Dual purpose crop production across a diversity of livestock systems in the EU:

The case of oilseed – production of foods, feeds and fuels.

Patrick Carré

Terres **Inovia**

Terres Inovia

About the speaker

Terres Inovia: French technical centre for oilseeds and pulses.

- Non-profit organization mainly focused on agronomy
- Staff : >150 people.

Patrick Carré: Process engineer

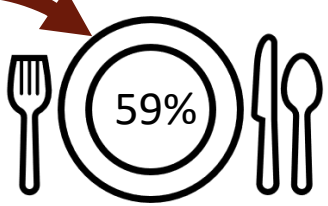
- 35 years of experience
- R&D on oilseeds processing / pilot-plant / impact of technologies on products quality

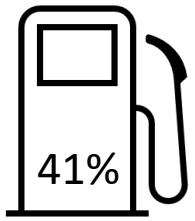
Oilseeds: multipurpose crops

Extraction of oils from oilseeds results in 2 co-products:

Oil

Meal





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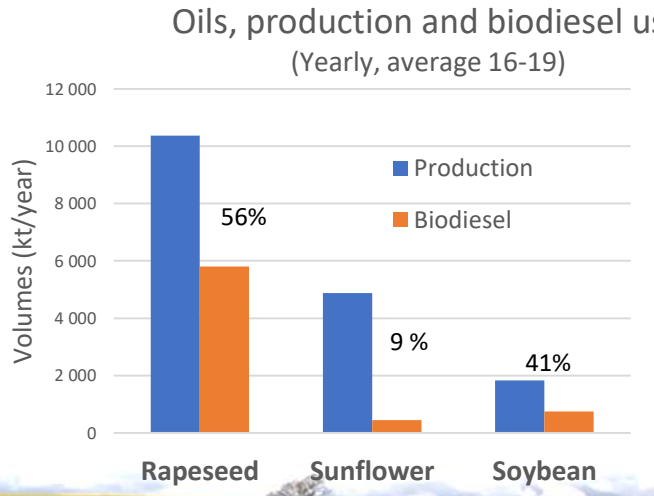
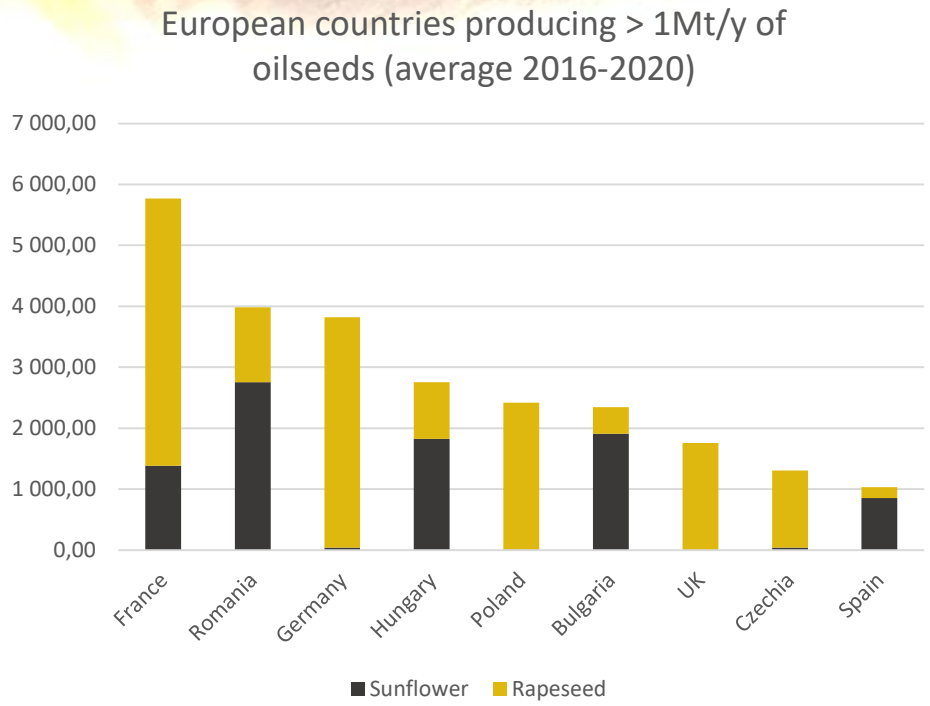
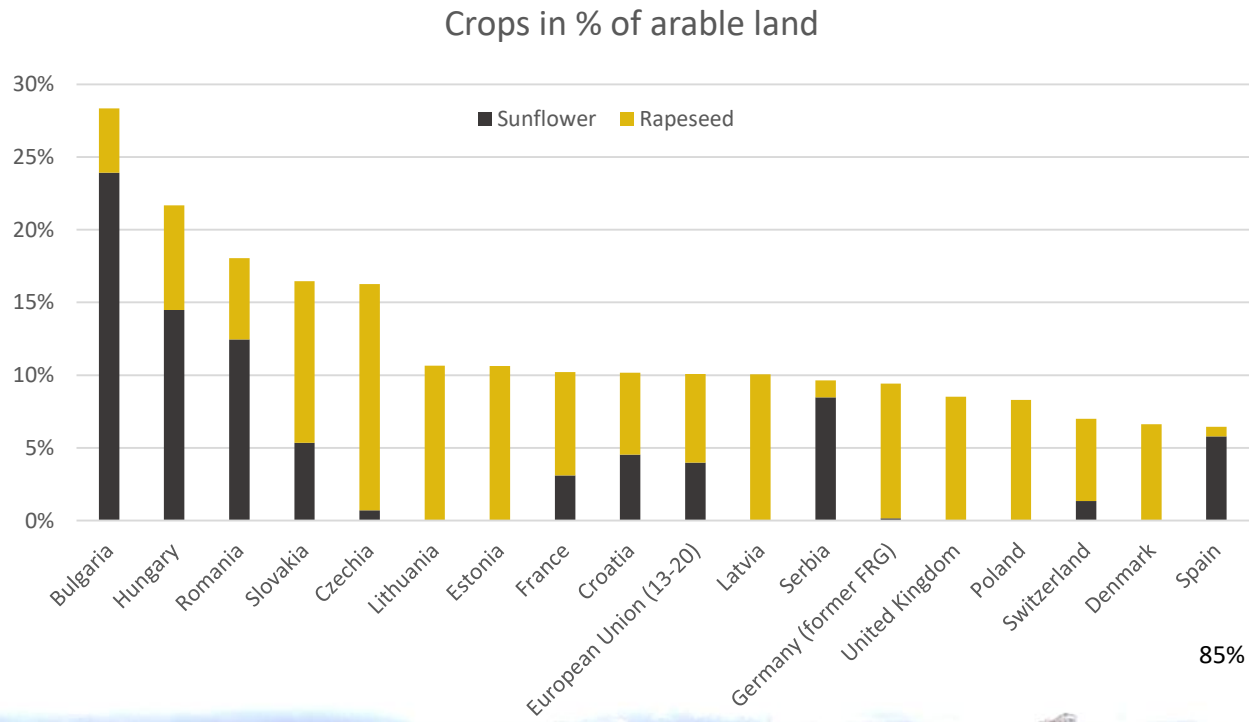


