

Pathology of Swine


**Dr. med. vet. Matti Kiupel, BS, MS, PhD,
DACVP**

**Diagnostic Center for Population and Animal Health
College of Veterinary Medicine, Michigan State University**

4125 Beaumont Road 152A, Lansing, MI 48910, USA

Tel.: ** 517 432 2670; Fax: ** 517 432 6557;

E-mail: kiupel@dcpah.msu.edu

A microscopic image of skin tissue, showing the epidermis and dermis. The epidermis is the outer layer, and the dermis is the inner layer. The image shows the intricate structure of the skin, including the papillary dermis and the stratum corneum.

Integumentary System

FMD

- **Aphthovirus in family of Picornaviridae**
- **positive single stranded RNA**
- **7 serotypes: A, O, C, SAT-1, SAT-2, SAT-3 and Asia 1**
- **contain subtypes and strains**
- **22-30 nm, non-enveloped**
- **world-wide distributed**
- **eradicated from developed parts of the world**
- **A, O, C in South America, Africa, Middle East, South-East Asia; SAT 1-3 in sub-Saharan Africa; Asia 1 in Middle East, South-East Asia**

Host / Reservoir

- African buffalo can sustain virus for indefinite period



- a variety of other wildlife will become periodically infected

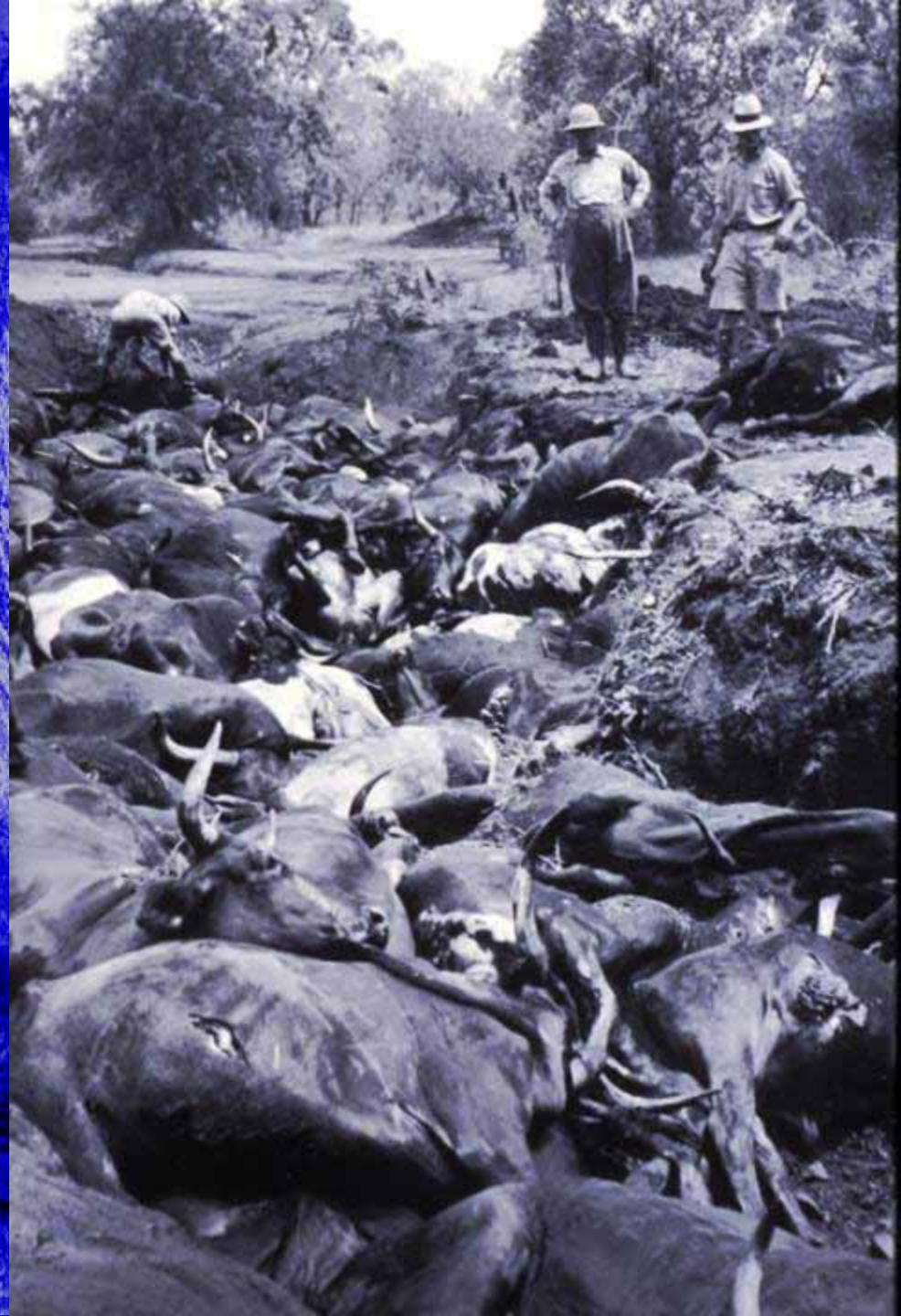
Transmission

- direct contact
- factors determining characteristics of transmission:
 - quantity, duration, means by which virus is liberated
 - ability of virus to survive outside the animal
 - quantities of virus required to initiate infection



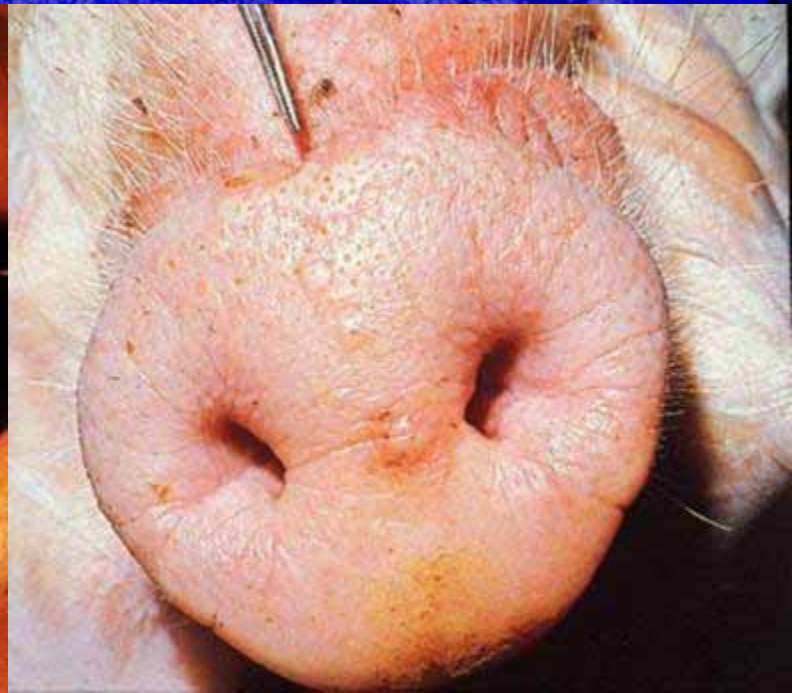
Socio-Economics

- kills only a few animals, but one of the most feared diseases of livestock:
 - highly contagious
 - high morbidity
 - immunologic variants
- decreased milk and meat production, decreased animal sales,
- cost of control measurements
- restrictions of export



Pathogenesis

- inhalation of organisms (oral in pigs)
- replication in mucosa and lymphoid tissue of pharynx and soft palate
- viremia for several days
- development of vesicles after infection of squamous epithelium (lysis of cells in stratum spinosum) and local friction or irritation: tongue, feet, teats, snout



Clinical signs

- incubation period: 2-8 days
- vesicles on feet, mouth and teats
- sudden death due to myocarditis (“tiger-heart”)
- acute: fever, dullness, inappetence, lower milk production, lameness, salivation, grinding of teeth

