



Chemical composition and nutritional characteristics of rapeseed meal produced in France

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A multi-year survey on the chemical composition of rapeseed meal produced in France



Object : A quality survey in the main French crushing factories since 2003 on chemical composition of rapeseed meal (RSM)

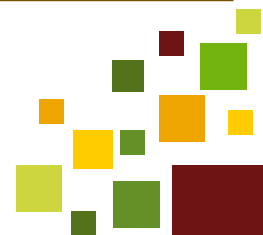


Context:

- 1) Increased RSM availability in France, with about 2.5 million in 2017 (+25% than in 2010), linked to bio-diesel production.
- 2) RSM consumption in France 2.4 million tons. RSM contributes to protein autonomy in France

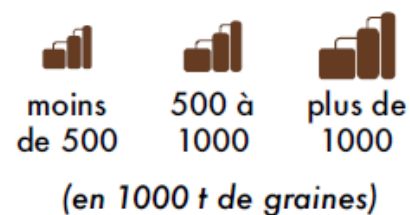


Goal : participating to the RSM value-enhancing in animal feeding, by improving knowledge on its chemical characteristics and variability and nutritional value



Material and methods

- One sample of RSM collected each month in 7 rapeseed-crushing factories
- Analyses in Terres Inovia's laboratory



- Rapeseed
- Sunflower
- Both rapeseed and sunflower

Material and methods



➤ Analyses in Terres Inovia's laboratory (Ardon, France)

- Dry matter content
- Oil content (NF EN ISO 22630 for oilseed meals),
- Protein content (Kjeldahl NF EN ISO 5983-2),
- Crude fiber content (Weende NF V 03-040),
- Glucosinolates (GSL) content with HPLC (NF ISO 10633-1),
- Calcium content
- Phosphorus content
- Protein solubility in potash (in-house method equivalent to ISO 14244)
- DE1, enzymatic digestibility 1 hour (internal method according to Aufrère et al., 1989)

Results expressed on Raw Matter standardized at 12% moisture
(**RM₁₂**)

Material and methods

Year N corresponds to a production season from July year N to June year N+1



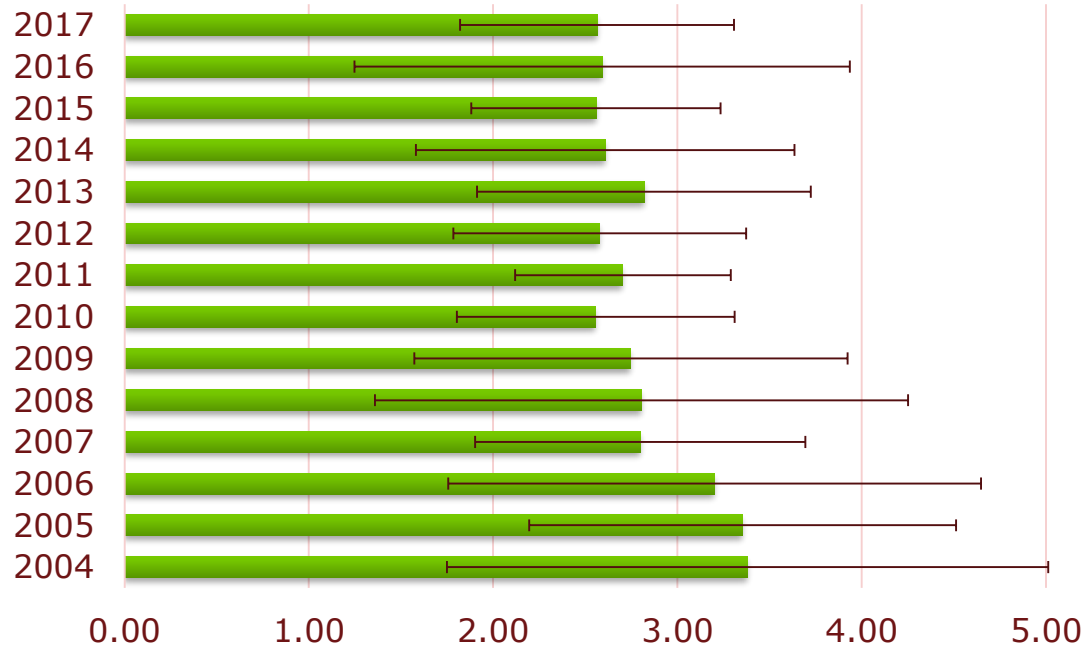
Year	Number of samples collected
2003	28
2004	55
2005	78
2006	75
2007	74
2008	78
2009	86
2010	81
2011	57
2012	72
2013	57
2014	62
2015	64
2016	58
2017	56

