

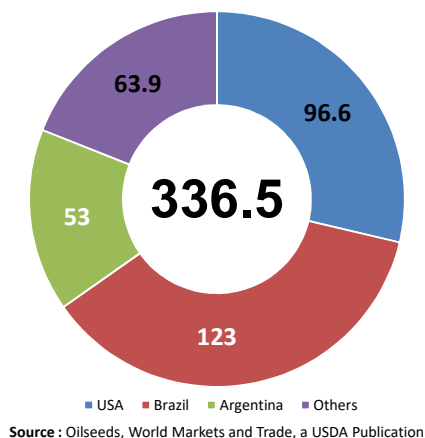
A Toast to Quality



09.10.2021
Soy Conclave

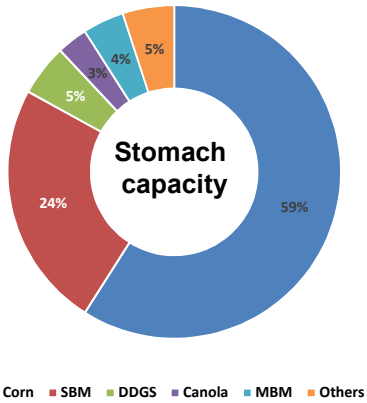
Population in the EAST, Crops in the WEST

World Soybean Production
2019-2020 (MMT)

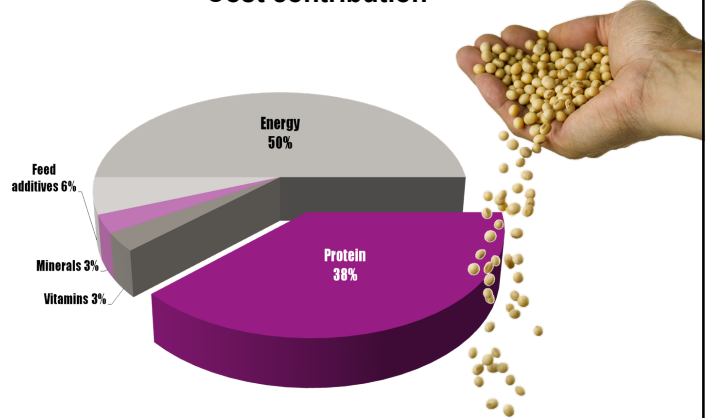


Share of Stomach and the contribution to feed cost

Broiler Diet Composition



*Cost contribution



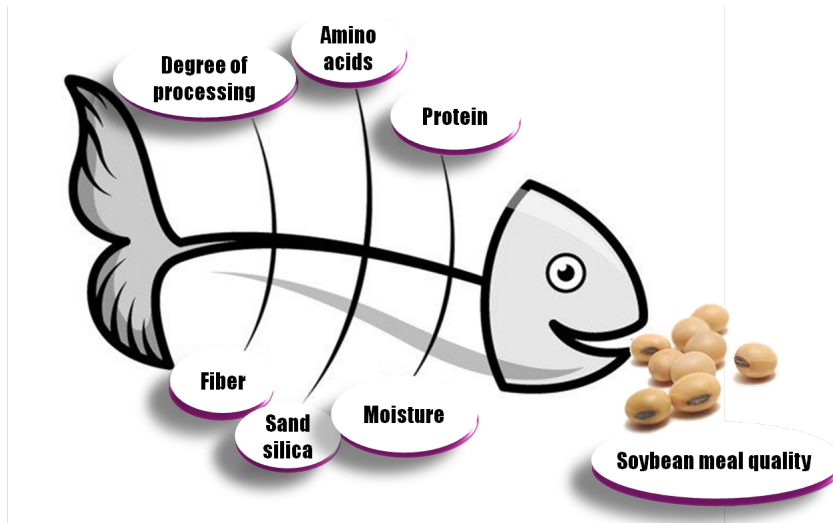
*cost contribution may vary depending on market situation

