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MINISTRY OF AGRICULTURE, FISHERIES AND FOOD AND
DEPARTMENT OF AGRICULTURE AND FISHERIES FOR SCOTLAND

External Parasites of Poultry

THE economic loss resulting from external parasites of poultry is very considerable. Although there may be no obviously sick or dying birds to cause alarm, the gradual deterioration in the health of the flock, reduction in egg yield, and impaired rate of growth can increase to such a point as to convert a reasonable profit into a considerable loss.

Four entirely different groups of external parasites, or ectoparasites, infest poultry in Britain: lice, fleas, bugs and mites. The nature of attack, its detection, treatment and control differ with each group and are described separately.

Lice (*Mallophaga*)

Infestation by lice is common to most birds unless they are reared in isolation, or have been recently treated. Fowls may carry no less than eight different kinds of lice, and turkeys, geese and ducks each have three species of their own. Every kind of louse is confined to its own kind of bird and is incapable of infesting any other sort of bird.

BIOLOGY

These various kinds of lice have many habits in common; all live on the feathers or the skin and do not long survive separation from the

birds; all have jaws adapted for chewing the fine feathers and skin scales on which they feed; all have flattened bodies which allow them to move rapidly among the feathers and to hide; all have clawed legs which cling to the feathers so that they are not easily dislodged by scratching.

The reproduction of the lice also follows the same general pattern. The eggs are cemented to the base of the feathers, the incubation periods vary from four to ten days, and the newly-hatched lice resemble their parents in everything except size. Development may be complete in as short a time as fourteen days, and the mature females lay at least one hundred eggs.

The principal differences in the habits of the lice are to be found in their preferences for different parts of the body; for example, the neck louse (*Lipeurus heterographus*) is a slender species and is found, often in large numbers, clinging to the feather shafts close to the skin on the neck and on top of the head. This is the most important kind of louse for young chicks, in whom heavy infestation may cause great weakness and even death.

The broad body louse (*Eomenacanthus stramineus*), as a second example, prefers the downy feathers, and is often abundant round the vent.

Body louse

Neck louse

Untrue

It lays its eggs in clusters on the fluffy feathers and may cause them to become matted together. This kind of louse causes considerable irritation, and is responsible for the scabs and abrasions often seen in the vent region; it also differs from the other species in feeding on the dried blood and scabs around the abrasions.

DETECTION

The lice or their eggs can be seen from a close inspection of the base of the feathers.

DAMAGE

The neck louse and broad body louse are the two most harmful, but the other kinds also cause damage, inducing restlessness and spoiling the appearance of the feathers.

TREATMENT AND CONTROL

Lice live only on the birds; therefore it is the birds that must be treated to obtain effective results, and control and eradication is then a quick and simple procedure. The synthetic insecticides DDT and the *gamma* isomer of benzene hexachloride (BHC) give excellent results and are better than the older methods of control. Despite the slight odour of some benzene hexachloride preparations, their use is to be preferred to that of DDT since they have a much wider range of action. In addition to the control of lice, bugs and fleas (which is also a property of DDT), benzene hexachloride kills the mite pests, such as depluming mites and red mites, against which DDT is relatively ineffective.

For dusting, a 5 per cent DDT or 1 per cent *gamma* benzene hexachloride powder may be used. If two people are engaged in the work, a horticultural powder-blower is an efficient and rapid method of applying the treatment. The head, neck, vent, and bare areas below the wings

should receive special attention. Alternatively, a powder-caster may be used, or pinches of the powder run through the plumage. Although not dangerous to humans, the dusts may be unpleasant and the operation should be done in the open air. Sodium fluoride may be used in the same way, and the same precautions should be observed.

If properly carried out, a single treatment with benzene hexachloride may completely exterminate the lice, since sufficient quantities of the insecticide persist in the feathers to kill any lice hatching from eggs after the treatment.