Mean characteristics for 2017-2018 RSM production

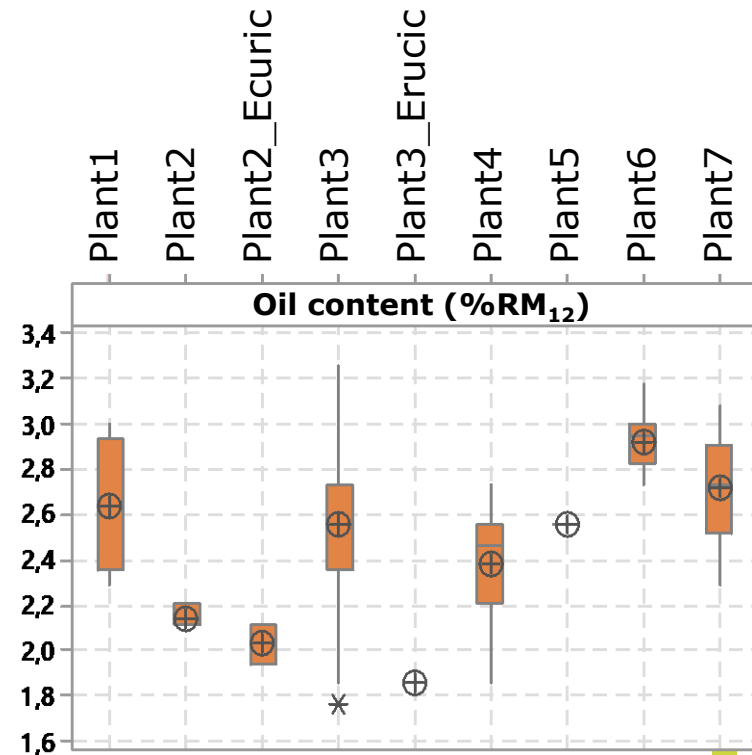
Variable	N	Mean	Stand Dev	Minimum	Maximum
Dry Matter (%)	56	88,3	0,8	85,5	90,8
Oil (%RM ₁₂)	56	2,6	0,4	1,8	3,2
Protein (%RM ₁₂)	56	33,6	1,3	32,3	37,3
Soluble protein (%RM ₁₂)	56	15,4	2,6	12,0	21,5
Crude fiber (%RM ₁₂)	55	13,9	0,8	12,3	15,8
Glucosinolates (μmol/g RM ₁₂)	56	7,2	5,1	1,2	19,6
Ca (g/kg)	34	7,45	0,6	6,27	8,65
P (g/kg)	34	10,95	0,77	9,69	12,72
Protein solubility (%)	56	45,8	7,0	36,3	61,1
DE1 (%)	56	20,0	5,6	13,5	33,4

Oil content : under 3% since 2007

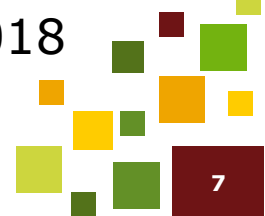
Oil content (% RM₁₂)



