

1959

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Recommended Citation

Kral, Frank (1959) "Etiology and Classification of Animal Dermatoses," *Iowa State University Veterinarian*: Vol. 21 : Iss. 2 , Article 9.
Available at: https://lib.dr.iastate.edu/iowastate_veterinarian/vol21/iss2/9

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Etiology and Classification of Animal Dermatoses

Frank Kral, V.M.D., M.V.D., (h.c.), doc. habil.

ANIMAL SKIN DISEASES may result from various etiological factors. Some of these may act directly upon the skin itself, or indirectly via the blood, the lymph or the nervous system. Many internal pathological conditions may be the primary cause of various skin manifestations thus explaining why skin diseases of animals have always been studied in internal medicine.

The rational treatment of any disease requires a correct diagnosis. Particularly in skin diseases, it is very important to establish not only symptomatic diagnosis according to the appearance of the skin lesions, but to find out the causative or predisposing agent and to establish the etiologic diagnosis. The fundamentals in an etiologic diagnosis of cutaneous disorders should be based upon the knowledge of direct or indirect causes found from an adequate history and a complete examination not only of the skin itself but also of the internal condition. Specific diagnostic methods, including ultraviolet rays, biologic tests, microscopic examination of skin scrapings, blood tests, bacteriologic investigation, tissue studies and even experimental animal inoculation may be an essential aid to the etiologic diagnosis of various cutaneous disorders.

The classification of animal skin diseases may be approached from several standpoints. Grouping may be based upon clinical cutaneous symptoms, pathologic-anatomic changes, functional disorders of the skin, or upon the origin of the skin lesions. No one system is able to include all the changes of the integument. In many animal skin conditions, we still do not know the exact pathology, the basic functional disorders, and in

many of them we do not know the primary cause. For practical purposes, therefore, the systems of classification are used in combination, or in supplement to each other.

Skin Inflammation. Dermatitis. Skin inflammations represent a reaction in the form of specific cutaneous changes in response to some potentially destructive agents of the skin. The skin primarily must evidence some degenerative or even necrotic changes, which secondarily produces a healing reaction in the form of a dermatitis. The development of these inflammatory skin lesions does not require any internal predisposition or any internal condition. The character and the degree of the skin inflammation depends on the irritating agent. Therefore, the lesions may vary greatly with regard to the form, size, depth and duration. Dermatitis could be acute or chronic, erythematous, papular, vesicular, pustular, moist, squamous, crusted or even gangrenous. According to the causative agent, the dermatitis could be classified: traumatic, caloric, irradiative, toxic or microgenic.

Eczematous Dermatoses. Many stubborn skin diseases develop as a manifestation of various internal disorders. These dermatoses are generally called *eczemas*. It is believed that eczema is a superficial skin inflammation which may be produced by various external irritations, but it always involves a special internal condition or an internal predisposition. Therefore, any kind of eczema is a dermatitis but not every dermatitis is an eczema. Because of this internal etiology, the eczematous skin lesions are, as a rule, symmetrically and bilaterally located and require for the treatment both systemic and topical treatment.

Etiologically, eczemas may develop in the course of:

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Squamous crusted eczema associated with hypoeestrogenism.

1. Deficient nutrition: vitamins, minerals, fat, protein, trace elements etc.
2. Internal diseases: nephritis, hepatitis, enteritis, disorders of anal glands, prostate, uterus.
3. Hormonal disorders: gonadal hormones; estrogens, androgens, anterior pituitary hormones, thyroidal hormones, adrenal cortical hormones and
4. Intoxications; thallium, mercury, ergot, drugs etc.

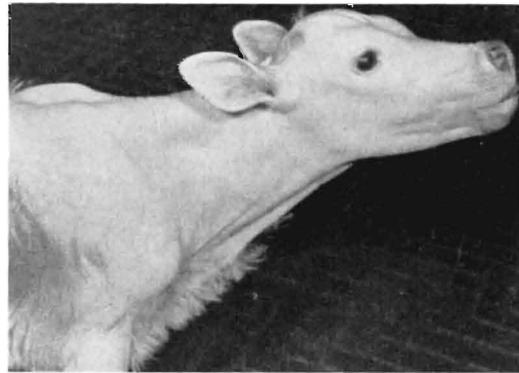
Allergic Dermatoses. Cutaneous allergy is a specifically acquired alteration in the capacity of living skin tissue to react. It results from exposure to an exciting agent or agents, and it appears upon re-exposure to the same or to an immunologically or chemically related agent. Allergic dermatoses in animals may be caused by foods, viruses, bacteria, fungi, internal or external parasites, chemicals, drugs, vitamins, hormones, antibiotics or various physical agents. Photosensitization is considered as a special type of a cutaneous allergy.

