Supplementary Material

INDEX

(Exposure)
(protein*) [tiab]

(Outcome)
AND
(Digestible indispensable amino acid score) [tiab] OR
(DIAAS) [tiab] OR
(Protein digestibility corrected amino acid score) [tiab] OR
(PDCAAS) [tiab] OR
(Ileal AND digestibility) [tiab]

(Limits)
NOT (broiler*) [tiab]

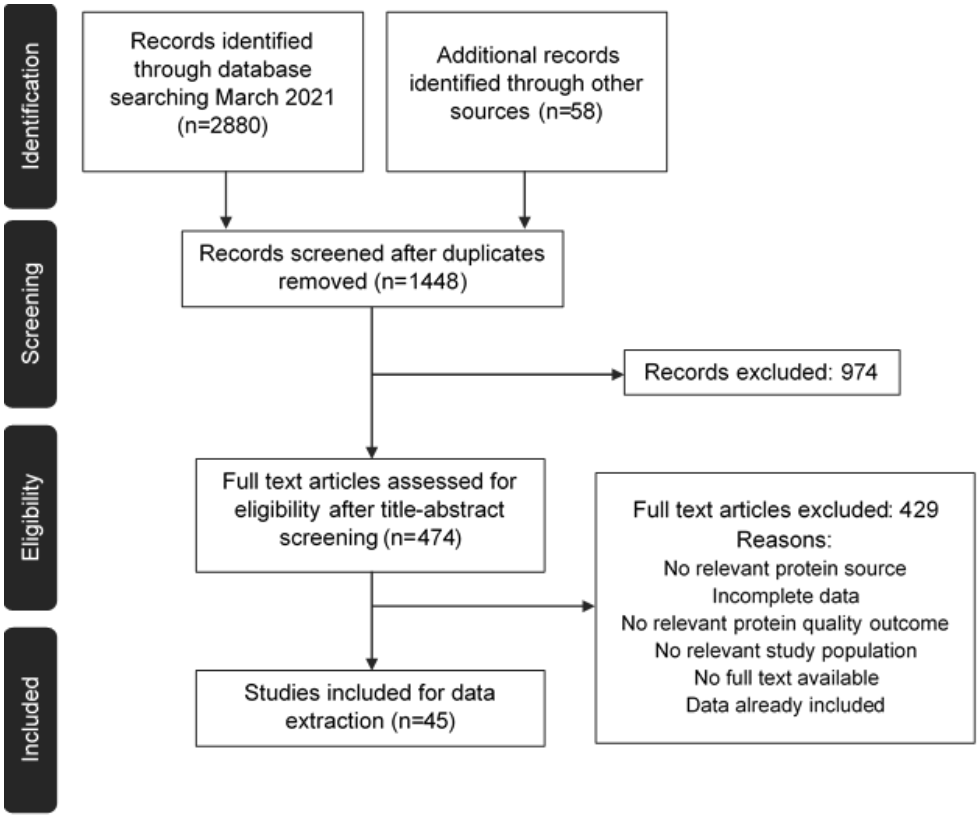
Supplementary Figure 2: Search strategy.

Supplementary Table 1: Amino acid scoring patterns for DIAAS calculations from the 2013 FAO report [13].