Error bar = 2 x SD

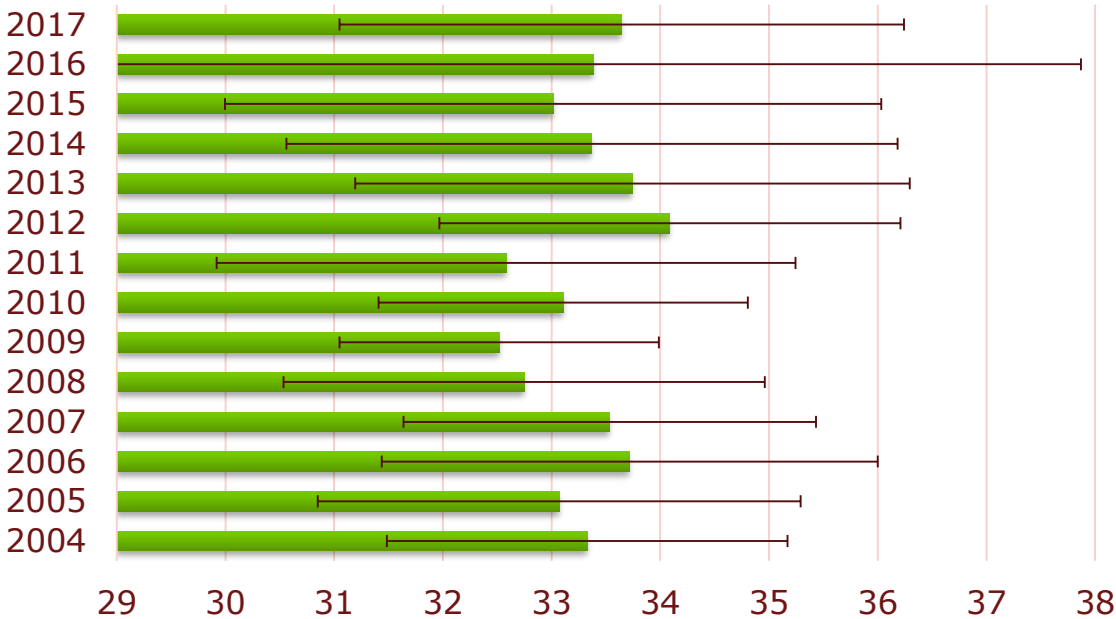


2017-2018



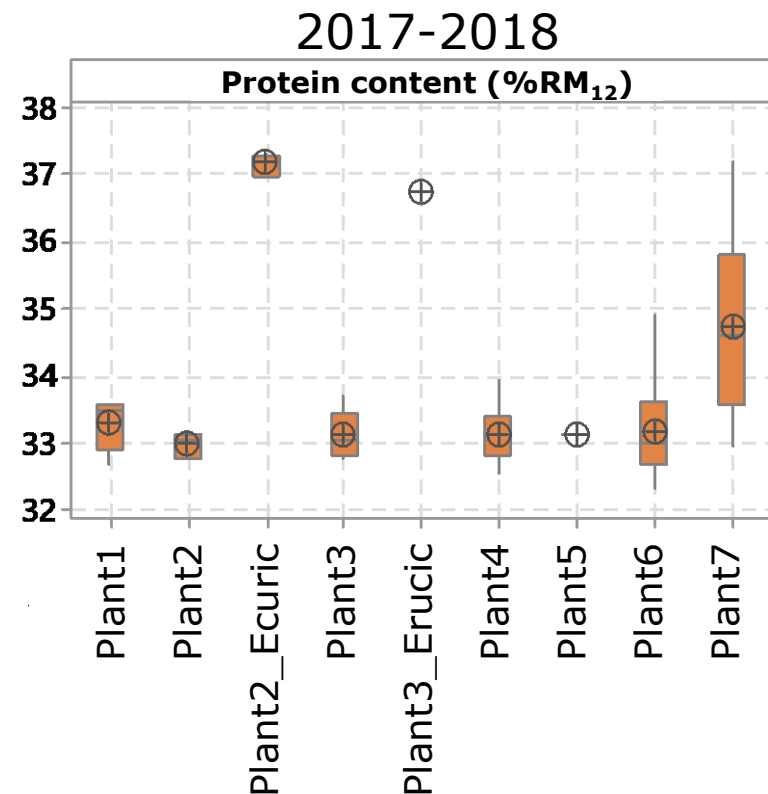
Protein content : 32.5 to 34.1% according year, large variation

