Disorders of the integumentary system of backyard poultry – Part 1 of 2

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Feather and skin diseases, especially parasitic infestations, are common reasons for poultry owners to contact a veterinarian. As well as being the easiest part of the bird to see, the visual appearance of birds (especially when showing) is a major part of their appeal.

Feather and skin disorders are, therefore, often accorded an importance out of proportion with their clinical significance. Conversely, some feather and skin disorders may appear minor yet reflect serious internal disease.

ANATOMICAL AND PHYSIOLOGICAL CONSIDERATIONS:

The anatomy and physiology of birds have been discussed in a previous article (see Vet News November 2023). However, there are some important points to note:

- Gallinaceous birds are quite 'loose-feathered', and feathers are easily lost if rough-handled. This also results in reduced waterproofing.
- Waterfowl have very good feather waterproofing through a tight feather structure and extensive interlocking barbules. Underneath the outer layer, they have a layer of down feathers to provide thermal insulation. Their feathers need to be removed before venipuncture.
- Poultry have more extensive dermal and subdermal fat than other birds, resulting in yellowing of the skin and can make visualization of blood vessels more difficult.
- Moulting occurs annually in chickens as they enter the non-laying period in the autumn or twice a year in waterfowl.

HISTORY AND CLINICAL EXAMINATION

With all species, it is important to consider the whole bird and not just the integument. A full history and clinical examination are required in all cases. Further diagnostic investigations are required in complex cases or where there may be an underlying systemic disease.

Important aspects of the clinical history:

- Number of birds in the flock and number affected
- Age range of flock and of affected birds
- Routine parasite control (internal & external)
- Housing
- State of lay
- Number of birds in flock moulting
- Access to dust baths or bathing for waterfowl
- Diet
- Initial lesions or areas of feather loss (and how these have changed)
- Response to treatment
- Other medical history

Specific dermatological sampling techniques:

Technique	Indication	Notes
Skin Scrape	Crusts; hyperkeratotic lesions	Performed like for small animals
Feather digest	Feather damage; changes in calamus	The feather is digested in warmed 10% potassium hydroxide and then centrifuged.
Pulp cytology	Feather damage	Calamus incised and contents scraped onto the slide.
Skin acetate	Excessive scale; hyperkeratotic lesions; crusts; exudative lesions	Performed like for small animals
Biopsy	Unusual lesions; lesions refractory to treatment	The sample should include a feather follicle. The skin should not be aseptically prepared

FEATHER DISORDERS

FEATHER LOSS OR DAMAGE

A distinction must always be made between physiological feather loss (e.g. moulting) and pathological feather loss. Where the cause is physiological, one or more of the following features is usually present:

- The bird appears normal without any other pathological findings
- Absence (or very small numbers) of ectoparasites
- No observed aggression from other birds
- Feathers are lost intact and the base of the calamus is closed off
- Growing (replacement) feathers are present
- The presence of other moulting birds in the group
- Spontaneous recovery

When the moult is abnormal, the cause is likely pathological. Some birds (particularly ex-battery hens) may have pre-existing feather and feather follicle loss. In these cases, feathers do not always grow back and additional protection from the elements must be provided. Reasons for pathological feather loss include:

- Physical rubbing
- Plucking/pecking by other birds
- Trauma
- Malnutrition
- Ectoparasite infestation
- Bacterial/Fungal infection

PHYSICAL CAUSES OF FEATHER LOSS AND DAMAGE

The distribution of feather loss is a major indicator of the cause. For example, feather loss over the dorsal head and circumferentially around the neck indicates rubbing of the neck feathers as this bird pushes its head through a fence or narrow feeder to obtain food. Feather loss around the dorsal head, neck and around the vent indicate plucking/pecking by other birds. Management changes can be implemented, and the feathers should regrow. Mating injuries can also result in feather loss/damage. In these cases, the use of mating saddles can be used.

TRAUMA

As poultry are loose-feathered, they will readily lose feathers if attacked. Feathers tend to regrow spontaneously.