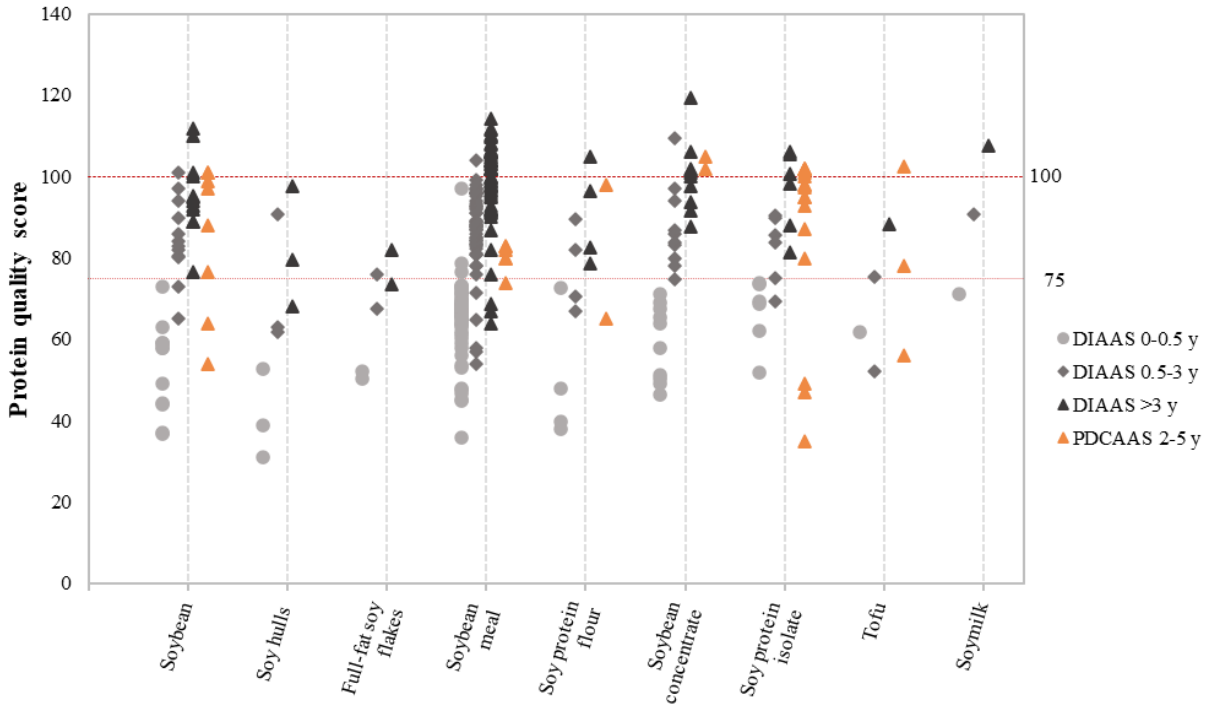
Amino acid (mg/g crude protein)	Infant (0-0.5 years)	Child (0.5-3 years)	Child (>3 years), adolescent, adult
Histidine	21	20	16
Isoleucine	55	32	30
Leucine	96	66	61
Lysine	69	57	48
SAA	33	27	23
AAA	94	52	41
Threonine	44	31	25
Tryptophan	17	8.5	6.6
Valine	55	43	35

Supplementary Table 2: Amino acid scoring patterns for PDCAAS calculations from the 1985 WHO report [19].

Amino acid (mg/g crude protein)	Pre-school child (2-5 years)	School child (10-12 years)	Adult
Histidine	19	19	16
Leucine	28	28	13
Isoleucine	66	44	19
Lysine	58	44	16
SAA	25	22	17
AAA	63	22	19
Threonine	34	28	9
Tryptophan	11	9	5
Valine	35	25	13



Supplementary Figure 2: Flowchart of literature screening.



Supplementary Figure 3: Variation in DIAAS and PDCAAS of different soy products obtained from in-vivo and in-vitro studies. DIAAS calculated for three reference scoring patterns (2013 FAO report [13]) and PDCAAS for reference scoring pattern of children aged 2-5 year (1985 WHO report [19]).

Supplementary Table 3: Crude protein (mean ± SD) of soy product groups.

	Soybean (n=17)	Soy hulls (n=3)	Full-fat soy flakes (n=2)	SBM (n=54)	Soy flour (n=5)	SPC (n=12)	SPI (n=12)	Tofu (n=3)	Soymilk (n=1)	Total soy (n=109)
Crude protein (% wet matter)	38.45 ± 3.24	10.31 ± 0.99	40.16 ± 0.03	48.45 ± 4.19	54.50 ± 2.18	66.82 ± 4.50	84.38 ± 5.72	14.47 ± 5.84	3.82	50.60 ± 17.39

Supplementary Table 4: Reported digestible indispensable amino acids scores (DIAAS) and protein digestibility corrected amino acid scores (PDCAAS) (untruncated) for different soy products. DIAAS based on reference pattern score of children aged 0.5-3 years (2013 FAO report [1]). PDCAAS based on reference pattern score of children aged 2-5 years (1985 WHO report [2]).

