

# Chemical and nutritional value of organic feedstuffs : a need to address in 100% organic feeding of organic monogastric animals

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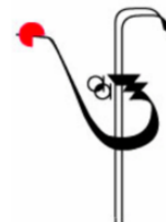
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# Rationale

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1

Ever increasing trend in organic monogastric production since 2010

2

EU regulation towards 100% organic feeds for organic animal production

3

A lack of protein feeds in organic production

4

Make a better use of organic protein feeds (CASDAR SECALIBIO)

**SECALIBIO**

Sécuriser les Systèmes Alimentaires en  
Production de Monogastriques Biologiques



# SECALIBIO

Sécuriser les Systèmes Alimentaires en  
Production de Monogastriques Biologiques



Avec la contribution financière  
du compte d'affectation spéciale  
«Développement agricole et rural»

- Producing organic protein feeds
- Characterizing protein feeds and other feeds to be included in the 100% organic diets
- Informing farmers about the correct use of organic protein feeds in the 100% organic diets

# Tasks and objectives

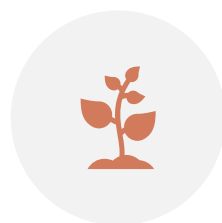
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CHARACTERIZE ORGANIC RAW MATERIALS THROUGH THE COLLECTION OF DATA AND THE CREATION OF A DEDICATED DATABASE



IDENTIFY GAPS OF DATA IN ORGANIC FEEDS

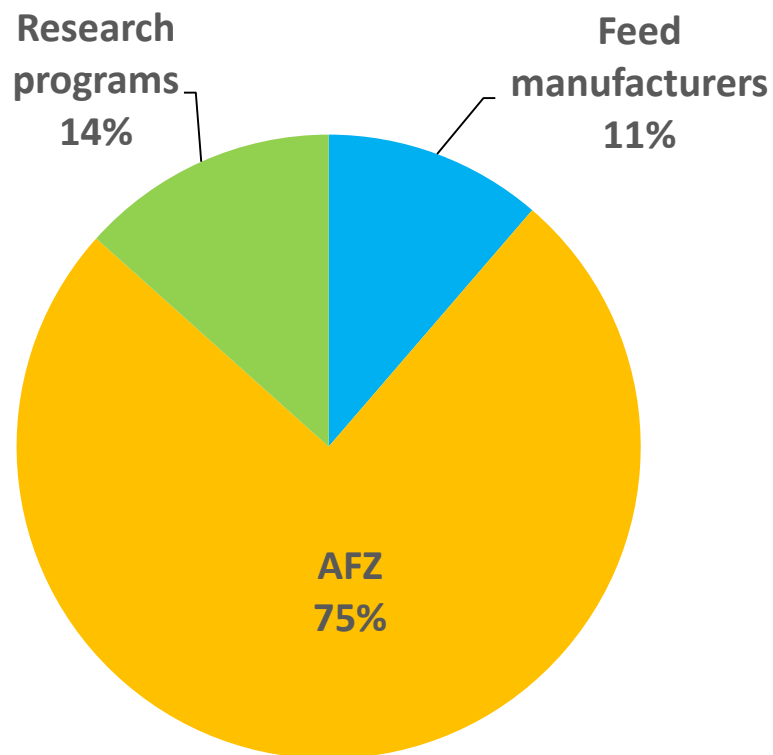


COMPARE ORGANIC FEEDS TO CONVENTIONAL FEEDS



ASSESS AND PROCESS DATA FOR PUBLICATION OF ORGANIC FEED TABLES

# Description of the organic database



**Origin of data**

- 35315 chemical data and 354 digestibility data
- 6577 samples (36 % after 2010)
- 94 different feeds (raw materials)
- Protein feed samples:
  - 877 soybean meal
  - 380 non-dehulled sunflower meal (71 dehulled)
  - 356 faba bean
  - 195 peas
- 70 % France ; 22 % unknown origin ; 4 % Spain ; 3 % Italy ; etc...