Quality of meal indeed affected by quality of bean

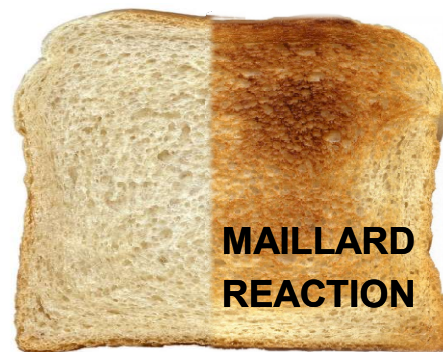
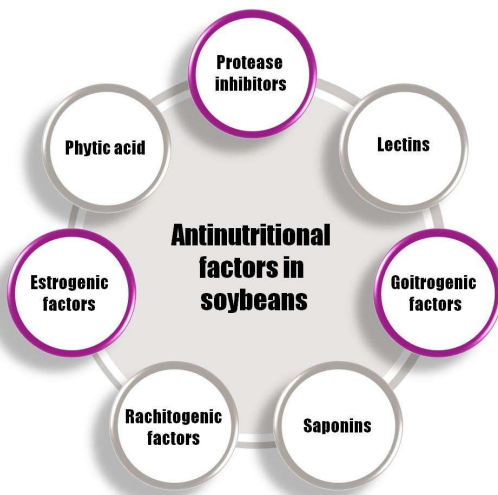


Source: Gonzalo Mateos, Polytechnic University of Madrid

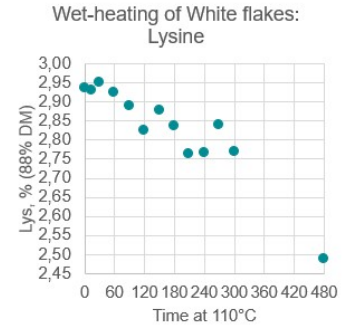
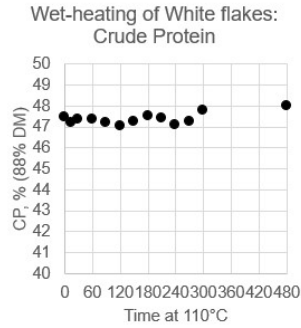
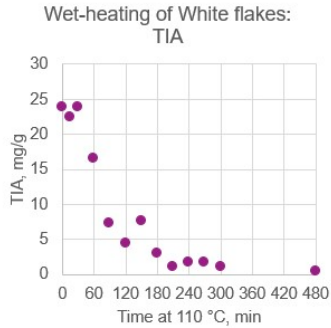
Soybean meal – Looking beyond Crude Protein (Ishikawa perspective)



Almost all ingredients have an "Achilles heel"



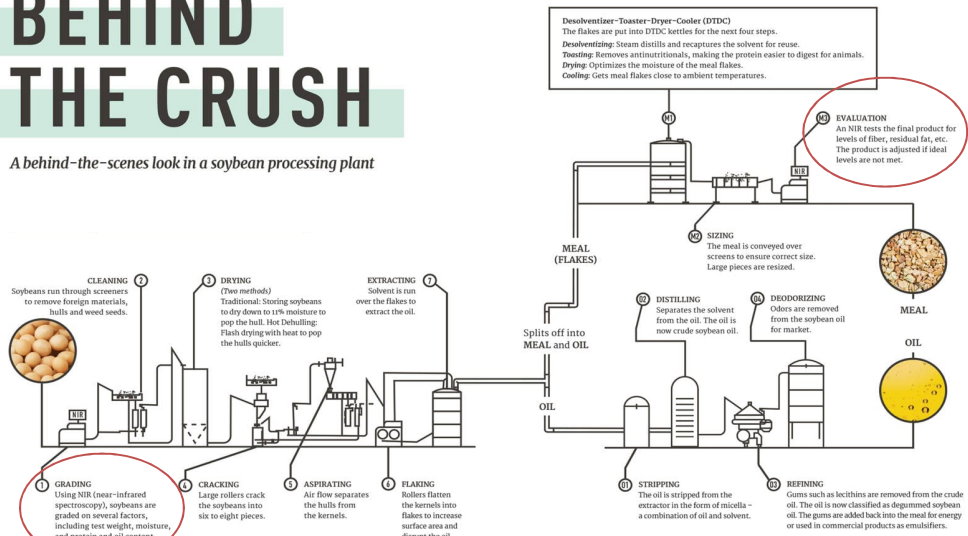
Heat processing is needed but overdoing it will destroy valuable nutrients



Evonik Research

BEHIND THE CRUSH

A behind-the-scenes look in a soybean processing plant



Soybean meal with similar crude protein but differing amino acid profile

Crude protein (%)*: 48.83
Crude protein (% as is): 47.31
Dry matter (%): 89.27

Results of amino acid analysis

Parameter	Content (%)*	AA (%) in CP	AA (%) AS IS
Methionine	0.590	1.266	0.599
Cystine	0.653	1.399	0.662
Methionine + Cystine **	1.242	2.665	1.270
Lysine	2.793	5.989	2.833
Threonine	1.747	3.747	1.773
Tryptophan	0.617	1.324	0.626
Arginine	3.422	7.338	3.471
Isoleucine	2.068	4.435	2.098
Leucine	3.409	7.311	3.458
Valine	2.167	4.646	2.198
Histidine	1.200	2.574	1.218
Phenylalanine	2.269	4.867	2.302
Glycine	1.947	4.174	1.975
Serine	2.268	4.865	2.301
Proline	2.365	5.072	2.400
Alanine	1.960	4.202	1.988
Aspartic acid	5.195	11.140	5.270
Glutamic acid	8.185	17.553	8.304
NH3	0.924	1.981	0.937
Total including NH3**	43.286	92.783	43.892
Total without NH3**	42.256	90.618	42.858