Functional Diseases of the Skin. Functional derangements in the skin of animals take a great variety of forms. Included are disorders of sensation, disturbed functioning of sweat and sebaceous glands, and deviations in hair and pigment development.

1. Pruritus. Generalized and localized itching.
2. Disorders in coil gland secretion. Ex-

cessive sweating, generalized or localized. Diminished or arrested sweating.

3. Disorders in activity of sebaceous glands. Generalized or localized seborrhea. Diminished or arrested activity of sebaceous glands.
4. Diseases of the hair follicles and the hair. Folliculitis. Alopecia; congenital. acquired. Structural disorders of the hair: trichoptilosis, trichorrhaxis nodosa.
5. Disorders in pigmentation of skin and hair: hyperpigmentation, depigmentation.



Congenital Alopecia

Hypertrophic Changes of the Skin.

1. Hypertrophy of the cutaneous cellular tissue.
2. Hyperkeratosis.
3. Parakeratosis.

Skin Tumors. Skin tumors can best be classified with regard to their location: epidermal, dermal, dermal appendages, subcutaneous tissue and as to their type: benign or malignant.

1. Epidermis: Benign; cutaneous horn, horny pads, papillomatosis. Malignant; squamous-cell carcinoma, basal cell carcinoma.
2. Dermis: Benign; fibroma, keloid, fibromatosis of rabbits, lumpy skin disease of cattle, neurofibroma, angioma, leiomyoma, sarcoid.
Malignant; fibrosarcoma, neurogenic sarcoma, lymphosarcoma, mast cell sarcoma, malignant melanoma, infectious myxomatosis of rabbits.
3. Dermal appendages: hair follicle tumors, sweat gland tumors, sebaceous gland tumors.

4. Subcutaneous tissue: lipoma.

Skin Manifestations in the Course of Infectious Diseases.

1. Virus infections: pox, virus papular dermatitis in horses, contagious ecthyma, infectious goat dermatitis, foot and mouth disease, vesicular stomatitis, vesicular exanthema of swine, coital vesicular exanthema in horses, rinderpest, cutaneous stranglers, hog cholera, distemper complex, pemphigus, scrapie.
2. Bacterial infections: impetigo, pyogenic dermatitis, contagious dermatitis in horses, swine erysipelas, anthrax, malignant edema, tuberculosis, glanders, ulcerous lymphagitis in horses and dogs (Nocardiosis).



Pyogenic dermatitis

Skin Disorders Caused by Fungi. Dermatoses of fungal origin may be classified as follows:

1. Blastomycoses: equine blastomycosis, canine blastomycosis.
2. Dermatomycoses: ringworm—tinea.
Microsporum group: *Microsporum canis*, *M. gypseum*, *M. audouini*.
Trichophyton group: *Trichophyton equinum*, *T. mentagrophytes*, *T. verrucosum*, *T. schoenleini*, *T. gallinae*.
3. Cutaneous moniliasis: *Monilia albicans*.

4. Mycetomycoses. actinomycosis, actinobacillosis, farcy of cattle, streptothricosis in dogs, botryomycosis.
5. Sporotrichosis.

Skin Manifestations of Protozoal Origin.

1. Babesiosis.
2. Surra.
3. Mal de Caderas.
4. Dourine.
5. Leshmaniosis.
6. Spirochaetosis.

Dermatoses Associated with Helminthes.

1. Nematodiasis: rhabditidiasis, ancylostomiasis, bunostomiasis, parafilaria-
iasis, stephanofilaria-
iasis, habronemia-
iasis, dirofilariasis, dracunculiasis, on-
chocerciasis.
2. Trematodiasis.

Acarine Dermatoses Associated with Ticks and Mites.

1. Ixodes acariasis.
2. Dermanysus acar-
iasis.
3. Trombiculidiasis.
4. Sarcoptic
acariasis: Genus sarcoptes, genus cnemi-
docoptes, genus notoedres, genus psorop-
tes, genus chorioptes, genus otodectes.
5. Demodectic acariasis.

Dermatoses Caused by Insects.

1. Pediculosis.
2. Siphonaptera.
3. Dip-
tera.
4. Hemiptera.
5. Coleoptera.
6. Hy-
menoptera.
7. Lepidoptera.

End



Pustular and phlegmonous form of Demodectic mange.

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