Dipping is the most effective method but should only be employed as a last resort. Treatment of the individual birds is time consuming, and egg production may be deranged temporarily. Tepid water should be used, and a suspension, emulsion or miscible oil preparation of benzene hexachloride or DDT should be prepared at the strength recommended by the various makers. The concentration of the active drugs varies in different proprietary preparations, but the diluted fluid should contain 0.1–0.2 per cent DDT or 0.05–0.1 per cent *gamma* benzene hexachloride. It is dangerous to exceed the recommended concentration. Birds under 8 weeks old should not be dipped in these preparations since they may prove toxic.

The birds should be held by the wings and lowered into the fluid; it should then be raised and lowered a few times to drive the liquid in against the lie of the feathers to ensure a thorough wetting, and the head immersed; the bird may then be lifted out and allowed to drain for a few seconds before being released. The dipping is quite safe if done sufficiently early in the day to allow the birds to dry before nightfall, and may be carried out in winter on a dry day.

Fleas (*Siphonaptera*)

Only one species—the hen flea (*Ceratophyllus gallinae*) — attacks poultry in Britain; it is also found regularly in pigeon-cotes and in wild birds' nests.

BIOLOGY

The hen flea resembles the human and dog fleas in appearance. Only the adult fleas attack fowls, and they may desert the birds temporarily between blood meals. When replete they may hide among debris in the nesting-boxes, or on the floor. Here the female flea may lay her pearly-white eggs, but she is quite indiscriminate in depositing these. They may be laid on the fowl, and any eggs so placed are shaken out as the fowl preens herself and develop on the ground with those already there.

In 3–10 days the eggs hatch into minute white maggots whose subsequent development is dependent on temperature and food; it may be complete in as little as 10 days, or may extend to as many months. The minute maggots do not attack the fowls, but feed on any dry organic matters such as waste mash or even droppings. Although the house provides the main refuge for these flea-maggots, they can also develop in the open field. In dirty houses, the fine dust in the corners may become a living mass of such maggots; but even in clean houses they find shelter and food in the spaces between the floor planks into which fine food-waste may be swept.

Once growth is complete the maggots spin a small cocoon and develop into the familiar adult state. The pupae are very resistant to external conditions and can survive many months in empty fowl houses.

DETECTION

Old, ill-kept fowl houses are often very heavily infested, and the fleas

or their minute maggot-like larvae may be seen if dry dusty litter from a nest-box or a dark corner is examined in sunlight.

DAMAGE

Infestations of nesting-boxes disturb laying birds and induce them to lay away from their houses; brooding hens may desert their eggs, and roosting birds are made restless.

TREATMENT AND CONTROL

See section on Eradication (p. 6).

Bugs (*Hemiptera*)

Two species of bugs are found in poultry houses, the pigeon bug (*Cimex columbarius*) and the bed bug (*C. lectularius*). Both have similar appearance and habits; both are dark, blackish-brown insects with flattened bodies and are able to feed on many different animals.

BIOLOGY

Bugs do not live continuously on the poultry but, like fleas and red mites, attack the birds at night while they are roosting. After becoming engorged with blood they hurriedly leave the fowls and seek refuge in crevices in the walls and masonry; less frequently, they hide among dry litter. After each feed of blood the bugs spend a few days in digestion. During this time the females ripen their eggs and deposit them in their hiding places. In about a week these eggs hatch out pale-coloured young bugs, which reach the adult stage in about two months.

DETECTION

When their refuges are disturbed the bugs may be seen scurrying for safety. Old poultry houses are the most often infested, but modern houses are not immune, and heated

brooder houses greatly favour the rapid increase of the pests. In brooder houses they may be seen under droppings trays, under the metal flanges of feeding troughs, and in the flannels of hover-curtains. They are very elusive and, though abundant, may often escape detection; but their presence may be betrayed by the small, dark, round, dried drops of their excrement on whitewash, or on light-coloured woodwork.

DAMAGE

Bugs resemble fleas in the damage they cause. Heavy infestations seriously disturb roosting or brooding fowls, and in severe infestations anaemia, and even death, may result from their blood-sucking.

TREATMENT AND CONTROL

See section on Eradication (p. 6).

Mites (*Acarina*)

Four different kinds of mites are important to poultry keepers; the blood-sucking red mite, the northern fowl mite, the depluming mite and the scaly-leg mite.