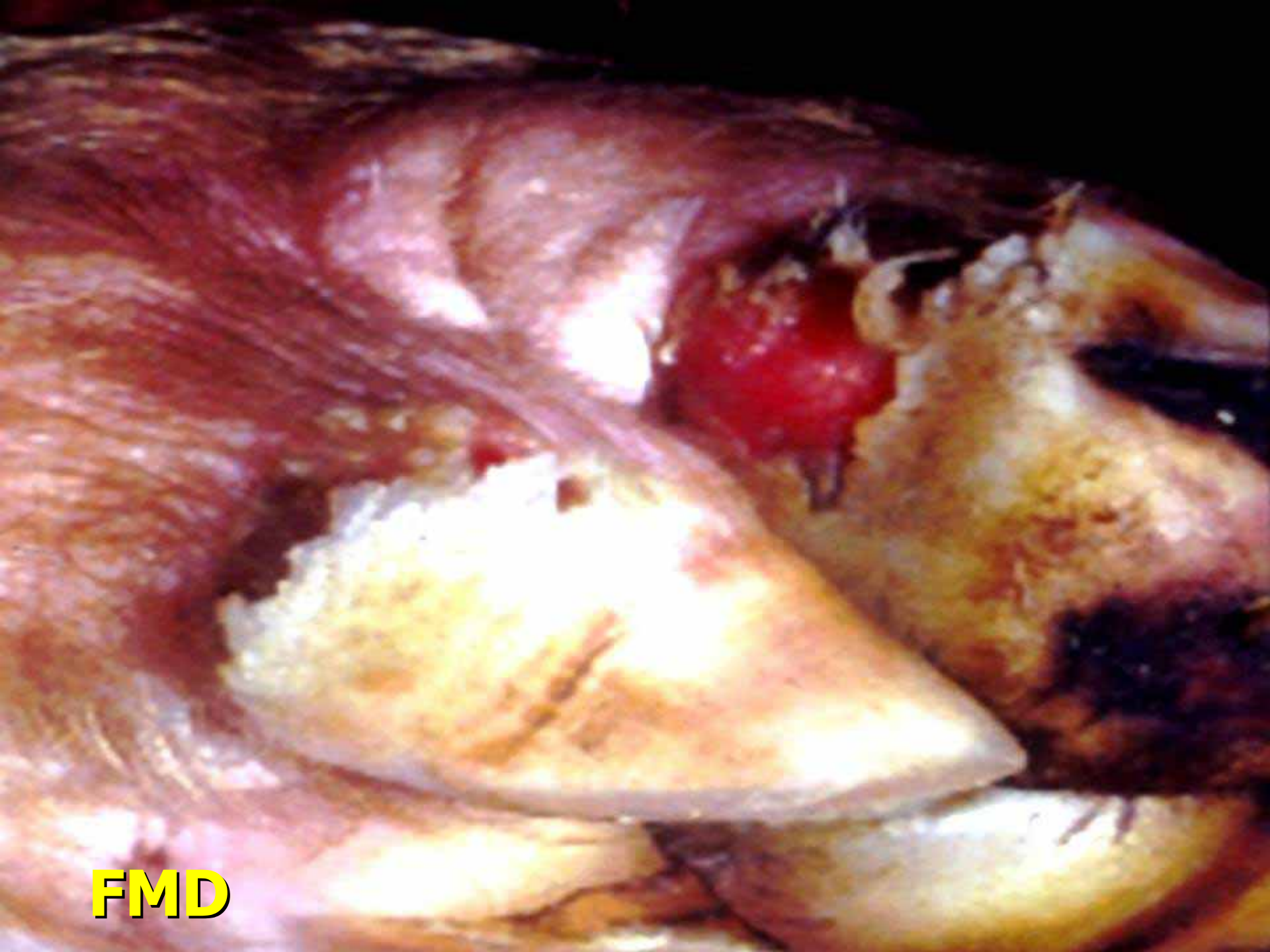




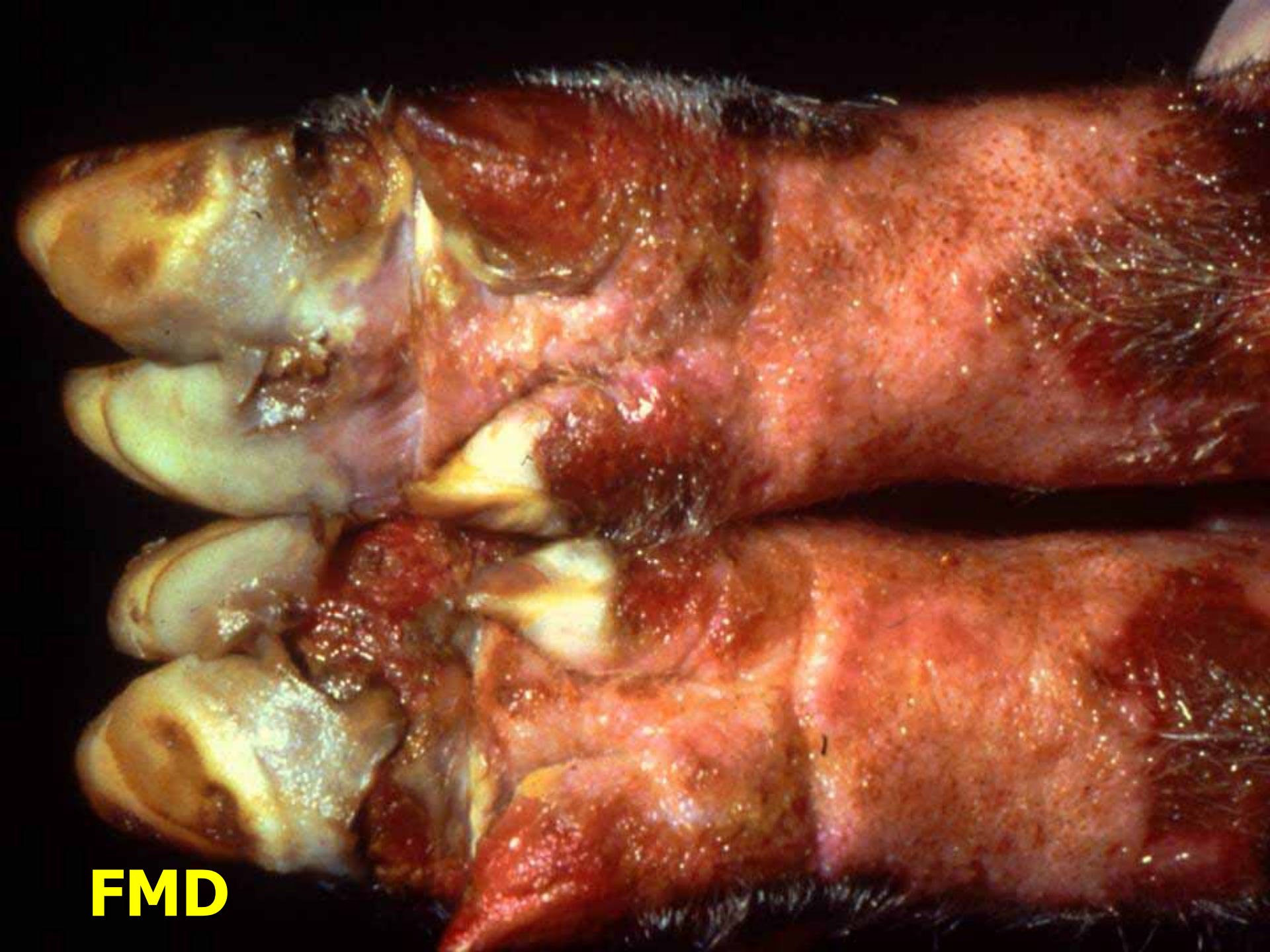
FMD



FMD



FMD



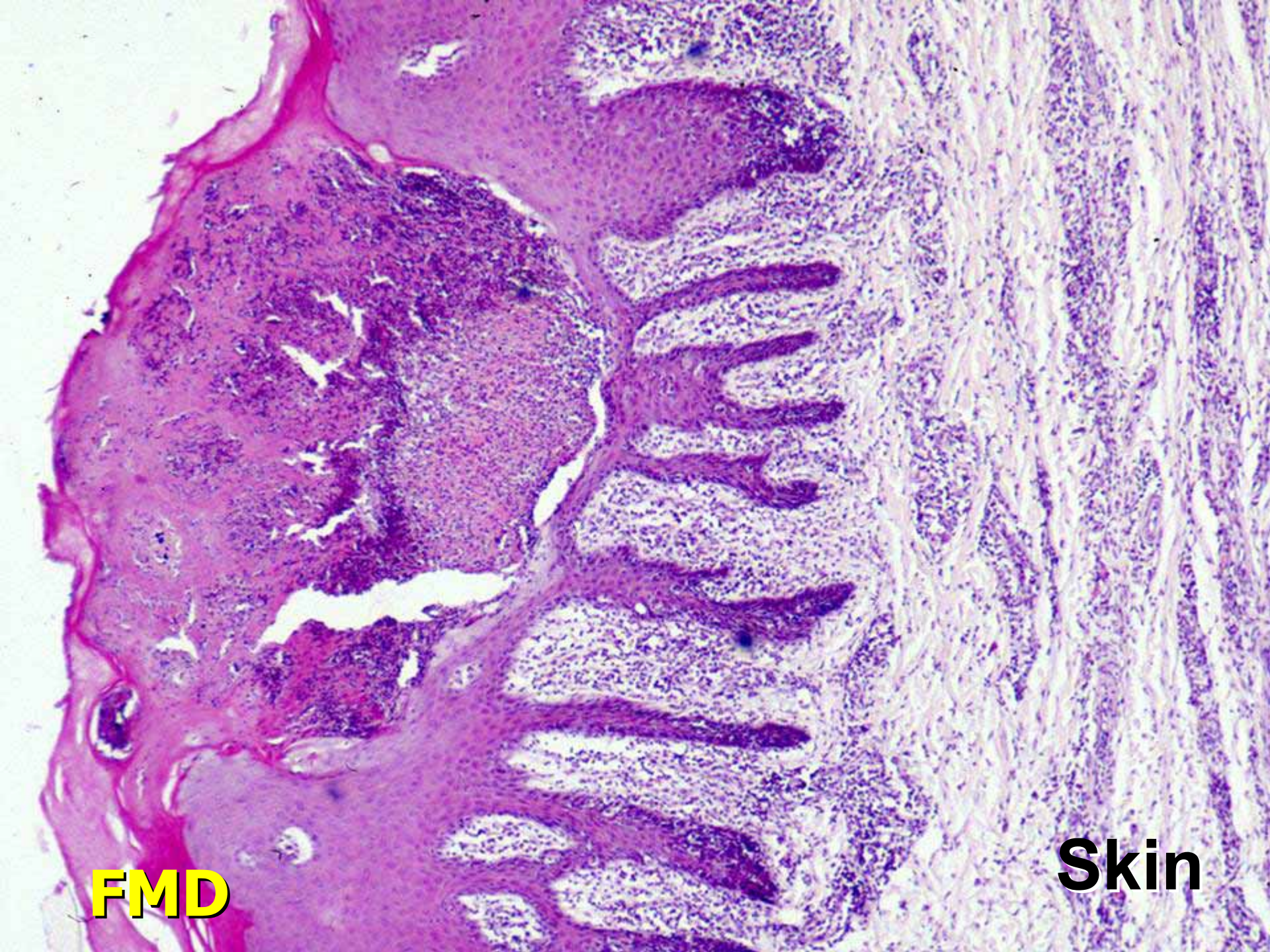
FMD



FMD

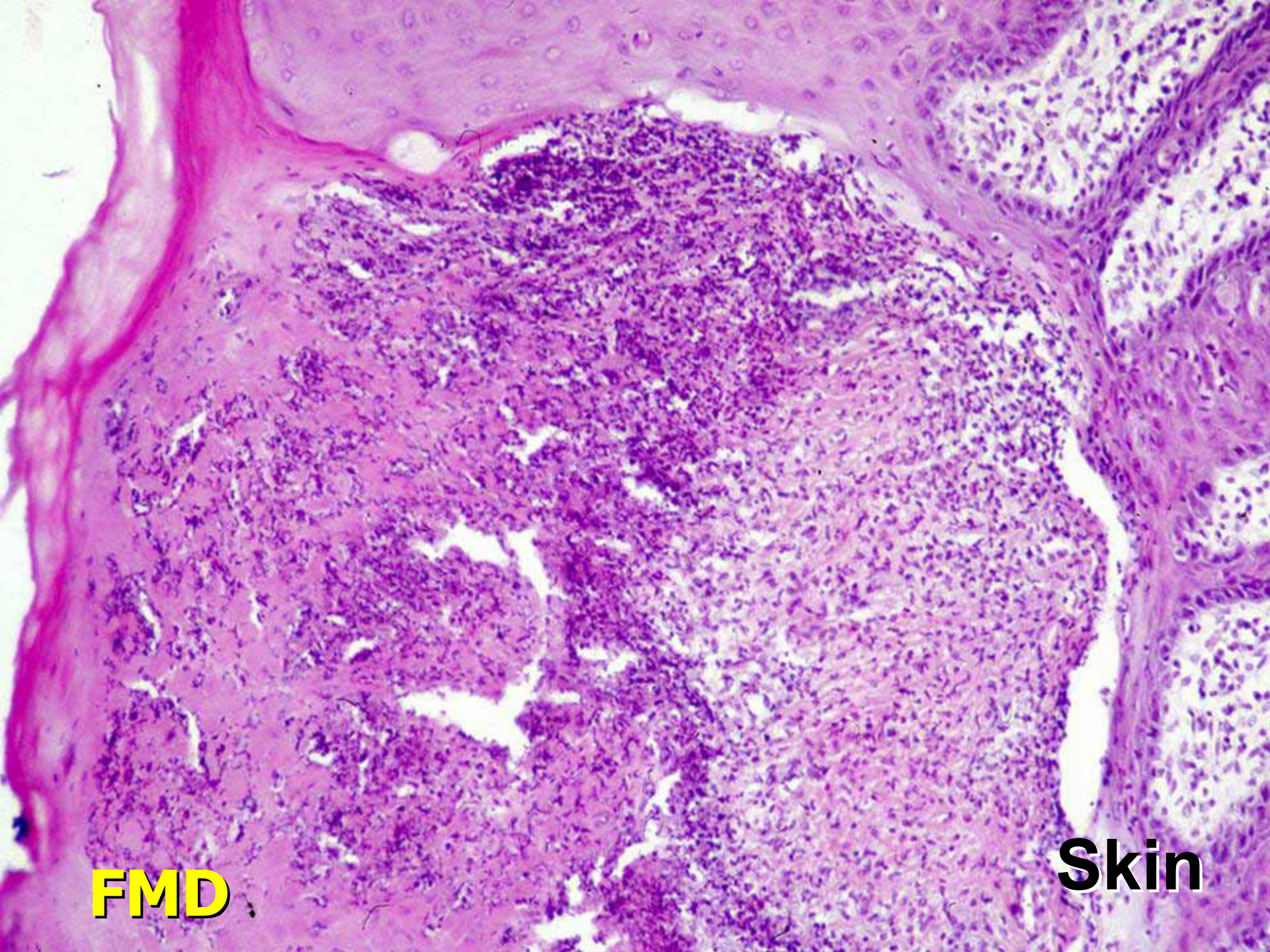


FMD



FMD

Skin



FMD

Skin

Diagnosis

- **Presumptive: clinical signs, epidemiology, gross lesions**
- **Laboratory confirmation:**
 - **virus isolation: roof of vesicle**
 - **antigen detection: ELISA, PCR, complement fixation**
 - **serology: ELISA**
 - **histopathology**



Control / Eradication

- outbreak: quarantine and stamp-out
- vaccinated animals may become carriers
- strict import control





