Summary of Product Characteristics

1 NAME OF THE VETERINARY MEDICINAL PRODUCT

Solubenol 100 mg/g oral emulsion for pigs and chickens.

2 QUALITATIVE AND QUANTITATIVE COMPOSITION

Each gram contains:		
Active substance		
Flubendazole	100.0	mg
Excipients		
Propyl parahydroxybenzoate (E216)	4.0	mg
Methyl parahydroxybenzoate (E218)	4.0	mg
Butylhydroxytoluene (E321)	0.2	mg
Propylene glycol (E1520)	50.0	mg

For a full list of excipients, see section 6.1.

3 PHARMACEUTICAL FORM

Oral emulsion.
White homogeneous viscous fluid.

4 CLINICAL PARTICULARS

4.1 Target Species

Pigs (piglets, pigs for fattening and pregnant sows) and chickens (layer hens, chickens for reproduction and pullets).

4.2 Indications for use, specifying the target species

In chickens:
Treatment of helminthiasis caused by:
- *Ascaridia galli* (mature stages)
- *Heterakis gallinarum* (mature stages)
- *Capillaria spp.(mature* stages)

In pigs:
Treatment of infection by mature stages and intestinal larval stages of *Ascaris suum* in piglets, pigs for fattening and pregnant sows.

4.3 Contraindications

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

4.4 Special warnings for each target species

In chickens, optimal results can only be achieved if strict rules of hygiene are respected in the maintenance of the cages.
In both species:
Care should be taken to avoid the following practices because they increase the risk of development of resistance and could ultimately result in ineffective therapy:

- Too frequent and repeated use of anthelmintics from the same class, over an extended period of time.
- Underdosing, which may be due to underestimation of body weight, misadministration of the product, or lack of calibration of the dosing device (if any).

Suspected clinical cases of resistance to anthelmintics should be further investigated using appropriate tests (e.g. Faecal Egg Count Reduction Test). Where the results of the test(s) strongly suggest resistance to a particular anthelmintic, an anthelmintic belonging to another pharmacological class and having a different mode of action should be used.

4.5 Special precautions for use

Special precautions for use in animals
Development disorders of the feathers can not be fully excluded after the administration of flubendazole.

Special precautions to be taken by the person administering the veterinary medicinal product to animals
Direct contact with product should be avoided.
It is advisable to wear gloves when handling the product. Wash hands after use.
People with known hypersensitivity to flubendazole should avoid contact with the veterinary medicinal product.
In the event of eye contact, rinse thoroughly with water and if conjunctival redness persists, seek medical advice.

Other special precautions
Due to concerns for the environment when the product is used in free range poultry or pigs, animals must be kept indoors during the treatment period and for 1 day after last treatment.

4.6 Adverse reactions (frequency and seriousness)

No undesirable effects have been demonstrated after administration of the therapeutic dose in pigs or in chickens.

4.7 Use during pregnancy, lactation or lay

The safety of the product has been demonstrated in layer hens. The product can be administered to these animals.

At the dose regimen of 1 mg flubendazole/kg/day for 5 days, the product can be used in pregnant sows.

The safety of the product has not been demonstrated at the dose regimen of 2.5 mg flubendazole/kg/day for 2 days. Do not use in pregnant sows at this dose regimen.

The safety of the product has not been assessed in lactating sows. The use of the product during the lactation should be subject to benefit/risk ratio 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

***Posology*:**

Chickens:

1.43 mg flubendazole (= 14.3 mg product) per kg body weight daily via oral administration during 7 days, i.e. 1 g of the product per 70 kg body weight daily for 7 days.

Pigs:

a. Treatment of mature stages and intestinal larval stages of *Ascaris suum* in piglets, pigs for fattening and pregnant sows

   1 mg flubendazole (= 10 mg product) per kg body weight daily via oral administration during 5 days, i.e. 1 g of the product per 100 kg body weight daily for 5 days

b. Treatment of mature stages of *Ascaris suum* in piglets and pigs for fattening

   2.5 mg flubendazole (= 25 mg product) per kg body weight daily via oral administration during 2 days, i.e. 2.5 g of the product per 100 kg body weight daily for 2 days.

Pigs should be grouped according to their bodyweight and dosed accordingly, in order to prevent under or overdosing.

Calculate the dosage accurately with the following formula:

$$\frac{\text{…mg [product] per kg bw/day} \times \text{Average bw (kg) of the treated animals}}{\text{average quantity of drinking water (litre/animal) consumed in 4 h}} = \text{.... mg [product] per litre drinking water}$$

This will result in a concentration of flubendazole between 20 and 200 mg per litre.

Method of administration

Administration in drinking water:

1) The required quantity of the product is in function of the estimated body weight of the total group animals (see table below for approximate amounts needed).

7 day treatment for chickens:

Total weight of chickens	**Amount of medication to be used (g/ day)**	**Total amount of medication used (g/ 7 days)**
1400 kg	20 g	7 x 20 g
7000 kg	100 g	7 x 100g
35000 kg	500 g	7 x 500 g

5 day treatment for pigs:

Total weight of pigs	**Amount of medication to be used (g/ day)**	**Total amount of medication used (g/ 5 days)**
2000 kg	20 g	5 x 20 g
10000 kg	100 g	5 x 100g
50000 kg	500 g	5 x 500 g

2 day treatment for pigs:

Total weight of pigs	Amount of medication to be used (g/ day)	Total amount of medication used (g/ 2 days)
2000 kg	50 g	2 x 50 g
10000 kg	250 g	2 x 250g
50000 kg	1250 g	2 x 1250 g

2) Each day a predilution is prepared containing the daily required dose of the product admixed in 10 to 100 times its weight in water depending on the distribution system. For example: for 500 g of the product, add 5 litres to 50 litres of water.