## Main feeds



- **Cereal grains:** Maize, wheat, barley, oats, rye, triticale, spelt
- **Legume seeds:** Pea, faba bean
- **Oilseeds:** Treated soybean seeds, sunflower seeds
- **Oilmeals :** rapeseed meal, soybean meal, sunflower meal, sesame meal
- **Others:** Dehydrated alfalfa, needle , whey,, alfalfa protein concentrate, wheat bran, wheat middlings

## Main parameters

- **Main chemical parameters:** DM, CP, CF, Crude Fat, Ash, Starch, Sugar, Van Soest fibre (NDF, ADF, ADL),Ca, P
- **Other chemical parameters:** Mg, Na, K, Zn, Cu, Mn, amino acids, fatty acids
- **Energy values for pigs:** growing pigs, fattening pigs (DE, ME, NE)
- **Energy values for poultry:** cockerels, broilers
- **Amino acid digestibilities:** SID in pigs, Standardised or Apparent ileal in poultry

# Data collection: sample information

**Samples** Consolidated data Chemical data Bioavailability data Export Zone

649876 Feeds 4725 Tourteau de chanvre (Cannabis sativa), huile > 5 %, biologique

Documents 8031 Juin, H.; Bordeaux, C.; Feuillet, D.; Roinsard, A., 2016. Valeur nutritionnelle de sources de protéines pour l'alimentation des volailles en production biologique. Résultat des essais digestibilités. Vers une alimentation 100 % AB en élevage avicole biolo

Source Biblio

Sample type Normal Entry 25/03/2016 Harvest 01/01/2012 Sampling 01/01/2012

Providers 0 Countries 0

Departments 0 Regions 0

Other areas Cultivar Physical state 0 Indéterminé

Old code Old name Tourteau de chanvre

Other codes: A 0 B 0 C 0 Feedipedia

Misc.

**Chemical data for** -> bioavailability data To Data Frame Convert Fresh -> DM Convert DM -> fresh Delete fresh values

Parameter	Par-M	Met	Labo	/fresh	/DM	Unit	Other	Unit	Valid	Include
Protéines brutes	1	0	29	28.62	31.68	%		-	OK	✓
Matière sèche	3	0	29	90.35		%		-	OK	✓
Matières grasses brutes	4	0	29	12.77	14.13	%		-	OK	✓
Lysine	10	0	29	0.98	1.08	%	3.41	g/16g N	OK	✓
Méthionine	11	0	29	0.64	0.71	%	2.24	g/16g N	OK	✓
Cystine	12	0	29	0.45	0.50	%	1.58	g/16g N	OK	✓
Thréonine	13	0	29	0.95	1.05	%	3.31	g/16g N	OK	✓
Glycine	14	0	29	1.17	1.29	%	4.07	g/16g N	OK	✓
Sérine	15	0	29	1.32	1.46	%	4.61	g/16g N	OK	✓
Leucine	16	0	29	1.74	1.93	%	6.09	g/16g N	OK	✓
Isoleucine	17	0	29	1.05	1.16	%	3.66	g/16g N	OK	✓
Valine	18	0	29	1.29	1.43	%	4.51	g/16g N	OK	✓
Histidine	19	0	29	0.70	0.78	%	2.46	g/16g N	OK	✓
Arginine	20	0	29	3.16	3.50	%	11.05	g/16g N	OK	✓
Phénylalanine	21	0	29	1.23	1.36	%	4.29	g/16g N	OK	✓
Tyrosine	22	0	29	0.84	0.93	%	2.94	g/16g N	OK	✓
Acide aspartique	23	0	29	2.71	3.00	%	9.47	g/16g N	OK	✓
Acide glutamique	24	0	29	4.54	5.03	%	15.88	g/16g N	OK	✓
Proline	25	0	29	1.07	1.18	%	3.72	g/16g N	OK	✓
Alanine	26	0	29	1.14	1.26	%	3.98	g/16g N	OK	✓
Acides aminés totaux	993	0	29	24.96	27.63	%	87.22	g/16g N	OK	✓
Méthionine + cystine	73	0	29	1.09	1.21	%	3.82	g/16g N	OK	✓
Phénylalanine + tyrosine	198	0	29	2.07	2.29	%	7.23	g/16g N	OK	✓
Cendres brutes	9	0	0	6.23	6.90	%	-	-	OK	✓
Energie brute	8	0	0	4787.65	5299.00	kcal/kg	-	-	OK	✓