Product	Additional information	Post-processing of product	Type of study	Crude protein (% wet matter)	DIAAS	PDCAAS	Limiting AA	References
Soybean			*In-vitro*	37.6		77	Thr	[3]
			In-vitro	37.2		88	Lys	[3]
			Growing pigs	38.6	80		AAA	[4]
	Conventional soybean		Growing pigs	37.6	82		n/a	[5]
	High-protein soybean		Growing pigs	42.8	86		n/a	[5]
	Low-oligosaccharide soybean		Growing pigs	39.3	101		n/a	[5]
		Heat-treated	Pigs	36.3	84		SAA	[6]
		Wet heated (100 °C, 16 min) + expanded (125°C, 15 sec) + autoclaved (110 °C, 60 min)	Growing pigs	37.3	79		SAA	[7]
		Treated (*unknown*)	Pigs	35.8	90		SAA	[8]
	Soybean variety SB 19	Boiled (100°C)	Weanling rats	35.2		101	Lys	[9]
	Soybean variety SB 25	Boiled (100°C)	Weanling rats	35.5		99	Lys	[9]
	Soybean variety SB 30	Boiled (100°C)	Weanling rats	34.6		97	Lys	[9]
	Soybean variety SB 132	Boiled (100°C)	Weanling rats	36.7		101	Lys	[9]
	Conventional soybean	Extruded (150 °C)	Growing pigs	35.8	97		Trp	[10]
	High-protein soybean	Extruded (150 °C)	Growing pigs	47.6	73		Trp	[10]
		Extruded	Piglets	39.2	65		SAA	[11]
		Extruded	Growing pigs	34.8	94		n/a	[12]

Product	Additional information	Post-processing of product	Type of study	Crude protein (% wet matter)	DIAAS	PDCAAS	Limiting AA	References
	Conventional soybean	Dry heated (89 °C ,5 min)	Rats	41.9		54	SAA	[13]
	Kunitz trypsin inhibitor and lipoxygenase free soybean	Dry heated (89 °C, 5 min)	Rats	40.0		64	SAA	[13]
		Toasted	Growing pigs	35.2	83		n/a	[12]
Soy hulls			Pigs	11.5	63		Leu	[6]
			Growing pigs	9.8	62		Trp	[14]
		Extruded (80 °C)	Growing pigs	9.7	91		Leu	[14]
Full-fat soy flakes	Low-oligosaccharide soybean flakes	Cooked at infrared radiant energy (105 °C, 50 sec)	Grower pigs	40.2	76		Leu	[15]
	Regular-oligosaccharide soybean flakes	Cooked at infrared radiant energy (105 °C, 50 sec)	Grower pigs	40.1	68		SAA	[15]
Soybean meal			Growing pigs	48.3	94		SAA	[16]
			Grower pigs	46.1	84		SAA	[17]
	Conventional soybean meal		Growing pigs	48.4	96		SAA	[18]
	High-protein soybean meal		Growing pigs	55.7	97		Leu	[18]
	Conventional soybean meal		Weanling pigs	47.8	87		SAA	[19]
			Finishing pigs	49.8	83		SAA	[20]
	Soybean meal from Korea 1		Growing pigs	47.1	57		SAA	[21]
	Soybean meal from Korea 2		Growing pigs	47.4	81		Trp	[21]
	Soybean meal from India		Growing pigs	39.6	65		SAA	[21]
			Growing pigs	45.2	85		SAA	[22]
			Growing pigs	53.1	86		SAA	[23]
	Soybean meal, expelled		Pigs	43.8	93		SAA	[6]
	Soybean meal (crude fiber <45 – crude protein >490 g/kg), solvent extracted		Pigs	48.5	96		Lys	[6]
			Weanling pigs	44.5	92		SAA	[24]
			Weanling pigs	45.0	88		SAA	[25]
		Microbially Fermented	Weanling pigs	53.9	84		Lys	[26]
	Conventional soybean meal		Weanling pigs	50.2	82		SAA	[26]
			Weanling pigs	47.7	88		SAA	[27]

Product	Additional information	Post-processing of product	Type of study	Crude protein (% wet matter)	DIAAS	PDCAAS	Limiting AA	References
			Growing pigs	42.9	93		Val	[10]
			Growing pigs	47.1	84		SAA	[28]
			Growing pigs	49.5	83		SAA	[29]
			Growing pigs	43.6	94		SAA	[14]
			Growing pigs	n/a	93		Val	[30]
			Weanling pigs	45.1	85		Val	[31]
			Growing pigs	45.6	71		Trp	[32]
			Grower pigs	47.2	96		SAA	[15]
	Soybean meal dehulled, expelled		Growing pigs	45.1	91		n/a	[5]
	Soybean meal dehulled solvent extracted		Growing pigs	47.7	92		n/a	[5]
	Soybean meal expelled		Growing pigs	44.6	91		n/a	[5]
	High-protein soybean meal dehulled, solvent extracted		Growing pigs	51.2	89		n/a	[5]
	High-protein soybean meal expelled		Growing pigs	56.0	89		n/a	[5]
	Soybean meal solvent extracted		Growing pigs	43.9	86		n/a	[5]
	Low oligosaccharide soybean meal expelled		Growing pigs	49.3	97		n/a	[5]
			Growing pigs	44.8	99		Val	[33]
	GMO-free soybean meal		Growing pigs	47.0	81		SAA	[34]
			Growing pigs	43.3	104		SAA	[35]
	Soybean meal 46		Growing pigs	43.4	96		n/a	[12]
	Soybean meal 48		Growing pigs	45.3	96		n/a	[12]
	Soybean meal 50		Growing pigs	47.2	98		n/a	[12]
			Early weaned piglets	46.2	88		Leu	[36]
		Microbially fermented	Early weaned piglets	56.2	88		Lys	[36]
		Microbially Fermented	Growing pigs	42.5	58		Lys	[37]