Source : Terres Univia

Oilseeds economy

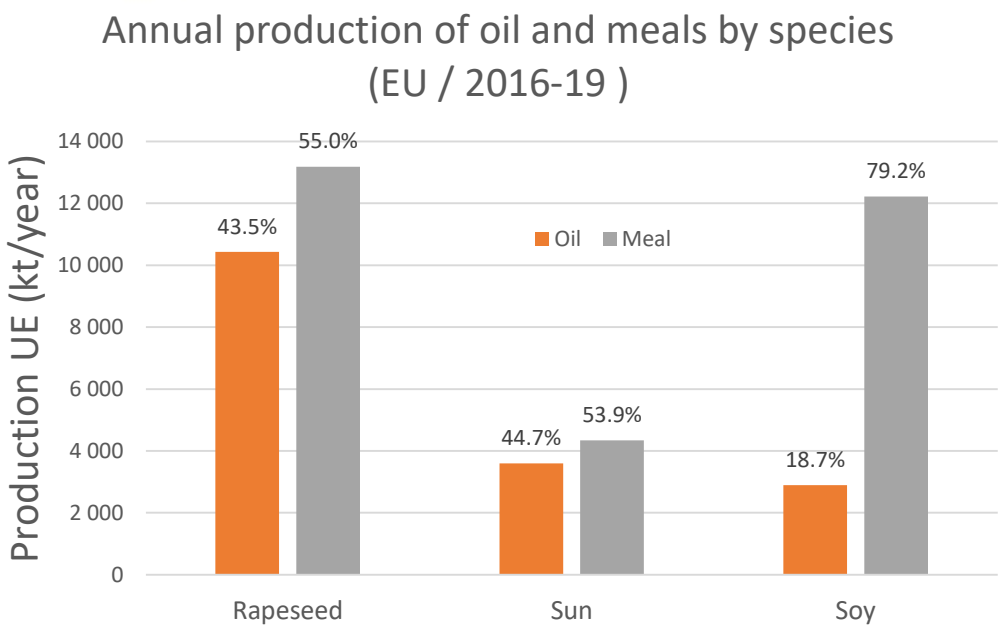




85% of UE AL

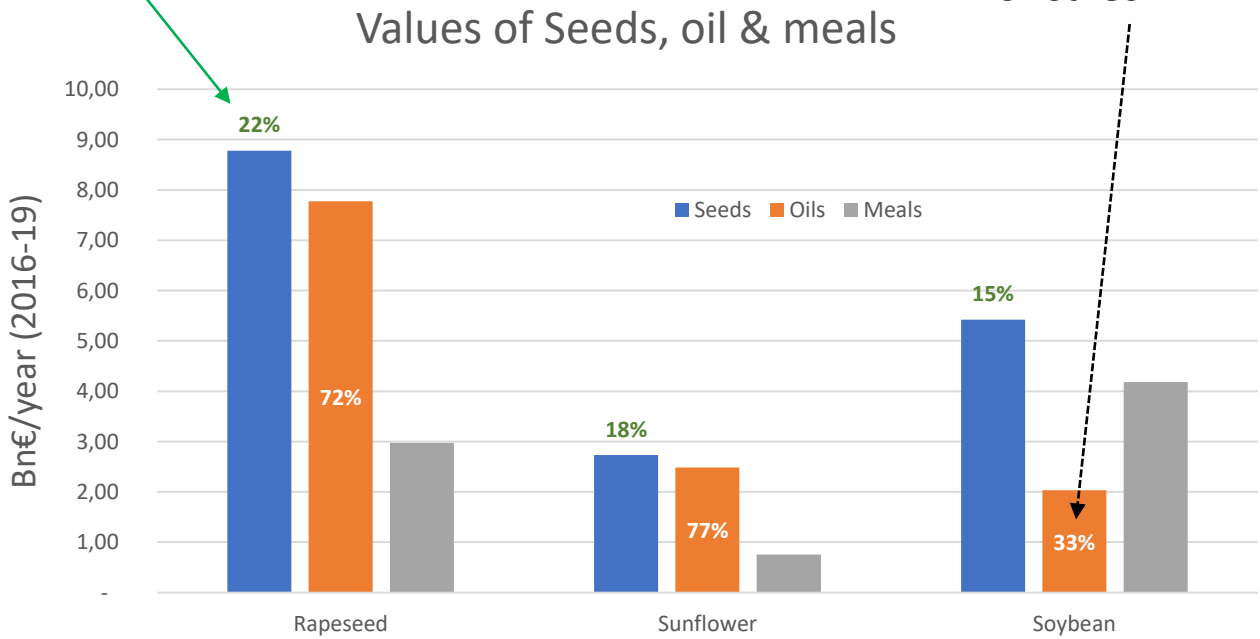
Source : Eurostat

UE Oilseeds crushing overview



Added value
(value of oil + meals – value of seeds)

