

6-87

013807



# Information Sheet No.6-87

Department of Conservation and Land Management

## CARING FOR WATERBIRDS

### WITH ALGAL POISONING OR BOTULISM

Cases of botulism and algal poisoning amongst waterbirds may occur throughout the State at any time of the year. Large outbreaks however, usually develop in the South-West only during the summer months. When they do, large numbers of birds are affected.

This is a guide for anyone willing to care for and treat afflicted birds

#### Botulism

Botulism affects both birds and mammals, and is a bacterial poisoning, not an infection. It is caused by the toxin produced by the bacterium scientifically known as *Clostridium botulinum*. The bacterium itself does not invade the living tissues of its victims.

There are three types of botulism and the one which affects birds is known as type C. Each of its cells can form a spore highly resistant to physical and chemical agents, and in this form it may be dormant for many years. When conditions are favourable; suitable temperature, an organic medium to satisfy food requirements, and an absence of atmospheric oxygen; the spores germinate and multiply. In so doing, they produce a potent nerve toxin as one of the end products of their metabolism.

A bird becomes affected by swallowing the toxin (usually in food containing the bacterium) and absorbing it through the lining of the digestive tract. The toxin reaches the peripheral nervous system by way of the blood stream. In some manner not yet clearly understood, it attacks the nerves and causes paralysis. If the dose of toxin is large enough, death of the animal results from paralysis of the respiratory system.

This toxin is very similar to the toxin which causes tetanus and gas gangrene. Treatment entails removing the bird from the affected site and helping it outlive the period of toxicity, if possible.

Most species of bird that occur on or near botulism-producing marsh areas have been affected at some stage by botulism, and the degree to which they are affected can be explained largely by the nature of their feeding habits. Most marshes and lakes where outbreaks occur are shallow and slightly alkaline. The bacterium requires anaerobic conditions: these often occur during 'algal blooms' or when aquatic plants die off in shallow lakes at the end of summer. The resulting decomposition of the algae takes oxygen out of the water and causes anaerobic conditions. The same is true, on a small scale, of excess bread fed to ducks on metropolitan lakes.

Botulism is usually a warm weather disease. Although the toxin is denatured quickly by heat above 80°C, it apparently loses its potency slowly in normal sunlight. It is unlikely that the botulism contracted by waterbirds would be transmissible to humans.

#### Blue-green Algae

Algae are primitive forms of plant life that are common in nearly all surface waters: fresh, salt, and brackish. Free-floating algae are not normally visible to the naked eye, and usually pass unnoticed until an 'algal bloom' occurs and we see long green strands growing in from the edge of the lake or the water becomes like 'green soup'. Algal blooms only occur when conditions favour the rapid multiplication of certain species. A high level of phosphorus is the most important factor in causing blooms.

Algae grow very rapidly when there is a good supply of nutrients in the water, a high water temperature (about 32°C) and a high light intensity. This is the reason why algal growths are rare in winter and only become a problem in summer, particularly towards the end of summer. They are also more common in shallow water, which can warm up rapidly with hot weather and receive more light than deeper water.

The most spectacular algal blooms are produced by a group of algae known as the blue-green algae, and as several of these contain dangerous toxins that can affect waterbirds, livestock and humans. Furthermore, by depleting the oxygen supply in the water overnight, algal blooms in shallow lakes can kill fish and other aquatic animals.

## What Can We Do?

Very little can be done to prevent outbreaks of either disease. Outbreaks of botulism and algal poisoning occur throughout the world when seasonal conditions favour the growth of the organisms. Deaths occur mostly among wild ducks and other waterbirds, and there are no reasonable preventative measures. No known spray would be selective enough to kill any of the causative organisms and not kill other harmless and beneficial ones.

If lakes become more eutrophic than they are currently (i.e. the level of nutrients, particularly phosphorus, from fertiliser run-off, septic tanks etc., becomes higher), botulism and deaths associated with algal blooms will become more common.

Many kinds of medication have been tested and many experiments have conducted. None, except antitoxin for botulism, have had any beneficial effect. However, the following treatment, which can be used for waterbirds affected by either botulism or blue-green algal poisoning, has been used successfully, and if followed very carefully, can save waterbirds.

## SYMPTOMS OF POISONING

### Early

- Birds generally found trying to leave water but unable to stand for any length of time.
- Feathers have fluffed appearance and wings are not crossed above tail.
- Generally can still propel themselves rapidly across water using wings.

### Later

- Totally lethargic.
- Almost total wing paralysis.
- Total leg paralysis.
- Neck weak and birds have difficulty keeping head erect.

- May open and close beak to breathe.
- Nictitating membrane (the inner or third eyelid) sluggish.
- Dilation reflex of the eyes slow.

### Advanced

- Nictitating membrane nonfunctional.
- Legs and wings totally paralysed.
- Total neck paralysis.
- Dilation reflex of the eyes very slow.
- Bird frequently gasping for air due to partial paralysis of respiratory muscles.
- Throat, upper and lower air passages possibly fouled with thick whitish opaque mucus.
- Swallowing reflex affected.