AA = Amino acid, CP = Crude protein
NIRS calibration equation: $sp(2014)3_2007_{us}_{002500}$

* Figures standardized to a dry matter content of 88%
** determined with separate calibration equation

Crude protein (%)*: 45.81
Crude protein (% as is): 47.57
Dry matter (%): 89.81

Results of amino acid analysis

Parameter	Content (%)*	AA (%) in CP	AA (%) AS IS
Methionine	0.600	1.287	0.612
Cystine	0.651	1.398	0.665
Methionine + Cystine **	1.273	2.731	1.299
Lysine	2.874	6.165	2.933
Threonine	1.819	3.902	1.856
Tryptophan	0.639	1.371	0.652
Arginine	3.521	7.554	3.593
Isoleucine	2.134	4.578	2.178
Leucine	3.547	7.610	3.620
Valine	2.274	4.878	2.320
Histidine	1.279	2.745	1.306
Phenylalanine	2.351	5.043	2.399
Glycine	2.028	4.351	2.070
Serine	2.357	5.057	2.406
Proline	2.452	5.259	2.502
Alanine	2.034	4.363	2.075
Aspartic acid	5.363	11.505	5.473
Glutamic acid	8.500	18.235	8.675
NH3	0.987	2.116	1.007
Total including NH3**	44.899	96.323	45.821
Total without NH3**	43.967	93.465	44.461

AA = Amino acid, CP = Crude protein
NIRS calibration equation: $sp(2014)3_2007_{us}_{002500}$

* Figures standardized to a dry matter content of 88%
** determined with separate calibration equation

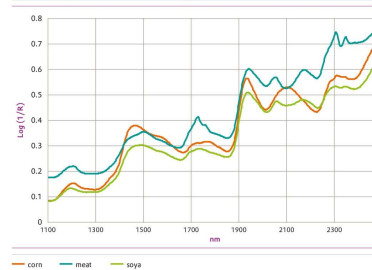
Detection of Soy products quality by NIR technology!



→ Infrared → Reflection Recorded spectra



Different raw materials have different spectra



AMINONIR® provides a complete profile of Soybean meal in less than 5 minutes

AMINONIR®

AMINONIR®

AMINONIR®

Analytical Report

Evonik SEA Pte. Ltd. (60336), Singapore, Singapore
 Lab Customer: Evonik SEA PTE LTD, Singapore, 4035
 Lab code: FMS-019824-001
 Description: Feed Ground feed labcode 62210000010011

Material: Soybean Meal

AMINONIR® Proxy

Parameter	Contract No. in %	Contract No.2
CP**	47.288	45.41
Effler Protein	1.9	1.9
Crude Fibre	12.4	12.4
Crude Ash	6.8	6.8
Moist	10.8	10.8
Acid Detergent Fibre (ADF)	8.2	8.2
Neutral Detergent Fibre (NDF)	16.7	16.4
Starch	10.3	10.1
Protein (mg/kg)	464	439
Phytic Phosphate equiv. (mg/kg)	286	273

**CP: Figure standardized to a dry matter content of 88. CP = Crude protein, calculation based on Dumas combustion method (2° factor 6.25)
 **Acidified with separate calibration equation
 **MS: calculation equation: $g/100g_{DM} = 100 \times \frac{MS}{1000}$

✓ Proximates Principles

Analytical Report

Evonik SEA Pte. Ltd. (60336), Singapore, Singapore
 Lab Customer: Evonik SEA PTE LTD, Singapore, 4035
 Lab code: FMS-019824-001
 Description: Feed Ground feed labcode 62210000010011