Oil value in % of sales



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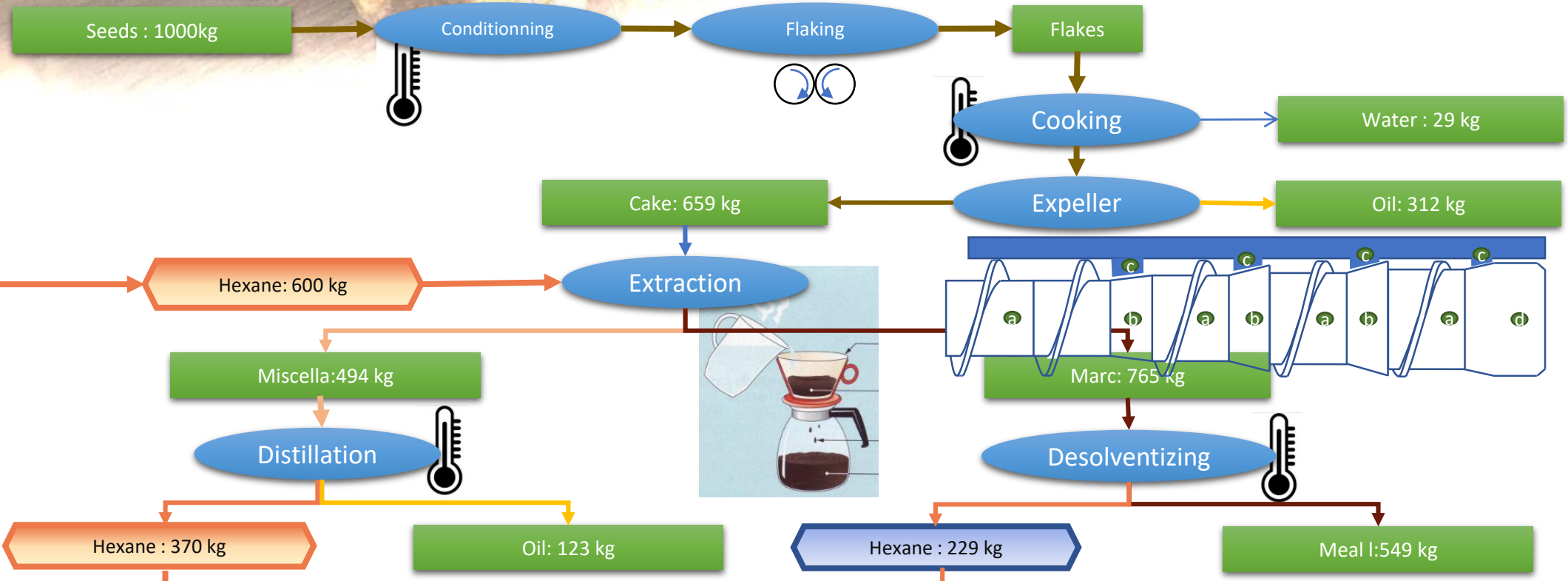
Overview of rapeseed & sunflower processing



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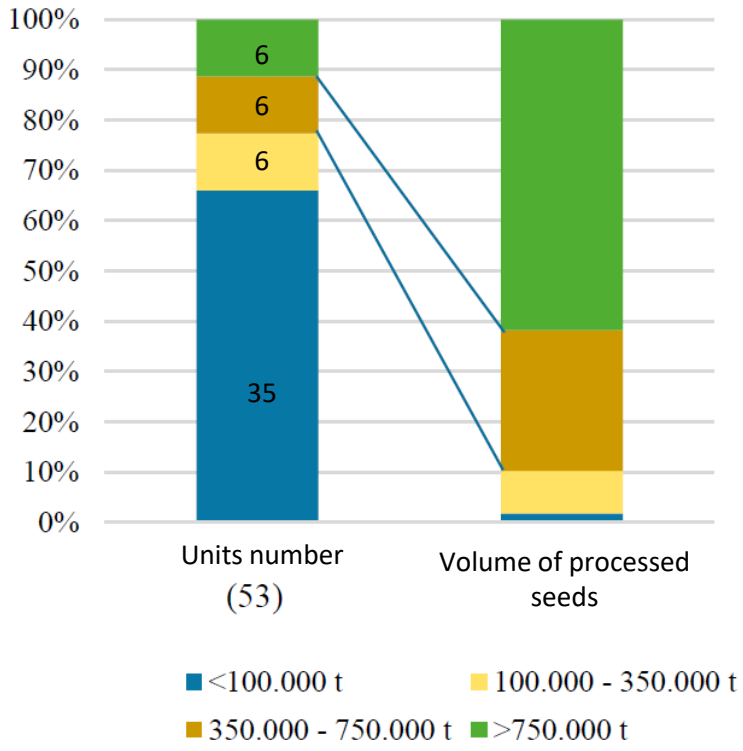
Process main features

- Oil is dominant in profitability of oil-mills
- High oil yield (98%)
- Highly optimized process
- Sizing of processing units for economies of scale
- Oligopolistic market with few multinational operators (ABC)

Oil-mills in Germany, number and volumes of production (2017)



