



## PARACOX

### Coccidiosis vaccine

#### Presentation

Vaccine containing per dose of 0.1 ml the following numbers of live sporulated oocysts derived from eight precocious lines of coccidia:

E. <i>acervulina</i> HP	500 per dose
E. <i>brunetti</i> HP	100 per dose
E. <i>maxima</i> CP	200 per dose
E. <i>maxima</i> MFP	100 per dose
E. <i>mitis</i> HP	1000 per dose
E. <i>necatrix</i> HP	500 per dose
E. <i>praecox</i> HP	100 per dose
E. <i>tenella</i> HP	500 per dose

#### Uses

For the active immunisation of healthy chickens to reduce infection and clinical signs of coccidiosis caused by *Eimeria acervulina*, *E. brunetti*, *E. maxima*, *E. mitis*, *E. necatrix*, *E. praecox* and *E. tenella*.

Immunity begins to develop within 10 days post vaccination and is maintained for at least 36 weeks when birds are housed in conditions that permit oocyst recycling.

#### Dosage and administration

For oral administration to chickens from one day of age by spray on feed, in drinking water or by hatchery spray in conjunction with added red colouring agent.

A single dose of vaccine (0.1 ml undiluted vaccine) should be administered to chickens between day-old and 9 days of age, inclusive.

It is necessary to shake and massage the sachet vigorously for 30 seconds before use to ensure homogeneous suspension of the oocysts.

The vaccine contains xanthan gum which will aid the suspension of oocysts in the water providing it is used within the recommendations made below.

##### a) *in water*

Pipeline drinkers with nipples.

The product may be administered in water via line drinkers from first

placement of the chicks at 1 day of age, provided that a procedure is used that ensures consumption of the vaccinated water evenly by all chicks, avoiding settlement of oocysts. For example, the following methods have been shown to be successful:

The vaccine should be diluted to a concentration of 1 dose per 2 ml in cold tap water and well stirred immediately before use. Calculate the total volume of water in the drinker system to be used, the average number of birds per drinking line and therefore the number of drinker lines and volume of diluted vaccine required. For static drinker lines, it is recommended that the birds should be thirsted for 1-2 hours prior to administration. Each line should be drained and primed under gravity with diluted vaccine immediately before allowing birds access to the nipples. An initial charge (about 1 litre) of an indicator (e.g. milk) can be used to show when the line has been filled to the end and can be closed without wasting vaccine. Turn on the mains water supply when all of the diluted vaccine has been consumed. For drinker lines temporarily connected up to a re-circulating system, it is recommended that vaccine dilution be carried out in a temporary reservoir incorporated within the circulation system, ensuring that the contents remain well mixed at all times. In order to mix the oocysts evenly, the diluted vaccine should be allowed to re-circulate for at least 2.5 hours through the drinker lines before the birds are allowed to drink.

The above examples are intended as a guide to illustrate the principles that should be followed in adapting a particular pipeline drinker system.

Due to the difficulties associated with getting very young birds to drink from nipple drinkers, particular care should be taken to ensure that chicks of 1-3 days old take sufficient water for vaccine uptake when vaccinated using this method.

Alternatively, vaccination using supplementary drinkers between 5-9 days may be preferred. Occasionally on farms using nipple lines, supplementary drinkers are provided for the first 4-5 days. These may be fount-type drinkers or small bell-type drinkers which are automatically fed from the nipple line. If each supplementary drinker of this type is fed individually from the line, then the method of vaccination is essentially similar to bell-type drinkers. If, however, these drinkers are fed in sequence from a single nipple, one may encounter problems of air-locks after this type of drinker has been disconnected in order to deprive the birds of water for the 1-2 hours before vaccination. In this case it may be more appropriate to make an initial dilution of vaccine in a suitable container, e.g. a watering can, and pour the diluted vaccine into each drinker, as for individual founts.

#### Automatic Circular Drinkers (Bell-type)

'Paracox' may be administered into individual drinkers. It is strongly advised that a single type of drinker is used and that the birds are fully accustomed to these drinkers before vaccination. This method therefore is not suited to day-old chickens.