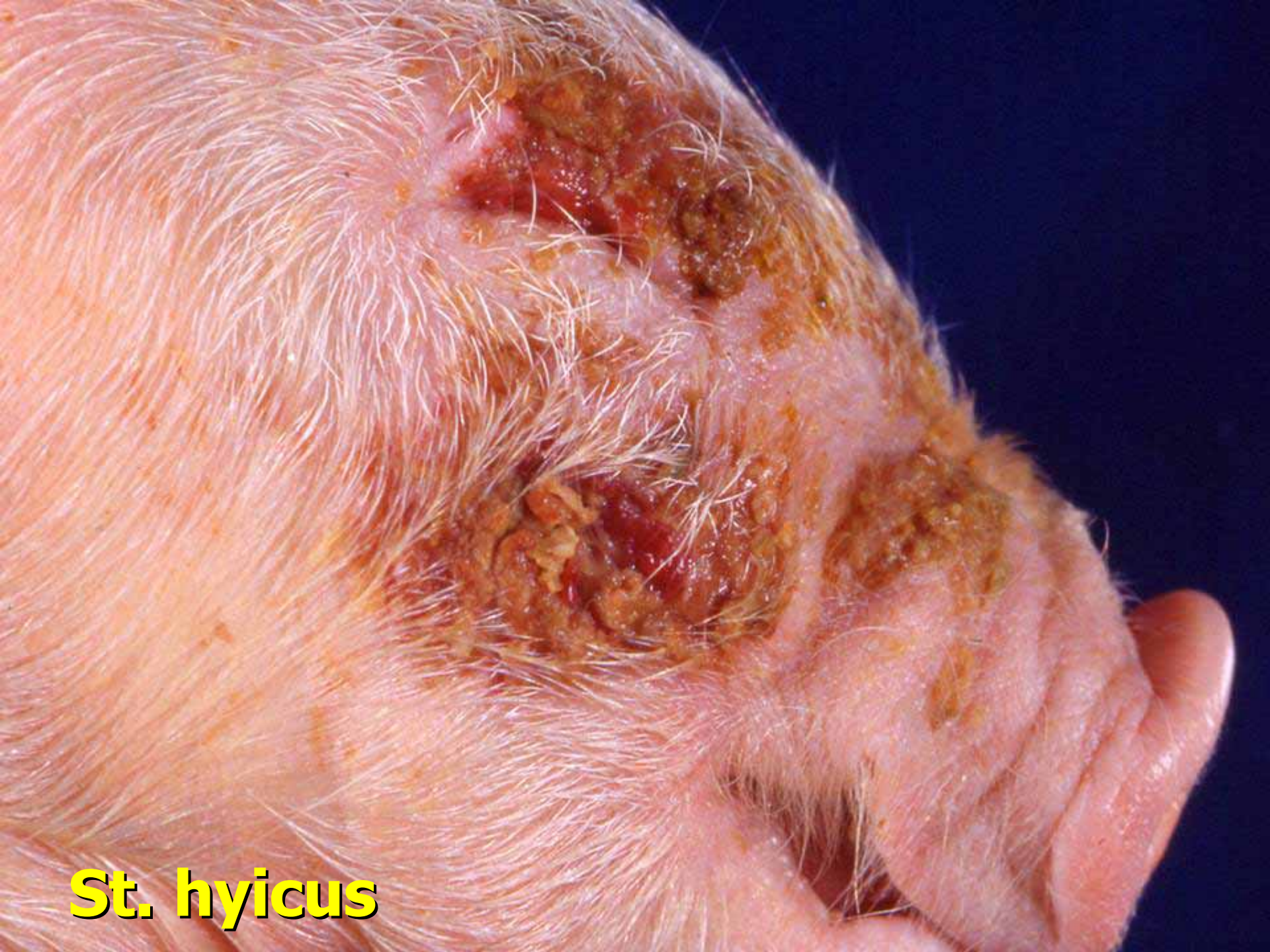
VSV



VSV



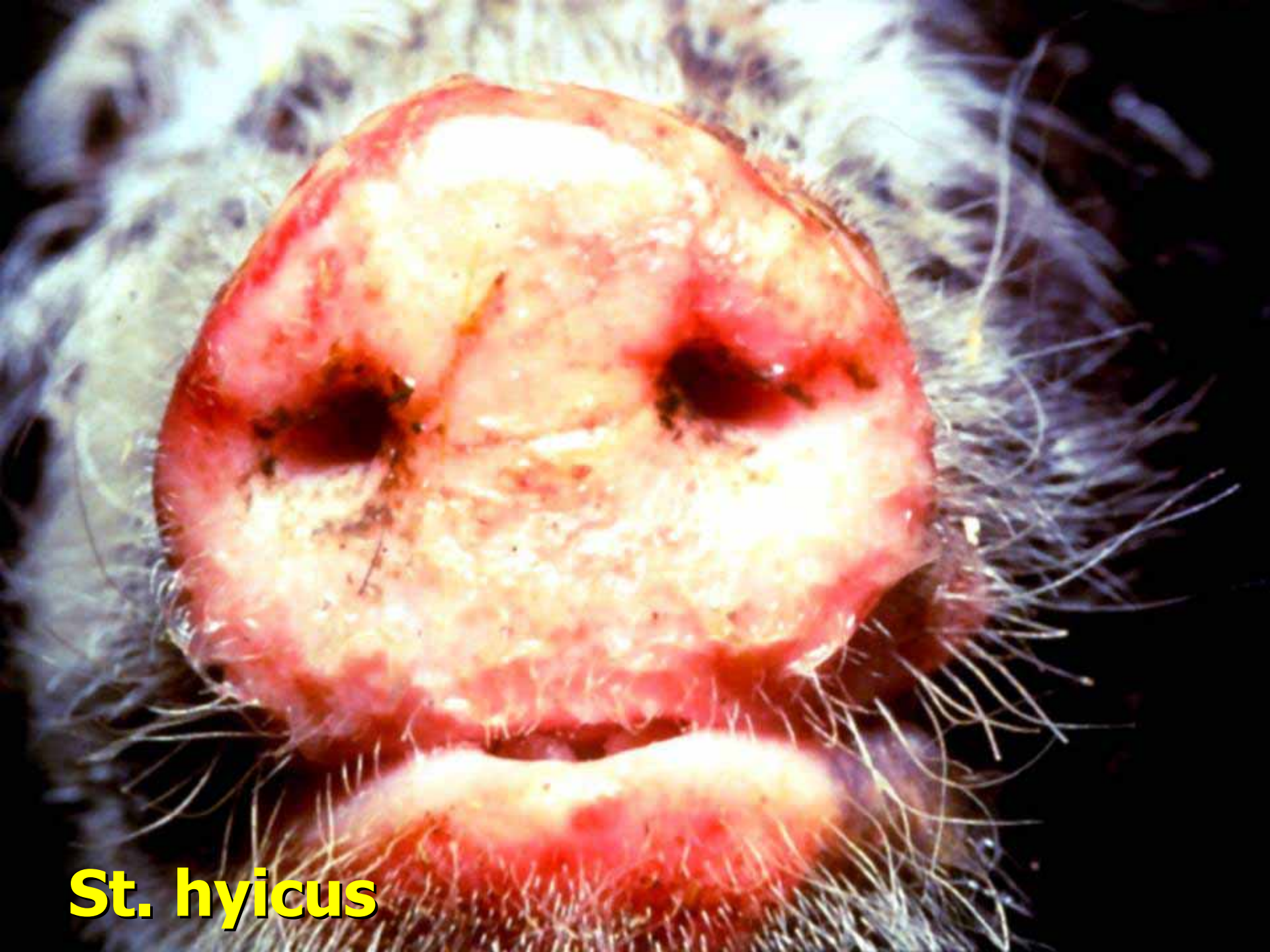
Fusobacterium necrophorum



St. hyicus



St. hyicus



St. hyicus

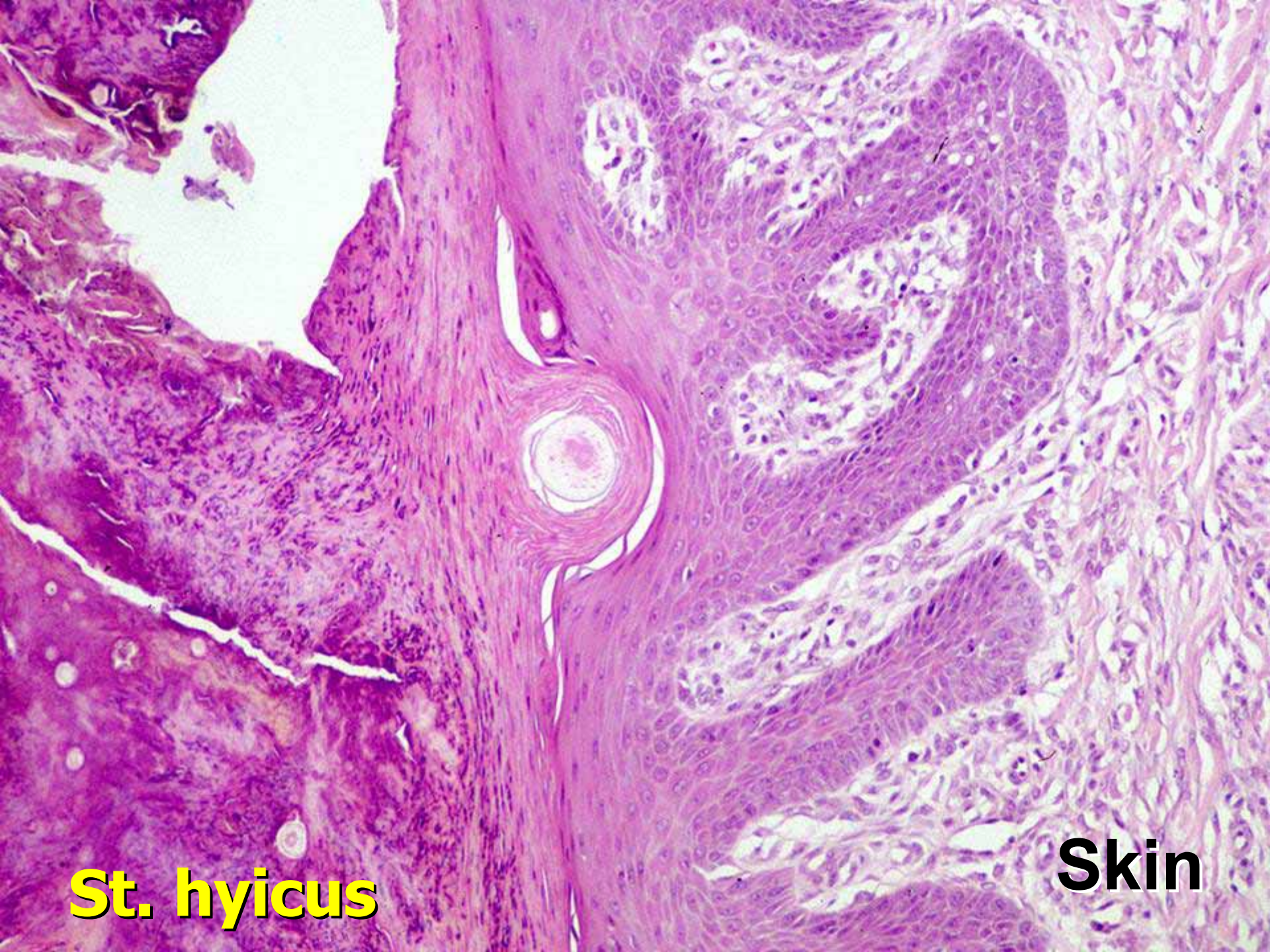


