

# **RESEARCH OF FUMONISINES IMPACT IN SWINE IMMUNE SYSTEM WITH PULMONARY PASTEURSELLOSIS EDEMA**

**(Project Proposal)**



Amália Ferreira; Luísa Ribeiro; Paula Alves

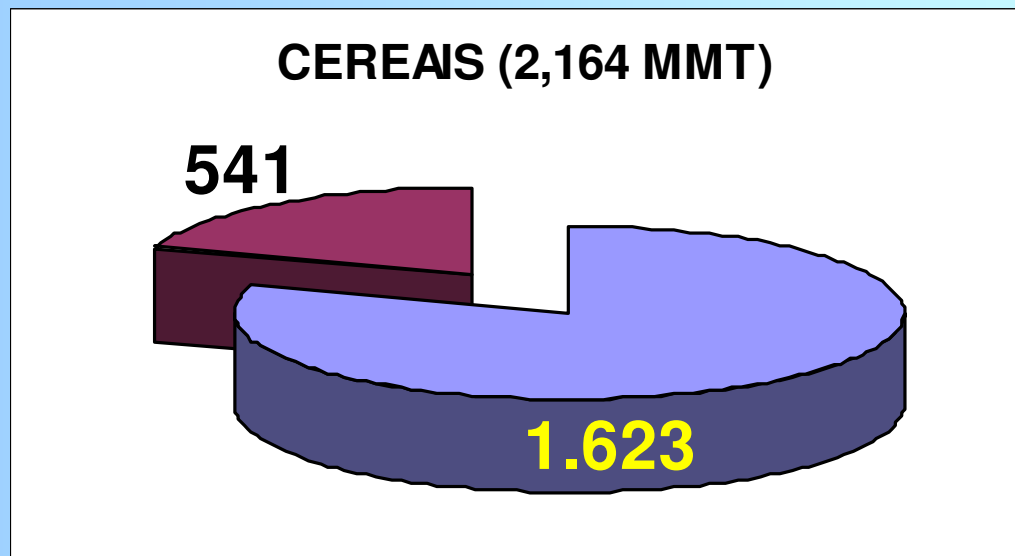
## MYCOTOXINS IN FOOD CHAIN

- 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 fumonisin 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.