Product	Additional information	Post-processing of product	Type of study	Crude protein (% wet matter)	DIAAS	PDCAAS	Limiting AA	References
		Microbially Fermented	Growing pigs	54.1	76		n/a	[5]
		Microbially Fermented	Weanling pigs	53.7	78		Lys	[31]
		Enzyme-treated	Growing pigs	55.6	81		n/a	[5]
	Enzyme-treated soybean meal 1	Enzyme-treated	Weanling pigs	56.8	85		SAA	[19]
	Enzyme-treated soybean meal 2	Enzyme-treated	Weanling pigs	52.1	84		SAA	[19]
		Enzyme-treated	Weanling pigs	54.4	87		Lys	[31]
			Weanling rats	n/a		82	Trp	[38]
		Autoclaved (121 °C, 20 min)	Weanling rats	n/a		85	Lys	[38]
			Young rats	n/a		82	Trp	[39]
			Adult rats	n/a		74	Trp	[39]
		Autoclaved (121 °C, 20 min)	Young rats	n/a		83	Lys	[39]
		Autoclaved (121 °C, 20 min)	Adult rats	n/a		80	Lys	[39]
		Secondary toasted (95-100 °C) in presence of lignosulfonate	Growing pigs		45		Lys	[23]
	Soybean meal <5% crude fiber		Pigs	47.1	95		SAA	[8]
	Soybean meal >5% crude fiber		Pigs	44.6	88		SAA	[8]
	Soybean meal	Extruded	Pigs	47.4	96		Lys	[8]
	Conventional soybean meal	Extruded (145 °C)	Growing pigs	47.1	89		SAA	[18]
	High-protein soybean meal	Extruded (145 °C)	Growing pigs	56.0	88		SAA	[18]
	Low-oligosaccharide soybean meal	Extruded (145 °C)	Growing pigs	49.3	97		SAA	[18]
Soy protein flour			Growing pigs		89	98	Lys, SAA, respectively	[40]
	Soy protein B	Microbially fermented	Piglets	55.7	67		Lys	[11]
	Soy protein A1	Enzymatically fermented	Piglets	53.3	70		SAA	[11]
	Soy protein A3	Enzymatically fermented	Piglets	57.7	82		SAA	[11]
		Textured	Adult rats			65	SAA	[13]
Soy protein concentrate			Weanling pigs	62.1	80		SAA	[19]
			Pigs	65.4	110		Lys	[8]

Product	Additional information	Post-processing of product	Type of study	Crude protein (% wet matter)	DIAAS	PDCAAS	Limiting AA	References
	Soy protein concentrate + phytase		Weanling pigs	61.2	87		SAA	[27]
			Growing pigs	64.2	97		SAA	[10]
			Growing pigs	65.2	86		n/a	[5]
	Soy protein concentrate Lab A		Weanling rats	74.6		106	Thr	[41]
	Soy protein concentrate Lab B		Weanling rats	74.7		101	Trp	[41]
	Soy protein concentrate A, coarse		Piglets	65.4	83		SAA	[11]
	Soy protein concentrate B, coarse		Piglets	66.5	78		SAA	[11]
	Soy protein concentrate B, fine		Piglets	71.9	75		SAA	[11]
			Early weaned pigs	66.3	94		Lys	[36]
Soy protein isolate	Soy protein isolate A		Growing rats	n/a	90	102	SAA	[42]
	Soy protein isolate B		Growing rats	n/a	90	97	SAA	[42]
			Weanling pigs	77.9	86		SAA	[31]
			Growing pigs	84.8	75		n/a	[5]
			Weanling rats	n/a		80	SAA	[43]
			Rats	84.2		87	SAA	[44]
	Soy protein isolate 1 (Lab A)		Weanling rats	86.5		102	SAA	[41]
	Soy protein isolate 1 (Lab B)		Weanling rats	87.5		95	SAA	[41]
	Soy protein isolate 2 (Lab A)		Weanling rats	85.9		102	SAA	[41]
	Soy protein isolate 2 (Lab B)		Weanling rats	87.0		95	SAA	[41]
	Soy protein isolate 3 (Lab A)		Weanling rats	85.7		102	SAA	[41]
	Soy protein isolate 3 (Lab B)		Weanling rats	86.7		98	SAA	[41]
			Growing pigs	92.7	84	93	SAA	[40]
		Hydrolyzed	Piglets	84.1	69		SAA	[11]
			Young rats	n/a		100	Lys + SAA	[39]
			Adult rats	n/a		98	Lys + SAA	[39]
		Alkaline/heat-treated (75 °C, 180 min)	Young rats	n/a		48	SAA	[39]

