

CHICKENS AS PATIENTS

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INTRODUCTION

The keeping of non-commercial backyard poultry is increasing greatly in popularity. Ducks, geese, pheasants, guinea fowl and other species may all be kept, but chickens are probably the most common species presented in general practice. People keep chickens for different reasons, including just having a few hens for private egg production and consumption, breeding of exhibition or “fancy” birds, small layer or meat bird flocks, or as true pets that also help to weed the garden. Chicken owners will vary from very experienced to complete novices. For these types of poultry, the local small animal or mixed veterinary practitioner is likely to be called upon rather than an experienced commercial poultry vet, although this may well be after advice has been sought from the breeder, agricultural merchant or internet first and various treatments applied. Many owners become very attached to their birds and invest time and money in their care, and will expect their veterinary surgeon to be knowledgeable, able to advise on general husbandry and management and to treat any problems effectively.

The domestic chicken is descended from the Red Jungle Fowl (*Gallus gallus*), but have been domesticated into a large variety of breeds. Choice of breed usually depends on the purpose of keeping the chicken. Bantams are often kept if space is limited; these are small varieties with correspondingly small eggs, and most large breeds have a bantam (miniature) version. People keeping chickens for eggs will either have pure traditional breeds, modern hybrids or “rescued” ex-battery hens. Hybrids will be the best layers (250-300 eggs/year for 2 years or more). Pure breeds are kept for exhibition and are classified as heavy (eat more, lay less eggs) or light (eat less, lay well, more flighty). Life expectancy of most chickens is 6-10 years, but bantams can live 8-12 years.

Basic husbandry

Chickens should be kept outside. Many kept as pets will become very tame and happily walk into the owner’s house. Outdoor accommodation must provide the basics of shelter from wind and rain, protection against predation, a dry safe area to roost and sleep in, and a secluded area to lay. This can be achieved in various ways, including small plastic pods with a wire run, static houses with a pen, mobile wooden units with a run, traditional arks or coops, or adapted outhouses, stables or barns. A garden shed with perches and additional ventilation near the roof is a good option for a few chickens. Many modern “trendy” units for back gardens actually provide very limited space and poor ventilation, and traditional triangular arks also provide very limited space. The ability to roam freely and forage during the day is also important, but may not be in option over the English/European winter, in which case floor space is very important - 30cm x 30cm per bird for large chickens and 20cm x 20cm per bird for bantams as a minimum, but more is always better. Dust-free wood shavings make good litter, and should be spot cleaned daily or changed entirely every 1-2 weeks depending on stocking density. Virkon or F10 are good disinfectants that can be used after removal of all litter and thorough cleaning. Alternatively a deep litter system can be used, removed once a year (makes good fertiliser/compost for the garden), but nest boxes should still be cleaned weekly. Straw and hay can

harbour fungal spores. Perches for roosting should be broad (5cm square dowelling with top edges rounded, or natural branches) and should be above nestbox height but easy to get up on to and not too high as landing heavily can cause bruising and eventually bumblefoot. Perches should allow about 15cm length for bantams and 23-25cm for large chickens. Lighting in winter is necessary if laying is to continue (14 hrs). Nestboxes should be in the lowest and darkest part of the housing. Light breeds come into lay at about 18-20 weeks old, and heavy breeds at about 26 weeks or later. Chickens can lay one egg per day (not at exactly the same time each day as an egg takes about 25 hours to produce) and may miss a day if it is dark at the time of ovulation, which usually occurs half an hour after laying. A hen will become broody and incubate the eggs when she has laid a clutch (missed a day) or if the eggs are not removed. It is possible to tell if a hen is in lay by placing the fingers between the pin bones ventrally- approximately three fingers width and a moist loose cloaca indicates the bird is in lay and a narrower width and a tight dry cloaca indicates it is not in lay – although obviously this will depend somewhat on the size of the hand and the bird! Incubation period for fertile eggs is 21 days.

Vaccination is not commonly carried out in small backyard flocks as chicken vaccines tend to come in 1000 dose vials. The decision to vaccinate e.g. for Marek's disease, will depend mainly on disease risk and flock size. Rescued end of lay hens will usually have been vaccinated against many diseases during rearing and at point of lay.