The appropriate amount of vaccine for delivery into each drinker is calculated thus:

Total number of chickens per house (or pen) \_\_\_\_\_ x 0.01ml = vaccine per drinker

Total number of drinkers per house (or pen)

The vaccine is delivered into each drinker through a short 19 gauge cannula attached to an automatic syringe. A suitable cannula is included with each 100 or 500 ml pack. The syringe is directed at an oblique angle to the surface of the water and moved around the drinker during delivery to ensure an even distribution of the vaccine. Care should be taken to ensure that the vaccination syringe is accurately calibrated.

Raise drinkers up to 2 hours before vaccination. Ensure that the drinkers are clean and adjust each valve if appropriate to make certain that drinkers contain a suitable volume of water (250 - 400 ml).

Deliver the appropriate volume of vaccine into each drinker as described above. Lower drinkers immediately. The minimum volume of vaccine which should be delivered is 10 ml per drinker and the maximum is 25 ml, i.e., ensure that there are between 100 and 250 birds per drinker. Water supply to the drinkers should not be turned off during vaccination, i.e., allow drinkers to refill automatically as the birds drink.

#### Line Drinkers with gravity-fed cups

Where nipple lines are equipped with gravity-activated cups at each position, vaccine is delivered directly into each cup. The method is generally similar to that for bell-type drinkers. Vaccine volume is likely to be between 3 and 5 ml per drinker.

#### Trough Drinkers

Method is essentially similar to that for Bell-type drinkers. Drain or remove drinkers up to 2 hours before vaccination. Ensure drinkers are clean. Allow them to refill immediately before delivery of an appropriate volume of vaccine. As a guide to the number of drinkers required at vaccination, there should be approximately 0.25-1.00 cm drinker space per bird.

#### Fount-type drinkers (manually filled)

Remove drinkers up to 2 hours before vaccination. Ensure drinkers are clean. Ensure that drinkers are filled with water and replaced immediately before delivery of an appropriate volume of vaccine. As a guide to the number of drinkers required at vaccination, there should be approximately 0.25-1.00 cm drinker space per bird.

### **IMPORTANT**

The vaccine should be diluted no more than 1/50. The vaccine should not be administered into the main header tank of the watering system; the dilution of vaccine would be too high and the oocysts would not remain in suspension.

#### *b) on feed*

A method of application should be chosen that ensures rapid, even

coverage of the total surface area of the feed available to the chicks. The vaccine may be sprayed, using a coarse spray, either neat or diluted in water. If the vaccine is diluted, not more than four volumes of water should be added to one volume of vaccine (5000 doses of Paracox added to 2 litres of water). Care should be taken to ensure that the applicator reservoir is agitated regularly throughout application to avoid settling out of oocysts.

#### c) *hatchery spray*

Vaccine should be delivered using a dose volume of 0.21 ml of diluted vaccine per bird in a cabinet providing a coarse spray. Determine the delivery capacity of the spray cabinet in terms of the volume delivered per 100 birds. Multiply this volume by 50 to give the total volume of diluted vaccine required for 5000 doses (or by 10 for 1000 doses). 5000 doses are presented in a 500 ml pack (1000 doses in a 100 ml pack). Subtract 500ml (or 100 ml) from the total volume calculated and add this volume of water to a suitable container (for a 21 ml dispensing volume this should be 550 ml for 5000 doses or 110 ml for 1000 doses).

Uptake of the vaccine by the birds, and therefore the efficacy of the vaccine, is improved if a red food colouring agent is added to the diluted vaccine before administration by spray. Add sufficient red food colouring agent (cochineal E120) to the water to give a concentration of 0.1% w/v.

Shake and massage the 5000 dose (or 1000 dose) sachet vigorously for 30 seconds to ensure re-suspension of the oocysts. Add the entire contents of the sachet to the water and mix thoroughly. Add the diluted vaccine to the applicator reservoir and operate the cabinet to spray evenly over the birds using a coarse spray.

Ensure a controlled, even coverage of the total internal surface area of the box containing the chicks. Agitate the applicator reservoir regularly throughout application to avoid settling out of oocysts. Prepare birds for delivery to rearing accommodation.

