



monitoring the safety of animal feed



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# Case study of Catalonia dairy chain

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# Catalonia Region



## GIRONA



# Defining GMO maize crops in Girona

Comarca	Farms surveyed	Cows/farm	Milk yield, l/d
Alt Empordà	1	50	23
Baix Empordà	23	79 (31-220)	26 (20-33)
Garrotxa	11	130 (45-230)	29 (22-32)
Gironès	7	124 (49-430)	28 (18-38)
La Selva	6	112 (49-210)	31 (24-36)
Plà de l'Estany	16	110 (20-690)	25 (16-33)
Ripollès	5	45 (28-69)	30 (27-33)



# Defining GMO maize crops in Girona

## Survey questions:

- Ingredients composition of the ration
  - Forages: varieties used and reasons
  - Grains: concern about feed origin



## FORAGES: percentage of each forage used by surveyed farms in the comarques

	Corn silage	Rye-grass silage	Alfalfa hay	Alfalfa silage
Baix Empordà	57%	78%	78%	9%
Garrotxa	91%	64%	55%	27%
Gironès	71%	86%	57%	14%
La Selva	33%	83%	50%	0%
Pla de l'Estany	19%	69%	50%	31%
Ripollès	60%	40%	40%	0%
<b>Average</b>	<b>52%</b>	<b>72%</b>	<b>61%</b>	<b>17%</b>



# FORAGES: forage corn varieties used in farms by comarques

	Non-GMO	GMO
Baix Empordà	Lerma/Oropesa/DKC 3333/DKC6717	SF1035T/SF1112T/Bt Helen/PR33Y72
Garrotxa	Carella/Beret/PR31Y43/P111 4/PR31Y43/DKC6903/DKC681 5/PR34B39	None
Gironès	Oropesa/Lerma/Oboe/ DKC6666/PR34B39/PR31Y43	None
La Selva	Carella	None
Pla de l'Estany	PR31Y43/PR32W86/Oropesa	None
Ripollès	PR34B39	None



# Reasons to choose the corn variety

- Productivity
- The one that raises well in the area



# Concentrates: Energy sources

	<b>Corn meal</b>	<b>High-moisture corn</b>	<b>Barley</b>	<b>Wheat</b>
Number of farms (69)	63	3	2	1



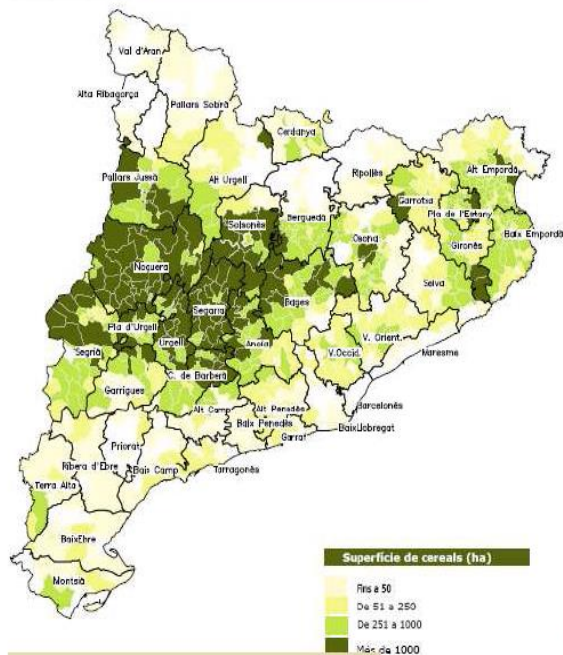


# Concentrates: Protein sources

	Soybean	Canola	Sunflower
Number of farms (69)	65	3	1

# Cereal production in Catalonia

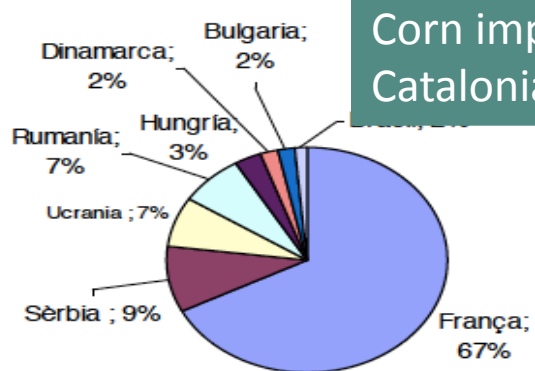
## Cultivated hectares of maize MON-810 in Catalonia



Comarca	Hectares (2014)	Percentage
Barcelona	194,12	0.53
Lleida	29.568,03	81.27
Girona	6.583,19	18.10
Tarragona	35,88	0.10
<b>TOTAL</b>	<b>36.381,22</b>	

# Corn and soybean import in Catalonia

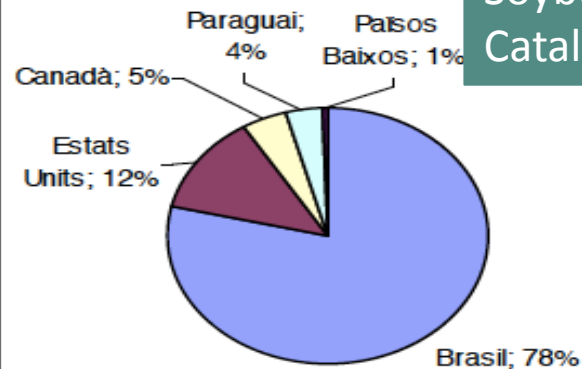
## Corn import Catalonia 2009



Elaboració Gabriel... a partir dades de... ons 119.580 t

	GMO permitted
France	X
Serbia	X
Ukraine	X
Romania	✓
Hungary	X
Denmark	X

## Soybean import Catalonia 2009



	Million Ha.	GMO ratio
Brazil	26.9	92%
USA	29.3	93%
Canada	1.6	90%
Paraguay	3.0	95%