Enr: 1 sur 25 | Aucun filtre | Rechercher

# Variability: organic vs. conventional feeds

	Variability organic vs. conventional			
	CP	Fibre	Fat	Starch
Soybean meal exp.	-	-	=	NA
Sunflower meal exp.	-	-	-	NA
Rapeseed meal exp.	+	=	=	NA
Linseed meal exp.	+	=	+	NA
Peas	+	=	+	+
Faba bean	=	=	=	=

NA: not applicable



# Legume seeds: organic vs. conventional

% DM		Protein	Fibre	Starch
Peas	Organic	23,6	<b>6,9</b>	50,8
	Conventional	23,0	6,4	51,9
	Significance	***	***	***
Faba bean	Organic	28,5	10,2	43,1
	Conventional	29,1	9,0	44,0
	Significance	*	***	*

\*0,01 < p < 0,05 ; \*\* 0,001 < p < 0,01 ; \*\*\* 0 < p < 0,001

- Slight but significant differences
- higher fibre content in organic seeds
- No rule for protein content

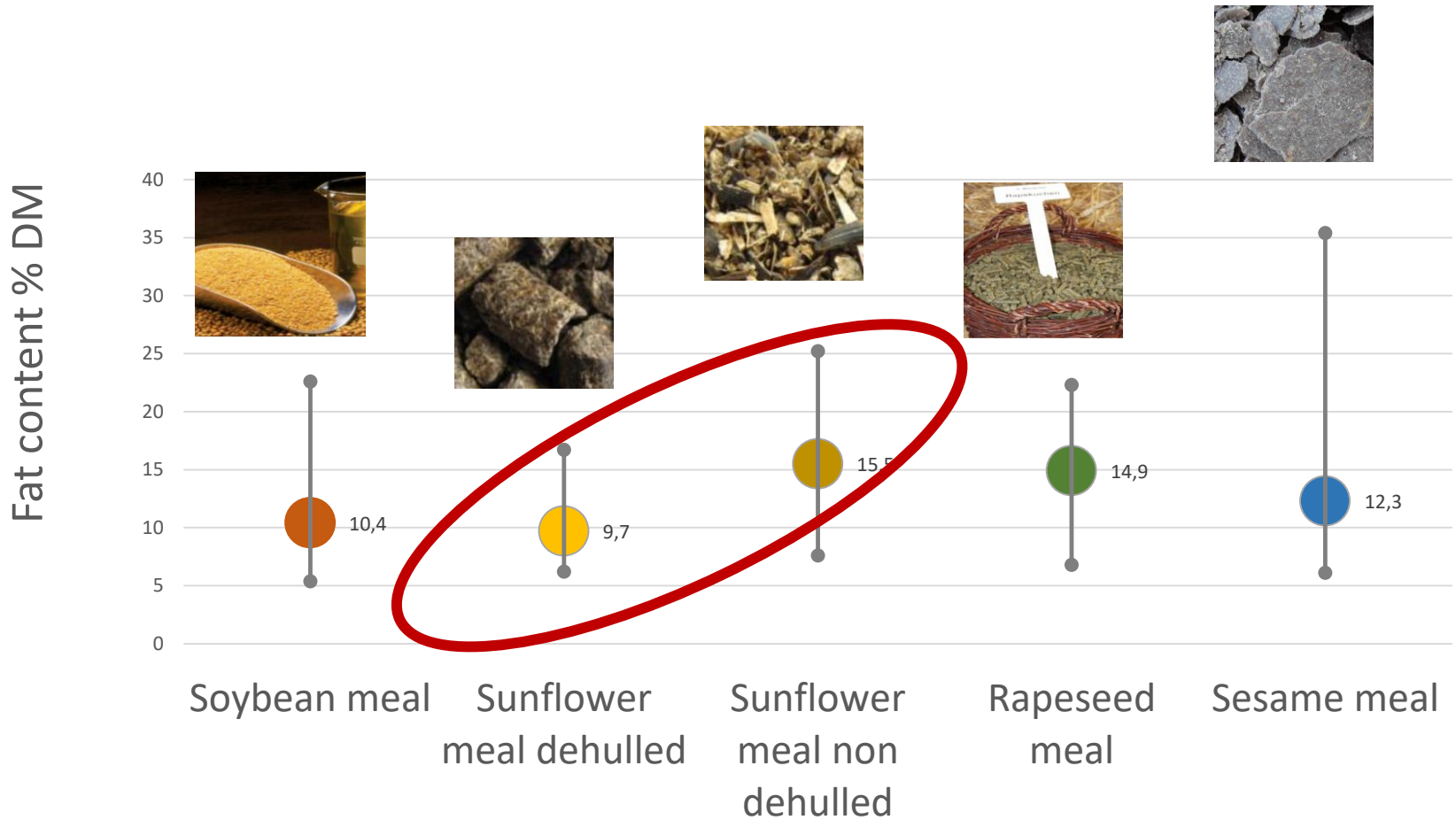
# Oilmeals: organic vs conventional

% DM		Protein	Fat	Fibre
Soybean meal exp.	Organic	47,4	10,4	5,9
	Conventional	47,1	9,8	6,1
	Significance	<b>NS</b>	<b>NS</b>	<b>NS</b>
Rapeseed meal exp.	Organic	32,3	14,9	12,4
	Conventional	32,5	14,8	12,9
	Significance	<b>NS</b>	<b>NS</b>	<b>NS</b>
Sunflower meal exp.	Organic	<b>28,2</b>	<b>14,5</b>	25,6
	Conventional	29,4	12,0	25,7
	Significance	<b>**</b>	<b>***</b>	<b>NS</b>