Moulting normally takes place in late summer/early autumn in the northern hemisphere and lasts 3-4 weeks.

Nutrition

Nutrition should be age-appropriate and many commercial formulated diets are available - crumbs up to 5 weeks, grower pellet up to 16 weeks and then layer pellets or mash. Whole grain can also be given after the age of 12 weeks to supplement the diet and provide enrichment if scatter-fed; common advice is to feed pellets in the morning (easily digestible) and grain (wheat, barley, kibbled maize) in the afternoon (stays in the crop longer so lasts overnight). Note that some commercial feeds contain coccidiostats which can be toxic for turkeys. Grit (soluble and insoluble) is important for gizzard function and egg shell formation. Insoluble grit is important to prevent impactions due to consumption of long grass. Household scraps are commonly given to pets but may unbalance the diet, however green stuff is always enjoyed. In Australia, it is illegal to feed poultry any food made from animals or animal by-products. Grass and garden plants are also enjoyed and chickens tend to avoid toxic plants, but should be kept away from known poisonous plants. A constant supply of clean drinking water is essential; drinkers should be cleaned and disinfected regularly otherwise there is a risk of biofilm build-up and disease e.g. botulism.

Legal requirements

Countries will vary over their legal requirements for keeping poultry, drug administration and withdrawal times, selling of eggs etc, and many owners will be unaware of these and assume they do not apply to the pet situation. For example, in the UK, there is a legal requirement for poultry to be registered if premises have 50 or more birds. It is vital that vets are aware of their local regulations. Very few products are licensed for use in egg laying birds or where eggs are used for human consumption, even just by the owner. For example, enrofloxacin should not be used in birds producing eggs for human consumption. The Australian Pesticide and Veterinary Medicines Authority has a list of prohibited drugs on their website, and vets should consult this. Avian influenza and

Newcastle disease are notifiable in most countries but generally not common in backyard flocks.

VETERINARY APPROACH

The clinical approach to a chicken as a patient follows the same format as for any animal and starts with a good history. Essential components include:

- Age, method of hatching and rearing
- Diet, including treats
- Housing arrangements
- Flock size
- Preventive medicine regime (if any):
 - ▶ Worming
 - ▶ External parasite treatment
 - ▶ Vaccination
 - ▶ Biosecurity/quarantine arrangements
 - ▶ Vermin control
- Addition of new stock
- Visits to exhibitions/breeders
- Medications used on the advice of other vets, neighbours, the old bloke down the road who's had chickens for 70 years, the local poultry club, or the Internet.

The reason for presentation should then be ascertained, followed by a thorough clinical examination. As with other birds, chickens will hide signs of ill health in order to preserve their position within the pecking order.

Handling is usually simple, the common presentation is a hen in a cardboard box. The hand is slid palm up underneath the bird's breast and the fingers clamped around the top of the legs (between first/second finger and third /fourth finger), then the other hand placed over the back and the bird lifted out of the box. The weight can then be rested on the forearm with the head towards the crook of the arm/armpit. For right handed handlers, the bird is held with the left arm and hand, leaving the right hand free for examination. Each wing should be spread in turn and examined. Body condition is assessed over the keel and by feeling the pin bones either side of the cloaca (vent), and an accurate bodyweight should always be obtained. A healthy chicken should be alert and active and have dry nostrils, a red comb, bright fully open eyes with no periocular swelling, shiny feathers with no areas of feather loss or obvious ectoparasites, a clean cloaca, and smooth straight legs and toes. Normal cloacal temperature is 40-42 C. The abdomen should be palpated for ascites and swelling. The beak should be opened to assess mucous membrane colour and check for abnormalities disease such as trichomonosis.

Blood sampling is best achieved from the right jugular vein or medial metatarsal vein. Faecal examination including worm egg/oocyst counts is often very useful from either single bird or pooled samples. Radiography, ultrasonography and endoscopy techniques are as in other birds. Gaseous anaesthesia using isoflurane is recommended, and chickens are simple to intubate. Standard supportive care includes fluid therapy (oral by crop tube, intravenous, intraosseous), nutritional support e.g avian critical care formulas by crop tube, warmth and oxygenation.