Product	Additional information	Post-processing of product	Type of study	Crude protein (% wet matter)	DIAAS	PDCAAS	Limiting AA	References
		Alkaline/heat-treated (75 °C, 180 min)	Adult rats	n/a		35	SAA	[39]
			Weanling rats	n/a		101	Lys, SAA	[38]
		Alkaline/heat-treated (75 °C, 180 min)	Weanling rats	n/a		49	SAA	[38]
Tofu			Adult minipigs	10.9	75		SAA	[45]
			Rats	n/a	52	56	n/a	[46]
			In-vitro	11.3		103	Lys	[47]
		Fried (170 °C, 20 sec)	*In-vitro*	21.2		78	Lys	[47]
Soymilk		Ultra-high processed (UHT)	Adult minipigs	3.8	91		Lys	[45]

Supplementary Table 5: Digestible indispensable amino acid scores (DIAAS) (mean ± SD) for total soy and non-post-processed[1] soybean meal obtained from studies in growing and weanling pigs.

Study conditions (number of datasets)	**DIAAS**
Total soy, growing pigs (n=50)	85.6 ± 12.3
Total soy, weanling pigs (n=26)	81.9 ± 7.5
Total non-post-processed soy, growing pigs (n=37)	87.4 ± 10.7
Tot non-post-processed soy, weanling pigs (n=14)	85.2 ± 5.3
Non-post-processed soybean meal, growing pigs (n=27)	88.5 ± 10.6
Non-post-processed soybean meal, weanling pigs (n=7)	87.1 ± 3.1

[1]*Assumed since no post-processing treatments were mentioned in the original articles.*

Supplementary Table 6: Protein digestibility corrected amino acid scores (PDCAAS) (mean ± SD) for total soy and non-post-processed[1] soy protein isolate obtained from studies in adult and weanling rats.

Study conditions (number of datasets)	**PDCAAS**
Total soy, adult rats (n=11)	73.7 ± 21.3
Total soy, weanling rats (n=21)	90.8 ± 16.2
Total non-post-processed soy, adult rats) (n=6)	85.7 ± 17.6
Total non-post-processed soy, weanling rats (n=13)	95.8 ± 8.6
Non-post-processed soy protein isolate, adult rats (n=4)	96.0 ± 6.2
Non-post-processed soy protein isolate, weanling rats (n=9)	97.1 ± 7.0

[1]*Assumed since no post-processing treatments were mentioned in the original articles.*