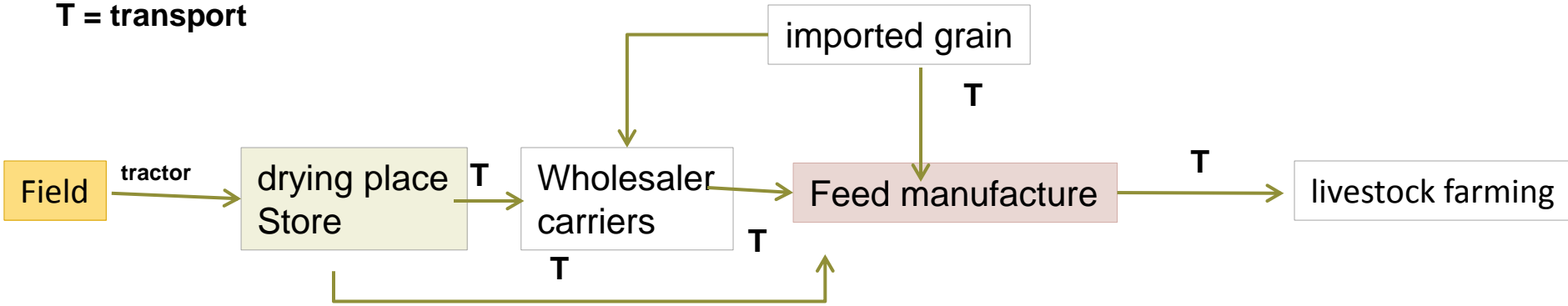


## Are you worried about the concentrate origin?

- All farmers answered NO

# Scheme of maize route along feed production

T = transport



→ **Documentary** traceability tools identified:

- Transport documents, delivery notes
- Register of arrivals and departures of materials
- Feed manufacture documents
- Labels (feed in bulk, in bag)



# Specific documentation required for each stakeholder

register of arrivals and departures:

**identification of farmer**

farm

kg

**GM/non-GM**

arrivals → document identification number

**origin** (country, region)

product description

weight

**GM/non-GM**

drying place  
store: mixing  
GM and non-GM  
maize

imported grain

wholesaler  
carriers

feed manufacture

livestock farming

tractor  
field

Local production

Declaration document → n° of hectares

kg produced

**place of commercialization**

**Maize variety**

Documents:

departure → document identification number

**destination**

carrier name

customer name

product description

**BATCH number**

**GM/non-GM ingredients**

→ transport documents (delivery notes):

identification number

**origin:** place of charge, region, country

destination, **GM/non-GM**



## Is it possible to know how much GMO feeds consume a dairy cow?

- No, with the actual traceability system
- Yes, if some changes in the traceability system occur:
  - Identify corn variety at the entrance of the feed manufacture
  - Quantify the amount of GMO and non-GMO food mixed at each batch in the drying store or feed manufacture (where the imported ingredients are mixed with the national ones)



## Is it possible to know if dairy cows consume or not GMO feeds?

- Batches of concentrate at farm arrival should be labelled with the following information:
  - ingredients variety
  - amount of GMO and non-GMO feeds





# Current surveillance system in dairy farms

- Private vet visits: samples to diagnostic labs
- Abattoir inspections of culled cows
- Individual monthly milk records and samples
- Daily milk samples from the milk tank by milk industry
- Annual blood samples by official veterinary services (sanitation campaigns for Brucellosis, Tuberculosis, Enzootic Bovine Pleuropneumonia)
- Random official inspection controls at farms: hygiene rules, farm documents and registers, animal sanitary inspections, control animal feedstuffs, farmer formation



# GMO health risk from WP1

- “....published data on the health of animals consuming GM crops did not give rise to concerns about the effect of GM feed on livestock health as most short-term, long-term and multigenerational studies conclude that animal health is not adversely affected by feeding GM feed”.
- “..the relationship between animal health and GM feed consumption is lacking.”
- “...much knowledge that would facilitate the monitoring of potential effects of GM feed on animal health is still missing”.



## GMO health risk from WP3

- Allergenicity case: “...impact of genetic modification on the intrinsic allergenicity may be limited compared to other factors”.
- Horizontal gene transfer case: “...the unintended plant-to-bacteria transfer will be a rare event and unlikely to pose health concerns.”

# Summary



- ✓ Forage variety
- ✓ GMO forage quantity



- Private vets
- Abattoirs
- Industry (milk)
- Veterinary services: random inspections, sanitary campaigns

**HEALTH INDICATORS???**



- ✓ Feed variety
- ✓ GMO feed quantity



- ✓ Feed variety
- ✓ GMO feed quantity

- ✗ Cereals feed variety
- ✗ GMO cereals quantity



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