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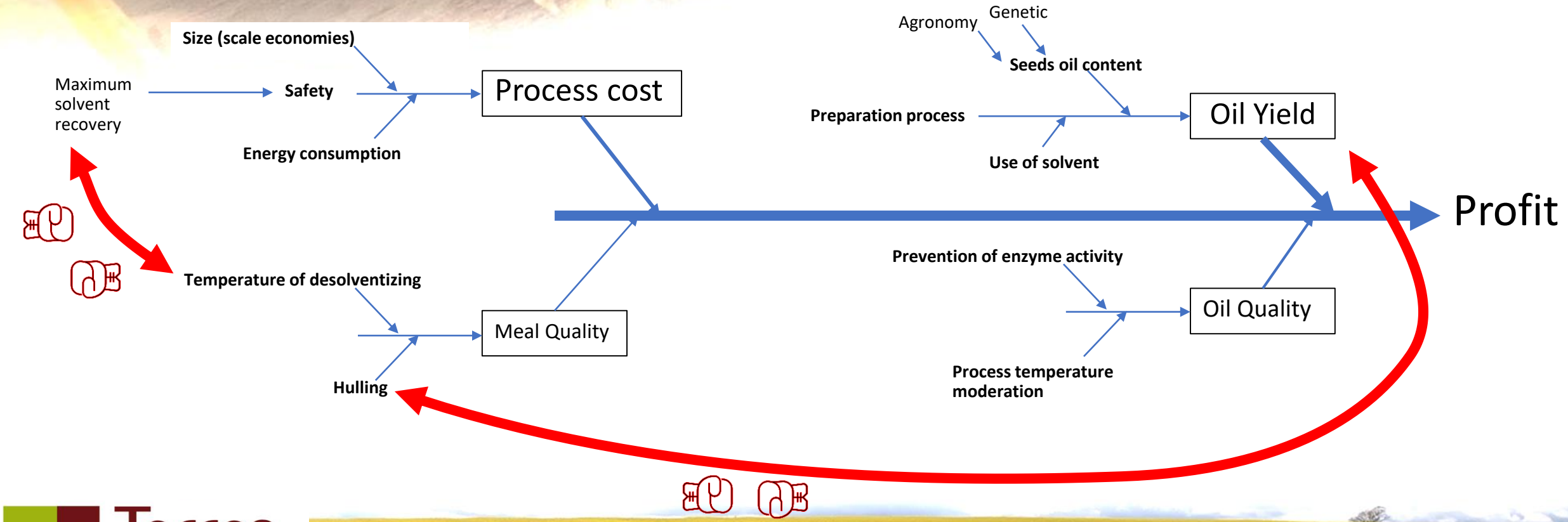
Determinants of competitivity



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Quality of Rapeseed meals

	Regular RSM	Dehulled mild processing
Proteins	34	43
NDF	28	11
ADF	18	7
Lignin	9	1
Ashes	7	9
Digestibility (pigs)		
Energy	67%	80%
Proteins	77%	85%
Lysine	5.3% of AA	6.2% of AA
Glucosinolates	<10 µMol	>20 µmol
Other phenolic	Bitterness	Concentration

Technical hurdles

Dehulling → oil losses

- Rapeseed hulls contains 8% of oil
- Sorting hulls & kernels is difficult

Poor performances of mechanical extraction

- Lack of fiber → lesser pressure generation
- Press cake with poor extractability by lack of structuration

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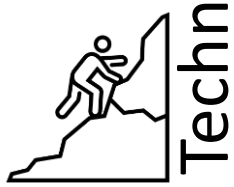
Quality of Sunflower meals

	"Lopro" SF meal	Available "Hipro"	Potential "Very-Hipro"
Proteins	**28**	**35**	**>40**
NDF	41	32	26
ADF	29	22	17
Lignin	10	7	5
Ashes	6	7	7
Digestibility % (pigs)			
Energy	52	60	66
Proteins	73	81	87



Technical hurdles

Dehulling → oil losses

- Modern SF hybrids: adhering hulls
- Removing > 60% of hulls is difficult

Poor performances of mechanical extraction

- Lack of fiber → lesser pressure generation
- Press cake with poor extractability by lack of structuration