St. hyicus



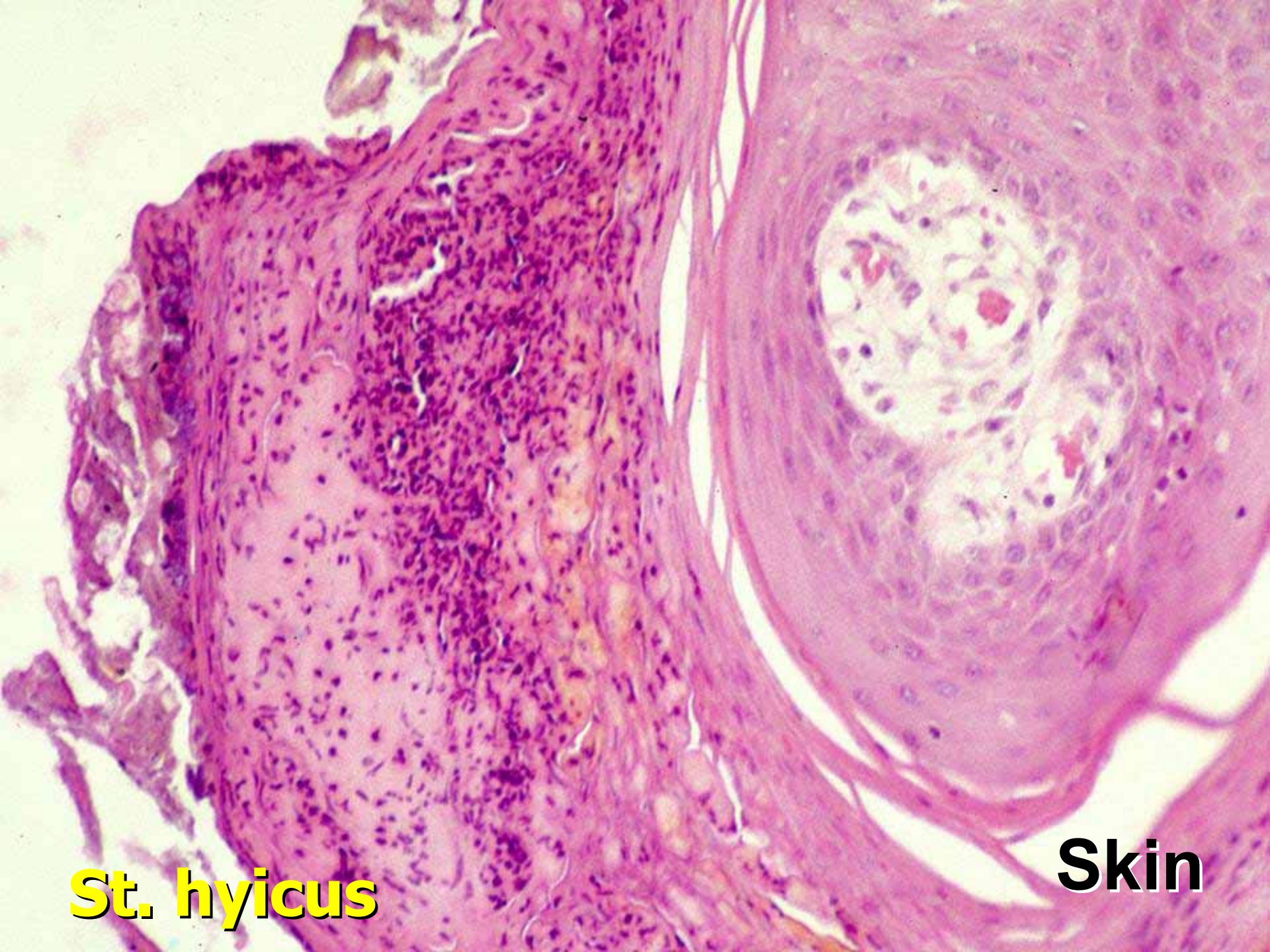
St. hyicus

Skin



St. hyicus

Skin



St. hyicus

Skin



St. hyicus

Skin



Erysipelas



PDNS



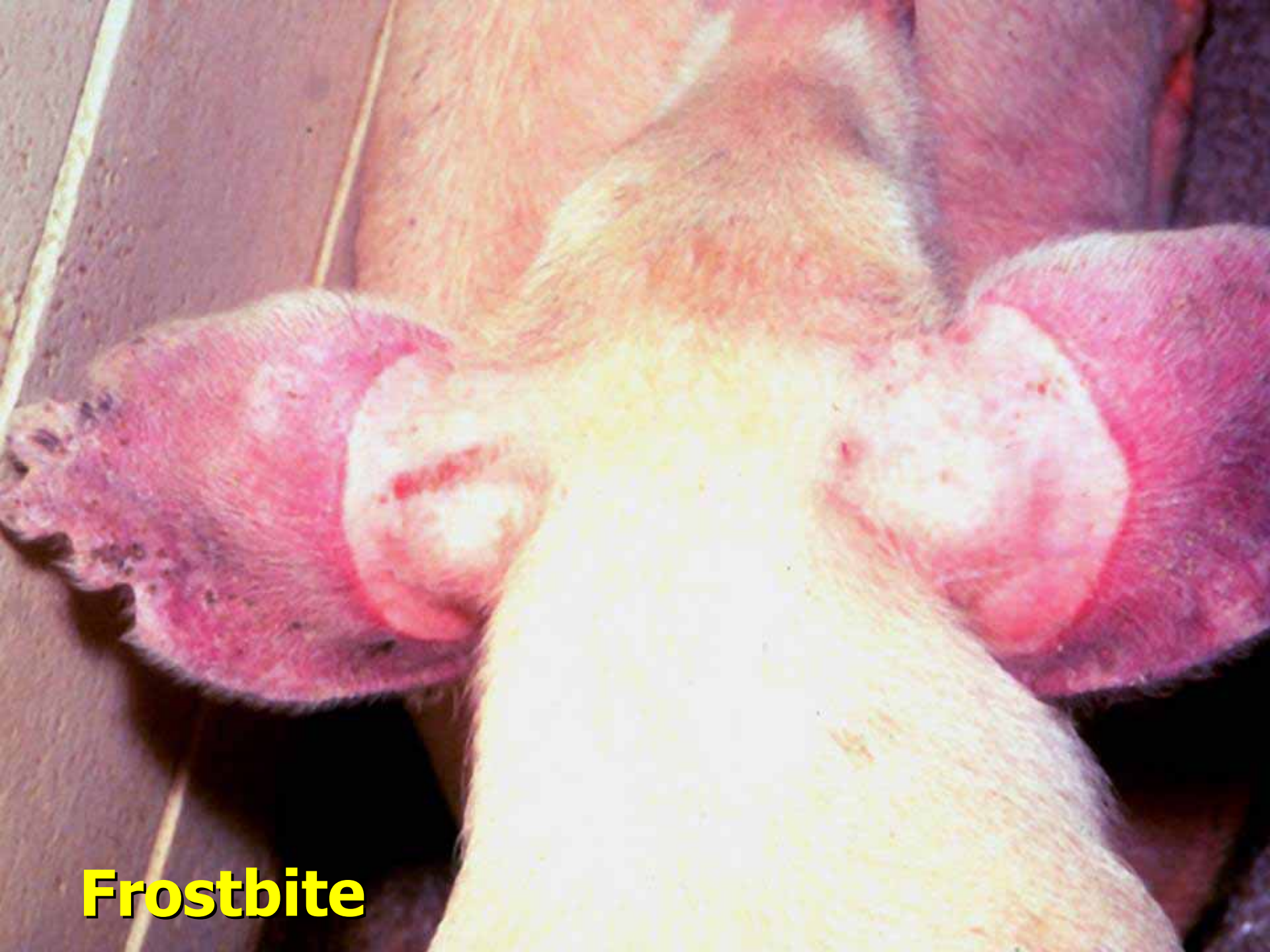
PDNS