References Supplementary Material

1. FAO. *Dietary protein quality evaluation in human nutrition. Report of an FAQ Expert Consultation.* FAO Food Nutr Pap, 2013. **92**: p. 1-66.
2. FAO/WHO/UNU Expert Consulation. *Energy and protein requirements Report of a Joint FAO/WHO/UNU Expert Consultation*, in *WHO Technical Report Series No. 724.* 1985, WHO: Geneva.
3. Stone AK, Nosworthy MG, Chiremba C, House JD, Nickerson MT. *A comparative study of the functionality and protein quality of a variety of legume and cereal flours.* Cereal Chemistry, 2019. **96**(6): p. 1159-1169. doi: 10.1002/cche.10226
4. Aderibigbe AS, Park CS, Adebiyi A, Olukosi OA, Adeola O. *Digestibility of Amino Acids in Protein-Rich Feed Ingredients Originating from Animals, Peanut Flour, and Full-Fat Soybeans Fed to Pigs.* Animals, 2020. **10**(11): p. 2062. doi: 10.3390/ani10112062
5. NRC, *Nutrient Requirements of Swine: Eleventh Revised Edition.* 2012, The National Academies Press: Washington, DC. https://doi.org/10.17226/13298
6. CVB, *Chemical compositions and nutritional values of feed ingredients*. 2016, Centraal Veevoeder Bureau: Wageningen, the Netherlands
7. Kaewtapee C, Eklund M, Wiltafsky M, Piepho H-P, Mosenthin R, Rosenfelder P. *Influence of wet heating and autoclaving on chemical composition and standardized ileal crude protein and amino acid digestibility in full-fat soybeans for pigs1,2.* Journal of Animal Science, 2017. **95**(2): p. 779-788. doi: 10.2527/jas.2016.0932
8. AFZ, Ajinomoto Eurolysine, Aventis Animal Nutrition, INRA, ITCF, 2000. AmiPig, *Ileal standardised digestibility of amino acids in feedstuffs for pigs.*
9. Agengo FB, Serrem CA,Wamunga FW. *Evaluation of protein nutritional quality of four soybean varieties grown in Western Kenya.* Journal of Food Research, 2018. **7**(5): p. 69-78. doi: 10.5539/jfr.v7n5p69
10. Cervantes-Pahm SK, Stein HH. *Effect of dietary soybean oil and soybean protein concentration on the concentration of digestible amino acids in soybean products fed to growing pigs1*. Journal of Animal Science, 2008. **86**(8): p. 1841-1849. doi: 10.2527/jas.2007-0721
11. Urbaityte R, Mosenthin R, Eklund M, Piepho H-P, Sauer N, Rademacher M. *Standardised ileal crude protein and amino acid digestibilities in protein supplements for piglets.* Archives of Animal Nutrition, 2009. **63**(5): p. 356-378. doi: 10.1080/17450390903052631
12. Sauvant D, Perez JM, Tran G. *Tables of composition and nutritional value of feed materials: pigs, poultry, cattle, sheep, goats, rabbits, horses and fish.* 2004, Wageningen Academic Publishers.
13. Pires CV, Oliveira MGDA, Rosa JC, Costa NMB. *Nutritional quality and chemical score of amino acids from different protein sources.* . Food Science and Technology, 2006. **26**(1): p. 179-187. doi: 10.1590/S0101-20612006000100029
14. Rodriguez DA, Lee SA, De Godoy MRC, Stein HH. *Extrusion of soybean hulls does not increase digestibility of amino acids or concentrations of digestible and metabolizable energy when fed to growing pigs.* Translational Animal Science, 2020. **4**(3). doi: 10.1093/tas/txaa169