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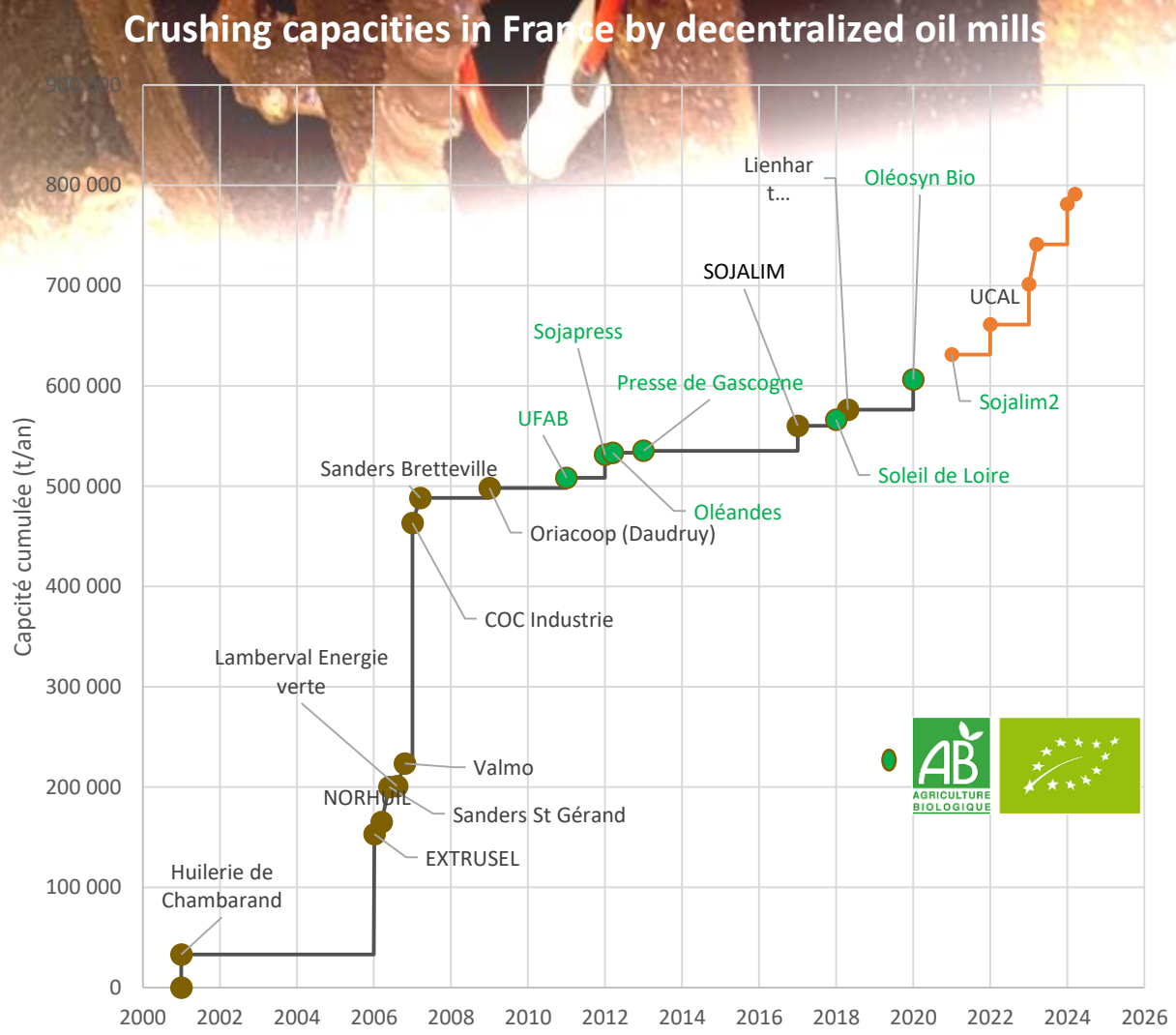
Emergence of decentralized oil-mills.

In France ➔ development of small units motivated by the need to produce local meals for the high-end market with:

- Locality
- Traceability
- Non-GMO
- No use of solvents.

➔Result: mechanical extraction only, higher fats content.

➔Greater interest for proteins quality



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4 Take away information and one reminder

Europe: Oilseed sector ≈10% of arable land

- important for crop rotation.

Processing

- Oil yield prevails on meal quality for the operators of large oil-mills

Meal quality

- Dehulling and milder thermal treatment could significantly improve meals quality

Actual perspectives of progress in meal quality

- Oilseeds breeding → Sunflower: hullability, Rapeseed: protein content
- Interesting, emergence of decentralized oil-mill → greater attention to protein uses

Competition feed vs. food

- Protein by-products from oilseed require heavy processing to become edible / humans
- Transformation by animals: not so poor solution.

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