Ear biting



Ischemia



Frostbite



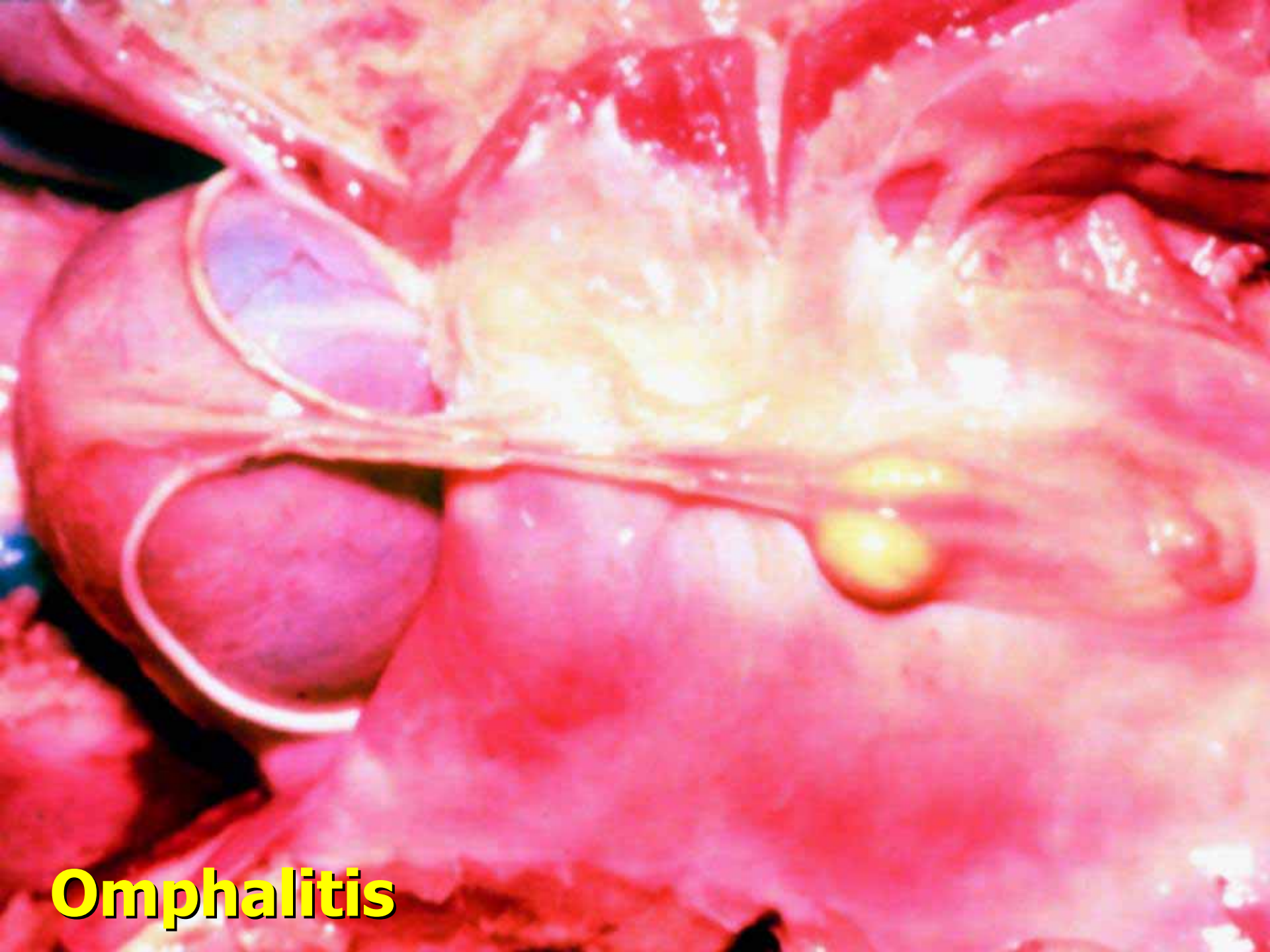
Frostbite



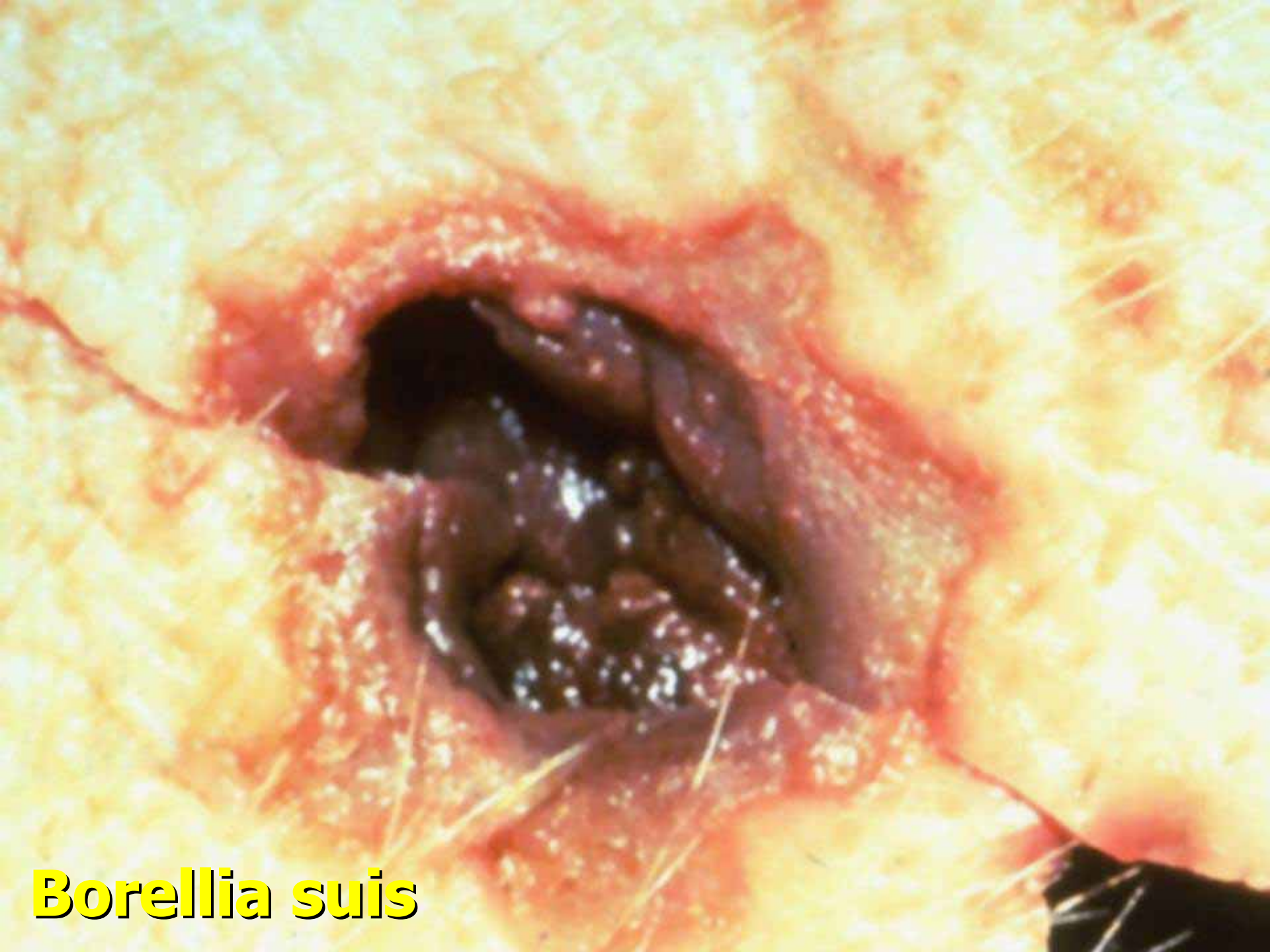
Tail biting



Navel ill



Omphalitis



Borellia suis



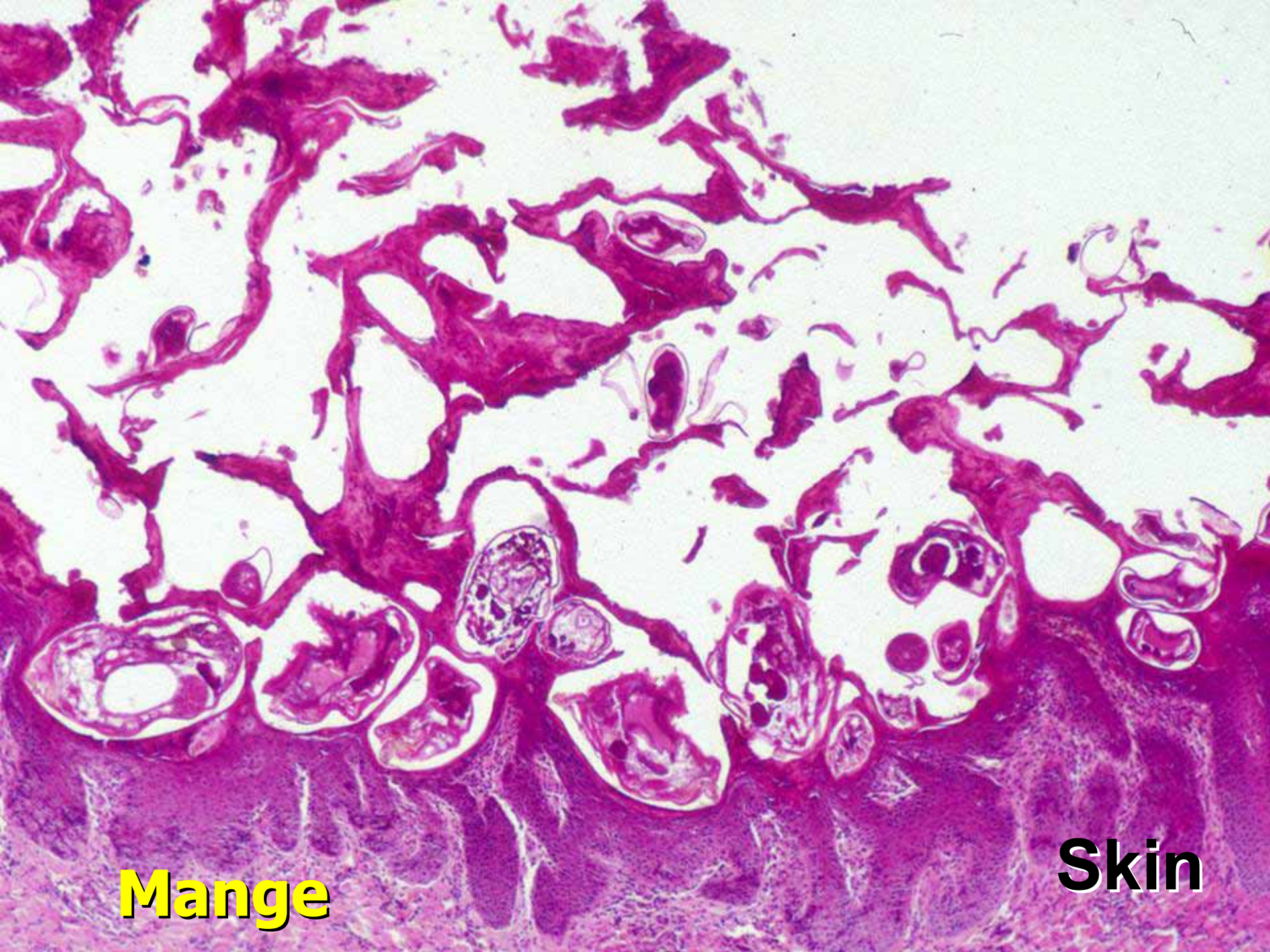