There are, in addition, very many kinds of mites which live on stored grain products, and which may sometimes be found in enormous numbers in the litter of deep-litter houses. These mites may be confused with red mites, and it is advisable to have an expert identification before starting treatment to eradicate red mites.

Red Mite (*Dermanyssus gallinae*) is probably the most important ectoparasite of fowls, being present in large numbers almost everywhere unless special precautions are taken against it. It can attack many species of birds, but fowls and turkeys suffer most severely. Transmission of these mites to man and to domestic animals (e.g., horses, dogs and cats)

is not uncommon, but although the mites cause some irritation, they will not remain for any length of time and readily yield to treatment. Hens should not be permitted to roost in stables and sheds where other animals are kept.

BIOLOGY

The adult mites are easily visible to the naked eye and resemble minute spiders in general appearance. They are blood-suckers and, like bugs and fleas, make their attack at night, although in dark places they may be active at any time. Roosting fowls and sitting hens are attacked, the mites rapidly engorging blood and then retiring to any dark crevice to digest their meal. It is from the bright-red appearance of the blood-filled, recently-fed mites that they are named. As digestion proceeds they become dark-brown, and then pale grey-white. The female mite, after feeding, leaves the bird for a sheltered place where she lays a batch of 4 to 6 eggs; these hatch in about 2 days into minute, six-legged mites which do not feed but remain motionless for some 24 hours, after which they become active blood-suckers and grow to maturity.

During the summer the life cycle may be completed in as little as a week, and heavy infestations are rapidly built up. The mites can survive starvation for many months.

DETECTION

Attention may be called to the presence of the mites through the fowls' eggs being marked with the reddish-black drops of mite excrement. Whenever these are seen a search should be made in nearby crevices for the hidden mites. Common hiding-places are the underside of nest-box lids, under roosting-spar joints, among dry litter or even among dry droppings. The mites are

found in groups, and disperse when they are disturbed. Their excrement dries in small pale round drops which clearly show against dark woodwork: there may be so much of this excrement that it completely over-lays the woodwork. Examination of the fowls at night-time may reveal the mites among the feathers.

DAMAGE

Infestations of this very harmful pest are frequently of such a severe character as to produce bloodlessness in the fowls, and even death in the most severe cases. There may be a serious reduction in egg output, brooding hens may desert the nest and young birds fail to thrive.

TREATMENT AND CONTROL

See section on Eradication (p. 6). **Northern Fowl Mite** (*Liponyssus sylviarum*). This species closely resembles the red mite (see above) in appearance and in its blood-sucking habit, but differs from that species in remaining permanently on the fowls. It is not thought to be widespread, but, when present, may occur in very large numbers.

TREATMENT AND CONTROL

Sprays, dusts or aerosols containing a suitable insecticide (e.g., B.H.C. pyrethrins, 'Sevin', Malathion or Dichloruos) will control the pest. In severe cases a second treatment may be necessary one week later. Dipping in sulphur or in benzene hexachloride as recommended for lice (page 2) also will control the Northern Fowl Mite.

Depluming Mite (*Cnemidocoptes gallinae*). The appearance and biology of this mite closely resemble those of the scaly-leg mite, except that the depluming mite does not attack the shanks but invades the skin in the region of the rump, back, neck and head, burrowing into the skin at the base of the feathers.

DETECTION

Although by no means rare, this disease is less frequent than is scaly-leg. The severe irritation causes acute reddening and inflammation around the base of the feathers in the early stages, and later the feathers are pulled out by the fowl or broken by violent scratching.

DAMAGE

Bare patches are produced, and in an effort to allay the itch the fowls pluck out the new feathers as they grow. The disturbance and constant regrowth of new plumage reduces the fowls' condition, and egg production ceases.

TREATMENT AND CONTROL

Local application of 20 per cent benzyl benzoate emulsion, or dipping the fowls in a fluid containing 0.1 per cent *gamma* benzene hexachloride as described in the treatment for lice (p. 2), will give complete cure. To prevent spread of the disease throughout the flock from birds that are affected but do not yet show symptoms, it is necessary to treat all those that have been in contact with the disease.

Scaly-leg Mite (*Cnemidocoptes mutans*). The adult mites are tiny, round, pearly-white creatures just visible to the naked eye. This mite and the depluming mite look like the mite of the human scabies.