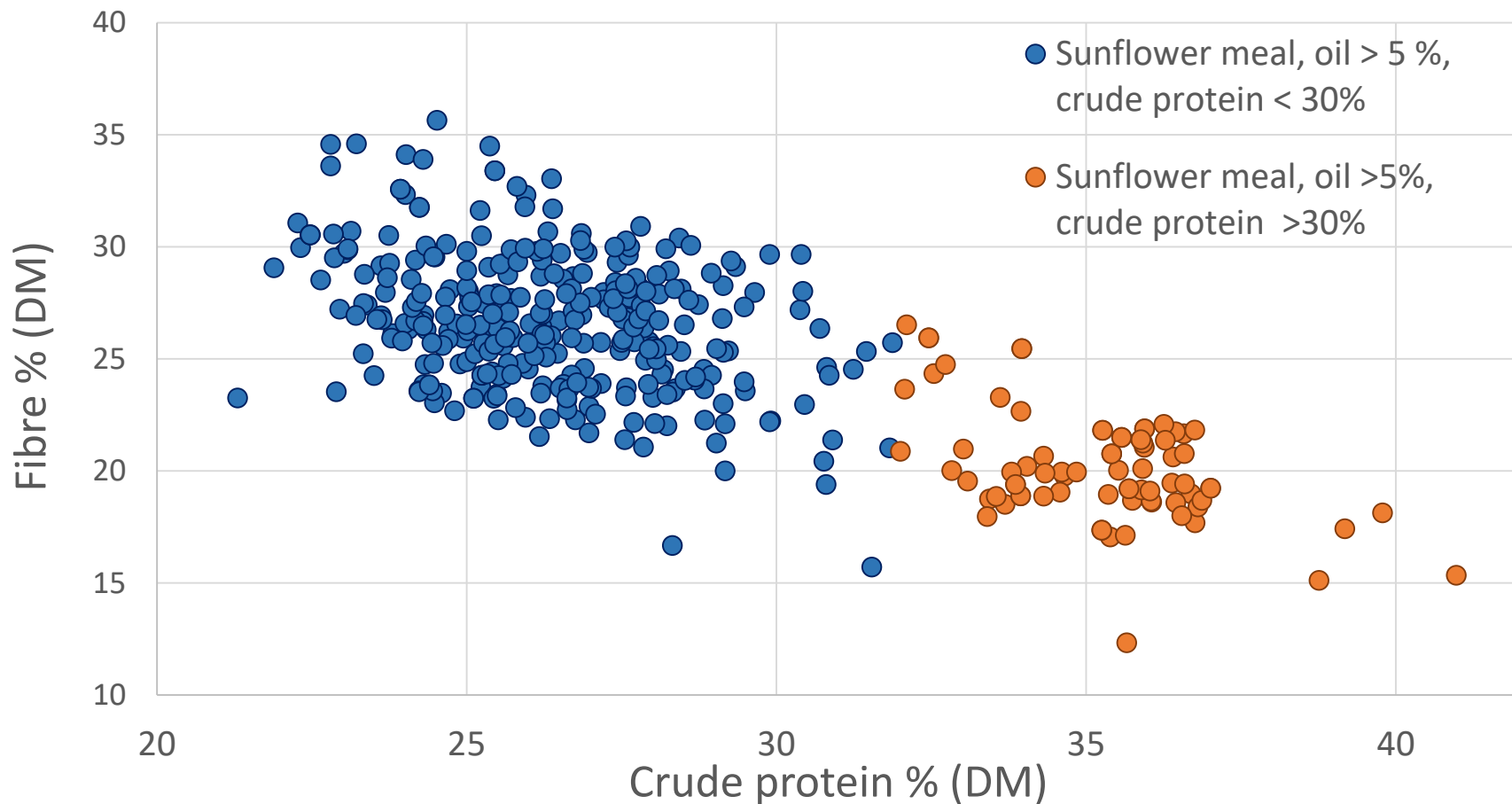
NS : non significant ; \*0,01 < p < 0,05 ; \*\* 0,001 < p < 0,01 ; \*\*\* 0 < p < 0,001

- Method = ANOVA organic vs. conventional expeller meals
- Sunflower: more fat, less protein => manage quality

