

**INCO MYCOTOX**  
**Visit to Argentina Project Team**  
**17<sup>th</sup> and 18<sup>th</sup> of February 2005**

## **Objective**

To discuss with the HACCP team and wheat chain actors in order to give some additional inputs to WP4 and WP5 work of MYCOTOX in Argentina.

## **Visit Programme**

- 16<sup>th</sup> PM: Buenos Aires – Presentation of the project advances (Marcelo Masana)
- 17<sup>th</sup> AM: General Pico – Meeting with INTA staff  
Marcelo Masana, Juan Torrado, Ruben Bogino, (HACCP team members) Andres Corro Molas (Plant pathologist), Laura Biasotti (socio economic student)
- 17<sup>th</sup> PM: General Pico – Visit of the Acopio Acopagro (store house)  
Horacio A. Beneitez, Fabian Schmidt, Daniel Aguilar
- 18<sup>th</sup> AM: General Pico – Discussion with one producer (Hector Canonero), and Visit of Don Antonio Mill (Claudio Lanz, Alejandro Navone, Javier Balvidares)
- 18<sup>th</sup> PM: Visit of “Buen Gusto” Panaderia (Nestor Ruben) and discussion with INTA staff (Marcelo Masana, Juan Torrado, Ruben Bogino, Andres Corro Molas, Laura Biasotti)

## **Highlights**

The points listed below, rose during the different visits and discussions, should be taken into consideration in the project follow up.

- The interest and characteristics of certified wheat seeds seem not to be well known. Most farmers use their own seeds.
- Wheat culture is traditional in the Pampa area; it also gives income at a difficult period (december to march) but the real financial interest is low compared to soya, sunflower or maize culture.
- There seem to be, in the wheat food chain, a lack of information on mycotoxins damages on health.
- At this stage of the project, it is not very clear whether we take and analyse samples in order to determine or to confirm CCP.
- Apart from 2000/2001, Fusariosis seems not to have been a real problem in the area.
- Usually, Good Agricultural or Manufacturing Practices guides are general and not only made to control one risk such as DON mycotoxin contamination.

We should also take into consideration that in our project, recommendations to reduce mycotoxin risk could be unsuitable for other agricultural objectives (such as yield for instance).

- The fact that today's incomes among the wheat food chain do not take much into consideration quality parameters is a point of matter in this project because actors will only make efforts and set up quality systems (follow GAP, record practises, trace or segregate...) if there is a financial interest.
- We can distinguish four different HACCP "Hazards": wheat contamination by *Fusarium*, *Fusarium* multiplication, DON production, DON contamination.
- The fact that the wheat food chain is not an integrated chain does not help to manage the project.
- The Don Antonio Mill makes visual controls on *Fusarium* contamination at reception but does not make mycotoxin analysis at all.
- One should clarify International, European, Mercosur, Argentina norms on mycotoxins in wheat, flour, pasta, manufactured products...
- The lot segregation is identified as an efficient or possible method of control at different steps of the CFD but it implicates important material modifications whereas the economic situation is actually not favourable to make such invests.

## Recommendations

At this stage of the project we can make a few recommendations.

- To identify and confirm critical control points by taking and analysing samples - on DON criteria – at different stages of the CFD, in different places (low risk : IV and IVS ; medium risk : IIS, IIN, VN ; and high risk : I and III) in la Pampa. This should be done taking into consideration Ray Coker e.mail of the 17<sup>th</sup> of February.
- To study the varietal susceptibilities to DON taking samples into INTA trials. These samples should concern the most used varieties in Pampa area, which is to say: Buck Guapo, Buck Panadero, Buck Liquen, Buck Arriero, Baguette 10, Klein Escorpion, ACA 223, Sureno, Mataco, Ppointa Puntal.
- To apply "HACCP Quality tools" in order to determine and select hazard causes of apparition and to determine and select preventive actions (**see annex 1**)
- To summarize in a model (**see annex 1**) the different results obtained in WP4 and WP5 (and WP6).
- To make compilation of preventive actions in order to propose "Good Agricultural and Manufacturing Recommendations" ment to reduce DON mycotoxin risk in wheat flour.
- To validate these "GAMR" by proving that it gives better results on DON than standard.
- To valorise on the market (if there is a market?: willingness to pay?) the flour produced following these "GAMR". **TO BE RELATED TO THE SOCIO ECONOMIC STUDY**