BIOLOGY

The mites burrow deeply into the skin, under the scales of the legs and feet. In these tunnels the female mites produce living young at the rate of two or four per day. These young mites make burrows for themselves, and the affected area is increased. Close contact between fowls on the roosts favours the spread of this disease.

DETECTION

The disease is no longer common, but its appearance is well known. At first there is a reddening of the shanks, then, as the disease progresses, masses of chalky material produced by the burrowing of the mites raise up the scales on the toes and shanks, and the characteristic 'scaly-leg' is produced.

DAMAGE

Besides having an unsightly appearance, the feet are deformed. The birds go lame and may even lose some of their toes. Even in lighter infestations unthriftiness results from their inability to forage properly, or to rest comfortably at night.

TREATMENT AND CONTROL

Where only a few birds are kept, it is possible to treat them by first softening and removing the chalky crusts with soap and water, and then applying a 20 per cent sulphur ointment, or emulsion of benzyl benzoate. Where large numbers of fowls are kept, treatment by dipping in paraffin or crude oil, though more drastic, is very effective. The bird's legs should be lowered into the paraffin in a bucket, taking care that the liquid does not go above the scaly part of the leg or wet the feathers, as it will irritate the skin. The oil penetrates the dense crusts, and it is not necessary to remove them before treatment. One application is usually sufficient, but it may be necessary to repeat it after one month if some birds do not appear to be completely cured.

Where a few affected birds are found it is as well to treat all the fowls in the flock, as many of the apparently unaffected birds are likely to harbour the disease in an undeveloped latent form. Eradication is possible, and a flock can be kept free

if all new birds are examined and treated before being introduced to the flock.

Eradication of Red Mites, Fleas and Bugs

Red mites, fleas and bugs have many habits in common, and it is a worthwhile practice to include lice in a common eradication programme, and to try to produce a pest-free flock. Fleas and mites are most abundant at the end of the summer and it is then that treatment should be undertaken, although treatment in the spring is also very desirable.

DISINFECTION OF POULTRY HOUSES

The fowl houses should be evacuated and the birds temporarily housed elsewhere. All movable nesting-boxes, feeding-troughs, boards, etc., are taken out of the house; litter and fine dusts are cleared out and burned. The houses should then be scrubbed clean and sprayed with an insecticide, for example one containing 0.1-0.5 per cent *gamma* benzene hexachloride or a suitable concentration of Dichloruoc. Wooden houses are better dressed with creosote oil.

These killing fluids may be painted on, or applied with horticultural or lime-wash sprayers, or even a garden syringe. The whole house, including the roof, must be drenched with the liquid, which should reach into every crevice. Greater certainty of the treatment is ensured if all the crevices are treated first. The nesting-boxes and other appliances should be scrubbed and sprayed before being returned to their places. Fumigation is rarely practicable, but for infestations of brooder houses with bugs it may be necessary to call in a firm of disinfestation experts.

Poultry houses should be constructed for ease of cleaning, with a minimum of small crevices. Nesting-

boxes and roost spars should be made removable, in order to give access to all the hiding places when the house is cleaned.

TREATMENT OF FOWLS

In moderate cases of infestation, thorough cleaning of the poultry houses and improving the feeding and hygiene of the flock will be sufficient to control the condition. In severe outbreaks, or where immediate eradication is necessary, the birds should be treated, either by dusting or dipping, before they are returned to the clean house. Despite its disadvantages, dipping is the better method of killing mites in addition to lice and fleas. (See section on Treatment and Control of Lice p. 2.)

DANGER FROM OUTSIDE SOURCES

Wild birds, particularly starlings and sparrows, harbour fleas and red mites; pigeons harbour bugs. These birds should be excluded from the fowl-runs and no pigeon-cotes allowed in the vicinity. All sparrows' and starlings' nests in or near the fowl houses may be a source of infestation. Newly-purchased fowls should be inspected and treated before introduction to the flock; poultry crates from markets, often a source of red mites and bugs, should be disinfected.

The thorough application of modern methods of control makes it possible to keep poultry free from all these parasites.

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