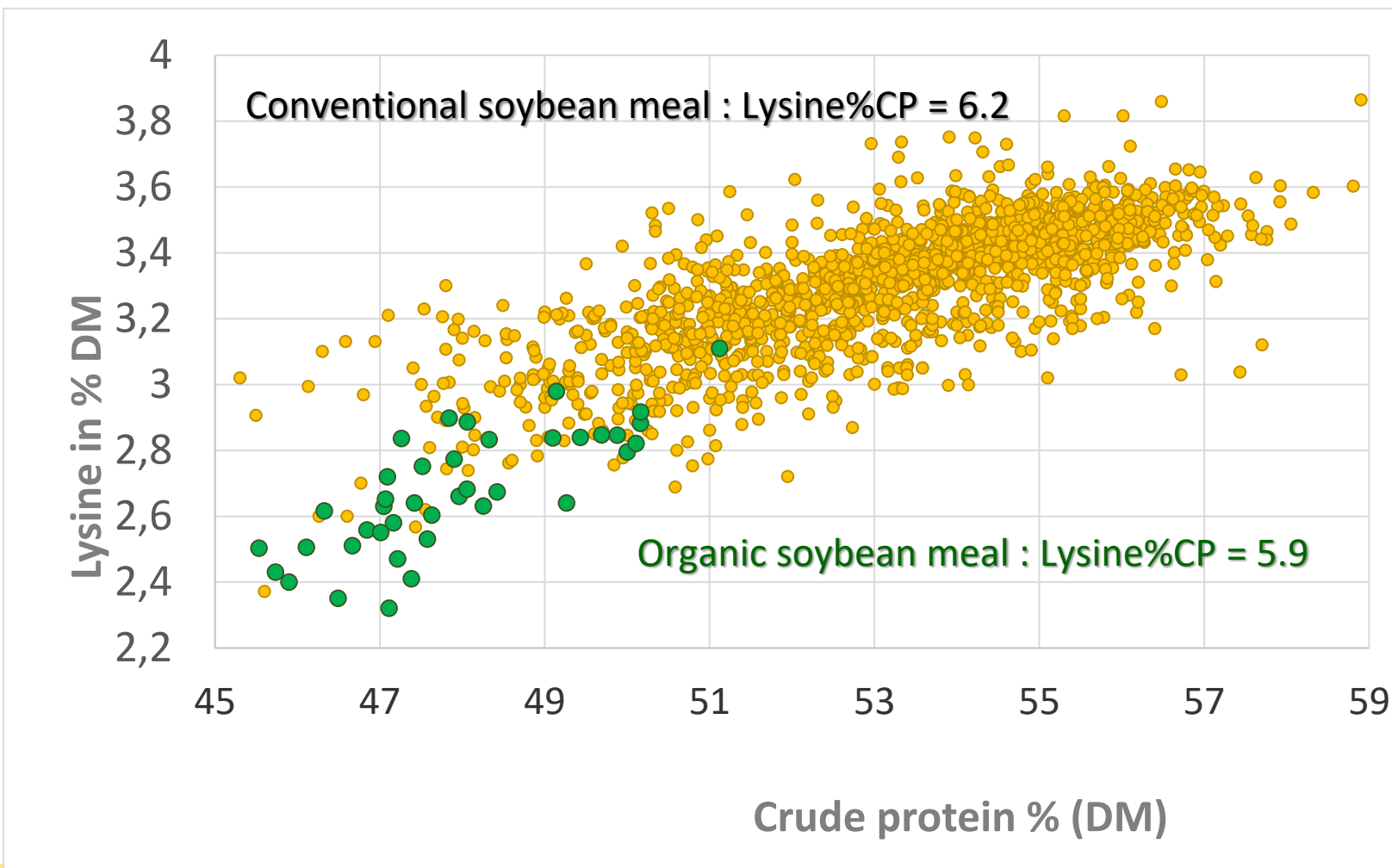
# Organic oilmeals: high and variable fat content