COMMON PROBLEMS

Respiratory disease

Poor ventilation, with resultant ammonia and dust levels will predispose to respiratory problems.

Mycoplasmosis is the most common respiratory problem in the UK, and either due to *M. gallisepticum* or *M. synoviae*, which causes swollen joints in addition to mild respiratory signs. Typical signs of mycoplasmosis are nasal discharge, foamy eyes, swollen eyelids and sinuses, sneezing and gasping. Egg production will be reduced. Treatment options include enrofloxacin, tylosin (licensed for mycoplasmosis), tiamulin, and tetracyclines, but choice of drug must take note of any restrictions for use, such as in birds laying eggs for human consumption. Antibiotics will control clinical signs and reduce incidence within a flock but not eliminate infection and it may recur. Mycoplasma vaccines are available but not generally used in a backyard situation.

Aspergillosis from high burdens of fungal spores in mouldy hay or straw or rotting vegetation can be common in stressed birds. Diagnosis and treatment are as in other avian species, but prognosis is usually poor. Treatment may be attempted with systemic itraconazole and nebulisation with F10.

Infectious bronchitis is caused by a coronavirus. It can also lead to renal damage and oviduct infection (wrinkled eggs). Clinical signs are similar to mycoplasmosis but the disease spreads rapidly in 1-3 days and is generally mild and often self-limiting. Concurrent mycoplasmosis predisposes to IB, and commercial flocks can be vaccinated (combined Newcastle disease and IB vaccine). Diagnosis is usually on clinical signs but serology and viral PCR are available.

Reproductive tract disease

Egg binding can occur in hens with low calcium levels. Warmth, fluid therapy, calcium supplementation and gentle lubrication of the cloaca may enable passage of the egg if it is within the cloaca, but if it is within the oviduct prognosis is more guarded. Breakage of the shell and removal per cloaca may be possible but oviductal trauma may occur.

Egg coelomitis (peritonitis) is probably the most common systemic problem seen in backyard poultry. It is caused by release of an ovum free into the abdomen, or as a result of an ascending bacterial infection of the oviduct via the cloaca. Both scenarios usually lead to an overwhelming systemic toxic bacterial infection, and a severe chronic salpingitis. Affected hens are depressed and lethargic with a swollen painful abdomen and cessation of laying. Supportive care and antibiotic treatment may be effective but generally prognosis is poor.

Prolapsed oviduct often presents as an emergency with a severely traumatised /pecked cloaca in a collapsed or dying bird. Stress, old age, obesity and poor nutrition/low calcium levels all predispose. Surgical salpingectomy can be performed, sectioning the oviduct at the level of the vagina.

Digestive tract disease

Sour crop due to *Candida albicans* infection can be secondary to oral antibiotic therapy, or often occurs in association with crop stasis secondary to underlying GI or reproductive disease, or Marek's Disease (see below). Treatment is with oral nystatin or ketoconazole, in addition to addressing any

other underlying cause.

Impactions Crop impactions are frequently due to ingestion of long grass which forms a ball and cannot be passed further down the GI tract. In mild cases, softening with liquid paraffin and gentle massage/milking out of the mouth with the head held down may be possible, monitoring carefully for any respiratory distress. Severe impactions will require general anaesthesia and ingluviotomy to remove the impacted material. An impacted crop frequently becomes pendulous and the muscles stretch and weaken. Pendulous crop and impaction may also occur secondary to heavy metal (lead or zinc) toxicity, or Marek's Disease.

Endoparasites

Coccidiosis is an important poultry disease and is common in rearing birds of 4-6 weeks of age. Seven species of *Eimeria* are specific to chickens and affect different parts of the GI tract with differing severity. All have direct life cycles, short prepatent periods (less than a week) and sporulation in the environment is rapid (a few days) in warm moist environments so rapid reinfection can occur and escalation of disease levels with mortality. Affected birds will have poor growth and wet watery diarrhoea. Diagnosis is confirmed by oocyst counts and treatment is with toltrazuril 7mg/kg (licensed for chickens in UK for broilers, eggs cannot be used). Prevention is with good biosecurity and hygiene. The use of coccidiostats in feed until 6 weeks used to be common, however, vaccination is now available in the UK (Paracox 8, MSD Animal Health), given orally to day-old chicks, which can be purchased in small amounts by Members of the Poultry Club of Great Britain under vet prescription.