Bowel movement may be affected. In normal droppings bird urine is white and bowel matter dark. Green is abnormal.

If doubtful whether a bird is affected, approach it, if the bird doesn't fly it is affected to some degree. An unaffected bird will always take flight.

## TREATMENT

*PLEASE NOTE: It is very important to correctly identify the air and food passages as it is these you mainly deal with in the treatment. Phone someone more experienced or have your vet assist you if you have any doubts - do not probe or insert tubes without the correct identification of the parts, or great suffering may result.*

The first step in treatment is to remove mucus from the air passages.

The upper air passage extends from the nostrils on the upper surface of the top beak through the top beak to its underside, which is the roof of the mouth (palate). There it looks like a central slit. This slit may be blocked by mucus or the passage may be blocked by maggots or leeches. You will be able to deal with mucus, but see your vet about removing maggots or leeches from this area as it must not be probed by unskilled hands.

The lower air passage from the mouth to the lungs begins just behind the back of the tongue - it is a central slit which opens and closes as the bird breathes, and marks the opening of the windpipe.

It is frequently partly covered or blocked by mucus when the bird is weakened by botulism, and you must repeatedly remove it to allow clearance for breathing until the bird can swallow and cope by itself.

Pulling the tongue slightly forward allows you to see and deal with the removal of mucus more easily in large birds like ducks and swans, but different species and smaller sizes may require modified methods.

The following description applies to mucus removal from a duck: Gently lever and hold open the beak. Place the index finger down on the tongue and draw (gently drag) it forward a few millimetres until resistance occurs (the tongue will not come forth much beyond the beak tip). Use a dry cotton bud and place it against the mucus, rotate it and remove. The rotating action should pick up the mucus. You may need to shine torchlight into the bird's mouth to see clearly how effective your work is. Use a clean dry cotton bud each time – damp, soiled or wet ones will not catch the mucus. The same action will remove mucus from the roof of the mouth (upper airway) slit, and the sides of the throat and mouth generally.

Next treat the bird with a dose of salts.

**Mixture:** 1 level teaspoon (4 mls) of Epsom or Glaubers (Glaubers is milder) to 1/2 cup (100 mls) of fresh water. Stir well.

- Small birds, e.g. stilts, give 1 ml.
- Grey teal and duck of this size, give 3 mls of salts.
- Pacific black ducks, Australian shelducks and ducks this size, give 5 mls.
- Swans, give 10 mls.
- Very small waders can take only 1/4 to 1 ml and choke easily.

In all cases, repeat the dose an hour later even if bowel action has occurred. If there has been no bowel action, repeat for a third time. Draw up required amount into an appropriate syringe fitted with soft plastic tubing as follows:

The tubing should be as long as the extended length of the bird's neck, plus a little extra e.g. Pacific black duck 15 cm approx.

The diameter must suit the bird.

- Small waders e.g. stilts, 2-3 mm external diameter.

- Pacific black duck, Grey teal and Australian shelduck, White-faced heron, - 4 mm external diameter.
- Pelicans - plastic funnel and 8 mm internal diameter tubing will suffice.

Tubing can be fitted directly onto syringe.

Open the beak and withdraw the tongue as before. Identify the windpipe opening and avoid it at all costs.

Insert the tubing slowly down bird's oesophagus until resistance is felt, withdraw slightly and slowly inject the mixture. Keep the bird's head and neck up and extended. Remove the tube slowly and hold bird's head up another half minute or so then relax hold.

When inserting the tube care should be taken to start the tube at one side of the mouth and ensure that it is not entering the bird's airway.

For swans and pelicans, it is essential to check the airway with a torch.

Guard against the welling back of fluid given by tube, both during the procedure and just after by keeping head well up with neck fully extended. (Welling back is very common in pelicans, seagulls and herons). Some birds are more frail (e.g. sandpipers) and are therefore more difficult to intubate without previous experience, and are hopeless to gravity feed. Ideally in these cases, expert help should be sought.

Syringes and tubing may be ordered from chemists or obtained from your local G.P. or Vet. Between use they can be soaked in Milton and rinsed before the next treatment.

### Treatment of Insect Infestation

There are many commercial brands of aerosol spray, powders and liquid insecticides. The most convenient are aerosol sprays recommended for birds, or Malawash. When spraying protect the bird's eyes, mouth and nostrils to prevent inhalation. Spray in a well ventilated area or preferably outside, taking note of wind direction. Spray neck first, middle of back, under wings and belly and vent area. Massage spray in lightly against grain of feathers.

## Maintenance Feeding With Glucose Mixture

Mixture: 1 level teaspoon (4 ml) of powdered Glucodin to 1/2 cup (100 ml) of fresh water. Add 4-5 drops of Pentavite. Stir well. This mixture should be made each day. If at all possible addition of an antibiotic to this mixture is desirable e.g. Aureomycin or Terramycin.

The first dose of glucose mixture should be given one hour after the last epsom salts. It should still be administered by tube and the dosage is the same as for Epsom salts. Thereafter it should be given every four hours. In serious cases treatment can be more frequent e.g. two hourly at 3/4 appropriate dose. Small birds e.g. stilts will need treating two hourly at 1 ml per treatment. Tubing of glucose mixture must not cease unless there is definite visual proof that the bird is drinking. Even then tubing can continue until the bird is taking solid food.

