

RESEARCH OF FUMONISINES IMPACT IN SWINE IMMUNE SYSTEM WITH PULMONARY PASTEURELLOSIS EDEMA

(Project Proposal)



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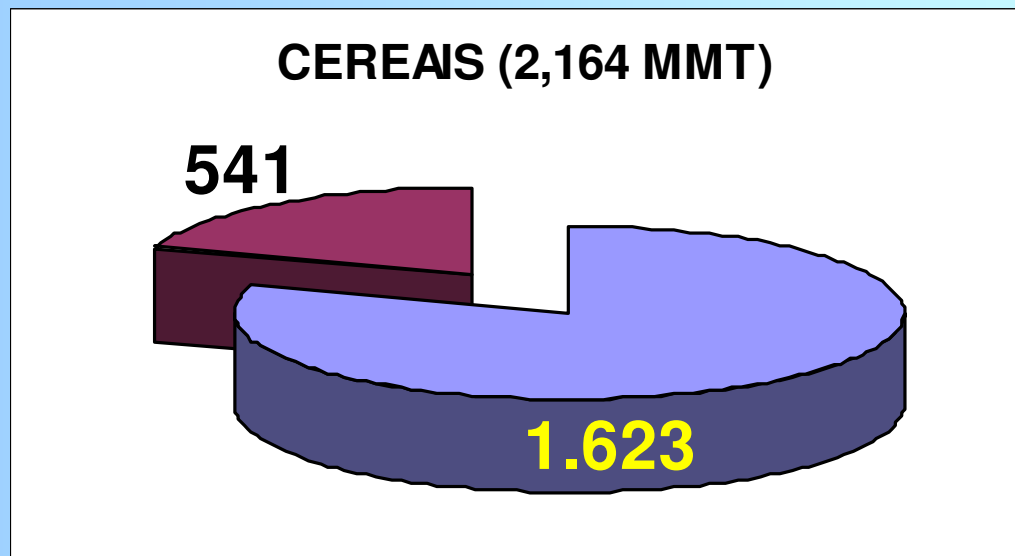
MYCOTOXINS IN FOOD CHAIN

- Mycotoxins are secondary metabolites produced by fungi, than can contaminate a wide variety of agricultural products, resulting in significant economic losses for grain and processed food producers.



MYCOTOXINES IN FOOD CHAIN

- According WHO estimates (2005), the contamination of cereals by fungi and mycotoxins is about 25% of world production.



MYCOTOXINES IN FOOD CHAIN

About 66% of corn world production is intended for feedingstuffs, 20% for direct human consumption and 8% for industry.



MYCOTOXINS IN FOOD CHAIN

- Consumption of contaminated food with mycotoxins can induce teratogenic, carcinogenic, oestrogenic, neurotoxic and immunosuppressive effects, which represents a risk to human and animal health.



FUMONISINS IN FOOD CHAIN

- Fumonisin are produced by species of *Fusarium*: *F. verticillioides* and *F. proliferatum*, which often occur in corn and its derivatives, being FB1 the predominant and with greater toxicity mycotoxin.
- The incidence of fumonisins in feeding stuffs and food is verified worldwide, as the *F. verticillioides* occurs in 90% of corn naturally contaminated.



TOXICOLOGICAL EFFECTS OF FUMONISINS

- Fumonisin, particularly FB1, induce several toxic effects in animals such as; leukoencephalomalacia in horses (ELEM), nephrotoxicity in sheep and rabbits and pulmonary oedema in pigs.
- There is epidemiological evidence linking fumonisin exposure with human esophageal cancer.

PULMONARY PASTEURELLOSIS EDEMA

- *Pasteurella* species (*P. multocida* type A is the most common pathogen in pigs) colonize the upper respiratory tract and mouth mucosa of swine, like commensals;
- In some cases of reducing defences, *Pasteurella* can spread to lower respiratory tract, causing bronchitis and pneumonia;
- More recently, it was observed that pulmonary pasteurellosis can occur also associated with other immunosuppressive agents such as mycotoxins, particularly fumonisins.

PULMONARY PASTEURELLOSIS EDEMA

- Primary bacterial infections by *Mycoplasma hyopneumoniae*, *Bordetella bronchiseptica*, *Actinobacillus pleuropneumoniae* and viral infections have been shown to increase also the susceptibility of swine to pulmonary pasteurellosis.



GENERAL OBJECTIVES

This will be achieved through:

- To analyse swine serum, urine and tissues, for evaluation of fumonisins exposure;
- To determine total serum proteins (TSP) and IgM, IgG and IgA concentrations and evaluate the haematological parameters in pigs, before and after vaccination against Pasteurellosis;
- To implement an epidemiological inquiry, checking vaccine efficiency against *Pasteurella* and the presence of fumonisins in pig farms.

RESEARCH OF FUMONISINES IMPACT IN SWINE IMMUNE SYSTEM WITH PULMONARY PASTEURELLOSIS EDEMA

The outcomes of this work should provide the useful background information for:

- Collaborate with data for better feeding practices which might be used in strategic breeding programs;
- Improve animal health and well-being;
- Contribute to minimize economical losses in livestock systems.