Material: Soybean Meal

Results of amino acid analysis

Parameter	Contract No. in %	Contract No.2	Contract No. in 12%
Dry matter	87.87		
CP**	47.1	45.41	
Methionine	0.432	0.432	0.543
Cystine	0.644	0.643	0.439
Methionine + Cystine**	1.076	1.075	0.982
Lysine	2.015	2.005	0.497
Threonine	1.366	1.327	0.362
Tryptophan	0.641	0.631	0.301
Arginine	1.369	1.243	0.153
Valine	2.125	2.025	0.512
Leucine	1.931	1.433	0.733
Isoleucine	2.226	2.165	0.748
Alanine	1.204	1.166	0.166
Phenylalanine	2.366	2.291	0.033
Glycine	1.965	1.933	0.173
Serine	2.133	2.044	0.833
Proline	2.333	2.21	0.833
Glutamic acid	2.033	1.969	0.216
Aspartic acid	2.384	2.069	0.178
Glutamic acid	8.38	8.115	0.729
MS	0.64	0.601	0.161
Total including MS**	44.489	43.383	0.462
Total without MS**	43.588	42.209	0.543

**CP: Figure standardized to a dry matter content of 88. CP = Crude protein, calculation based on Dumas combustion method (2° factor 6.25)
 **Acidified with separate calibration equation
 **MS: calculation equation: $g/100g_{DM} = 100 \times \frac{MS}{1000}$

✓ Total Amino Acid Profile

Analytical Report

Evonik SEA Pte. Ltd. (60336), Singapore, Singapore
 Lab Customer: Evonik SEA PTE LTD, Singapore, 4035
 Lab code: FMS-019824-001
 Description: Feed Ground feed labcode 62210000010011

Material: Soybean Meal

Standardized feed digestible amino acid content (g/kg DM)

Parameter	Contract No. in %	Contract No.2
Methionine	0.569	0.571
Cystine	0.569	0.568
Methionine + Cystine**	1.138	1.139
Lysine	2.366	2.316
Threonine	1.468	1.5
Tryptophan	0.57	0.572
Arginine	1.069	1.022
Valine	1.649	1.79
Leucine	1.124	0.92
Isoleucine	1.965	1.884
Methionine	1.024	1.048
Phenylalanine	2.125	2.029
Glycine	1.631	1.569
Serine	2.011	1.847
Proline	1.337	1.27
Alanine	1.768	1.684
Aspartic acid	4.475	4.333
Glutamic acid	0.468	0.222

**CP: Figure standardized to a dry matter content of 88
 **Acidified with separate calibration equation

✓ Digestible Amino Acid Profile



What gets measured gets managed

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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 — with international search report (Art. 21(3))

(54) Title: METHOD FOR THE DETERMINATION OF PROCESSING INFLUENCES ON THE NUTRITIONAL VALUE OF FEEDSTUFF RAW MATERIALS

(57) Abstract: The present invention relates to a method for the determination of processing influences on the quality of feedstuff raw materials and/or feedstuffs, in which the processing conditions indicator of the feedstuff raw materials and/or feedstuffs is determined and the specific digestibility coefficient of an amino acid of a feedstuff raw material and/or feedstuff in an animal species is determined. The present invention also relates to a process for the optimization of feedstuffs considering the determined processing influences and the thus obtained and/or obtainable feedstuffs.

Creating value to build brand image of Indian Soybean meal

AMINONIR®
NIR predictions of amino acids in feed raw materials and more

Optimised processing for optimum quality

Soy processor

Analytical Report **AMINONIR®**

Lab code: NNC1-013107-001 Material: Soybean Meal
Description: AMINONIR ADVANCED Evonik Soybean meal sample name 507A-18790-000

Overall evaluation of processing conditions
Processing Condition Indicator (PCI): 13

Results of single processing-related parameters

Parameter	Content (as is)
Protein Digestibility Index (PDI) [%]	18.8
KOH Protein Solubility (KOH PS) [%]	78.7
Tryptin Inhibitor Activity (TIA) [mg/g]	3.7
Reactive Lysine [%]	2.68
Reactive Lysine / Lysine [%]**	39.08

** estimated with separate calibration equation

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Evonik Operations GmbH | Animal Nutrition
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Evonik Operations GmbH | Animal Nutrition | Analytical Report AMINONIR

Getting more nutritive and economic value out of Soybean meal

- Near Infrared Spectroscopy

- Ingredient
- Process quality



- Foster greater dialogue

- Processor
- Economic buyer
- Nutritionist



Value Propositions of Indian Soy Industry



Soybean meal is a great source of protein for animals that can help meet growing demand of animal protein



Technology excellence has earned good name for Indian soybean meal in International market



Soy Industry has the infrastructure that can get the end users SBM supply on time



Fast and reliable quality control would further support consistent high-quality meal



Soybean meal provides more available nutrients with greater concentration of amino acids which makes for a healthier animal

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