## Cleaning of Bird and General Nursing

Only clean the bird after administration of the first dose of glucose mixture.

- If feathers are soiled wipe gently with a damp rag, do not be too fussy.
- Clean eyes if mucus is present. Gently roll a dampened cotton bud across the affected eye towards the end nearer to the beak. If the eyes are stuck shut and pressure from discharge has built up inside, they should be swabbed gently with clean warm water until open and drained. Check eyes with each treatment.
- Ensure breathing passages and beak remain clear of mucus.
- Ensure tongue is free to move and not stuck to beak. If it is, gently swab with warm water until free - with the head held down so water can't enter air passages.
- Check the vent area. If it is soiled swab well with warm water. Some birds, particularly seagulls, lose the power to expel their droppings, and gradually "blow-up" - a little seepage may occur, but no proper defaecation. The abdomen becomes distended and the bird distressed. This may occur if it has been force-fed with solid food in the earlier stages of rehabilitation. Fortunately, this illness is relatively uncommon. Washing of the vent area often stimulates bowel evacuation. Also gentle pressure just above the cloaca can help. If feasible, placing bird in

water always stimulates a bowel action. But care must be taken if bird is in danger of drowning.

- If cloaca is fly blown, cut away the feathers around the vent, dip the area in a solution of Malawash and, using a syringe, flush around and just inside the cloaca. Dry the bird carefully, without overheating or stressing, in front of a heater and recheck after a few hours. If a few maggots remain, remove with forceps.
- At each treatment gently move both legs to aid circulation and prevent stiffness. Also move both wings to full extension and closure a few times. This aids circulation and, more importantly, respiration. Likewise firmly but gently massage chest area with fingertips moving against the lie of the feathers. Large birds, e.g. swans, are best nursed on something soft as their body weight causes tremendous pressure on their chest. Very sick birds benefit from having soft material under the chest area.
- Treat wounds according to a vet's advice. Rigidly guard against fly strike. Eggs may be hidden in feathers near a wound or soggy soiled area, not actually on it.

## Holding Area

Ideally birds should be housed separately as recovery speeds vary and the sicker birds are then not distressed by more active birds crawling over them. Large cardboard boxes are ideal for this purpose. Several sheets of newspaper should be placed in the bottom of the boxes. These should be changed when soiled, usually with each treatment. Paper towelling can be used under the vent of less active birds. This can be changed more easily.

The birds should be kept in an area where temperature is fairly constant and moderate. Ideally an indoor or garage (not metal) area should be used. Flies must be avoided.

If it is necessary to hold the birds outside, a well mowed grass area is ideal. Sand is unsuitable. Concrete pavement can be used provided it is scrubbed and disinfected daily - twice daily is better still. One pen can be used for very sick birds and a second and third for birds that are able to walk about. The pens should be shaded. This technique of housing requires strict cleaning of faecal material (droppings) on a regular basis and a thorough hosing and spray with fly spray in between use. There is still the problem mentioned earlier of different speeds of recovery, unless very frequent observations are made.

## Rehabilitation

When the swallowing reflex has definitely been regained and the bird is coping with water, solid food may be offered and intubation ceased. If two or more birds are housed together, it is difficult to observe whether all are eating. Once a bird is walking there is less problem in ensuring they are all obtaining food.

Supply food in a shallow wide container e.g. shallow cake tin. For ducks, use chick starter crumbles or pellets made up with fresh water, till very watery. Make up fresh each day. Wheat pre-soaked in a bowl of water can be offered to well-recovered birds as can finely chopped lettuce. Dry crumbles and separate water bowls can be given to birds that are feeding well. Swans can be fed a similar diet. Other types of water birds e.g. waders, seagulls, herons, often require specialized diets. In these cases expert advice should be sought.

Less affected birds will only take 2-3 days to recover. Recovery of some birds may take up to 10 days or even longer, especially if the plumage has lost a lot of its water proofing after a severe bout of poisoning and much handling. A light spray with

the hose, and providing a bird bath will help rectify this situation when the bird is strong enough and able to preen.

It is important to avoid unnecessary disturbance at all stages of the illness. Do not assume that because a bird is active and feeding, it is fit for release. The keel (or breastbone) should be felt to ensure presence of adequate breast muscle. If the bird is obviously thin, its captivity should be continued for a short period until adequately fleshed. However, the keel will always stand out fairly prominently on captive birds - do not expect a completely rounded breast. If birds will not begin eating and remain inactive, tubing should be continued with the addition of a baby cereal such as Farex.

Birds are normally ready for release when they are water proof and show signs of restlessness. Ideally they should be transported to a large body of permanent fresh water. They should not be released close to the lake they came from as the likelihood of them flying back in and becoming re-poisoned is high.

**NOTE:** *Domestic ducks must not be released back into the wild.*

## FURTHER INFORMATION

Department of Conservation and Land Management, Wildlife Research Centre, Ocean Reef Road, WOODVALE WA 6026. Ph: (09) 405 5100