3) Squeeze the sachet gently before use and then empty the contents into the predilution recipient.

4) Stir the predilution vigorously with a manual mixer (whisk) for at least 3 minutes to obtain a white milky homogenous mixture.

5) This predilution must be distributed via the general water supply system:

Tanks: add the predilution to the quantity of water usually consumed by the animals over a period of up to 4 hours, homogenize the contents of the reservoir at least every 30 minutes with an electric or manual mixer.

Dosing pumps: adjust the flow rate of the pump to distribute the predilution over a period of up to 4 hours. Homogenize the predilution every 30 minutes with an automatic mixer or manually.

In order to ensure administration of the correct dose, a substantial water flow must be present in the drinking water system and mixing of the solution in the delivery system (tank or dosing pump) is essential during application. Administration of the product over a period of up to 4 hours on each treatment day, at times when water consumption is likely to be highest, prevents precipitation of flubendazole in the water delivery system and allows washing out of the drinking water system within a 24 hour period after the period of drug administration is finished.

6) Prior to and after the period of treatment make sure the water distribution system is cleaned.

7) Make sure that all animals in the group receive enough drinking water with the product. Withhold drinking water for 2 hours before treatment to stimulate thirst.

8) The corresponding dose must always be distributed when the water consumption of the animals is highest.

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

In chickens, no undesirable effects have been observed after administration of up to 4 times the recommended dose for 14 days. Even at doses 4 times the recommended dose, egg quality is not altered. Only a reduction in egg weight and a slight decrease in egg production can be observed with doses of twice the recommended dose and over. Egg weight returns to normal when treatment is discontinued.

In pigs, no undesirable effects have been observed at the highest dose; 5 x 2.5 mg per kg body weight during 3 x 2 consecutive days (or 12.5 mg during 6 consecutive days).

In the event of a massive overdose, mild transient diarrhoea can occur by the 2nd day of treatment, possibly lasting for 7 to 12 days without affecting the behaviour or performance of the animals.

4.11 Withdrawal Period(s)

Meat and offal:	chickens: 4 days.
	pigs: 4 days.
Eggs:	zero days.

5 PHARMACOLOGICAL or IMMUNOLOGICAL PROPERTIES

Pharmacotherapeutic group: Anthelmintic agent
ATCvet code: QP52AC12.

5.1 Pharmacodynamic properties

Flubendazole is a benzimidazole anthelmintic. It acts by binding to tubulin of the parasite, the dimeric subunit protein of the microtubules. It inhibits micro tubular assembly in absorptive cells: i.e. in intestinal cells of nematodes or the tegumental cells of cestodes. This is shown by disappearance of cytoplasmic microtubules, accumulation of secretory granules in the cytoplasm due to a block in their transport, leading to an impaired coating of the cellular membrane and a decreased digestion and absorption of nutrients. Irreversible lytic degeneration of the cell, due to the accumulation of secretory substances (hydrolytic and proteolytic enzymes), results in the death of the parasite. These changes are relatively fast and are primarily seen in those organelles directly involved in the secretory and absorptive functions of the cells. In contrast the changes are not seen in cells of the host.
Another tubulin-related effect is the strong inhibition of egg hatch by inhibition of microtubule-dependent processes in the developing worm egg (cell division).

5.2 Pharmacokinetic properties

Flubendazole is poorly soluble in aqueous systems, such as the gastrointestinal tract, which results in a low dissolution rate and a low absorption. This is reflected by the high faecal excretion of unchanged parent drug. The small fraction absorbed is extensively metabolised by first-pass metabolism in the liver, involving carbamate hydrolysis and ketone reduction. The biotransformation products are conjugated to glucuronides or sulphate conjugates and excreted with the bile and the urine.
The excretion with urine is relatively low and consists almost exclusively of metabolites with only small amounts of unchanged compound.
In pigs and chicken, the half-life of flubendazole and its metabolites in plasma is 12 hours to 2 days.

6 PHARMACEUTICAL PARTICULARS

6.1 List of excipients

Butylhydroxytoluene (E 321)
Propyl parahydroxybenzoate (E 216)
Methyl parahydroxybenzoate (E 218)
Propylene glycol (E 1520)
High oleic sunflower oil
Acacia
Monoglyceride citrate
Xanthan gum
Citric acid monohydrate
Disodium edetate
Sodium hydroxide
Purified water

6.2 Incompatibilities

Do not mix with any other veterinary medicinal products.

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: 1 day

6.4 Special precautions for storage

This veterinary medicinal product does not require any special storage conditions.

6.5 Nature and composition of immediate packaging

Sachets consisting of four layers PE/PET/ALU/PET in cardboard box :

- Box containing 2 sachets of 20 g
- Box containing 24 sachets of 20 g
- Box containing 1 sachet of 100 g
- Box containing 5 sachets of 100 g
- Box containing 1 sachet of 500 g
- Box containing 5 sachets of 500 g.

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 material derived from such veterinary medicinal product should be disposed of in accordance with local requirements.

7 MARKETING AUTHORISATION HOLDER

Eli Lilly & Company Limited
Elanco Animal Health
Lilly House
Priestly Road
Basingstoke
Hampshire
England
RG24 9NL

8 MARKETING AUTHORISATION NUMBER(S)

VPA 10047/040/001

9 DATE OF THE FIRST AUTHORISATION/RENEWAL OF THE AUTHORISATION

Date of first authorisation: 31st August 2007

Date of last renewal: 29th March 2011

10 DATE OF REVISION OF THE TEXT

October 2014