

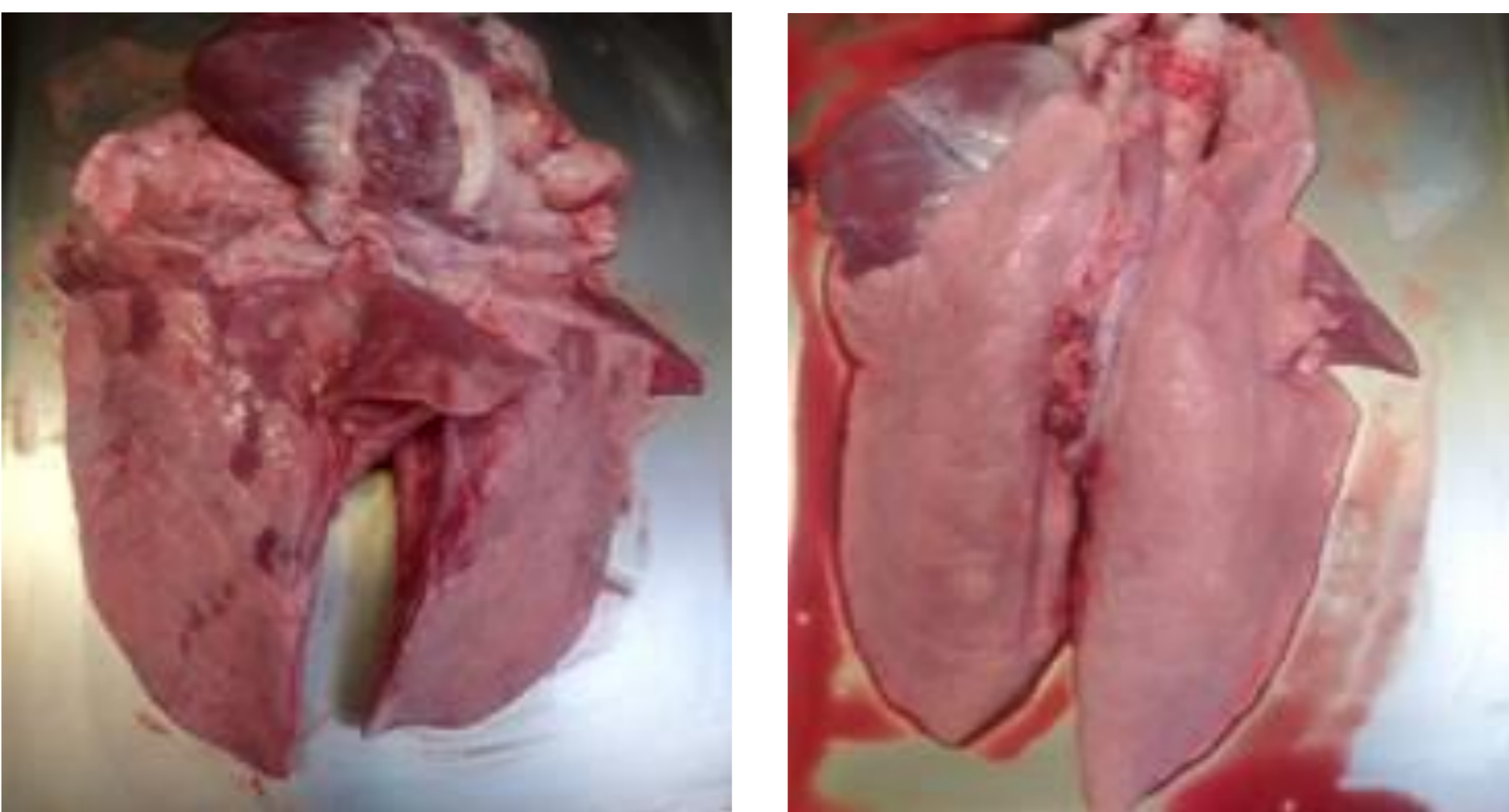
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1. *M. hyopneumoniae*

- ❖ Respiratory pathogen in pigs
 - endemic in most countries
 - primary cause of enzootic pneumonia
- ❖ Clinical signs
 - dry cough
 - concomitant other infections
→ more severe clinical signs
 - cranio-ventral bronchopneumonia
- ❖ Economic impact
 - lower performance (daily gain, feed conversion)
 - more antibiotic use and treatment costs

M. hyopneumoniae lesions at the cranial, accessory and cardiac lung lobes of pigs experimentally infected with *M. hyopneumoniae*



2. Pathogen-host interaction

- ❖ Known and unknown cell adhesion proteins
 - P97 and P102 are important
- ❖ Adhesion to swine extracellular matrix molecules
 - internalization and migration of *M. hyopneumoniae*?
- ❖ Production of H₂O₂ in vitro
 - does this happen in vivo?
- ❖ Lipid associated membrane proteins activate production of nitric oxide and reactive oxygen species causing cell damage
- ❖ Membrane nuclease MnuA degrades DNA-based extracellular traps in *M. bovis*
 - MnuA also present in *M. hyopneumoniae*
→ escape from the host immune system?
- ❖ **Further research**
 - other *M. hyopneumoniae* genes and antigens involved in pathogen-host interaction
→ targets to include in vaccines and diagnostic tools

3. Immunity

- ❖ Humoral
 - systemic IgG → not correlated with protection
 - local mucosal IgA
- ❖ Cell mediated
 - different T-cell subsets
 - pro-inflammatory and immunoregulatory cytokines such as IFN- γ , IL-17A, and IL-4

4. Control

- ❖ Optimizing management and housing
- ❖ Antimicrobial medication → not recommended
 - selection of antimicrobial resistance
 - residues in carcasses
- ❖ Vaccination
 - decreases clinical signs and economic losses
 - does not prevent infection nor transmission

5. Vaccines

- ❖ Commercial vaccines
 - mostly inactivated, whole-cell vaccines (J-strain)
 - mostly administered intramuscularly, sometimes intradermally
 - partial protection against clinical signs and lesions
 - no prevention of colonization nor transmission
- ❖ Experimental vaccines
 - vector, subunit or new bacterin vaccines
 - P97 antigen mostly included
 - different administration routes: oral, intranasal or parenteral
 - different adjuvants
 - reduction of lung lesions, clinical signs or bacterial load **BUT** mostly less than commercial vaccines
- ❖ **Further research**
 - vaccines conferring better mucosal immunity
 - administered at mucosal level
 - prevention of colonization?
 - Importance of adjuvants
 - modulation of immune responses
 - safety
 - Attenuated vaccines?
 - sufficient attenuation
 - no reversion to virulence
 - potent mucosal immunity when administered locally?