Protein content (% RM12)



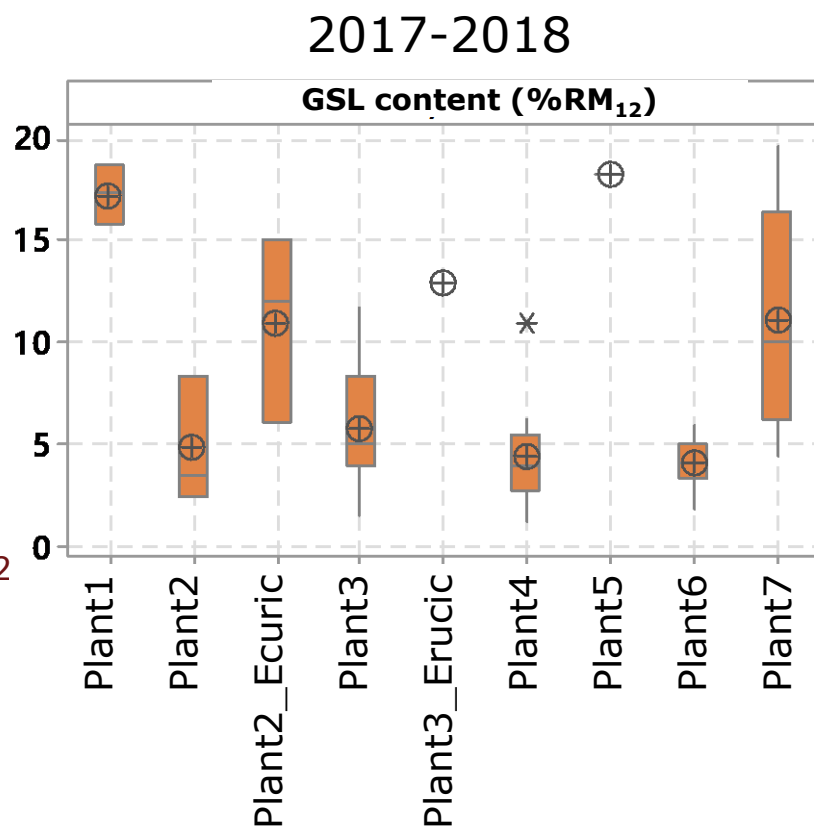
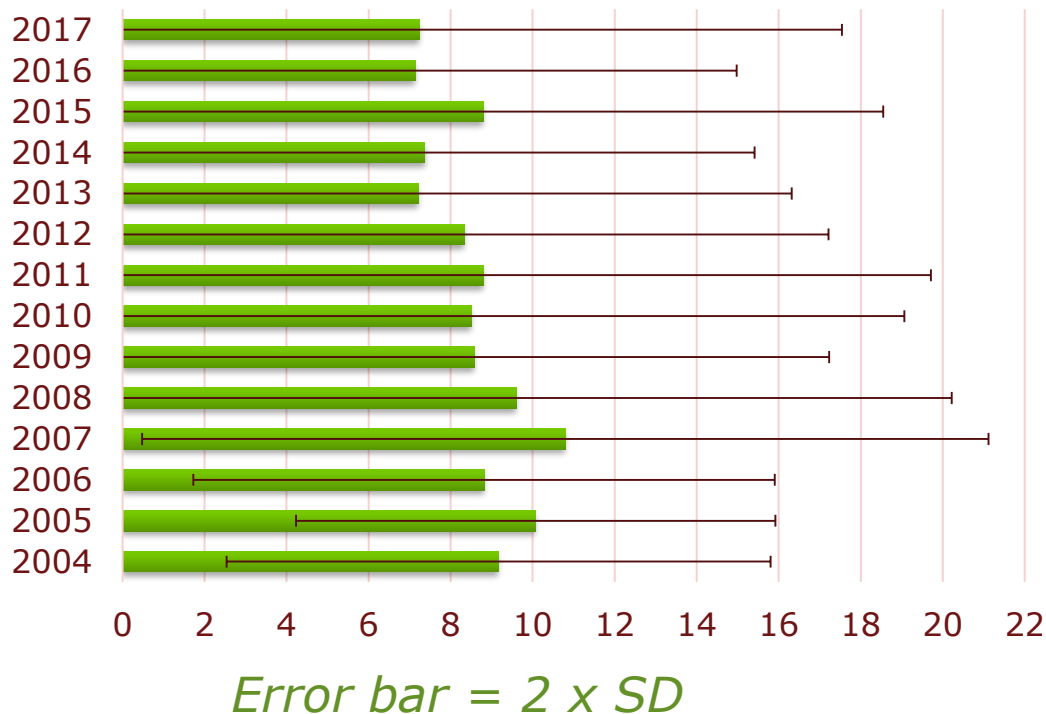
Error bar = 2 x SD