#### Information about the sachet

The all-plastic sachet is self-collapsing and does not require a vent needle. The contents will remain sterile and cannot be tampered with until opened by inserting the plastic probe (affixed to the delivery tube). The sachet may be suspended from the operator's belt or neck.

#### Instructions on use of the sachet

Attach open end of delivery tube (included in each pack) to a suitably calibrated, automatic syringe. Centre the plastic probe (affixed to the delivery tube) onto the circular stud at the base of the sachet. Using sharp, firm pressure, force the probe straight through the stud membrane. The probe will snap-lock into a secure operating position within the stud. A small amount of extra vaccine is added to each sachet to allow for priming of the syringe.

#### **Contra-indications, warnings, etc.**

Do not use in birds in lay.

Only vaccinate healthy birds.

Food and water provided at any stage before or after vaccination must be free from anticoccidial agents including sulphonamides and antibacterial agents having anticoccidial activity.

The vaccine contains live coccidia and is dependent upon replication of the vaccinal lines within the host for development of protection.

It is common to find oocysts in the gastrointestinal tract of vaccinated birds from 1-3 weeks or more after vaccination. These oocysts are most likely to be vaccinal oocysts which recycle in the birds/litter. This ensures satisfactory flock protection against all the pathogenic strains of the same species of *Eimeria* that are contained in the vaccine.

Chickens should be healthy and floor-reared on deep litter.

Litter should be removed and chicken housing thoroughly cleaned and disinfected between rearing cycles. This will reduce the chances of a coccidial field challenge occurring before the development of adequate flock protection.

Particular care should be taken to ensure that all chicks take water when vaccinated by pipeline nipples at day-old.

Ensure that all vaccination equipment is thoroughly cleaned before use.

Do not administer to dry drinkers.

A reduction in efficacy may be observed if a red food colouring agent cochineal E120 is not added to the diluted vaccine before administration by hatchery spray to give a concentration in the diluted vaccine of 0.1% w/v., equivalent to 210-280 µg/bird. The purity of the cochineal E120 must be in compliance with Commission Directive 95/45/EC.<sup>1</sup>

Addition of a red food colouring agent cochineal red is only to be employed for hatchery spray administration.

The recommended colouring agent is cochineal E120 and full efficacy of the product may not be achieved if an alternative to cochineal E120 food colouring agent is used.

In any animal population there may be a small number of individuals which fail to respond fully to vaccination. Successful vaccination depends upon correct administration of the vaccine together with the animal's ability to respond. This can be influenced by such factors as genetic constitution, intercurrent infection, age, the presence of maternally derived antibodies, nutritional status, concurrent drug therapy and stress.

#### **Side effects**

Mild lesions e.g. *E. acervulina*, *E. necatrix* and *E. tenella* [lesion score of +1 or +2 using the numerical ranking system of Johnson and Reid (1970)] have occasionally been discovered in birds 3-4 weeks after vaccination. Lesions of this severity will not affect the performance of chickens.

Severe overdose (× 5 or more) may lead to a temporary reduction in daily live weight gain.

**Interactions**

Since the protection against coccidial infection following vaccine administration is enhanced by natural challenge, it should be noted that access to any therapeutic agents having anticoccidial activity at any time following vaccination may reduce the duration of effective protection. This is particularly important in the four weeks following vaccination.

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<sup>1</sup>Cochineal E120 supplied by the manufacturer for use with hatchery spray application complies with this Directive.

No information is available on the safety and efficacy from the concurrent use of this vaccine with any other. It is therefore recommended that no other vaccines should be administered within 14 days before or after vaccination with this product.

Do not mix with any other veterinary medicinal product.

**User warnings:**

Wash hands immediately after use.

Operators should wear masks and eye protection when spraying on the feed or in the hatchery.

**Withdrawal period:**

Zero days.

For animal treatment only. Keep out of reach and sight of children.

**Pharmaceutical precautions**

Store in a refrigerator (2°C – 8°C). Do not store below 2°C. Do not freeze. Protect from light.

Sachets should be used immediately on opening.

**Disposal advice:**

Partially used sachets/waste materials should be disposed of by boiling, incineration or immersion in an appropriate disinfectant in accordance with local requirements.

**Packaging quantities**

100 ml and 500 ml flexible nylon/polyethylene sachets.