15. Woyengo TA, Jha R, Beltranena E, Pharazyn A, Zijlstra RT. *Nutrient digestibility of lentil and regular- and low-oligosaccharide, micronized full-fat soybean fed to grower pigs1*. Journal of Animal Science, 2014. **92**(1): p. 229-237. doi: 10.2527/jas.2013-6555
16. Berrocoso JD, Rojas OJ, Liu Y, Shoulders J, González-Vega JC, Stein HH. *Energy concentration and amino acid digestibility in high-protein canola meal, conventional canola meal, and soybean meal fed to growing pigs.* Journal of Animal Science, 2015. **93**(5): p. 2208-2217. doi: 10.2527/jas.2014-8528
17. Le Thanh BV, Beltranena E, Zhou X, Wang LF, Zijlstra RT. *Amino acid and energy digestibility of Brassica napus canola meal from different crushing plants fed to ileal-cannulated grower pigs.* Animal Feed Science and Technology, 2019. **252**: p. 83-91. doi: 10.1016/j.anifeedsci.2019.04.008
18. Baker KM, Stein HH. *Amino acid digestibility and concentration of digestible and metabolizable energy in soybean meal produced from conventional, high-protein, or low-oligosaccharide varieties of soybeans and fed to growing pigs1*. Journal of Animal Science, 2009. **87**(7): p. 2282-2290. doi: 10.2527/jas.2008-1414
19. Navarro DMDL, Liu Y, Bruun TS, Stein HH. *Amino acid digestibility by weanling pigs of processed ingredients originating from soybeans, 00-rapeseeds, or a fermented mixture of plant ingredients.* Journal of Animal Science, 2017. **95**(6): p. 2658-2669. doi: 10.2527/jas.2016.1356
20. González-Vega JC, Stein HH. *Amino acid digestibility in canola, cottonseed, and sunflower products fed to finishing pigs.* Journal of Animal Science, 2012. **90**(12): p. 4391-4400. doi: 10.2527/jas.2011-4631
21. Son AR, Park CS, Park KR, Kim BG. *Amino acid digestibility in plant protein sources fed to growing pigs.* Asian-Australasian journal of animal sciences, 2019. **32**(11): p. 1745-1752. doi: 10.5713/ajas.19.0037
22. Wang JP, Kim JD, Kim JE, Kim IH. *Amino acid digestibility of single cell protein from Corynebacterium ammoniagenes in growing pigs.* Animal Feed Science and Technology, 2013. **180**(1): p. 111-114. doi: 10.1016/j.anifeedsci.2012.12.006
23. Hulshof TG, Bikker P, Van Der Poel AFB, Hendriks WH. *Assessment of protein quality of soybean meal and 00-rapeseed meal toasted in the presence of lignosulfonate by amino acid digestibility in growing pigs and Maillard reaction products.* Journal of Animal Science, 2016. **94**(3): p. 1020-1030. doi: 10.2527/jas.2015-9700
24. Petersen GI, Liu Y, Stein HH. *Coefficient of standardized ileal digestibility of amino acids in corn, soybean meal, corn gluten meal, high-protein distillers dried grains, and field peas fed to weanling pigs.* Animal Feed Science and Technology, 2014. **188**: p. 145-149. doi: 10.1016/j.anifeedsci.2013.11.002
25. Kim K, Goel A, Lee S, Choi Y, Chae B-J. *Comparative ileal amino acid digestibility and growth performance in growing pigs fed different level of canola meal.* Journal of Animal Science and Technology, 2015. **57**(1): p. 21. doi: 10.1186/s40781-015-0055-3
26. Rojas OJ, Stein HH. *Concentration of digestible, metabolizable, and net energy and digestibility of energy and nutrients in fermented soybean meal, conventional soybean meal, and fish meal fed to weanling pigs.* Journal of Animal Science, 2013. **91**(9): p. 4397-4405. doi: 10.2527/jas.2013-6409

27. Oliveira MS, Stein HH. *Digestibility of energy, amino acids, and phosphorus in a novel source of soy protein concentrate and in soybean meal fed to growing pigs.* Journal of Animal Science, 2016. **94**(8): p. 3343-3352. doi: 10.2527/jas.2016-0505
28. Liu Y, Song M, Maison T, Stein HH. *Effects of protein concentration and heat treatment on concentration of digestible and metabolizable energy and on amino acid digestibility in four sources of canola meal fed to growing pigs.* Journal of Animal Science, 2014. **92**(10): p. 4466-4477. doi: 10.2527/jas.2013-7433
29. Liu Y, Jaworski NW, Rojas OJ, Stein HH. *Energy concentration and amino acid digestibility in high protein canola meal, conventional canola meal, and in soybean meal fed to growing pigs.* Animal Feed Science and Technology, 2016. **212**: p. 52-62. doi: 10.1016/j.anifeedsci.2015.11.017
30. Jondreville C, Broecke JVD, Gâtel F, Grosjean F, Cauwenberghe SV, Sève B. *Ileal amino acid digestibility and estimates of endogenous amino acid losses in pigs fed rapeseed meal, sunflower meal and soybean meal.* Canadian Journal of Animal Science, 2000. **80**(3): p. 495-506. doi: 10.4141/a99-104
31. Cervantes-Pahm SK, Stein HH. *Ileal digestibility of amino acids in conventional, fermented, and enzyme-treated soybean meal and in soy protein isolate, fish meal, and casein fed to weanling pigs1.* Journal of Animal Science, 2010. **88**(8): p. 2674-2683. doi: 10.2527/jas.2009-2677
32. Kong C, Kang HG, Kim BG, Kim KH. *Ileal digestibility of amino acids in meat meal and soybean meal fed to growing pigs.* Asian-Australasian journal of animal sciences, 2014. **27**(7): p. 990-995. doi: 10.5713/ajas.2014.14217
33. Lee SA, Ahn JY, Son AR, Kim BG. *Standardized ileal digestibility of amino acids in cereal grains and co-products in growing pigs.* Asian-Australasian journal of animal sciences, 2020. **33**(7): p. 1148-1155. doi: 10.5713/ajas.19.0449
34. Kaewtapee C, Mosenthin R, Nenning S, Wiltafsky M, Schäffler M, Eklund M, et al. *Standardized ileal digestibility of amino acids in European soya bean and rapeseed products fed to growing pigs.* J Anim Physiol Anim Nutr (Berl), 2018. **102**(2): p. e695-e705. doi: 10.1111/jpn.12814
35. Stein HH, Kim SW, Nielsen TT, Easter RA. *Standardized ileal protein and amino acid digestibility by growing pigs and sows.* Journal of Animal Science, 2001. **79**(8): p. 2113-2122. doi: 10.2527/2001.7982113x
36. Zhang HY, Yi JQ, Piao XS, Li PF, Zeng ZK, Wang D, et al. *The Metabolizable Energy Value, Standardized Ileal Digestibility of Amino Acids in Soybean Meal, Soy Protein Concentrate and Fermented Soybean Meal, and the Application of These Products in Early-weaned Piglets.* Asian-Australasian journal of animal sciences, 2013. **26**(5): p. 691-699. doi: 10.5713/ajas.2012.12429
37. Graham A, Derouchey J, Goodband R, Tokach M, Dritz S, Thaler R. *Amino acid digestibility and energy concentration of fermented soybean meal and camelina meal for swine.* Kansas Agricultural Experiment Station Research Reports, 2013: p. 246-255. doi: 10.4148/2378-5977.7035
38. Sarwar G. *The protein digestibility-corrected amino acid score method overestimates quality of proteins containing antinutritional factors and of poorly digestible proteins*