## Annex 1 : HACCP Model – Synthesis of results obtained in WP4, WP5 and WP6

### Scope of the study : Control of DON contamination in packaged wheat flour

#### WP4

Commodity Flow Diagram (1)	Type of hazards (2)	Hazard's origin (3)	Risk of each hazard's origin (5)
<b>Storage (silos)</b>	Contamination by <i>Fusarium</i>		
	<b>Multiplication of <i>Fusarium</i></b>	Favourable temperature (4)	16
		<b>Favourable humidity</b>	24
	Production of DON		
	Contamination by DON		

(1) The Hazard Analysis should be done for each step of the CFD.

(2) We can distinguish four types of hazards : contamination by *Fusarium*, multiplication of *Fusarium*, Production of DON, contamination by DON. During storage, the four of them could occur.

(3) Ishikawa diagram is a good “brain storming tool” to use in order to identify Hazard’s origins.

(4) These favourable conditions (what humidity, what temperature?) should be determined.

(5) For each Hazard’s origin determine its risk’s probability thanks to the example below.

All hazard’s origin could be treated whereas, in lack of time or resources (which is always the case), only “high risk probability” should be considered.

<b>Hazard's origin</b>	<b>Risk = “Gravity” x “Frequency” x “Probability of Non Detection”</b> Scale = 1,2,3,4			
	G	F	PND	Total
Favourable temperature	4	2	2	16
Favourable humidity	4	3	2	<b>24</b>

## WP5

Hazard's origin	Preventive action (6)	Functionality of each preventive action (7)	Critical Control Point (8)
<b>Favourable humidity</b>	<b>Effective ventilation</b>	36	Ventilation
	Moving wheat from one silo cell to another	18	/

(6) 5M is a good “brain storming tool” to use in order to identify Preventive actions.

(7) For each preventive action determine its functionality thanks to the example below.

All Preventive actions could be implemented, whereas in lack of time or resources (which is always the case), only “high functionality” should be considered.

Preventive actions	Functionality = “Cost” x “Speed of implementation” x “Acceptability by the Personal” Scale = 1,2,3,4			
	C	S	AP	Total
Effective ventilation	3	4	3	<b>36</b>
Moving wheat from one silo cell to another	3	3	2	18

(8) Identification of CCP can be done according to “Functionality study” where as a “decision tree” is sometimes used.

(9) The compilation of the different relevant Preventive actions constitutes the basis for GAP and GMP building.

## WP6

<b>Critical Control Point</b>	<b>Target</b>	<b>Critical limits</b>	<b>Control (10)</b>	<b>Immediate Corrective actions (11)</b>
<b>Ventilation</b>	<b>Extraction of 8m3/hour</b>	<b>+/- 0,5 m3/hour</b>	<b>Check effectiveness of ventilation every 8 hours</b>	<b>Repair ventilation Measure wheat moisture Take decision (downgrading, drying...) for wheat</b>
			Check air moisture every 12 hours	

(10) The Control should normally be applied to the Preventive action (considering its Target and Critical limits).  
If Control is applied to the Hazard's origin, Target and Critical limits have to be defined according to Hazard's origin.

(11) The system should propose - in order to cure loss of control - immediate corrective actions, whereas structural corrective actions (example : replace old ventilator by a new one) will be defined according to frequency or gravity of the control loss.

(12) The WP6 also requires definition of global verification and documentation systems.