Nematodes are common in backyard chickens. Intestinal nematodes include roundworms (*Ascaridia* spp.), hairworms (*Capillaria* spp.) and caecal worms (*Heterakis* spp.; vector for *Histomonas*). All may be associated with weight loss ("going light") and heavy ascarid burdens may cause intestinal impactions which can be fatal. Diagnosis is confirmed by faecal worm egg counts although large worms may be visible in droppings. Flubendazole is the only wormer licensed in the UK, usually given in feed as a powder, and prophylactic use is advised especially when birds are kept on the same area of ground which cannot be rotated. Levamisole is registered (licensed) for use in poultry in Australia. Tapeworms may also be found and can cause weight loss. *Syngamus trachea* is the tracheal of "gape" worm and causes characteristic gasping or 'snicking' with the neck extended.

Bacterial diarrhoea may be due to *Salmonella pullorum*, *S. gallinarum* (fowl typhoid), *S. typhimurium* and *S. enteritidis* (the latter two being zoonotic). *E. Coli* and *Campylobacter jejuni* may also cause diarrhoea, especially in chicks. General hygiene and vermin control is important and vaccination is available for *Salmonella* and *E. coli*. Treatment of individuals with amoxicillin is possible.

Ectoparasites

Mites and lice. Ectoparasites commonly affect outdoor chickens. Red mites (*Dermanyssus gallinae*) live in the environment and feed on the birds at night and can cause anaemia and lethargy, and even death. These mites can survive 6 months off the host and meticulous cleaning and treatment of the environment is essential – a blow torch can be used and environmental permethrin or pyrethrum powders or spray. Northern fowl mite (*Ornithonyssus silvarum*) has its life cycle entirely on the bird and causes dirty moist patches on the feathers. Pyrethrum powders or spot-on ivermectin or eprinomectin is effective (avermectins are not licenced in UK, so off-label use), and bathing the bird is also helpful.

Scaly leg mites (*Cnemidoptes mutans*) are very common and can cause intense irritation and a build-up of yellowish musty –smelling debris (scaly leg). Ivermectin is effective but many other old-fashioned remedies also exist for scaly leg such as benzyl benzoate, surgical spirit or Vaseline (petroleum jelly). Depluming mites (*Cnemidoptes gallinae*) occasionally cause feather loss around the head and neck, and fipronil can be effective.

The chicken louse is *Menopon gallinae*, which is flat, fast-moving and about 2mm long so easily visible with the naked eye. The eggs (nits) clump together and have the appearance of granulated sugar at the base of the feathers. Treatment is with fipronil, ivermectin or pyrethrum powder.

Locomotor disease

Bumblefoot is a common sequela to bruising from jumping off perches that are too high, and secondary Staphylococcal infection. Mild cases may respond to antibiotics and NSAIDs combined with a change in husbandry, but more advanced cases will need surgical debridement as in raptors.

Fractures. Fracture repair may be requested by the dedicated chicken owner. The principles of repair are the same as in any avian species and

Marek's disease (fowl paralysis) is caused by an alphaherpesvirus - 'Marek's disease virus' (MDV) or Gallid herpesvirus 2 (GaHV-2) – that causes lymphoid tumours and demyelination of peripheral nerves leading to wing droop and leg paralysis. Tumours develop in a variety of organs as well as the brachial and sciatic nerve plexi and affected birds will be immunosuppressed, lose condition and may die. If the vagus nerve is affected, difficulty breathing or dilation of the crop may occur. No treatment is possible and control is by vaccination at one day old. The virus can survive for a year in feather dander and dust.