MALNUTRITION

Interruption of growth due to periods of malnutrition may result in the formation of stress marks in the feathers. These visible lines often occur in the same place on several feathers. Feathers are weakened at these marks and are easily broken. The diet should be corrected, and the growth of new feathers observed. Protein supplementation may be useful.

ECTOPARASITE INFESTATION

Lice: Chewing lice are commonly found on birds. In small numbers, these are not considered pathogenic and control is not necessary, as preening, dust bathing, swimming and wing flapping will control numbers in healthy birds. In unhealthy birds, numbers may become very heavy and feather damage may result.

Mites: Feather mites are commonly seen. Mites are relatively non-pathogenic. Feather damage will only occur in heavy infestations when mites move off the feathers and onto the skin causing irritation. Malasol, ivermectin and fipronil are effective. Withdrawal periods need to be observed.

BACTERIAL INFECTION

Bacterial disease is very rare. In unhygienic conditions or when there is severe soiling, feather loss occurs due to infection of the follicles. Cleaning and topical disinfection are recommended.

FUNGAL INFECTION

Feather loss around the head and neck may be caused by avian ringworm. (see below)

SKIN DISORDERS

SKIN REDDENING

Erythema is common. Areas usually affected include contact areas, such as the crop, keel and ventrum, and around the vent, abdomen or dorsum where feathers have been lost. These lesions appear as pigmented skin without inflammation and do not appear to be irritant to the bird or cause any other problems. These lesions usually represent a skin response to exposure or abrasion and attention should be paid to the reasons for feather loss.

IRRITATION

Skin irritation may be seen in any region, but particularly in featherless areas and especially the feet. Exposure to irritant substances is usually the cause.

FROSTBITE

Skin irritation needs to be distinguished from frostbite of the extremities. With frostbite, the lesions tend to be the full thickness of the extremity whereas with irritation or photosensitization, lesions are rarely full thickness.

MITE INFESTATION

Red mites

Red mites (*Dermanyssus* spp.) are one of the most common and significant ectoparasites of backyard poultry. They are blood-sucking mites that cause extreme skin irritation and can result in anaemia and debilitation, especially in young birds, where death can occur. Clinical signs include debility, lethargy and, occasionally, pale wattles and combs.

Red mites are photophobic and only emerge at night to feed. The lifecycle of the mite is spent predominantly off the host. The diagnosis is rarely confirmed by finding mites on the bird; instead, environmental checks should be performed.

The use of pyrethrum powders and permethrin sprays has been described. However, penetration of housing materials is poor, thus these treatments are only effective in limiting mite numbers.

Diatomaceous earth can be used in the housing as a desiccant. Ivermectin can also be used. The only guaranteed way to clear the infestation is to destroy existing housing and replace it with plastic.

Northern mites

Northern mites (*Ornithonyssus* spp.) are becoming more common. Unlike the red mite, these mites spend the entire lifecycle on the bird, resulting in continuous irritation and a more rapid onset of anaemia and debilitation.

The diagnosis is based on the clinical signs and on finding the mite on the bird. Infestation is much more easily controlled, as on-bird treatment is all that is required. Ivermectin is given every 2 weeks on three occasions.

Epidermoptid mites

Epidermoptid mites are a relatively common burrowing mite that causes feather loss and skin irritation, mainly of the face and neck ('depluming itch').

Secondary bacterial infections can be seen. Treatment is the same as for the northern mite. All in-contact birds should be treated, even if asymptomatic.

Knemidocoptid mites

The knemidocoptid mite is probably the most common skin parasite of clinical importance. *Knemidocoptes pilae* is typically the cause of scaly leg in poultry.

Scaly leg describes the formation of extensive crusts in the scaled skin of the feet and legs. Secondary bacterial infection and pododermatitis are common.

The diagnosis is confirmed by the clinical signs and skin scrapes. Treatment is the same as for the northern and epidermoptid mites; however, topical therapy may also be of use. In mild cases, Vaseline may be used to suffocate the mite.

TICKS

Soft ticks (tampans) can infest chickens and cause skin irritation. *Argus walkerae* occurs in South Africa. The larval ticks excrete a toxin causing paralysis in ducks and chickens (Argas paralysis).