- Erucic RSM with higher protein content
- Plant7 : more variable because some imported canola seeds



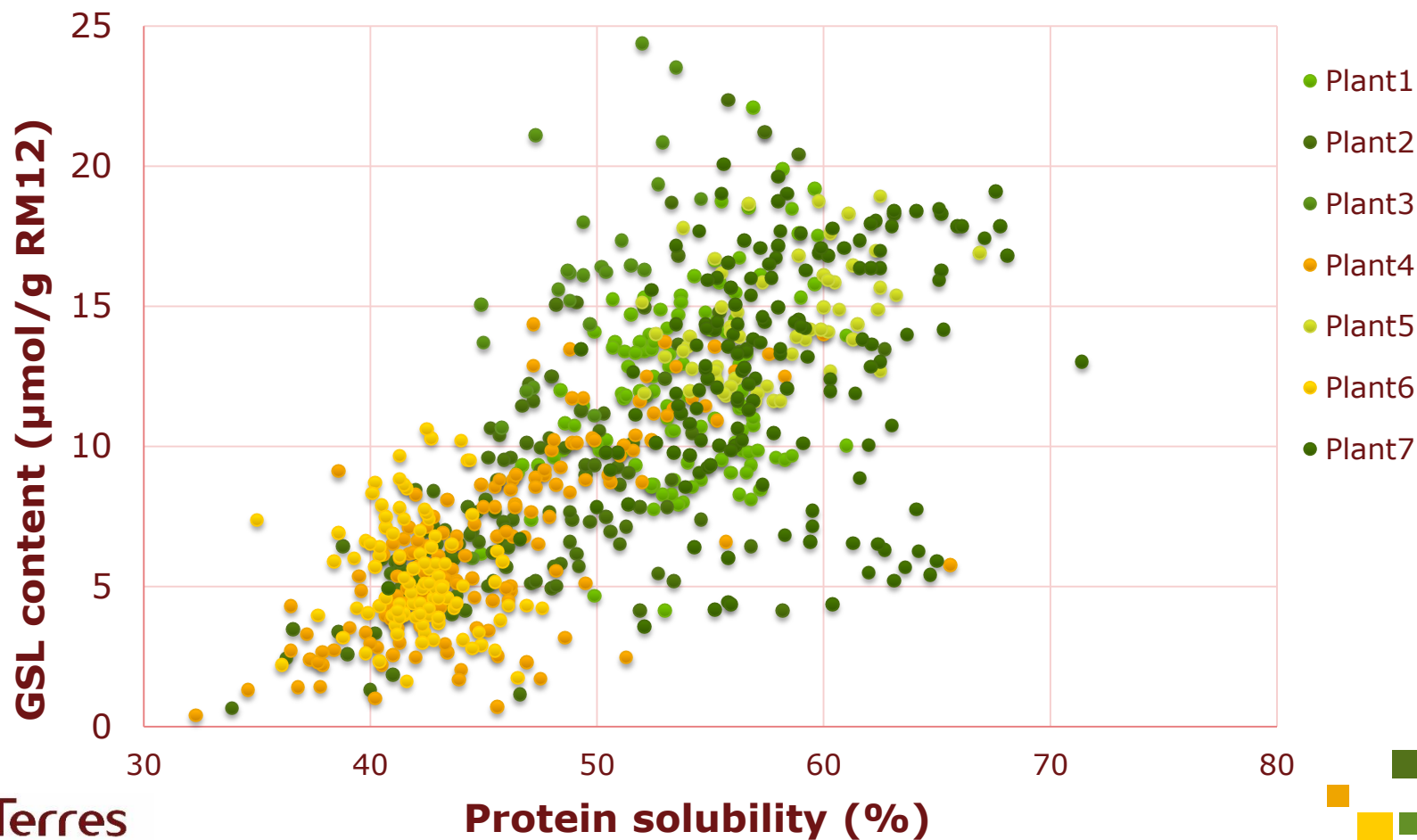
Glucosinolates content : 7-9%, large variation due to strong factory effect