Other disease

Newcastle disease (fowl pest) is a notifiable disease caused by a paramyxovirus and can cause both respiratory and neurological signs. Other signs include reduced egg production and greenish diarrhoea. Disease in backyard chickens is not common in the UK but may occur via feral pigeons, and vaccination in the face of an outbreak is possible.

Behavioural problems Feather-pecking, vent-pecking and evisceration/cannibalism can be very distressing for owners to witness and is a serious welfare issue. It is usually related to stress, including heat stress and overcrowding. Hens are attracted to red mucosa and so this common just after laying when the cloacal mucosa is still everted and exposed. Vent pecking can also be related to disease as it sometimes becomes prevalent in cases of Gumboro disease (Infectious Bursal Disease).

REFERENCES AND FURTHER READING

- Lister S and Houghton-Wallace J, 2012. Backyard Poultry 1. Husbandry and general management. In Practice 34, 136-145
- Lister S and Houghton-Wallace J, 2012. Backyard Poultry 2. Veterinary care and disease control. In Practice 34, 2114-225
- Roberts V, 2009. Diseases of free range poultry, 3rd edition. Whittet Books, Stansted, UK

Useful website:

http://www.bva-awf.org.uk/sites/bva-awf.org.uk/files/user/free_range_poultry_diseases.pdf

Table 1

Common antimicrobial medications licensed for use in poultry. Adapted from Lister and Houghton-Wallace (2012).

Drug	Dose rate	Species	Withdrawal period		Indication
			Meat	Eggs	
Tylvalosin	25 mg/kg	Chickens Pheasants	2 days	DNU	<i>Mycoplasma gallisepticum</i>
Amoxicillin	15 - 20 mg/kg	Chickens	1 day	DNU	<i>Escherichia coli</i> , <i>Pasteurella</i> species
Apramycin	20 - 40 mg/kg	Chickens	7 days	DNU	<i>Escherichia coli</i>
Toltrazuril	7 mg/kg	Chickens	18 days	DNU	Coccidiosis
Enrofloxacin	10 mg/kg	Chickens Turkeys	8 days	DNU	Bacterial and <i>Mycoplasma</i> disease
Chlortetracycline	20 mg/kg	Chickens	3 days	DNU	Bacterial disease
Colistin	75,000 IU/kg	Poultry	1 day	0	Bacterial disease
Tiamulin	25 mg/kg	Chickens Turkeys	2 days 5 days	0 DNU	<i>Mycoplasma</i> species
Difloxacin	10 mg/kg	Chickens Turkeys	1 day	DNU	Bacterial and <i>Mycoplasma</i> disease
Enrofloxacin	10 mg/kg	Chickens Turkeys	10 days 11 days	DNU	Bacterial and <i>Mycoplasma</i> disease
Erythromycin	25-5 mg/kg	Chickens	6 days	6 days	<i>Mycoplasma</i> species
Lincomycin/ spectinomycin	50 to 150 mg/kg	Poultry	5 days	DNU	Bacterial and <i>Mycoplasma</i> disease
Amoxicillin	8 to 16 mg/kg	Chickens	1 day	DNU	Gram-negative and Gram-positive bacteria
Tilmicosin	15 to 20 mg/kg	Chickens Turkeys	12 days 19 days	DNU	<i>Mycoplasma</i> species
Doxycycline	10 mg/kg	Chickens	3 days	DNU	Bacterial disease
Tetracycline	60 mg/kg	Chickens	6 days	DNU	<i>Clostridium perfringens</i>
Tilmicosin	15 to 20 mg/kg	Chickens Turkeys	12 days 19 days	DNU	<i>Mycoplasma</i> species
Tylosin	50 to 200 mg/kg	Chickens Turkeys	1 day 0	0 DNU	<i>Mycoplasma</i> and <i>Pasteurella</i> species
Amoxicillin	20 mg/kg	Chickens Turkeys	2 days 5 days	DNU	<i>Escherichia coli</i> , <i>Pasteurella</i> species, erysipelas

Prescribing of products outside their Summary of Product Characteristics indications must be carried out with caution under the prescribing cascade and a minimum withdrawal period of 28 days for meat and seven days for eggs must be observed. DNU= Do not use