# Typology of sunflower meals: de-hulling effect



# Lysine/CP ratio: lower in organic soybean meal



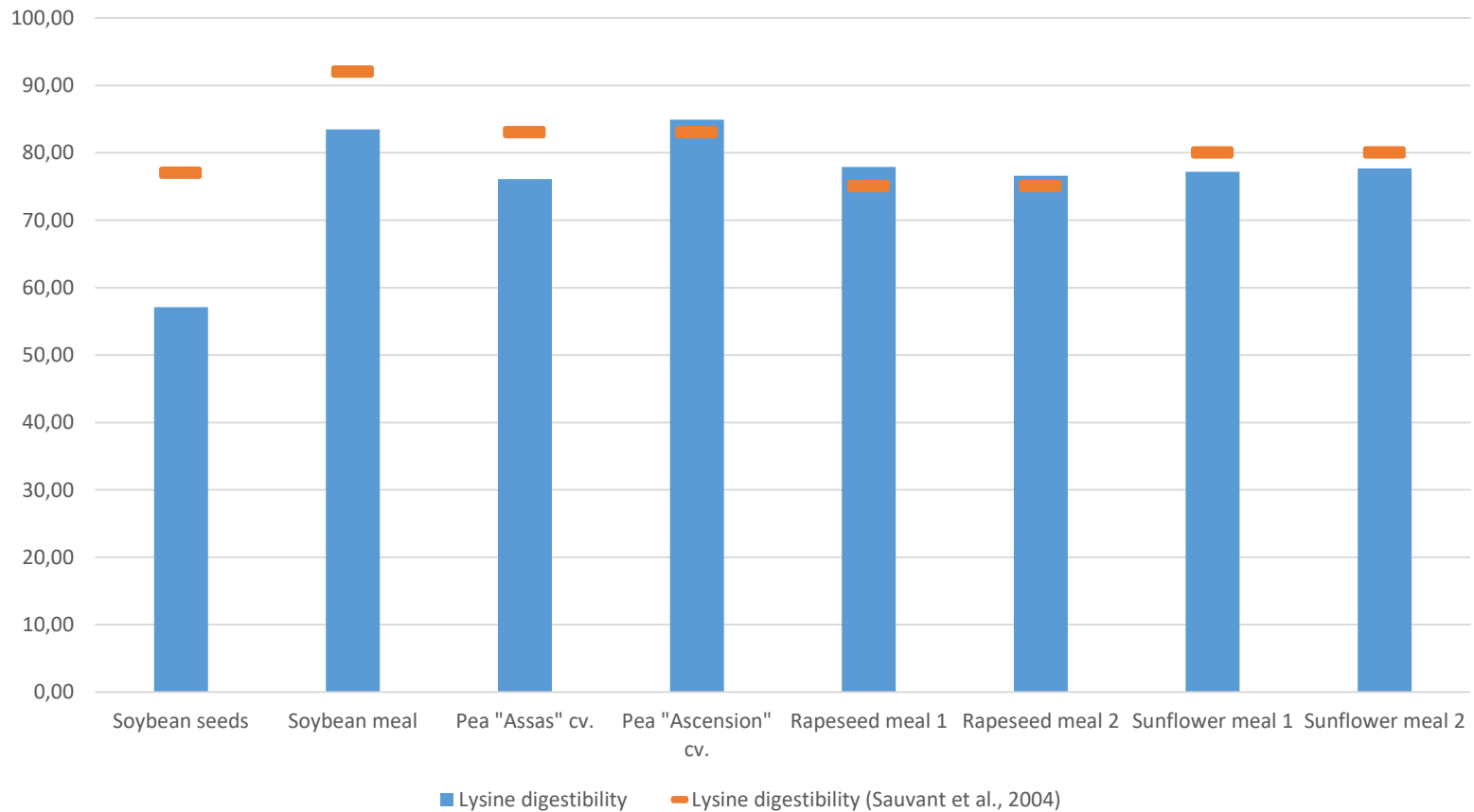
# Nutritional values: poultry

		AMEn (kcal/kg)
Soybean meal exp. N=4	Organic	3002
	Min/max	2676 / 3121
	Conventional	2590 (avg.)
Sunflower meal exp. N= 8	Organic	2495
	Min/max	2274 / 2769
	Conventional	1620-1760*

AMEn : high (slow growth rate animals)

# Nutritional values: pigs

## Lysine digestibilities of organic feedstuffs in pigs



# Take-home message

- No higher variability than in conventional feedstuffs
- For all feeds, only slight differences between organic and conventional feeds (organic oilmeals are compared to conventional expeller oilmeals (undefatted oilmeals))
- Scarce digestibility data (to be addressed within SECALIBIO)
- Categorization of oilmeals is possible and will be taken into account in the organic feed tables
- Conclusion: methodology for the development of organic feed tables can rely on the knowledge developed for conventional feeds





Thank you for your attention