Dermatophytosis



Insect bites



Mange



Mange

Skin



Mangle

Skin



Swinepox



Swinepox



Swinepox



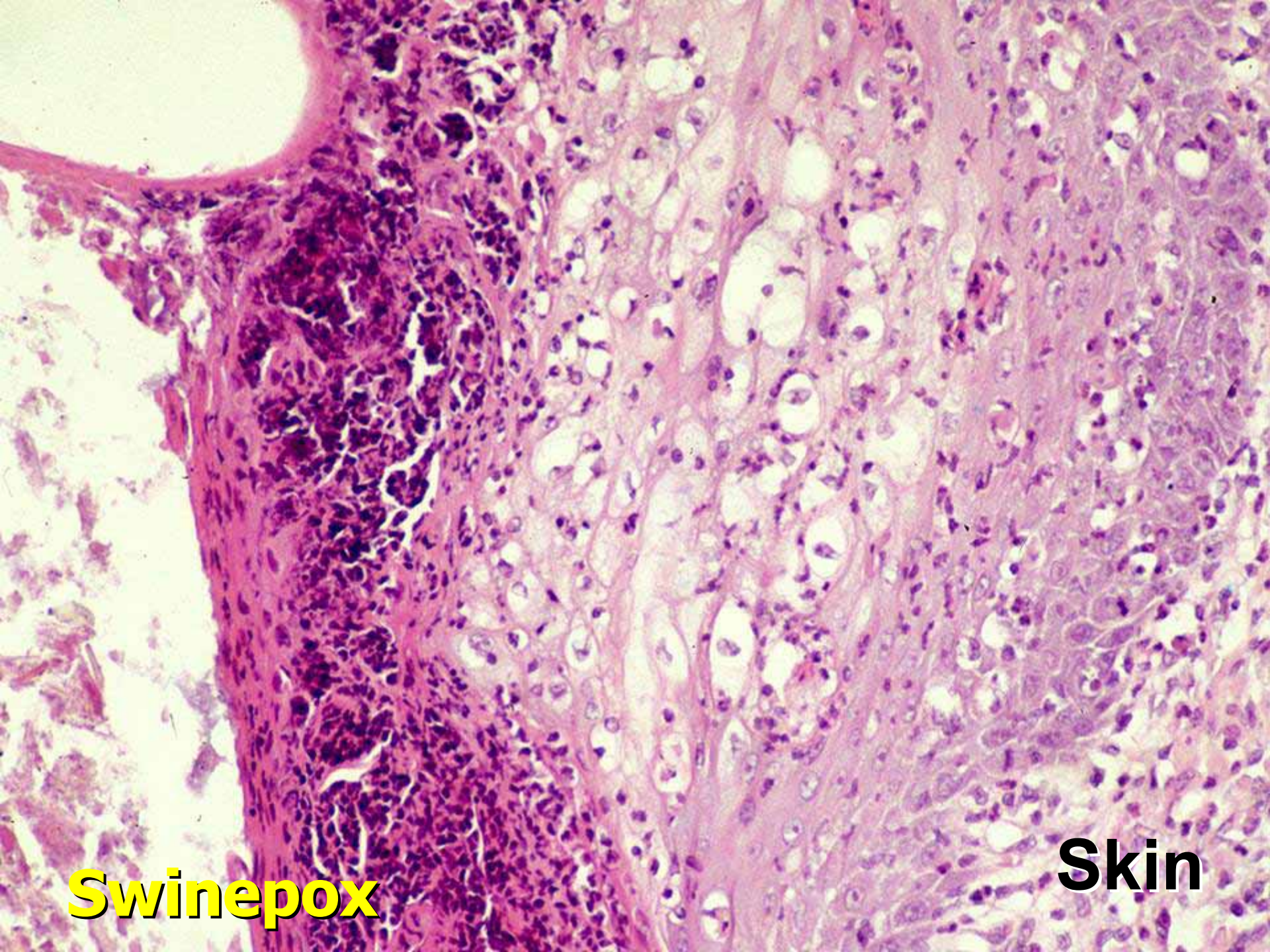
Swinepox



Swinepox