Ticks are not a major concern in backyard flocks as the birds often ingest the ticks. Ivermectin, fipronil or fluralaner may be used if needed.

BACTERIAL INFECTION

Primary bacterial diseases are uncommon. Secondary bacterial infection of damaged skin is frequently seen and should be addressed and treated when suspected.

Treatment should ideally be based on culture and antibiogram, but co-amoxiclav can be tried first.

FUNGAL INFECTION

Favus (also known as avian ringworm) is common and is caused by *Trichophyton megnini*. Lesions appear as white scales over the face and wattles, spreading down the skin of the head and neck. Favus can cause feather loss, and a deep infection may cause damage to the eyelids and beak.

The diagnosis is confirmed by microscopic identification of the fungus in scrapes or from biopsies. Favus is treated with topical antifungal agents like F10 or iodine until lesions resolve.

Topical miconazole or systemic antifungal agents can be used, although it should be noted that none of these are authorized for use in food-producing animals. Very severe cases may require euthanasia.

VIRAL INFECTION

Poxvirus is an occasional finding in backyard poultry. Lesions are seen in featherless areas (especially the feet and face) and consist of either raised plaques or pale scabs.

Transmission occurs directly or via vector-borne spread. Treatment is supportive. Vaccination is recommended annually.

REFERENCES

1. Govender K. 2024. *Personal communication.*
2. Mia M Z. 2024. *Personal communication.*
3. Poland G., Raftery A. 2019. *Backyard poultry medicine and surgery.*
4. Smith *et al.* 2009. *Basic poultry production and management. UP course notes.*
5. Stoltz H. 2013. *Ectoparasitology. UP course notes.*

QUESTION 1

Backyard poultry are comparatively loose feathered when compared to other avian species. This is significant as:

a. This increases their waterproofing
b. Feathers are easily lost if the birds are rough handled
c. Feathers need not be removed if venipuncture is needed
d. Ectoparasites do not affect loose feathered birds
e. All of the above

QUESTION 2

Which of the following is not an important factor when taking a history?

a. Diet
b. Housing
c. Feather colour
d. Age
e. Routine parasite control

QUESTION 3

Which dermatological sampling techniques can be used:

a. Skin scraping
b. Feather digest
c. Pulp cytology
d. Biopsy
e. All of the above

QUESTION 4

Which of the following is not a physiological cause of feather loss?

a. Replacement feathers are present
b. Presence of other moulting birds in the flock
c. Absence of ectoparasites
d. Feathers are lost intact and there are no other pathological findings
e. Physical rubbing

QUESTION 5

Which of the following is false?

a. Malnutrition can cause the formation of stress marks in feathers.
b. As poultry are loose-feathered, they seldom lose feathers if attacked.
c. The distribution of feather loss is a major indicator of the cause.
d. Lost feathers regrow spontaneously.
e. Mating injuries can result in feather damage.

QUESTION 6

What is the most significant ectoparasite of backyard poultry?

a. Red mites
b. Northern mites
c. Ticks
d. Fleas
e. Epidermoptid mites

QUESTION 7

Mrs. Smith brings in a 2 year old Buff Orpington hen in moult. She has scaly leg. What is the causative agent?

a. Dermanyssus
b. Ornithonyssus
c. Knemidocoptes
d. Argus spp
e. Rough flooring

QUESTION 8

Mr. Mia brings in is show quality Brown Leghorn with depluming itch. What is the causative agent?

a. Dermanyssus
b. Ornithonyssus
c. Knemidocoptes
d. Argus spp
e. Epidermoptid mites

QUESTION 9

Which antibiotic should be used whilst awaiting a bacterial culture and antibiogram?

a. Enrofloxacin
b. Potentiated sulphonamides
c. Doxycycline
d. Co-amoxiclav
e. Metronidazole

QUESTION 10

Mr Jones brings in his trio of Polish Crested Bantams. They are hyporexic and have raised plaques on their feet and wattles. What is the most likely cause?

a. Newcastle disease
b. Avian Influenza
c. Papilloma virus
d. Pox virus
e. Pecking from boredom

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