supplemented with limiting amino acids in rats. J Nutr, 1997. **127**(5): p. 758-64. doi: 10.1093/jn/127.5.758

39. Gilani GS, Sepehr E. *Protein Digestibility and Quality in Products Containing Antinutritional Factors Are Adversely Affected by Old Age in Rats.* The Journal of Nutrition, 2003. **133**(1): p. 220-225. doi: 10.1093/jn/133.1.220
40. Mathai JK, Liu Y, Stein HH. *Values for digestible indispensable amino acid scores (DIAAS) for some dairy and plant proteins may better describe protein quality than values calculated using the concept for protein digestibility-corrected amino acid scores (PDCAAS).* British Journal of Nutrition, 2017. **117**(4): p. 490-499. doi: 10.1017/S0007114517000125
41. Hughes GJ, Ryan DJ, Mukherjea R, Schasteen CS. *Protein Digestibility-Corrected Amino Acid Scores (PDCAAS) for Soy Protein Isolates and Concentrate: Criteria for Evaluation.* Journal of Agricultural and Food Chemistry, 2011. **59**(23): p. 12707-12712. doi: 10.1021/jf203220v
42. Rutherfurd SM, Fanning AC, Miller BJ, Moughan PJ. *Protein Digestibility-Corrected Amino Acid Scores and Digestible Indispensable Amino Acid Scores Differentially Describe Protein Quality in Growing Male Rats.* The Journal of Nutrition, 2014. **145**(2): p. 372-379. doi: 10.3945/jn.114.195438
43. Sun M, Mu T, Zhang M, Arogundade LA. *Nutritional assessment and effects of heat processing on digestibility of Chinese sweet potato protein.* Journal of Food Composition and Analysis, 2012. **26**(1): p. 104-110. doi: 10.1016/j.jfca.2012.03.008
44. Fleddermann M, Fechner A, Rößler A, Bähr M, Pastor A, Liebert F, et al. *Nutritional evaluation of rapeseed protein compared to soy protein for quality, plasma amino acids, and nitrogen balance – A randomized cross-over intervention study in humans.* Clinical Nutrition, 2013. **32**(4): p. 519-526. doi: 10.1016/j.clnu.2012.11.005
45. Reynaud Y, Buffière C, Cohade B, Vauris M, Liebermann K, Hafnaoui N, et al. *True ileal amino acid digestibility and digestible indispensable amino acid scores (DIAASs) of plant-based protein foods.* Food Chemistry, 2021. **338**: p. 128020. doi: 10.1016/j.foodchem.2020.128020
46. Marinangeli CPF, House JD. *Potential impact of the digestible indispensable amino acid score as a measure of protein quality on dietary regulations and health.* Nutr Rev, 2017. **75**(8): p. 658-667. doi: 10.1093/nutrit/nux025
47. Anwar D, El-Chaghaby G. *Nutritional quality, amino acid profiles, protein digestibility corrected amino acid scores and antioxidant properties of fried tofu and seitan.* 2019, 2019. **18**(3).