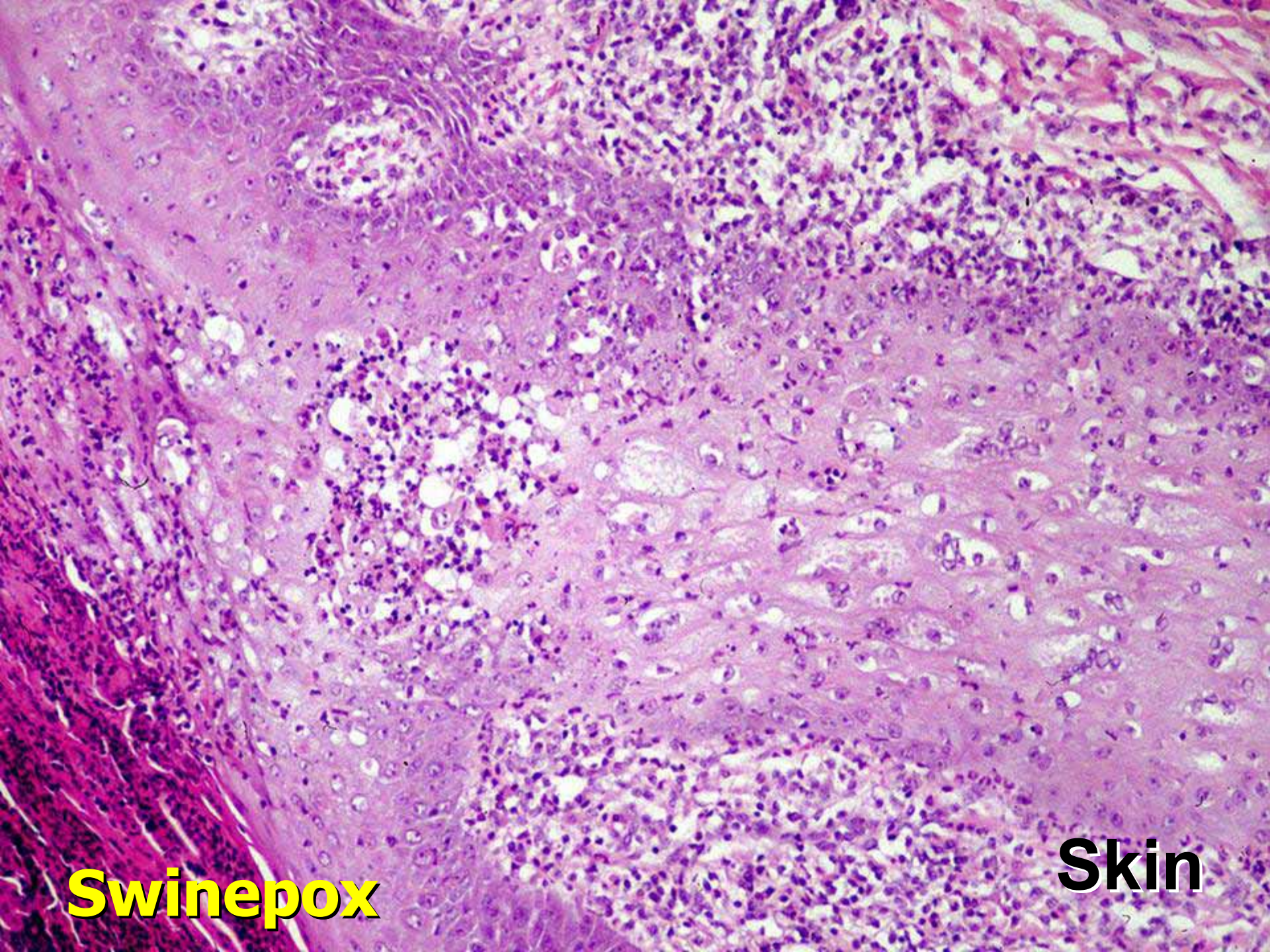


Swinepox



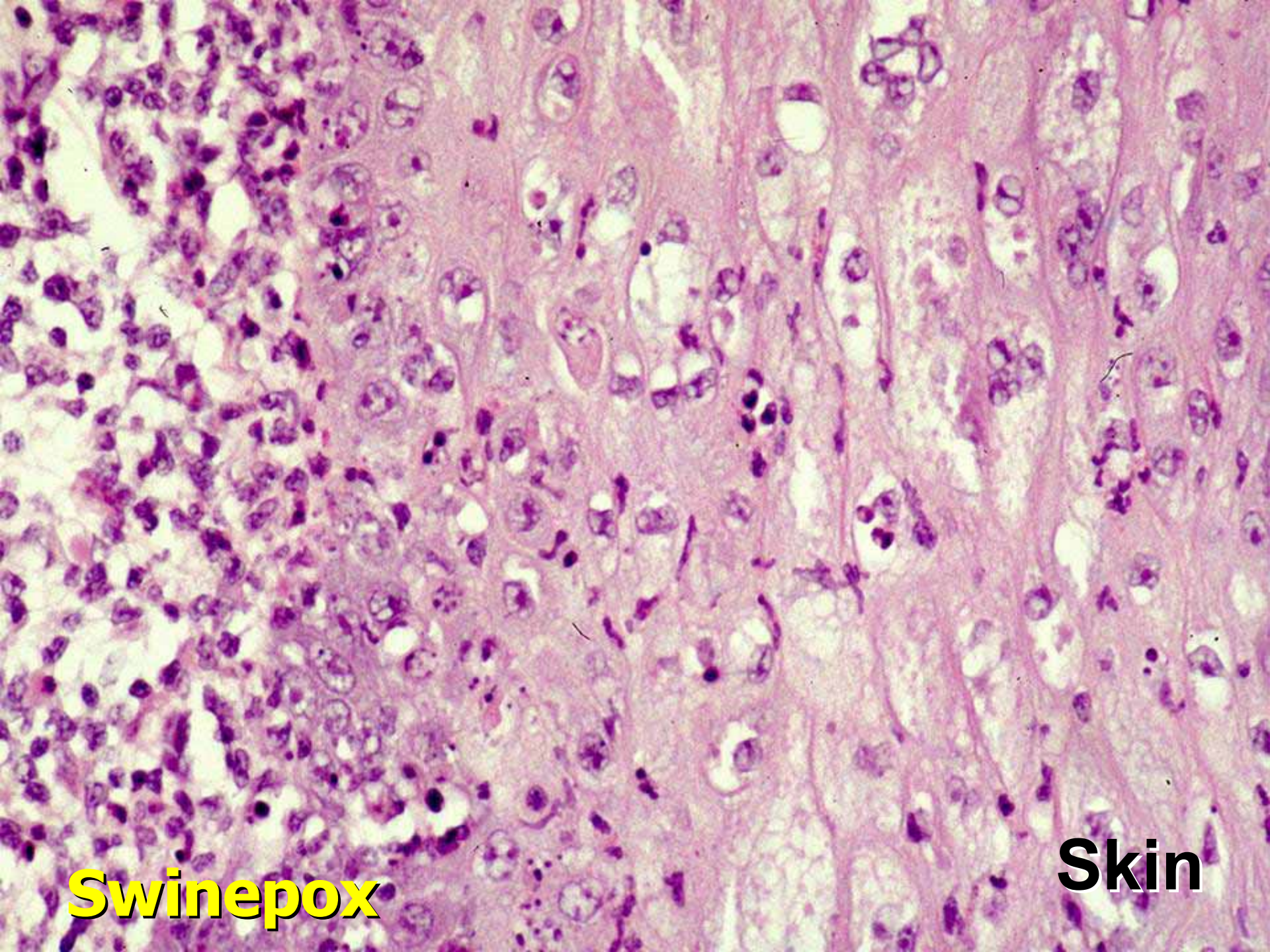
Swinepox

Skin



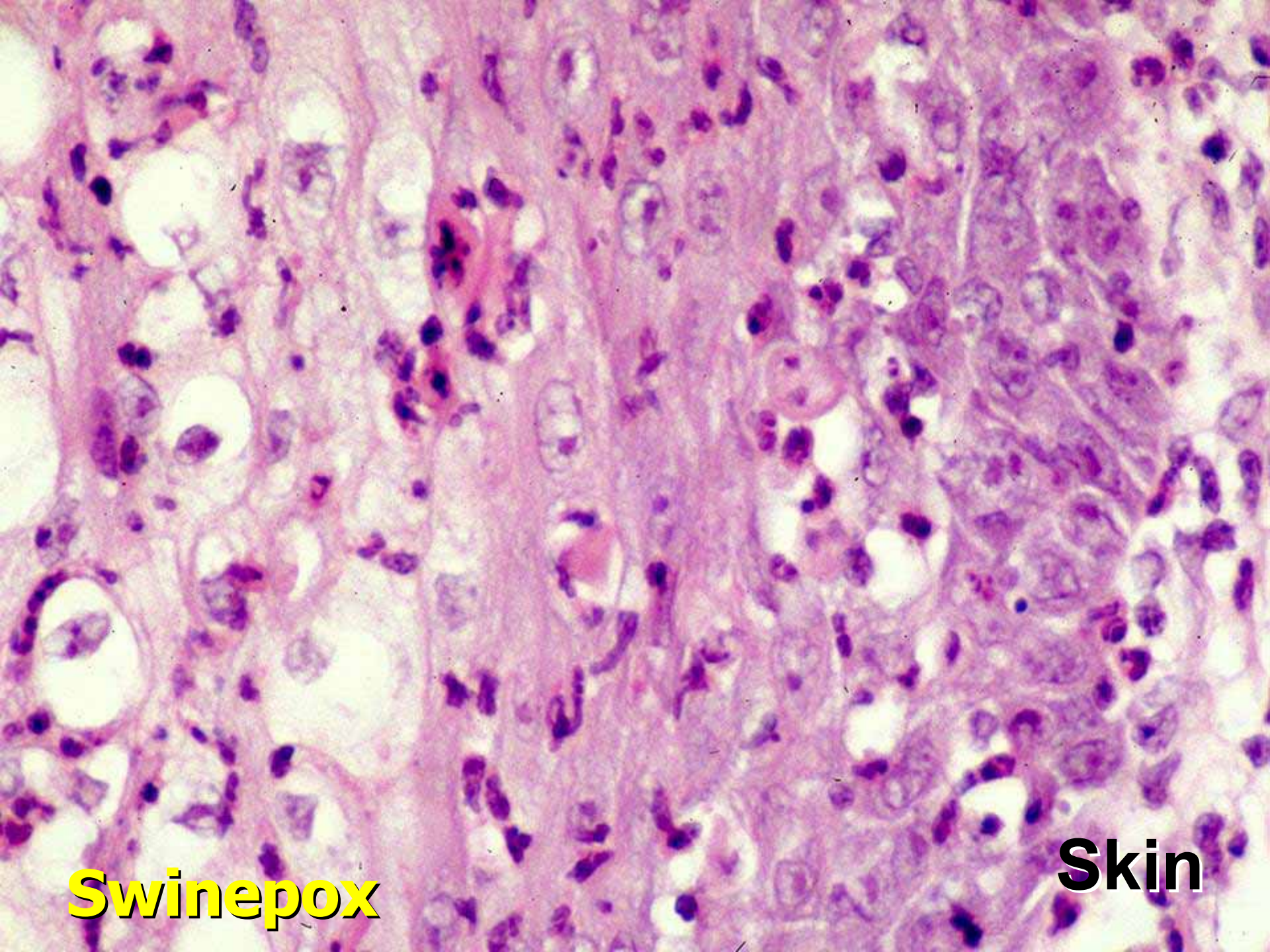
Swinepox

Skin



Swinepox

Skin



Swinepox

Skin



Zinc deficiency