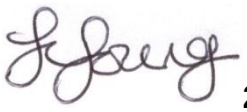
Vm 35079/4000

9) DATE OF FIRST MARKETING AUTHORISATION

20 April 2010

10) DATE OF REVISION OF THE TEXT

March 2013

Approved:  **27/03/2013**