GSL content (%RM₁₂)



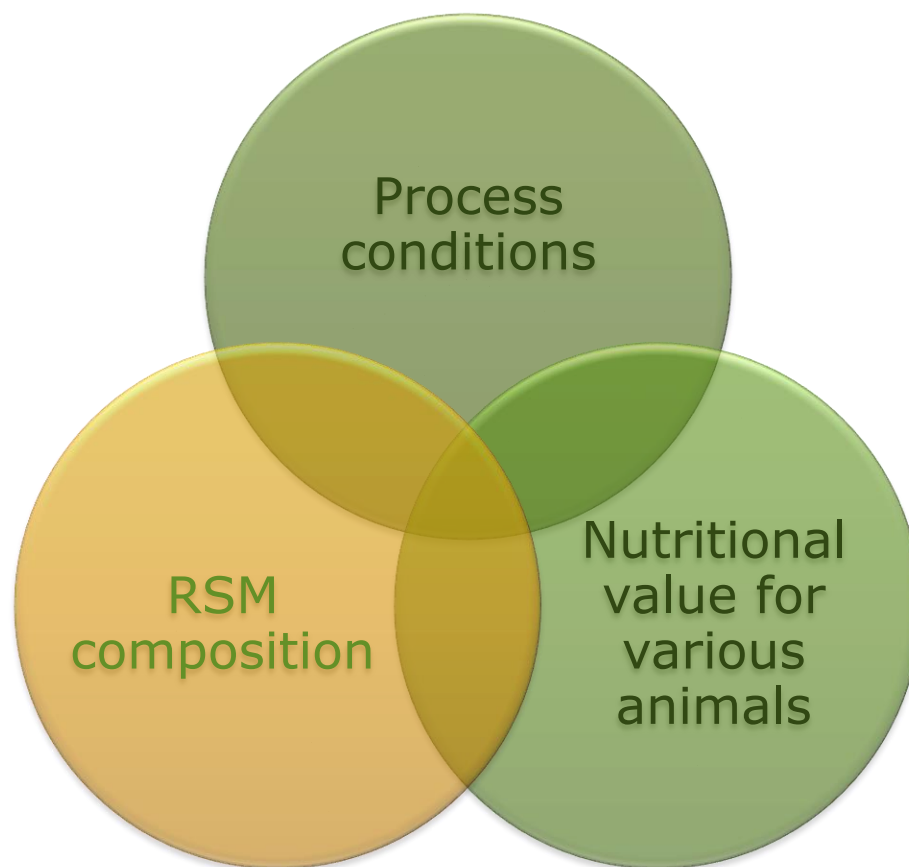
Relationship between GSL content and protein solubility

→ Higher hydrothermal conditions during desolvantization decreased GSL content (due to GSL degradation) and reduced protein solubility



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A basis for initiating new projects



Thank you for your attention !

